RELION® PROTECTION AND CONTROL

REX640

IEC 60870-5-103 Communication Protocol Manual







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This product complies with the directive of the Council of the European Communities on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive 2014/30/EU) and concerning electrical equipment for use within specified voltage limits (Low-voltage directive 2014/35/EU). This conformity is the result of tests conducted by the third party testing laboratory Intertek in accordance with the product standard EN 60255-26 for the EMC directive, and with the product standards EN 60255-1 and EN 60255-27 for the low voltage directive. The product is designed in accordance with the international standards of the IEC 60255 series.

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1 Introduction

1.1 This manual

The communication protocol manual describes a communication protocol supported by the protection relay. The manual concentrates on vendor-specific implementations.

1.2 Intended audience

This manual addresses the communication system engineer or system integrator responsible for pre-engineering and engineering the communication setup in a substation from a protection relay's perspective.

The system engineer or system integrator must have a basic knowledge of communication in protection and control systems and thorough knowledge of the specific communication protocol.

1.3 Product documentation

1.3.1 Product documentation set

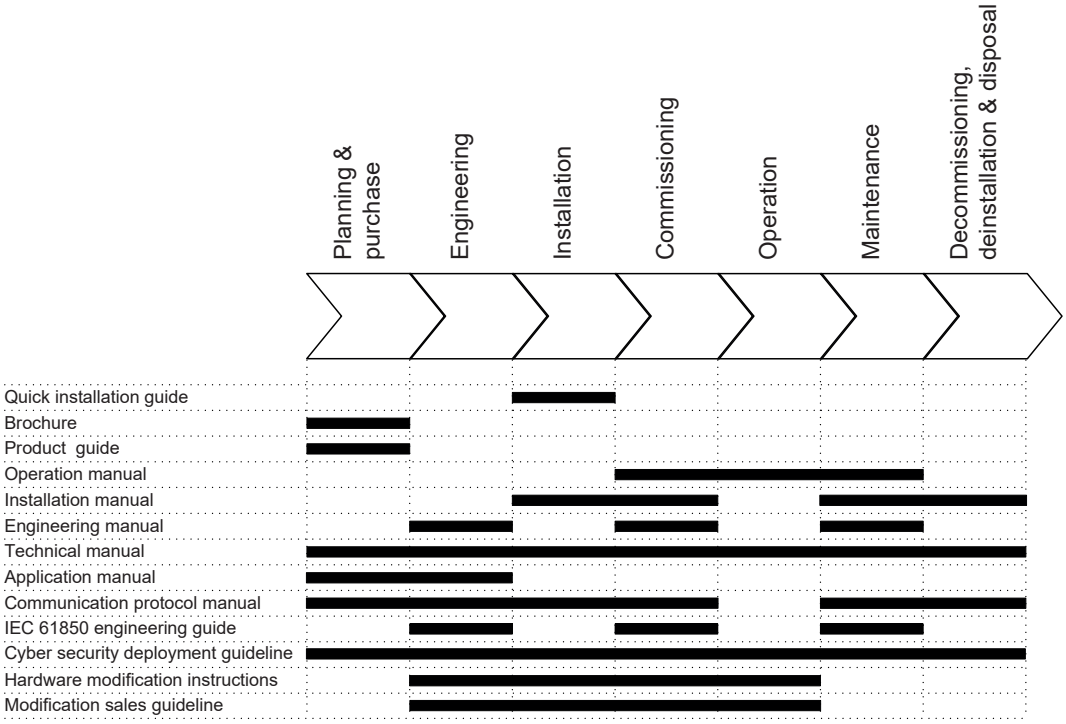


Figure 1: The intended use of documents during the product life cycle

1.3.2 Document revision history

Document revision/ date	Product connectivity level	History
A/2018-12-14	PCL1	First release
B/2020-02-13	PCL2	Content updated to correspond to the product connectivity level
C/2020-12-10	PCL3	Content updated to correspond to the product connectivity level
D/2023-02-15	PCL4	Content updated to correspond to the product connectivity level

1.3.3 Related documentation

Download the latest documents from the ABB Web site *www.abb.com/mediumvoltage*.

1.4 Symbols and conventions

1.4.1 Symbols



The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.



The information icon alerts the reader of important facts and conditions.



The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Menu paths are presented in bold.

  Select **Main menu** > **Settings**.
- Parameter names are shown in italics.

  The function can be enabled and disabled with the *Operation* setting
- Parameter values are indicated with quotation marks.

  The corresponding parameter values are "On" and "Off".
- Input/output messages and monitored data names are shown in Courier font.

  When the function starts, the `START` output is set to TRUE.
- Values of quantities are expressed with a number and an SI unit. The corresponding imperial units may be given in parentheses.
- This document assumes that the parameter setting visibility is "Advanced".

2 IEC 60870-5-103 overview

2.1 IEC 60870-5-103 standard

IEC 60870-5-103 is defined as a companion standard for the informative element of protection equipment. While the official IEC 60870-5-103 standard dates back to 1997, the protocol has its roots in the VDEW6 communication protocol from the late 1980s. A VDEW6 device can be seen as a subset of an IEC 60870-5-103 device but not the opposite.

IEC 60870-5-103 defines communication for a serial, unbalanced link only. Communication speeds are defined as either 9600 or 19200 baud.

Standard documentation

This manual assumes that the reader has some basic knowledge of the IEC 60870-5-103 protocol and the standard IEC 60870 documents relating to the protocol.

Table 1: Standard IEC 60870 documents relating to IEC 60870-5-103

IEC 60870 document part	Description
5-1	Transmission frame formats
5-2	Link transmission procedures
5-3	General structure of application data
5-4	Definition and coding of application information elements
5-5	Basic application functions
5-6	Conformance testing guidelines
5-103	Companion standard for the informative interface of protection equipment.

The IEC 60870-5-1…6 parts are also used in communication protocols like IEC 60870-5-101 and IEC 60870-5-104.

Interoperability and interchangeability

An IEC 60870-5-103 device can be interoperable and interchangeable or only interoperable. Interoperability means that any required application data in the device, which can be coded into an IEC 60870-5-103 data type, can be mapped into the IEC 60870-5-103 address space. This data is recognized by any IEC 60870-5-103 client.

Interchangeability means supporting the application data (informative elements) whose semantics are pre-defined by the IEC 60870-5-103 standard. However, only a very limited set of application data informative elements has been defined by the standard. These sets of data are mainly defined for a single-function protection

relay. REX640 is a multifunctional protection and control relay whose internal data model is based on the IEC 61850 standard.

Interoperability list

The standard requires the IEC 60870-5-103 device to provide an interoperability list, which actually is more an interchangeability list.

Default data mapping principle

Whenever possible, process data is mapped into standard IEC 60870-5-103 function types and information numbers. When this is not possible, the process data is mapped into private function types and information numbers. General principle of the mapping is to keep all process data belonging to the same function design inside the same IEC 60870-5-103 function type definition. However, if this default mapping principle causes interoperability problems with older installations, every available IEC 60870-5-103 process data point can be freely remapped with PCM600. All the mapped data is not in use by default.

3 Vendor-specific implementation

3.1 REX640 implementation

IEC 60870-5-103 is specified for single-function protective equipment with a limited set of process data. Some extensions are necessary for supporting the protection relays.

- Multiple protection functionality
- Objects with four valid positions such as circuit breakers or disconnectors
- Circuit breaker and disconnector control operations
- Class 1 event overflow handling

Since these features are not a part of the IEC 60870-5-103 standard, different vendors might implement them differently. In addition to having relay-specific default settings for private function type and information number application data definitions, the user can reprogram these settings if required. The user can also affect the way in which Class 1 event overflows should be treated and reported.

ASDU type 2 data is generally supported: the generation of a fault number and a relative time stamp for protection-related Class 1 events. Despite the default ASDU type settings, the user can configure either ASDU type 1 or 2 separately for each private Class 1 data.

Different Class 2 measurand value sets are selectable. All the standardized ASDU 3 (Meas I) and ASDU 9 (Meas II) sets can be selected. Additionally, some relay-dependent private ASDU 9 frames are also provided. The user can also freely define an own (private) Class 2 measurand set.

IEC 60870-5-103 disturbance files are supported. The IEC 60870-5-103 communication stack adapter contains a conversion functionality between the protection relay's native disturbance recorder files and the IEC 60870-5-103 specific disturbance recorder data and setting definitions.

3.2 Object data implementation

The IEC 60870-5-103 protocol can only operate on a serial communication link. The standard defines serial data characteristics.

Table 2: Serial data characteristics

Parameter	Value
Com speed	9600 or 19200 bauds
Data bits	8
Parity	Even
Start bits	1
Stop bits	1

The serial communication cards can host one or several serial channels. The IEC 60870-5-103 protocol can operate in up to two instances and therefore supports two IEC 60870-5-103 clients in parallel. The two instances share the same point configuration, but each instance has its own independent Class 1 event buffer. Instances can also have different Class 2 measurand frames. Separate link setting parameters exist for both instances. Setting parameters have the suffixes 1 or 2 depending on the instance.

A function block represents the IEC 60870-5-103 protocol on the relay's application configuration level. The block is named I3CLPRT1 or I3CLPRT2, depending on which of the two protocol instances is in use.



Figure 2: Function block

By default, Instance 1 is active in the protection relay, but needs to be set "On" by the *Operation* parameter to start operating. Instance 1 is active regardless of whether the I3CLPTR1 function block is present in the relay's application configuration or not. For a second client, Instance 2 has to be activated by dragging the I3CLPTR2 function block to the application configuration using PCM600.

3.2.1 Communication link setup

Serial communication link setup in the protection relay consists of serial driver setup and protocol link setup. Serial drivers are related to the physical serial ports of the protection relay. If the protection relay has two physical ports, they are named COM1 and COM2. Setting parameters for COMn (n = 1 or 2) ports are found in **Configuration** > **Communication** > **COMn**. The COMn setting parameters are protocol-independent and related to the physical link. The communication speed is set in the COMn parameters.

For the COM port parameter settings and hardware setup, see the technical manual.

Biasing and bus terminations are selected from the DIP switch located on the communication card.

Once the COMn port is configured, the next step is to attach the IEC 60870-5-103 protocol to the port. This is done by the setting parameters of the communication protocol. The IEC 60870-5-103 protocol setting parameters are located in **Configuration** > **Communication** > **Protocols** > **IEC 60870-5-103** > **I3C0n**.

For example, *Serial port* has to be set to "COM2" and *Address* to "25" to attach IEC 60870-5-103 to the COM2 port and assign the link unit address to 25.

- *Serial port* = "COM2"
- *Address* = "25"

3.2.2 Diagnostic counters

The IEC 60870-5-103 protocol diagnostic counters can be viewed via menu path **Monitoring** > **Communication** > **Protocols** > **IEC 60870-5-103** > **I3C0n**. Counters related to the IEC 60870-5-103 link instances 1 and 2 have the suffixes (n) 1 and 2. The diagnostic counters show complete IEC 60870-5-103 link frames and link errors.

The serial drivers (COMn) have their own diagnostic counters for lower-level serial communication character, error and link messages. The COMn counters count all the messages on the serial line. COMn *Link status* is “Up” when IEC 103 protocol is defined to the port, the cable is correctly connected and there is an IEC 103 client polling on the line. It is possible to reset the diagnostic counters by setting the *Reset counters* value to “True”. The IEC 60870-5-103 instance *Status* is “True” when COMn *Link status* is “Up” and there is an IEC 103 client polling on the line. When the *Status* of the IEC 60870-5-103 instance has never been “True”, the diagnostic counters belonging to the instance contain value “-1”. Counter value “0” in turn means that the instance is in use, but no messages have been detected.

The diagnostic status indication automatically turns from "True" to "False" when there has not been any incoming IEC 60870-5-103 message directed to the protection relay for 15 seconds. The `STATUS` indication output is also visible in the I3CLPRT function blocks through the Application Configuration tool (ACT) in PCM600. This output can be used, for example, for example, for a dedicated indication on the HMI.

Table 3: Protocol diagnostic counters (I3C01 and I3C02)

Attribute	Values (range)	Default	Description
Status	False = Communication inactive True = Communication active	False	Status (read)
Reset counters	False/True	False	True (reset)
Received frames	-1...2147483646		Received frames
Checksum errors	-1...2147483646		Checksum errors
Transmitted frames	-1...2147483646		Transmitted frames

3.3 IEC 60870-5-103 process data

3.3.1 IEC 60870-5-103 data objects

The IEC 60870-5-103 protocol in the protection relay is built on top of the internal IEC 61850 data model. Thus, the IEC 60870-5-103 application data objects and Class 1 events are derived from IEC 61850 data objects and the internal change detection mechanism aimed for IEC 61850 data set reporting. The protection relay has a default IEC 61850 data set configuration, so it is predefined which internal data object changes the protection relay detects.

The mapped IEC 60870-5-103 Class 1 data objects in the protection relay are selected from the objects defined in the IEC 61850 data sets.

3.3.1.1 Update rate of analog and indication protocol data

Update rate of protocol data depends on multiple factors that needs to be considered when communication engineering is done. This chapters describes the mechanism how process data change is updated to IEC 60870-5-103, IEC 60870-5-104, Modbus and DNP3 communication protocols to process it further.

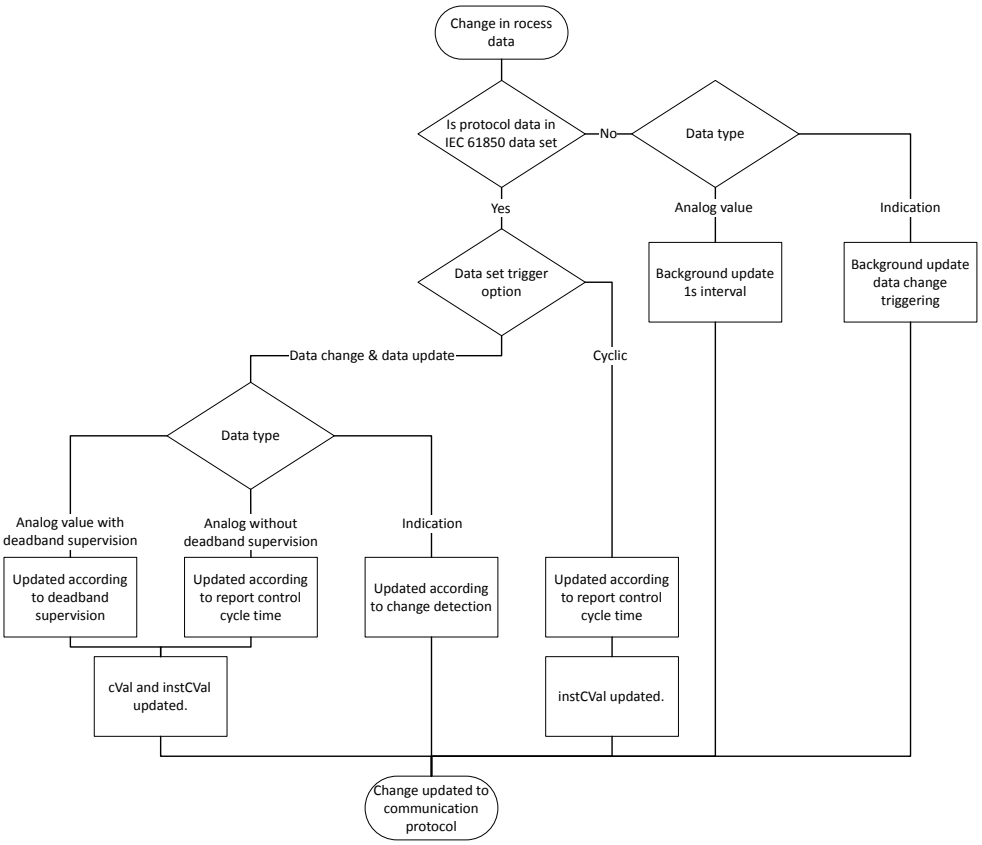


Figure 3: Data flow from process data change to communication protocol

Report Control in IEC 61850

Data update rate is dependent of data set and report control engineering in IEC 61850. In the most cases default values are suitable, but it is necessary to understand all dependencies when modifications are needed.

- Data set content
- Trigger options for report control
- Signals selected in communication management (instantaneous or deadband supervised value)

Engineering of event reporting is described in IEC 61850 Engineering Guide.

Application function deadband supervision

The deadband supervision function reports the measured value according to integrated changes over a time period. The sensitivity of reporting can be adjusted with the *X deadband* parameter of a measurement function. By default, deadband supervision defines update rate of analog values to communication protocol. Technical manual describes dead band supervision in more details.

3.3.2 Indications

The IEC 60870-5-103 standard defines indications to be of ON/OFF type. The value coding for indications is always DPI, where only values 1 and 2 (binary 01 and 10) are used. Value 1 means OFF and value 2 means ON. Indications are assigned to IEC 60870-5-103 Class 1 data transactions.

Indications relate to general purpose signals or protection signals (start and trip). The standard defines two ASDU object types for indications: ASDU 1 and ASDU 2. ASDU 1 type is intended for general purpose objects and ASDU 2 type for protection objects. These ASDU types are shown as TypeID 1 and TypeID 2 in the Communication Management tool of PCM600.

The IEC 60870-5-103 standard was originally defined for protective equipment only. Therefore the standard does not include circuit breaker control and object definitions. For circuit breaker and disconnector position information the IEC 60870-5-103 DPI value is extended to also include values 0 and 3 (binary 00 and 11). These values represent the four-pole object's intermediate and faulty positions.

3.3.2.1 ASDU 2 type fault number and relative time data

In addition to the absolute event time stamp, the ASDU 2 type requires that the message also contains a fault number and relative time data. However, these are not available in the IEC 61850 data model. Therefore, the IEC 60870-5-103 stack automatically creates a fault number which is incremented each time the protection relay's internal IEC 61850 data attribute LD0.LEDPTRC1.Str.general (Start LED) is activated. The relative time is calculated from the time stamp of this IEC 61850 data attribute and is represented as a 16-bit millisecond value which saturates to its maximum value 65535 ms if necessary.

3.3.2.2 Configuring of IEC 60870-5-103 indications

With PCM600 the user can reconfigure the default IEC 60870-5-103 indication definitions.

- Add or remove existing indications
- Change function type/information number definition of indication
- Restore default function type/information number definition of indications
- Change GI assignment of indications
- Change ASDU type used by the indications
- Change the data coding value (DPI) representation (four-pole objects only)
- Suppress falling edge Class 1 events (non-standard feature)

Function type 0 has a special meaning for indications. An indication with *FunType* = ”0” is changed into parameter *DevFunType* value for event reporting, general interrogation, and recorded data.

Changing the DPI value representation means that the DPI value only shows the standard defined ON and OFF values instead of four-pole values ON, OFF, INTERMEDIATE and FAULTY.

Table 4: Conversion rule for the DPI value representation

True object position	IEC 60870-5-103 value
CLOSED	ON
OPEN	OFF
INTERMEDIATE	ON
FAULTY	ON

Suppressing the falling edge, that is the OFF Class 1 events, is useful in some cases. For example, the Operate-OFF signals could often be omitted. This decreases the amount of Class 1 events and thus saves the bandwidth.

Suppressing the OFF event is an non-standard feature. The standard requires that every position change of a Class 1 object is reported.

The difference between a readable/writable object and a write-only (control-only) object is not visible in Communication Management of PCM600. An object is write-only if it is located on an IEC 61850 Oper.ctlVal data attribute. In this case, the GI enabling and other possible event configuration settings are meaningless.

3.3.2.3 Class 1 event overflow

The size of the Class 1 event buffer in the protection relay is 500 events. The IEC 60870-5-103 standard does not define any method of indicating Class 1 event buffer overflows. Instead, the standard suggests that the client performs a general interrogation integrity scan every 15 minutes (or more), to detect indications that have not been updated spontaneously.

The protection relay contains a special overflow Class 1 ASDU 1 indication. The default setting of this overflow indication is FUN = 10, INF = 255. The FUN/INF definition can be changed if required. This object creates an ON event when the overflow occurs. It is also possible to take the overflow operation completely out of use and operate without any overflow indication as the IEC 60870-5-103 standard defines. The IEC 60870-5-103 instances can also be configured differently.

There are four setting parameters related to the IEC 60870-5-103 Class 1 overflow operation in the protection relay. The setting parameters are located in **Configuration** > **Communication** > **Protocols** > **IEC 60870-5-103** > **I3C0n** (parameter suffix n = 1 or 2, depending on the instance).

- *Class1OvInd n*: takes the overflow object into use. Settings: "No indication", "Both edges", "Rising edge".
- *Class1OvFType n*: defines the Function Type (FUN) for the overflow indication.
- *Class1OvInfNo n*: defines the Information Number (INF) for the overflow indication.
- *Class1OvBackOff n*: defines how many events have to be emptied from the Class 1 event buffer until new ones are collected. Default setting is “500” (meaning the whole event buffer must be emptied).

The overflow operation preserves the oldest events in the buffer. The overflow Class 1 event is given the time stamp of the indication that first created the overflow situation. In other words, the indication event is lost and replaced with the Class 1 overflow event.

3.3.2.4 Chronology of Class 1 events

In some special cases Class 1 events can be transmitted in a wrong chronological order. However, this never occurs for the same object and the time stamps for all Class 1 events are always correct. The reasons for the disorder can be the filtering time of a physical digital input, or suppressing of the intermediate state of four-pole objects. The event detection time and reporting time are different in these cases.

3.3.2.5 Class 1 data message priorities

1. User command responses (highest priority)
2. Class 1 change events
3. Disturbance file transfer messages
4. General interrogation data responses (lowest priority)

Disturbance file transfer increases the overall response time for Class 1 change events on the IEC 60870-5-103 interface. The standard does not suggest any particular priority division between these two message types. It is therefore possible to configure the priority division between the Class 1 change events and disturbance file transfer messages. There are three possible priority levels:

- Ev High: Class 1 change events have higher priority
- Ev/DR Equal: Priority is equal between the two message types
- DR High: Disturbance file transfer has higher priority

The setting parameter for the priority level is located via **Configuration** > **Communication** > **Protocols** > **IEC 60870-5-103** > **I3C0n** > **Class1Priority**. The default level is "Ev High".

3.3.2.6 Virtual indication objects

The user-definable HMI virtual indication objects, LEDGGIO, are also visible as IEC 60870-5-103 Class 1 data. The objects can be used in two modes: having two states, Off-Alarm, or three states, Off-OK-Alarm. There are two alternative IEC 60870-5-103 mappings available for the objects depending on how they are used.

- If the objects are configured to show two positions, for example Off-OK or Off-Alarm, object positions can be viewed through the *LED Type 1* object variants. DPI values are “01” for Off and “10” for OK or Alarm.
- If the objects are configured to show all three positions or the two positions OK-Alarm, *LED Type 2* can be used. *LED Type 2* data is by default configured to show all the three possible LED state values in the extended DPI data octet. DPI values are “01” for Off, “10” for OK and “11” for Alarm.

3.3.3 Analog events

Some selected analog values in the relay are available as ASDU 4 or TypeID 4 analog Class 1 events. Depending on the supported applications, the values may include the registered maximum current and voltage values during a fault and fault locator registrations. For example, tap changer position values can be obtained through TypeID 4.

There is no internal prioritization between TypeID 4 and indication events in the protection relay. Enabling events, for example for fault record function, can cause considerable delay in indication event reporting. It should be carefully considered which TypeID 4 data is included in event reporting by setting “TypeId4 in use” in Communication Management.

Fault record data can be configured to be generated only at operation situations. At operation, the circuit breaker opens, and after that, no more protection or indication events are generated by the protection relay. In such case, the trailing fault record data does not overload the event buffer.

3.3.3.1 Configuring of analog events

The selection of available TypeID 4 values can be seen in the measurand list of Communication Management in PCM600 with other analog values of the relay. The object state column shows if a measurand is a TypeID 4 object, either in use or not. By default, most of these objects are not in use. The predefined private function types and information numbers for these objects can be edited freely.

3.3.3.2 Value interpretation

According to the IEC 60870-5-103 standard, the TypeID 4 value coding format is 32-bit floating point. Since most of the measurands in the relay are natively of this format, no rescaling of the analog values is needed. If the native value is an integer, then the relay automatically converts this into floating point for TypeID 4. The scaling factor, seen in the measurands table, does not affect TypeID 4 objects.

3.3.4 Controls

The IEC 60870-5-103 standard defines remote control of indications or control of objects without corresponding indication. An example of a controllable indication could be a circuit breaker ON/OFF whose position can be monitored as a normal ASDU 1 indication, and which also can be controlled ON or OFF by the IEC 60870-5-103 client. An example of a control object without corresponding indication could be an acknowledge object, for example LED Reset.

According to the standard, the remote control operations are performed using the ASDU 20 object type. Controllable indications can usually be controlled into two positions, ON or OFF. Acknowledge points can only be controlled ON. If the protection relay is in local mode, the remote circuit breaker controls are rejected.

3.3.4.1 Circuit breaker control model

A circuit breaker can only be controlled with DIRECT ON/OFF commands. This is due to the limitations in the IEC 60870-5-103 standard. If the protection relay’s internal (IEC 61850) circuit breaker control model is set to Select-Before-Operate, the IEC 60870-5-103 stack internally emulates both SELECT and OPERATE commands toward the circuit breaker. To the IEC 60870-5-103 client, the control operation always appears to be DIRECT.

3.3.4.2 Local, Remote, Station, All and Off states

The relay can be set to five different states: Local, Remote, Station, All or Off. Circuit breaker controls from an IEC 60870-5-103 client are possible when the relay is in the Remote, Station or All state. When the relay is in the Local or Off state, the circuit breaker cannot be controlled via IEC 60870-5-103. The IEC 60870-5-103 mapping includes two ASDU1 ON or OFF points dealing with these states.

The Local or Remote ON or OFF indication, CTRL.LLN0. Loc, is the easiest signal to use on the client side. The indication shows "ON" when the relay is in the Local or Off state, and "OFF" when the relay is in the Remote, Station or All state. This object tells if control is possible from the IEC 60870-5-103 client at a particular moment. This object is sufficient for most users.

The relay cannot distinguish if the IEC 60870-5-103 client is of the Station or Remote (NCC) type. However, it is possible to locally reject the control operations on the IEC 60870-5-103 client side based on this indication and information about the client type (NCC or Station).

3.3.4.3 Control operation rejections

The IEC 60870-5-103 standard does not take into account that the protection relay could have several remote client connections, so a remote control operation could be rejected if another remote client is performing a control operation at the same time. The protection relay handles the remote command rejection in three ways.

- Remote command to an existing object while the protection relay is in Local mode or in Remote mode, but control operation is blocked for some reason (for example, simultaneous control being performed by another remote client):
  - The command is accepted on link level (Link ACK)
  - The command is rejected on application level (Negative response, COT=21)
- Remote command while the protection relay is still performing the previous command of the same client:
  - The command is rejected on link level (Link NAK, DFC=1)
- Remote command performed on a non-existing object:
  - The command is rejected on link level (Link NAK, DFC=0)

In the last two cases the DFC flag is used to distinguish the faults.

3.3.5 Measurands

Measurand object transmission is defined by the IEC 60870-5-103 standard. The standard does not define any method for transporting integer values like counters or enumeral objects.

Measurands are transmitted as a set of Class 2 data, referred to as a Class 2 measurands frame. According to the standard the coding of IEC 60870-5-103 measurand objects must be 13 bit signed values in the range of -1…+1.

When an IEC 60870-5-103 measurand, for example phase current, is scaled as 2.4, it means that the measurand value 1 corresponds to 2.4 × In, measurand value 0.5 corresponds to 1.2 × In, and so on. If the measurand value in this case exceeds 2.4 × In, the IEC 60870-5-103 object value saturates at its maximum value and an overflow flag is set in the IEC 60870-5-103 object transmission.

3.3.5.1 Class 2 measurands

The interchangeable part of the IEC 60870-5-103 standard defines that only five Class 2 measurands frames exist. The measurands transmitted in these frames relate to current and voltage values only. The allowed scale factors, meaning |max values| of per unit coded measurands, are 1.2 or 2.4. The protection relay supports all five interchangeable Class 2 measurand frames defined by the standard.

Table 5: Interchangeable Class 2 measurand frames

Frame number	ASDU	FUN [1]	INF	Num of data	Data in the Class 2 frame
1	3	0	144	1	IL2
2	3	0	145	2	IL2, U12
3	3	0	146	4	IL2, U12, P3, Q3
4	3	0	147	2	Io, Uo
5	9	0	148	9	IL1, IL2, IL3, UL1, UL2, UL3, P3, Q3, f

3.3.5.2 Other Class 2 measurand frames

Class 2 frame 6

This frame contains predefined mappings to most of the measurands in the protection relay. If the relay configuration does not contain some of the measurands of Class 2 frame 6, then the corresponding values are set as constant 0. Trailing 0 values are cut from the frame and the frame becomes shorter. The default function type/information number definitions for frame 6 are FUN = 10, INF = 236.

Class 2 frame 7

This frame may be selected, but it is currently empty. The default function type/ information number definitions for frame 7 are FUN = 10, INF= 237.

Table 6: Function type (FUN) and Information number (INF) definitions for frames 6 and 7

Frame number	ASDU	FUN	INF	Num of data	Data in Class 2 frame
6	9	10	236	21 (max)	IL1, IL2, IL3, Io, UL1, UL2, UL3, U12, U23, U31, Uo, P, Q, Pf, Freq, SeqCurrent [Pos,Neg,Zro], SeqVoltage [Pos,Neg,Zro]
7	9	10	237	0	-

[1] FUN = 0 means that the Function type is coded as the Device function type which in turn is defined by the setting parameter *DevFunType n.*

User-definable Class 2 frame 0

As a third option, an own private Class 2 frame can freely be composed using PCM600. The function type and information number can also be configured for this user-definable Class 2 frame through the setting parameters *UsrFType n* and *UsrInfNo n* via **Configuration** > **Communication** > **Protocols** > **IEC 60870-5-103** > **I3C0n**. Default values are FUN = 10, INF = 230.

3.3.5.3 Selection of Class 2 frame

The Class 2 frame is selected with parameter *Frame1InUse n*. The user can select between the user-defined frame 0, standard frames 1...5, or relay-dependent frames 6 and 7. Selection of frames 0...7 is possible even if the protection relay does not produce all the values required by the Class 2 frames. The values that are not available in the protection relay are set to 0 in the selected Class 2 data frame.

Simultaneous use of several Class 2 frames

Using several Class 2 frames simultaneously is not a standard feature. However, it is possible to define that the protection relay sends more than one Class 2 frame to the client. Up to four Class 2 frames can be defined. The additional Class 2 frame selection is defined in setting parameters *Frame2InUse n*, *Frame3InUse* and *Frame4InUse*. For example, if *Frame1InUse* is set to "Private frame 6" and *Frame2InUse* is set to " User frame ", the protection relay gives out Class 2 "Private frame 6" and Class 2 "User frame" responses to every second Class 2 poll made by the client.

3.3.5.4 Scaling of Class 2 measurands

All Class 2 measurands can be rescaled separately using PCM600. The scale value defines the highest value expressed by the IEC 60870-5-103 measurand. Values 1.2 and 2.4 are standard values but the protection relay can accept any value. For example, scale 4.0 for IL1 enlarges the measurand range to -4.0…+4.0 × In. The IEC 60870-5-103 measurand value is always signed even if the original value is a positive-only value.

3.3.5.5 Unsupported analog values

The IEC 60870-5-103 protocol does not support the transmission of counters or integrated totals meaning cumulative values such as energy values. The IEC Technical Committee 57 has defined the companion standard IEC 60870-5-102 for this purpose.

3.3.5.6 Measurand events and registration objects

The relay contains some regular measurands that can be received as ASDU 4 or TypeID 4 change events through the Class 1 buffer. All these objects are disabled by default. They can be located in the point list and enabled through PCM600.

Depending on the relay configuration, the internal fault record can register various start current and voltage and maximum current and voltage values during a fault situation. The fault reactance and distance to fault can also be registered, providing that the relay variant supports the fault locator function. The fault record data is

available as ASDU 4 Class 1 objects. All these objects are disabled by default. They can be located in the point list and enabled through PCM600.

Fault records

The fault record needs to be separately configured for the desired registration actions. For example, registrations can be defined to be made only in operate (trip) situation, or also at any start on/off situation. The fault record function component contains all registration object values that could have been used by the relay. It depends on the relay type and the relay configuration if a certain registration is made. Objects that are not registered remain constantly at value 0.

The fault record registers several values at the same time. All values belonging to the same fault get the same ASDU 4 event time stamp. This makes it easy to collect registrations belonging to the same fault situation.

ASDU 4 events can easily fill up the Class 1 event buffer, therefore the fault record can, for example, be configured to register only after an operate (trip) event. In such a case, the registration value events are generated and transmitted following the last “Breaker open” event when the relay is idle.

3.3.6 Energy counters

Counters are not defined by the IEC 60870-5-103 standard in general. A private data unit ASDU 205 is used to define counters. All IEC 60870-5-103 clients do not support this non-standard ASDU type.

Table 7: ASDU 205 Class1 event message

Octets	Description
205	Type ID
0×81	VSQ (= one data)
1	COT (= spontaneous)
Addr	Unit address
FUN	Function type
INF	Information number
LSB	Counter value
:	
:	
MSB	
[ms]	Time stamp
[min]	
[hour]	

Table 8: Counter value structure

Octet	Description
1	Bits 0...7 = Counter bits 0…7
2	Bits 0…7 = Counter bits 8…15

Table continues on the next page

Octet	Description
3	Bits 0…7 = Counter bits 16..23
4	Bits 0…3 = Counter bits 24...27, Bit 4= sign, Bits 5...7 = Not used

3.3.6.1 Operation principle

The energy counter values are frozen and propagated as ASDU 205 Class1 events with a time stamp based on the send criteria that can be freely defined.

Freezing and sending

The EC_FRZ binary inputs can be seen in the I3CLPRT function blocks through Application Configuration in PCM600. When a function block detects a rising edge "1" on the EC_FRZ input, it freezes and latches the defined counter values in the protection relay's real time. Thereafter ASDU205 counter events are created in the Class1 buffer.

Alternatives for EC_FRZ activation

- A common alternative for the operation is that counters should be frozen and transmitted cyclically, once a minute. This can be achieved in Application Configuration by defining a 1-minute timer that creates a pulse to the EC_FRZ input. If required it is possible to define other values for the timer, for example, 10 minutes, 15 minutes, 60 minutes and so on.
- If there are several IEC 60870-5-103 units in the network that should transmit ASDU 205 values, freezing can be done at the same moment. The timer signal in one of the units can be connected to a physical binary output signal and wired to physical binary inputs in the other units. Thereafter, the freezing pulse can be synchronized in all the units.
- Freezing can also be triggered from the IEC 60870-5-103 client unit. The protection relay contains generic control objects like SPCGAPC that can be written from the client. A generic control object is defined as pulsed type and connected to the EC_FRZ input with Application Configuration. If the generic control object in parallel can be connected to a binary output and wired to other units, a broadcast freeze can be achieved.

3.3.6.2 Interpretation of the counter values

The ASDU 205 counters are derived from the corresponding IEC 61850 counter objects. Due to range differences, the scaling of the IEC 61850 counter objects is not similar to the expected ASDU 205 scaling. With the default settings the difference is approximately:

ASDU 205 value = 0.2684 × IEC 61850 counter value

Information about how to interpret the IEC 61850 counter values is found elsewhere in the relay documentation.

The scale factor is the quotient between the maximum range values of the different counter types.

ASDU 205 counter range is 0…268435455 (0…0×0FFFFFF)

IEC 61850 counter range is 0…999999999 (0…0×3B9AC9FF)

For calculation purposes, the IEC 60870-5-103 protocol needs to know the source counter roll-over value. The roll-over values can be defined through the scale value in Communication Management. Default setting is 1000000000 (999999999 + 1).

3.3.7 Accessing of non-protocol-mapped data

The protection relay application includes some general-purpose I/O data which is by default mapped to this protocol. See the point list manual for the exact mappings.

The general-purpose objects can be connected to any internal object in the protection relay configuration application using Application Configuration or Signal Matrix. This gives additional opportunities to the protocols.

Example 1

Due to security reasons, protocols do not contain mappings for the direct control of physical outputs. This way, the client cannot accidentally write a change to a physical output.

It is possible to connect general-purpose outputs to physical outputs using Application Configuration. The general-purpose output can also be controlled from the protocol.

Example 2

The legacy protocol default mappings are a selection of the most important signals produced by the IEC 61850-based protection relay applications. The manufacturer's selection of important signals may not always serve every customer.

Any non-protocol-mapped internal signal can be freely connected to a general-purpose input object via Application Configuration. This object can then be accessed by the legacy protocol as regular protocol application data.

Example 3

The basic IEC 61850 application model of the protection relay produces a great amount of information. In some cases, this is more than what is feasible to transport through a legacy protocol. Via Communication Management in PCM600, unnecessary data objects can be excluded from the legacy protocol.

However, in some cases a better solution is to OR together several internal signals into one general signal. This OR output can be connected to a general-purpose input and accessed by the legacy protocol as regular protocol application data.



The general-purpose input object and OR function block may cause delays to time stamps.

3.4 Other IEC 60870-5-103 data

3.4.1 Changing of parameter setting group

The relay supports remote changing of the used parameter setting group. The six setting groups in the relay are coded as objects Characteristic 1…Characteristic 6 using standard information numbers 23…28.

On the relay's native IEC 61850 model level the parameter setting group change object is also a setting parameter, not a process object as it is assumed in the IEC 60870-5-103 standard. In a normal case, any parameter setting change in the relay requires that the client first reserves the parameter setting rights, then changes the setting and finally stores the change. An exception to this is the *Parameter setting group change* parameter. Writing remotely to this parameter automatically includes reservation and storing. Consequently, the setting group writing fails if parameter settings are edited simultaneously via the HMI, or remotely from another client.

3.4.2 Device identification

3.4.2.1 Device function type

The IEC 60870-5-103 standard requires that a protection relay is identified as a certain device type. The standard has only the following single functional device types:

- 128 distance protection
- 160 overcurrent protection device
- 176 transformer differential protection
- 192 line differential protection

Since the protection relay is multifunctional, the device type is set to the private function type value 9 as default. However, if this definition causes incompatibility with some client systems, the definition can be changed through the *DevFunType n* parameter.

The value in *DevFunType n* is automatically assigned to all IEC 60870-5-103 data points that have their function type defined as 0. The user has to ensure that no similar IEC 60870-5-103 point definitions already exist with the same function type and information number.

3.4.2.2 Device identification code

The device identification information for the protection relay consists of three parts.

- Compatibility level (COL) = 2
- Eight character ASCII ID string: "REX640"
- Internal code = 4 octets

3.4.3 Time synchronization

Time synchronization over IEC 60870-5-103 is supported. This requires that the protection relay's global *Time Sychronization Source* parameter (in **Configuration** > **Time** > **Synchronization** > **Synch source**) is set to "IEC 60870-5-103" mode. If some other time synchronization source is configured for the protection relay, the IEC 60870-5-103 time synchronization messages are rejected.

3.4.4 Block monitoring

The *Block monitoring* setting parameter prevents the relay from sending Class 1 events. Two blocking modes exist: the relay can keep or discard the occurring Class 1 events during the blocking period. In any case, every Class 1 data object updates its momentary value with the latest change event. A general interrogation following the blocking period always reveals the present state of all Class 1 data objects. When blocking mode is activated, it is reported by the protection relay with event code Fun 0 (=DevFunType) Inf 20. If the event buffer overflows during "Blocked Keep Events" mode, the oldest events are retained. The *Block Monitoring* parameter is found in **Configuration** > **Communication** > **Protocols** > **IEC 60870-5-103** > **I3C0n**.

3.5 Disturbance recorder file transfer

The protection relay includes a functionality that converts the protection relay's natively captured disturbance file contents into IEC 60870-5-103 disturbance data. Disturbance files are also available as standard COMTRADE files through PCM600 or HMI.

The IEC 60870-5-103 disturbance recorder's spontaneous Class 1 notification message (disturbance recorder file directory ASDU 23) can be enabled or disabled via the setting parameter *DR Notification n*. The default setting is disabled. This notification message informs the IEC 60870-5-103 client that the disturbance file directory has been updated. Usually this means that a new disturbance recording has been captured and stored by the system. If a disturbance recorder file transfer is not required from the protection relay, the notification is unnecessary.

3.5.1 Disturbance recorder file directory (ASDU 23)

The disturbance recorder files IEC 60870-5-103 identification in the protection relay is a sequential 16-bit number starting from 1 at protection relay's reset and incrementing for each new captured disturbance recorder file.



IEC 60870-5-103 standard defines the disturbance recorder file identification to be the fault number (FAN), which is the same number that is generated by ASDU 2 Class 1 events during the same fault. The protection relay could theoretically capture several disturbance recorder files during the same fault, be triggered by a non-protection signal, triggered externally or triggered periodically. That is why the disturbance recorder file does not correspond to any particular fault detected by the protection relay.

The IEC 60870-5-103 directory information octet SOF bits TP, TEST and OTEV are not supported by the protection relay's native disturbance recorder file system. These bits are therefore always set to 0. The TM bit is however supported.

The IEC 60870-5-103 disturbance recorder directory structure only allows up to eight disturbance recorder files to be available in the protection relay. If the protection relay's native disturbance recorder file system contains more than eight disturbance recorder files, only the latest eight files are accessible through the IEC 60870-5-103 protocol.

The IEC 60870-5-103 disturbance recorder file directory can be requested by the client at any time by asking for GI data. In addition, the disturbance recorder file directory should be sent spontaneously by the protection relay (through Class 1 report) to the client if the directory structure changes. A change in the directory structure normally means that a new disturbance recorder file has been captured and stored. It could also mean that a disturbance recorder file is deleted from the native disturbance recorder file system. Disturbance recorder files can be deleted by the IEC 60870-5-103 client. The recorder file is deleted by the protection relay after it has been sent to the IEC 60870-5-103 client according to the standard. Disturbance recorder files can also be deleted from PCM600, HMI or the IEC 60870-5-103 client.

The protection relay stores only one instance of disturbance records in memory for IEC 60870-5-103 protocol. Reading a complete recording deletes it from the common database. Thus, it is recommended to use only one protocol client to read disturbance records via IEC 60870-5-103 protocol.

3.5.2 Disturbance recorder channel identification

IEC 60870-5-103 defines channels (analog data) and tags (digital data) to be transferred from a disturbance recorder file. The IEC 60870-5-103 file transfer is random access, meaning that the client can select what information to read from the file.

The standard defines the identification, ACC (actual channel), for eight channels, numbered 1...8. For example, when a client requests channel 1, it always means phase current L1. The protection relay supports all the eight IEC 60870-5-103 standard channel numbers and in addition defines some private channel numbers. Private channel numbers start from ACC 64 as is defined by the standard.

Table 9: Disturbance channel identification

ACC Number	Signal
1	Phase current IL1-A
2	Phase current IL2-A
3	Phase current IL3-A
4	Neutral current Io-A
5	Phase voltage U1-A or phase-to-phase voltage U12-A
6	Phase voltage U2-A or phase-to-phase voltage U23-A
7	Phase voltage U3-A or phase-to-phase voltage U31-A
8	Neutral voltage Uo-A
Private channel numbers	

Table continues on the next page

ACC Number	Signal
64	Neutral current Io-B
65	Phase current IL1-B
66	Phase current IL2-B
67	Phase current IL3-B
68	Neutral voltage Uo-B
69	Phase voltage U1-B or phase-to-phase voltage U12-B
70	Phase voltage U2-B or phase-to-phase voltage U23-B
71	Phase voltage U3-B or phase-to-phase voltage U31-B

Disturbance recorder channels are the physical measurement inputs to the protection relay. It depends on the protection relay type if all the disturbance recorder channel signals are available or not. The protection relay measures voltages either between phase and ground or between phases. The contents in ACC 5...8 and 69...71 are coupled directly to these voltage measurements.

The default setting of the native disturbance recorder supports the channels, meaning physical analog input channels, listed in *Table 9*. User-defined channels in the IEC 60870-5-103 files appear as ACC=255 (unknown channel).

Disturbance recorder channels can be selected from the disturbance recorder's configuration settings. Only the selected channels are included in the IEC 60870-5-103 files.

3.5.3 Disturbance recorder tag identification

According to the IEC 60870-5-103 standard the disturbance recorder tags (digital signals) are identified by the same function type/information number combination that corresponds to the signal in the normal IEC 60870-5-103 Class 1 event transfer. This rule is followed by the protection relay if the indication signal is connected only to the disturbance recorder digital channel. If the signal, for example, is OR-ed together with other internal digital signals or if the signal is not present in the normal IEC 60870-5-103 Class 1 data, then the tag identification is always:

Function type = 5

Information number = disturbance recorder's digital channel number

Tags are always sent in digital channel order.

3.5.4 Disturbance recorder transfer

When the IEC 60870-5-103 client selects a disturbance recording to be transferred, the corresponding disturbance recording data is fetched from the protection relay's native disturbance recorder file, cached and converted into IEC 60870-5-103 format. This operation may take some time depending on the size of the disturbance recorder file.

Once an IEC 60870-5-103 disturbance recorder channel or tag transmission is in progress, it can be performed till the end, even if the native original disturbance

recorder file simultaneously is deleted from the system. Unless the IEC 60870-5-103 client does not abort the transmission.

Disturbance recorder transfer verification

The IEC 60870-5-103 disturbance recorder file transfer implemented in the protection relay has been verified by a third-party client software.

3.6 Non-standard features

The IEC 60870-5-103 protocol is defined for a single-function protection device with limited set of functionalities. The problem that arises in a multiple functionality protection relay is mainly the large amount of Class 1 events generated during a fault. Modern multifunctional protection relays may create 20-40 times more events during a fault compared to single-function devices that were the basis for the IEC 60870-5-103 standard. IEC 60870-5-103 has some limitations:

- The protocol is defined to be used on serial interfaces (max. allowed baud rate 19200 bauds).
- The protocol can only transfer one change event per Class 1 poll.
- Unbalanced communication: the client must poll all protection relays in the network cyclically which means that the client cannot remain polling out events from a certain protection relay for a very long time since this degrades the overall response time from the whole substation.

The protection relay includes some possibilities to speed up and optimize the IEC 60870-5-103 communication. However, it is necessary to verify that these features are accepted by the network and the IEC 60870-5-103 client used.

- Remove unnecessary Class 1 objects. Even if the protection relay can provide a lot of valuable information, it is not feasible to send everything on slower serial links.
- Remove falling edge events for selected Class 1 objects.
- Serial communication speed can be increased up to 115.2 kbauds. However, all protection relays on a multidrop link must support the same communication speed.
- GI data optimization which means that not all data is sent as GI data in a GI cycle.

