

DAA

Data acquisition application for continuous emission monitoring – Software version 1.2.4

Performance-tested program system for acquisition and handling of continuous emission data

Measurement made easy

DAA

Data acquisition application for continuous emission monitoring –
Software version 1.2.4

System manual

TD/DAA-EN
Revision A
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1 Introduction

DAA and CEM-DAS are a qualified programming system for acquisition and management of continuous emission data. They are designed for use as an intranet application and include DAA (Data Acquisition Application) as well as CEM-DAS (Continuous Emission Monitoring Data Acquisition System), a software component running on a PC.

DAA consists of a software component (program) and one or several TALAS/7-IO input and output modules.

The term DAA may refer either only to the software component, or to the complete system consisting of the software component and the input/output modules. In each case, the meaning of DAA should always be clear from the context.

DAA runs on Microsoft Windows on a PC as a Windows service or as a program in the foreground. On one PC only one DAA can be executed.

2 System overview

2.1 Functions overview

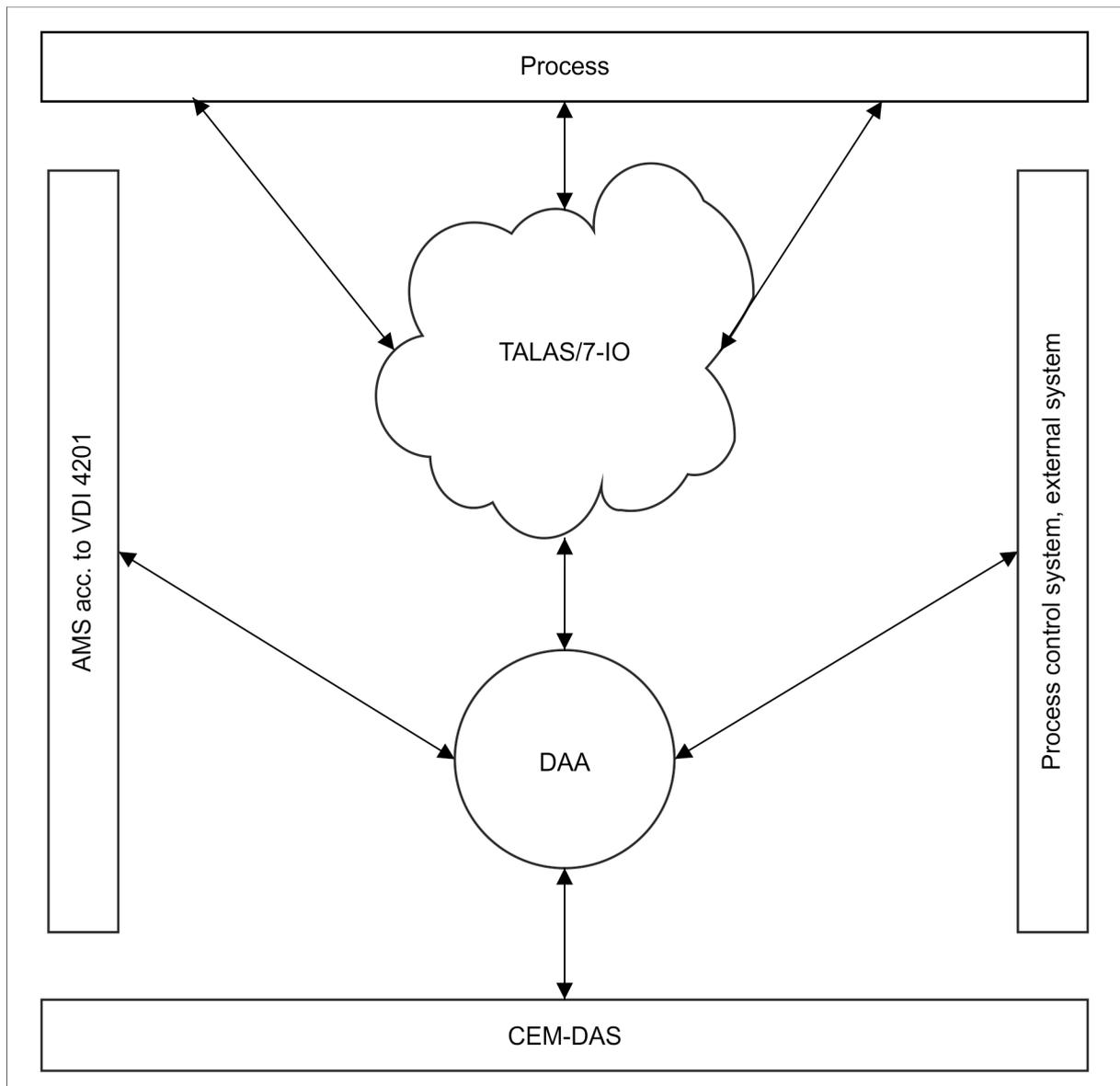


Figure 1: DAA and its environment

The external interfaces of DAA are summarized in the context diagram depicted in Figure 1.

DAA acquires the process data via several TALAS/7-IO modules that are connected to it via network. In addition, data are output to the process by DAA via the TALAS/7-IO modules.

The time of DAA is synchronized with the time of CEM-DAS. Connection and data exchange to CEM-DAS is carried out via a network.

Additionally, a data exchange with an external system (control system, ...) is possible. As of version 1.2, DAA can also communicate with an AMS via the digital interface VDI 4201 and capture measured values. The functionality and parameterization of this interface are described in /3/.

2.2 System configuration

The following illustrations show possible configurations of CEM-DAS and DAA. Users only need network access to CEM-DAS.