3.6.1 General interrogation optimization

The client should initiate a GI always after the protection relay has reported a Class 1 event buffer overflow. The protection relay starts then to send GI data through the Class 1 event buffer. As the standard defines, new events always have higher send priority than GI data in the protection relay's Class 1 buffer. The standard also defines that all data that is subject to GI is sent by the protection relay.

Optimization of GI data is a non-standard feature. As default the *Optimize GI n* parameter is set to "Standard behaviour", meaning that the GI cycle operates as defined by the standard. GI optimization strives to send less data to the client through the Class 1 report. The GI optimization in the protection relay is based on two facts:

- It is enough to send certain Class 1 data once to the client after a GI initiation. This could be either the GI data report or a spontaneously updated data report. In either case the client has the true position of the Class 1 data in its database.
- The protection relay also remembers which Class 1 data object changes have overflowed. After the GI initiation only these marked Class 1 data objects are reported through the GI cycle.

Table 10: GI optimization alternatives

Parameter value	Description
Standard behaviour	No optimization.
Skip spontaneous	Enables the protection relay to not send GI data for those objects that have already been spontaneously updated by the protection relay (that is, sent as Class 1 events) after the initiation of a GI.
Only overflown	Enables the protection relay to send only the Class 1 data that has overflowed in the Class 1 buffer. The first GI cycle initiated after a client Reset CU or Reset FCB does not use this feature, that is, the protection relay keeps track of that it actually has reported a value to the client at least once since the last reset.
Combined	Combines the two optimization features explained above.

3.7 Advanced Protocol Customization

Different advanced customization features are supported by the protocol; these features can be enabled via the Prtl Customization configuration parameter. The Prtl Customization parameter is a 31-bit bitmask. Currently, this parameter is reserved for future use.



Possible firmware version dependent expansions to customization parameter can be queried from ABB Customer support.

The use of advanced customization features can be monitored in **Monitoring** > **Communication** > **Protocols** > **IEC103 (n)**.

4 IEC 60870-5-103 parameters and diagnostics

4.1 Parameter list

The IEC 60870-5-103 parameters can be accessed with PCM600 or via the HMI path **Configuration** > **Communication** > **Protocols** > **IEC 60870-5-103** > **I3C0n**.

Some parameters are not visible in the “Basic” setting visibility mode. To view all parameters, use “Advanced” setting visibility mode in Parameter Setting in PCM600 and HMI.

4.1.1 IEC 103 Settings

Table 11: Non group settings

Parameter	Values (Range)	Unit	Step	Default	Description
Operation	1=on 5=off			5=off	Selects if this protocol instance is enabled or disabled
Serial port	1=COM 1 2=COM 2			1=COM 1	COM port
Address	1...255		1	1	Unit address
Start delay	0...20	char	1	4	Start frame delay in chars
End delay	0...20	char	1	4	End frame delay in chars
DevFunType	0...255		1	9	Device Function Type
UsrFunType	0...255		1	10	Function type for User Class 2 Frame
UsrInfNo	0...255		1	230	Information Number for User Class2 Frame
Class1Priority	0=Ev High 1=Ev/DR Equal 2=DR High			0=Ev High	Class 1 data sending priority relationship between Events and Disturbance Recorder data.
Class2Interval	0...86400	s	1	0	Interval in seconds to send class 2 response
Frame1InUse	-1=Not in use 0=User frame 1=Standard frame 1 2=Standard frame 2 3=Standard frame 3 4=Standard frame 4			6=Private frame 6	Active Class2 Frame 1

Table continues on the next page

Parameter	Values (Range)	Unit	Step	Default	Description
	5=Standard frame 5 6=Private frame 6 7=Private frame 7				
Frame2InUse	-1=Not in use 0=User frame 1=Standard frame 1 2=Standard frame 2 3=Standard frame 3 4=Standard frame 4 5=Standard frame 5 6=Private frame 6 7=Private frame 7			-1=Not in use	Active Class2 Frame 2
Frame3InUse	-1=Not in use 0=User frame 1=Standard frame 1 2=Standard frame 2 3=Standard frame 3 4=Standard frame 4 5=Standard frame 5 6=Private frame 6 7=Private frame 7			-1=Not in use	Active Class2 Frame 3
Frame4InUse	-1=Not in use 0=User frame 1=Standard frame 1 2=Standard frame 2 3=Standard frame 3 4=Standard frame 4 5=Standard frame 5 6=Private frame 6 7=Private frame 7			-1=Not in use	Active Class2 Frame 4
Class1OvInd	0=No indication 1=Both edges 2=Rising edge			2=Rising edge	Overflow Indication
Class1OvFType	0...255		1	10	Function Type for Class 1 overflow indication
Class1OvInfNo	0...255		1	255	Information Number for Class 1 overflow indication
Class1OvBackOff	0...500		1	500	Backoff Range for Class1 buffer
GI Optimize	0=Standard behaviour 1=Skip spontaneous 2=Only overflown			0=Standard behaviour	Optimize GI traffic

Table continues on the next page

Parameter	Values (Range)	Unit	Step	Default	Description
	3=Combined				
DR Notification	0=False 1=True			0=False	Disturbance Recorder spontaneous indications enabled/disabled
Block Monitoring	0=Not in use 1=Discard events 2=Keep events			0=Not in use	Blocking of Monitoring Direction
EC_FRZ	0=False 1=True			0=False	Control point for freezing energy counters
Prtl Customization	0...2147483647		1	0	Customization parameter. Please, refer to the protocol manual.

4.2 IEC 103 Monitored data

Table 12: Monitored data

Name	Type	Values (Range)	Unit	Description
Customization Mode	Enum	0=Off/Normal 1=By Parameter 2=By File		Protocol Customization Mode
Reset counters	BOOLEAN	0=False 1=True		Reset counters
Received frames	INT32	-1...2147483646		Received frames
Checksum errors	INT32	-1...2147483646		Checksum errors
Transmitted frames	INT32	-1...2147483646		Transmitted frames

5 IEC 60870-5-103 data mappings

5.1 Overview

This chapter describes the IEC 60870-5-103 data points and structures available in the protection relay.

The point lists describe a superset of all the available IEC 60870-5-103 application data in the supported relay functions. The data points become available when relay functions are added to the relay configuration. However, the data points that belong to the IED system are always available.

The tables show the default configuration of the data points. All this data can be freely remapped, after which PCM600 can provide an updated point list export of the new outlook.

5.1.1 Indications and controls

Table 13: Explanations of the indications and controls table columns

Column name	Description
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in Application Configuration in PCM600.
Description	Short description of the signal. See the technical manual for more information.
DPI value	IEC 60870-5-103 indication and control values are coded as two-bit values (= DPI). 10 = ON, 01 = OFF
FUN	Default function type definition for the signal. Can be modified via PCM600.
INF	Default information number definition for the signal. Can be modified via PCM600.
U	Signal in use or not as default. 1 = In use, 0 = Not in use Can be configured via PCM600.
ASDU	type of the signal as default. ASDU type of indications can be modified via PCM600. ASDU 1 and 2 are indications. ASDU 20 is control.
I	General interrogation (GI) setting as default. 1 = In GI, 0 = Not in GI

Table continues on the next page

Column name	Description
	ASDU Can be modified via PCM600.
C	Extended DPI coding. 1 = Regular OFF/ON (01/10) values 2 = Four-pole INTERMEDIATE/OFF/ON/ERROR values (00/01/10/11)

5.2 System functions

5.2.1 General data (FUN=0) IEC 60870-5-103 standard

Table 14: General data (FUN=0) IEC 60870-5-103 standard

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LLN0									
.IndLEDRs.Oper.ctlVal	-	LED reset	10=Reset	0	19	1	20	0	1
		Blocking of monitoring	10=On	0 [1]	20	1	20	0	1
.Beh.stVal.(Test)	-	Test mode	10=On	0 [1]	21	1	1	1	1
LD0.LLN0									
.ActSetGr.ctlVal/stVal (SG1)	-	Param setting group 1	10=SG 1	0 [1]	23	1	1,20	1	1
.ActSetGr.ctlVal/stVal (SG2)	-	Param setting group 2	10=SG 2	0 [1]	24	1	1,20	1	1
.ActSetGr.ctlVal/stVal (SG3)	-	Param setting group 3	10=SG 3	0 [1]	25	1	1,20	1	1
.ActSetGr.ctlVal/stVal (SG4)	-	Param setting group 4	10=SG 4	0 [1]	26	1	1,20	1	1
.ActSetGr.ctlVal/stVal (SG5)	-	Param setting group 5	10=SG 5	0 [1]	27	1	1,20	1	1
.ActSetGr.ctlVal/stVal (SG6)	-	Param setting group 6	10=SG 6	0 [1]	28	1	1,20	1	1
LD0.TCSSCBR1									
.CircAlm.stVal	ALARM	Trip circuit 1 alarm	10=Alarm	0 [1]	36	1	1	1	1
LD0.LEDPTRC1									
.Op.general	-	Global operate	10=Oper-ate	0 [1]	68	1	2	1	1
.Str.general	-	Global start	10=Start	0 [1]	84	1	2	1	1

5.2.2 General data (FUN=0) IEC 60870-5-103 standard, AR data

Table 15: General data (FUN=0) IEC 60870-5-103 standard, AR data

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DARREC1									
.AutoRecOn.stVal	-	AR state	10=On	0	16	1	1	1	1
.SucRec.stVal	SUC_RECL	AR success	10=Succ.	0	128	1	1	0	1

[1] FUN type 0 is linked to parameter *DevFunType*. Default value is 9.

5.2.3 General data (FUN=10)

Table 16: General data (FUN=10)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.TRPPTRC1									
.Op.general	-	Trip1 input	10=On	10	1	1	2	0	1
.Tr.general	-	Trip1 output	10=On	10	2	1	2	0	1
LD0.TRPPTRC2									
.Op.general	-	Trip2 input	10=On	10	3	1	2	0	1
.Tr.general	-	Trip2 output	10=On	10	4	1	2	0	1
LD0.TRPPTRC3									
.Op.general	HIGH_ALARM	Trip3 input	10=On	10	5	1	2	1	1
.Tr.general	HIGH_WARN	Trip3 output	10=On	10	6	1	2	1	1
LD0.TRPPTRC4									
.Op.general	HIGH_ALARM	Trip4 input	10=On	10	7	1	2	1	1
.Tr.general	HIGH_WARN	Trip4 output	10=On	10	8	1	2	1	1
LD0.TRPPTRC5									
.Op.general	HIGH_ALARM	Trip5 input	10=On	10	12	1	2	1	1
.Tr.general	HIGH_WARN	Trip5 output	10=On	10	13	1	2	1	1
LD0.TRPPTRC6									
.Op.general	HIGH_ALARM	Trip6 input	10=On	10	14	1	2	1	1
.Tr.general	HIGH_WARN	Trip6 output	10=On	10	15	1	2	1	1
CTRL.LLN0									
.Loc.stVal	-	Local/Remote state	10=Local	10	10	1	1	1	1
.LocKeyHMI.stVal	-	Station state	10=On	10	11	1	1	1	1
LD0.LLN0									
.ProgLEDRs.Oper.ctlVal	-	Reset alarm LEDs	10=Reset	10	21	1	20	0	1
LD0.LDEV1									
.DevFail.IRF	-	Internal fault	10=Fault	10	100	1	1	0	1
LD0.TCSSCBR2									
.CircAlm.stVal	ALARM	Trip circuit 2 alarm	10=Alarm	10	36	1	1	1	1
DR.RDRE1									
.RcdTrg.ctlVal	-	Trig DR recording	10=Trig	10	41	1	20	0	1
.MemClr.ctlVal	-	Clear DR memory	10=Clear	10	42	1	20	0	1
LD0.CMMXU1									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	45	1	20	0	1
LD0.CMMXU2									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	46	1	20	0	1
LD0.CMMXU3									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	21	1	20	0	1
LD0.CMMXU4									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	22	1	20	0	1
LD0.CMMXU5									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	23	1	20	0	1
LD0.CMMXU6									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	24	1	20	0	1
LD0.CMMXU7									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	25	1	20	0	1
LD0.CMMXU8									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	26	1	20	0	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU1									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	47	1	20	0	1
LD0.RESCMMXU2									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	48	1	20	0	1
LD0.RESCMMXU3									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	40	1	20	0	1
LD0.RESCMMXU4									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	41	1	20	0	1
LD0.RESCMMXU5									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	42	1	20	0	1
LD0.RESCMMXU6									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	43	1	20	0	1
LD0.RESCMMXU7									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	44	1	20	0	1
LD0.RESCMMXU8									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	45	1	20	0	1
LD0.RESVMMXU1									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	49	1	20	0	1
LD0.RESVMMXU2									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	50	1	20	0	1
LD0.RESVMMXU3									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	61	1	20	0	1
LD0.RESVMMXU4									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	62	1	20	0	1
LD0.RESVMMXU5									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	63	1	20	0	1
LD0.RESVMMXU6									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	64	1	20	0	1
LD0.RESVMMXU7									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	65	1	20	0	1
LD0.RESVMMXU8									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	66	1	20	0	1
LD0.VMMXU1									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	52	1	20	0	1
LD0.VMMXU2									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	53	1	20	0	1
LD0.VMMXU3									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	54	1	20	0	1
LD0.VMMXU4									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	55	1	20	0	1
LD0.VMMXU5									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	56	1	20	0	1
LD0.VMMXU6									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	57	1	20	0	1
LD0.VMMXU7									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	58	1	20	0	1
LD0.VMMXU8									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	59	1	20	0	1
LD0.PEMMXU1									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	10	51	1	20	0	1
LD0.PEMMXU2									

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	71	1	20	0	1
LD0.PEMMXU3									
.RcdRs.Oper.ctlVal		Reset max. demands	10=Reset	12	72	1	20	0	1
LD0.LEDPTRC1		Global protection:							
.Str.phsA	-	Start-phsA	10=Start	10	61	0	2	1	1
.Str.phsB	-	Start-phsB	10=Start	10	62	0	2	1	1
.Str.phsC	-	Start-phsC	10=Start	10	63	0	2	1	1
.Op.phsA	-	Operate-phsA	10=Operate	10	65	0	2	0	1
.Op.phsB	-	Operate-phsB	10=Operate	10	66	0	2	0	1
.Op.phsC	-	Operate-phsC	10=Operate	10	67	0	2	0	1
LD0.LDPRLRC1									
.MemWrn.stVal		Load profile file memory warning		10	198	0	1	0	1
.MemAlm.stVal		Load profile file memory alarm		10	199	0	1	0	1

5.2.4 LD0.GNRLLTMS1 Time synchronization (1)

Table 17: LD0.GNRLLTMS1 Time synchronization (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.GNRLLTMS1									
.TmChSt1.stVal		Time channel status	01=Up; 10=Down	10	85	1	1	0	1

5.2.5 LD0.GSELPRT1 GOOSE supervision (1)

Table 18: LD0.GSELPRT1 GOOSE supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.GSELPRT1									
.Alm.stVal	ALARM	Goose alarm	10=Alarm	10	88	1	1	0	1

5.2.6 LD0.I3CLPRT1 IEC 60870-5-103 protocol (1)

Table 19: LD0.I3CLPRT1 IEC 60870-5-103 protocol (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.I3CLPRT1									
.ECFreeze.Oper.ctlVal		ASDU 205 trigger (1)	10=Trig	10	201	1	20	0	1

5.2.7 LD0.I3CLPRT2 IEC 60870-5-103 protocol (2)

Table 20: LD0.I3CLPRT2 IEC 60870-5-103 protocol (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.I3CLPRT2									
.ECFreeze.Oper.ctlVal		ASDU 205 trigger (2)	10=Trig	10	202	1	20	0	1

5.2.8 LD0.LEDGGIO1 LHMI LED indications Type 1 (2 states)

When two LED states are used, LED value “00-None” is coded as DPI value OFF, and LED values “01-Ok” and “11-Alarm” are coded as DPI value ON.

Table 21: LD0.LEDGGIO1 LHMI LED indications Type 1 (2 states)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO1									
.LEDSt1.stVal	-	LED 1 state	10=On	253	89	1	1	1	1
.LEDSt2.stVal	-	LED 2 state	10=On	253	90	1	1	1	1
.LEDSt3.stVal	-	LED 3 state	10=On	253	91	1	1	1	1
.LEDSt4.stVal	-	LED 4 state	10=On	253	92	1	1	1	1
.LEDSt5.stVal	-	LED 5 state	10=On	253	93	1	1	1	1
.LEDSt6.stVal	-	LED 6 state	10=On	253	94	1	1	1	1
.LEDSt7.stVal	-	LED 7 state	10=On	253	95	1	1	1	1
.LEDSt8.stVal	-	LED 8 state	10=On	253	96	1	1	1	1
.LEDSt9.stVal	-	LED 9 state	10=On	253	97	1	1	1	1
.LEDSt10.stVal	-	LED 10 state	10=On	253	98	1	1	1	1
.LEDSt11.stVal	-	LED 11 state	10=On	253	99	1	1	1	1

5.2.9 LD0.LEDGGIO2 LHMI LED indications Type 1 (2 states)

When two LED states are used, LED value “00-None” is coded as DPI value OFF, and LED values “01-Ok” and “11-Alarm” are coded as DPI value ON.

Table 22: LD0.LEDGGIO2 LHMI LED indications Type 1 (2 states)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO2									
.LEDSt1.stVal	-	LED 1 state	10=On	253	100	1	1	1	1
.LEDSt2.stVal	-	LED 2 state	10=On	253	101	1	1	1	1
.LEDSt3.stVal	-	LED 3 state	10=On	253	102	1	1	1	1
.LEDSt4.stVal	-	LED 4 state	10=On	253	103	1	1	1	1
.LEDSt5.stVal	-	LED 5 state	10=On	253	104	1	1	1	1
.LEDSt6.stVal	-	LED 6 state	10=On	253	105	1	1	1	1
.LEDSt7.stVal	-	LED 7 state	10=On	253	106	1	1	1	1
.LEDSt8.stVal	-	LED 8 state	10=On	253	107	1	1	1	1
.LEDSt9.stVal	-	LED 9 state	10=On	253	108	1	1	1	1
.LEDSt10.stVal	-	LED 10 state	10=On	253	109	1	1	1	1
.LEDSt11.stVal	-	LED 11 state	10=On	253	110	1	1	1	1

5.2.10 LD0.LEDGGIO3 LHMI LED indications Type 1 (2 states)

When two LED states are used, LED value “00-None” is coded as DPI value OFF, and LED values “01-Ok” and “11-Alarm” are coded as DPI value ON.

Table 23: LD0.LEDGGIO3 LHMI LED indications Type 1 (2 states)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO3									
.LEDSt1.stVal	-	LED 1 state	10=On	253	78	1	1	1	1
.LEDSt2.stVal	-	LED 2 state	10=On	253	79	1	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.LEDSt3.stVal	-	LED 3 state	10=On	253	80	1	1	1	1
.LEDSt4.stVal	-	LED 4 state	10=On	253	81	1	1	1	1
.LEDSt5.stVal	-	LED 5 state	10=On	253	82	1	1	1	1
.LEDSt6.stVal	-	LED 6 state	10=On	253	83	1	1	1	1
.LEDSt7.stVal	-	LED 7 state	10=On	253	84	1	1	1	1
.LEDSt8.stVal	-	LED 8 state	10=On	253	85	1	1	1	1
.LEDSt9.stVal	-	LED 9 state	10=On	253	86	1	1	1	1
.LEDSt10.stVal	-	LED 10 state	10=On	253	87	1	1	1	1
.LEDSt11.stVal	-	LED 11 state	10=On	253	88	1	1	1	1

5.2.11 LD0.LEDGGIO4 LHMI LED indications Type 1 (2 states)

When two LED states are used, LED value “00-None” is coded as DPI value OFF, and LED values “01-Ok” and “11-Alarm” are coded as DPI value ON.

Table 24: LD0.LEDGGIO4 LHMI LED indications Type 1 (2 states)

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO4									
.LEDSt1.stVal	-	LED 1 state	10=On	253	172	1	1	1	1
.LEDSt2.stVal	-	LED 2 state	10=On	253	173	1	1	1	1
.LEDSt3.stVal	-	LED 3 state	10=On	253	174	1	1	1	1
.LEDSt4.stVal	-	LED 4 state	10=On	253	175	1	1	1	1
.LEDSt5.stVal	-	LED 5 state	10=On	253	176	1	1	1	1
.LEDSt6.stVal	-	LED 6 state	10=On	253	177	1	1	1	1
.LEDSt7.stVal	-	LED 7 state	10=On	253	178	1	1	1	1
.LEDSt8.stVal	-	LED 8 state	10=On	253	179	1	1	1	1
.LEDSt9.stVal	-	LED 9 state	10=On	253	180	1	1	1	1
.LEDSt10.stVal	-	LED 10 state	10=On	253	181	1	1	1	1
.LEDSt11.stVal	-	LED 11 state	10=On	253	182	1	1	1	1

5.2.12 LD0.LEDGGIO5 LHMI LED indications Type 1 (2 states)

When two LED states are used, LED value “00-None” is coded as DPI value OFF, and LED values “01-Ok” and “11-Alarm” are coded as DPI value ON.

Table 25: LD0.LEDGGIO5 LHMI LED indications Type 1 (2 states)

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO5									
.LEDSt1.stVal	-	LED 1 state	10=On	253	194	1	1	1	1
.LEDSt2.stVal	-	LED 2 state	10=On	253	195	1	1	1	1
.LEDSt3.stVal	-	LED 3 state	10=On	253	196	1	1	1	1
.LEDSt4.stVal	-	LED 4 state	10=On	253	197	1	1	1	1
.LEDSt5.stVal	-	LED 5 state	10=On	253	198	1	1	1	1
.LEDSt6.stVal	-	LED 6 state	10=On	253	199	1	1	1	1
.LEDSt7.stVal	-	LED 7 state	10=On	253	200	1	1	1	1
.LEDSt8.stVal	-	LED 8 state	10=On	253	201	1	1	1	1
.LEDSt9.stVal	-	LED 9 state	10=On	253	202	1	1	1	1
.LEDSt10.stVal	-	LED 10 state	10=On	253	203	1	1	1	1
.LEDSt11.stVal	-	LED 11 state	10=On	253	204	1	1	1	1

5.2.13 LD0.LEDGGIO6 LHMI LED indications Type 1 (2 states)

When two LED states are used, LED value “00-None” is coded as DPI value OFF, and LED values “01-Ok” and “11-Alarm” are coded as DPI value ON.

Table 26: LD0.LEDGGIO6 LHMI LED indications Type 1 (2 states)

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO6									
.LEDSt1.stVal	-	LED 1 state	10=On	253	216	1	1	1	1
.LEDSt2.stVal	-	LED 2 state	10=On	253	217	1	1	1	1
.LEDSt3.stVal	-	LED 3 state	10=On	253	218	1	1	1	1
.LEDSt4.stVal	-	LED 4 state	10=On	253	219	1	1	1	1
.LEDSt5.stVal	-	LED 5 state	10=On	253	220	1	1	1	1
.LEDSt6.stVal	-	LED 6 state	10=On	253	221	1	1	1	1
.LEDSt7.stVal	-	LED 7 state	10=On	253	222	1	1	1	1
.LEDSt8.stVal	-	LED 8 state	10=On	253	223	1	1	1	1
.LEDSt9.stVal	-	LED 9 state	10=On	253	224	1	1	1	1
.LEDSt10.stVal	-	LED 10 state	10=On	253	225	1	1	1	1
.LEDSt11.stVal	-	LED 11 state	10=On	253	226	1	1	1	1

5.2.14 LD0.LEDGGIO1 LHMI LED indications Type 2 (3 states, 1:1 LED state)

When all three LED states are used, the possible LED values “00-None”, “01-Ok” and “11-Alarm” are coded as such.

Table 27: LD0.LEDGGIO1 LHMI LED indications Type 2 (3 states, 1:1 LED state)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO1									
.LEDSt1.stVal	-	LED 1 state	00/01/11=LED State	253	119	1	1	1	2
.LEDSt2.stVal	-	LED 2 state	00/01/11=LED State	253	120	1	1	1	2
.LEDSt3.stVal	-	LED 3 state	00/01/11=LED State	253	121	1	1	1	2
.LEDSt4.stVal	-	LED 4 state	00/01/11=LED State	253	122	1	1	1	2
.LEDSt5.stVal	-	LED 5 state	00/01/11=LED State	253	123	1	1	1	2
.LEDSt6.stVal	-	LED 6 state	00/01/11=LED State	253	124	1	1	1	2
.LEDSt7.stVal	-	LED 7 state	00/01/11=LED State	253	125	1	1	1	2
.LEDSt8.stVal	-	LED 8 state	00/01/11=LED State	253	126	1	1	1	2
.LEDSt9.stVal	-	LED 9 state	00/01/11=LED State	253	127	1	1	1	2
.LEDSt10.stVal	-	LED 10 state	00/01/11=LED State	253	128	1	1	1	2
.LEDSt11.stVal	-	LED 11 state	00/01/11=LED State	253	129	1	1	1	2

5.2.15 LD0.LEDGGIO2 LHMI LED indications Type 2 (3 states, 1:1 LED state)

When all three LED states are used, the possible LED values “00-None”, “01-Ok” and “11-Alarm” are coded as such.

Table 28: LD0.LEDGGIO2 LHMI LED indications Type 2 (3 states, 1:1 LED state)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO2									
.LEDSt1.stVal	-	LED 1 state	00/01/11=LED State	253	150	1	1	1	2
.LEDSt2.stVal	-	LED 2 state	00/01/11=LED State	253	151	1	1	1	2
.LEDSt3.stVal	-	LED 3 state	00/01/11=LED State	253	152	1	1	1	2
.LEDSt4.stVal	-	LED 4 state	00/01/11=LED State	253	153	1	1	1	2
.LEDSt5.stVal	-	LED 5 state	00/01/11=LED State	253	154	1	1	1	2
.LEDSt6.stVal	-	LED 6 state	00/01/11=LED State	253	155	1	1	1	2
.LEDSt7.stVal	-	LED 7 state	00/01/11=LED State	253	156	1	1	1	2
.LEDSt8.stVal	-	LED 8 state	00/01/11=LED State	253	157	1	1	1	2
.LEDSt9.stVal	-	LED 9 state	00/01/11=LED State	253	158	1	1	1	2
.LEDSt10.stVal	-	LED 10 state	00/01/11=LED State	253	159	1	1	1	2
.LEDSt11.stVal	-	LED 11 state	00/01/11=LED State	253	160	1	1	1	2

5.2.16 LD0.LEDGGIO3 LHMI LED indications Type 2 (3 states, 1:1 LED state)

When all three LED states are used, the possible LED values “00-None”, “01-Ok” and “11-Alarm” are coded as such.

Table 29: LD0.LEDGGIO3 LHMI LED indications Type 2 (3 states, 1:1 LED state)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO3									
.LEDSt1.stVal	-	LED 1 state	00/01/11=LED State	253	161	1	1	1	2
.LEDSt2.stVal	-	LED 2 state	00/01/11=LED State	253	162	1	1	1	2
.LEDSt3.stVal	-	LED 3 state	00/01/11=LED State	253	163	1	1	1	2
.LEDSt4.stVal	-	LED 4 state	00/01/11=LED State	253	164	1	1	1	2
.LEDSt5.stVal	-	LED 5 state	00/01/11=LED State	253	165	1	1	1	2
.LEDSt6.stVal	-	LED 6 state	00/01/11=LED State	253	166	1	1	1	2
.LEDSt7.stVal	-	LED 7 state	00/01/11=LED State	253	167	1	1	1	2
.LEDSt8.stVal	-	LED 8 state	00/01/11=LED State	253	168	1	1	1	2
.LEDSt9.stVal	-	LED 9 state	00/01/11=LED State	253	169	1	1	1	2
.LEDSt10.stVal	-	LED 10 state	00/01/11=LED State	253	170	1	1	1	2
.LEDSt11.stVal	-	LED 11 state	00/01/11=LED State	253	171	1	1	1	2

5.2.17 LD0.LEDGGIO4 LHMI LED indications Type 2 (3 states, 1:1 LED state)

When all three LED states are used, the possible LED values “00-None”, “01-Ok” and “11-Alarm” are coded as such.

Table 30: LD0.LEDGGIO4 LHMI LED indications Type 2 (3 states, 1:1 LED state)

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO4									
.LEDSt1.stVal	-	LED 1 state	00/01/11=LED State	253	183	1	1	1	2
.LEDSt2.stVal	-	LED 2 state	00/01/11=LED State	253	184	1	1	1	2

Table continues on the next page

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
.LEDSt3.stVal	-	LED 3 state	00/01/11=LED State	253	185	1	1	1	2
.LEDSt4.stVal	-	LED 4 state	00/01/11=LED State	253	186	1	1	1	2
.LEDSt5.stVal	-	LED 5 state	00/01/11=LED State	253	187	1	1	1	2
.LEDSt6.stVal	-	LED 6 state	00/01/11=LED State	253	188	1	1	1	2
.LEDSt7.stVal	-	LED 7 state	00/01/11=LED State	253	189	1	1	1	2
.LEDSt8.stVal	-	LED 8 state	00/01/11=LED State	253	190	1	1	1	2
.LEDSt9.stVal	-	LED 9 state	00/01/11=LED State	253	191	1	1	1	2
.LEDSt10.stVal	-	LED 10 state	00/01/11=LED State	253	192	1	1	1	2
.LEDSt11.stVal	-	LED 11 state	00/01/11=LED State	253	193	1	1	1	2

5.2.18 LD0.LEDGGIO5 LHMI LED indications Type 2 (3 states, 1:1 LED state)

When all three LED states are used, the possible LED values “00-None”, “01-Ok” and “11-Alarm” are coded as such.

Table 31: LD0.LEDGGIO5 LHMI LED indications Type 2 (3 states, 1:1 LED state)

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO5									
.LEDSt1.stVal	-	LED 1 state	00/01/11=LED State	253	205	1	1	1	2
.LEDSt2.stVal	-	LED 2 state	00/01/11=LED State	253	206	1	1	1	2
.LEDSt3.stVal	-	LED 3 state	00/01/11=LED State	253	207	1	1	1	2
.LEDSt4.stVal	-	LED 4 state	00/01/11=LED State	253	208	1	1	1	2
.LEDSt5.stVal	-	LED 5 state	00/01/11=LED State	253	209	1	1	1	2
.LEDSt6.stVal	-	LED 6 state	00/01/11=LED State	253	210	1	1	1	2
.LEDSt7.stVal	-	LED 7 state	00/01/11=LED State	253	211	1	1	1	2
.LEDSt8.stVal	-	LED 8 state	00/01/11=LED State	253	212	1	1	1	2
.LEDSt9.stVal	-	LED 9 state	00/01/11=LED State	253	213	1	1	1	2
.LEDSt10.stVal	-	LED 10 state	00/01/11=LED State	253	214	1	1	1	2
.LEDSt11.stVal	-	LED 11 state	00/01/11=LED State	253	215	1	1	1	2

5.2.19 LD0.LEDGGIO6 LHMI LED indications Type 2 (3 states, 1:1 LED state)

When all three LED states are used, the possible LED values “00-None”, “01-Ok” and “11-Alarm” are coded as such.

Table 32: LD0.LEDGGIO6 LHMI LED indications Type 2 (3 states, 1:1 LED state)

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
LD0.LEDGGIO6									
.LEDSt1.stVal	-	LED 1 state	00/01/11=LED State	253	227	1	1	1	2
.LEDSt2.stVal	-	LED 2 state	00/01/11=LED State	253	228	1	1	1	2
.LEDSt3.stVal	-	LED 3 state	00/01/11=LED State	253	229	1	1	1	2
.LEDSt4.stVal	-	LED 4 state	00/01/11=LED State	253	230	1	1	1	2
.LEDSt5.stVal	-	LED 5 state	00/01/11=LED State	253	231	1	1	1	2
.LEDSt6.stVal	-	LED 6 state	00/01/11=LED State	253	232	1	1	1	2
.LEDSt7.stVal	-	LED 7 state	00/01/11=LED State	253	233	1	1	1	2
.LEDSt8.stVal	-	LED 8 state	00/01/11=LED State	253	234	1	1	1	2
.LEDSt9.stVal	-	LED 9 state	00/01/11=LED State	253	235	1	1	1	2
.LEDSt10.stVal	-	LED 10 state	00/01/11=LED State	253	236	1	1	1	2
.LEDSt11.stVal	-	LED 11 state	00/01/11=LED State	253	237	1	1	1	2

5.3 Switchgear functions

5.3.1 CTRL.CBXCBR1 Circuit-breaker control (1)

Table 33: CTRL.CBXCBR1 Circuit-breaker control (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.CBCILO1									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	240	21	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	240	22	1	1	1	1
.SynItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	240	25	0	1	1	1
CTRL.CBXCBR1									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	240	23	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	240	24	1	1	1	1
CTRL.CCBRBRF1									
.Str.general	CB_FAULT_AL	Start, timer running	10=Start	240	101	0	2	1	1
.OpEx.general	TRBU	Failure, ext trip	10=Failure	240	102	0	2	0	1
.OpIn.general	TRRET	Operate, retrip	10=Operate	240	103	0	2	0	1
CTRL.CBCSWI1									
.stSeld.stVal	SELECTED	CB selected	10=Selected	240	120	1	1	1	1
.Pos.stVal/ctlVal	POSITION	CB pos/control	10/01=Close/ Open	240	160	1	1,20	1	2

5.3.2 CTRL.CBXCBR2 Circuit-breaker control (2)

Table 34: CTRL.CBXCBR2 Circuit-breaker control (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.CBCILO2									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	240	26	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	240	27	1	1	1	1
.SynItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	240	30	0	1	1	1
CTRL.CBXCBR2									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	240	28	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	240	29	1	1	1	1
CTRL.CCBRBRF2									
.Str.general	CB_FAULT_AL	Start, timer running	10=Start	240	104	0	2	1	1
.OpEx.general	TRBU	Failure, ext trip	10=Failure	240	105	0	2	0	1
.OpIn.general	TRRET	Operate, retrip	10=Operate	240	106	0	2	0	1
CTRL.CBCSWI2									
.stSeld.stVal	SELECTED	CB selected	10=Selected	240	121	1	1	1	1
.Pos.stVal/ctlVal	POSITION	CB pos/control	10/01=Close/ Open	240	161	1	1,20	1	2

5.3.3 CTRL.CBXCBR3 Circuit-breaker control (3)

Table 35: CTRL.CBXCBR3 Circuit-breaker control (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.CBCILO3									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	240	31	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	240	32	1	1	1	1
.SynItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	240	35	0	1	1	1
CTRL.CBXCBR3									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	240	33	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	240	34	1	1	1	1
CTRL.CCBRBRF3									
.Str.general	CB_FAULT_AL	Start, timer running	10=Start	240	107	0	2	1	1
.OpEx.general	TRBU	Failure, ext trip	10=Failure	240	108	0	2	0	1
.OpIn.general	TRRET	Operate, retrip	10=Operate	240	109	0	2	0	1
CTRL.CBCSWI3									
.stSeld.stVal	SELECTED	CB selected	10=Selected	240	122	1	1	1	1
.Pos.stVal/ctlVal	POSITION	CB pos/control	10/01=Close/ Open	240	162	1	1,20	1	2

5.3.4 CTRL.CBXCBR4 Circuit-breaker control (4)

Table 36: CTRL.CBXCBR4 Circuit-breaker control (4)

IEC 61850 Name		Description	Values	FUN	INF	U	ASDU	I	C
CTRL.CBCILO4									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	240	36	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	240	37	1	1	1	1
.SynItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	240	40	0	1	1	1

Table continues on the next page

IEC 61850 Name		Description	Values	FUN	INF	U	ASDU	I	C
CTRL.CBXCBR4									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	240	28	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	240	29	1	1	1	1
CTRL.CBCSWI4									
.stSeld.stVal	SELECTED	CB selected	10=Selected	240	123	1	1	1	1
.Pos.stVal/ctlVal	POSITION	CB pos/control	10/01=Close/ Open	240	163	1	1,20	1	2

5.3.5 CTRL.CBXCBR5 Circuit-breaker control (5)

Table 37: CTRL.CBXCBR5 Circuit-breaker control (5)

IEC 61850 Name		Description	Values	FUN	INF	U	ASDU	I	C
CTRL.CBCILO5									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	240	41	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	240	42	1	1	1	1
.SynItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	240	45	0	1	1	1
CTRL.CBXCBR5									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	240	43	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	240	44	1	1	1	1
CTRL.CBCSWI5									
.stSeld.stVal	SELECTED	CB selected	10=Selected	240	124	1	1	1	1
.Pos.stVal/ctlVal	POSITION	CB pos/control	10/01=Close/ Open	240	164	1	1,20	1	2

5.3.6 CTRL.DCSXSWI1 Disconnector position indication (1)

Table 38: CTRL.DCSXSWI1 Disconnector position indication (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI1									
.Pos.stVal	POSITION	Disconnector 1 pos	10/01=Close/ Open	253	1	1	1	1	2

5.3.7 CTRL.DCSXSWI2 Disconnector position indication (2)

Table 39: CTRL.DCSXSWI2 Disconnector position indication (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI2									
.Pos.stVal	POSITION	Disconnector 2 pos	10/01=Close/ Open	253	2	1	1	1	2

5.3.8 CTRL.DCSXSWI3 Disconnector position indication (3)

Table 40: CTRL.DCSXSWI3 Disconnector position indication (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI3									
.Pos.stVal	POSITION	Disconnector 3 pos	10/01=Close/ Open	253	3	1	1	1	2

5.3.9 CTRL.DCSXSWI4 Disconnector position indication (4)

Table 41: CTRL.DCSXSWI4 Disconnector position indication (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI4									
.Pos.stVal	POSITION	Disconnector 4 pos	10/01=Close/ Open	253	4	1	1	1	2

5.3.10 CTRL.DCSXSWI5 Disconnector position indication (5)

Table 42: CTRL.DCSXSWI5 Disconnector position indication (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI5									
.Pos.stVal	POSITION	Disconnector 5pos	10/01=Close/ Open	253	5	1	1	1	2

5.3.11 CTRL.DCSXSWI6 Disconnector position indication (6)

Table 43: CTRL.DCSXSWI6 Disconnector position indication (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI6									
.Pos.stVal	POSITION	Disconnector 6 pos	10/01=Close/ Open	253	5	1	1	1	2

5.3.12 CTRL.DCSXSWI7 Disconnector position indication (7)

Table 44: CTRL.DCSXSWI7 Disconnector position indication (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI7									
.Pos.stVal	POSITION	Disconnector 7 pos	10/01=Close/ Open	253	5	1	1	1	2

5.3.13 CTRL.DCSXSWI8 Disconnector position indication (8)

Table 45: CTRL.DCSXSWI8 Disconnector position indication (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCSXSWI8									
.Pos.stVal	POSITION	Disconnector 8 pos	10/01=Close/ Open	253	5	1	1	1	2

5.3.14 CTRL.DCXSWI1 Disconnector control (1)

Table 46: CTRL.DCXSWI1 Disconnector control (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO1									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	245	21	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	245	22	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	245	25	1	1	1	1
CTRL.DCXSWI1									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	245	23	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	245	24	1	1	1	1
CTRL.DCCSWI1									
.stSeld.stVal	SELECTED	DC selected	10=Selected	245	120	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	245	160	1	1,20	1	2

5.3.15 CTRL.DCXSWI2 Disconnector control (2)

Table 47: CTRL.DCXSWI2 Disconnector control (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO2									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	246	21	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	246	22	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	246	25	1	1	1	1
CTRL.DCXSWI2									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	246	23	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	246	24	1	1	1	1
CTRL.DCCSWI2									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	120	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	246	160	1	1,20	1	2

5.3.16 CTRL.DCXSWI3 Disconnector control (3)

Table 48: CTRL.DCXSWI3 Disconnector control (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO3									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	246	26	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	246	27	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	246	30	1	1	1	1
CTRL.DCXSWI3									

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	246	28	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	246	29	1	1	1	1
CTRL.DCCSWI3									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	121	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	246	161	1	1,20	1	2

5.3.17 CTRL.DCXSWI4 Disconnector control (4)

Table 49: CTRL.DCXSWI4 Disconnector control (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO4									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	246	31	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	246	32	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	246	35	1	1	1	1
CTRL.DCXSWI4									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	246	33	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	246	34	1	1	1	1
CTRL.DCCSWI4									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	122	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	246	162	1	1,20	1	2

5.3.18 CTRL.DCXSWI5 Disconnector control (5)

Table 50: CTRL.DCXSWI5 Disconnector control (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO5									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	246	36	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	246	37	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	246	40	1	1	1	1
CTRL.DCXSWI5						1	1	1	1
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	246	38	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	246	39	1	1	1	1
CTRL.DCCSWI5						1	1	1	1
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	123	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	246	163	1	1,20	1	2

5.3.19 CTRL.DCXSWI6 Disconnector control (6)

Table 51: CTRL.DCXSWI6 Disconnector control (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO6									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	246	41	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	246	42	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	246	45	1	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCXSWI6						1	1	1	1
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	246	43	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	246	44	1	1	1	1
CTRL.DCCSWI6						1	1	1	1
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	124	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	246	164	1	1,20	1	2

5.3.20 CTRL.DCXSWI7 Disconnector control (7)

Table 52: CTRL.DCXSWI7 Disconnector control (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO7									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	246	46	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	246	47	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	246	50	1	1	1	1
CTRL.DCXSWI7						1	1	1	1
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	246	48	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	246	50	1	1	1	1
CTRL.DCCSWI7						1	1	1	1
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	125	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	246	165	1	1,20	1	2

5.3.21 CTRL.DCXSWI8 Disconnector control (8)

Table 53: CTRL.DCXSWI8 Disconnector control (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.DCCILO8									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	246	51	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	246	52	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	246	55	1	1	1	1
CTRL.DCXSWI8						1	1	1	1
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	246	53	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	246	54	1	1	1	1
CTRL.DCCSWI8						1	1	1	1
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	126	1	1	1	1
.Pos.stVal/ctlVal	POSITION	DC pos/control	10/01=Close/ Open	246	166	1	1,20	1	2

5.3.22 CTRL.ESSXSWI1 Earthing switch position indication (1)

Table 54: CTRL.ESSXSWI1 Earthing switch position indication (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.ESSXSWI1									
.Pos.stVal	POSITION	Earth switch pos	10/01=Close/ Open	253	11	1	1	1	2

5.3.23 CTRL.ESSXSWI2 Earthing switch position indication (2)

Table 55: CTRL.ESSXSWI2 Earthing switch position indication (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.ESSXSWI2									
.Pos.stVal	POSITION	Earth switch pos	10/01=Close/ Open	253	12	1	1	1	2

5.3.24 CTRL.ESSXSWI3 Earthing switch position indication (3)

Table 56: CTRL.ESSXSWI3 Earthing switch position indication (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.ESSXSWI3									
.Pos.stVal	POSITION	Earth switch pos	10/01=Close/ Open	253	13	1	1	1	2

5.3.25 CTRL.ESXSWI1 Earthing switch control (1)

Table 57: CTRL.ESXSWI1 Earthing switch control (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.ESCILO1									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	247	21	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	247	22	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	247	25	1	1	1	1
CTRL.ESXSWI1									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	247	23	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	247	24	1	1	1	1
CTRL.ESCSWI1									
.stSeld.stVal	SELECTED	ES selected	10=Selected	247	120	1	1	1	1
.Pos.stVal/ctlVal	POSITION	ES pos/control	10/01=Close/ Open	247	160	1	1,20	1	2

5.3.26 CTRL.ESXSWI2 Earthing switch control (2)

Table 58: CTRL.ESXSWI2 Earthing switch control (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.ESCILO2									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	247	26	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	247	27	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	247	30	1	1	1	1
CTRL.ESXSWI2									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	247	28	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	247	29	1	1	1	1
CTRL.ESCSWI2									
.stSeld.stVal	SELECTED	ES selected	10=Selected	247	121	1	1	1	1
.Pos.stVal/ctlVal	POSITION	ES pos/control	10/01=Close/ Open	247	161	1	1,20	1	2

5.3.27 CTRL.ESXSWI3 Earthing switch control (3)

Table 59: CTRL.ESXSWI3 Earthing switch control (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.ESCILO3									
.EnaOpn.stVal	ENA_OPEN	Open enabled	10=Enabled	247	31	1	1	1	1
.EnaCls.stVal	ENA_CLOSE	Close enabled	10=Enabled	247	32	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	247	35	1	1	1	1
CTRL.ESXSWI3									
.BlkOpn.stVal	BLK_OPEN	Open blocked	10=Blocked	247	33	1	1	1	1
.BlkCls.stVal	BLK_CLOSE	Close blocked	10=Blocked	247	34	1	1	1	1
CTRL.ESCSWI3									
.stSeld.stVal	SELECTED	ES selected	10=Selected	247	122	1	1	1	1
.Pos.stVal/ctlVal	POSITION	ES pos/control	10/01=Close/ Open	247	162	1	1,20	1	2

5.3.28 CTRL.P3SSXSWI1 Three-state disconnector position indication (1)

Table 60: CTRL.P3SSXSWI1 Three-state disconnector position indication (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SSDCSWI1									
.Pos.stVal	POSITION_DC	Disconnector 1 pos	10/01=Close/ Open	248	201	1	1	1	2
CTRL.P3SSECSWI1									
.Pos.stVal	POSITION_ES	Earth switch 1 pos	10/01=Close/ Open	248	202	1	1	1	2

5.3.29 CTRL.P3SSXSWI2 Three-state disconnector position indication (2)

Table 61: CTRL.P3SSXSWI2 Three-state disconnector position indication (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SSDCSWI2									
.Pos.stVal	POSITION_DC	Disconnector 2 pos	10/01=Close/ Open	248	201	1	1	1	2
CTRL.P3SSECSWI2									
.Pos.stVal	POSITION_ES	Earth switch 2 pos	10/01=Close/ Open	248	202	1	1	1	2

5.3.30 CTRL.P3SSXSWI3 Three-state disconnector position indication (3)

Table 62: CTRL.P3SSXSWI3 Three-state disconnector position indication (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SSDCSWI3									
.Pos.stVal	POSITION_DC	Disconnector 3 pos	10/01=Close/ Open	248	203	1	1	1	2
CTRL.P3SSECSWI3									
.Pos.stVal	POSITION_ES	Earth switch 3 pos	10/01=Close/ Open	248	204	1	1	1	2

5.3.31 CTRL.P3SSXSWI4 Three-state disconnector position indication (4)

Table 63: CTRL.P3SSXSWI4 Three-state disconnector position indication (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SSDCSWI4									
.Pos.stVal	POSITION_DC	Disconnector 4 pos	10/01=Close/ Open	248	205	1	1	1	2
CTRL.P3SSECSWI4									
.Pos.stVal	POSITION_ES	Earth switch 4 pos	10/01=Close/ Open	248	206	1	1	1	2

5.3.32 CTRL.P3SSXSWI5 Three-state disconnector position indication (5)

Table 64: CTRL.P3SSXSWI5 Three-state disconnector position indication (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SSDCSWI5									
.Pos.stVal	POSITION_DC	Disconnector 5 pos	10/01=Close/ Open	248	207	1	1	1	2
CTRL.P3SSECSWI5									
.Pos.stVal	POSITION_ES	Earth switch 5 pos	10/01=Close/ Open	248	208	1	1	1	2

5.3.33 CTRL.P3SSXSWI6 Three-state disconnector position indication (6)

Table 65: CTRL.P3SSXSWI6 Three-state disconnector position indication (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SSDCSWI6									
.Pos.stVal	POSITION_DC	Disconnector 6 pos	10/01=Close/ Open	248	209	1	1	1	2
CTRL.P3SSECSWI6									
.Pos.stVal	POSITION_ES	Earth switch 6 pos	10/01=Close/ Open	248	210	1	1	1	2

5.3.34 CTRL.P3SXSWI1 Three-state disconnector control (1)

Table 66: CTRL.P3SXSWI1 Three-state disconnector control (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SDCILO1									
.EnaOpn.stVal	ENA_DCOPEN	Open enabled	10=Enabled	248	21	1	1	1	1
.EnaCls.stVal	ENA_DCCLOSE	Close enabled	10=Enabled	248	22	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	25	1	1	1	1
CTRL.P3SECILO1									
.EnaOpn.stVal	ENA_ESOPEN	Open enabled	10=Enabled	248	26	1	1	1	1
.EnaCls.stVal	ENA_ESOPEN	Close enabled	10=Enabled	248	27	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	30	1	1	1	1
CTRL.P3SDXSWI1									
.BlkOpn.stVal	BLK_DCOPEN	Open blocked	10=Blocked	246	23	1	1	1	1
.BlkCls.stVal	BLK_DCCLOSE	Close blocked	10=Blocked	246	24	1	1	1	1
CTRL.P3SEXSWI1									
.BlkOpn.stVal	BLK_ESOPEN	Open blocked	10=Blocked	246	28	1	1	1	1
.BlkCls.stVal	BLK_ESCLOSE	Close blocked	10=Blocked	246	29	1	1	1	1
CTRL.P3SDCSWI1									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	120	1	1	1	1
.Pos.stVal/ctlVal	POSITION_DC	DC pos/control	10/01=Close/ Open	246	160	1	1,20	1	2
CTRL.P3SECSWI1									
.stSeld.stVal	SELECTED	ES selected	10=Selected	246	121	1	1	1	1
.Pos.stVal/ctlVal	POSITION_ES	ES pos/control	10/01=Close/ Open	246	161	1	1,20	1	2

5.3.35 CTRL.P3SXSWI2 Three-state disconnector control (2)

Table 67: CTRL.P3SXSWI2 Three-state disconnector control (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SDCILO2									
.EnaOpn.stVal	ENA_DCOPEN	Open enabled	10=Enabled	248	31	1	1	1	1
.EnaCls.stVal	ENA_DCCLOSE	Close enabled	10=Enabled	248	32	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	35	1	1	1	1
CTRL.P3SECILO2									
.EnaOpn.stVal	ENA_ESOPEN	Open enabled	10=Enabled	248	36	1	1	1	1
.EnaCls.stVal	ENA_ESOPEN	Close enabled	10=Enabled	248	37	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	40	1	1	1	1
CTRL.P3SDXSWI2									
.BlkOpn.stVal	BLK_DCOPEN	Open blocked	10=Blocked	246	33	1	1	1	1
.BlkCls.stVal	BLK_DCCLOSE	Close blocked	10=Blocked	246	34	1	1	1	1
CTRL.P3SEXSWI2									
.BlkOpn.stVal	BLK_ESOPEN	Open blocked	10=Blocked	246	38	1	1	1	1
.BlkCls.stVal	BLK_ESCLOSE	Close blocked	10=Blocked	246	39	1	1	1	1
CTRL.P3SDCSWI2									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	122	1	1	1	1
.Pos.stVal/ctlVal	POSITION_DC	DC pos/control	10/01=Close/ Open	246	162	1	1,20	1	2
CTRL.P3SECSWI2									
.stSeld.stVal	SELECTED	ES selected	10=Selected	246	123	1	1	1	1
.Pos.stVal/ctlVal	POSITION_ES	ES pos/control	10/01=Close/ Open	246	163	1	1,20	1	2

5.3.36 CTRL.P3SXSWI3 Three-state disconnector control (3)

Table 68: CTRL.P3SXSWI3 Three-state disconnector control (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SDCILO3									
.EnaOpn.stVal	ENA_DCOPEN	Open enabled	10=Enabled	248	41	1	1	1	1
.EnaCls.stVal	ENA_DCCLOSE	Close enabled	10=Enabled	248	42	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	45	1	1	1	1
CTRL.P3SECILO3									
.EnaOpn.stVal	ENA_ESOPEN	Open enabled	10=Enabled	248	46	1	1	1	1
.EnaCls.stVal	ENA_ESOPEN	Close enabled	10=Enabled	248	47	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	50	1	1	1	1
CTRL.P3SDXSWI3									
.BlkOpn.stVal	BLK_DCOPEN	Open blocked	10=Blocked	246	43	1	1	1	1
.BlkCls.stVal	BLK_DCCLOSE	Close blocked	10=Blocked	246	44	1	1	1	1
CTRL.P3SEXSWI3									
.BlkOpn.stVal	BLK_ESOPEN	Open blocked	10=Blocked	246	48	1	1	1	1
.BlkCls.stVal	BLK_ESCLOSE	Close blocked	10=Blocked	246	49	1	1	1	1
CTRL.P3SDCSWI3									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	124	1	1	1	1
.Pos.stVal/ctlVal	POSITION_DC	DC pos/control	10/01=Close/ Open	246	164	1	1,20	1	2
CTRL.P3SECSWI3									
.stSeld.stVal	SELECTED	ES selected	10=Selected	246	125	1	1	1	1
.Pos.stVal/ctlVal	POSITION_ES	ES pos/control	10/01=Close/ Open	246	165	1	1,20	1	2

5.3.37 CTRL.P3SXSWI4 Three-state disconnector control (4)

Table 69: CTRL.P3SXSWI4 Three-state disconnector control (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SDCILO4									
.EnaOpn.stVal	ENA_DCOPEN	Open enabled	10=Enabled	248	51	1	1	1	1
.EnaCls.stVal	ENA_DCCLOSE	Close enabled	10=Enabled	248	52	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	55	1	1	1	1
CTRL.P3SECILO4									
.EnaOpn.stVal	ENA_ESOPEN	Open enabled	10=Enabled	248	56	1	1	1	1
.EnaCls.stVal	ENA_ESOPEN	Close enabled	10=Enabled	248	57	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	60	1	1	1	1
CTRL.P3SDXSWI4									
.BlkOpn.stVal	BLK_DCOPEN	Open blocked	10=Blocked	246	53	1	1	1	1
.BlkCls.stVal	BLK_DCCLOSE	Close blocked	10=Blocked	246	54	1	1	1	1
CTRL.P3SEXSWI4									
.BlkOpn.stVal	BLK_ESOPEN	Open blocked	10=Blocked	246	58	1	1	1	1
.BlkCls.stVal	BLK_ESCLOSE	Close blocked	10=Blocked	246	59	1	1	1	1
CTRL.P3SDCSWI4									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	126	1	1	1	1
.Pos.stVal/ctlVal	POSITION_DC	DC pos/control	10/01=Close/ Open	246	166	1	1,20	1	2

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SECSWI4									
.stSeld.stVal	SELECTED	ES selected	10=Selected	246	127	1	1	1	1
.Pos.stVal/ctlVal	POSITION_ES	ES pos/control	10/01=Close/ Open	246	167	1	1,20	1	2

5.3.38 CTRL.P3SXSWI5 Three-state disconnector control (5)

Table 70: CTRL.P3SXSWI5 Three-state disconnector control (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SDCILO5									
.EnaOpn.stVal	ENA_DCOPEN	Open enabled	10=Enabled	248	61	1	1	1	1
.EnaCls.stVal	ENA_DCCLOSE	Close enabled	10=Enabled	248	62	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	65	1	1	1	1
CTRL.P3SECILO5									
.EnaOpn.stVal	ENA_ESOPEN	Open enabled	10=Enabled	248	66	1	1	1	1
.EnaCls.stVal	ENA_ESOPEN	Close enabled	10=Enabled	248	67	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	70	1	1	1	1
CTRL.P3SDXSWI5									
.BlkOpn.stVal	BLK_DCOPEN	Open blocked	10=Blocked	246	63	1	1	1	1
.BlkCls.stVal	BLK_DCCLOSE	Close blocked	10=Blocked	246	64	1	1	1	1
CTRL.P3SEXSWI5									
.BlkOpn.stVal	BLK_ESOPEN	Open blocked	10=Blocked	246	68	1	1	1	1
.BlkCls.stVal	BLK_ESCLOSE	Close blocked	10=Blocked	246	69	1	1	1	1
CTRL.P3SDCSWI5									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	128	1	1	1	1
.Pos.stVal/ctlVal	POSITION_DC	DC pos/control	10/01=Close/ Open	246	168	1	1,20	1	2
CTRL.P3SECSWI5									
.stSeld.stVal	SELECTED	ES selected	10=Selected	246	129	1	1	1	1
.Pos.stVal/ctlVal	POSITION_ES	ES pos/control	10/01=Close/ Open	246	169	1	1,20	1	2

5.3.39 CTRL.P3SXSWI6 Three-state disconnector control (6)

Table 71: CTRL.P3SXSWI6 Three-state disconnector control (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
CTRL.P3SDCILO6									
.EnaOpn.stVal	ENA_DCOPEN	Open enabled	10=Enabled	248	71	1	1	1	1
.EnaCls.stVal	ENA_DCCLOSE	Close enabled	10=Enabled	248	72	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	75	1	1	1	1
CTRL.P3SECILO6									
.EnaOpn.stVal	ENA_ESOPEN	Open enabled	10=Enabled	248	76	1	1	1	1
.EnaCls.stVal	ENA_ESOPEN	Close enabled	10=Enabled	248	77	1	1	1	1
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	10=Bypassed	248	80	1	1	1	1
CTRL.P3SDXSWI6									
.BlkOpn.stVal	BLK_DCOPEN	Open blocked	10=Blocked	246	73	1	1	1	1
.BlkCls.stVal	BLK_DCCLOSE	Close blocked	10=Blocked	246	74	1	1	1	1
CTRL.P3SEXSWI6									
.BlkOpn.stVal	BLK_ESOPEN	Open blocked	10=Blocked	246	78	1	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.BlkCls.stVal	BLK_ESCLOSE	Close blocked	10=Blocked	246	79	1	1	1	1
CTRL.P3SDCSWI6									
.stSeld.stVal	SELECTED	DC selected	10=Selected	246	130	1	1	1	1
.Pos.stVal/ctlVal	POSITION_DC	DC pos/control	10/01=Close/ Open	246	170	1	1,20	1	2
CTRL.P3SECSWI6									
.stSeld.stVal	SELECTED	ES selected	10=Selected	246	131	1	1	1	1
.Pos.stVal/ctlVal	POSITION_ES	ES pos/control	10/01=Close/ Open	246	171	1	1,20	1	2

5.4 Sensors and monitoring functions

5.4.1 LD0.ARCSARC1 Arc protection (1)

Table 72: LD0.ARCSARC1 Arc protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ARCSARC11									
.FADet.stVal	ARC_FLT_DE T	Arc detected	10=Detect	156	211	1	1	0	1
.SpvnAlm.stVal	ALARM	Supervision alarm	10=Alarm	156	214	1	1	0	1
LD0.ARCPTRC11									
.Op.general	OPERATE	Operate	10=Operate	156	213	1	2	0	1

5.4.2 LD0.ARCSARC2 Arc protection (2)

Table 73: LD0.ARCSARC2 Arc protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ARCSARC21									
.FADet.stVal	ARC_FLT_DE T	Arc detected	10=Detect	156	221	1	1	0	1
.SpvnAlm.stVal	ALARM	Supervision alarm	10=Alarm	156	224	1	1	0	1
LD0.ARCPTRC21									
.Op.general	OPERATE	Operate	10=Operate	156	223	1	2	0	1

5.4.3 LD0.ARCSARC3 Arc protection (3)

Table 74: LD0.ARCSARC3 Arc protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ARCSARC31									
.FADet.stVal	ARC_FLT_DE T	Arc detected	10=Detect	156	231	1	1	0	1
.SpvnAlm.stVal	ALARM	Supervision alarm	10=Alarm	156	234	1	1	0	1
LD0.ARCPTRC31									
.Op.general	OPERATE	Operate	10=Operate	156	233	1	2	0	1

5.4.4 LD0.ARCSARC4 Arc protection (4)

Table 75: LD0.ARCSARC4 Arc protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ARCSARC41									
.FADet.stVal	ARC_FLT_DE T	Arc detected	10=Detect	156	241	1	1	0	1
.SpvnAlm.stVal	ALARM	Supervision alarm	10=Alarm	156	244	1	1	0	1
LD0.ARCPTRC41									
.Op.general	OPERATE	Operate	10=Operate	156	243	1	2	0	1

5.4.5 LD0.CCSPVC1 Current circuit supervision (1)

Table 76: LD0.CCSPVC1 Current circuit supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CCSPVC1									
.FailACirc.general	FAIL	Fail Operate	10=Operate	71	21	1	1	1	1
.SigFailAlm.stVal	ALARM	Fail Alarm	10=Alarm	71	22	1	2	0	1

5.4.6 LD0.CCSPVC2 Current circuit supervision (2)

Table 77: LD0.CCSPVC2 Current circuit supervision (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CCSPVC2									
.FailACirc.general	FAIL	Fail Operate	10=Operate	71	23	1	1	1	1
.SigFailAlm.stVal	ALARM	Fail Alarm	10=Alarm	71	24	1	2	0	1

5.4.7 LD0.CCSPVC3 Current circuit supervision (3)

Table 78: LD0.CCSPVC3 Current circuit supervision (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CCSPVC3									
.FailACirc.general	FAIL	Fail Operate	10=Operate	71	25	1	1	1	1
.SigFailAlm.stVal	ALARM	Fail Alarm	10=Alarm	71	26	1	2	0	1

5.4.8 LD0.CCSPVC4 Current circuit supervision (4)

Table 79: LD0.CCSPVC4 Current circuit supervision (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CCSPVC4									
.FailACirc.general	FAIL	Fail Operate	10=Operate	71	27	1	1	1	1
.SigFailAlm.stVal	ALARM	Fail Alarm	10=Alarm	71	28	1	2	0	1

5.4.9 LD0.CCSPVC5 Current circuit supervision (5)

Table 80: LD0.CCSPVC5 Current circuit supervision (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CCSPVC5									
.FailACirc.general	FAIL	Fail Operate	10=Operate	71	29	1	1	1	1
.SigFailAlm.stVal	ALARM	Fail Alarm	10=Alarm	71	30	1	2	0	1

5.4.10 LD0.CTSRCTF1 Current circuit supervision for transformers (1)

Table 81: LD0.CTSRCTF1 Current circuit supervision for transformers (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CTSRCTF1									
.Alm.general	ALARM	Alarm	10=Alarm	26	11	1	1	1	1
.Op.general	FAIL	CT secondary failure	10=Operate	26	12	1	2	1	1

5.4.11 LD0.HZCCASPVC1 Current transformer supervision for high-impedance protection scheme for phase A (1)

Table 82: LD0.HZCCASPVC1 Current transformer supervision for high-impedance protection scheme for phase A (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HZCCASPVC1									
.Alm.stVal	ALARM	Alarm	10=Alarm	71	31	1	1	0	1

5.4.12 LD0.HZCCBSPVC1 Current transformer supervision for high-impedance protection scheme for phase B (1)

Table 83: LD0.HZCCBSPVC1 Current transformer supervision for high-impedance protection scheme for phase B (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HZCCBSPVC1									
.Alm.stVal	ALARM	Alarm	10=Alarm	71	32	1	1	0	1

5.4.13 LD0.HZCCCSPVC1 Current transformer supervision for high-impedance protection scheme for phase C (1)

Table 84: LD0.HZCCCSPVC1 Current transformer supervision for high-impedance protection scheme for phase C (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HZCCCSPVC1									
.Alm.stVal	ALARM	Alarm	10=Alarm	71	33	1	1	0	1

5.4.14 LD0.ILTCTR1 Phase current preprocessing (1)

Table 85: LD0.ILTCTR1 Phase current preprocessing (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR1									
.Wrn.stVal	WARNING	Warning	10=Warning	81	101	1	2	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	102	1	2	0	1

5.4.15 LD0.ILTCTR2 Phase current preprocessing (2)

Table 86: LD0.ILTCTR2 Phase current preprocessing (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR2									
.Wrn.stVal	WARNING	Warning	10=Warning	81	103	1	2	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	104	1	2	0	1

5.4.16 LD0.ILTCTR3 Phase current preprocessing (3)

Table 87: LD0.ILTCTR3 Phase current preprocessing (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR3									
.Wrn.stVal	WARNING	Warning	10=Warning	81	151	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	152	1	1	0	1

5.4.17 LD0.ILTCTR4 Phase current preprocessing (4)

Table 88: LD0.ILTCTR4 Phase current preprocessing (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR4									
.Wrn.stVal	WARNING	Warning	10=Warning	81	153	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	154	1	1	0	1

5.4.18 LD0.ILTCTR5 Phase current preprocessing (5)

Table 89: LD0.ILTCTR5 Phase current preprocessing (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR5									
.Wrn.stVal	WARNING	Warning	10=Warning	81	155	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	156	1	1	0	1

5.4.19 LD0.ILTCTR6 Phase current preprocessing (6)

Table 90: LD0.ILTCTR6 Phase current preprocessing (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR6									
.Wrn.stVal	WARNING	Warning	10=Warning	81	157	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	158	1	1	0	1

5.4.20 LD0.ILTCTR7 Phase current preprocessing (7)

Table 91: LD0.ILTCTR7 Phase current preprocessing (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR7									
.Wrn.stVal	WARNING	Warning	10=Warning	81	159	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	160	1	1	0	1

5.4.21 LD0.ILTCTR8 Phase current preprocessing (8)

Table 92: LD0.ILTCTR8 Phase current preprocessing (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.IL1TCTR8									
.Wrn.stVal	WARNING	Warning	10=Warning	81	161	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	162	1	1	0	1

5.4.22 LD0.MDSOPT1 Runtime counter for machines and devices (1)

Table 93: LD0.MDSOPT1 Runtime counter for machines and devices (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MDSOPT1									
.OpTmWrn.stVal	WARNING	Accum.op.time Warning	10=Warning	71	1	1	1	1	1
.OpTmAlm.stVal	ALARM	Accum.op.time Alarm	10=Alarm	71	2	1	1	1	1

5.4.23 LD0.MDSOPT2 Runtime counter for machines and devices (2)

Table 94: LD0.MDSOPT2 Runtime counter for machines and devices (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MDSOPT2									
.OpTmWrn.stVal	WARNING	Accum.op.time Warning	10=Warning	71	3	1	1	1	1
.OpTmAlm.stVal	ALARM	Accum.op.time Alarm	10=Alarm	71	4	1	1	1	1

5.4.24 LD0.MSVPR1 Remanent voltage supervision (1)

Table 95: LD0.MSVPR1 Remanent voltage supervision (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.MSVPR1								
.VLo.stVal	U_LOW	Low remanent voltage	10=Voltage low	45	71	1	1	0

5.4.25 LD0.MSVPR2 Remanent voltage supervision (2)

Table 96: LD0.MSVPR2 Remanent voltage supervision (2)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.MSVPR2								
.VLo.stVal	U_LOW	Low remanent voltage	10=Voltage low	45	72	1	1	0

5.4.26 LD0.MSVPR3 Remanent voltage supervision (3)

Table 97: LD0.MSVPR3 Remanent voltage supervision (3)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.MSVPR3								
.VLo.stVal	U_LOW	Low remanent voltage	10=Voltage low	45	73	1	1	0

5.4.27 LD0.PCSITPC1 Protection communication supervision (1)

Table 98: LD0.PCSITPC1 Protection communication supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PCSITPC1									
.HealthAlm.stVal	ALARM	Protection communication alarm	10=Alarm	81	30	0	1	0	1

5.4.28 LD0.RCHLCCH1 Redundant Ethernet channel supervison (1)

Table 99: LD0.RCHLCCH1 Redundant Ethernet channel supervison (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RCHLCCH1									
.ChLiv.stVal	CHLIV	Ethernet channel live	10=Live	10	90	1	1	0	1
.RedChLiv.stVal	REDCHLIV	Redundant Ethernet channel live	10=Live	10	91	1	1	0	1

5.4.29 LD0.SCHLCCHx Ethernet channel supervision (1...3)

Table 100: LD0.SCHLCCHx Ethernet channel supervision (1...3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SCHLCCH1									
.ChLiv.stVal	CH1LIV	Ethernet channel 1 live	10=Live	10	92	1	1	0	1
LD0.SCHLCCH2									

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.ChLiv.stVal	CH2LIV	Ethernet channel 2 live	10=Live	10	93	1	1	0	1
LD0.SCHLCCH3									
.ChLiv.stVal	CH3LIV	Ethernet channel 2 live	10=Live	10	94	1	1	0	1

5.4.30 LD0.RESTCTR1 Residual current preprocessing (1)

Table 101: LD0.RESTCTR1 Residual current preprocessing (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR1									
.Wrn.stVal	WARNING	Warning	10=Warning	81	105	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	106	1	1	0	1

5.4.31 LD0.RESTCTR2 Residual current preprocessing (2)

Table 102: LD0.RESTCTR2 Residual current preprocessing (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR2									
.Wrn.stVal	WARNING	Warning	10=Warning	81	107	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	108	1	1	0	1

5.4.32 LD0.RESTCTR3 Residual current preprocessing (3)

Table 103: LD0.RESTCTR3 Residual current preprocessing (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR3									
.Wrn.stVal	WARNING	Warning	10=Warning	81	109	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	110	1	1	0	1

5.4.33 LD0.RESTCTR4 Residual current preprocessing (4)

Table 104: LD0.RESTCTR4 Residual current preprocessing (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR4									
.Wrn.stVal	WARNING	Warning	10=Warning	81	111	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	112	1	1	0	1

5.4.34 LD0.RESTCTR5 Residual current preprocessing (5)

Table 105: LD0.RESTCTR5 Residual current preprocessing (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR5									
.Wrn.stVal	WARNING	Warning	10=Warning	81	113	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	114	1	1	0	1

5.4.35 LD0.RESTCTR6 Residual current preprocessing (6)

Table 106: LD0.RESTCTR6 Residual current preprocessing (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR6									
.Wrn.stVal	WARNING	Warning	10=Warning	81	115	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	116	1	1	0	1

5.4.36 LD0.RESTCTR7 Residual current preprocessing (7)

Table 107: LD0.RESTCTR7 Residual current preprocessing (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR7									
.Wrn.stVal	WARNING	Warning	10=Warning	81	117	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	118	1	1	0	1

5.4.37 LD0.RESTCTR8 Residual current preprocessing (8)

Table 108: LD0.RESTCTR8 Residual current preprocessing (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTCTR8									
.Wrn.stVal	WARNING	Warning	10=Warning	81	119	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	120	1	1	0	1

5.4.38 LD0.RESTVTR1 Uo VT supervision (1)

Table 109: LD0.RESTVTR1 Uo VT supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR1									
.Wrn.stVal	WARNING	Warning	10=Warning	81	125	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	126	1	1	0	1

5.4.39 LD0.RESTVTR2 Uo VT supervision (2)

Table 110: LD0.RESTVTR2 Uo VT supervision (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR2									
.Wrn.stVal	WARNING	Warning	10=Warning	81	127	1	2	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	128	1	2	0	1

5.4.40 LD0.RESTVTR3 Uo VT supervision (3)

Table 111: LD0.RESTVTR3 Uo VT supervision (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR3									
.Wrn.stVal	WARNING	Warning	10=Warning	81	129	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	130	1	1	0	1

5.4.41 LD0.RESTVTR4 Uo VT supervision (4)

Table 112: LD0.RESTVTR4 Uo VT supervision (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR4									
.Wrn.stVal	WARNING	Warning	10=Warning	81	131	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	132	1	1	0	1

5.4.42 LD0.RESTVTR5 Uo VT supervision (5)

Table 113: LD0.RESTVTR5 Uo VT supervision (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR5									
.Wrn.stVal	WARNING	Warning	10=Warning	81	133	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	134	1	1	0	1

5.4.43 LD0.RESTVTR6 Uo VT supervision (6)

Table 114: LD0.RESTVTR6 Uo VT supervision (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR6									
.Wrn.stVal	WARNING	Warning	10=Warning	81	135	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	136	1	1	0	1

5.4.44 LD0.RESTVTR7 Uo VT supervision (7)

Table 115: LD0.RESTVTR7 Uo VT supervision (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR7									
.Wrn.stVal	WARNING	Warning	10=Warning	81	117	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	118	1	1	0	1

5.4.45 LD0.RESTVTR8 Uo VT supervision (8)

Table 116: LD0.RESTVTR8 Uo VT supervision (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESTVTR8									
.Wrn.stVal	WARNING	Warning	10=Warning	81	119	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	120	1	1	0	1

5.4.46 LD0.SEQSPVC1 Fuse failure supervision (1)

Table 117: LD0.SEQSPVC1 Fuse failure supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEQSPVC1									
.Str.general	FUSEF_U	General start	10=Start	22	84	1	2	1	1
.Str3Ph.general	FUSEF_3PH	3 phase start	10=Start	22	94	1	2	1	1

5.4.47 LD0.SEQSPVC2 Fuse failure supervision (2)

Table 118: LD0.SEQSPVC2 Fuse failure supervision (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEQSPVC2									
.Str.general	FUSEF_U	General start	10=Start	22	95	1	2	1	1
.Str3Ph.general	FUSEF_3PH	3 phase start	10=Start	22	96	1	2	1	1

5.4.48 LD0.SEQSPVC3 Fuse failure supervision (3)

Table 119: LD0.SEQSPVC3 Fuse failure supervision (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEQSPVC3									
.Str.general	FUSEF_U	General start	10=Start	22	97	1	2	1	1
.Str3Ph.general	FUSEF_3PH	3 phase start	10=Start	22	98	1	2	1	1

5.4.49 LD0.SEQSPVC4 Fuse failure supervision (4)

Table 120: LD0.SEQSPVC4 Fuse failure supervision (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEQSPVC4									
.Str.general	FUSEF_U	General start	10=Start	22	99	1	2	1	1
.Str3Ph.general	FUSEF_3PH	3 phase start	10=Start	22	100	1	2	1	1

5.4.50 LD0.SEQSPVC5 Fuse failure supervision (5)

Table 121: LD0.SEQSPVC5 Fuse failure supervision (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEQSPVC5									
.Str.general	FUSEF_U	General start	10=Start	22	101	1	2	1	1
.Str3Ph.general	FUSEF_3PH	3 phase start	10=Start	22	102	1	2	1	1

5.4.51 LD0.SEQSPVC6 Fuse failure supervision (6)

Table 122: LD0.SEQSPVC6 Fuse failure supervision (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEQSPVC6									
.Str.general	FUSEF_U	General start	10=Start	22	103	1	2	1	1
.Str3Ph.general	FUSEF_3PH	3 phase start	10=Start	22	104	1	2	1	1

5.4.52 LD0.SEQSPVC7 Fuse failure supervision (7)

Table 123: LD0.SEQSPVC7 Fuse failure supervision (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEQSPVC7									
.Str.general	FUSEF_U	General start	10=Start	22	105	1	2	1	1
.Str3Ph.general	FUSEF_3PH	3 phase start	10=Start	22	106	1	2	1	1

5.4.53 LD0.SSCBR1 Circuit-breaker condition monitoring (1)

Table 124: LD0.SSCBR1 Circuit-breaker condition monitoring (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SSCBR1									
.RsAccmAPwr.Oper.ctlVal	RST_IPOW	Accumul. energy reset	10=Reset	242	19	1	20	0	1
.RsCBWear.Oper.ctlVal	RST_CB_WEAR	CB life/op.counters reset	10=Reset	242	20	1	20	0	1
.RsTrvTm.Oper.ctlVal	RST_TRV_T	Travel time alarm reset	10=Reset	242	21	1	20	0	1
.OpnAlm.stVal	TRV_T_OP_ALM	Opn travel time alarm	10=Alarm	242	101	0	1	1	1
.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	10=Alarm	242	102	0	1	1	1
.OpCntAlm.stVal	OPR_ALM	CB operations alarm	10=Alarm	242	104	0	1	1	1
.OpCntLO.stVal	OPR_LO	CB operations lockout	10=Lockout	242	105	0	1	1	1
.LonTmAlm.stVal	MON_ALM	CB inactive alarm	10=Alarm	242	106	0	1	1	1
.InsAlm.stVal	PRES_ALM	Low pressure alarm	10=Alarm	242	107	0	1	1	1
.InsBlk.stVal	PRES_LO	Low pressure lockout	10=Lockout	242	108	0	1	1	1
.APwrAlm.stVal	IPOW_ALM	Iyt alarm	10=Alarm	242	109	0	1	1	1
.APwrLO.stVal	IPOW_LO	Iyt lockout	10=Lockout	242	110	0	1	1	1
.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	10=Alarm	242	111	0	1	1	1
LD0.SSOPM1									
.RsSprChaTm.Oper.ctlVal	RST_SPR_T	Charge time alarm reset	10=Reset	242	22	1	20	0	1
.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge time alarm	10=Alarm	242	103	0	1	1	1

5.4.54 LD0.SSCBR2 Circuit-breaker condition monitoring (2)

Table 125: LD0.SSCBR2 Circuit-breaker condition monitoring (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SSCBR2									
.RsAccmAPwr.Oper.ctlVal	RST_IPOW	Accumul. energy reset	10=Reset	242	29	1	20	0	1
.RsCBWear.Oper.ctlVal	RST_CB_WEAR	CB life/op.counters reset	10=Reset	242	30	1	20	0	1
.RsTrvTm.Oper.ctlVal	RST_TRV_T	Travel time alarm reset	10=Reset	242	31	1	20	0	1
.OpnAlm.stVal	TRV_T_OP_ALM	Opn travel time alarm	10=Alarm	242	121	0	1	1	1
.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	10=Alarm	242	122	0	1	1	1
.OpCntAlm.stVal	OPR_ALM	CB operations alarm	10=Alarm	242	124	0	1	1	1
.OpCntLO.stVal	OPR_LO	CB operations lockout	10=Lockout	242	125	0	1	1	1
.LonTmAlm.stVal	MON_ALM	CB inactive alarm	10=Alarm	242	126	0	1	1	1
.InsAlm.stVal	PRES_ALM	Low pressure alarm	10=Alarm	242	127	0	1	1	1
.InsBlk.stVal	PRES_LO	Low pressure lockout	10=Lockout	242	128	0	1	1	1
.APwrAlm.stVal	IPOW_ALM	Iyt alarm	10=Alarm	242	129	0	1	1	1
.APwrLO.stVal	IPOW_LO	Iyt lockout	10=Lockout	242	130	0	1	1	1
.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	10=Alarm	242	131	0	1	1	1
LD0.SSOPM2									
.RsSprChaTm.Oper.ctlVal	RST_SPR_T	Charge time alarm reset	10=Reset	242	32	1	20	0	1
.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge time alarm	10=Alarm	242	123	0	1	1	1

5.4.55 LD0.SSCBR3 Circuit-breaker condition monitoring (3)

Table 126: LD0.SSCBR3 Circuit-breaker condition monitoring (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SSCBR3									
.RsAccmAPwr.Oper.ctlVal	RST_IPOW	Accumul. energy reset	10=Reset	242	39	1	20	0	1
.RsCBWear.Oper.ctlVal	RST_CB_WEAR	CB life/op.counters reset	10=Reset	242	40	1	20	0	1
.RsTrvTm.Oper.ctlVal	RST_TRV_T	Travel time alarm reset	10=Reset	242	41	1	20	0	1
.OpnAlm.stVal	TRV_T_OP_ALM	Opn travel time alarm	10=Alarm	242	141	0	1	1	1
.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	10=Alarm	242	142	0	1	1	1
.OpCntAlm.stVal	OPR_ALM	CB operations alarm	10=Alarm	242	144	0	1	1	1
.OpCntLO.stVal	OPR_LO	CB operations lockout	10=Lockout	242	145	0	1	1	1
.LonTmAlm.stVal	MON_ALM	CB inactive alarm	10=Alarm	242	146	0	1	1	1
.InsAlm.stVal	PRES_ALM	Low pressure alarm	10=Alarm	242	147	0	1	1	1
.InsBlk.stVal	PRES_LO	Low pressure lockout	10=Lockout	242	148	0	1	1	1
.APwrAlm.stVal	IPOW_ALM	Iyt alarm	10=Alarm	242	149	0	1	1	1
.APwrLO.stVal	IPOW_LO	Iyt lockout	10=Lockout	242	150	0	1	1	1
.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	10=Alarm	242	151	0	1	1	1
LD0.SSOPM3									
.RsSprChaTm.Oper.ctlVal	RST_SPR_T	Charge time alarm reset	10=Reset	242	42	1	20	0	1
.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge time alarm	10=Alarm	242	143	0	1	1	1

5.4.56 LD0.UL1TVTR1 Three-phase VT supervision (1)

Table 127: LD0.UL1TVTR1 Three-phase VT supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR1									
.Wrn.stVal	WARNING	Warning	10=Warning	81	121	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	122	1	1	0	1

5.4.57 LD0.UL1TVTR2 Three-phase VT supervision (2)

Table 128: LD0.UL1TVTR2 Three-phase VT supervision (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR2									
.Wrn.stVal	WARNING	Warning	10=Warning	81	123	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	124	1	1	0	1

5.4.58 LD0.UL1TVTR3 Three-phase VT supervision (3)

Table 129: LD0.UL1TVTR3 Three-phase VT supervision (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR3									
.Wrn.stVal	WARNING	Warning	10=Warning	81	181	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	182	1	1	0	1

5.4.59 LD0.UL1TVTR4 Three-phase VT supervision (4)

Table 130: LD0.UL1TVTR4 Three-phase VT supervision (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR4									
.Wrn.stVal	WARNING	Warning	10=Warning	81	183	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	184	1	1	0	1

5.4.60 LD0.UL1TVTR5 Three-phase VT supervision (5)

Table 131: LD0.UL1TVTR5 Three-phase VT supervision (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR5									
.Wrn.stVal	WARNING	Warning	10=Warning	81	185	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	186	1	1	0	1

5.4.61 LD0.UL1TVTR6 Three-phase VT supervision (6)

Table 132: LD0.UL1TVTR6 Three-phase VT supervision (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR6									
.Wrn.stVal	WARNING	Warning	10=Warning	81	187	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	188	1	1	0	1

5.4.62 LD0.UL1TVTR7 Three-phase VT supervision (7)

Table 133: LD0.UL1TVTR7 Three-phase VT supervision (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR7									
.Wrn.stVal	WARNING	Warning	10=Warning	81	189	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	190	1	1	0	1

5.4.63 LD0.UL1TVTR8 Three-phase VT supervision (8)

Table 134: LD0.UL1TVTR8 Three-phase VT supervision (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UL1TVTR8									
.Wrn.stVal	WARNING	Warning	10=Warning	81	191	1	1	0	1
.Alm.stVal	ALARM	Alarm	10=Alarm	81	192	1	1	0	1

5.5 Automatic control functions

5.5.1 LD0.OL5ATCC1 Tap changer control with voltage regulator (1)

Table 135: LD0.OL5ATCC1 Tap changer control with voltage regulator (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.OL5ATCC1									
.TapOpErr.stVal	ALARM	Alarm	10=Alarm	81	1	2	1	1	1
.TapOpR.stVal	RAISE_OWN	Raise cmd	10=Raise	81	2	2	1	1	1
.TapOpL.stVal	LOWER_OWN	Lower cmd	10=Lower	81	3	2	1	1	1
.EndPosR.stVal	–	Block raise	10=Block	81	4	2	1	1	1
.EndPosL.stVal	–	Block lower	10=Block	81	5	2	1	1	1
.ParOp.stVal/ctlVal	PARALLEL	Parallel or single op.	10=Parallel	81	6	2	1	1	1
.Auto.stVal	AUTO	Auto or manual op.	10=Auto	81	7	2	1	1	1
.LTCBlkAHi.stVal	BLKD_I_LOD	Overcurrent block	10=Block	81	11	2	1	1	1
.LTCBlkVLo.stVal	BLKD_U_UN	Undervoltage block	10=Block	81	12	2	1	1	1
.LTCRnbk.stVal	RNBK_U_OV	Raise voltage runback block	10=Block	81	13	2	1	1	1
.CircAHiBlk.stVal	BLKD_I_CIR	High circulating current block	10=Block	81	14	2	1	1	1
.Blk.stVal	BLKD_LTCBLK	External block	10=Block	81	15	2	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.ErrPar.stVal	PAR_FAIL	Parallel failure detected	10=Failure	81	16	2	1	1	1
.TapChg.ValWTr.ctl Val	–	Tap changer control lower	10=Lower	81	20	1	20	1	1
.TapChg.ValWTr.ctl Val	–	Tap changer control higher	10=Higher	81	21	1	20	1	1

5.5.2 LD0.PASANCR1 Petersen coil controller (1)

Table 136: LD0.PASANCR1 Petersen coil controller (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PASANCR1									
.VResMax.stVal	UMAX_RES	Z-seq Uo max level reached	10=Reached	45	170	1	1	1	1
.VResMin.stVal	UMIN_RES	Z-seq Uo min level reached	10=Reached	45	171	1	1	1	1
.ColDftPos.stVal	DEFAULT_POS	Coil in default position	10=Reached	45	172	1	1	1	1
.ColErrPos.stVal	ERROR_POS	Coil in error position	10=Reached	45	173	1	1	1	1
.TunDl.stVal	TUN_DL	Tuning delay in progress	10=Reached	45	174	1	1	1	1
.ClcSeqWrn.stVal	CLC_SEQ_WRN	Max. num of tuning cycles warning	10=Warning	45	175	1	1	1	1
.Auto.Oper.ctlVal		Automatic or manual mode	10=Auto	45	177	1	1,20	1	1

5.6 Metering and measurand functions

5.6.1 LD0.CMMXU1 Three-phase current measurement (1)

Table 137: LD0.CMMXU1 Three-phase current measurement (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU1									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	210	1	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	210	2	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	210	3	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	210	4	1	1	1	1

5.6.2 LD0.CMMXU2 Three-phase current measurement (2)

Table 138: LD0.CMMXU2 Three-phase current measurement (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU2									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	1	0	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	2	0	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	212	3	0	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	212	4	0	1	1	1

5.6.3 LD0.CMMXU3 Three-phase current measurement (3)

Table 139: LD0.CMMXU3 Three-phase current measurement (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU3									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	51	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	52	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	212	53	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	212	54	1	1	1	1

5.6.4 LD0.CMMXU4 Three-phase current measurement (4)

Table 140: LD0.CMMXU4 Three-phase current measurement (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU4									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	55	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	56	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	212	57	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	212	58	1	1	1	1

5.6.5 LD0.CMMXU5 Three-phase current measurement (5)

Table 141: LD0.CMMXU5 Three-phase current measurement (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU5									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	59	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	60	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	212	61	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	212	62	1	1	1	1

5.6.6 LD0.CMMXU6 Three-phase current measurement (6)

Table 142: LD0.CMMXU6 Three-phase current measurement (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU6									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	63	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	64	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	212	65	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	212	65	1	1	1	1

5.6.7 LD0.CMMXU7 Three-phase current measurement (7)

Table 143: LD0.CMMXU7 Three-phase current measurement (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU7									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	67	1	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	68	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	212	69	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	212	70	1	1	1	1

5.6.8 LD0.CMMXU8 Three-phase current measurement (8)

Table 144: LD0.CMMXU8 Three-phase current measurement (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMMXU8									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	71	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	72	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	212	73	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	212	74	1	1	1	1

5.6.9 LD0.CMSWI1 Selection between two current measurement sources (1)

Table 145: LD0.CMSWI1 Selection between two current measurement sources (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMSWI1									
.Wrn.stVal	WARNING	Warning	10=Warning	213	1	1	1	1	1
.Alm.stVal	ALARM	Alarm	10=Alarm	213	2	1	1	1	1

5.6.10 LD0.CMSWI2 Selection between two current measurement sources (2)

Table 146: LD0.CMSWI2 Selection between two current measurement sources (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMSWI2									
.Wrn.stVal	WARNING	Warning	10=Warning	213	3	1	1	1	1
.Alm.stVal	ALARM	Alarm	10=Alarm	213	4	1	1	1	1

5.6.11 LD0.CMSWI3 Selection between two current measurement sources (3)

Table 147: LD0.CMSWI3 Selection between two current measurement sources (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMSWI3									
.Wrn.stVal	WARNING	Warning	10=Warning	213	5	1	1	1	1
.Alm.stVal	ALARM	Alarm	10=Alarm	213	6	1	1	1	1

5.6.12 LD0.RESCMMXU1 Residual current measurement (1)

Table 148: LD0.RESCMMXU1 Residual current measurement (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU1									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	210	11	0	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	210	12	0	1	1	1

5.6.13 LD0.RESCMMXU2 Residual current measurement (2)

Table 149: LD0.RESCMMXU2 Residual current measurement (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU2									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	11	0	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	12	0	1	1	1

5.6.14 LD0.RESCMMXU3 Residual current measurement (3)

Table 150: LD0.RESCMMXU3 Residual current measurement (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU3									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	13	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	14	1	1	1	1

5.6.15 LD0.RESCMMXU4 Residual current measurement (4)

Table 151: LD0.RESCMMXU4 Residual current measurement (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU4									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	15	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	16	1	1	1	1

5.6.16 LD0.RESCMMXU5 Residual current measurement (5)

Table 152: LD0.RESCMMXU5 Residual current measurement (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU5									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	17	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	18	1	1	1	1

5.6.17 LD0.RESCMMXU6 Residual current measurement (6)

Table 153: LD0.RESCMMXU6 Residual current measurement (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU6									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	19	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	20	1	1	1	1

5.6.18 LD0.RESCMMXU7 Residual current measurement (7)

Table 154: LD0.RESCMMXU7 Residual current measurement (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU7									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	21	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	22	1	1	1	1

5.6.19 LD0.RESCMMXU8 Residual current measurement (8)

Table 155: LD0.RESCMMXU8 Residual current measurement (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCMMXU8									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	212	23	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	212	24	1	1	1	1

5.6.20 LD0.RESVMMXU1 Residual voltage measurement (1)

Table 156: LD0.RESVMMXU1 Residual voltage measurement (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU1									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	11	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	12	1	1	1	1

5.6.21 LD0.RESVMMXU2 Residual voltage measurement (2)

Table 157: LD0.RESVMMXU2 Residual voltage measurement (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU2									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	31	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	32	1	1	1	1

5.6.22 LD0.RESVMMXU3 Residual voltage measurement (3)

Table 158: LD0.RESVMMXU3 Residual voltage measurement (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU3									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	33	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	34	1	1	1	1

5.6.23 LD0.RESVMMXU4 Residual voltage measurement (4)

Table 159: LD0.RESVMMXU4 Residual voltage measurement (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU4									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	35	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	36	1	1	1	1

5.6.24 LD0.RESVMMXU5 Residual voltage measurement (5)

Table 160: LD0.RESVMMXU5 Residual voltage measurement (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU5									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	37	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	38	1	1	1	1

5.6.25 LD0.RESVMMXU6 Residual voltage measurement (6)

Table 161: LD0.RESVMMXU6 Residual voltage measurement (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU6									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	39	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	40	1	1	1	1

5.6.26 LD0.RESVMMXU7 Residual voltage measurement (7)

Table 162: LD0.RESVMMXU7 Residual voltage measurement (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU7									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	41	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	42	1	1	1	1

5.6.27 LD0.RESVMMXU8 Residual voltage measurement (8)

Table 163: LD0.RESVMMXU8 Residual voltage measurement (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESVMMXU8									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	43	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	44	1	1	1	1

5.6.28 LD0.VAMMXU1 Single-phase voltage measurement (1)

Table 164: LD0.VAMMXU1 Single-phase voltage measurement (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VAMMXU1									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	101	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	102	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	103	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	104	1	1	1	1

5.6.29 LD0.VAMMXU2 Single-phase voltage measurement (2)

Table 165: LD0.VAMMXU2 Single-phase voltage measurement (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VAMMXU2									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	105	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	106	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	107	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	108	1	1	1	1

5.6.30 LD0.VAMMXU3 Single-phase voltage measurement (3)

Table 166: LD0.VAMMXU3 Single-phase voltage measurement (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VAMMXU3									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	109	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	110	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	111	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	112	1	1	1	1

5.6.31 LD0.VAMMXU4 Single-phase voltage measurement (4)

Table 167: LD0.VAMMXU4 Single-phase voltage measurement (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VAMMXU4									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	113	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	114	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	115	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	116	1	1	1	1

5.6.32 LD0.VMMXU1 Three-phase voltage measurement (1)

Table 168: LD0.VMMXU1 Three-phase voltage measurement (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU1									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	1	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	2	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	3	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	4	1	1	1	1

5.6.33 LD0.VMMXU2 Three-phase voltage measurement (2)

Table 169: LD0.VMMXU2 Three-phase voltage measurement (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU2									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	21	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	22	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	23	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	24	1	1	1	1

5.6.34 LD0.VMMXU3 Three-phase voltage measurement (3)

Table 170: LD0.VMMXU3 Three-phase voltage measurement (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU3									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	51	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	52	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	53	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	54	1	1	1	1

5.6.35 LD0.VMMXU4 Three-phase voltage measurement (4)

Table 171: LD0.VMMXU4 Three-phase voltage measurement (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU4									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	55	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	56	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	57	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	58	1	1	1	1

5.6.36 LD0.VMMXU5 Three-phase voltage measurement (5)

Table 172: LD0.VMMXU5 Three-phase voltage measurement (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU5									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	59	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	60	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	61	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	62	1	1	1	1

5.6.37 LD0.VMMXU6 Three-phase voltage measurement (6)

Table 173: LD0.VMMXU6 Three-phase voltage measurement (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU6									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	63	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	64	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	65	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	66	1	1	1	1

5.6.38 LD0.VMMXU7 Three-phase voltage measurement (7)

Table 174: LD0.VMMXU7 Three-phase voltage measurement (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU7									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	67	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	68	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	69	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	70	1	1	1	1