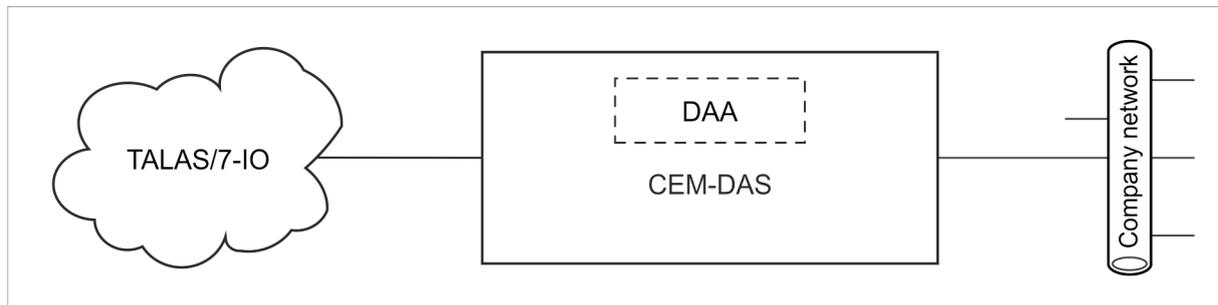


Figure 2: Internal configuration 1

In Figure 2, a DAA is executed on the same PC as CEM-DAS. Both applications communicate via the internal network interface. DAA is connected to the TALAS/7-IO modules via its private network (Annex C).

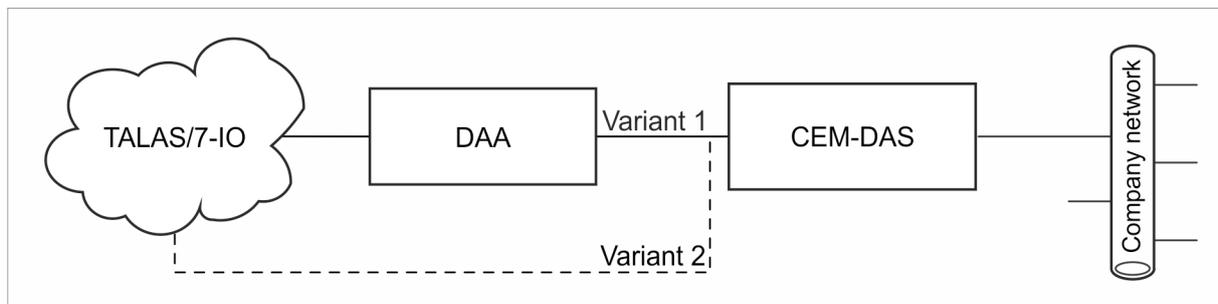


Figure 3: Internal configuration 2

In Figure 3, a DAA is executed on a PC separated from CEM-DAS. Both applications communicate independent of the company network via a separate private network connection (variant 1)¹. DAA is connected to the TALAS/7-IO modules via its private network (Annex C).

This variant should be applied if the DAA PC is used for data archiving (ZIP, archive) of CEM-DAS. The TALAS/7-IO modules can then be accessed via “Remote Desktop” to the DAA PC from the CEM-DAS PC.

Alternatively, CEM-DAS may also be added to the private network (Annex C) of DAA and the TALAS/7-IO modules (variant 2). This variant allows direct access to the TALAS/7-IO modules from the CEM-DAS PC. Variant 2 must of course be applied if the DAA PC only has one network interface.

If an NAS server shall be integrated into the internal network, both variant 1 and variant 2 can be applied.

In the first case, CEM-DAS and the NAS server are located in the private network 192.168.1.0/24.

¹ For variant 1, IP addresses from network 192.168.1.0/24 should be selected (Annex C).

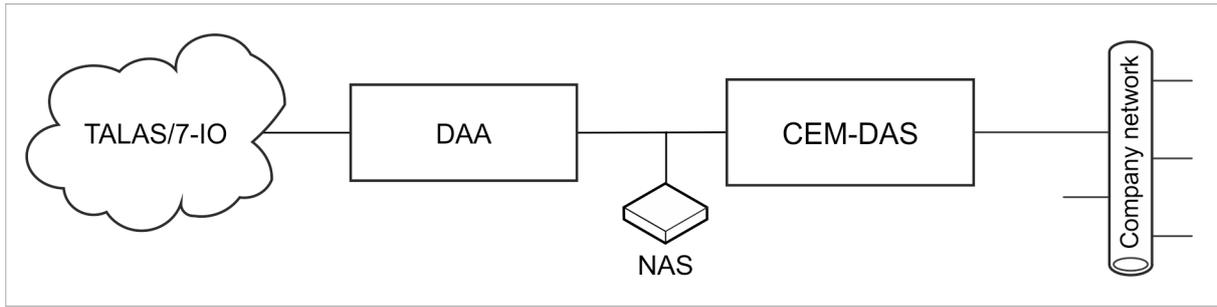


Figure 4: NAS server, internal variant 1 (acc. to internal configuration 2)

In the second case, all systems are located in the private network 192.168.0.0/24.

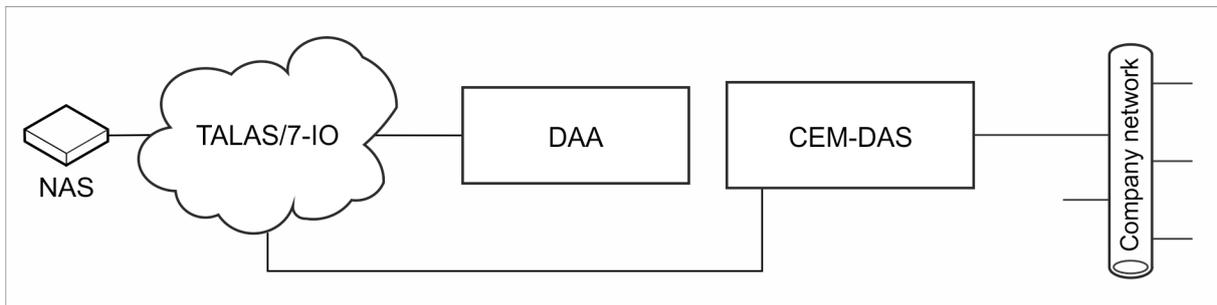


Figure 5: NAS server, internal variant 2 (acc. to internal configuration 2)

Of course the NAS server may also be located in the company network.