5.6.39 LD0.VMMXU8 Three-phase voltage measurement (8)

Table 175: LD0.VMMXU8 Three-phase voltage measurement (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMMXU8									
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	71	1	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	72	1	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	73	1	1	1	1
.LoAlm.stVal	LOW_ALARM	Low alarm	10=Alarm	211	74	1	1	1	1

5.6.40 LD0.VMSWI1 Selection between two voltage measurement sources (1)

Table 176: LD0.VMSWI1 Selection between two voltage measurement sources (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMSWI1									
.Wrn.stVal	WARNING	Warning	10=Warning	213	11	1	1	1	1
.Alm.stVal	ALARM	Alarm	10=Alarm	213	12	1	1	1	1

5.6.41 LD0.VMSWI2 Selection between two voltage measurement sources (2)

Table 177: LD0.VMSWI2 Selection between two voltage measurement sources (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMSWI2									
.Wrn.stVal	WARNING	Warning	10=Warning	213	13	1	1	1	1
.Alm.stVal	ALARM	Alarm	10=Alarm	213	14	1	1	1	1

5.6.42 LD0.VMSWI3 Selection between two voltage measurement sources (3)

Table 178: LD0.VMSWI3 Selection between two voltage measurement sources (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMSWI3									
.Wrn.stVal	WARNING	Warning	10=Warning	213	15	1	1	1	1
.Alm.stVal	ALARM	Alarm	10=Alarm	213	16	1	1	1	1

5.6.43 LD0.VPHMMXU1 Three-phase voltage measurement (1)

Table 179: LD0.VPHMMXU1 Three-phase voltage measurement (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.VPHMMXU1								
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	131	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	132	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	133	1	1	1
.LoAlm.stVal	LOWALM	Low alarm	10=Alarm	211	134	1	1	1

5.6.44 LD0.VPHMMXU2 Three-phase voltage measurement (2)

Table 180: LD0.VPHMMXU2 Three-phase voltage measurement (2)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.VPHMMXU2								
.HiAlm.stVal	HIGH_ALARM	High alarm	10=Alarm	211	135	1	1	1
.HiWrn.stVal	HIGH_WARN	High warning	10=Warning	211	136	1	1	1
.LoWrn.stVal	LOW_WARN	Low warning	10=Warning	211	137	1	1	1
.LoAlm.stVal	LOWALM	Low alarm	10=Alarm	211	138	1	1	1

5.7 Power quality functions

5.7.1 LD0.CMHAI1 Current total demand distortion (1)

Table 181: LD0.CMHAI1 Current total demand distortion (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMHAI1									
.Alm.stVal	ALARM	Distortion Alarm	10=Alarm	95	101	1	2	0	1

5.7.2 LD0.CMHAI2 Current total demand distortion (2)

Table 182: LD0.CMHAI2 Current total demand distortion (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CMHAI2									
.Alm.stVal	ALARM	Distortion Alarm	10=Alarm	95	102	1	2	0	1

5.7.3 LD0.PHQVVR1 Voltage variation (1)

Table 183: LD0.PHQVVR1 Voltage variation (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PH1QVVR1									
.VarStrGen.stVal		Variation event detected	10=Detected	95	121	1	2	0	1
.VarEnd.stVal		Variation event ended	10=Ended	95	122	1	2	0	1
.SwlOp.stVal		Swell event detected	10=Detected	95	123	1	2	0	1
.DipOp.stVal		Dip event detected	10=Detected	95	124	1	2	0	1
.IntrOptVal		Interruption event detected	10=Detected	95	125	1	2	0	1

5.7.4 LD0.PHQVVR2 Voltage variation (2)

Table 184: LD0.PHQVVR2 Voltage variation (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PH1QVVR2									
.VarStrGen.stVal		Variation event detected	10=Detected	95	126	1	2	0	1
.VarEnd.stVal		Variation event ended	10=Ended	95	127	1	2	0	1
.SwlOp.stVal		Swell event detected	10=Detected	95	128	1	2	0	1
.DipOp.stVal		Dip event detected	10=Detected	95	129	1	2	0	1
.IntrOptVal		Interruption event detected	10=Detected	95	130	1	2	0	1

5.7.5 LD0.VMHAI1 Voltage total harmonic distortion (1)

Table 185: LD0.VMHAI1 Voltage total harmonic distortion (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMHAI1									
.Alm.stVal	ALARM	Distortion Alarm	10=Alarm	95	105	1	2	0	1

5.7.6 LD0.VMHAI2 Voltage total harmonic distortion (2)

Table 186: LD0.VMHAI2 Voltage total harmonic distortion (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VMHAI2									
.Alm.stVal	ALARM	Distortion Alarm	10=Alarm	95	106	1	2	0	1

5.7.7 LD0.VSQVUB1 Voltage unbalance (1)

Table 187: LD0.VSQVUB1 Voltage unbalance (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VSQVUB1									
.VarStr.stVal	MN_UNB_AL	3 min unbalance alarm	10=Alarm	95	131	1	2	0	1
.HiPctVUnb.stVal	PCT_UNB_AL	Percentile unbalance alarm	10=Alarm	95	132	1	2	0	1

5.7.8 LD0.VSQVUB2 Voltage unbalance (2)

Table 188: LD0.VSQVUB2 Voltage unbalance (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VSQVUB2									
.VarStr.stVal	MN_UNB_AL	Unbalance alarm	10=Alarm	95	133	1	1	0	1
.HiPctVUnb.stVal	PCT_UNB_AL	Percentile unbalance alarm	10=Alarm	95	134	1	1	0	1

5.8 Protection functions

5.8.1 LD0.CNUPTOV1 Compensated neutral unbalance voltage protection (1)

Table 189: LD0.CNUPTOV1 Compensated neutral unbalance voltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CNUPTOV1									
.Str.general	START	Stage start	10=Start	46	21	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	46	22	1	2	0	1

5.8.2 LD0.CNUPTOV2 Compensated neutral unbalance voltage protection (2)

Table 190: LD0.CNUPTOV2 Compensated neutral unbalance voltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CNUPTOV2									
.Str.general	START	Stage start	10=Start	46	23	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	46	24	1	2	0	1

5.8.3 LD0.COLPTOC1 Three-phase overload protection for shunt capacitor banks (1)

Table 191: LD0.COLPTOC1 Three-phase overload protection for shunt capacitor banks (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.COL1PTOC1									
.Op.general	OPERATE	Overload operate	10=Operate	60	22	1	2	0	1
.Str.general	START	Overload start	10=Start	60	21	1	2	1	1
LD0.COL2PTOC1									
.Op.general	ALARM	Alarm	10=Alarm	60	23	1	2	0	1
LD0.COLPTUC1									
.Op.general	OPERATE	Undercurrent operate	10=Operate	60	2	1	2	0	1
.Str.general	START	Undercurrent start	10=Start	60	1	1	2	1	1

5.8.4 LD0.CRWPSCH1 Current reversal and weak-end infeed logic (1)

Table 192: LD0.CRWPSCH1 Current reversal and weak-end infeed logic (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CRWPSCH1									
.Op.general	OPR_WEI	Operate, WEI logic phsC	10=Operate	45	41	1	2	0	1
.TxPrm.general	ECHO	Carrier send, WEI logic	10=Send	45	42	1	2	0	1
.RvABlk.general	OPR_IRV	Operate, WEI logic phsB	10=Operate	45	43	1	2	0	1

5.8.5 LD0.CUBxPTOC1 Capacitor bank unbalance current, double Y bridge (1)

Table 193: LD0.CUBxPTOC1 Capacitor bank unbalance current, double Y bridge (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CUB2PTOC1									
.Op.general	OPERATE	Unbalance operate	10=Operate	60	112	1	2	0	1
.Str.general	START	Unbalance start	10=Start	60	111	1	2	1	1
LD0.CUB1PTOC1									
.Op.general	ALARM	Alarm	10=Alarm	60	102	1	2	0	1

5.8.6 LD0.CUBxPTOC2 Capacitor bank unbalance current, double Y bridge (2)

Table 194: LD0.CUBxPTOC2 Capacitor bank unbalance current, double Y bridge (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CUB2PTOC2									
.Op.general	OPERATE	Unbalance operate	10=Operate	60	115	1	2	0	1
.Str.general	START	Unbalance start	10=Start	60	114	1	2	1	1
LD0.CUB1PTOC2									
.Op.general	ALARM	Alarm	10=Alarm	60	113	1	2	0	1

5.8.7 LD0.CUBxPTOC3 Capacitor bank unbalance current, double Y bridge (3)

Table 195: LD0.CUBxPTOC3 Capacitor bank unbalance current, double Y bridge (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CUB2PTOC3									
.Op.general	OPERATE	Unbalance operate	10=Operate	60	125	1	2	0	1
.Str.general	START	Unbalance start	10=Start	60	124	1	2	1	1
LD0.CUB1PTOC3									
.Op.general	ALARM	Alarm	10=Alarm	60	123	1	2	0	1

5.8.8 LD0.CVPSOF1 Switch-onto-fault protection (1)

Table 196: LD0.CVPSOF1 Switch-onto-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CVPSOF1									
.TrFltSt.stVal	OPERATE	Trip fault state	10=Trip fault	170	201	1	2	0	1

5.8.9 LD0.DEFHPDEF1 Directional earth-fault protection, high stage (1)

Table 197: LD0.DEFHPDEF1 Directional earth-fault protection, high stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFHPTOC1		High (1) stage							
.Str.general	START	-Start	10=Start	163	96	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	98	1	2	0	1

5.8.10 LD0.DEFHPDEF2 Directional earth-fault protection, high stage (2)

Table 198: LD0.DEFHPDEF2 Directional earth-fault protection, high stage (2)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFHPTOC2		High (2) stage							
.Str.general	START	-Start	10=Start	163	111	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	112	1	2	0	1

5.8.11 LD0.DEFHPDEF3 Directional earth-fault protection, high stage (3)

Table 199: LD0.DEFHPDEF3 Directional earth-fault protection, high stage (3)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFHPTOC3		High (3) stage							
.Str.general	START	-Start	10=Start	163	113	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	114	1	2	0	1

5.8.12 LD0.DEFHPDEF4 Directional earth-fault protection, high stage (4)

Table 200: LD0.DEFHPDEF4 Directional earth-fault protection, high stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFHPTOC4		High (4) stage							
.Str.general	START	-Start	10=Start	163	115	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	116	1	2	0	1

5.8.13 LD0.DEFHPDEF5 Directional earth-fault protection, high stage (5)

Table 201: LD0.DEFHPDEF5 Directional earth-fault protection, high stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFHPTOC5		High (5) stage							
.Str.general	START	-Start	10=Start	163	117	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	118	1	2	0	1

5.8.14 LD0.DEFLPDEF1 Directional earth-fault protection, low stage (1)

Table 202: LD0.DEFLPDEF1 Directional earth-fault protection, low stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFLPTOC1		Low (1) stage							
.Str.general	START	-Start	10=Start	163	84	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	90	1	2	0	1

5.8.15 LD0.DEFLPDEF2 Directional earth-fault protection, low stage (2)

Table 203: LD0.DEFLPDEF2 Directional earth-fault protection, low stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFLPTOC2		Low (2) stage							
.Op.general	OPERATE	-Operate	10=Operate	163	91	1	2	0	1
.Str.general	START	-Start	10=Start	163	94	1	2	1	1

5.8.16 LD0.DEFLPDEF3 Directional earth-fault protection, low stage (3)

Table 204: LD0.DEFLPDEF3 Directional earth-fault protection, low stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFLPTOC3		Low (3) stage							
.Str.general	START	-Start	10=Start	163	99	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	100	1	2	0	1

5.8.17 LD0.DEFLPDEF4 Directional earth-fault protection, low stage (4)

Table 205: LD0.DEFLPDEF4 Directional earth-fault protection, low stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFLPTOC4		Low (4) stage							
.Str.general	START	-Start	10=Start	163	101	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	102	1	2	0	1

5.8.18 LD0.DEFLPDEF5 Directional earth-fault protection, low stage (5)

Table 206: LD0.DEFLPDEF5 Directional earth-fault protection, low stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DEFLPTOC5		Low (5) stage							
.Str.general	START	-Start	10=Start	163	103	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	163	104	1	2	0	1

5.8.19 LD0.DNSPDOC1 Directional negative-sequence overcurrent protection (1)

Table 207: LD0.DNSPDOC1 Directional negative-sequence overcurrent protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DNSPTOC1									
.Str.general	START	Stage start	10=Start	46	31	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	46	32	1	2	0	1

5.8.20 LD0.DNSPDOC2 Directional negative-sequence overcurrent protection (2)

Table 208: LD0.DNSPDOC2 Directional negative-sequence overcurrent protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DNSPTOC2									
.Str.general	START	Stage start	10=Start	46	33	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	46	34	1	2	0	1

5.8.21 LD0.DNZPDIS1 Directional negative sequence impedance protection (1)

Table 209: LD0.DNZPDIS1 Directional negative sequence impedance protection (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.DNZPDIS1								
.Str.general	START	Start	10=Start	46	181	1	1	1
.Op.general	OPERATE	Operate	10=Operate	46	182	1	1	0

5.8.22 LD0.DNZPDIS2 Directional negative sequence impedance protection (2)

Table 210: LD0.DNZPDIS2 Directional negative sequence impedance protection (2)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.DNZPDIS2								
.Str.general	START	Start	10=Start	46	183	1	1	1
.Op.general	OPERATE	Operate	10=Operate	46	184	1	1	0

5.8.23 LD0.DNZPDIS3 Directional negative sequence impedance protection (3)

Table 211: LD0.DNZPDIS3 Directional negative sequence impedance protection (3)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.DNZPDIS3								
.Str.general	START	Start	10=Start	46	185	1	1	1
.Op.general	OPERATE	Operate	10=Operate	46	186	1	1	0

5.8.24 LD0.DOPPDPR1 Reverse power/directional overpower protection (1)

Table 212: LD0.DOPPDPR1 Reverse power/directional overpower protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPPDOP1									
.Str.general	START	Stage start	10=Start	28	91	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	92	1	2	0	1

5.8.25 LD0.DOPPDPR2 Reverse power/directional overpower protection (2)

Table 213: LD0.DOPPDPR2 Reverse power/directional overpower protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPPDOP2									
.Str.general	START	Stage start	10=Start	28	93	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	94	1	2	0	1

5.8.26 LD0.DOPPDPR3 Reverse power/directional overpower protection (3)

Table 214: LD0.DOPPDPR3 Reverse power/directional overpower protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPPDOP3									
.Str.general	START	Stage start	10=Start	28	95	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	96	1	2	0	1

5.8.27 LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1)

Table 215: LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHHPTOC1		High stage							
.Str.phsA	-	-PhsA start	10=Start	32	44	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	45	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	46	0	2	1	1
.Str.general	START	-General start	10=Start	32	96	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	98	1	2	0	1

5.8.28 LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2)

Table 216: LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHHPTOC2		High stage							
.Str.phsA	-	-PhsA start	10=Start	32	34	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	35	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	36	0	2	1	1
.Str.general	START	-General start	10=Start	32	99	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	100	1	2	0	1

5.8.29 LD0.DPHHPDOC3 Three-phase directional overcurrent protection, high stage (3)

Table 217: LD0.DPHHPDOC3 Three-phase directional overcurrent protection, high stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHHPTOC3		High stage							
.Str.phsA	-	-PhsA start	10=Start	32	153	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	154	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	155	0	2	1	1
.Str.general	START	-General start	10=Start	32	106	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	107	1	2	0	1

5.8.30 LD0.DPHHPDOC4 Three-phase directional overcurrent protection, high stage (4)

Table 218: LD0.DPHHPDOC4 Three-phase directional overcurrent protection, high stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHHPTOC4		High stage							
.Str.phsA	-	-PhsA start	10=Start	32	162	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	163	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	164	0	2	1	1
.Str.general	START	-General start	10=Start	32	112	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	113	1	2	0	1

5.8.31 LD0.DPHHPDOC5 Three-phase directional overcurrent protection, high stage (5)

Table 219: LD0.DPHHPDOC5 Three-phase directional overcurrent protection, high stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHHPTOC5		High stage							
.Str.phsA	-	-PhsA start	10=Start	162	165	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	162	166	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	162	167	0	2	1	1
.Str.general	START	-General start	10=Start	162	114	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	162	115	1	2	0	1

5.8.32 LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1)

Table 220: LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHLPTOC1		Low (1) stage							
.Str.phsA	-	-PhsA start	10=Start	32	64	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	65	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	66	0	2	1	1
.Str.general	START	-General start	10=Start	32	84	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	90	1	2	0	1

5.8.33 LD0.DPHLPDOC2 Three-phase directional overcurrent protection, low stage (2)

Table 221: LD0.DPHLPDOC2 Three-phase directional overcurrent protection, low stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHLPTOC2		Low (2) stage							
.Str.phsA	-	-PhsA start	10=Start	32	54	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	55	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	56	0	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	91	1	2	0	1
.Str.general	START	-General start	10=Start	32	94	1	2	1	1

5.8.34 LD0.DPHLPDOC3 Three-phase directional overcurrent protection, low stage (3)

Table 222: LD0.DPHLPDOC3 Three-phase directional overcurrent protection, low stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHLPTOC3		Low (2) stage							
.Str.phsA	-	-PhsA start	10=Start	32	150	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	151	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	152	0	2	1	1
.Str.general	START	-General start	10=Start	32	104	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	105	1	2	0	1

5.8.35 LD0.DPHLPDOC4 Three-phase directional overcurrent protection, low stage (4)

Table 223: LD0.DPHLPDOC4 Three-phase directional overcurrent protection, low stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHLPTOC4		Low (4) stage							
.Str.phsA	-	-PhsA start	10=Start	32	156	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	32	157	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	32	158	0	2	1	1
.Str.general	START	-General start	10=Start	32	108	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	32	109	1	2	0	1

5.8.36 LD0.DPHLPDOC5 Three-phase directional overcurrent protection, low stage (5)

Table 224: LD0.DPHLPDOC5 Three-phase directional overcurrent protection, low stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPHLPTOC5		Low (5) stage							
.Str.phsA	-	-PhsA start	10=Start	162	159	0	2	1	1
.Str.phsB	-	-PhsB start	10=Start	162	160	0	2	1	1
.Str.phsC	-	-PhsC start	10=Start	162	161	0	2	1	1
.Str.general	START	-General start	10=Start	162	110	1	2	1	1
.Op.general	OPERATE	-General operate	10=Operate	162	111	1	2	0	1

5.8.37 LD0.DQPTUV1 Directional reactive power undervoltage protection (1)

Table 225: LD0.DQPTUV1 Directional reactive power undervoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DQPTUV1									
.Str.general	START	Stage start	10=Start	28	100	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	101	1	2	0	1

5.8.38 LD0.DQPTUV2 Directional reactive power undervoltage protection (2)

Table 226: LD0.DQPTUV2 Directional reactive power undervoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DQPTUV2									
.Str.general	START	Stage start	10=Start	28	200	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	201	1	2	0	1

5.8.39 LD0.DSOCPSCH1 Scheme communication logic (1)

Table 227: LD0.DSOCPSCH1 Scheme communication logic (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DSOCPSCH1									
.Op.general	OPERATE	Phs A start	10=Operate	45	31	1	2	0	1
.TxPrm.general	CS_PRM	Permissive transmitted	10=Transmit-ted	45	32	1	2	0	1
.TxBlk.general	CS_BLOCKING	Blocking transmitted	10=Transmit-ted	45	33	1	2	0	1
.TxTr.general	CS_INTER_TR	Direct trip transmitted	10=Transmit-ted	45	34	1	2	0	1

5.8.40 LD0.DSTPDIS1 Distance protection (1)

Table 228: LD0.DSTPDIS1 Distance protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.GFCPDIS1									
.Str.general	START_GFC	Start, GFC	10=Start	45	11	1	2	1	1
.Op.general	OPERATE_GFC	Operate, time delayed	10=Operate	45	12	1	2	0	1
LD0.DSTPDIS1									
.Str.general	START_Z1	General start, Zone 1	10=Start	45	1	1	2	1	1
.Op.general	OPERATE_Z1	General operate, Zone 1	10=Operate	45	2	1	2	0	1
LD0.DSTPDIS2									
.Str.general	START_Z2	General start, Zone 2	10=Start	45	3	1	2	1	1
.Op.general	OPERATE_Z2	General operate, Zone 2	10=Operate	45	4	1	2	0	1
LD0.DSTPDIS3									
.Str.general	START_Z3	General start, Zone	10=Start	45	5	1	2	1	1
.Op.general	OPERATE_Z3	General operate, Zone 3	10=Operate	45	6	1	2	0	1
LD0.DSTPDIS4									
.Str.general	START_Z4	General start, Zone 4	10=Start	45	7	1	2	1	1
.Op.general	OPERATE_Z4	General operate, Zone 4	10=Operate	45	8	1	2	0	1
LD0.DSTPDIS5									
.Str.general	START_Z5	General start, Zone 5	10=Start	45	9	1	2	1	1
.Op.general	OPERATE_Z5	General operate, Zone 5	10=Operate	45	10	1	2	0	1

5.8.41 LD0.DSTPLAL1 Local acceleration logic (1)

Table 229: LD0.DSTPLAL1 Local acceleration logic (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DSTPLAL1									
.Op1.general	OPR_Z_EXTN	Operate, zone extension	10=Start	45	21	1	2	0	1
.Op2.general	OPR_LOSSLOAD	Operate, loss of load	10=Operate	45	22	1	2	0	1

5.8.42 LD0.DUPPDPR1 Underpower protection (1)

Table 230: LD0.DUPPDPR1 Underpower protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPPDUP1									
.Str.general	START	Stage start	10=Start	28	81	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	82	1	2	0	1

5.8.43 LD0.DUPPDPR2 Underpower protection (2)

Table 231: LD0.DUPPDPR2 Underpower protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPPDUP2									
.Str.general	START	Stage start	10=Start	28	83	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	84	1	2	0	1

5.8.44 LD0.DUPPDPR3 Underpower protection (3)

Table 232: LD0.DUPPDPR3 Underpower protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPPDUP3		Low stage							
.Str.general	START	-Start	10=Start	32	104	0	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	32	105	1	2	0	1

5.8.45 LD0.EFHPTOC1 Non-directional earth-fault protection, high stage (1)

Table 233: LD0.EFHPTOC1 Non-directional earth-fault protection, high stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFHPTOC1		High stage							
.Str.general	START	-Start	10=Start	159	96	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	98	1	2	0	1

5.8.46 LD0.EFHPTOC2 Non-directional earth-fault protection, high stage (2)

Table 234: LD0.EFHPTOC2 Non-directional earth-fault protection, high stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFHPTOC2		High stage							
.Str.general	START	-Start	10=Start	159	100	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	101	1	2	0	1

5.8.47 LD0.EFHPTOC3 Non-directional earth-fault protection, high stage (3)

Table 235: LD0.EFHPTOC3 Non-directional earth-fault protection, high stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFHPTOC3		High stage							
.Str.general	START	-Start	10=Start	159	110	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	111	1	2	0	1

5.8.48 LD0.EFHPTOC4 Non-directional earth-fault protection, high stage (4)

Table 236: LD0.EFHPTOC4 Non-directional earth-fault protection, high stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFHPTOC4		High stage							
.Str.general	START	-Start	10=Start	159	116	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	117	1	2	0	1

5.8.49 LD0.EFHPTOC5 Non-directional earth-fault protection, high stage (5)

Table 237: LD0.EFHPTOC5 Non-directional earth-fault protection, high stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFHPTOC5		High stage							
.Str.general	START	-Start	10=Start	159	118	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	119	1	2	0	1

5.8.50 LD0.EFIPTOC1 Non-directional earth-fault protection, instantaneous stage (1)

Table 238: LD0.EFIPTOC1 Non-directional earth-fault protection, instantaneous stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LDO.EFIPTOC1		Instantaneous stage							
.Str.general	START	-Start	10=Start	159	97	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	99	1	2	0	1

5.8.51 LD0.EFIPTOC2 Non-directional earth-fault protection, instantaneous stage (2)

Table 239: LD0.EFIPTOC2 Non-directional earth-fault protection, instantaneous stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LDO.EFIPTOC2		Instantaneous stage							
.Str.general	START	-Start	10=Start	159	102	0	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	103	1	2	0	1

5.8.52 LD0.EFIPTOC3 Non-directional earth-fault protection, instantaneous stage (3)

Table 240: LD0.EFIPTOC3 Non-directional earth-fault protection, instantaneous stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LDO.EFIPTOC3		Instantaneous stage							
.Str.general	START	-Start	10=Start	159	108	0	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	109	1	2	0	1

5.8.53 LD0.EFIPTOC4 Non-directional earth-fault protection, instantaneous stage (4)

Table 241: LD0.EFIPTOC4 Non-directional earth-fault protection, instantaneous stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFIPTOC4		Instantaneous stage							
.Str.general	START	-Start	10=Start	159	120	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	121	1	2	0	1

5.8.54 LD0.EFIPTOC5 Non-directional earth-fault protection, instantaneous stage (5)

Table 242: LD0.EFIPTOC5 Non-directional earth-fault protection, instantaneous stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFIPTOC5		Instantaneous stage							
.Str.general	START	-Start	10=Start	159	122	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	123	1	2	0	1

5.8.55 LD0.EFLPTOC1 Non-directional earth-fault protection, low stage (1)

Table 243: LD0.EFLPTOC1 Non-directional earth-fault protection, low stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFLPTOC1		Low (1) stage							
.Str.general	START	-Start	10=Start	159	84	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	90	1	2	0	1

5.8.56 LD0.EFLPTOC2 Non-directional earth-fault protection, low stage (2)

Table 244: LD0.EFLPTOC2 Non-directional earth-fault protection, low stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFLPTOC2		Low (2) stage							
.Op.general	OPERATE	-Operate	10=Operate	159	91	1	2	0	1
.Str.general	START	-Start	10=Start	159	94	1	2	1	1

5.8.57 LD0.EFLPTOC3 Non-directional earth-fault protection, low stage (3)

Table 245: LD0.EFLPTOC3 Non-directional earth-fault protection, low stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFLPTOC3		Low stage							
.Str.general	START	-Start	10=Start	159	104	0	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	105	1	2	0	1

5.8.58 LD0.EFLPTOC4 Non-directional earth-fault protection, low stage (4)

Table 246: LD0.EFLPTOC4 Non-directional earth-fault protection, low stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFLPTOC4		Low stage							
.Str.general	START	-Start	10=Start	159	112	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	113	1	2	0	1

5.8.59 LD0.EFLPTOC5 Non-directional earth-fault protection, low stage (5)

Table 247: LD0.EFLPTOC5 Non-directional earth-fault protection, low stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFLPTOC5		Low stage							
.Str.general	START	-Start	10=Start	159	114	1	2	1	1
.Op.general	OPERATE	-Operate	10=Operate	159	115	1	2	0	1

5.8.60 LD0.EFPADM1 Admittance-based earth-fault protection (1)

Table 248: LD0.EFPADM1 Admittance-based earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFPADM1									
.Str.general	START	Stage1 start	10=Start	25	84	1	2	1	1
.Op.general	OPERATE	Stage1 operate	10=Operate	25	90	1	2	0	1

5.8.61 LD0.EFPADM2 Admittance-based earth-fault protection (2)

Table 249: LD0.EFPADM2 Admittance-based earth-fault protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFPADM2									
.Op.general	OPERATE	Stage2 operate	10=Operate	25	91	1	2	0	1
.Str.general	START	Stage2 start	10=Start	25	94	1	2	1	1

5.8.62 LD0.EFPADM3 Admittance-based earth-fault protection (3)

Table 250: LD0.EFPADM3 Admittance-based earth-fault protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.EFPADM3									
.Str.general	START	Stage3 start	10=Start	25	96	1	2	1	1
.Op.general	OPERATE	Stage3 operate	10=Operate	25	98	1	2	0	1

5.8.63 LD0.FPIPTOC1 Fault passage indicator (1)

Table 251: LD0.FPIPTOC1 Fault passage indicator (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FPIPTOC1									
.Str.general	START	General start	10=Start	46	1	1	2	1	1
.Str.phsA	ST_A	Phase A start	10=Start	46	2	1	2	1	1
.Str.phsB	ST_B	Phase B start	10=Start	46	3	1	2	1	1
.Str.phsC	ST_C	Phase C start	10=Start	46	4	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	46	5	1	2	0	1

5.8.64 LD0.FRPFRQ1 Frequency protection (1)

Table 252: LD0.FRPFRQ1 Frequency protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC1									
.Str.general	START	Stage start	10=Start	27	11	1	2	1	1
LD0.FRPTOF1		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	12	1	2	0	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTUF1		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	13	1	2	0	1
LD0.FRPFRC1		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	14	1	2	0	1

5.8.65 LD0.FRPFRQ2 Frequency protection (2)

Table 253: LD0.FRPFRQ2 Frequency protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC2									
.Str.general	START	Stage start	10=Start	27	21	1	2	1	1
LD0.FRPTOF2		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	22	1	2	0	1
LD0.FRPTUF2		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	23	1	2	0	1
LD0.FRPFRC2		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	24	1	2	0	1

5.8.66 LD0.FRPFRQ3 Frequency protection (3)

Table 254: LD0.FRPFRQ3 Frequency protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC3									
.Str.general	START	Stage start	10=Start	27	31	1	2	1	1
LD0.FRPTOF3		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	32	1	2	0	1
LD0.FRPTUF3		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	33	1	2	0	1
LD0.FRPFRC3		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	34	1	2	0	1

5.8.67 LD0.FRPFRQ4 Frequency protection (4)

Table 255: LD0.FRPFRQ4 Frequency protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC4									
.Str.general	START	Stage start	10=Start	27	41	1	2	1	1
LD0.FRPTOF4		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	42	1	2	0	1
LD0.FRPTUF4		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	43	1	2	0	1
LD0.FRPFRC4		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	44	1	2	0	1

5.8.68 LD0.FRPFRQ5 Frequency protection (5)

Table 256: LD0.FRPFRQ5 Frequency protection (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC5									
.Str.general	START	Stage start	10=Start	27	51	1	2	1	1
LD0.FRPTOF5		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	52	1	2	0	1
LD0.FRPTUF5		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	53	1	2	0	1
LD0.FRPFRC5		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	54	1	2	0	1

5.8.69 LD0.FRPFRQ6 Frequency protection (6)

Table 257: LD0.FRPFRQ6 Frequency protection (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC6									
.Str.general	START	Stage start	10=Start	27	61	1	2	1	1
LD0.FRPTOF6		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	62	1	2	0	1
LD0.FRPTUF6		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	63	1	2	0	1
LD0.FRPFRC6		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	64	1	2	0	1

5.8.70 LD0.FRPFRQ7 Frequency protection (7)

Table 258: LD0.FRPFRQ7 Frequency protection (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC7									
.Str.general	START	Stage start	10=Start	27	71	1	2	1	1
LD0.FRPTOF7		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	72	1	2	0	1
LD0.FRPTUF7		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	73	1	2	0	1
LD0.FRPFRC7		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	74	1	2	0	1

5.8.71 LD0.FRPFRQ8 Frequency protection (8)

Table 259: LD0.FRPFRQ8 Frequency protection (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC8									
.Str.general	START	Stage start	10=Start	27	81	1	2	1	1
LD0.FRPTOF8		Overfrequency							

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	82	1	2	0	1
LD0.FRPTUF8		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	83	1	2	0	1
LD0.FRPFRC8		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	84	1	2	0	1

5.8.72 LD0.FRPFRQ9 Frequency protection (9)

Table 260: LD0.FRPFRQ9 Frequency protection (9)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC9									
.Str.general	START	Stage start	10=Start	27	91	1	2	1	1
LD0.FRPTOF9		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	92	1	2	0	1
LD0.FRPTUF9		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	93	1	2	0	1
LD0.FRPFRC9		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	94	1	2	0	1

5.8.73 LD0.FRPFRQ10 Frequency protection (10)

Table 261: LD0.FRPFRQ10 Frequency protection (10)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC10									
.Str.general	START	Stage start	10=Start	27	101	1	2	1	1
LD0.FRPTOF10		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	102	1	2	0	1
LD0.FRPTUF10		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	103	1	2	0	1
LD0.FRPFRC10		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	104	1	2	0	1

5.8.74 LD0.FRPFRQ11 Frequency protection (11)

Table 262: LD0.FRPFRQ11 Frequency protection (11)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC11									
.Str.general	START	Stage start	10=Start	27	111	1	2	1	1
LD0.FRPTOF11		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	112	1	2	0	1
LD0.FRPTUF11		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	113	1	2	0	1
LD0.FRPFRC11		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	114	1	2	0	1

5.8.75 LD0.FRPFRQ12 Frequency protection (12)

Table 263: LD0.FRPFRQ12 Frequency protection (12)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.FRPTRC12									
.Str.general	START	Stage start	10=Start	27	121	1	2	1	1
LD0.FRPTOF12		Overfrequency							
.Op.general	OPR_OFRQ	-Operate	10=Operate	27	122	1	2	0	1
LD0.FRPTUF12		Underfrequency							
.Op.general	OPR_UFRQ	-Operate	10=Operate	27	123	1	2	0	1
LD0.FRPFRC12		Frequency gradient							
.Op.general	OPR_FRG	-Operate	10=Operate	27	124	1	2	0	1

5.8.76 LD0.GAEPVOC1 Accidental energization protection for synchronous generator (1)

Table 264: LD0.GAEPVOC1 Accidental energization protection for synchronous generator (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.GAEPVOC1									
.Str.general	START	Stage start	10/01=On/Off	46	101	1	2	1	1
.Op.general	OPERATE	Stage operate	10/01=On/Off	46	102	1	2	0	1
.ALimAct.stVal	ARMED	Current limit active	10/01=On/Off	46	103	1	2	1	1

5.8.77 LD0.GSLPTOC1 Generator shaft leakage current (1)

Table 265: LD0.GSLPTOC1 Generator shaft leakage current (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.GSL1PTOC1								
.Op.general	ALARM	Alarm	10=Alarm	46	111	1	1	0
LD0.GSL2PTOC1								
.Op.general	OPERATE	Operate	10=Operate	46	112	1	1	0
.Str.general	START	Start	10=Start	46	113	1	1	1

5.8.78 LD0.H3EFPSEF1 Third harmonic-based stator earth-fault protection (1)

Table 266: LD0.H3EFPSEF1 Third harmonic-based stator earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.H3EFPTRC1									
.Str.general	START	Stage start	10=Start	28	121	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	122	1	2	0	1
LD0.H3EFPTOV1									
.BlkIntnSt.general	INT_BLKD	Internally blocked	10=Blocked	28	123	1	2	1	1

5.8.79 LD0.HAEFPTOC1 Harmonics-based earth-fault protection (1)

Table 267: LD0.HAEFPTOC1 Harmonics-based earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HAEFPTOC1		Stage							
Str.general	START	-start	10=Start	100	121	1	2	1	1
Op.general	OPERATE	-operate	10=Operate	100	122	1	2	0	1

5.8.80 LD0.HCUBxPTOC1 Capacitor bank unbalance current, H bridge (1)

Table 268: LD0.HCUBxPTOC1 Capacitor bank unbalance current, H bridge (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HCUB2PTOC1									
.Op.general	OPERATE	Unbalance operate	10=Operate	60	212	1	2	0	1
.Str.general	START	Unbalance start	10=Start	60	211	1	2	1	1
LD0.HCUB1PTOC1									
.Op.general	ALARM	Alarm	10=Alarm	60	202	1	2	0	1

5.8.81 LD0.HCUBxPTOC2 Capacitor bank unbalance current, H bridge (2)

Table 269: LD0.HCUBxPTOC2 Capacitor bank unbalance current, H bridge (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HCUB2PTOC2									
.Op.general	OPERATE	Unbalance operate	10=Operate	45	215	1	2	0	1
.Str.general	START	Unbalance start	10=Start	45	214	1	2	1	1
LD0.HCUB1PTOC2									
.Op.general	ALARM	Alarm	10=Alarm	45	213	1	2	0	1

5.8.82 LD0.HIAPDIF1 High-impedance differential protection for phase A (1)

Table 270: LD0.HIAPDIF1 High-impedance differential protection for phase A (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HIAPDIF1									
.Str.general	START	Stage start	10=Start	170	170	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	172	1	2	0	1

5.8.83 LD0.HIBPDIF1 High-impedance differential protection for phase B (1)

Table 271: LD0.HIBPDIF1 High-impedance differential protection for phase B (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HIBPDIF1									
.Str.general	START	Stage start	10=Start	170	173	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	174	1	2	0	1

5.8.84 LD0.HICPDIF1 High-impedance differential protection for phase C (1)

Table 272: LD0.HICPDIF1 High-impedance differential protection for phase C (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HICPDIF1									
.Str.general	START	Stage start	10=Start	170	175	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	176	1	2	0	1

5.8.85 LD0.HIAPDIF2 High-impedance differential protection for phase A (2)

Table 273: LD0.HIAPDIF2 High-impedance differential protection for phase A (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HIAPDIF2									
.Str.general	START	Stage start	10=Start	170	190	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	191	1	2	0	1

5.8.86 LD0.HIBPDIF2 High-impedance differential protection for phase B (2)

Table 274: LD0.HIBPDIF2 High-impedance differential protection for phase B (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HIBPDIF2									
.Str.general	START	Stage start	10=Start	170	192	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	193	1	2	0	1

5.8.87 LD0.HICPDIF2 High-impedance differential protection for phase C (2)

Table 275: LD0.HICPDIF2 High-impedance differential protection for phase C (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HICPDIF2									
.Str.general	START	Stage start	10=Start	170	194	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	195	1	2	0	1

5.8.88 LD0.HIAPDIF3 High-impedance differential protection for phase A (3)

Table 276: LD0.HIAPDIF3 High-impedance differential protection for phase A (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HIAPDIF3									
.Str.general	START	Stage start	10=Start	170	210	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	211	1	2	0	1

5.8.89 LD0.HIBPDIF3 High-impedance differential protection for phase B (3)

Table 277: LD0.HIBPDIF3 High-impedance differential protection for phase B (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HIBPDIF3									
.Str.general	START	Stage start	10=Start	170	212	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	213	1	2	0	1

5.8.90 LD0.HICPDIF3 High-impedance differential protection for phase C (3)

Table 278: LD0.HICPDIF3 High-impedance differential protection for phase C (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HICPDIF3									
.Str.general	START	Stage start	10=Start	170	214	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	215	1	2	0	1

5.8.91 LD0.HREFPDIF1 High-impedance based restricted earth-fault protection (1)

Table 279: LD0.HREFPDIF1 High-impedance based restricted earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HREFPDIF1									
.Str.general	START	Stage start	10=Start	171	84	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	171	91	1	2	0	1

5.8.92 LD0.HREFPDIF2 High-impedance based restricted earth-fault protection (2)

Table 280: LD0.HREFPDIF2 High-impedance based restricted earth-fault protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HREFPDIF2									
.Str.general	START	Stage start	10=Start	171	94	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	171	92	1	2	0	1

5.8.93 LD0.IFPTOC1 Touch voltage protection (1)

Table 281: LD0.IFPTOC1 Touch voltage protection (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.IFPTRC1								
.Str.general	START	Start	10=Start	46	141	1	1	1
.Op.general	OPERATE	Operate	10=Operate	46	142	1	1	0

5.8.94 LD0.IFPTOC2 Touch voltage protection (2)

Table 282: LD0.IFPTOC2 Touch voltage protection (2)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.IFPTRC2								
.Str.general	START	Start	10=Start	46	143	1	1	1
.Op.general	OPERATE	Operate	10=Operate	46	144	1	1	0

5.8.95 LD0.IFPTOC3 Touch voltage protection (3)

Table 283: LD0.IFPTOC3 Touch voltage protection (3)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.IFPTRC3								
.Str.general	START	Start	10=Start	46	145	1	1	1
.Op.general	OPERATE	Operate	10=Operate	46	146	1	1	0

5.8.96 LD0.INRPHAR1 Three-phase inrush detector (1)

Table 284: LD0.INRPHAR1 Three-phase inrush detector (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.INRPHAR1									
.Str.phsA	-	Phs A start	10=Start	167	64	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	167	65	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	167	66	0	2	1	1
.Str.general	BLK2H	General start	10=Start	167	84	1	2	1	1

5.8.97 LD0.INRPHAR2 Three-phase inrush detector (2)

Table 285: LD0.INRPHAR2 Three-phase inrush detector (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.INRPHAR2									
.Str.phsA	-	Phs A start	10=Start	167	54	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	167	55	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	167	55	0	2	1	1
.Str.general	BLK2H	General start	10=Start	167	94	1	2	1	1

5.8.98 LD0.INTRPTEF1 Transient/intermittent earth-fault protection (1)

Table 286: LD0.INTRPTEF1 Transient/intermittent earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.INTRPTEF1									
.Str.general	START	Stage start	10=Start	158	84	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	158	90	1	2	0	1

5.8.99 LD0.INTRPTEF2 Transient/intermittent earth-fault protection (2)

Table 287: LD0.INTRPTEF2 Transient/intermittent earth-fault protection (2)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.INTRPTEF2									
.Str.general	START	Stage start	10=Start	158	91	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	158	92	1	2	0	1

5.8.100 LD0.JAMPTOC1 Motor load jam protection (1)

Table 288: LD0.JAMPTOC1 Motor load jam protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.JAMPTOC1									
.Op.phsA		Phs A operate	1=Operate	73	11	0	2	0	1
.Op.phsB		Phs B operate	1=Operate	73	12	0	2	0	1
.Op.phsC		Phs C operate	1=Operate	73	13	0	2	0	1
.Op.general	OPERATE	Stalled operate	10=Operate	73	90	1	2	0	1

5.8.101 LD0.JAMPTOC2 Motor load jam protection (2)

Table 289: LD0.JAMPTOC2 Motor load jam protection (2)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.JAMPTOC2									
.Op.phsA		Phs A operate	1=Operate	73	14	0	2	0	1
.Op.phsB		Phs B operate	1=Operate	73	15	0	2	0	1
.Op.phsC		Phs C operate	1=Operate	73	16	0	2	0	1
.Op.general	OPERATE	Stalled operate	10=Operate	73	91	1	2	0	1

5.8.102 LD0.LNPLDF1 Line differential protection with in-zone power transformer (1)

Table 290: LD0.LNPLDF1 Line differential protection with in-zone power transformer (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LNPTRC1									
.Str.phsA		Phs A start	10=Start	193	61	0	2	1	1
.Str.phsB		Phs B start	10=Start	193	62	0	2	1	1
.Str.phsC		Phs C start	10=Start	193	63	0	2	1	1
.Op.phsA		Phs A operate	10=Operate	193	65	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	193	66	0	2	0	1
.Op.phsC		Phs C operate	10=Operate	193	67	0	2	0	1
.Op.general	OPERATE	Operate (Local or remote)	10=Operate	193	68	1	2	0	1
.Str.general	START	Start (Local or remote)	10=Start	193	84	1	2	1	1

5.8.103 LD0.LOFLPTUC1 Loss of load supervision (1)

Table 291: LD0.LOFLPTUC1 Loss of load supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LOFLPTUC1									
.Str.general	START	Stage start	10=Start	78	84	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	78	90	1	2	0	1

5.8.104 LD0.LOFLPTUC2 Loss of load supervision (2)

Table 292: LD0.LOFLPTUC2 Loss of load supervision (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LOFLPTUC2									
.Str.general	START	Stage start	10=Start	78	94	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	78	91	1	2	0	1

5.8.105 LD0.LREFPNDF1 Numerically stabilized low-impedance restricted earth-fault protection (1)

Table 293: LD0.LREFPNDF1 Numerically stabilized low-impedance restricted earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LREFPNDF1									
.Str.general	START	Stage start	10=Start	170	84	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	91	1	2	0	1

5.8.106 LD0.LREFPNDF2 Numerically stabilized low-impedance restricted earth-fault protection (2)

Table 294: LD0.LREFPNDF2 Numerically stabilized low-impedance restricted earth-fault protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LREFPNDF2									
.Str.general	START	Stage start	10=Start	170	94	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	170	92	1	2	0	1

5.8.107 LD0.LSHDPFRQ1 Load-shedding and restoration (1)

Table 295: LD0.LSHDPFRQ1 Load-shedding and restoration (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LSHDPTRC1									
.Str.general	START	Stage start	10=Start	82	11	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	82	12	1	2	0	1
.Str.general	ST_REST	Start of restore	10=Start	82	13	1	2	1	1
.Op.general	RESTORE	Restore the load	10=Restore	82	14	1	2	0	1
.ManRest.Oper.ctlVal	MAN_RESTORE	Manual restore	10=Restore	82	15	1	20	0	1
.BlkRest.Oper.ctlVal	BLK_REST	Cancel restore	10=Cancel	82	16	1	20	0	1

5.8.108 LD0.LSHDPFRQ2 Load-shedding and restoration (2)

Table 296: LD0.LSHDPFRQ2 Load-shedding and restoration (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LSHDPTRC2									
.Str.general	START	Stage start	10=Start	82	21	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	82	22	1	2	0	1
.Str.general	ST_REST	Start of restore	10=Start	82	23	1	2	1	1
.Op.general	RESTORE	Restore the load	10=Restore	82	24	1	2	0	1
.ManRest.Oper.ctlVal	MAN_RESTORE	Manual restore	10=Restore	82	25	1	20	0	1
.BlkRest.Oper.ctlVal	BLK_REST	Cancel restore	10=Cancel	82	26	1	20	0	1

5.8.109 LD0.LSHDPFRQ3 Load-shedding and restoration (3)

Table 297: LD0.LSHDPFRQ3 Load-shedding and restoration (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LSHDPTRC3									
.Str.general	START	Stage start	10=Start	82	31	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	82	32	1	2	0	1
.Str.general	ST_REST	Start of restore	10=Start	82	33	1	2	1	1
.Op.general	RESTORE	Restore the load	10=Restore	82	34	1	2	0	1
.ManRest.Oper.ctlVal	MAN_RESTORE	Manual restore	10=Restore	82	35	1	20	0	1
.BlkRest.Oper.ctlVal	BLK_REST	Cancel restore	10=Cancel	82	36	1	20	0	1

5.8.110 LD0.LSHDPFRQ4 Load-shedding and restoration (4)

Table 298: LD0.LSHDPFRQ4 Load-shedding and restoration (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LSHDPTRC4									
.Str.general	START	Stage start	10=Start	82	41	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	82	42	1	2	0	1
.Str.general	ST_REST	Start of restore	10=Start	82	43	1	2	1	1
.Op.general	RESTORE	Restore the load	10=Restore	82	44	1	2	0	1
.ManRest.Oper.ctlVal	MAN_RESTORE	Manual restore	10=Restore	82	45	1	20	0	1
.BlkRest.Oper.ctlVal	BLK_REST	Cancel restore	10=Cancel	82	46	1	20	0	1

5.8.111 LD0.LSHDPFRQ5 Load-shedding and restoration (5)

Table 299: LD0.LSHDPFRQ5 Load-shedding and restoration (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LSHDPTRC5									
.Str.general	START	Stage start	10=Start	82	51	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	82	52	1	2	0	1
.Str.general	ST_REST	Start of restore	10=Start	82	53	1	2	1	1
.Op.general	RESTORE	Restore the load	10=Restore	82	54	1	2	0	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.ManRest.Oper.ctlVal	MAN_RESTORE	Manual restore	10=Restore	82	55	1	20	0	1
.BlkRest.Oper.ctlVal	BLK_REST	Cancel restore	10=Cancel	82	56	1	20	0	1

5.8.112 LD0.LSHDPFRQ6 Load-shedding and restoration (6)

Table 300: LD0.LSHDPFRQ6 Load-shedding and restoration (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LSHDPTRC6									
.Str.general	START	Stage start	10=Start	82	61	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	82	62	1	2	0	1
.Str.general	ST_REST	Start of restore	10=Start	82	63	1	2	1	1
.Op.general	RESTORE	Restore the load	10=Restore	82	64	1	2	0	1
.ManRest.Oper.ctlVal	MAN_RESTORE	Manual restore	10=Restore	82	65	1	20	0	1
.BlkRest.Oper.ctlVal	BLK_REST	Cancel restore	10=Cancel	82	66	1	20	0	1

5.8.113 LD0.LVRTPTUV1 Low-voltage ride-through protection (1)

Table 301: LD0.LVRTPTUV1 Low-voltage ride-through protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LVRTPTUV1									
.Str.general	START	Stage start	10=Start	42	150	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	42	151	1	2	0	1

5.8.114 LD0.LVRTPTUV2 Low-voltage ride-through protection (2)

Table 302: LD0.LVRTPTUV2 Low-voltage ride-through protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LVRTPTUV2									
.Str.general	START	Stage start	10=Start	42	152	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	42	153	1	2	0	1

5.8.115 LD0.LVRTPTUV3 Low-voltage ride-through protection (3)

Table 303: LD0.LVRTPTUV3 Low-voltage ride-through protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.LVRTPTUV3									
.Str.general	START	Stage start	10=Start	42	154	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	42	155	1	2	0	1

5.8.116 LD0.MFADPSDE1 Multifrequency admittance-based earth-fault protection (1)

Table 304: LD0.MFADPSDE1 Multifrequency admittance-based earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MFADPSDE1									
.Str.general	START	Stage start	10=Start	28	75	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	76	1	2	0	1

5.8.117 LD0.MFADPSDE2 Multifrequency admittance-based earth-fault protection (2)

Table 305: LD0.MFADPSDE2 Multifrequency admittance-based earth-fault protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MFADPSDE2									
.Str.general	START	Stage start	10=Start	28	77	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	78	1	2	0	1

5.8.118 LD0.MFADPSDE3 Multifrequency admittance-based earth-fault protection (3)

Table 306: LD0.MFADPSDE3 Multifrequency admittance-based earth-fault protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MFADPSDE3									
.Str.general	START	Stage start	10=Start	28	79	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	80	1	2	0	1

5.8.119 LD0.MHZPDIF1 High-impedance or flux-balance based differential protection (1)

Table 307: LD0.MHZPDIF1 High-impedance or flux-balance based differential protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MHZPDIF1									
.Str.general	START	Stage start	10=Start	29	51	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	29	52	1	2	0	1

5.8.120 LD0.MNSPTOC1 Negative-sequence overcurrent protection for machines (1)

Table 308: LD0.MNSPTOC1 Negative-sequence overcurrent protection for machines (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MNSPTOC1									
.Str.general	START	Stage1 start	10=Start	72	84	1	2	1	1
.Op.general	OPERATE	Stage1 operate	10=Operate	72	90	1	2	0	1

5.8.121 LD0.MNSPTOC2 Negative-sequence overcurrent protection for machines (2)

Table 309: LD0.MNSPTOC2 Negative-sequence overcurrent protection for machines (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MNSPTOC2									
.Str.general	START	Stage2 start	10=Start	72	94	1	2	1	1
.Op.general	OPERATE	Stage2 operate	10=Operate	72	91	1	2	0	1

5.8.122 LD0.MPDIF1 Stabilized and instantaneous differential protection for machines (1)

Table 310: LD0.MPDIF1 Stabilized and instantaneous differential protection for machines (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MPTRC1									
.Op.general	OPERATE	General operate	10=Operate	29	20	1	2	0	1
.Op.phsA		Phs A operate	10=Operate	29	21	1	2	0	1
.Op.phsB		Phs B operate	10=Operate	29	22	1	2	0	1
.Op.phsB		Phs C operate	10=Operate	29	23	1	2	0	1
LD0.MLPDIF1									
.BlkIntnSt.general	INT_BLKD	Internal block	10=Blocked	29	24	1	2	1	1
.BlkIntnSt.phsA	INT_BLKD_A	Internal block phs A	10=Blocked	29	25	1	2	1	1
.BlkIntnSt.phsB	INT_BLKD_B	Internal block phs B	10=Blocked	29	26	1	2	1	1
.BlkIntnSt.phsC	INT_BLKD_C	Internal block phs C	10=Blocked	29	27	1	2	1	1

5.8.123 LD0.MPTTR1 Thermal overload protection for motors (1)

Table 311: LD0.MPTTR1 Thermal overload protection for motors (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MPTTR1									
.StrInh.general	BLK_RESTART	Block restart	10=Restart	76	83	1	2	1	1
.AlmThm.general	ALARM	Thermal alarm	10=Alarm	76	85	1	2	1	1
.Op.general	OPERATE	Thermal operate	10=Operate	76	90	1	2	0	1

5.8.124 LD0.MPUPF1 Underpower factor protection (1)

Table 312: LD0.MPUPF1 Underpower factor protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.M1PUPF1									
.Op.general	ALARM	Alarm	10/01=On/Off	46	11	1	2	0	1
LD0.M2PUPF1									
.Str.general	START	Stage start	10/01=On/Off	46	12	1	2	1	1
.Op.general	OPERATE	Stage operate	10/01=On/Off	46	13	1	2	0	1

5.8.125 LD0.MPUPF2 Underpower factor protection (2)

Table 313: LD0.MPUPF2 Underpower factor protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.M1PUPF2									
.Op.general	ALARM	Alarm	10/01=On/Off	46	14	1	2	0	1
LD0.M2PUPF2									
.Str.general	START	Stage start	10/01=On/Off	46	15	1	2	1	1
.Op.general	OPERATE	Stage operate	10/01=On/Off	46	16	1	2	0	1

5.8.126 LD0.MREFPTOC1 Rotor earth-fault protection (1)

Table 314: LD0.MREFPTOC1 Rotor earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MRE1PTOC1									
.Op.general	ALARM	Alarm	10=Alarm	29	101	1	2	0	1
LD0.MRE2PTOC1									
.Str.general	START	Stage start	10=Start	29	102	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	29	103	1	2	0	1

5.8.127 LD0.MREFPTOC2 Rotor earth-fault protection (2)

Table 315: LD0.MREFPTOC2 Rotor earth-fault protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MRE1PTOC2									
.Op.general	ALARM	Alarm	10=Alarm	29	106	1	2	0	1
LD0.MRE2PTOC2									
.Str.general	START	Stage start	10=Start	29	107	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	29	108	1	2	0	1

5.8.128 LD0.MSCPMRI1 Motor start counter (1)

Table 316: LD0.MSCPMRI1 Motor start counter (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MSCPMRI1									
.Op.general	OPERATE	Operate	10=Operate	73	200	1	2	0	1
.StrInh.stVal	BLK_RESTART	Restart inhibited	10=Inhibited	73	201	1	2	1	1

5.8.129 LD0.NSPTOC1 Negative-sequence overcurrent protection (1)

Table 317: LD0.NSPTOC1 Negative-sequence overcurrent protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.NSPTOC1									
.Str.general	START	Stage1 start	10=Start	21	84	1	2	1	1
.Op.general	OPERATE	Stage1 operate	10=Operate	21	90	1	2	0	1

5.8.130 LD0.NSPTOC2 Negative-sequence overcurrent protection (2)

Table 318: LD0.NSPTOC2 Negative-sequence overcurrent protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.NSPTOC2									
.Op.general	OPERATE	Stage2 operate	10=Operate	21	91	1	2	0	1
.Str.general	START	Stage2 start	10=Start	21	94	1	2	1	1

5.8.131 LD0.NSPTOC3 Negative-sequence overcurrent protection (3)

Table 319: LD0.NSPTOC3 Negative-sequence overcurrent protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.NSPTOC3									
.Str.general	START	Stage3 start	10=Start	21	96	1	2	1	1
.Op.general	OPERATE	Stage3 operate	10=Operate	21	98	1	2	0	1

5.8.132 LD0.NSPTOV1 Negative-sequence overvoltage protection (1)

Table 320: LD0.NSPTOV1 Negative-sequence overvoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.NSPTOV1		Stage 1							
.Str.general	START	-general start	10=Start	43	84	1	2	1	1
.Op.general	OPERATE	-general operate	10=Operate	43	90	1	2	0	1

5.8.133 LD0.NSPTOV2 Negative-sequence overvoltage protection (2)

Table 321: LD0.NSPTOV2 Negative-sequence overvoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.NSPTOV2		Stage 2							
.Op.general	OPERATE	-general operate	10=Operate	43	91	1	2	0	1
.Str.general	START	-general start	10=Start	43	94	1	2	1	1

5.8.134 LD0.NSPTOV3 Negative-sequence overvoltage protection (3)

Table 322: LD0.NSPTOV3 Negative-sequence overvoltage protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.NSPTOV3		Stage 3							
.Str.general	START	-general start	10=Start	43	95	1	2	1	1
.Op.general	OPERATE	-general operate	10=Operate	43	96	1	2	0	1

5.8.135 LD0.NSPTOV4 Negative-sequence overvoltage protection (4)

Table 323: LD0.NSPTOV4 Negative-sequence overvoltage protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.NSPTOV4		Stage 3							
.Str.general	START	Stage3 start	10=Start	43	97	1	2	1	1
.Op.general	OPERATE	Stage3 operate	10=Operate	43	98	1	2	0	1

5.8.136 LD0.OEPVPH1 Overexcitation protection (1)

Table 324: LD0.OEPVPH1 Overexcitation protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.OEPVPH1									
.Str.general	START	Stage start	10=Start	28	111	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	112	1	2	0	1

5.8.137 LD0.OEPVPH2 Overexcitation protection (2)

Table 325: LD0.OEPVPH2 Overexcitation protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.OEPVPH2									
.Str.general	START	Stage start	10=Start	28	113	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	114	1	2	0	1

5.8.138 LD0.PDNSPTOC1 Phase discontinuity protection (1)

Table 326: LD0.PDNSPTOC1 Phase discontinuity protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PDNSPTOC1									
.Str.general	START	Stage start	10=Start	157	84	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	157	90	1	2	0	1

5.8.139 LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1)

Table 327: LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHHPTOC1		High stage (1)							
.Str.phsA	-	Phs A start	10=Start	162	54	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	55	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	56	0	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	91	1	2	0	1
.Str.general	START	General start	10=Start	162	94	1	2	1	1

5.8.140 LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2)

Table 328: LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHHPTOC2		High stage (2)							
.Str.phsA	-	Phs A start	10=Start	162	44	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	45	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	46	0	2	1	1
.Str.general	START	General start	10=Start	162	96	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	98	1	2	0	1

5.8.141 LD0.PHHPTOC3 Three-phase non-directional overcurrent protection, high stage (3)

Table 329: LD0.PHHPTOC3 Three-phase non-directional overcurrent protection, high stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHHPTOC3		High stage (3)							
.Str.phsA	-	Phs A start	10=Start	162	153	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	154	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	155	0	2	1	1
.Str.general	START	General start	10=Start	162	106	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	107	1	2	0	1

5.8.142 LD0.PHHPTOC4 Three-phase non-directional overcurrent protection, high stage (4)

Table 330: LD0.PHHPTOC4 Three-phase non-directional overcurrent protection, high stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHHPTOC4		High stage (4)							
.Str.phsA	-	Phs A start	10=Start	162	159	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	160	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	161	0	2	1	1
.Str.general	START	General start	10=Start	162	131	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	132	1	2	0	1

5.8.143 LD0.PHHPTOC5 Three-phase non-directional overcurrent protection, high stage (5)

Table 331: LD0.PHHPTOC5 Three-phase non-directional overcurrent protection, high stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHLPTOC5		High stage (5)							
.Str.phsA	-	Phs A start	10=Start	162	162	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	163	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	164	0	2	1	1
.Str.general	START	General start	10=Start	162	133	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	134	1	2	0	1

5.8.144 LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1)

Table 332: LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHIPTOC1		Instantaneous stage (1)							
.Str.phsA	-	Phs A start	10=Start	162	34	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	35	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	36	0	2	1	1
.Str.general	START	General start	10=Start	162	97	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	99	1	2	0	1

5.8.145 LD0.PHIPTOC2 Three-phase non-directional overcurrent protection, instantaneous stage (2)

Table 333: LD0.PHIPTOC2 Three-phase non-directional overcurrent protection, instantaneous stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHIPTOC2		Instantaneous stage (2)							
.Str.phsA	-	Phs A start	10=Start	162	24	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	25	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	26	0	2	1	1
.Str.general	START	General start	10=Start	162	102	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	103	1	2	0	1

5.8.146 LD0.PHIPTOC3 Three-phase non-directional overcurrent protection, instantaneous stage (3)

Table 334: LD0.PHIPTOC3 Three-phase non-directional overcurrent protection, instantaneous stage (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHIPTOC3		Instantaneous stage (3)							
.Str.phsA	-	Phs A start	10=Start	162	156	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	157	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	158	0	2	1	1
.Str.general	START	General start	10=Start	162	108	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	109	1	2	0	1

5.8.147 LD0.PHIPTOC4 Three-phase non-directional overcurrent protection, instanteous stage (4)

Table 335: LD0.PHIPTOC4 Three-phase non-directional overcurrent protection, instanteous stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHIPTOC4		Instantaneous stage (4)							
.Str.phsA	-	Phs A start	10=Start	162	165	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	166	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	167	0	2	1	1
.Str.general	START	General start	10=Start	162	110	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	111	1	2	0	1

5.8.148 LD0.PHIPTOC5 Three-phase non-directional overcurrent protection, instanteous stage (5)

Table 336: LD0.PHIPTOC5 Three-phase non-directional overcurrent protection, instanteous stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHIPTOC5		Instantaneous stage (5)							
.Str.phsA	-	Phs A start	10=Start	162	168	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	169	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	170	0	2	1	1
.Str.general	START	General start	10=Start	162	112	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	113	1	2	0	1

5.8.149 LD0.PHIZ1 High-impedance fault detection (1)

Table 337: LD0.PHIZ1 High-impedance fault detection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHIZ1									
.Op.general	OPERATE	Stage operate	10=Operate	28	72	1	2	0	1
.Str.general	START	Stage start	10=Start	28	71	1	2	1	1

5.8.150 LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1)

Table 338: LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHLPTOC1		Low stage (1)							
.Str.phsA	-	Phs A start	10=Start	162	64	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	65	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	66	0	2	1	1
.Str.general	START	General start	10=Start	162	84	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	90	1	2	0	1

5.8.151 LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2)

Table 339: LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHLPTOC2		Low stage (2)							
.Str.phsA	-	Phs A start	10=Start	162	74	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	75	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	76	0	2	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.Str.general	START	General start	10=Start	162	100	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	101	1	2	0	1

5.8.152 LD0.PHLPTOC4 Three-phase non-directional overcurrent protection, low stage (4)

Table 340: LD0.PHLPTOC4 Three-phase non-directional overcurrent protection, low stage (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHLPTOC4		Low stage (4)							
.Str.phsA	-	Phs A start	10=Start	162	171	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	172	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	173	0	2	1	1
.Str.general	START	General start	10=Start	162	121	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	122	1	2	0	1

5.8.153 LD0.PHLPTOC5 Three-phase non-directional overcurrent protection, low stage (5)

Table 341: LD0.PHLPTOC5Three-phase non-directional overcurrent protection, low stage (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHLPTOC5		Low stage (5)							
.Str.phsA	-	Phs A start	10=Start	162	174	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	162	175	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	162	176	0	2	1	1
.Str.general	START	General start	10=Start	162	123	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	162	124	1	2	0	1

5.8.154 LD0.PHPTOV1 Three-phase overvoltage protection (1)

Table 342: LD0.PHPTOV1 Three-phase overvoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTOV1		Stage 1							
.Str.phsA	-	Phs A start	10=Start	40	64	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	40	65	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	40	66	0	2	1	1
.Str.general	START	General start	10=Start	40	84	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	90	1	2	0	1

5.8.155 LD0.PHPTOV2 Three-phase overvoltage protection (2)

Table 343: LD0.PHPTOV2 Three-phase overvoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTOV2		Stage 3							
.Str.phsA	-	Phs A start	10=Start	40	54	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	40	55	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	40	56	0	2	1	1
.Op.general	OPERATE	General operate	10=Start	40	91	1	2	0	1
.Str.general	START	General start	10=Operate	40	94	1	2	1	1

5.8.156 LD0.PHPTOV3 Three-phase overvoltage protection (3)

Table 344: LD0.PHPTOV3 Three-phase overvoltage protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTOV3		Stage 3							
.Str.phsA	-	Phs A start	10=Start	40	44	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	40	45	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	40	46	0	2	1	1
.Str.general	START	General start	10=Start	40	96	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	98	1	2	0	1

5.8.157 LD0.PHPTOV4 Three-phase overvoltage protection (4)

Table 345: LD0.PHPTOV4 Three-phase overvoltage protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTOV4		Stage 3							
.Str.phsA	-	Phs A start	10=Start	40	34	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	40	35	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	40	36	0	2	1	1
.Str.general	START	General start	10=Start	40	99	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	100	1	2	0	1

5.8.158 LD0.PHPTUC1 Loss of phase (undercurrent) (1)

Table 346: LD0.PHPTUC1 Loss of phase (undercurrent) (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUC1									
.Str.phsA		Phs A start	10=Start	41	201	0	2	1	1
.Str.phsB		Phs B start	10=Start	41	202	0	2	1	1
.Str.phsC		Phs C start	10=Start	41	203	0	2	1	1
.Str.general	START	Stage start	10=Start	41	200	1	2	1	1
.Op.phsA		Phs A operate	10=Operate	41	205	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	41	206	0	2	0	1
.Op.phsC		Phs C operate	10=Operate	41	207	0	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	41	204	1	2	0	1

5.8.159 LD0.PHPTUC2 Loss of phase (undercurrent) (2)

Table 347: LD0.PHPTUC2 Loss of phase (undercurrent) (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUC2									
.Str.phsA		Phs A start	10=Start	41	209	0	2	1	1
.Str.phsB		Phs B start	10=Start	41	210	0	2	1	1
.Str.phsC		Phs C start	10=Start	41	211	0	2	1	1
.Str.general	START	Stage start	10=Start	41	208	1	2	1	1
.Op.phsA		Phs A operate	10=Operate	41	213	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	41	214	0	2	0	1
.Op.phsC		Phs C operate	10=Operate	41	215	0	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	41	212	1	2	0	1

5.8.160 LD0.PHPTUC3 Loss of phase (undercurrent) (3)

Table 348: LD0.PHPTUC3 Loss of phase (undercurrent) (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUC3									
.Str.phsA		Phs A start	10=Start	41	217	0	2	1	1
.Str.phsB		Phs B start	10=Start	41	218	0	2	1	1
.Str.phsC		Phs C start	10=Start	41	219	0	2	1	1
.Str.general	START	General start	10=Start	41	216	1	2	1	1
.Op.phsA		Phs A operate	10=Operate	41	221	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	41	222	0	2	0	1
.Op.phsC		Phs C operate	10=Operate	41	223	0	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	41	220	1	2	0	1

5.8.161 LD0.PHPTUV1 Three-phase undervoltage protection (1)

Table 349: LD0.PHPTUV1 Three-phase undervoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUV1		Stage 1							
.Str.phsA	-	Phs A start	10=Start	41	64	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	41	65	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	41	66	0	2	1	1
.Str.general	START	General start	10=Start	41	84	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	41	90	1	2	0	1

5.8.162 LD0.PHPTUV2 Three-phase undervoltage protection (2)

Table 350: LD0.PHPTUV2 Three-phase undervoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUV2		Stage 2							
.Str.phsA	-	Phs A start	10=Start	41	54	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	41	55	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	41	56	0	2	1	1
.Op.general	OPERATE	General start	10=Operate	41	91	1	2	0	1
.Str.general	START	General operate	10=Start	41	94	1	2	1	1

5.8.163 LD0.PHPTUV3 Three-phase undervoltage protection (3)

Table 351: LD0.PHPTUV3 Three-phase undervoltage protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUV3		Stage 3							
.Str.phsA	-	Phs A start	10=Start	41	44	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	41	45	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	41	46	0	2	1	1
.Str.general	START	General start	10=Start	41	96	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	41	98	1	2	0	1

5.8.164 LD0.PHPTUV4 Three-phase undervoltage protection (4)

Table 352: LD0.PHPTUV4 Three-phase undervoltage protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUV4		Stage 4							
.Str.phsA	-	Phs A start	10=Start	41	99	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	41	34	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	41	35	0	2	1	1
.Str.general	START	General start	10=Start	41	36	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	41	100	1	2	0	1

5.8.165 LD0.PHPTUV5 Three-phase undervoltage protection (5)

Table 353: LD0.PHPTUV5 Three-phase undervoltage protection (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPTUV5		Stage 5							
.Str.phsA	-	Phs A start	10=Start	41	37	0	2	1	1
.Str.phsB	-	Phs B start	10=Start	41	38	0	2	1	1
.Str.phsC	-	Phs C start	10=Start	41	39	0	2	1	1
.Str.general	START	General start	10=Start	41	101	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	41	102	1	2	0	1

5.8.166 LD0.PHPVOC1 Three-phase voltage-dependent overcurrent protection (1)

Table 354: LD0.PHPVOC1 Three-phase voltage-dependent overcurrent protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPVOC1									
.Str.general	START	General start	10=Start	40	184	1	2	1	1
.Str.phsA		Phs A start	10=Start	40	164	0	2	1	1
.Str.phsB		Phs B start	10=Start	40	165	0	2	1	1
.Str.phsC		Phs B start	10=Start	40	166	0	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	190	1	2	0	1
.Op.phsA		Phs A operate	10=Operate	40	154	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	40	155	0	2	0	1
.Op.phsC		Phs B operate	10=Operate	40	156	0	2	0	1

5.8.167 LD0.PHPVOC2 Three-phase voltage-dependent overcurrent protection (2)

Table 355: LD0.PHPVOC2 Three-phase voltage-dependent overcurrent protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPVOC2									
.Str.general	START	General start	10=Start	40	200	1	2	1	1
.Str.phsA		Phs A start	10=Start	40	201	0	2	1	1
.Str.phsB		Phs B start	10=Start	40	202	0	2	1	1
.Str.phsC		Phs B start	10=Start	40	203	0	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	204	1	2	0	1
.Op.phsA		Phs A operate	10=Operate	40	205	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	40	206	0	2	0	1
.Op.phsC		Phs B operate	10=Operate	40	207	0	2	0	1

5.8.168 LD0.PHPVOC3 Three-phase voltage-dependent overcurrent protection (3)

Table 356: LD0.PHPVOC3 Three-phase voltage-dependent overcurrent protection (3)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPVOC3									
.Str.general	START	General start	10=Start	40	208	1	2	1	1
.Str.phsA		Phs A start	10=Start	40	209	0	2	1	1
.Str.phsB		Phs B start	10=Start	40	210	0	2	1	1
.Str.phsC		Phs B start	10=Start	40	211	0	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	212	1	2	0	1
.Op.phsA		Phs A operate	10=Operate	40	213	0	2	0	1

Table continues on the next page

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.Op.phsB		Phs B operate	10=Operate	40	214	0	2	0	1
.Op.phsC		Phs B operate	10=Operate	40	215	0	2	0	1

5.8.169 LD0.PHPVOC4 Three-phase voltage-dependent overcurrent protection (4)

Table 357: LD0.PHPVOC4 Three-phase voltage-dependent overcurrent protection (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPVOC4									
.Str.general	START	General start	10=Start	40	216	1	2	1	1
.Str.phsA		Phs A start	10=Start	40	217	0	2	1	1
.Str.phsB		Phs B start	10=Start	40	218	0	2	1	1
.Str.phsC		Phs B start	10=Start	40	219	0	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	220	1	2	0	1
.Op.phsA		Phs A operate	10=Operate	40	221	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	40	222	0	2	0	1
.Op.phsC		Phs B operate	10=Operate	40	223	0	2	0	1

5.8.170 LD0.PHPVOC5 Three-phase voltage-dependent overcurrent protection (5)

Table 358: LD0.PHPVOC5 Three-phase voltage-dependent overcurrent protection (5)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHPVOC5									
.Str.general	START	General start	10=Start	40	224	1	2	1	1
.Str.phsA		Phs A start	10=Start	40	225	0	2	1	1
.Str.phsB		Phs B start	10=Start	40	226	0	2	1	1
.Str.phsC		Phs B start	10=Start	40	227	0	2	1	1
.Op.general	OPERATE	General operate	10=Operate	40	228	1	2	0	1
.Op.phsA		Phs A operate	10=Operate	40	229	0	2	0	1
.Op.phsB		Phs B operate	10=Operate	40	230	0	2	0	1
.Op.phsC		Phs B operate	10=Operate	40	231	0	2	0	1

5.8.171 LD0.PHVPTOV1 Three-phase magnitude variation overvoltage protection (1)

Table 359: LD0.PHVPTOV1 Three-phase magnitude variation overvoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHVPTOV1		Stage 1							
.Str.phsA		Phs A start	10=Start	45	81	0	2	1	1
.Str.phsB		Phs B start	10=Start	45	82	0	2	1	1
.Str.phsC		Phs B start	10=Start	45	83	0	2	1	1
.Str.general	START	General start	10=Start	45	84	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	45	85	1	2	0	1

5.8.172 LD0.PHVPTOV2 Three-phase magnitude variation overvoltage protection (2)

Table 360: LD0.PHVPTOV2 Three-phase magnitude variation overvoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PHVPTOV2		Stage 2							
.Str.phsA		Phs A start	10=Start	45	86	0	2	1	1
.Str.phsB		Phs B start	10=Start	45	87	0	2	1	1
.Str.phsC		Phs B start	10=Start	45	88	0	2	1	1
.Str.general	START	General start	10=Start	45	89	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	45	90	1	2	0	1

5.8.173 LD0.PREVPTOC1 Phase reversal protection (1)

Table 361: LD0.PREVPTOC1 Phase reversal protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PREVPTOC1									
.Str.general	START	Stage start	10=Start	75	84	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	75	90	1	2	0	1

5.8.174 LD0.PSPTOV1 Positive-sequence overvoltage protection (1)

Table 362: LD0.PSPTOV1 Positive-sequence overvoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTOV1									
.Str.general	START	Stage 1 start	10=Start	45	91	1	2	1	1
.Op.general	OPERATE	Stage 1 operate	10=Operate	45	95	1	2	0	1

5.8.175 LD0.PSPTOV2 Positive-sequence overvoltage protection (2)

Table 363: LD0.PSPTOV2 Positive-sequence overvoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTOV2									
.Str.general	START	Stage 1 start	10=Start	45	99	1	2	1	1
.Op.general	OPERATE	Stage 1 operate	10=Operate	45	100	1	2	0	1

5.8.176 LD0.PSPTOV3 Positive-sequence overvoltage protection (3)

Table 364: LD0.PSPTOV3 Positive-sequence overvoltage protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTOV3									
.Str.general	START	Stage 1 start	10=Start	45	101	1	2	1	1
.Op.general	OPERATE	Stage 1 operate	10=Operate	45	105	1	2	0	1

5.8.177 LD0.PSPTOV4 Positive-sequence overvoltage protection (4)

Table 365: LD0.PSPTOV4 Positive-sequence overvoltage protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTOV4									
.Str.general	START	Stage 1 start	10=Start	45	106	1	2	1	1
.Op.general	OPERATE	Stage 1 operate	10=Operate	45	110	1	2	0	1

5.8.178 LD0.PSPTUV1 Positive-sequence undervoltage protection (1)

Table 366: LD0.PSPTUV1 Positive-sequence undervoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTUV1		Stage 1							
.Str.general	START	General start	10=Start	42	84	1	2	1	1
.Op.general	OPERATE	General operate	10=Operate	42	90	1	2	0	1

5.8.179 LD0.PSPTUV2 Positive-sequence undervoltage protection (2)

Table 367: LD0.PSPTUV2 Positive-sequence undervoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTUV2		Stage 2							
.Op.general	OPERATE	General operate	10=Operate	42	91	1	2	0	1
.Str.general	START	General start	10=Start	42	94	1	2	1	1

5.8.180 LD0.PSPTUV3 Positive-sequence undervoltage protection (3)

Table 368: LD0.PSPTUV3 Positive-sequence undervoltage protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTUV3									
.Str.general	START	Stage 3 start	10=Start	42	95	1	2	1	1
.Op.general	OPERATE	Stage 3 operate	10=Operate	42	96	1	2	0	1

5.8.181 LD0.PSPTUV4 Positive-sequence undervoltage protection (4)

Table 369: LD0.PSPTUV4 Positive-sequence undervoltage protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.PSPTUV4									
.Str.general	START	Stage 4 start	10=Start	42	97	1	2	1	1
.Op.general	OPERATE	Stage 4 operate	10=Operate	42	98	1	2	0	1

5.8.182 LD0.RESCPSCH1 Communication logic for residual overcurrent (1)

Table 370: LD0.RESCPSCH1 Communication logic for residual overcurrent (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RESCPSCH1									
.Op.general	OPERATE	Operate	10=Operate	45	51	1	2	0	1

5.8.183 LD0.RCRWPSCH1 Current reversal and weak-end infeed logic for residual overcurrent (1)

Table 371: LD0.RCRWPSCH1 Current reversal and weak-end infeed logic for residual overcurrent (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RCRWPSCH1									
.Op.general	OPR_WEI	Operate, WEI logic	10=Operate	45	55	1	2	0	1

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IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.TxPrm.general	ECHO	Carrier send, WEI logic	10=Send	45	56	1	2	0	1
.RvABlk.general	OPR_IRV	Operate, current reversal logic	10=Operate	45	57	1	2	0	1

5.8.184 LD0.ROVPTOV1 Residual overvoltage protection (1)

Table 372: LD0.ROVPTOV1 Residual overvoltage protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ROVPTOV1									
.Str.general	START	Stage 1 start	10=Start	44	84	1	2	1	1
.Op.general	OPERATE	Stage 1 operate	10=Operate	44	90	1	2	0	1

5.8.185 LD0.ROVPTOV2 Residual overvoltage protection (2)

Table 373: LD0.ROVPTOV2 Residual overvoltage protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ROVPTOV2									
.Op.general	OPERATE	Stage 2 operate	10=Operate	44	91	1	2	0	1
.Str.general	START	Stage 2 start	10=Start	44	94	1	2	1	1

5.8.186 LD0.ROVPTOV3 Residual overvoltage protection (3)

Table 374: LD0.ROVPTOV3 Residual overvoltage protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ROVPTOV3									
.Str.general	START	Stage 3 Start	10=Start	44	96	1	2	1	1
.Op.general	OPERATE	Stage 3 Operate	10=Operate	44	98	1	2	0	1

5.8.187 LD0.ROVPTOV4 Residual overvoltage protection (4)

Table 375: LD0.ROVPTOV4 Residual overvoltage protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ROVPTOV4									
.Str.general	START	Stage 4 Start	10=Start	44	99	1	2	1	1
.Op.general	OPERATE	Stage 4 Operate	10=Operate	44	100	1	2	0	1

5.8.188 LD0.RPTTR1 Rotor thermal overload protection (1)

Table 376: LD0.RPTTR1 Rotor thermal overload protection (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.RPTTR1								
.Op.general	OPERATE	Operate	10=Operate	46	121	1	1	0
.AlmThm.general	ALARM	Thermal alarm	10=Alarm	46	122	1	1	0
.BlkThm.stVal	BLK_RESTART	Restart inhibit	10=Inhibit	46	123	1	1	1

5.8.189 LD0.SRCxPTOC1 Capacitor resonance protection (1)

Table 377: LD0.SRCxPTOC1 Capacitor resonance protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SRC2PTOC1									
.Op.general	OPERATE	Resonance operate	10=Operate	60	252	1	2	0	1
LD0.SRC1PTOC1									
.Op.general	ALARM	Alarm	10=Alarm	60	251	1	2	0	1

5.8.190 LD0.STTPMSU1 Motor start-up supervision (1)

Table 378: LD0.STTPMSU1 Motor start-up supervision (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.STTPMSU1									
.Str.general	MOT_START	Motor start in progress	10=Startup	74	84	1	2	1	1
.Op.general	OPR_IIT	Thermal stress operate	10=Operate	74	90	1	2	0	1

5.8.191 LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1)

Table 379: LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.T1PTTR1									
.Str.general	START	Start	10=Start	168	84	1	2	1	1
.AlmThm.general	ALARM	Thermal alarm	10=Alarm	168	85	1	2	1	1
.Op.general	OPERATE	Operate	10=Operate	168	90	1	2	0	1

5.8.192 LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1)

Table 380: LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.T2PTTR1									
.Str.general	START	Start	10=Start	168	104	1	2	1	1
.AlmThm.general	ALARM	Thermal alarm	10=Alarm	168	105	1	2	1	1
.Op.general	OPERATE	Operate	10=Operate	168	106	1	2	0	1

5.8.193 LD0.TR2PTDF1 Stabilized and instantaneous differential protection for two-winding transformers (1)

Table 381: LD0.TR2PTDF1 Stabilized and instantaneous differential protection for two-winding transformers (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.TR2PTRC1									
.Op.general	OPERATE	General operate	10=Operate	176	91	1	2	0	1
.Op.phsA	OPR_A	Phs A operate	10=Operate	176	92	1	2	0	1
.Op.phsB	OPR_B	Phs B operate	10=Operate	176	93	1	2	0	1
.Op.phsC	OPR_C	Phs C operate	10=Operate	176	94	1	2	0	1
LD0.TR2LPDIF1									
.BlkWavSt.general	BLKDWAV	Waveform block, general	10=Blocking	176	158	1	2	1	1
.BlkWavSt.phsA	BLKDWAV_A	Waveform block, phsA	10=Blocking	176	159	0	2	1	1
.BlkWavSt.phsB	BLKDWAV_B	Waveform block, phsB	10=Blocking	176	160	0	2	1	1
.BlkWavSt.phsC	BLKDWAV_C	Waveform block, phsC	10=Blocking	176	161	0	2	1	1
.Blk2HSt.general	BLKD2H	2nd harmonic res. block, general	10=Blocking	176	150	1	2	1	1
.Blk2HSt.phsA	BLKD2H_A	2nd harmonic res. block, phsA	10=Blocking	176	151	0	2	1	1
.Blk2HSt.phsB	BLKD2H_B	2nd harmonic res. block, phsB	10=Blocking	176	152	0	2	1	1
.Blk2HSt.phsC	BLKD2H_C	2nd harmonic res. block, phsC	10=Blocking	176	153	0	2	1	1
.Blk5HSt.general	BLKD5H	5th harmonic res. block, general	10=Blocking	176	154	1	2	1	1
.Blk5HSt.phsA	BLKD5H_A	5th harmonic res. block, phsA	10=Blocking	176	155	0	2	1	1
.Blk5HSt.phsB	BLKD5H_B	5th harmonic res. block, phsB	10=Blocking	176	156	0	2	1	1
.Blk5HSt.phsC	BLKD5H_C	5th harmonic res. block, phsC	10=Blocking	176	157	0	2	1	1

5.8.194 LD0.TR3PTDF1 Transformer differential protection of two or three winding transformers with 2-3 restraints

Table 382: LD0.TR3PTDF1 Transformer differential protection of two or three winding transformers with 2-3 restraints

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.TR3PTRC1									
.Op.general	OPERATE	General operate	10=Operate	176	171	1	2	0	1
.Op.phsA	OPR_A	Phs A operate	10=Operate	176	172	1	2	0	1
.Op.phsB	OPR_B	Phs B operate	10=Operate	176	173	1	2	0	1
.Op.phsC	OPR_C	Phs C operate	10=Operate	176	174	1	2	0	1
LD0.TR3LPDIF1									
.BlkWavSt.general	BLKDWAV	Waveform block, general	10=Blocking	176	178	1	2	1	1
.BlkWavSt.phsA	BLKDWAV_A	Waveform block, phsA	10=Blocking	176	179	0	2	1	1
.BlkWavSt.phsB	BLKDWAV_B	Waveform block, phsB	10=Blocking	176	180	0	2	1	1
.BlkWavSt.phsC	BLKDWAV_C	Waveform block, phsC	10=Blocking	176	181	0	2	1	1
.Blk2HSt.general	BLKD2H	2nd harmonic res. block, general	10=Blocking	176	190	1	2	1	1
.Blk2HSt.phsA	BLKD2H_A	2nd harmonic res. block, phsA	10=Blocking	176	191	0	2	1	1
.Blk2HSt.phsB	BLKD2H_B	2nd harmonic res. block, phsB	10=Blocking	176	192	0	2	1	1
.Blk2HSt.phsC	BLKD2H_C	2nd harmonic res. block, phsC	10=Blocking	176	193	0	2	1	1
.Blk5HSt.general	BLKD5H	5th harmonic res. block, general	10=Blocking	176	194	1	2	1	1
.Blk5HSt.phsA	BLKD5H_A	5th harmonic res. block, phsA	10=Blocking	176	195	0	2	1	1
.Blk5HSt.phsB	BLKD5H_B	5th harmonic res. block, phsB	10=Blocking	176	196	0	2	1	1
.Blk5HSt.phsC	BLKD5H_C	5th harmonic res. block, phsC	10=Blocking	176	197	0	2	1	1

5.8.195 LD0.UEXPDIS1 Three-phase underexcitation protection (1)

Table 383: LD0.UEXPDIS1 Three-phase underexcitation protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UEXPDIS1									
.Str.general	START	Stage start	10=Start	28	131	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	132	1	2	0	1

5.8.196 LD0.UEXPDIS2 Three-phase underexcitation protection (2)

Table 384: LD0.UEXPDIS2 Three-phase underexcitation protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UEXPDIS2									
.Str.general	START	Stage start	10=Start	28	133	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	134	1	2	0	1

5.8.197 LD0.UZPDIS1 Three-phase underimpedance protection (1)

Table 385: LD0.UZPDIS1 Three-phase underimpedance protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UZPDIS1									
.Str.general	START	Stage start	10=Start	28	141	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	142	1	2	0	1

5.8.198 LD0.UZPDIS2 Three-phase underimpedance protection (2)

Table 386: LD0.UZPDIS2 Three-phase underimpedance protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UZPDIS2									
.Str.general	START	Stage start	10=Start	28	143	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	28	144	1	2	0	1

5.8.199 LD0.UZPDIS3 Three-phase underimpedance protection (3)

Table 387: LD0.UZPDIS3 Three-phase underimpedance protection (3)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.UZPDIS3									
.Str.general	START	Stage start	10=Start	128	145	1	2	1	1
.Op.general	OPERATE	Stage operate	10=Operate	128	146	1	2	0	1

5.8.200 LD0.VVSPPAM1 Voltage vector shift protection (1)

Table 388: LD0.VVSPPAM1 Voltage vector shift protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VVSPPAM1									
.Op.general	OPERATE	Stage operate	10=Operate	28	102	1	2	0	1
.BlkIntnSt.general	INT_BLKD	Blocked	10=Blocked	28	103	1	2	0	1

5.8.201 LD0.VVSPPAM2 Voltage vector shift protection (2)

Table 389: LD0.VVSPPAM2 Voltage vector shift protection (2)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VVSPPAM2									
.Op.general	OPERATE	Stage operate	10=Operate	28	104	1	2	1	1
.BlkIntnSt.general	INT_BLKD	Blocked	10=Blocked	28	105	1	2	0	1

5.8.202 LD0.VVSPPAM3 Voltage vector shift protection (3)

Table 390: LD0.VVSPPAM3 Voltage vector shift protection (3)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.VVSPPAM3									
.Op.general	OPERATE	Stage operate	10=Operate	28	106	1	2	1	1
.BlkIntnSt.general	INT_BLKD	Blocked	10=Blocked	28	107	1	2	0	1

5.8.203 LD0.WPWDE1 Wattmetric-based earth-fault protection (1)

Table 391: LD0.WPWDE1 Wattmetric-based earth-fault protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.WPDSE1		Stage 1							
Str.general	START	-Start	10=Start	100	101	1	2	1	1
Op.general	OPERATE	-Operate	10=Operate	100	102	1	2	0	1

5.8.204 LD0.WPWDE2 Wattmetric-based earth-fault protection (2)

Table 392: LD0.WPWDE2 Wattmetric-based earth-fault protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.WPDSE2		Stage 2							
Str.general	START	-Start	10=Start	100	103	1	2	1	1
Op.general	OPERATE	-Operate	10=Operate	100	104	1	2	0	1

5.8.205 LD0.WPWDE3 Wattmetric-based earth-fault protection (3)

Table 393: LD0.WPWDE3 Wattmetric-based earth-fault protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.WPDSE3		Stage 3							
Str.general	START	-Start	10=Start	100	105	1	2	1	1
Op.general	OPERATE	-Operate	10=Operate	100	106	1	2	0	1

5.9 Protection-related functions

5.9.1 LD0.DARREC1 Autoreclosing (1)

Table 394: LD0.DARREC1 Autoreclosing (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DARREC1									
.RecRs.Oper.ctlVal	-	AR reset	10=Reset	169	19	1	20	0	1
.CntRs.Oper.ctlVal	-	AR counters reset	10=Reset	169	20	1	20	0	1
.PrgRec1.stVal	INPRO_1	AR 1st reclose	10=In progress	169	101	1	2	0	1
.PrgRec2.stVal	INPRO_2	AR 2nd reclose	10=In progress	169	102	1	2	0	1
.PrgRec3.stVal	INPRO_3	AR 3rd reclose	10=In progress	169	103	1	2	0	1
.PrgRec4.stVal	INPRO_4	AR 4th reclose	10=In progress	169	104	1	2	0	1
.PrgRec5.stVal	INPRO_5	AR 5th reclose	10=In progress	169	105	1	2	0	1
.PrgRec.stVal	INPRO	AR in progress	10=In progress	169	120	1	2	0	1
.CBManCls.stVal	MAN_CB_CL	CB manually closed	10=CB closed	169	159	1	2	0	1
.LO.stVal	LOCKED	Lockout status	10=Lockout	169	164	1	2	0	1
.UnsRec.stVal	UNSUC_RECL	Reclose fail status	10=Failed	169	170	1	2	0	1
.RdyRec.stVal	READY	Ready reclose status	10=Ready	169	172	1	2	0	1
.ActRec.stVal	ACTIVE	Active reclose status	10=Active	169	173	1	2	0	1
.PrgDsr.stVal	DISCR_INPRO	Discrimination time in p.	10=In progress	169	174	1	2	0	1
.PrgCutOut.stVal	CUTOUT_INPRO	Cutout time in progress	10=In progress	169	175	1	2	0	1
.FrqOpAlm.stVal	FRQ_OP_ALM	Frequent operation alarm	10=Alarm	169	176	1	2	0	1
.OpCls.general	CLOSE_CB	Operate (close XCBR)	10=Close CB	169	179	1	2	0	1
.OpOpn.general	OPEN_CB	Operate (open XCBR)	10=Open CB	169	180	1	2	0	1
.UnsCBCls.stVal	UNSUC_CB	CB closing failed	10=Failed	169	181	1	2	0	1
.WtMstr.stVal	CMD_WAIT	Client signal to follower	10=Signal	169	182	1	2	0	1
.RclTmStr.stVal		Reclaim time start	10=Start	169	183	1	2	0	1

5.9.2 LD0.DARREC2 Autoreclosing (2)

Table 395: LD0.DARREC2 Autoreclosing (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DARREC2									
.RecRs.Oper.ctlVal	-	AR reset	10=Reset	179	19	1	20	0	1
.CntRs.Oper.ctlVal	-	AR counters reset	10=Reset	179	20	1	20	0	1
.PrgRec1.stVal	INPRO_1	AR 1st reclose	10=In progress	179	101	1	2	0	1
.PrgRec2.stVal	INPRO_2	AR 2nd reclose	10=In progress	179	102	1	2	0	1
.PrgRec3.stVal	INPRO_3	AR 3rd reclose	10=In progress	179	103	1	2	0	1
.PrgRec4.stVal	INPRO_4	AR 4th reclose	10=In progress	179	104	1	2	0	1
.PrgRec5.stVal	INPRO_5	AR 5th reclose	10=In progress	179	105	1	2	0	1
.PrgRec.stVal	INPRO	AR in progress	10=In progress	179	120	1	2	0	1
.CBManCls.stVal	MAN_CB_CL	CB manually closed	10=CB closed	179	159	1	2	0	1
.LO.stVal	LOCKED	Lockout status	10=Lockout	179	164	1	2	0	1
.UnsRec.stVal	UNSUC_RECL	Reclose fail status	10=Failed	179	170	1	2	0	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.RdyRec.stVal	READY	Ready reclose status	10=Ready	179	172	1	2	0	1
.ActRec.stVal	ACTIVE	Active reclose status	10=Active	179	173	1	2	0	1
.PrgDsr.stVal	DISCR_INPRO	Discrimination time in p.	10=In progress	179	174	1	2	0	1
.PrgCutOut.stVal	CUTOUT_INPRO	Cutout time in progress	10=In progress	179	175	1	2	0	1
.FrqOpAlm.stVal	FRQ_OP_ALM	Frequent operation alarm	10=Alarm	179	176	1	2	0	1
.OpCls.general	CLOSE_CB	Operate (close XCBR)	10=Close CB	179	179	1	2	0	1
.OpOpn.general	OPEN_CB	Operate (open XCBR)	10=Open CB	179	180	1	2	0	1
.UnsCBCls.stVal	UNSUC_CB	CB closing failed	10=Failed	179	181	1	2	0	1
.WtMstr.stVal	CMD_WAIT	Client signal to follower	10=Signal	179	182	1	2	0	1
.RclTmStr.stVal		Reclaim time start	10=Start	179	183	1	2	0	1