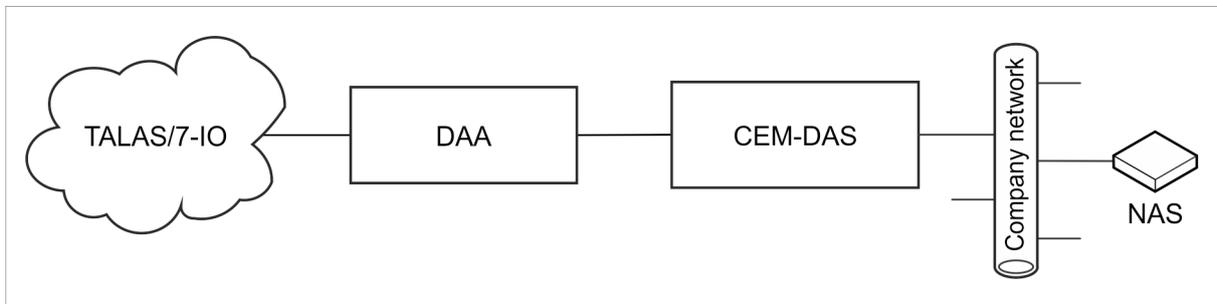


Figure 6: NAS server, external variant

In Figure 7, several DAA, each executed on separate PCs, are connected via the company network to CEM-DAS, which is executed on a separate PC. Each DAA is connected to its TALAS/7-IO modules via its private network (Annex C).

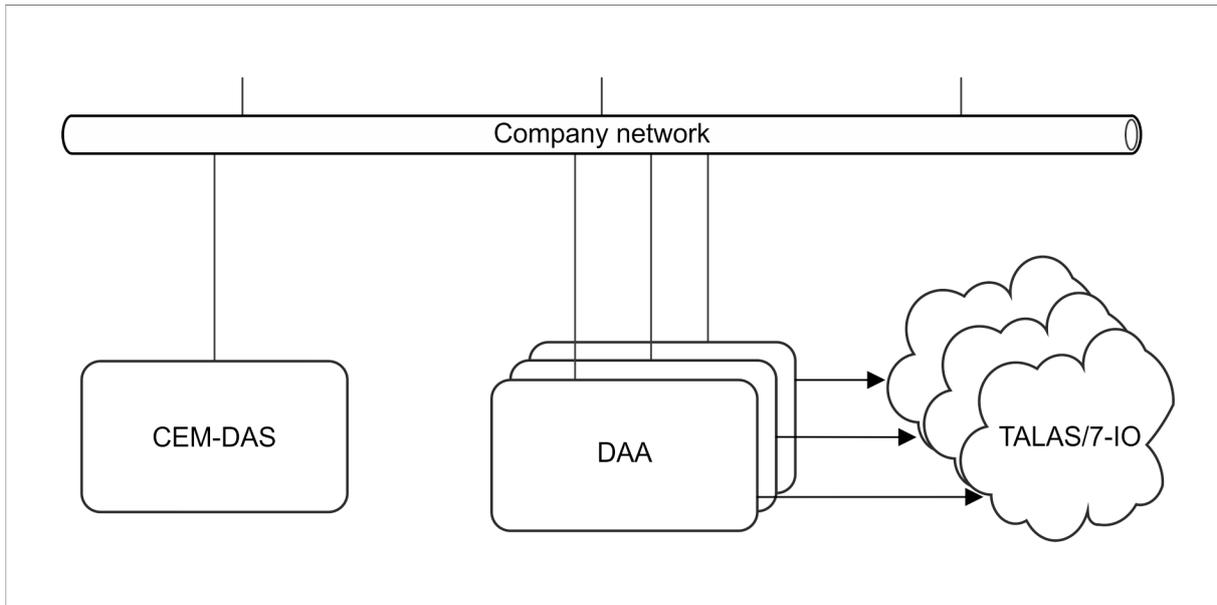


Figure 7: External configuration

2.3 Replication / Redundancy system

DAA can be used in a CEM-DAS replication / redundancy system. The following two configurations are possible.

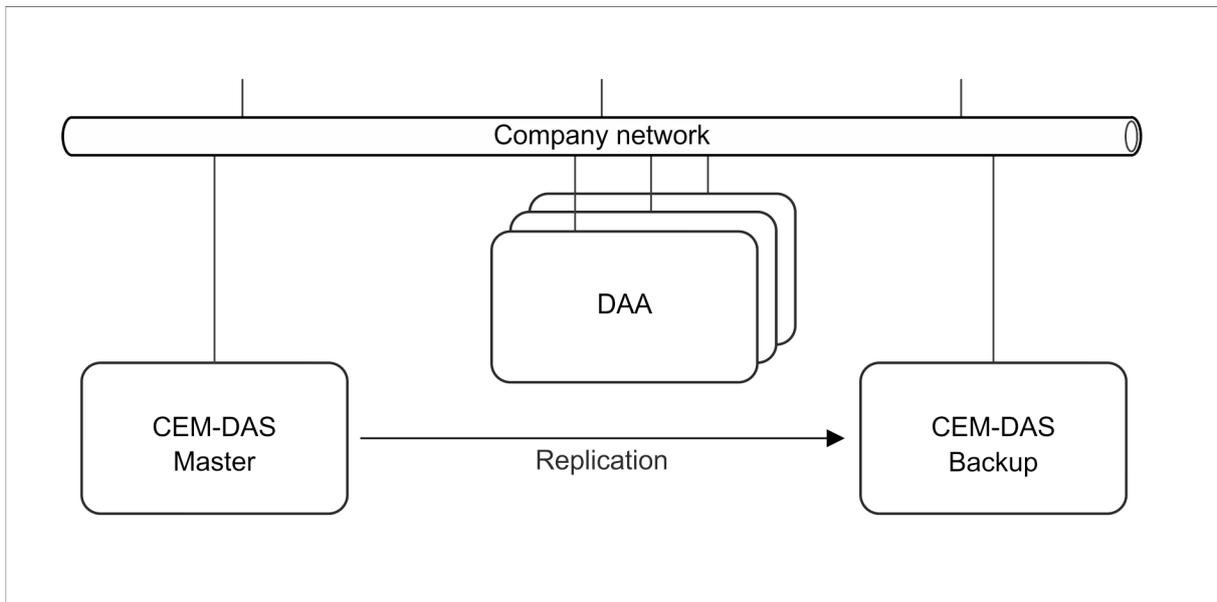


Figure 8: Replication with external DAA

One or more DAA is/are installed on separate PCs. The master as well as the backup of CEM-DAS request data from DAA. However, the time is only synchronized by the master.