5.9.3 LD0.DNZSRDIR1 Directional negative zero seq power (1)

Table 396: LD0.DNZSRDIR1 Directional negative zero seq power (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DNZSRDIR1									
.Dir.general	RELEASE	Release of DIRECTION being valid	10=Release	45	61	1	2	1	1
.Dir.DirGeneral	DIRECTION	Direction forward	10=Forward	45	62	1	2	1	1
.Dir.DirGeneral	DIRECTION	Direction backward	10=Backward	45	63	1	2	1	1

5.9.4 LD0.DNZSRDIR2 Directional negative zero seq power (2)

Table 397: LD0.DNZSRDIR2 Directional negative zero seq power (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DNZSRDIR2									
.Dir.general	RELEASE	Release of DIRECTION being valid	10=Release	45	61	1	2	1	1
.Dir.DirGeneral	DIRECTION	Direction forward	10=Forward	45	62	1	2	1	1
.Dir.DirGeneral	DIRECTION	Direction backward	10=Backward	45	63	1	2	1	1

5.9.5 LD0.DPSRDIR1 Directional positive seq power (1)

Table 398: LD0.DPSRDIR1 Directional positive seq power (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPSRDIR1									
.Dir.general	–	Release	10/01=On/Off	45	61	1	2	1	1

5.9.6 LD0.DPSRDIR2 Directional positive seq power (2)

Table 399: LD0.DPSRDIR2 Directional positive seq power (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPSRDIR2									
.Dir.general	–	Release	10/01=On/Off	45	64	1	2	1	1

5.9.7 LD0.DPSRDIR3 Directional positive seq power (3)

Table 400: LD0.DPSRDIR3 Directional positive seq power (3)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPSRDIR3									
.Dir.general	–	Release	10/01=On/Off	45	67	1	2	1	1

5.9.8 LD0.DPSRDIR4 Directional positive seq power (4)

Table 401: LD0.DPSRDIR4 Directional positive seq power (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DPSRDIR4									
.Dir.general	–	Release	10/01=On/Off	45	75	1	2	1	1

5.9.9 LD0.DSTRPSB1 Power swing detection (1)

Table 402: LD0.DSTRPSB1 Power swing detection (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.DSTRPSB1								
.Str.general	SWING_ST	Impedance detected	10=Detected	46	161	1	1	1
.BlkZn.stVal	PSB	Power swing detected	10=Detected	46	162	1	1	1

5.9.10 LD0.ESMGAPC1 Emergency start-up (1)

Table 403: LD0.ESMGAPC1 Emergency start-up (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.ESMGAPC1									
.Str.general	ST_EMERG_ENA	Emergency start	10=Start	77	84	1	2	1	1

5.9.11 LD0.LBRDOB1 Load blinder (1)

Table 404: LD0.LBRDOB1 Load blinder (1)

IEC 61850 name	SA name	Description	Values	FUN	INF	U	ASDU	I
LD0.LBRDOB1								
.LodDsrFwd.stVal	LB_FORWARD	Active in forward dir	10=Forward	46	171	1	1	1
.LodDsrRv.stVal	LB_REVERSE	Active in reverse dir	10=Reverse	46	172	1	1	1

5.9.12 LD0.OOSRPSB1 Out of step blocking and tripping (1)

Table 405: LD0.OOSRPSB1 Out of step blocking and tripping (1)

IEC 61850 name	SA name	Description	DPI values	FUN	INF	U	ASDU	I	C
LD0.OOSRPSB1									
.Op.general	OPERATE	Out of step operate zone 1,2	10=Operate	67	1	1	2	0	1
.BlkZn.stVal	OSB	Out of step block for zone 1	10=Block	67	2	1	1	0	1
.Blk2Zn.stVal	OSB_Z2	Out of step block for zone 2	10=Block	67	3	1	1	0	1
.SwgOp.general	SWING_OP	Out of step block for zone 3	10=Block	67	4	1	2	0	1

5.9.13 LD0.RCFD1 Self Clearing Fault Detection (1)

Table 406: LD0.RCFD1 Self Clearing Fault Detection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.RCFD1									
.Str.general	START	Start	10=Start	67	81	1	2	1	1
.Str.phsA	DetectfaultPhA	Fault detected, phs A	10=Detected	67	82	1	2	1	1
.Str.phsB	DetectfaultPhB	Fault detected, phs B	10=Detected	67	83	1	2	1	1
.Str.phsC	DetectfaultPhC	Fault detected, phs C	10=Detected	67	84	1	2	1	1
.Str.neut	DetectfaultNeut	Fault detected, neut	10=Detected	67	80	1	2	1	1
.Op.general	OPERATE	Operate	10=Operate	67	85	1	2	0	1
.Rs.Oper.ctlVal	RCFD1 reset	Reset	10=Reset	67	86	1	20	1	1

5.9.14 LD0.SCEFRFLO1 Fault locator (1)

Table 407: LD0.SCEFRFLO1 Fault locator (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SCEFRFLO1									
.Alm.stVal	ALARM	Alarm signal	10=Alarm	65	1	1	2	0	1
.TrgSt.stVal	TRIGG	Triggered	10=Triggered	65	2	1	2	0	2

5.9.15 LD0.SECRSYN1 Synchronism and energizing check (1)

Table 408: LD0.SECRSYN1 Synchronism and energizing check (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SECRSYN1									
.SynPrg.stVal	SYNC_INPRO	Synch in progress	10=Progress	26	1	1	1	1	1
.FailCmd.stVal	CMD_FAIL_AL	CB close req failed	10=Fail	26	2	1	1	0	1
.FailSyn.stVal	CL_FAIL_AL	CB close cmd failed	10=Fail	26	3	1	1	0	1

5.9.16 LD0.SECRSYN2 Synchronism and energizing check (2)

Table 409: LD0.SECRSYN2 Synchronism and energizing check (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SECRSYN2									
.SynPrg.stVal	SYNC_INPRO	Synch in progress	10=Progress	26	4	1	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.FailCmd.stVal	CMD_FAIL_AL	CB close req failed	10=Operate	26	5	1	1	0	1
.FailSyn.stVal	CL_FAIL_AL	CB close cmd failed	10=Fail	26	6	1	1	0	1

5.9.17 LD0.SECRSYN3 Synchronism and energizing check (3)

Table 410: LD0.SECRSYN3 Synchronism and energizing check (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SECRSYN3									
.SynPrg.stVal	SYNC_INPRO	Synch in progress	10=Progress	26	7	1	1	1	1
.FailCmd.stVal	CMD_FAIL_AL	CB close req failed	10=Operate	26	8	1	1	0	1
.FailSyn.stVal	CL_FAIL_AL	CB close cmd failed	10=Fail	26	9	1	1	0	1

5.9.18 LD0.SECRSYN4 Synchronism and energizing check (4)

Table 411: LD0.SECRSYN4 Synchronism and energizing check (4)

IEC 61850 Name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SECRSYN4									
.SynPrg.stVal	SYNC_INPRO	Synch in progress	10=Progress	26	13	1	2	1	1
.FailCmd.stVal	CMD_FAIL_AL	CB close req failed	10=Operate	26	14	0	2	1	1
.FailSyn.stVal	CL_FAIL_AL	CB close cmd failed	10=Fail	26	15	0	2	1	1

5.10 Generic functions

5.10.1 LD0.CALGAPC1 Calendar function (1)

Table 412: LD0.CALGAPC1 Calendar function (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CALGAPC1									
.Op.general	Q	Output Status	10=Activated	77	91	0	1	0	1

5.10.2 LD0.CALGAPC2 Calendar function (2)

Table 413: LD0.CALGAPC2 Calendar function (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CALGAPC2									
.Op.general	Q	Output Status	10=Activated	77	92	0	1	0	1

5.10.3 LD0.CALGAPC3 Calendar function (3)

Table 414: LD0.CALGAPC3 Calendar function (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CALGAPC3									
.Op.general	Q	Output Status	10=Activated	77	93	0	1	0	1

5.10.4 LD0.CALGAPC4 Calendar function (4)

Table 415: LD0.CALGAPC4 Calendar function (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.CALGAPC4									
.Op.general	Q	Output Status	10=Activated	77	94	0	1	0	1

5.10.5 LD0.DGMCGAPC1 Diesel generator monitoring (1)

Table 416: LD0.DGMCGAPC1 Diesel generator monitoring (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.DGMCGAPC1									
.Str.general	PRE_TRIP	Pre-trip signal	10=Pre-trip	45	198	1	2	1	1
.Op.general	OPERATE	Operate	10=Operate	45	199	1	2	0	1
.BlkIntnSt.general	INT_BLKD	Internally blocked	10=Blocked	45	200	1	2	0	1
LD0.DGMZGEN1									
.OpOvExt.stVal	OV_EXCT_FLT	Over excitation fault	10=Fault	45	201	1	2	0	1
.OpUnExt.stVal	UN_EXCT_FLT	Under excitation fault	10=Fault	45	202	1	2	0	1
.Dext.stVal	DE_EXCITE	De-excite generator	10=In progress	45	203	1	2	0	1

5.10.6 LD0.HLTGAPC1 Hotline tag (1)

Table 417: LD0.HLTGAPC1 Hotline tag (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.HLTGAPC1									
.HotTagOn.stVal	TAG_ON	Pre-trip signal	10=Pre-trip	80	71	0	1	0	1
.HotTagOn.stVal	TAG_OFF	Operate	10=Operate	80	72	0	1	0	1
.HotTagSrc.stVal.Loc	TAG_SOURCE	Tag source-Local	10=Local	80	73	0	1	0	1
.HotTagSrc.stVal.Rem	TAG_SOURCE	Tag source-Remote	10=Remote	80	74	0	1	0	1

5.10.7 LD0.MAPGAPC1 Multipurpose protection (1)

Table 418: LD0.MAPGAPC1 Multipurpose protection (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC1									
.Str.general	START	Stage start	10=Start	27	151	1	1	1	1
.Op.general	OPERATE	Stage operate	10=Operate	27	152	1	1	0	1

5.10.8 LD0.MAPGAPC2 Multipurpose protection (2)

Table 419: LD0.MAPGAPC2 Multipurpose protection (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC2									
.Str.general	START	Stage start	10=Start	27	153	1	1	1	1
.Op.general	OPERATE	Stage operate	10=Operate	27	154	1	1	0	1

5.10.9 LD0.MAPGAPC3 Multipurpose protection (3)

Table 420: LD0.MAPGAPC3 Multipurpose protection (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC3									
.Str.general	START	Stage start	10=Start	27	155	1	1	1	1
.Op.general	OPERATE	Stage operate	10=Operate	27	156	1	1	0	1

5.10.10 LD0.MAPGAPC4 Multipurpose protection (4)

Table 421: LD0.MAPGAPC4 Multipurpose protection (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC4									
.Str.general	START	Stage start	10=Start	27	157	1	1	1	1
.Op.general	OPERATE	Stage operate	10=Operate	27	158	1	1	0	1

5.10.11 LD0.MAPGAPC5 Multipurpose protection (5)

Table 422: LD0.MAPGAPC5 Multipurpose protection (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC5									
.Str.general	START	Stage start	10=Start	27	159	1	1	1	1
.Op.general	OPERATE	Stage operate	10=Operate	27	160	1	1	0	1

5.10.12 LD0.MAPGAPC6 Multipurpose protection (6)

Table 423: LD0.MAPGAPC6 Multipurpose protection (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC6									
.Str.general	START	Stage start	10=Start	27	161	1	1	1	1
.Op.general	OPERATE	Stage operate	10=Operate	27	162	1	1	0	1

5.10.13 LD0.MAPGAPC7 Multipurpose protection (7)

Table 424: LD0.MAPGAPC7 Multipurpose protection (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC7									
.Str.general	START	Stage start	10=Start	27	163	1	1	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	164	1	1	1	1

5.10.14 LD0.MAPGAPC8 Multipurpose protection (8)

Table 425: LD0.MAPGAPC8 Multipurpose protection (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC8									
.Str.general	START	Stage start	10=Start	27	165	1	1	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	166	1	1	1	1

5.10.15 LD0.MAPGAPC9 Multipurpose protection (9)

Table 426: LD0.MAPGAPC9 Multipurpose protection (9)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC9									
.Str.general	START	Stage start	10=Start	27	167	1	1	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	168	1	1	1	1

5.10.16 LD0.MAPGAPC10 Multipurpose protection (10)

Table 427: LD0.MAPGAPC10 Multipurpose protection (10)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC10									
.Str.general	START	Stage start	10=Start	27	169	1	1	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	170	1	1	1	1

5.10.17 LD0.MAPGAPC11 Multipurpose protection (11)

Table 428: LD0.MAPGAPC11 Multipurpose protection (11)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC11									
.Str.general	START	Stage start	10=Start	27	171	1	1	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	172	1	1	1	1

5.10.18 LD0.MAPGAPC12 Multipurpose protection (12)

Table 429: LD0.MAPGAPC12 Multipurpose protection (12)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC12									
.Str.general	START	Stage start	10=Start	27	173	1	1	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	174	1	1	1	1

5.10.19 LD0.MAPGAPC13 Multipurpose protection (13)

Table 430: LD0.MAPGAPC13 Multipurpose protection (13)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC13									
.Str.general	START	Stage start	10=Start	27	175	1	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	176	1	2	1	1

5.10.20 LD0.MAPGAPC14 Multipurpose protection (14)

Table 431: LD0.MAPGAPC14 Multipurpose protection (14)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC14									
.Str.general	START	Stage start	10=Start	27	177	1	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	178	1	2	1	1

5.10.21 LD0.MAPGAPC15 Multipurpose protection (15)

Table 432: LD0.MAPGAPC15 Multipurpose protection (15)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC15									
.Str.general	START	Stage start	10=Start	27	179	1	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	180	1	2	1	1

5.10.22 LD0.MAPGAPC16 Multipurpose protection (16)

Table 433: LD0.MAPGAPC16 Multipurpose protection (16)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC16									
.Str.general	START	Stage start	10=Start	27	181	1	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	182	1	2	1	1

5.10.23 LD0.MAPGAPC17 Multipurpose protection (17)

Table 434: LD0.MAPGAPC17 Multipurpose protection (17)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC17									
.Str.general	START	Stage start	10=Start	27	183	1	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	184	1	2	1	1

5.10.24 LD0.MAPGAPC18 Multipurpose protection (18)

Table 435: LD0.MAPGAPC18 Multipurpose protection (18)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC18									
.Str.general	START	Stage start	10=Start	27	185	1	2	0	1
.Op.general	OPERATE	Stage operate	10=Operate	27	186	1	2	1	1

5.10.25 LD0.MAPGAPC19 Multipurpose protection (19)

Table 436: LD0.MAPGAPC19 Multipurpose protection (19)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC19									
.Str.general	START	Stage start	10=On	27	187	1	2	0	1
.Op.general	OPERATE	Stage operate	10=On	27	188	1	2	1	1

5.10.26 LD0.MAPGAPC20 Multipurpose protection (20)

Table 437: LD0.MAPGAPC20 Multipurpose protection (20)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC20									
.Str.general	START	Stage start	10=On	27	189	1	2	0	1
.Op.general	OPERATE	Stage operate	10=On	27	190	1	2	1	1

5.10.27 LD0.MAPGAPC21 Multipurpose protection (21)

Table 438: LD0.MAPGAPC21 Multipurpose protection (21)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC21									
.Str.general	START	Stage start	10=On	27	191	1	2	0	1
.Op.general	OPERATE	Stage operate	10=On	27	192	1	2	1	1

5.10.28 LD0.MAPGAPC22 Multipurpose protection (22)

Table 439: LD0.MAPGAPC22 Multipurpose protection (22)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC22									
.Str.general	START	Stage start	10=On	27	193	1	2	0	1
.Op.general	OPERATE	Stage operate	10=On	27	194	1	2	1	1

5.10.29 LD0.MAPGAPC23 Multipurpose protection (23)

Table 440: LD0.MAPGAPC23 Multipurpose protection (23)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC23									
.Str.general	START	Stage start	10=On	27	195	1	2	0	1
.Op.general	OPERATE	Stage operate	10=On	27	196	1	2	1	1

5.10.30 LD0.MAPGAPC24 Multipurpose protection (24)

Table 441: LD0.MAPGAPC24 Multipurpose protection (24)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MAPGAPC24									
.Str.general	START	Stage start	10=On	27	197	1	2	0	1
.Op.general	OPERATE	Stage operate	10=On	27	198	1	2	1	1

5.10.31 LD0.MVGAPC1 Move (8 pcs) (1)

Table 442: LD0.MVGAPC1 Move (8 pcs) (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC1									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	1	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	2	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	3	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	4	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	5	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	6	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	7	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	8	0	1	1	1

5.10.32 LD0.MVGAPC2 Move (8 pcs) (2)

Table 443: LD0.MVGAPC2 Move (8 pcs) (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC2									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	11	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	12	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	13	0	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.SPCSO4.stVal	-	Input 4 signal	10=On	11	14	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	15	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	16	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	17	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	18	0	1	1	1

5.10.33 LD0.MVGAPC3 Move (8 pcs) (3)

Table 444: LD0.MVGAPC3 Move (8 pcs) (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC3									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	21	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	22	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	23	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	24	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	25	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	26	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	27	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	28	0	1	1	1

5.10.34 LD0.MVGAPC4 Move (8 pcs) (4)

Table 445: LD0.MVGAPC4 Move (8 pcs) (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC4									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	31	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	32	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	33	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	34	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	35	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	36	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	37	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	38	0	1	1	1

5.10.35 LD0.MVGAPC5 Move (8 pcs) (5)

Table 446: LD0.MVGAPC5 Move (8 pcs) (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC5									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	41	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	42	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	43	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	44	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	45	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	46	0	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.SPCSO7.stVal	-	Input 7 signal	10=On	11	47	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	48	0	1	1	1

5.10.36 LD0.MVGAPC6 Move (8 pcs) (6)

Table 447: LD0.MVGAPC6 Move (8 pcs) (6)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC6									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	51	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	52	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	53	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	54	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	55	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	56	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	57	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	58	0	1	1	1

5.10.37 LD0.MVGAPC7 Move (8 pcs) (7)

Table 448: LD0.MVGAPC7 Move (8 pcs) (7)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC7									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	61	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	62	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	63	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	64	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	65	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	66	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	67	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	68	0	1	1	1

5.10.38 LD0.MVGAPC8 Move (8 pcs) (8)

Table 449: LD0.MVGAPC8 Move (8 pcs) (8)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC8									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	71	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	72	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	73	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	74	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	75	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	76	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	77	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	78	0	1	1	1

5.10.39 LD0.MVGAPC9 Move (8 pcs) (9)

Table 450: LD0.MVGAPC9 Move (8 pcs) (9)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC9									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	81	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	82	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	83	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	84	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	85	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	86	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	87	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	88	0	1	1	1

5.10.40 LD0.MVGAPC10 Move (8 pcs) (10)

Table 451: LD0.MVGAPC10 Move (8 pcs) (10)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.MVGAPC10									
.SPCSO1.stVal	-	Input 1 signal	10=On	11	91	0	1	1	1
.SPCSO2.stVal	-	Input 2 signal	10=On	11	92	0	1	1	1
.SPCSO3.stVal	-	Input 3 signal	10=On	11	93	0	1	1	1
.SPCSO4.stVal	-	Input 4 signal	10=On	11	94	0	1	1	1
.SPCSO5.stVal	-	Input 5 signal	10=On	11	95	0	1	1	1
.SPCSO6.stVal	-	Input 6 signal	10=On	11	96	0	1	1	1
.SPCSO7.stVal	-	Input 7 signal	10=On	11	97	0	1	1	1
.SPCSO8.stVal	-	Input 8 signal	10=On	11	98	0	1	1	1

5.10.41 LD0.SPCGAPC1 Generic control point (16 pcs) (1)

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "ON". Persistent-type outputs can be written with both values "ON" and "OFF". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 452: LD0.SPCGAPC1 Generic control point (16 pcs) (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SPCGAPC1									
.SPCS01.ctlVal	-	Output control 1	10/01=On/Off	11	141	1	20	0	1
.SPCS02.ctlVal	-	Output control 2	10/01=On/Off	11	142	1	20	0	1
.SPCS03.ctlVal	-	Output control 3	10/01=On/Off	11	143	1	20	0	1
.SPCS04.ctlVal	-	Output control 4	10/01=On/Off	11	144	1	20	0	1
.SPCS05.ctlVal	-	Output control 5	10/01=On/Off	11	145	1	20	0	1
.SPCS06.ctlVal	-	Output control 6	10/01=On/Off	11	146	1	20	0	1
.SPCS07.ctlVal	-	Output control 7	10/01=On/Off	11	147	1	20	0	1
.SPCS08.ctlVal	-	Output control 8	10/01=On/Off	11	148	1	20	0	1
.SPCS09.ctlVal	-	Output control 9	10/01=On/Off	11	149	1	20	0	1
.SPCS10.ctlVal	-	Output control 10	10/01=On/Off	11	150	1	20	0	1
.SPCS11.ctlVal	-	Output control 11	10/01=On/Off	11	151	1	20	0	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.SPCS12.ctlVal	-	Output control 12	10/01=On/Off	11	152	1	20	0	1
.SPCS13.ctlVal	-	Output control 13	10/01=On/Off	11	153	1	20	0	1
.SPCS14.ctlVal	-	Output control 14	10/01=On/Off	11	154	1	20	0	1
.SPCS15.ctlVal	-	Output control 15	10/01=On/Off	11	155	1	20	0	1
.SPCS16.ctlVal	-	Output control 16	10/01=On/Off	11	156	1	20	0	1

5.10.42 LD0.SPCGAPC2 Generic control point (16 pcs) (2)

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "ON". Persistent-type outputs can be written with both values "ON" and "OFF". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 453: LD0.SPCGAPC2 Generic control point (16 pcs) (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SPCGAPC2									
.SPCS01.ctlVal	-	Output control 1	10/01=On/Off	11	181	1	1,20	0	1
.SPCS02.ctlVal	-	Output control 2	10/01=On/Off	11	182	1	1,20	0	1
.SPCS03.ctlVal	-	Output control 3	10/01=On/Off	11	183	1	1,20	0	1
.SPCS04.ctlVal	-	Output control 4	10/01=On/Off	11	184	1	1,20	0	1
.SPCS05.ctlVal	-	Output control 5	10/01=On/Off	11	185	1	1,20	0	1
.SPCS06.ctlVal	-	Output control 6	10/01=On/Off	11	186	1	1,20	0	1
.SPCS07.ctlVal	-	Output control 7	10/01=On/Off	11	187	1	1,20	0	1
.SPCS08.ctlVal	-	Output control 8	10/01=On/Off	11	188	1	1,20	0	1
.SPCS09.ctlVal	-	Output control 9	10/01=On/Off	11	189	1	1,20	0	1
.SPCS10.ctlVal	-	Output control 10	10/01=On/Off	11	190	1	1,20	0	1
.SPCS11.ctlVal	-	Output control 11	10/01=On/Off	11	191	1	1,20	0	1
.SPCS12.ctlVal	-	Output control 12	10/01=On/Off	11	192	1	1,20	0	1
.SPCS13.ctlVal	-	Output control 13	10/01=On/Off	11	193	1	1,20	0	1
.SPCS14.ctlVal	-	Output control 14	10/01=On/Off	11	194	1	1,20	0	1
.SPCS15.ctlVal	-	Output control 15	10/01=On/Off	11	195	1	1,20	0	1
.SPCS16.ctlVal	-	Output control 16	10/01=On/Off	11	196	1	1,20	0	1

5.10.43 LD0.SPCGAPC3 Generic control point (16 pcs) (3)

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "ON". Persistent-type outputs can be written with both values "ON" and "OFF". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 454: LD0.SPCGAPC3 Generic control point (16 pcs) (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SPCGAPC3									
.SPCS01.ctlVal	-	Output control 1	10/01=On/Off	11	161	1	1,20	0	1
.SPCS02.ctlVal	-	Output control 2	10/01=On/Off	11	162	1	1,20	0	1
.SPCS03.ctlVal	-	Output control 3	10/01=On/Off	11	163	1	1,20	0	1
.SPCS04.ctlVal	-	Output control 4	10/01=On/Off	11	164	1	1,20	0	1
.SPCS05.ctlVal	-	Output control 5	10/01=On/Off	11	165	1	1,20	0	1
.SPCS06.ctlVal	-	Output control 6	10/01=On/Off	11	166	1	1,20	0	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.SPCS07.ctlVal	-	Output control 7	10/01=On/Off	11	167	1	1,20	0	1
.SPCS08.ctlVal	-	Output control 8	10/01=On/Off	11	168	1	1,20	0	1
.SPCS09.ctlVal	-	Output control 9	10/01=On/Off	11	169	1	1,20	0	1
.SPCS10.ctlVal	-	Output control 10	10/01=On/Off	11	170	1	1,20	0	1
.SPCS11.ctlVal	-	Output control 11	10/01=On/Off	11	171	1	1,20	0	1
.SPCS12.ctlVal	-	Output control 12	10/01=On/Off	11	172	1	1,20	0	1
.SPCS13.ctlVal	-	Output control 13	10/01=On/Off	11	173	1	1,20	0	1
.SPCS14.ctlVal	-	Output control 14	10/01=On/Off	11	174	1	1,20	0	1
.SPCS15.ctlVal	-	Output control 15	10/01=On/Off	11	175	1	1,20	0	1
.SPCS16.ctlVal	-	Output control 16	10/01=On/Off	11	176	1	1,20	0	1

5.10.44 LD0.SPCGAPC4 Generic control point (16 pcs) (4)

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "ON". Persistent-type outputs can be written with both values "ON" and "OFF". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 455: LD0.SPCGAPC4 Generic control point (16 pcs) (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SPCGAPC4									
.SPCSO1.Oper.ctlVal	-	Output control 1	10/01=On/Off	12	101	1	1,20	1	1
.SPCSO2.Oper.ctlVal	-	Output control 2	10/01=On/Off	12	102	1	1,20	1	1
.SPCSO3.Oper.ctlVal	-	Output control 3	10/01=On/Off	12	103	1	1,20	1	1
.SPCSO4.Oper.ctlVal	-	Output control 4	10/01=On/Off	12	104	1	1,20	1	1
.SPCSO5.Oper.ctlVal	-	Output control 5	10/01=On/Off	12	105	1	1,20	1	1
.SPCSO6.Oper.ctlVal	-	Output control 6	10/01=On/Off	12	106	1	1,20	1	1
.SPCSO7.Oper.ctlVal	-	Output control 7	10/01=On/Off	12	107	1	1,20	1	1
.SPCSO8.Oper.ctlVal	-	Output control 8	10/01=On/Off	12	108	1	1,20	1	1
.SPCSO9.Oper.ctlVal	-	Output control 9	10/01=On/Off	12	109	1	1,20	1	1
.SPCSO10.Oper.ctlVal	-	Output control 10	10/01=On/Off	12	110	1	1,20	1	1
.SPCSO11.Oper.ctlVal	-	Output control 11	10/01=On/Off	12	111	1	1,20	1	1
.SPCSO12.Oper.ctlVal	-	Output control 12	10/01=On/Off	12	112	1	1,20	1	1
.SPCSO13.Oper.ctlVal	-	Output control 13	10/01=On/Off	12	113	1	1,20	1	1
.SPCSO14.Oper.ctlVal	-	Output control 14	10/01=On/Off	12	114	1	1,20	1	1
.SPCSO15.Oper.ctlVal	-	Output control 15	10/01=On/Off	12	115	1	1,20	1	1
.SPCSO16.Oper.ctlVal	-	Output control 16	10/01=On/Off	12	116	1	1,20	1	1

5.10.45 LD0.SPCGAPC5 Generic control point (16 pcs) (5)

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "ON". Persistent-type outputs can be written with both values "ON" and "OFF". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 456: LD0.SPCGAPC5 Generic control point (16 pcs) (5)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SPCGAPC5									
.SPCSO1.Oper.ctlVal	-	Output control 1	10/01=On/Off	12	121	1	1,20	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.SPCSO2.Oper.ctlVal	-	Output control 2	10/01=On/Off	12	122	1	1,20	1	1
.SPCSO3.Oper.ctlVal	-	Output control 3	10/01=On/Off	12	123	1	1,20	1	1
.SPCSO4.Oper.ctlVal	-	Output control 4	10/01=On/Off	12	124	1	1,20	1	1
.SPCSO5.Oper.ctlVal	-	Output control 5	10/01=On/Off	12	125	1	1,20	1	1
.SPCSO6.Oper.ctlVal	-	Output control 6	10/01=On/Off	12	126	1	1,20	1	1
.SPCSO7.Oper.ctlVal	-	Output control 7	10/01=On/Off	12	127	1	1,20	1	1
.SPCSO8.Oper.ctlVal	-	Output control 8	10/01=On/Off	12	128	1	1,20	1	1
.SPCSO9.Oper.ctlVal	-	Output control 9	10/01=On/Off	12	129	1	1,20	1	1
.SPCSO10.Oper.ctlVal	-	Output control 10	10/01=On/Off	12	130	1	1,20	1	1
.SPCSO11.Oper.ctlVal	-	Output control 11	10/01=On/Off	12	131	1	1,20	1	1
.SPCSO12.Oper.ctlVal	-	Output control 12	10/01=On/Off	12	132	1	1,20	1	1
.SPCSO13.Oper.ctlVal	-	Output control 13	10/01=On/Off	12	133	1	1,20	1	1
.SPCSO14.Oper.ctlVal	-	Output control 14	10/01=On/Off	12	134	1	1,20	1	1
.SPCSO15.Oper.ctlVal	-	Output control 15	10/01=On/Off	12	135	1	1,20	1	1
.SPCSO16.Oper.ctlVal	-	Output control 16	10/01=On/Off	12	136	1	1,20	1	1

5.10.46 LD0.SPCGAPC6 Generic control point (16 pcs) (6)

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "ON". Persistent-type outputs can be written with both values "ON" and "OFF". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 457: LD0.SPCGAPC6 Generic control point (16 pcs) (6)

IEC 61850 Name	SA Name	Description	Values	FUN	INF	U	ASDU	I	C
LD0.SPCGAPC6									
.SPCSO1.Oper.ctlVal	-	Output control 1	10/01=On/Off	13	101	1	1,20	1	1
.SPCSO2.Oper.ctlVal	-	Output control 2	10/01=On/Off	13	102	1	1,20	1	1
.SPCSO3.Oper.ctlVal	-	Output control 3	10/01=On/Off	13	103	1	1,20	1	1
.SPCSO4.Oper.ctlVal	-	Output control 4	10/01=On/Off	13	104	1	1,20	1	1
.SPCSO5.Oper.ctlVal	-	Output control 5	10/01=On/Off	13	105	1	1,20	1	1
.SPCSO6.Oper.ctlVal	-	Output control 6	10/01=On/Off	13	106	1	1,20	1	1
.SPCSO7.Oper.ctlVal	-	Output control 7	10/01=On/Off	13	107	1	1,20	1	1
.SPCSO8.Oper.ctlVal	-	Output control 8	10/01=On/Off	13	108	1	1,20	1	1
.SPCSO9.Oper.ctlVal	-	Output control 9	10/01=On/Off	13	109	1	1,20	1	1
.SPCSO10.Oper.ctlVal	-	Output control 10	10/01=On/Off	13	110	1	1,20	1	1
.SPCSO11.Oper.ctlVal	-	Output control 11	10/01=On/Off	13	111	1	1,20	1	1
.SPCSO12.Oper.ctlVal	-	Output control 12	10/01=On/Off	13	112	1	1,20	1	1
.SPCSO13.Oper.ctlVal	-	Output control 13	10/01=On/Off	13	113	1	1,20	1	1
.SPCSO14.Oper.ctlVal	-	Output control 14	10/01=On/Off	13	114	1	1,20	1	1
.SPCSO15.Oper.ctlVal	-	Output control 15	10/01=On/Off	13	115	1	1,20	1	1
.SPCSO16.Oper.ctlVal	-	Output control 16	10/01=On/Off	13	116	1	1,20	1	1

5.10.47 LD0.SPCLGAPC1 Local generic control points (1)

Table 458: LD0.SPCLGAPC1 Local generic control points (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SPCLGAPC1									
.SPCS01.ctlVal	-	Output control 1	10/01=On/Off	11	221	1	1	0	1
.SPCS02.ctlVal	-	Output control 2	10/01=On/Off	11	222	1	1	0	1
.SPCS03.ctlVal	-	Output control 3	10/01=On/Off	11	223	1	1	0	1
.SPCS04.ctlVal	-	Output control 4	10/01=On/Off	11	224	1	1	0	1
.SPCS05.ctlVal	-	Output control 5	10/01=On/Off	11	225	1	1	0	1
.SPCS06.ctlVal	-	Output control 6	10/01=On/Off	11	226	1	1	0	1
.SPCS07.ctlVal	-	Output control 7	10/01=On/Off	11	227	1	1	0	1
.SPCS08.ctlVal	-	Output control 8	10/01=On/Off	11	228	1	1	0	1
.SPCS09.ctlVal	-	Output control 9	10/01=On/Off	11	229	1	1	0	1
.SPCS10.ctlVal	-	Output control 10	10/01=On/Off	11	230	1	1	0	1
.SPCS11.ctlVal	-	Output control 11	10/01=On/Off	11	231	1	1	0	1
.SPCS12.ctlVal	-	Output control 12	10/01=On/Off	11	232	1	1	0	1
.SPCS13.ctlVal	-	Output control 13	10/01=On/Off	11	233	1	1	0	1
.SPCS14.ctlVal	-	Output control 14	10/01=On/Off	11	234	1	1	0	1
.SPCS15.ctlVal	-	Output control 15	10/01=On/Off	11	235	1	1	0	1
.SPCS16.ctlVal	-	Output control 16	10/01=On/Off	11	236	1	1	0	1

5.10.48 LD0.SPCRGAPC1 Remote generic control points (1)

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "ON". Persistent-type outputs can be written with both values "ON" and "OFF". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 459: LD0.SPCRGAPC1 Remote generic control points (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SPCRGAPC1									
.SPCS01.ctlVal	-	Output control 1	10/01=On/Off	1	201	1	1,20	0	1
.SPCS02.ctlVal	-	Output control 2	10/01=On/Off	1	202	1	1,20	0	1
.SPCS03.ctlVal	-	Output control 3	10/01=On/Off	1	203	1	1,20	0	1
.SPCS04.ctlVal	-	Output control 4	10/01=On/Off	1	204	1	1,20	0	1
.SPCS05.ctlVal	-	Output control 5	10/01=On/Off	1	205	1	1,20	0	1
.SPCS06.ctlVal	-	Output control 6	10/01=On/Off	1	206	1	1,20	0	1
.SPCS07.ctlVal	-	Output control 7	10/01=On/Off	1	207	1	1,20	0	1
.SPCS08.ctlVal	-	Output control 8	10/01=On/Off	1	208	1	1,20	0	1
.SPCS09.ctlVal	-	Output control 9	10/01=On/Off	1	209	1	1,20	0	1
.SPCS10.ctlVal	-	Output control 10	10/01=On/Off	1	210	1	1,20	0	1
.SPCS11.ctlVal	-	Output control 11	10/01=On/Off	1	211	1	1,20	0	1
.SPCS12.ctlVal	-	Output control 12	10/01=On/Off	1	212	1	1,20	0	1
.SPCS13.ctlVal	-	Output control 13	10/01=On/Off	1	213	1	1,20	0	1
.SPCS14.ctlVal	-	Output control 14	10/01=On/Off	1	214	1	1,20	0	1
.SPCS15.ctlVal	-	Output control 15	10/01=On/Off	1	215	1	1,20	0	1
.SPCS16.ctlVal	-	Output control 16	10/01=On/Off	1	216	1	1,20	0	1

5.10.49 LD0.SRGAPC1 Set-reset (8 pcs) (1)

Table 460: LD0.SRGAPC1 Set-reset (8 pcs) (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SRGAPC1									
.Rs1.ctlVal	-	Reset flip-flop 1	10=Reset	11	101	1	20	0	1
.Rs2.ctlVal	-	Reset flip-flop 2	10=Reset	11	102	1	20	0	1
.Rs3.ctlVal	-	Reset flip-flop 3	10=Reset	11	103	1	20	0	1
.Rs4.ctlVal	-	Reset flip-flop 4	10=Reset	11	104	1	20	0	1
.Rs5.ctlVal	-	Reset flip-flop 5	10=Reset	11	105	1	20	0	1
.Rs6.ctlVal	-	Reset flip-flop 6	10=Reset	11	106	1	20	0	1
.Rs7.ctlVal	-	Reset flip-flop 7	10=Reset	11	107	1	20	0	1
.Rs8.ctlVal	-	Reset flip-flop 8	10=Reset	11	108	1	20	0	1

5.10.50 LD0.SRGAPC2 Set-reset (8 pcs) (2)

Table 461: LD0.SRGAPC2 Set-reset (8 pcs) (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SRGAPC2									
.Rs1.ctlVal	-	Reset flip-flop 1	10=Reset	11	111	1	20	0	1
.Rs2.ctlVal	-	Reset flip-flop 2	10=Reset	11	112	1	20	0	1
.Rs3.ctlVal	-	Reset flip-flop 3	10=Reset	11	113	1	20	0	1
.Rs4.ctlVal	-	Reset flip-flop 4	10=Reset	11	114	1	20	0	1
.Rs5.ctlVal	-	Reset flip-flop 5	10=Reset	11	115	1	20	0	1
.Rs6.ctlVal	-	Reset flip-flop 6	10=Reset	11	116	1	20	0	1
.Rs7.ctlVal	-	Reset flip-flop 7	10=Reset	11	117	1	20	0	1
.Rs8.ctlVal	-	Reset flip-flop 8	10=Reset	11	118	1	20	0	1

5.10.51 LD0.SRGAPC3 Set-reset (8 pcs) (3)

Table 462: LD0.SRGAPC3 Set-reset (8 pcs) (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SRGAPC3									
.Rs1.ctlVal	-	Reset flip-flop 1	10=Reset	11	121	1	20	0	1
.Rs2.ctlVal	-	Reset flip-flop 2	10=Reset	11	122	1	20	0	1
.Rs3.ctlVal	-	Reset flip-flop 3	10=Reset	11	123	1	20	0	1
.Rs4.ctlVal	-	Reset flip-flop 4	10=Reset	11	124	1	20	0	1
.Rs5.ctlVal	-	Reset flip-flop 5	10=Reset	11	125	1	20	0	1
.Rs6.ctlVal	-	Reset flip-flop 6	10=Reset	11	126	1	20	0	1
.Rs7.ctlVal	-	Reset flip-flop 7	10=Reset	11	127	1	20	0	1
.Rs8.ctlVal	-	Reset flip-flop 8	10=Reset	11	128	1	20	0	1

5.10.52 LD0.SRGAPC4 Set-reset (8 pcs) (4)

Table 463: LD0.SRGAPC4 Set-reset (8 pcs) (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SRGAPC4									
.Rs1.ctlVal	-	Reset flip-flop 1	10=Reset	11	131	1	20	0	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.Rs2.ctlVal	-	Reset flip-flop 2	10=Reset	11	132	1	20	0	1
.Rs3.ctlVal	-	Reset flip-flop 3	10=Reset	11	133	1	20	0	1
.Rs4.ctlVal	-	Reset flip-flop 4	10=Reset	11	134	1	20	0	1
.Rs5.ctlVal	-	Reset flip-flop 5	10=Reset	11	135	1	20	0	1
.Rs6.ctlVal	-	Reset flip-flop 6	10=Reset	11	136	1	20	0	1
.Rs7.ctlVal	-	Reset flip-flop 7	10=Reset	11	137	1	20	0	1
.Rs8.ctlVal	-	Reset flip-flop 8	10=Reset	11	138	1	20	0	1

5.10.53 LD0.TIMGAPC1 Daily timer function (1)

Table 464: LD0.TIMGAPC1 Daily timer function (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.TIMGAPC1									
.Op.general	Q	Output Status	10=Activated	77	101	0	1	0	1

5.10.54 LD0.TIMGAPC2 Daily timer function (2)

Table 465: LD0.TIMGAPC2 Daily timer function (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.TIMGAPC2									
.Op.general	Q	Output Status	10=Activated	77	102	0	1	0	1

5.10.55 LD0.TIMGAPC3 Daily timer function (3)

Table 466: LD0.TIMGAPC3 Daily timer function (3)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.TIMGAPC3									
.Op.general	Q	Output Status	10=Activated	77	103	0	1	0	1

5.10.56 LD0.TIMGAPC4 Daily timer function (4)

Table 467: LD0.TIMGAPC4 Daily timer function (4)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.TIMGAPC4									
.Op.general	Q	Output Status	10=Activated	77	104	0	1	0	1

5.11 Physical and raw I/O data

5.11.1 LD0.BSTGGIO1 Binary signal transfer (1)

Table 468: LD0.BSTGGIO1 Binary signal transfer (1)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.BSTGGIO1									
.SPCSO1.stVal	RECV_SIG_1	Output 1 State	01/10=Off/On	80	51	0	1,20	0	1
.SPCSO2.stVal	RECV_SIG_2	Output 2 State	01/10=Off/On	80	52	0	1,20	0	1
.SPCSO3.stVal	RECV_SIG_3	Output 3 State	01/10=Off/On	80	53	0	1,20	0	1
.SPCSO4.stVal	RECV_SIG_4	Output 4 State	01/10=Off/On	80	54	0	1,20	0	1
.SPCSO5.stVal	RECV_SIG_5	Output 5 State	01/10=Off/On	80	55	0	1,20	0	1
.SPCSO6.stVal	RECV_SIG_6	Output 6 State	01/10=Off/On	80	56	0	1,20	0	1
.SPCSO7.stVal	RECV_SIG_7	Output 7 State	01/10=Off/On	80	57	0	1,20	0	1
.SPCSO8.stVal	RECV_SIG_8	Output 8 State	01/10=Off/On	80	58	0	1,20	0	1
.Ind1.stVal	SEND_SIG_1	Input 1 State	01/10=Off/On	80	11	0	1	0	1
.Ind2.stVal	SEND_SIG_2	Input 2 State	01/10=Off/On	80	12	0	1	0	1
.Ind3.stVal	SEND_SIG_3	Input 3 State	01/10=Off/On	80	13	0	1	0	1
.Ind4.stVal	SEND_SIG_4	Input 4 State	01/10=Off/On	80	14	0	1	0	1
.Ind5.stVal	SEND_SIG_5	Input 5 State	01/10=Off/On	80	15	0	1	0	1
.Ind6.stVal	SEND_SIG_6	Input 6 State	01/10=Off/On	80	16	0	1	0	1
.Ind7.stVal	SEND_SIG_7	Input 7 State	01/10=Off/On	80	17	0	1	0	1
.Ind8.stVal	SEND_SIG_8	Input 8 State	01/10=Off/On	80	18	0	1	0	1

5.11.2 LD0.BSTGGIO2 Binary signal transfer (2)

Table 469: LD0.BSTGGIO2 Binary signal transfer (2)

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.BSTGGIO2									
.SPCSO1.stVal	RECV_SIG_1	Output 1 State	01/10=Off/On	80	61	0	1,20	0	1
.SPCSO2.stVal	RECV_SIG_2	Output 2 State	01/10=Off/On	80	62	0	1,20	0	1
.SPCSO3.stVal	RECV_SIG_3	Output 3 State	01/10=Off/On	80	63	0	1,20	0	1
.SPCSO4.stVal	RECV_SIG_4	Output 4 State	01/10=Off/On	80	64	0	1,20	0	1
.SPCSO5.stVal	RECV_SIG_5	Output 5 State	01/10=Off/On	80	65	0	1,20	0	1
.SPCSO6.stVal	RECV_SIG_6	Output 6 State	01/10=Off/On	80	66	0	1,20	0	1
.SPCSO7.stVal	RECV_SIG_7	Output 7 State	01/10=Off/On	80	67	0	1,20	0	1
.SPCSO8.stVal	RECV_SIG_8	Output 8 State	01/10=Off/On	80	68	0	1,20	0	1
.Ind1	SEND_SIG_1	Input 1 State	01/10=Off/On	80	21	0	1	0	1
.Ind2	SEND_SIG_2	Input 2 State	01/10=Off/On	80	22	0	1	0	1
.Ind3	SEND_SIG_3	Input 3 State	01/10=Off/On	80	23	0	1	0	1
.Ind4	SEND_SIG_4	Input 4 State	01/10=Off/On	80	24	0	1	0	1
.Ind5	SEND_SIG_5	Input 5 State	01/10=Off/On	80	25	0	1	0	1
.Ind6	SEND_SIG_6	Input 6 State	01/10=Off/On	80	26	0	1	0	1
.Ind7	SEND_SIG_7	Input 7 State	01/10=Off/On	80	27	0	1	0	1
.Ind8	SEND_SIG_8	Input 8 State	01/10=Off/On	80	28	0	1	0	1

5.11.3 LD0.SBBxGGIO1 Slot B Binary I/O data

Availability depends on I/O card variant.

Table 470: LD0.SBBxGGIO1 Slot B Binary I/O data

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SBBIGGIO1									
.Ind1		Input 1 state	10/01=On/Off	51	1	0	1	1	1
.Ind2		Input 2 state	10/01=On/Off	51	2	0	1	1	1
.Ind3		Input 3 state	10/01=On/Off	51	3	0	1	1	1
.Ind4		Input 4 state	10/01=On/Off	51	4	0	1	1	1
.Ind5		Input 5 state	10/01=On/Off	51	5	0	1	1	1
.Ind6		Input 6 state	10/01=On/Off	51	6	0	1	1	1
.Ind7		Input 7 state	10/01=On/Off	51	7	0	1	1	1
.Ind8		Input 8 state	10/01=On/Off	51	8	0	1	1	1
.Ind9		Input 9 state	10/01=On/Off	51	9	0	1	1	1
.Ind10		Input 10 state	10/01=On/Off	51	10	0	1	1	1
.Ind11		Input 11 state	10/01=On/Off	51	11	0	1	1	1
.Ind12		Input 12 state	10/01=On/Off	51	12	0	1	1	1
.Ind13		Input 13 state	10/01=On/Off	51	13	0	1	1	1
.Ind14		Input 14 state	10/01=On/Off	51	14	0	1	1	1
.Ind15		Input 15 state	10/01=On/Off	51	15	0	1	1	1
.Ind16		Input 16 state	10/01=On/Off	51	16	0	1	1	1
LD0.SBBOGGIO1									
.SPCSO1.stVal		Output 1 state	10/01=On/Off	51	101	0	1	1	1
.SPCSO2.stVal		Output 2 state	10/01=On/Off	51	102	0	1	1	1
.SPCSO3.stVal		Output 3 state	10/01=On/Off	51	103	0	1	1	1
.SPCSO4.stVal		Output 4 state	10/01=On/Off	51	104	0	1	1	1
.SPCSO5.stVal		Output 5 state	10/01=On/Off	51	105	0	1	1	1
.SPCSO6.stVal		Output 6 state	10/01=On/Off	51	106	0	1	1	1
.SPCSO7.stVal		Output 7 state	10/01=On/Off	51	107	0	1	1	1
.SPCSO8.stVal		Output 8 state	10/01=On/Off	51	108	0	1	1	1
.SPCSO9.stVal		Output 9 state	10/01=On/Off	51	109	0	1	1	1
.SPCSO10.stVal		Output 10 state	10/01=On/Off	51	110	0	1	1	1
.SPCSO11.stVal		Output 11 state	10/01=On/Off	51	111	0	1	1	1
.SPCSO12.stVal		Output 12 state	10/01=On/Off	51	112	0	1	1	1
.SPCSO13.stVal		Output 13 state	10/01=On/Off	51	113	0	1	1	1
.SPCSO14.stVal		Output 14 state	10/01=On/Off	51	114	0	1	1	1
.SPCSO15.stVal		Output 15 state	10/01=On/Off	51	115	0	1	1	1
.SPCSO16.stVal		Output 16 state	10/01=On/Off	51	116	0	1	1	1

5.11.4 LD0.SCBxGGIO1 Slot C Binary I/O data

Availability depends on I/O card variant.

Table 471: LD0.SCBxGGIO1 Slot C Binary I/O data

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SCBIGGIO1									
.Ind1		Input 1 state	10/01=On/Off	51	17	0	1	1	1
.Ind2		Input 2 state	10/01=On/Off	51	18	0	1	1	1
.Ind3		Input 3 state	10/01=On/Off	51	19	0	1	1	1
.Ind4		Input 4 state	10/01=On/Off	51	20	0	1	1	1
.Ind5		Input 5 state	10/01=On/Off	51	21	0	1	1	1
.Ind6		Input 6 state	10/01=On/Off	51	22	0	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.Ind7		Input 7 state	10/01=On/Off	51	23	0	1	1	1
.Ind8		Input 8 state	10/01=On/Off	51	24	0	1	1	1
.Ind9		Input 9 state	10/01=On/Off	51	25	0	1	1	1
.Ind10		Input 10 state	10/01=On/Off	51	26	0	1	1	1
.Ind11		Input 11 state	10/01=On/Off	51	27	0	1	1	1
.Ind12		Input 12 state	10/01=On/Off	51	28	0	1	1	1
.Ind13		Input 13 state	10/01=On/Off	51	29	0	1	1	1
.Ind14		Input 14 state	10/01=On/Off	51	30	0	1	1	1
.Ind15		Input 15 state	10/01=On/Off	51	31	0	1	1	1
.Ind16		Input 16 state	10/01=On/Off	51	32	0	1	1	1
LD0.SCBOGGIO1									
.SPCSO1.stVal		Output 1 state	10/01=On/Off	51	117	0	1	1	1
.SPCSO2.stVal		Output 2 state	10/01=On/Off	51	118	0	1	1	1
.SPCSO3.stVal		Output 3 state	10/01=On/Off	51	119	0	1	1	1
.SPCSO4.stVal		Output 4 state	10/01=On/Off	51	120	0	1	1	1
.SPCSO5.stVal		Output 5 state	10/01=On/Off	51	121	0	1	1	1
.SPCSO6.stVal		Output 6 state	10/01=On/Off	51	122	0	1	1	1
.SPCSO7.stVal		Output 7 state	10/01=On/Off	51	123	0	1	1	1
.SPCSO8.stVal		Output 8 state	10/01=On/Off	51	124	0	1	1	1
.SPCSO9.stVal		Output 9 state	10/01=On/Off	51	125	0	1	1	1
.SPCSO10.stVal		Output 10 state	10/01=On/Off	51	126	0	1	1	1
.SPCSO11.stVal		Output 11 state	10/01=On/Off	51	127	0	1	1	1
.SPCSO12.stVal		Output 12 state	10/01=On/Off	51	128	0	1	1	1
.SPCSO13.stVal		Output 13 state	10/01=On/Off	51	129	0	1	1	1
.SPCSO14.stVal		Output 14 state	10/01=On/Off	51	130	0	1	1	1
.SPCSO15.stVal		Output 15 state	10/01=On/Off	51	131	0	1	1	1
.SPCSO16.stVal		Output 16 state	10/01=On/Off	51	132	0	1	1	1

5.11.5 LD0.SDBxGGIO1 Slot D Binary I/O data

Availability depends on I/O card variant.

Table 472: LD0.SDBxGGIO1 Slot D Binary I/O data

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SDBIGGIO1									
.Ind1		Input 1 state	10/01=On/Off	51	33	0	1	1	1
.Ind2		Input 2 state	10/01=On/Off	51	34	0	1	1	1
.Ind3		Input 3 state	10/01=On/Off	51	35	0	1	1	1
.Ind4		Input 4 state	10/01=On/Off	51	36	0	1	1	1
.Ind5		Input 5 state	10/01=On/Off	51	37	0	1	1	1
.Ind6		Input 6 state	10/01=On/Off	51	38	0	1	1	1
.Ind7		Input 7 state	10/01=On/Off	51	39	0	1	1	1
.Ind8		Input 8 state	10/01=On/Off	51	40	0	1	1	1
.Ind9		Input 9 state	10/01=On/Off	51	41	0	1	1	1
.Ind10		Input 10 state	10/01=On/Off	51	42	0	1	1	1
.Ind11		Input 11 state	10/01=On/Off	51	43	0	1	1	1
.Ind12		Input 12 state	10/01=On/Off	51	44	0	1	1	1
.Ind13		Input 13 state	10/01=On/Off	51	45	0	1	1	1
.Ind14		Input 14 state	10/01=On/Off	51	46	0	1	1	1
.Ind15		Input 15 state	10/01=On/Off	51	47	0	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.Ind16		Input 16 state	10/01=On/Off	51	48	0	1	1	1
LD0.SDBOGGIO1									
.SPCSO1.stVal		Output 1 state	10/01=On/Off	51	133	0	1	1	1
.SPCSO2.stVal		Output 2 state	10/01=On/Off	51	134	0	1	1	1
.SPCSO3.stVal		Output 3 state	10/01=On/Off	51	135	0	1	1	1
.SPCSO4.stVal		Output 4 state	10/01=On/Off	51	136	0	1	1	1
.SPCSO5.stVal		Output 5 state	10/01=On/Off	51	137	0	1	1	1
.SPCSO6.stVal		Output 6 state	10/01=On/Off	51	138	0	1	1	1
.SPCSO7.stVal		Output 7 state	10/01=On/Off	51	139	0	1	1	1
.SPCSO8.stVal		Output 8 state	10/01=On/Off	51	140	0	1	1	1
.SPCSO9.stVal		Output 9 state	10/01=On/Off	51	141	0	1	1	1
.SPCSO10.stVal		Output 10 state	10/01=On/Off	51	142	0	1	1	1
.SPCSO11.stVal		Output 11 state	10/01=On/Off	51	143	0	1	1	1
.SPCSO12.stVal		Output 12 state	10/01=On/Off	51	144	0	1	1	1
.SPCSO13.stVal		Output 13 state	10/01=On/Off	51	145	0	1	1	1
.SPCSO14.stVal		Output 14 state	10/01=On/Off	51	146	0	1	1	1
.SPCSO15.stVal		Output 15 state	10/01=On/Off	51	147	0	1	1	1
.SPCSO16.stVal		Output 16 state	10/01=On/Off	51	148	0	1	1	1

5.11.6 LD0.SEBxGGIO1 Slot E Binary I/O data

Availability depends on I/O card variant.

Table 473: LD0.SEBxGGIO1 Slot E Binary I/O data

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SEBIGGIO1									
.Ind1		Input 1 state	10/01=On/Off	51	49	0	1	1	1
.Ind2		Input 2 state	10/01=On/Off	51	50	0	1	1	1
.Ind3		Input 3 state	10/01=On/Off	51	51	0	1	1	1
.Ind4		Input 4 state	10/01=On/Off	51	52	0	1	1	1
.Ind5		Input 5 state	10/01=On/Off	51	53	0	1	1	1
.Ind6		Input 6 state	10/01=On/Off	51	54	0	1	1	1
.Ind7		Input 7 state	10/01=On/Off	51	55	0	1	1	1
.Ind8		Input 8 state	10/01=On/Off	51	56	0	1	1	1
.Ind9		Input 9 state	10/01=On/Off	51	57	0	1	1	1
.Ind10		Input 10 state	10/01=On/Off	51	58	0	1	1	1
.Ind11		Input 11 state	10/01=On/Off	51	59	0	1	1	1
.Ind12		Input 12 state	10/01=On/Off	51	60	0	1	1	1
.Ind13		Input 13 state	10/01=On/Off	51	61	0	1	1	1
.Ind14		Input 14 state	10/01=On/Off	51	62	0	1	1	1
.Ind15		Input 15 state	10/01=On/Off	51	63	0	1	1	1
.Ind16		Input 16 state	10/01=On/Off	51	64	0	1	1	1
LD0.SEBOGGIO1									
.SPCSO1.stVal		Output 1 state	10/01=On/Off	51	149	0	1	1	1
.SPCSO2.stVal		Output 2 state	10/01=On/Off	51	150	0	1	1	1
.SPCSO3.stVal		Output 3 state	10/01=On/Off	51	151	0	1	1	1
.SPCSO4.stVal		Output 4 state	10/01=On/Off	51	152	0	1	1	1
.SPCSO5.stVal		Output 5 state	10/01=On/Off	51	153	0	1	1	1
.SPCSO6.stVal		Output 6 state	10/01=On/Off	51	154	0	1	1	1
.SPCSO7.stVal		Output 7 state	10/01=On/Off	51	155	0	1	1	1

Table continues on the next page

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
.SPCSO8.stVal		Output 8 state	10/01=On/Off	51	156	0	1	1	1
.SPCSO9.stVal		Output 9 state	10/01=On/Off	51	157	0	1	1	1
.SPCSO10.stVal		Output 10 state	10/01=On/Off	51	158	0	1	1	1
.SPCSO11.stVal		Output 11 state	10/01=On/Off	51	159	0	1	1	1
.SPCSO12.stVal		Output 12 state	10/01=On/Off	51	160	0	1	1	1
.SPCSO13.stVal		Output 13 state	10/01=On/Off	51	161	0	1	1	1
.SPCSO14.stVal		Output 14 state	10/01=On/Off	51	162	0	1	1	1
.SPCSO15.stVal		Output 15 state	10/01=On/Off	51	163	0	1	1	1
.SPCSO16.stVal		Output 16 state	10/01=On/Off	51	164	0	1	1	1

5.11.7 LD0.SFBxGGIO1 Slot F Binary I/O data

Availability depends on I/O card variant.

Table 474: LD0.SFBxGGIO1 Slot F Binary I/O data

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SFBIGGIO1									
.Ind1		Input 1 state	10/01=On/Off	51	65	0	1	1	1
.Ind2		Input 2 state	10/01=On/Off	51	66	0	1	1	1
.Ind3		Input 3 state	10/01=On/Off	51	67	0	1	1	1
.Ind4		Input 4 state	10/01=On/Off	51	68	0	1	1	1
.Ind5		Input 5 state	10/01=On/Off	51	69	0	1	1	1
.Ind6		Input 6 state	10/01=On/Off	51	70	0	1	1	1
.Ind7		Input 7 state	10/01=On/Off	51	71	0	1	1	1
.Ind8		Input 8 state	10/01=On/Off	51	72	0	1	1	1
.Ind9		Input 9 state	10/01=On/Off	51	73	0	1	1	1
.Ind10		Input 10 state	10/01=On/Off	51	74	0	1	1	1
.Ind11		Input 11 state	10/01=On/Off	51	75	0	1	1	1
.Ind12		Input 12 state	10/01=On/Off	51	76	0	1	1	1
.Ind13		Input 13 state	10/01=On/Off	51	77	0	1	1	1
.Ind14		Input 14 state	10/01=On/Off	51	78	0	1	1	1
.Ind15		Input 15 state	10/01=On/Off	51	79	0	1	1	1
.Ind16		Input 16 state	10/01=On/Off	51	80	0	1	1	1
LD0.SFBOGGIO1									
.SPCSO1.stVal		Output 1 state	10/01=On/Off	51	165	0	1	1	1
.SPCSO2.stVal		Output 2 state	10/01=On/Off	51	166	0	1	1	1
.SPCSO3.stVal		Output 3 state	10/01=On/Off	51	167	0	1	1	1
.SPCSO4.stVal		Output 4 state	10/01=On/Off	51	168	0	1	1	1
.SPCSO5.stVal		Output 5 state	10/01=On/Off	51	169	0	1	1	1
.SPCSO6.stVal		Output 6 state	10/01=On/Off	51	170	0	1	1	1
.SPCSO7.stVal		Output 7 state	10/01=On/Off	51	171	0	1	1	1
.SPCSO8.stVal		Output 8 state	10/01=On/Off	51	172	0	1	1	1
.SPCSO9.stVal		Output 9 state	10/01=On/Off	51	173	0	1	1	1
.SPCSO10.stVal		Output 10 state	10/01=On/Off	51	174	0	1	1	1
.SPCSO11.stVal		Output 11 state	10/01=On/Off	51	175	0	1	1	1
.SPCSO12.stVal		Output 12 state	10/01=On/Off	51	176	0	1	1	1
.SPCSO13.stVal		Output 13 state	10/01=On/Off	51	177	0	1	1	1
.SPCSO14.stVal		Output 14 state	10/01=On/Off	51	178	0	1	1	1
.SPCSO15.stVal		Output 15 state	10/01=On/Off	51	179	0	1	1	1
.SPCSO16.stVal		Output 16 state	10/01=On/Off	51	180	0	1	1	1

5.11.8 LD0.SGBxGGIO1 Slot G Binary I/O data

Availability depends on I/O card variant.

Table 475: LD0.SGBxGGIO1 Slot G Binary I/O data

IEC 61850 name	SA name	Description	DPI value	FUN	INF	U	ASDU	I	C
LD0.SGBIGGIO1									
.Ind1		Input 1 state	10/01=On/Off	51	81	0	1	1	1
.Ind2		Input 2 state	10/01=On/Off	51	82	0	1	1	1
.Ind3		Input 3 state	10/01=On/Off	51	83	0	1	1	1
.Ind4		Input 4 state	10/01=On/Off	51	84	0	1	1	1
.Ind5		Input 5 state	10/01=On/Off	51	85	0	1	1	1
.Ind6		Input 6 state	10/01=On/Off	51	86	0	1	1	1
.Ind7		Input 7 state	10/01=On/Off	51	87	0	1	1	1
.Ind8		Input 8 state	10/01=On/Off	51	88	0	1	1	1
.Ind9		Input 9 state	10/01=On/Off	51	89	0	1	1	1
.Ind10		Input 10 state	10/01=On/Off	51	90	0	1	1	1
.Ind11		Input 11 state	10/01=On/Off	51	91	0	1	1	1
.Ind12		Input 12 state	10/01=On/Off	51	92	0	1	1	1
.Ind13		Input 13 state	10/01=On/Off	51	93	0	1	1	1
.Ind14		Input 14 state	10/01=On/Off	51	94	0	1	1	1
.Ind15		Input 15 state	10/01=On/Off	51	95	0	1	1	1
.Ind16		Input 16 state	10/01=On/Off	51	96	0	1	1	1
LD0.SGBOGGIO1									
.SPCSO1.stVal		Output 1 state	10/01=On/Off	51	181	0	1	1	1
.SPCSO2.stVal		Output 2 state	10/01=On/Off	51	182	0	1	1	1
.SPCSO3.stVal		Output 3 state	10/01=On/Off	51	183	0	1	1	1
.SPCSO4.stVal		Output 4 state	10/01=On/Off	51	184	0	1	1	1
.SPCSO5.stVal		Output 5 state	10/01=On/Off	51	185	0	1	1	1
.SPCSO6.stVal		Output 6 state	10/01=On/Off	51	186	0	1	1	1
.SPCSO7.stVal		Output 7 state	10/01=On/Off	51	187	0	1	1	1
.SPCSO8.stVal		Output 8 state	10/01=On/Off	51	188	0	1	1	1
.SPCSO9.stVal		Output 9 state	10/01=On/Off	51	189	0	1	1	1
.SPCSO10.stVal		Output 10 state	10/01=On/Off	51	190	0	1	1	1
.SPCSO11.stVal		Output 11 state	10/01=On/Off	51	191	0	1	1	1
.SPCSO12.stVal		Output 12 state	10/01=On/Off	51	192	0	1	1	1
.SPCSO13.stVal		Output 13 state	10/01=On/Off	51	193	0	1	1	1
.SPCSO14.stVal		Output 14 state	10/01=On/Off	51	194	0	1	1	1
.SPCSO15.stVal		Output 15 state	10/01=On/Off	51	195	0	1	1	1
.SPCSO16.stVal		Output 16 state	10/01=On/Off	51	196	0	1	1	1

5.12 Analog events

Analog events are generated as ASDU 4 messages, according to the IEC 60870-5-103 standard. The value coding format is short floating point. The value is directly taken from the corresponding source IEC 61850 value, and cannot be rescaled. If the source IEC 61850 value is of integer format, it is automatically converted into short floating point for the ASDU 4 message.

Table 476: Explanations of the analog event table columns

Column name	Description
IEC 61850 name	Source object name
Description	Short description of the signal. See the technical manual for more information.
Values	Value range of the source object
FUN	Default function type definition for the object. Editable.
INF	Default information number definition for the object. Editable.
U	Object in use or not. As default, ASDU 4 objects are not in use. Editable.
ASDU	ASDU number of the message. In this case 4.
I	General interrogation default setting. Editable.

5.12.1 LD0.CMMXU1 Three-phase current measurement (1)

Table 477: LD0.CMMXU1 Three-phase current measurement (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU1							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	66	181	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	66	182	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	66	183	0	4	0
LD0.CMAMMXU1							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	66	150	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	66	151	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	66	152	0	4	0
LD0.CMIMMXU1							
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	66	153	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	66	154	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	66	155	0	4	0

5.12.2 LD0.CMMXU2 Three-phase current measurement (2)

Table 478: LD0.CMMXU2 Three-phase current measurement (2)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU2							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	66	184	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	66	185	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	66	186	0	4	0
LD0.CMAMMXU2							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	66	156	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	66	157	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	66	158	0	4	0
LD0.CMIMMXU2							
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	66	159	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	66	160	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	66	161	0	4	0

5.12.3 LD0.CMMXU3 Three-phase current measurement (3)

Table 479: LD0.CMMXU3 Three-phase current measurement (3)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU3							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	68	1	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	68	2	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	68	3	0	4	0
LD0.CMAMMXU3							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	68	4	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	68	5	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	68	6	0	4	0
LD0.CMIMMXU3							
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	68	7	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	68	8	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	68	9	0	4	0

5.12.4 LD0.CMMXU4 Three-phase current measurement (4)

Table 480: LD0.CMMXU4 Three-phase current measurement (4)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU4							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	68	11	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	68	12	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	68	13	0	4	0
LD0.CMAMMXU4							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	68	14	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	68	15	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	68	16	0	4	0
LD0.CMIMMXU4							
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	68	17	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	68	18	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	68	19	0	4	0

5.12.5 LD0.CMMXU5 Three-phase current measurement (5)

Table 481: LD0.CMMXU5 Three-phase current measurement (5)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU5							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	68	21	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	68	22	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	68	23	0	4	0
LD0.CMAMMXU5							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	68	24	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	68	25	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	68	26	0	4	0
LD0.CMIMMXU5							

Table continues on the next page

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	68	27	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	68	28	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	68	29	0	4	0

5.12.6 LD0.CMMXU6 Three-phase current measurement (6)

Table 482: LD0.CMMXU6 Three-phase current measurement (6)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU6							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	68	31	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	68	32	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	68	33	0	4	0
LD0.CMAMMXU6							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	68	34	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	68	35	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	68	36	0	4	0
LD0.CMIMMXU6							
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	68	37	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	68	38	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	68	39	0	4	0

5.12.7 LD0.CMMXU7 Three-phase current measurement (7)

Table 483: LD0.CMMXU7 Three-phase current measurement (7)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU7							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	68	41	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	68	42	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	68	43	0	4	0
LD0.CMAMMXU7							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	68	44	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	68	45	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	68	46	0	4	0
LD0.CMIMMXU7							
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	68	47	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	68	48	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	68	49	0	4	0

5.12.8 LD0.CMMXU8 Three-phase current measurement (8)

Table 484: LD0.CMMXU8 Three-phase current measurement (8)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CAVMMXU8							
.A.phsA.cVal.mag	Phs A demand	0…50.00 [×In]	68	51	0	4	0
.A.phsB.cVal.mag	Phs B demand	0…50.00 [×In]	68	52	0	4	0
.A.phsC.cVal.mag	Phs C demand	0…50.00 [×In]	68	53	0	4	0

Table continues on the next page

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.CMAMMXU8							
.A.phsA.cVal.mag	Phs A max. demand	0…50.00 [×In]	68	54	0	4	0
.A.phsB.cVal.mag	Phs B max. demand	0…50.00 [×In]	68	55	0	4	0
.A.phsC.cVal.mag	Phs C max. demand	0…50.00 [×In]	68	56	0	4	0
LD0.CMIMMXU8							
.A.phsA.cVal.mag	Phs A min. demand	0…50.00 [×In]	68	57	0	4	0
.A.phsB.cVal.mag	Phs B min. demand	0…50.00 [×In]	68	58	0	4	0
.A.phsC.cVal.mag	Phs C min. demand	0…50.00 [×In]	68	59	0	4	0

5.12.9 LD0.FLTRFRC1 Fault record (1)

The fault recorder component contains a lot of potential registration data available for the device type in question. The registration data in turn depends on that the device application performs the needed measurement functions.

Table 485: LD0.FLTRFRC1 Fault record (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.FLTRFRC1							
.FltPtR.mag	Fault resistance	0...1000000 ohm	66	1	0	4	0
.FltDiskm.mag	Fault distance	0.00...3000.00 pu	66	2	0	4	0
.Max50DifAA.mag	Max. diff current IL1	0.000...80.000 pu	66	3	0	4	0
.Max50DifAB.mag	Max. diff current IL2	0.000...80.000 pu	66	4	0	4	0
.Max50DifAC.mag	Max. diff current IL3	0.000...80.000 pu	66	5	0	4	0
.Max50RstAA.mag	Max. bias current IL1	0.000...50.000 pu	66	6	0	4	0
.Max50RstAB.mag	Max. bias current IL2	0.000...50.000 pu	66	7	0	4	0
.Max50RstAC.mag	Max. bias current IL3	0.000...50.000 pu	66	8	0	4	0
.DifAPhsA.mag	Diff current IL1	0.000...80.000 pu	66	9	0	4	0
.DifAPhsB.mag	Diff current IL2	0.000...80.000 pu	66	10	0	4	0
.DifAPhsC.mag	Diff current IL3	0.000...80.000 pu	66	11	0	4	0
.RstAPhsA.mag	Bias current IL1	0.000...50.000 pu	66	12	0	4	0
.RstAPhsB.mag	Bias current IL2	0.000...50.000 pu	66	13	0	4	0
.RstAPhsC.mag	Bias current IL3	0.000...50.000 pu	66	14	0	4	0
.DifARes.mag	Diff current Io	0.000...80.000 pu	66	15	0	4	0
.RstARes.mag	Bias current Io	0.000...50.000 pu	66	16	0	4	0
.Max50APhsA.mag	Max. current IL1	0.000...50.000 ×In	66	17	0	4	0
.Max50APhsB.mag	Max. current IL2	0.000...50.000 xIn	66	18	0	4	0
.Max50APhsC.mag	Max. current IL3	0.000...50.000 ×In	66	19	0	4	0
.Max50ARes.mag	Max. current Io	0.000...50.000 ×In	66	20	0	4	0
.APhsA.mag	Current IL1	0.000...50.000 ×In	66	21	0	4	0
.APhsB.mag	Current IL2	0.000...50.000 ×In	66	22	0	4	0
.APhsC.mag	Current IL3	0.000...50.000 ×In	66	23	0	4	0
.ARes.mag	Current Io	0.000...50.000 ×In	66	24	0	4	0
.AResClc.mag	Current Io-calculated	0.000...50.000 ×In	66	25	0	4	0
.APsSeq.mag	Current Pos-Seq	0.000...50.000 ×In	66	26	0	4	0
.ANgSeq.mag	Current Neg-Seq	0.000...50.000 ×In	66	27	0	4	0
.PhVPhsA.mag	Voltage UL1	0.000...4.000 ×Un	66	50	0	4	0
.PhVPhsB.mag	Voltage UL2	0.000...4.000 ×Un	66	51	0	4	0
.PhVPhsC.mag	Voltage UL3	0.000...4.000 ×Un	66	52	0	4	0
.PPVPhsAB.mag	Voltage U12	0.000...4.000 ×Un	66	53	0	4	0
.PPVPhsBC.mag	Voltage U23	0.000...4.000 ×Un	66	54	0	4	0

Table continues on the next page

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
.PPVPhsCA.mag	Voltage U31	0.000...4.000 ×Un	66	55	0	4	0
.VRes.mag	Voltage Uo	0.000...4.000 ×Un	66	56	0	4	0
.VZro.mag	Voltage Zero-Seq	0.000...4.000 ×Un	66	57	0	4	0
.VPsSeq.mag	Voltage Pos-Seq	0.000...4.000 ×Un	66	58	0	4	0
.VNgSeq.mag	Voltage Neg-Seq	0.000...4.000 ×Un	66	59	0	4	0
.MaxTmpRl.mag	PTTR thermal level	0.00...99.99	66	70	0	4	0
.AMaxNgPs.mag	PDNSPTOC1 ratio I2/I1	0.00...999.99 %	66	71	0	4	0
.DifANAngVN.mag	Angle Uo - Io	–180.00...180.00 deg	66	72	0	4	0
.DifAAAngVBC.mag	Angle U23 - IL1	–180.00...180.00 deg	66	73	0	4	0
.DifABAngVCA.mag	Angle U31 - IL2	–180.00...180.00 deg	66	74	0	4	0
.DifACAngVAB.mag	Angle U12 - IL3	–180.00...180.00 deg	66	75	0	4	0
.HzRteChg.mag	Frequency gradient	–10.00...10.00 Hz/s	66	80	0	4	0
.CondNeut.mag	Conductance Yo	–1000.00...1000.00 mS	66	81	0	4	0
.SusNeut.mag	Susceptance Yo	–1000.00...1000.00 mS	66	82	0	4	0
.PPLoopRis.mag	Fault loop Resistance	–1000.00...1000.00 ohm	66	83	0	4	0
.PPLoopReact.mag	Fault loop Reactance	–1000.00...1000.00 ohm	66	84	0	4	0
.CBClrTm.mag	Breaker clear time	0.000...3.000 s	66	85	0	4	0
.Hz.mag	Frequency	30.00...80.00 Hz	66	86	0	4	0
LD0.FLTRFRC2							
.Max50APhsA.mag	Max. current IL1(b)	0.000...50.000 ×In	66	28	0	4	0
.Max50APhsB.mag	Max. current IL2(b)	0.000...50.000 ×In	66	29	0	4	0
.Max50APhsC.mag	Max. current IL3(b)	0.000...50.000 ×In	66	30	0	4	0
.Max50ARes.mag	Max. current Io(b)	0.000...50.000 ×In	66	31	0	4	0
.APhsA.mag	Current IL1(b)	0.000...50.000 ×In	66	32	0	4	0
.APhsB.mag	Current IL2(b)	0.000...50.000 ×In	66	33	0	4	0
.APhsC.mag	Current IL3(b)	0.000...50.000 ×In	66	34	0	4	0
.ARes.mag	Current Io(b)	0.000...50.000 ×In	66	35	0	4	0
.AResClc.mag	Current Io-calculated(b)	0.000...50.000 ×In	66	36	0	4	0
.APsSeq.mag	Current Pos-Seq(b)	0.000...50.000 ×In	66	37	0	4	0
.ANgSeq.mag	Current Neg-Seq(b)	0.000...50.000 ×In	66	38	0	4	0
.PhVPhsA.mag	Voltage UL1(b)	0.000...4.000 ×Un	66	60	0	4	0
.PhVPhsB.mag	Voltage UL2(b)	0.000...4.000 ×Un	66	61	0	4	0
.PhVPhsC.mag	Voltage UL3(b)	0.000...4.000 ×Un	66	62	0	4	0
.PPVPhsAB.mag	Voltage U12(b)	0.000...4.000 ×Un	66	63	0	4	0
.PPVPhsBC.mag	Voltage U23(b)	0.000...4.000 ×Un	66	64	0	4	0
.PPVPhsCA.mag	Voltage U31(b)	0.000...4.000 ×Un	66	65	0	4	0
.VRes.mag	Voltage Uo(b)	0.000...4.000 ×Un	66	66	0	4	0
.VZro.mag	Voltage Zero-Seq(b)	0.000...4.000 ×Un	66	67	0	4	0
.VPsSeq.mag	Voltage Pos-Seq(b)	0.000...4.000 ×Un	66	68	0	4	0
.VNgSeq.mag	Voltage Neg-Seq(b)	0.000...4.000 ×Un	66	69	0	4	0
.DifANAngVN.mag	Angle Uo - Io(b)	–180.00...180.00 deg	66	76	0	4	0
.DifAAAngVBC.mag	Angle U23 - IL1(b)	–180.00...180.00 deg	66	77	0	4	0
.DifABAngVCA.mag	Angle U31 - IL2(b)	–180.00...180.00 deg	66	78	0	4	0
.DifACAngVAB.mag	Angle U12 - IL3(b)	–180.00...180.00 deg	66	79	0	4	0
LD0.FLTRFRC3							
.Max50APhsA.mag	Max. current IL1(c)	0.000...50.000 ×In	66	39	0	4	0
.Max50APhsB.mag	Max. current IL2(c)	0.000...50.000 ×In	66	40	0	4	0
.Max50APhsC.mag	Max. current IL3(c)	0.000...50.000 ×In	66	41	0	4	0
.Max50ARes.mag	Max. current Io(c)	0.000...50.000 ×In	66	42	0	4	0
.APhsA.mag	Current IL1(c)	0.000...50.000 ×In	66	43	0	4	0
.APhsB.mag	Current IL2(c)	0.000...50.000 ×In	66	44	0	4	0

Table continues on the next page

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
.APhsC.mag	Current IL3(c)	0.000...50.000 ×In	66	45	0	4	0
.ARes.mag	Current Io(c)	0.000...50.000 ×In	66	46	0	4	0
.AResClc.mag	Current Io-calculated(c)	0.000...50.000 ×In	66	47	0	4	0
.APsSeq.mag	Current Pos-Seq(c)	0.000...50.000 ×In	66	48	0	4	0
.ANgSeq.mag	Current Neg-Seq(c)	0.000...50.000 ×In	66	49	0	4	0

5.12.10 LD0.PEMMXU1 Three-phase power and energy measurement (1)

Table 486: LD0.PEMMXU1 Three-phase power and energy measurement (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.PEAVMMXU1							
.TotVA.mag	S demand	–999999.9...999999.9 kVA	66	205	0	4	0
.TotW.mag	P demand	–999999.9...999999.9 kW	66	208	0	4	0
.TotVAr.mag	Q demand	–999999.9...999999.9 kVAr	66	211	0	4	0
.TotPF.mag	PF demand	–1.00…1.00	66	214	0	4	0
LD0.PEMAMMXU1							
.TotVA.mag	S max. demand	–999999.9...999999.9 kVA	66	206	0	4	0
.TotW.mag	P max. demand	–999999.9...999999.9 kW	66	209	0	4	0
.TotVAr.mag	Q max. demand	–999999.9...999999.9 kVAr	66	212	0	4	0
LD0.PEMIMMXU1							
.TotVA.mag	S min. demand	–999999.9...999999.9 kVA	66	207	0	4	0
.TotW.mag	P min. demand	–999999.9...999999.9 kW	66	210	0	4	0
.TotVAr.mag	Q min. demand	–999999.9...999999.9 kVAr	66	213	0	4	0

5.12.11 LD0.PEMMXU2 Three-phase power and energy measurement (2)

Table 487: LD0.PEMMXU2 Three-phase power and energy measurement (2)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.PEAVMMXU2							
.TotVA.mag	S demand	–999999.9...999999.9 kVA	68	215	0	4	0
.TotW.mag	P demand	–999999.9...999999.9 kW	68	216	0	4	0
.TotVAr.mag	Q demand	–999999.9...999999.9 kVAr	68	217	0	4	0
.TotPF.mag	PF demand	–1.00…1.00	68	224	0	4	0
LD0.PEMAMMXU2							
.TotVA.mag	S max. demand	–999999.9...999999.9 kVA	68	218	0	4	0
.TotW.mag	P max. demand	–999999.9...999999.9 kW	68	219	0	4	0

Table continues on the next page

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
.TotVAr.mag	Q max. demand	–999999.9...999999.9 kVAr	68	220	0	4	0
LD0.PEMIMMXU2							
.TotVA.mag	S min. demand	–999999.9...999999.9 kVA	68	221	0	4	0
.TotW.mag	P min. demand	–999999.9...999999.9 kW	68	222	0	4	0
.TotVAr.mag	Q min. demand	–999999.9...999999.9 kVAr	68	223	0	4	0

5.12.12 LD0.PEMMXU3 Three-phase power and energy measurement (3)

Table 488: LD0.PEMMXU3 Three-phase power and energy measurement (3)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.PEAVMMXU3							
.TotVA.mag	S demand	–999999.9...999999.9 kVA	68	225	0	4	0
.TotW.mag	P demand	–999999.9...999999.9 kW	68	226	0	4	0
.TotVAr.mag	Q demand	–999999.9...999999.9 kVAr	68	227	0	4	0
.TotPF.mag	PF demand	–1.00…1.00	68	234	0	4	0
LD0.PEMAMMXU3							
.TotVA.mag	S max. demand	–999999.9...999999.9 kVA	68	228	0	4	0
.TotW.mag	P max. demand	–999999.9...999999.9 kW	68	229	0	4	0
.TotVAr.mag	Q max. demand	–999999.9...999999.9 kVAr	68	230	0	4	0
LD0.PEMIMMXU3							
.TotVA.mag	S min. demand	–999999.9...999999.9 kVA	68	231	0	4	0
.TotW.mag	P min. demand	–999999.9...999999.9 kW	68	232	0	4	0
.TotVAr.mag	Q min. demand	–999999.9...999999.9 kVAr	68	233	0	4	0

5.12.13 LD0.RESCMMXU1 Residual current measurement (1)

Table 489: LD0.RESCMMXU1 Residual current measurement (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU1							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	66	187	0	4	0
LD0.RCMAMMXU1							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	66	162	0	4	0
LD0.RCMIMMXU1							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	66	163	0	4	0

5.12.14 LD0.RESCMMXU2 Residual current measurement (2)

Table 490: LD0.RESCMMXU2 Residual current measurement (2)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU2							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	66	188	0	4	0
LD0.RCMAMMXU2							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	66	164	0	4	0
LD0.RCMIMMXU2							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	66	165	0	4	0

5.12.15 LD0.RESCMMXU3 Residual current measurement (3)

Table 491: LD0.RESCMMXU3 Residual current measurement (3)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU3							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	68	90	0	4	0
LD0.RCMAMMXU3							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	68	91	0	4	0
LD0.RCMIMMXU3							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	68	92	0	4	0

5.12.16 LD0.RESCMMXU4 Residual current measurement (4)

Table 492: LD0.RESCMMXU4 Residual current measurement (4)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU4							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	68	93	0	4	0
LD0.RCMAMMXU4							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	68	94	0	4	0
LD0.RCMIMMXU4							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	68	95	0	4	0

5.12.17 LD0.RESCMMXU5 Residual current measurement (5)

Table 493: LD0.RESCMMXU5 Residual current measurement (5)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU5							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	68	96	0	4	0
LD0.RCMAMMXU5							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	68	97	0	4	0
LD0.RCMIMMXU5							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	68	98	0	4	0

5.12.18 LD0.RESCMMXU6 Residual current measurement (6)

Table 494: LD0.RESCMMXU6 Residual current measurement (6)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU6							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	68	99	0	4	0
LD0.RCMAMMXU6							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	68	100	0	4	0
LD0.RCMIMMXU6							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	68	101	0	4	0

5.12.19 LD0.RESCMMXU7 Residual current measurement (7)

Table 495: LD0.RESCMMXU7 Residual current measurement (7)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU7							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	68	102	0	4	0
LD0.RCMAMMXU7							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	68	103	0	4	0
LD0.RCMIMMXU7							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	68	104	0	4	0

5.12.20 LD0.RESCMMXU8 Residual current measurement (8)

Table 496: LD0.RESCMMXU8 Residual current measurement (8)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RCAVMMXU8							
.A.res.cVal.mag	Residual demand	0…50.00 [×In]	68	105	0	4	0
LD0.RCMAMMXU8							
.A.res.cVal.mag	Residual max. demand	0…50.00 [×In]	68	106	0	4	0
LD0.RCMIMMXU8							
.A.res.cVal.mag	Residual min. demand	0…50.00 [×In]	68	107	0	4	0

5.12.21 LD0.RESVMMXU1 Residual voltage measurement (1)

Table 497: LD0.RESVMMXU1 Residual voltage measurement (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU1							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	66	203	0	4	0

5.12.22 LD0.RESVMMXU2 Residual voltage measurement (2)

Table 498: LD0.RESVMMXU2 Residual voltage measurement (2)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU2							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	66	204	0	4	0

5.12.23 LD0.RESVMMXU3 Residual voltage measurement (3)

Table 499: LD0.RESVMMXU3 Residual voltage measurement (3)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU3							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	68	205	0	4	0

5.12.24 LD0.RESVMMXU4 Residual voltage measurement (4)

Table 500: LD0.RESVMMXU4 Residual voltage measurement (4)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU4							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	68	206	0	4	0

5.12.25 LD0.RESVMMXU5 Residual voltage measurement (5)

Table 501: LD0.RESVMMXU5 Residual voltage measurement (5)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU5							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	68	207	0	4	0

5.12.26 LD0.RESVMMXU6 Residual voltage measurement (6)

Table 502: LD0.RESVMMXU6 Residual voltage measurement (6)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU6							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	68	208	0	4	0

5.12.27 LD0.RESVMMXU7 Residual voltage measurement (7)

Table 503: LD0.RESVMMXU7 Residual voltage measurement (7)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU7							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	68	209	0	4	0

5.12.28 LD0.RESVMMXU8 Residual voltage measurement (8)

Table 504: LD0.RESVMMXU8 Residual voltage measurement (8)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.RVAVMMXU8							
.PhV.res.cVal.mag	Residual demand	0…4.00 [×Un]	68	210	0	4	0

5.12.29 LD0.SCEFRFLO1 Fault locator

Table 505: LD0.SCEFRFLO1 Fault locator

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.FLO1RFRC1							
.PhReact.mag	Fault reactance	0...1000000 ohm	65	10	0	4	0
.FltDiskm.mag	Fault distance	0…3000.000 km	65	21	0	4	0
.FltLoop.stVal	Fault loop	0...1000000 ohm	65	22	0	4	0
.FltPtR.mag	Fault point resistance	0...1000000 ohm	65	23	0	4	0
.FltR.mag	Fault loop resistance	0...1000000 ohm	65	24	0	4	0
.FltX.mag	Fault loop reactance	0...1000000 ohm	65	25	0	4	0
.RatFltALod.mag	Fault to load current ratio	0...60000.00	65	26	0	4	0
.EqDisLod.mag	Estim. equivalent load distance	0.00...1.00	65	27	0	4	0
.PhGndCapac.mag	Estim. PE line capacitive reactance	0...1000000 ohm	65	28	0	4	0
.FltDisQ.stVal	Fault distance quality	0…511	65	29	0	4	0

5.12.30 LD0.SECRSYN1 Synchronism and energizing check (1)

Table 506: LD0.SECRSYN1 Synchronism and energizing check (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.SECRSYN1							
.EnSt.stVal	Line/Bus energy state	0…4	80	60	0	4	0

5.12.31 LD0.SECRSYN2 Synchronism and energizing check (2)

Table 507: LD0.SECRSYN2 Synchronism and energizing check (2)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.SECRSYN2							
.EnSt.stVal	Line/Bus energy state	0…4	80	160	0	4	0

5.12.32 LD0.SECRSYN3 Synchronism and energizing check (3)

Table 508: LD0.SECRSYN3 Synchronism and energizing check (3)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.SECRSYN3							
.EnSt.stVal	Line/Bus energy state	0…4	80	161	0	4	0

5.12.33 LD0.SPEMMXU1 Single-phase power and energy measurement (1)

Table 509: LD0.SPEMMXU1 Single-phase power and energy measurement (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.SPEAVMMXU1							
.W.phsA.cVal.mag.f	P demand, Phase A	–999999.9...999999.9 kW	69	100	0	4	0
.W.phsB.cVal.mag.f	P demand, Phase B	–999999.9...999999.9 kW	69	101	0	4	0
.W.phsC.cVal.mag.f	P demand, Phase C	–999999.9...999999.9 kW	69	102	0	4	0
.VAr.phsA.cVal.mag.f	Q demand, Phase A	–999999.9...999999.9 kVAr	69	103	0	4	0
.VAr.phsB.cVal.mag.f	Q demand, Phase B	–999999.9...999999.9 kVAr	69	104	0	4	0
.VAr.phsC.cVal.mag.f	Q demand, Phase C	–999999.9...999999.9 kVAr	69	105	0	4	0
.VA.phsA.cVal.mag.f	S demand, Phase A	–999999.9...999999.9 kVA	69	106	0	4	0
.VA.phsB.cVal.mag.f	S demand, Phase B	–999999.9...999999.9 kVA	69	107	0	4	0
.VA.phsC.cVal.mag.f	S demand, Phase C	–999999.9...999999.9 kVA	69	108	0	4	0
.PF.phsA.cVal.mag.f	PF demand, Phase A	–1.00…1.00	69	109	0	4	0
.PF.phsB.cVal.mag.f	PF demand, Phase B	–1.00…1.01	69	110	0	4	0
.PF.phsC.cVal.mag.f	PF demand, Phase C	–1.00…1.02	69	111	0	4	0
.SPEMAMMXU1							
.W.phsA.cVal.mag.f	P max demand, Phase A	–999999.9...999999.9 kW	69	112	0	4	0
.W.phsB.cVal.mag.f	P max demand, Phase B	–999999.9...999999.9 kW	69	113	0	4	0
.W.phsC.cVal.mag.f	P max demand, Phase C	–999999.9...999999.9 kW	69	114	0	4	0
.VAr.phsA.cVal.mag.f	Q max demand, Phase A	–999999.9...999999.9 kVAr	69	115	0	4	0
.VAr.phsB.cVal.mag.f	Q max demand, Phase B	–999999.9...999999.9 kVAr	69	116	0	4	0
.VAr.phsC.cVal.mag.f	Q max demand, Phase C	–999999.9...999999.9 kVAr	69	117	0	4	0
.VA.phsA.cVal.mag.f	S max demand, Phase A	–999999.9...999999.9 kVA	69	118	0	4	0
.VA.phsB.cVal.mag.f	S max demand, Phase B	–999999.9...999999.9 kVA	69	119	0	4	0
.VA.phsC.cVal.mag.f	S max demand, Phase C	–999999.9...999999.9 kVA	69	120	0	4	0
.SPEMIMMXU1							
.W.phsA.cVal.mag.f	P min demand, Phase A	–999999.9...999999.9 kW	69	121	0	4	0
.W.phsB.cVal.mag.f	P min demand, Phase B	–999999.9...999999.9 kW	69	122	0	4	0
.W.phsC.cVal.mag.f	P min demand, Phase C	–999999.9...999999.9 kW	69	123	0	4	0
.VAr.phsA.cVal.mag.f	Q min demand, Phase A	–999999.9...999999.9 kVAr	69	124	0	4	0
.VAr.phsB.cVal.mag.f	Q min demand, Phase B	–999999.9...999999.9 kVAr	69	125	0	4	0
.VAr.phsC.cVal.mag.f	Q min demand, Phase C	–999999.9...999999.9 kVAr	69	126	0	4	0
.VA.phsA.cVal.mag.f	S min demand, Phase A	–999999.9...999999.9 kVA	69	127	0	4	0

Table continues on the next page

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
.VA.phsB.cVal.mag.f	S min demand, Phase B	–999999.9...999999.9 kVA	69	128	0	4	0
.VA.phsC.cVal.mag.f	S min demand, Phase C	–999999.9...999999.9 kVA	69	129	0	4	0

5.12.34 LD0.SPEMMXU2 Single-phase power and energy measurement (2)

Table 510: LD0.SPEMMXU2 Single-phase power and energy measurement (2)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.SPEAVMMXU2							
.W.phsA.cVal.mag.f	P demand, Phase A	–999999.9...999999.9 kW	69	140	0	4	0
.W.phsB.cVal.mag.f	P demand, Phase B	–999999.9...999999.9 kW	69	141	0	4	0
.W.phsC.cVal.mag.f	P demand, Phase C	–999999.9...999999.9 kW	69	142	0	4	0
.VAr.phsA.cVal.mag.f	Q demand, Phase A	–999999.9...999999.9 kVAr	69	143	0	4	0
.VAr.phsB.cVal.mag.f	Q demand, Phase B	–999999.9...999999.9 kVAr	69	144	0	4	0
.VAr.phsC.cVal.mag.f	Q demand, Phase C	–999999.9...999999.9 kVAr	69	145	0	4	0
.VA.phsA.cVal.mag.f	S demand, Phase A	–999999.9...999999.9 kVA	69	146	0	4	0
.VA.phsB.cVal.mag.f	S demand, Phase B	–999999.9...999999.9 kVA	69	147	0	4	0
.VA.phsC.cVal.mag.f	S demand, Phase C	–999999.9...999999.9 kVA	69	148	0	4	0
.PF.phsA.cVal.mag.f	PF demand, Phase A	–1.00…1.00	69	149	0	4	0
.PF.phsB.cVal.mag.f	PF demand, Phase B	–1.00…1.01	69	150	0	4	0
.PF.phsC.cVal.mag.f	PF demand, Phase C	–1.00…1.02	69	151	0	4	0
.SPEMAMMXU2							
.W.phsA.cVal.mag.f	P max demand, Phase A	–999999.9...999999.9 kW	69	152	0	4	0
.W.phsB.cVal.mag.f	P max demand, Phase B	–999999.9...999999.9 kW	69	153	0	4	0
.W.phsC.cVal.mag.f	P max demand, Phase C	–999999.9...999999.9 kW	69	154	0	4	0
.VAr.phsA.cVal.mag.f	Q max demand, Phase A	–999999.9...999999.9 kVAr	69	155	0	4	0
.VAr.phsB.cVal.mag.f	Q max demand, Phase B	–999999.9...999999.9 kVAr	69	156	0	4	0
.VAr.phsC.cVal.mag.f	Q max demand, Phase C	–999999.9...999999.9 kVAr	69	157	0	4	0
.VA.phsA.cVal.mag.f	S max demand, Phase A	–999999.9...999999.9 kVA	69	158	0	4	0
.VA.phsB.cVal.mag.f	S max demand, Phase B	–999999.9...999999.9 kVA	69	159	0	4	0
.VA.phsC.cVal.mag.f	S max demand, Phase C	–999999.9...999999.9 kVA	69	160	0	4	0
.SPEMIMMXU2							
.W.phsA.cVal.mag.f	P min demand, Phase A	–999999.9...999999.9 kW	69	161	0	4	0
.W.phsB.cVal.mag.f	P min demand, Phase B	–999999.9...999999.9 kW	69	162	0	4	0

Table continues on the next page

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
.W.phsC.cVal.mag.f	P min demand, Phase C	–999999.9...999999.9 kW	69	163	0	4	0
.VAr.phsA.cVal.mag.f	Q min demand, Phase A	–999999.9...999999.9 kVAr	69	164	0	4	0
.VAr.phsB.cVal.mag.f	Q min demand, Phase B	–999999.9...999999.9 kVAr	69	165	0	4	0
.VAr.phsC.cVal.mag.f	Q min demand, Phase C	–999999.9...999999.9 kVAr	69	166	0	4	0
.VA.phsA.cVal.mag.f	S min demand, Phase A	–999999.9...999999.9 kVA	69	167	0	4	0
.VA.phsB.cVal.mag.f	S min demand, Phase B	–999999.9...999999.9 kVA	69	168	0	4	0
.VA.phsC.cVal.mag.f	S min demand, Phase C	–999999.9...999999.9 kVA	69	169	0	4	0

5.12.35 LD0.TPOSYLTC1 Tap changer position indication (1)

Table 511: LD0.TPOSYLTC1 Tap changer position indication (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.TPOSYLTC1							
.ValWTr.posVal	Tap position	–64...63	25	20	1	4	1

5.12.36 LD0.VAMMXU1 Single-phase voltage measurement (1)

Table 512: LD0.VAMMXU1 Single-phase voltage measurement (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAAVMMXU1							
.PhV.phsA.cVal.mag	Demand value phsA	0.00…4.00 [xUn]	66	215	0	4	0
.PPV.phsAB.cVal.mag	Demand value phsAB	0.00…4.00 [xUn]	66	216	0	4	0

5.12.37 LD0.VAMMXU2 Single-phase voltage measurement (2)

Table 513: LD0.VAMMXU2 Single-phase voltage measurement (2)

IEC 61850 name	Description	DPI value	FUN	INF	U	ASDU	I
LD0.VAAVMMXU2							
.PhV.phsA.cVal.mag	Demand value phsA	0.00…4.00 [xUn]	66	217	0	4	0
.PPV.phsAB.cVal.mag	Demand value phsAB	0.00…4.00 [xUn]	66	218	0	4	0

5.12.38 LD0.VAMMXU3 Single-phase voltage measurement (3)

Table 514: LD0.VAMMXU3 Single-phase voltage measurement (3)

IEC 61850 name	Description	DPI value	FUN	INF	U	ASDU	I
LD0.VAAVMMXU3							
.PhV.phsA.cVal.mag	Demand value phsA	0.00…4.00 [xUn]	66	219	0	4	0
.PPV.phsAB.cVal.mag	Demand value phsAB	0.00…4.00 [xUn]	66	220	0	4	0

5.12.39 LD0.VAMMXU4 Single-phase voltage measurement (4)

Table 515: LD0.VAMMXU4 Single-phase voltage measurement (4)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAAVMMXU4							
.PhV.phsA.cVal.mag	Demand value phsA	0.00…4.00 [xUn]	66	221	0	4	0
.PPV.phsAB.cVal.mag	Demand value phsAB	0.00…4.00 [xUn]	66	222	0	4	0

5.12.40 LD0.VMMXU1 Three-phase voltage measurement (1)

Table 516: LD0.VMMXU1 Three-phase voltage measurement (1)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU1							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	66	191	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	66	192	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	66	193	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	66	194	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	66	195	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	66	196	0	4	0

5.12.41 LD0.VMMXU2 Three-phase voltage measurement (2)

Table 517: LD0.VMMXU2 Three-phase voltage measurement (2)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU2							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	66	197	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	66	198	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	66	199	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	66	200	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	66	201	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	66	202	0	4	0

5.12.42 LD0.VMMXU3 Three-phase voltage measurement (3)

Table 518: LD0.VMMXU3 Three-phase voltage measurement (3)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU3							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	68	130	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	68	131	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	68	132	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	68	133	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	68	134	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	68	135	0	4	0

5.12.43 LD0.VMMXU4 Three-phase voltage measurement (4)

Table 519: LD0.VMMXU4 Three-phase voltage measurement (4)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU4							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	68	136	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	68	137	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	68	138	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	68	139	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	68	140	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	68	141	0	4	0

5.12.44 LD0.VMMXU5 Three-phase voltage measurement (5)

Table 520: LD0.VMMXU5 Three-phase voltage measurement (5)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU5							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	68	142	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	68	143	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	68	144	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	68	145	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	68	146	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	68	147	0	4	0

5.12.45 LD0.VMMXU6 Three-phase voltage measurement (6)

Table 521: LD0.VMMXU6 Three-phase voltage measurement (6)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU6							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	68	148	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	68	149	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	68	150	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	68	151	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	68	152	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	68	153	0	4	0

5.12.46 LD0.VMMXU7 Three-phase voltage measurement (7)

Table 522: LD0.VMMXU7 Three-phase voltage measurement (7)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU7							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	68	154	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	68	155	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	68	156	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	68	157	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	68	158	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	68	159	0	4	0

5.12.47 LD0.VMMXU8 Three-phase voltage measurement (8)

Table 523: LD0.VMMXU8 Three-phase voltage measurement (8)

IEC 61850 name	Description	Values	FUN	INF	U	ASDU	I
LD0.VAVMMXU7							
.PhV.phsA.cVal.mag	Phs A demand	0…4.00 [×Un]	68	160	0	4	0
.PhV.phsB.cVal.mag	Phs B demand	0…4.00 [×Un]	68	161	0	4	0
.PhV.phsC.cVal.mag	Phs C demand	0…4.00 [×Un]	68	162	0	4	0
.PPV.phsAB.cVal.mag	Phs AB demand	0…4.00 [×Un]	68	163	0	4	0
.PPV.phsBC.cVal.mag	Phs BC demand	0…4.00 [×Un]	68	164	0	4	0
.PPV.phsCA.cVal.mag	Phs CA demand	0…4.00 [×Un]	68	165	0	4	0

5.13 Energy counters

Energy counters are coded as private ASDU 205 data objects. Energy values are taken directly from the corresponding source IEC 61850 objects, and are therefore dependent on how the source objects are coded.