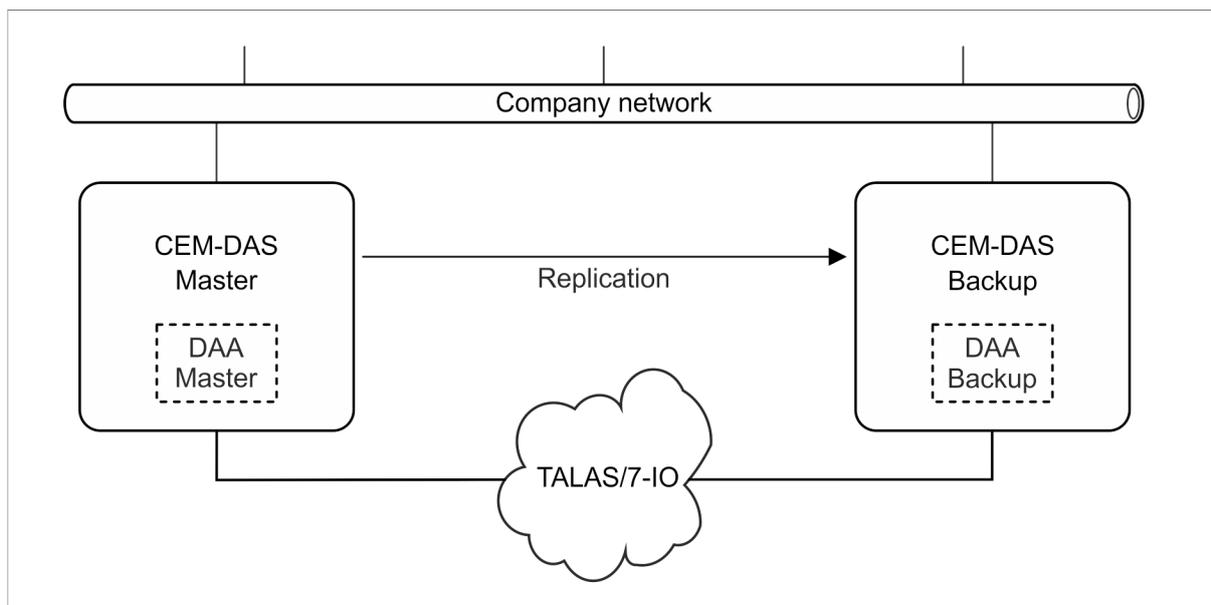


Figure 9: Replication with internal DAA

Internal DAA systems are installed on the master as well as on the backup of CEM-DAS. Both DAA can receive the UDP telegrams of the TALAS/7-IO modules and evaluate them with the identical parameterization.

The control points of the TALAS/7-IO modules are only set by the DAA master. The master also establishes a TCP connection to the DAA backup, which disables setting of the control points by the DAA backup. If there is no longer a connection between DAA master and backup (e.g. due to a failure of the master), the DAA backup will resume setting of the control points.

When loading new DAA parameters (only possible from the CEM-DAS master), the loader program will make sure that the same parameters are loaded to both DAA.

Since the DAA master and the loader program require the IP address of the DAA backup, it is necessary to parameterize this IP address in the options of DAA as `,talas7.backup.ip=n.n.n.n'`.

2.4 External systems

DAA can exchange data with external systems:

- data transmission via Modbus TCP/RTU (see /2/)
- data transmission via S5-RK512 (Siemens)
- data transmission via ABB TS01 interface

3 Function model

3.1 Overview

The functions of DAA are realized by the following program units (threads) within the DAA program. Program units ending in ,n' may be present several times, with ,n' running from 0, 1, etc.

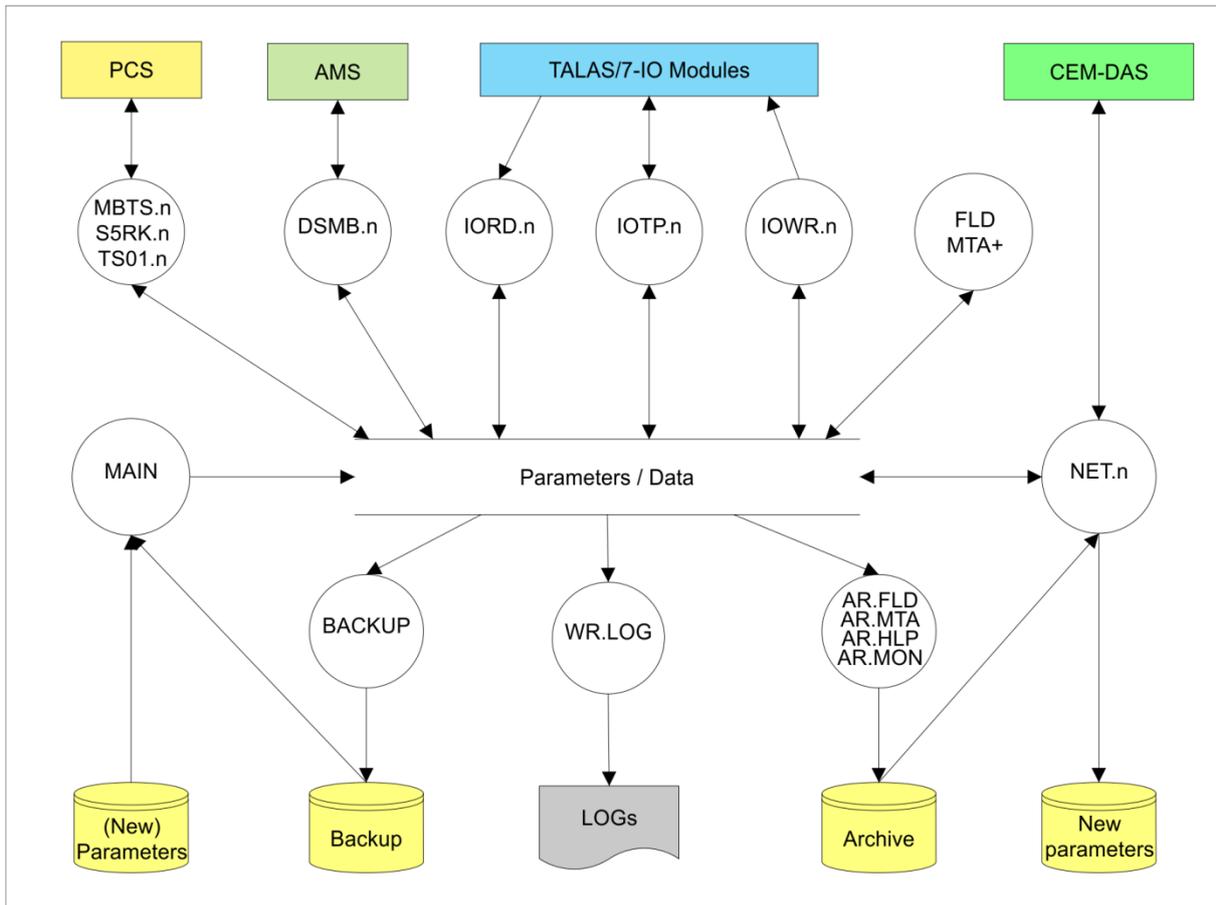


Figure 10: Program units of DAA

3.2 Program units

3.2.1 MAIN

This program unit is the first to be called up upon starting of the program DAA. It initializes the internal memory units and reads in the previous or new parameters from a file. If a backup is available, the program unit will read from it the last available status of DAA. After that, it starts all other program units and monitors their execution.

3.2.2 IORD.n

This program unit waits for the input values sent by the TALAS/7-IO input modules via UDP telegrams. The received values are then compressed for the parameterized devices.

3.2.3 IOWR.n

This program unit sends the output values to the TALAS/7-IO output modules and checks whether they were correctly set.

3.2.4 FLD

The program unit FLD runs in the measured values sequence, retrieves the acquired input values and compiles the measured values after parameterization. Also, it increases the counter for short term values and last slow average (LSA). In addition, it calculates the binary links (B-MS) and then calculates and provides the output values.

3.2.5 MTA+

The program unit MTA+ runs in the short term values sequence and creates short term values, running slow average (RSA) and, as required, the last slow averages, if their integration time has expired.

3.2.6 BACKUP

This program unit cyclically saves the current state of DAA, so that the previously collected data may be reconstructed after a restart of DAA.

3.2.7 AR.FLD, AR.MTA, AR.HLP, AR.MON

These program units cyclically save the created values and system messages in archive files. AR.FLD saves the measured values and AR.MTA saves the short term values and last slow averages. AR.MON ensures that the parameterized memory space for the data is adhered to. AR.HLP executes longer lasting actions on the storage media on behalf of AR.MON.

3.2.8 LOGWR

This program unit writes the log messages put out by DAA into files. By default, no log files are written, only an error file is created.

3.2.9 NET.n

These program units communicate via TCP with the corresponding process "dasDaa" of CEM-DAS. They transmit the requested values and receive a new parameter file from CEM-DAS.

3.2.10 IOTP.n

This program unit communicates via TCP with a TALAS/7-IO module, from which it receives the input values. The received values are then compressed for the parameterized device. Also, it sends the output values to the module and checks whether these have been set correctly.

3.2.11 MBTS.n

This program unit works as a MODBUS TCP server. Input data can be written and output data can be read via this program unit. Functionality and parameterization of this interface are described in /2/.

3.2.12 S5RK.n

This program unit realizes the S5-RK512 interface.

3.2.13 TS01.n

This program unit realizes the ABB-TS01 interface.

3.2.14 DSMB.n

This program unit realizes the digital interface according to VDI 4201 via Modbus. Functionality and parameterization of this interface are described in /3/.

3.2.15 HBEAT

This program unit (not depicted) runs to a DAA master, if there is a replication (see Section 2.3). It cyclically transmits its life signal to the DAA backup.

3.2.16 USER

This program unit (not depicted) builds the DAA user interface.

3.3 Directories

The installation directory of DAA can be freely selected during installation. The following directories are created below this installation directory:

Directory	Meaning
SYS	Contains the cyclically created backup files and the error file
XLG	Contains the optionally created log files
FLD	Contains the archived measured values
MTA	Contains the archived short term values
STA	Contains the archived last slow averages

4 TALAS/7-IO modules

4.1 General

TALAS/7-IO is the name under which NIS provides measurement and control modules mountable on EN 50022 DIN rails. Mounted in 4 or 8 WU (width unit @17.5mm per width unit) cases, they can provide up to 14 or 30 process I/Os (connections for sensors and actuators). The modules are coupled via 10BASE-T (RJ45 Ethernet) connectors. Every module consists of a CPU part (1 WU on the left side) followed by subsequent IO parts.

The modules can be supplied with power either via standard PoE (Power over Ethernet as described in IEEE802.3af) or by dedicated polarity independent screw-type terminal power supply inputs located directly below the RJ45 Ethernet socket.

The modules can contain analog or digital inputs or outputs. The signals are connected to the modules by screw-type terminal.