ASDU 205 objects are intended to be binary counters, which make their value roll over at the maximum binary value (all bits 1). Source value roll-over is usually defined as 999999999 decimal from where the value rolls over to 0. This is a directly user-readable energy value. Therefore, the source roll-over value needs to be known to synchronize it with the ASDU 205 value.

The source roll-over values are fixed in the protection relay and cannot be changed using PCM600.

Table 524: Explanations of the energy counter value table columns

Column name	Description
IEC 61850 name	Source object name
Description	Short description of the signal. See the technical manual for more information.
FUN	Default function type definition for the object, editable.
INF	Default information number definition for the object, editable.
Source roll-over	Needed for synchronizing the ASDU 205 counter value roll-over, editable.

5.13.1 LD0.PCGAPC1…4 Generic energy pulse counters (1…4)

Table 525: LD0.PCGAPC1…4 Generic energy pulse counters (1…4)

IEC 61850 name	Description	FUN	INF	Source roll-over
LD0.PCGAPC1				
.CntVal1.actVal	Generic counter 1	133	201	LSB from source counter copied 1:1
LD0.PCGAPC2				
.CntVal1.actVal	Generic counter 2	133	202	LSB from source counter copied 1:1
LD0.PCGAPC3				
.CntVal1.actVal	Generic counter 3	133	203	LSB from source counter copied 1:1
LD0.PCGAPC4				
.CntVal1.actVal	Generic counter 4	133	204	LSB from source counter copied 1:1

5.13.2 LD0.PEMMXU1 Three-phase power and energy measurement (1)

Table 526: LD0.PEMMXU1 Three-phase power and energy measurement (1)

IEC 61850 name	Description	FUN	INF	Source roll-over
LD0.PEMMTR1				
.SupWh.actVal	Reverse active energy	133	51	1000000000
.SupVArh.actVal	Reverse reactive energy	133	52	1000000000
.DmdWh.actVal	Forward active energy	133	53	1000000000
.DmdVArh.actVal	Forward reactive energy	133	54	1000000000

5.13.3 LD0.PEMMXU2 Three-phase power and energy measurement (2)

Table 527: LD0.PEMMXU2 Three-phase power and energy measurement (2)

IEC 61850 name	Description	FUN	INF	Source roll-over
LD0.PEMMTR2				
.SupWh.actVal	Reverse active energy	133	55	1000000000
.SupVArh.actVal	Reverse reactive energy	133	56	1000000000
.DmdWh.actVal	Forward active energy	133	57	1000000000
.DmdVArh.actVal	Forward reactive energy	133	58	1000000000

5.13.4 LD0.PEMMXU3 Three-phase power and energy measurement (3)

Table 528: LD0.PEMMXU3 Three-phase power and energy measurement (3)

IEC 61850 name	Description	FUN	INF	Source roll-over
LD0.PEMMTR3				
.SupWh.actVal	Reverse active energy	133	59	1000000000
.SupVArh.actVal	Reverse reactive energy	133	60	1000000000
.DmdWh.actVal	Forward active energy	133	61	1000000000
.DmdVArh.actVal	Forward reactive energy	133	62	1000000000

5.13.5 LD0.SPEMMXU1 Single-phase energy measurement (1)

Table 529: LD0.SPEMMXU1 Single-phase energy measurement (1)

IEC 61850 name	Description	FUN	INF	Source roll-over
LD0.SPE1MMTR1	Energy values for phase A			
.SupWh.actVal	– Reverse active energy	133	80	1000000000
.SupVArh.actVal	– Reverse reactive energy	133	81	1000000000
.DmdWh.actVal	– Forward active energy	133	82	1000000000
.DmdVArh.actVal	– Forward reactive energy	133	83	1000000000
LD0.SPE2MMTR1	Energy values for phase B			

Table continues on the next page

IEC 61850 name	Description	FUN	INF	Source roll-over
.SupWh.actVal	– Reverse active energy	133	84	1000000000
.SupVArh.actVal	– Reverse reactive energy	133	85	1000000000
.DmdWh.actVal	– Forward active energy	133	86	1000000000
.DmdVArh.actVal	– Forward reactive energy	133	87	1000000000
LD0.SPE3MMTR1	Energy values for phase C			
.SupWh.actVal	– Reverse active energy	133	88	1000000000
.SupVArh.actVal	– Reverse reactive energy	133	89	1000000000
.DmdWh.actVal	– Forward active energy	133	90	1000000000
.DmdVArh.actVal	– Forward reactive energy	133	91	1000000000

5.13.6 LD0.SPEMMXU2 Single-phase energy measurement (2)

Table 530: LD0.SPEMMXU2 Single-phase energy measurement (2)

IEC 61850 name	Description	FUN	INF	Source roll-over
LD0.SPE1MMTR2	Energy values for phase A			
.SupWh.actVal	– Reverse active energy	133	92	1000000000
.SupVArh.actVal	– Reverse reactive energy	133	93	1000000000
.DmdWh.actVal	– Forward active energy	133	94	1000000000
.DmdVArh.actVal	– Forward reactive energy	133	95	1000000000
LD0.SPE2MMTR2	Energy values for phase B			
.SupWh.actVal	– Reverse active energy	133	96	1000000000
.SupVArh.actVal	– Reverse reactive energy	133	97	1000000000
.DmdWh.actVal	– Forward active energy	133	98	1000000000
.DmdVArh.actVal	– Forward reactive energy	133	99	1000000000
LD0.SPE3MMTR2	Energy values for phase C			
.SupWh.actVal	– Reverse active energy	133	100	1000000000
.SupVArh.actVal	– Reverse reactive energy	133	101	1000000000
.DmdWh.actVal	– Forward active energy	133	102	1000000000
.DmdVArh.actVal	– Forward reactive energy	133	103	1000000000

5.14 Class 2 measurands

The information here relates to nonstandard Class 2 data frames. It is also possible to select any standard Meas I or Meas II Class 2 frame for the protocol. User-definable Class 2 data measurands use ASDU type 9. The function type and information number for the user frame can be freely configured. The default setting is FUN=10, INF=230.

Figure 4 shows how the values are located when adding measurands to the user frame with PCM600.

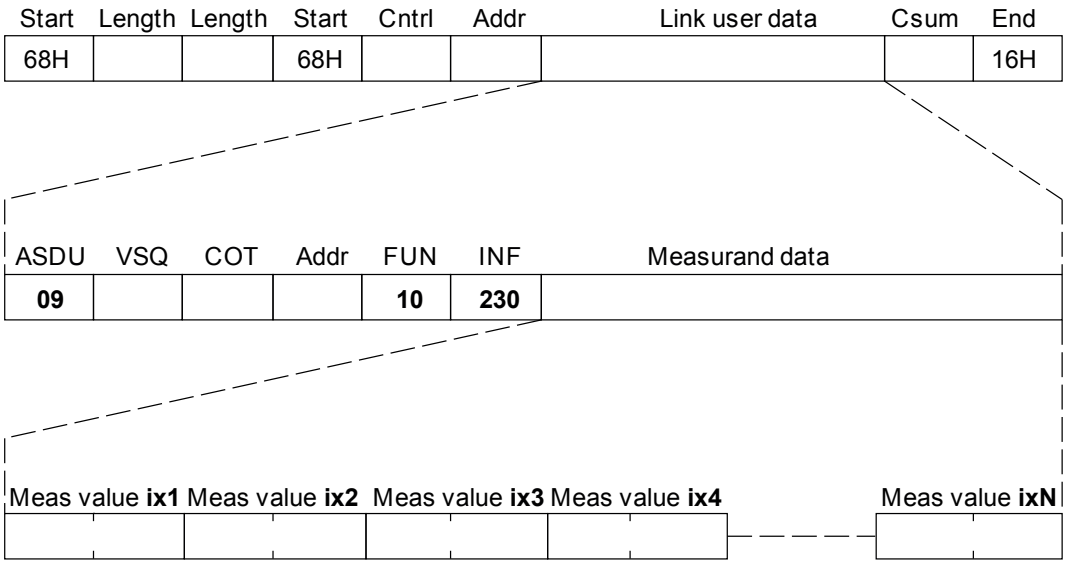


Figure 4: Class 2 frame response for the user-definable private Class 2 frame number 0

Table 531: Explanations of the Class 2 data measurands table columns

Column name	Description
IEC 61850 name	Source object name
Description	Short description of the signal. See the technical manual for more information.
Values	Source value range
Scaled max. value	Limit setting for the IEC 60870-5-103 value as default. Editable.

5.14.1 LD0.CMMXU1 Three-phase current measurement (1)

Table 532: LD0.CMMXU1 Three-phase current measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU1			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.2 LD0.CMMXU2 Three-phase current measurement (2)

Table 533: LD0.CMMXU2 Three-phase current measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU2			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.3 LD0.CMMXU3 Three-phase current measurement (3)

Table 534: LD0.CMMXU3 Three-phase current measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU3			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.4 LD0.CMMXU4 Three-phase current measurement (4)

Table 535: LD0.CMMXU4 Three-phase current measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU4			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.5 LD0.CMMXU5 Three-phase current measurement (5)

Table 536: LD0.CMMXU5 Three-phase current measurement (5)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU5			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.6 LD0.CMMXU6 Three-phase current measurement (6)

Table 537: LD0.CMMXU6 Three-phase current measurement (6)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU6			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.7 LD0.CMMXU7 Three-phase current measurement (7)

Table 538: LD0.CMMXU7 Three-phase current measurement (7)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU7			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.8 LD0.CMMXU8 Three-phase current measurement (8)

Table 539: LD0.CMMXU8 Three-phase current measurement (8)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CMMXU8			
.A.phsA.instCVal.mag	Phase IL1 magnitude	0.00…50.00 ×In	2.4
.A.phsB.instCVal.mag	Phase IL2 magnitude	0.00…50.00 ×In	2.4
.A.phsC.instCVal.mag	Phase IL3 magnitude	0.00…50.00 ×In	2.4

5.14.9 LD0.CSMSQI1 Sequence current measurement (1)

Table 540: LD0.CSMSQI1 Sequence current measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI1			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.10 LD0.CSMSQI2 Sequence current measurement (2)

Table 541: LD0.CSMSQI2 Sequence current measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI2			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.11 LD0.CSMSQI3 Sequence current measurement (3)

Table 542: LD0.CSMSQI3 Sequence current measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI3			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.12 LD0.CSMSQI4 Sequence current measurement (4)

Table 543: LD0.CSMSQI4 Sequence current measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI4			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.13 LD0.CSMSQI5 Sequence current measurement (5)

Table 544: LD0.CSMSQI5 Sequence current measurement (5)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI5			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.14 LD0.CSMSQI6 Sequence current measurement (6)

Table 545: LD0.CSMSQI6 Sequence current measurement (6)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI6			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.15 LD0.CSMSQI7 Sequence current measurement (7)

Table 546: LD0.CSMSQI7 Sequence current measurement (7)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI7			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.16 LD0.CSMSQI8 Sequence current measurement (8)

Table 547: LD0.CSMSQI8 Sequence current measurement (8)

IEC 61850 name	Description	Values	Scaled max. value
LD0.CSMSQI8			
.SeqA.c1.instCVal.mag	Pos. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c2.instCVal.mag	Neg. seq. magnitude	0.00…50.00 ×In	2.4
.SeqA.c3.instCVal.mag	Zero seq. magnitude	0.00…50.00 ×In	2.4

5.14.17 LD0.FMMXU1 Frequency measurement (1)

Table 548: LD0.FMMXU1 Frequency measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.FMMXU1			
.Hz.instMag	Frequency	35.00...75.00 Hz	100

5.14.18 LD0.FMMXU2 Frequency measurement (2)

Table 549: LD0.FMMXU2 Frequency measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.FMMXU2			
.Hz.instMag	Frequency	35.00...75.00 Hz	100

5.14.19 LD0.FMMXU3 Frequency measurement (3)

Table 550: LD0.FMMXU3 Frequency measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.FMMXU3			
.Hz.instMag	Frequency	35.00...75.00 Hz	100

5.14.20 LD0.FMMXU4 Frequency measurement (4)

Table 551: LD0.FMMXU4 Frequency measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.FMMXU4			
.Hz.instMag	Frequency	35.00...75.00 Hz	100

5.14.21 LD0.FMMXU5 Frequency measurement (5)

Table 552: LD0.FMMXU5 Frequency measurement (5)

IEC 61850 name	Description	Values	Scaled max. value
LD0.FMMXU5			
.Hz.instMag	Frequency	35.00...75.00 Hz	100

5.14.22 LD0.HAEFPTOC1 Harmonics-based earth-fault protection (1)

Table 553: LD0.HAEFPTOC1 Harmonics-based earth-fault protection (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.HAEFMHAI1			
.HRmsA.res.cVal.mag	Calc. harmonics current	0.0...30000.0 A	250

5.14.23 LD0.MPTTR1 Thermal overload protection for motors (1)

Table 554: LD0.MPTTR1 Thermal overload protection for motors (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.MPTTR1			
.TmpRl.mag	Relative temp	0.00…9.99	10

5.14.24 LD0.PEMMXU1 Three-phase power and energy measurement (1)

Table 555: LD0.PEMMXU1 Three-phase power and energy measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.PEMMXU1			
.TotW.instMag	Active power P	–999999.9...999999.9 kW	1000
.TotVAr.instMag	Ractive power Q	–999999.9...999999.9 kVAr	1000
.TotVA.instMag	Apparent power S	–999999.9...999999.9 kVA	1000
.TotPF.instMag	Power factor	–1.00...1.00	1

5.14.25 LD0.PEMMXU2 Three-phase power and energy measurement (2)

Table 556: LD0.PEMMXU2 Three-phase power and energy measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.PEMMXU2			
.TotW.instMag	Active power P	–999999.9...999999.9 kW	1000
.TotVAr.instMag	Ractive power Q	–999999.9...999999.9 kVAr	1000
.TotVA.instMag	Apparent power S	–999999.9...999999.9 kVA	1000
.TotPF.instMag	Power factor	–1.00...1.00	1

5.14.26 LD0.PEMMXU3 Three-phase power and energy measurement (3)

Table 557: LD0.PEMMXU3 Three-phase power and energy measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.PEMMXU3			
.TotW.instMag	Active power P	–999999.9...999999.9 kW	1000
.TotVAr.instMag	Ractive power Q	–999999.9...999999.9 kVAr	1000
.TotVA.instMag	Apparent power S	–999999.9...999999.9 kVA	1000
.TotPF.instMag	Power factor	–1.00...1.00	1

5.14.27 LD0.RESCMMXU1 Residual current measurement (1)

Table 558: LD0.RESCMMXU1 Residual current measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU1			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.28 LD0.RESCMMXU2 Residual current measurement (2)

Table 559: LD0.RESCMMXU2 Residual current measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU2			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.29 LD0.RESCMMXU3 Residual current measurement (3)

Table 560: LD0.RESCMMXU3 Residual current measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU3			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.30 LD0.RESCMMXU4 Residual current measurement (4)

Table 561: LD0.RESCMMXU4 Residual current measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU4			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.31 LD0.RESCMMXU5 Residual current measurement (5)

Table 562: LD0.RESCMMXU5 Residual current measurement (5)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU5			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.32 LD0.RESCMMXU6 Residual current measurement (6)

Table 563: LD0.RESCMMXU6 Residual current measurement (6)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU6			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.33 LD0.RESCMMXU7 Residual current measurement (7)

Table 564: LD0.RESCMMXU7 Residual current measurement (7)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU7			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.34 LD0.RESCMMXU8 Residual current measurement (8)

Table 565: LD0.RESCMMXU8 Residual current measurement (8)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESCMMXU8			
.A.res.instCVal.mag	Io magnitude	0.00…50.00 ×In	2.4

5.14.35 LD0.RESVMMXU1 Residual voltage measurement (1)

Table 566: LD0.RESVMMXU1 Residual voltage measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU1			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.36 LD0.RESVMMXU2 Residual voltage measurement (2)

Table 567: LD0.RESVMMXU2 Residual voltage measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU2			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.37 LD0.RESVMMXU3 Residual voltage measurement (3)

Table 568: LD0.RESVMMXU3 Residual voltage measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU3			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.38 LD0.RESVMMXU4 Residual voltage measurement (4)

Table 569: LD0.RESVMMXU4 Residual voltage measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU4			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.39 LD0.RESVMMXU5 Residual voltage measurement (5)

Table 570: LD0.RESVMMXU5 Residual voltage measurement (5)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU5			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.40 LD0.RESVMMXU6 Residual voltage measurement (6)

Table 571: LD0.RESVMMXU6 Residual voltage measurement (6)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU6			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.41 LD0.RESVMMXU7 Residual voltage measurement (7)

Table 572: LD0.RESVMMXU7 Residual voltage measurement (7)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU7			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.42 LD0.RESVMMXU8 Residual voltage measurement (8)

Table 573: LD0.RESVMMXU8 Residual voltage measurement (8)

IEC 61850 name	Description	Values	Scaled max. value
LD0.RESVMMXU8			
.PhV.res.instCVal.mag	Uo magnitude	0.00...4.00 ×Un	2.4

5.14.43 LD0.SCA4GAPC1 Analog value scaling (1)

Table 574: LD0.SCA4GAPC1 Analog value scaling (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.SCA4GAPC1			
.AnValOut1.mag	Value 1 after scaling	–2000000.0...2000000.0	1
.AnValOut2.mag	Value 2 after scaling	–2000000.0...2000000.0	1
.AnValOut3.mag	Value 3 after scaling	–2000000.0...2000000.0	1
.AnValOut4.mag	Value 4 after scaling	–2000000.0...2000000.0	1

5.14.44 LD0.SPEMMXU1 Single-phase power and energy measurement (1)

Table 575: LD0.SPEMMXU1 Single-phase power and energy measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.SPEMMXU1			
.W.phsA.instCVal.mag.f	Phase A Active power P	–999999.9...999999.9 kW	1000
.W.phsB.instCVal.mag.f	Phase B Active power P	–999999.9...999999.9 kW	1000
.W.phsC.instCVal.mag.f	Phase C Active power P	–999999.9...999999.9 kW	1000
.VAr.phsA.instCVal.mag.f	Phase A Reactive power Q	–999999.9...999999.9 kVAr	1000
.VAr.phsB.instCVal.mag.f	Phase B Reactive power Q	–999999.9...999999.9 kVAr	1000
.VAr.phsC.instCVal.mag.f	Phase C Reactive power Q	–999999.9...999999.9 kVAr	1000
.VA.phsA.instCVal.mag.f	Phase A Apparent power S	–999999.9...999999.9 kVA	1000
.VA.phsB.instCVal.mag.f	Phase B Apparent power S	–999999.9...999999.9 kVA	1000
.VA.phsC.instCVal.mag.f	Phase C Apparent power S	–999999.9...999999.9 kVA	1000

Table continues on the next page

IEC 61850 name	Description	Values	Scaled max. value
.PF.phsA.instCVal.mag.f	Phase A Power factor	–1.00...1.00	1
.PF.phsB.instCVal.mag.f	Phase B Power factor	–1.00...1.00	1
.PF.phsC.instCVal.mag.f	Phase C Power factor	–1.00...1.00	1

5.14.45 LD0.SPEMMXU2 Single-phase power and energy measurement (2)

Table 576: LD0.SPEMMXU2 Single-phase power and energy measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.SPEMMXU2			
.W.phsA.instCVal.mag.f	Phase A Active power P	–999999.9...999999.9 kW	1000
.W.phsB.instCVal.mag.f	Phase B Active power P	–999999.9...999999.9 kW	1000
.W.phsC.instCVal.mag.f	Phase C Active power P	–999999.9...999999.9 kW	1000
.VAr.phsA.instCVal.mag.f	Phase A Reactive power Q	–999999.9...999999.9 kVAr	1000
.VAr.phsB.instCVal.mag.f	Phase B Reactive power Q	–999999.9...999999.9 kVAr	1000
.VAr.phsC.instCVal.mag.f	Phase C Reactive power Q	–999999.9...999999.9 kVAr	1000
.VA.phsA.instCVal.mag.f	Phase A Apparent power S	–999999.9...999999.9 kVA	1000
.VA.phsB.instCVal.mag.f	Phase B Apparent power S	–999999.9...999999.9 kVA	1000
.VA.phsC.instCVal.mag.f	Phase C Apparent power S	–999999.9...999999.9 kVA	1000
.PF.phsA.instCVal.mag.f	Phase A Power factor	–1.00...1.00	1
.PF.phsB.instCVal.mag.f	Phase B Power factor	–1.00...1.00	1
.PF.phsC.instCVal.mag.f	Phase C Power factor	–1.00...1.00	1

5.14.46 LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1)

Table 577: LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.T1PTTR1			
.Tmp.mag	Object temp.	–100.0...9999.9°C	1000
.TmpRl.mag	Relative temp.	0.00...99.99	100

5.14.47 LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1)

Table 578: LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.T2PTTR1			
.Tmp.mag	Object temp.	–100.0...9999.9°C	1000
.TmpRl.mag	Relative temp.	0.00...99.99	100

5.14.48 LD0.TR2PTDF1 Transformer differential protection of two winding transformers (1)

Table 579: LD0.TR2PTDF1 Transformer differential protection of two winding transformers (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.TR2PTDF1			
.DifAClc.phsA.cVal.mag	Diff. current phs A	0.00...80.00 ×Ir	1.2
.DifAClc.phsB.cVal.mag	Diff. current phs B	0.00...80.00 ×Ir	1.2
.DifAClc.phsC.cVal.mag	Diff. current phs C	0.00...80.00 ×Ir	1.2
.RstA.phsA.cVal.mag	Bias current phs A	0.00...80.00 ×Ir	1.2
.RstA.phsB.cVal.mag	Bias current phs B	0.00...80.00 ×Ir	1.2
.RstA.phsC.cVal.mag	Bias current phs C	0.00...80.00 ×Ir	1.2

5.14.49 LD0.TR3PTDF1 Transformer differential protection of two or three winding transformers with 2-3 restraints (1)

Table 580: LD0.TR3PTDF1 Transformer differential protection of two or three winding transformers with 2-3 restraints (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.TR3PTDF1			
.DifAClc.phsA.cVal.mag	Diff. current phs A	0.00...80.00 ×Ir	1.2
.DifAClc.phsB.cVal.mag	Diff. current phs B	0.00...80.00 ×Ir	1.2
.DifAClc.phsC.cVal.mag	Diff. current phs C	0.00...80.00 ×Ir	1.2
.RstA.phsA.cVal.mag	Bias current phs A	0.00...80.00 ×Ir	1.2
.RstA.phsB.cVal.mag	Bias current phs B	0.00...80.00 ×Ir	1.2
.RstA.phsC.cVal.mag	Bias current phs C	0.00...80.00 ×Ir	1.2

5.14.50 LD0.VAMMXU1 Single-phase voltage measurement (1)

Table 581: LD0.VAMMXU1 Single-phase voltage measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VAMMXU1			
.PhV.phsA.cVal.mag	Phase voltage A	0.00…4.00 [xUn]	2.4
.PPV.phsAB.cVal.mag	Phase-to-phase voltage AB	0.00…4.00 [xUn]	2.4

5.14.51 LD0.VAMMXU2 Single-phase voltage measurement (2)

Table 582: LD0.VAMMXU2 Single-phase voltage measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VAMMXU2			
.PhV.phsA.cVal.mag	Phase voltage A	0.00…4.00 [xUn]	2.4
.PPV.phsAB.cVal.mag	Phase-to-phase voltage AB	0.00…4.00 [xUn]	2.4

5.14.52 LD0.VAMMXU3 Single-phase voltage measurement (3)

Table 583: LD0.VAMMXU3 Single-phase voltage measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VAMMXU3			
.PhV.phsA.cVal.mag	Phase voltage A	0.00…4.00 [xUn]	2.4
.PPV.phsAB.cVal.mag	Phase-to-phase voltage AB	0.00…4.00 [xUn]	2.4

5.14.53 LD0.VAMMXU4 Single-phase voltage measurement (4)

Table 584: LD0.VAMMXU4 Single-phase voltage measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VAMMXU4			
.PhV.phsA.cVal.mag	Phase voltage A	0.00…4.00 [xUn]	2.4
.PPV.phsAB.cVal.mag	Phase-to-phase voltage AB	0.00…4.00 [xUn]	2.4

5.14.54 LD0.VMMXU1 Three-phase voltage measurement (1)

Table 585: LD0.VMMXU1 Three-phase voltage measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU1			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	U12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	U23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	U31 magnitude	0.00...4.00 ×Un	2.4

5.14.55 LD0.VMMXU2 Three-phase voltage measurement (2)

Table 586: LD0.VMMXU2 Three-phase voltage measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU2			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	UL12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	UL23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	UL31 magnitude	0.00...4.00 ×Un	2.4

5.14.56 LD0.VMMXU3 Three-phase voltage measurement (3)

Table 587: LD0.VMMXU3 Three-phase voltage measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU3			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4

Table continues on the next page

IEC 61850 name	Description	Values	Scaled max. value
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	UL12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	UL23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	UL31 magnitude	0.00...4.00 ×Un	2.4

5.14.57 LD0.VMMXU4 Three-phase voltage measurement (4)

Table 588: LD0.VMMXU4 Three-phase voltage measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU4			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	UL12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	UL23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	UL31 magnitude	0.00...4.00 ×Un	2.4

5.14.58 LD0.VMMXU5 Three-phase voltage measurement (5)

Table 589: LD0.VMMXU5 Three-phase voltage measurement (5)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU5			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	UL12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	UL23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	UL31 magnitude	0.00...4.00 ×Un	2.4

5.14.59 LD0.VMMXU6 Three-phase voltage measurement (6)

Table 590: LD0.VMMXU6 Three-phase voltage measurement (6)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU6			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	UL12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	UL23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	UL31 magnitude	0.00...4.00 ×Un	2.4

5.14.60 LD0.VMMXU7 Three-phase voltage measurement (7)

Table 591: LD0.VMMXU7 Three-phase voltage measurement (7)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU7			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	UL12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	UL23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	UL31 magnitude	0.00...4.00 ×Un	2.4

5.14.61 LD0.VMMXU8 Three-phase voltage measurement (8)

Table 592: LD0.VMMXU8 Three-phase voltage measurement (8)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VMMXU8			
.PhV.phsA.instCVal.mag	UL1 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsB.instCVal.mag	UL2 magnitude	0.00...4.00 ×Un	2.4
.PhV.phsC.instCVal.mag	UL3 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsAB.instCVal.mag	UL12 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsBC.instCVal.mag	UL23 magnitude	0.00...4.00 ×Un	2.4
.PPV.phsCA.instCVal.mag	UL31 magnitude	0.00...4.00 ×Un	2.4

5.14.62 LD0.VSMSQI1 Sequence voltage measurement (1)

Table 593: LD0.VSMSQI1 Sequence voltage measurement (1)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI1			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c2.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c3.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.63 LD0.VSMSQI2 Sequence voltage measurement (2)

Table 594: LD0.VSMSQI2 Sequence voltage measurement (2)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI2			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.64 LD0.VSMSQI3 Sequence voltage measurement (3)

Table 595: LD0.VSMSQI3 Sequence voltage measurement (3)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI3			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.65 LD0.VSMSQI4 Sequence voltage measurement (4)

Table 596: LD0.VSMSQI4 Sequence voltage measurement (4)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI4			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.66 LD0.VSMSQI6 Sequence voltage measurement (6)

Table 597: LD0.VSMSQI6 Sequence voltage measurement (6)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI6			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.67 LD0.VSMSQI7 Sequence voltage measurement (7)

Table 598: LD0.VSMSQI7 Sequence voltage measurement (7)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI7			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.68 LD0.VSMSQI5 Sequence voltage measurement (5)

Table 599: LD0.VSMSQI5 Sequence voltage measurement (5)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI5			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.69 LD0.VSMSQI8 Sequence voltage measurement (8)

Table 600: LD0.VSMSQI8 Sequence voltage measurement (8)

IEC 61850 name	Description	Values	Scaled max. value
LD0.VSMSQI8			
.SeqV.c1.instCVal.mag	Pos. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Neg. seq. magnitude	0.00...4.00 ×Un	2.4
.SeqV.c1.instCVal.mag	Zero seq. magnitude	0.00...4.00 ×Un	2.4

5.14.70 LD0.SCAIGGIO1 Slot C Analog Inputs. Availability depends on I/O card variant

Table 601: LD0.SCAIGGIO1 Slot C Analog Inputs. Availability depends on I/O card variant

IEC 61850 name	Description	Values	Scaled max. value
LD0.SCAIGGIO1			
.AnIn1.instMag	RTD input 1	–10000.0...10000.0	1000
.AnIn2.instMag	RTD input 2	–10000.0...10000.0	1000
.AnIn3.instMag	RTD input 3	–10000.0...10000.0	1000
.AnIn4.instMag	RTD input 4	–10000.0...10000.0	1000
.AnIn5.instMag	RTD input 5	–10000.0...10000.0	1000
.AnIn6.instMag	RTD input 6	–10000.0...10000.0	1000
.AnIn7.instMag	RTD input 7	–10000.0...10000.0	1000
.AnIn8.instMag	RTD input 8	–10000.0...10000.0	1000
.AnIn9.instMag	RTD input 9	–10000.0...10000.0	1000
.AnIn10.instMag	RTD input 10	–10000.0...10000.0	1000
.AnIn11.instMag	RTD input 11	–10000.0...10000.0	1000
.AnIn12.instMag	RTD input 12	–10000.0...10000.0	1000

5.14.71 LD0.SDAIGGIO1 Slot D Analog Inputs. Availability depends on I/O card variant

Table 602: LD0.SDAIGGIO1 Slot D Analog Inputs. Availability depends on I/O card variant

IEC 61850 name	Description	Values	Scaled max. value
LD0.SDAIGGIO1			
.AnIn1.instMag	RTD input 1	–10000.0...10000.0	1000
.AnIn2.instMag	RTD input 2	–10000.0...10000.0	1000
.AnIn3.instMag	RTD input 3	–10000.0...10000.0	1000
.AnIn4.instMag	RTD input 4	–10000.0...10000.0	1000
.AnIn5.instMag	RTD input 5	–10000.0...10000.0	1000
.AnIn6.instMag	RTD input 6	–10000.0...10000.0	1000
.AnIn7.instMag	RTD input 7	–10000.0...10000.0	1000
.AnIn8.instMag	RTD input 8	–10000.0...10000.0	1000
.AnIn9.instMag	RTD input 9	–10000.0...10000.0	1000
.AnIn10.instMag	RTD input 10	–10000.0...10000.0	1000
.AnIn11.instMag	RTD input 11	–10000.0...10000.0	1000
.AnIn12.instMag	RTD input 12	–10000.0...10000.0	1000

6 Interoperability profile for REX640 IEC 60870-5-103

6.1 Physical layer

6.1.1 Electrical interface

☒ EIA RS-485

☐ Number of loads ..... for one protection equipment

NOTE - EIA RS-485 standard defines unit loads so that 32 of them can be operated on one line. For detailed information refer to clause 3 of EIA RS-485 standard.

6.1.2 Optical interface

☒ Glass fibre

☐ Plastic fibre

☐ F-SMA type connector

☐ BFOC/2,5 type connector

6.1.3 Transmission speed

☒ 9 600 bit/s

☒ 19 200 bit/s

6.2 Link layer

There are no choices for the link layer.

6.3 Application layer

6.3.1 Transmission mode for application data

Mode 1 (least significant octet first), as defined in 4.10 of IEC 60870-5-4, is used exclusively in this companion standard.

6.3.2 COMMON ADDRESS of ASDU

☒ One COMMON ADDRESS OF ASDU (identical with station address)

☐ More than one COMMON ADDRESS OF ASDU

6.3.3 Selection of standard information numbers in monitor direction

6.3.3.1 System functions in monitor direction

	INF	Semantics
☒	<0>	End of general interrogation
☒	<1>	Time synchronization
☒	<2>	Reset FCB
☒	<3>	Reset CU
☒	<4>	Start/restart
☒	<5>	Power on

6.3.3.2 Status indications in monitor direction

	INF	Semantics
☒	<16>	Auto-recloser active
☐	<17>	Teleprotection active
☐	<18>	Protection active
☐	<19>	LED reset
☒	<20>	Monitor direction blocked
☒	<21>	Test mode
☐	<22>	Local parameter setting
☒	<23>	Characteristic 1
☒	<24>	Characteristic 2
☒	<25>	Characteristic 3
☒	<26>	Characteristic 4
☐	<27>	Auxiliary input 1
☐	<28>	Auxiliary input 2
☐	<29>	Auxiliary input 3
☐	<30>	Auxiliary input 4

Note <27>...<30>: Depending on Binary I/O options and application usage there may be additional auxiliary inputs available in the IED. As default, all "raw" binary input data are

mapped to private data. It is possible for user to re-map these additional inputs into standard <27>...<30> 'Auxiliary Inputs', if wanted.

6.3.3.3 Supervision indications in monitor direction

	INF	Semantics
☐	<32>	Measurand supervision I
☐	<33>	Measurand supervision V
☐	<35>	Phase sequence supervision
☒	<36>	Trip circuit supervision
☐	<37>	I>> back-up operation
☐	<38>	VT fuse failure
☐	<39>	Teleprotection disturbed
☐	<46>	Group warning
☐	<47>	Group alarm

Note <32>, <33> and <38>: Protection relay's current and voltage measurement supervision signals and alarms are found in private data definitions. Semantics of these signals are more complex in this protection relay than what is defined by the IEC 60870-5-103 standard.

6.3.3.4 Earth fault indications in monitor direction

	INF	Semantics
☐	<48>	Earth fault L_1
☐	<49>	Earth fault L_2
☐	<50>	Earth fault L_3
☐	<51>	Earth fault forward, for example line
☐	<52>	Earth fault reverse, for example busbar

Note: In this protection relay there exist different functions (and signals) for non-directional or directional earth-fault protection. Function- and stage-dependent start/pickup signals are found in private data locations.

6.3.3.5 Fault indications in monitor direction

	INF	Semantics
☐	<64>	Start /pick-up L_1
☐	<65>	Start /pick-up L_2
☐	<66>	Start /pick-up L_3
☐	<67>	Start /pick-up N
☒	<68>	General trip
☐	<69>	Trip L_1
☐	<70>	Trip L_2
☐	<71>	Trip L_3
☐	<72>	Trip I>> (back-up operation)
☐	<73>	Fault location X in ohms
☐	<74>	Fault forward/line

Table continues on the next page

☐	<75>	Fault reverse/busbar
☐	<76>	Teleprotection signal transmitted
☐	<77>	Teleprotection signal received
☐	<78>	Zone 1
☐	<79>	Zone 2
☐	<80>	Zone 3
☐	<81>	Zone 4
☐	<82>	Zone 5
☐	<83>	Zone 6
☐	<84>	General start/pick-up
☒	<85>	Breaker failure
☐	<86>	Trip measuring system L_1
☐	<87>	Trip measuring system L_2
☐	<88>	Trip measuring system L_3
☐	<89>	Trip measuring system E
☐	<90>	Trip I>
☐	<91>	Trip I>>
☐	<92>	Trip IN>
☐	<93>	Trip IN>>

Note: In this protection relay, function-specific fault signals are as default mapped to private data locations.

6.3.3.6 Auto-reclosure indications in monitor direction

	INF	Semantics
☒	<128>	CB 'on' by AR
☐	<129>	CB 'on' by long-time AR
☒	<130>	AR blocked

6.3.3.7 Measurands in monitor direction

	INF	Semantics
☒	<144>	Measurand I
☒	<145>	Measurands I, V
☒	<146>	Measurands I, V, P, Q
☒	<147>	Measurands I_N, V_{EN}
☒	<148>	Measurands $I_{L1,2,3}$, $V_{L1,2,3}$, P, Q, f

6.3.3.8 Generic functions in monitor direction

	INF	Semantics
☐	<240>	Read headings of all defined groups
☐	<241>	Read values or attributes of all entries of one group
☐	<243>	Read directory of a single entry

Table continues on the next page

- ☐ <244> Read value or attribute of a single entry
- ☐ <245> End of general interrogation of generic data
- ☐ <249> Write entry with confirmation
- ☐ <250> Write entry with execution
- ☐ <251> Write entry aborted

6.3.4 Selection of standard information numbers in control direction

6.3.4.1 System functions in control direction

	INF	Semantics
☒	<0>	Initiation of general interrogation
☒	<0>	Time synchronization

6.3.4.2 Generic functions in monitor direction

	INF	Semantics
☐	<240>	Read headings of all defined groups
☐	<241>	Read values or attributes of all entries of one group
☐	<243>	Read directory of a single entry
☐	<244>	Read value or attribute of a single entry
☐	<245>	End of general interrogation of generic data
☐	<249>	Write entry with confirmation
☐	<250>	Write entry with execution
☐	<251>	Write entry aborted

6.3.5 Basic application functions

- ☒ Test mode
- ☒ Blocking of monitor direction
- ☒ Disturbance data
- ☐ Generic services
- ☒ Private data

6.3.6 Miscellaneous

Measurands are transmitted as Class2 data using ASDU 3 or ASDU 9. The default MVAL scaling in this protection relay is 2.4. The MVAL for each separate measurand can be freely reprogrammed.

Measurand	Max. MVAL = rated value times	
	1.2 or	2.4
Current L_1	☒	☒
Current L_2	☒	☒
Current L_3	☒	☒
Voltage L_{1-E}	☒	☒
Voltage L_{2-E}	☒	☒
Voltage L_{3-E}	☒	☒
Active power P	☒	☒
Reactive power Q	☒	☒
Frequency f	☒	☒
Voltage L_1 - L_2	☒	☒

The protection relay contains additional private Class2 frames, including private measurands. User can freely select between standard or private Class2 frames.

If some required application data is not included in this chapter, it does not necessarily mean that it is missing from the protection relay. For example, the data is available in the protection relay, but it does not create time-tagged change events which are required for Class1 data, or the data in the protection relay is not defined like in the IEC 60870-5-103 standard. Map this missing data into generic application object points using Application Configuration. The protocol identification (function type, information number) for the generic points can thereafter be freely modified by PCM600. See the point list for the outlook and default definitions of the generic application object points.

7 Glossary

ACC	Actual channel, related to IEC 60870-5-103 disturbance record
ACK	Positive acknowledgement
AFL	Application function block library
ASCII	American standard code for information interchange
ASDU	Application-layer service data unit
COMTRADE	Common format for transient data exchange for power systems. Defined by the IEEE Standard.
COT	Cause of transmission
Data set	The content basis for reporting and logging containing references to the data and data attribute values.
DFC	Data flow control
DIP switch	A set of on-off switches arranged in a standard dual in-line package
DPI	Double-point information
EIA RS-485	Electrical communication interface standard
EMC	Electromagnetic compatibility
Ethernet	A standard for connecting a family of frame-based computer networking technologies into a LAN.
FAN	Fault number
FUN	Function type
GI	General interrogation
HMI	Human-machine interface
IEC	International electrotechnical commission
IEC 60870-5-101	Companion standard for basic telecontrol tasks
IEC 60870-5-103	1. Communication standard for protective equipment 2. A serial client/server protocol for point-to-point communication
IEC 60870-5-104	Network access for IEC 60870-5-101
IEC 61850	International standard for substation communication and modeling
IED	Intelligent electronic device
INF	Information number
LED	Light-emitting diode
LSB	Least significant bit
MSB	Most significant bit
NAK	Negative acknowledgement
NCC	Network control center
OTEV	Disturbance recording triggered from start bit
PCM600	Protection and control IED manager

PE	1. Polyethylene 2. Protective earth
Reset CU	Reset communication unit
Reset FCB	Reset flow control bit
SI	Sensor input
SOF	Status of fault
TEST	Disturbance data recorded in test mode bit
TM	Disturbance data transmission in progress bit
TP	Disturbance data recorded with or without trip bit
VDEW6	Communication protocol standard for protection devices
VSQ	Variable structure qualifier

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