The TALAS/7-IO modules do not have a 24 V signal supply feed! An external 24 V signal supply feed has to be provided when digital inputs are utilized.

Standard conforming DIN rail mountable case according to EN 50022

Dimensions IO4:	D: 90 mm, H: 60 mm, W: 70 mm (4 WU)
Dimensions IO8:	D: 90 mm, H: 60 mm, W: 140 mm (8 WU)
Protection category:	IP20
Ambient temperature:	Operation: 0 to 50 °C, storage: -40 to +80 °C
Cooling:	Passive via convection (no fan)
Relative humidity:	0 to 90 %, above dew point
Voltage supply:	By Power over Ethernet (PoE, IEEE802.3af), see Section 4.2 Alternatively by screw-type terminals with external supply of 18 to 48 V DC, galvanic isolation of voltages up to 1500 Volt, isolating distance ≥ 2 mm
Power drain:	Max. 8 Watt
Network:	10BASE-T Full Duplex (RJ45), no auto-negotiation
Telemetry:	via UDP/IP, TCP/IP

Every module contains a digital input and output on the CPU part as well as an additional internal analog input that is used to monitor the module temperature.

4.2 Power supply

The TALAS/7-IO modules are supplied with power by either the network interface using PoE (Power over Ethernet) or alternatively by the polarity independent screw-type terminals below the Ethernet (RJ45) socket.

The supply lines must be sufficiently insulated when the alternative screw type POWER terminals (18 to 48 V DC) are utilized. The screw type POWER terminals are polarity independent!

The galvanic isolation specifications of the device power supply are:

- Voltage: 1500 Volt
- Isolating distance: ≥ 2 mm

The power drain per device is max. 8 W.

4.3 Analog inputs

AD converter:	per input
T correction:	per input
Resolution:	0.763 μ A (15 bit)
Accuracy:	0.04 % FSR (full scale range: 25 mA)
Sampling interval:	approx. 25 ms
Measuring range:	0 to 25 mA
Ohmic resistance:	50 Ω
Polarity independent:	Yes
Galvanic isolation:	Voltage to the device: 3000 V Isolating distance device: \geq 4 mm Isolating distance terminals: \geq 2 mm

4.4 Digital inputs

External voltages:	12 to 25 V AC or 12 to 60 V DC
Isolated contacts:	Requires an external 24V signal power supply ²
Internal resistance:	$>$ 50 k Ω
Sampling interval:	approx. 2 ms
Polarity independent:	Yes
Galvanic isolation:	Voltage to the device: 3000 V Isolating distance device: \geq 4 mm Isolating distance terminals: \geq 2 mm

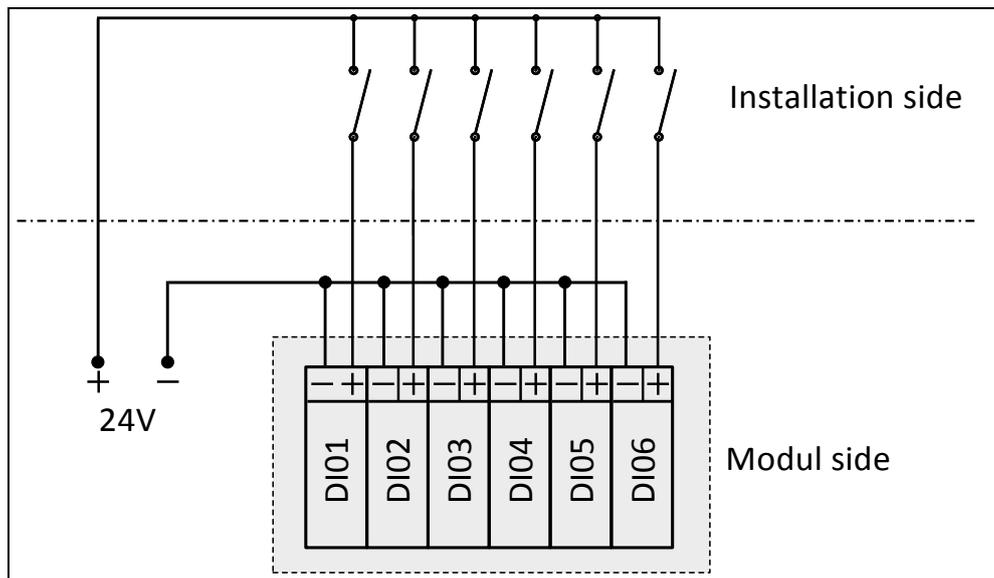


Figure 11: Digital input connection

² A TALAS/7-IO8/DI uses $<$ 0.5 Watt when all inputs are active.

4.5 Digital outputs

Relays, make contact (contact material: AgNi)

After reset / on:	0
Rated current:	6 A, making current 15 A
Rated voltage:	12 to 25 V AC or 12 to 60 V DC
Max. contact rating:	1500 VA
Contact lifetime (VDE0660, VDE 0631, UL 508):	1x10 ⁵ by 6 A and 250 V AC 5x10 ⁵ by 6 A (ohmic) and 30 V DC > 3x10 ⁶ by 0.3 A (L/R = 40 ms) and 50 V DC
Galvanic isolation:	Voltage to the device: 3000 V Isolating distance device: ≥ 4 mm Isolating distance terminals: ≥ 2 mm

4.6 Analog outputs

AD converter:	per output
T correction:	per output
Output range:	0 to 20 mA
Resolution:	0.3 µA (16 Bit)
Accuracy:	0.04 % FSR (full scale range: 20 mA)
Ohmic resistance:	400 Ω per output
After reset / on:	0 mA
Galvanic isolation:	Voltage to the device: 3000 V Isolating distance device: ≥ 4 mm Isolating distance terminals: ≥ 2 mm

4.7 Modules

The following input and output modules are available. The layout of each module is provided in the Annex B Layout of the TALAS/7-IO modules.

Module	AI	DI	AO	DO
TALAS/7-IO8/AI	28	1		1
TALAS/7-IO8/DI		29		1
TALAS/7-IO8/AIDI	14	15		1
TALAS/7-IO8/AO		1	14	1
TALAS/7-IO4/AI	12	1		1
TALAS/7-IO4/DI		13		1
TALAS/7-IO4/AIDI	6	7		1
TALAS/7-IO4/DIDO		7		7
TALAS/7-IO4/AO		1	6	1
TALAS/7-IO4/DO		1		13
TALAS/7-IO4/AODO		1	2	9

4.8 Label

The relevant TALAS/7-IO module specifications are stated in the case label.

Product	TALAS/7 I04/AIDI
MAC	00 - 40 - 86 - 11 - <u>aa</u> - <u>aa</u>
Power	18 - 48V DC / <u>PoE</u>
Analog Input - AI	0 - 24 mA
Analog Output - AO	0 - 20 mA
Digital Input - DI	12 - 25 V AC bzw. 12 - 60 V DC
Digital Output - DO	Relais 12 - 25 V AC bzw. 12 - 60 V DC / 6A
 <p>Siempelkamp NIS Ingenieurgesellschaft mbH <u>Industriestr. 13</u> · 63755 Alzenau Tel. +49 (0) 6023 / 91 38 74 Fax +49 (0) 6023 / 91 39 80</p> 	

Figure 12: Case label

4.9 Serial number

The last two hexadecimal octets of the MAC address make up the serial number of the TALAS/7-IO module. In the example in Figure 12 the serial number is AAAA.

4.10 Contacts and indicator lights

The TALAS/7-IO module is delivered in a strong yet compact case. All input and output contacts as well as the alternative power supply contacts use screw-type terminals.

The network connection is a RJ45 socket for standard twisted pair cables. We recommend standard 10BASE-T patch cables and cables of at least the quality CAT5.

The indicator lights show the status of the TALAS/7-IO modules. The following statuses are shown:

Indicator light	Colour	Status
Status	Green light	OK
	Red light	An error occurred.
	Green light, Red flashing	Configuration mode
Link/Act	Green light	Network link active
	Red flashing	Network data transfer 10 MBit/s
Process E/A	Green light / off	State of the corresponding process I/O connector. Green: Active, Red: Error
	Red light / off	

On analog process I/Os, the light intensity of the green light corresponds to the current signal (measurement or set value). The light intensity variation may be one of the following four steps: Off, low, medium and full.

5 Beckhoff Bus Terminals

- BK9050 Ethernet TCP/IP "Compact" Bus Coupler for up to 64 Bus Terminals, distance 100 m between hub/switch and Bus Coupler
- KL3142 2-channel analog input terminal, 0...20 mA, 16 bit, differential input
- KL3054 4-channel analog input terminal, 4...20 mA, 12 bit, single-ended
- KL1404 4-channel digital input terminal, 24 V DC, 2-wire
- KL1808 8-channel digital input terminal, 24 V DC, 2-wire
- KL4424 4-channel analog output terminal, 4...20 mA, 12 bit
- KL4428 8-channel analog output terminal, 4...20 mA, 12 bit
- KL2404 4-channel digital output terminal, 24 V DC, 2-wire
- KL2808 8-channel digital output terminal, 24 V DC, 2-wire
- KL9010 End terminal

For further information please refer to <http://www.beckhoff.com/BusTerminal/>.

6 System requirements

6.1 DAA

The evaluation systems may only be used for the purpose of emission monitoring. In the following, the system requirements for a PC with only DAA running are specified.

Characteristic	Configuration
Processor	minimum Intel Atom Z510 A more powerful CPU may become necessary for “large” parameterizations.
Operating system	Windows XP embedded (32 Bit) Windows 7 Professional (32 Bit und 64 Bit) Windows 8 Professional (32 Bit und 64 Bit) Windows Server 2008 R2 – Standard (64 Bit) Windows Server 2012 R2 – Standard (64 Bit)
RAM	minimum 1 GB for Windows XPe/7 (32 Bit) minimum 2 GB for Windows 7 (64 Bit) minimum 4 GB for Server 2008 R2 (64 Bit) minimum 4 GB for Server 2012 R2 (64 Bit)
Hard drive/SSD	The more storage space available to DAA, the longer the data can be saved and the more measuring points can be processed. 2 GB storage space shall be considered as minimum.
Network interface	yes

6.2 TALAS/7-IO

Characteristic	Configuration
Network interface	Yes, the modules are connected with 10BaseT on RJ45. Please refer to Annex C for IP address configuration in a private network.
Power supply	External 24 V DC or PoE (Power over Ethernet)

7 Maintenance

7.1 System messages

DAA records errors into its system messages and transmits them to CEM-DAS. It is advised to check these system messages in CEM-DAS in order to assure that DAA is operating as intended. Arrays {0} and {1} are identical for all system messages, starting from {3} the arrays are message-specific.

- {0} Time of the message
- {1} Consecutive message number (Modulo 512)

The following system messages are generated by DAA:

{0} [{1}] DAA {3} initialization successful

- {3} designation of DAA in CEM-DAS
- The initialization after a restart or reset is done successfully.

{0} [{1}] DAA restart software version {5} / last processing {4}

- {4} Time of last processing
 - {5} Version of DAA³
- This message is reported if the reason for restart or reset is known.

{0} [{1}] DAA power failure software version {5} / last processing {4}

- {4} Time of last processing
 - {5} Version of DAA³
- This message is reported if the reason for restart or reset is unknown.

{0} [{1}] Program exit due to user input

DAA was terminated by user.

{0} [{1}] Program exit due to shutdown of operating system

DAA was terminated by operating system.

{0} [{1}] Program exit due to shutdown of service

DAA was terminated because DAA service stopped.

{0} [{1}] Program reset/exit due to [{3}]

- {3} name of the program (see Section 3.2).
- DAA program was terminated or restarted because it does not work properly.

{0} [{1}] program reset due to user input

DAA program was terminated by user input.

{0} [{1}] program reset due to new parameters

DAA reset due to new parameters.

³ Certified installations of CEM-DAS display a version number like 7.2(004). Non certified installations display a build date like 2017(02) [year(month)].

{0} {{1}} New parameters loaded / Revision {3}{5} subrevision {4}

{3} Revision of the parameter.

{4} Date of the parameter status.

{5} The flag "!" is printed if the CEM-DAS parameter were not released.

This message follows the message "program reset due to new parameter".

{0} {{1}} Hardware-Watchdog not configured

Hardware-Watchdog is not configured for DAA.

{0} {{1}} Hardware-Watchdog {{3}} initialized and activated

{3} Designation of the Hardware-Watchdog

Hardware-Watchdog is activated properly.

{0} {{1}} Hardware-Watchdog {{3}} error {{4}}

{3} Designation of the Hardware-Watchdog

{4} Error number and error message

The configured Hardware-Watchdog is unknown, is not initialized or is not activated.

Hardware-Watchdog is not available.

{0} {{1}} Hardware-Watchdog {{3}} unknown type

{3} Designation of the Hardware-Watchdog

The configured Hardware-Watchdog is unknown.

{0} {{1}} IO-Module {{3}}/{{4}} Receive error {{5}}

{3} Designation of TALAS/7-IO module

{4} IP4 address of the TALAS/7-IO module

{5} Error number or error message.

Receive error in the UDP telegram form TALAS/7-IO module.

{0} {{1}} IO-Module {{3}}/{{4}} No more telegrams received

{3} Designation of TALAS/7-IO module

{4} IP4 address of the TALAS/7-IO module

UDP telegrams form TALAS/7-IO module are received no longer. Either the module is damaged or the network is disconnected.

{0} {{1}} IO-Module {{3}}/{{4}} Transmit error {{5}}

{3} Designation of TALAS/7-IO module

{4} IP4 address of the TALAS/7-IO module

{5} Error number or error message.

Transmitting to TALAS/7-IO module is corrupted.

{0} {{1}} IO-Module {{3}}/{{4}} Control point

{3} Designation of TALAS/7-IO module

{4} IP4 address of the TALAS/7-IO module

Sending control points to the TALAS/7-IO module is corrupted.

{0} {{1}} IO-Module {{3}}/{{4}} OK

{3} Designation of TALAS/7-IO module

{4} IP4 Adresse of the TALAS/7-IO module

TALAS/7-IO module is readjusted.

{0} [{1}] Thread [{3}] Receive error [{4}]

{3} Designation of the DAA thread

{4} Error number or error message

Receiving telegrams is corrupted.

{0} [{1}] Thread [{3}] No more telegrams received

{3} Designation of the DAA thread

Receiving no more telegrams.

{0} [{1}] Thread [{3}] OK

{3} Designation of the DAA thread

The DAA thread is working properly.

{0} [{1}] Error reading parameters

Reading parameter is incorrect. DAA starts without parameter and calculates no data.

Reasons:

- No file ,Transfer7'
- No file parameter
- No file checksum
- Corrupted checksum
- File paramter corrupted

{0} [{1}] standby system started / no connection

No data processing, only a connection is established. This message is reported if no parameter exist DAA starts with errors.

{0} [{1}] IO-Module [{3}/{4}] Connection established

{3} Designation of TALAS/7-IO module

{4} IP4 address of the TALAS/7-IO module

TCP network is connected.

{0} [{1}] IO-Module [{3}/{4}] No connection

{3} Designation of TALAS/7-IO module

{4} IP4 address of the TALAS/7-IO module

TCP network is disconnected.

{0} [{1}] Inspection modus +++ ON +++

Inspection mode for some DAA entities is activated.

{0} [{1}] Inspection modus --- OFF ---

Inspection mode for DAA is deactivated.

{0} [{1}] Simulation modus +++ ON +++

Simulation mode for DAA is activated.

{0} [{1}] Simulation modus --- OFF ---

Simulation mode for DAA is deactivated.

{0} [{1}] Backup system [{3}] Connection established

{3} IP4 address of the DAA-backup system
DAA-Backup system⁴ is connected.

{0} [{1}] Backup system [{3}] No Connection

{3} IP4 address of the DAA-backup system
DAA-Backup system is not connected. Automatic retries are following. Just a DAA-Master can send this message.

{0} [{1}] Replacement device {3} is being used for device {4}

{3} Designation of the replacement device
{4} Designation of the TALAS/7-IO module
A prepared and configured device is replaced for the faulty TALAS/7-IO module. The IP address of the faulty device is switched to the replacement.

{0} [{1}] Too many replacement devices {3}

{3} Designation of the replacement device
There are more than one replacement device of the same type. DAA cannot decide which device is in use.

{0} [{1}] Too many defect devices {3}

{3} Designation of the defect TALAS/7-IO module
There are more than one defect device of the same type. DAA cannot decide which device is to replace.

{0} [{1}] Test modus +++ ON +++

Unreleased revision of parameter is used.

{0} [{1}] Test modus --- OFF ---

Released revision is now used.

{0} [{1}] System maintenance +++ ON +++

DAA is in test modus or simulation modus.

{0} [{1}] System maintenance --- OFF --- Period {3} h:mi

{3} Length of maintenance in ,h:mi'.
DAA finished test modus or simulation modus.

{0} [{1}] New program version {3}

{3} Version of program ,1.x (nnn)'.
DAA is running in a new version.

{0} [{1}] Update Program reset due to new program version

A new version is existing. DAA will stop.

{0} [{1}] DAA initialization finished

All stored data are deleted.

⁴ DAA backup system may be exist in a CEM-DAS replication/redundance system.

{0} [{1}] AMS [{3}] in normal operation

{3} Designation of AMS

AMS is not in simulation and reference material is not applied.

{0} [{1}] AMS [{3}] in Simulation mode

{3} Designation of AMS

At least one measured component is in simulation. Reference material is applied.

{0} [{1}] AMS [{3}] with reference material

{3} Designation of AMS

Reference material is applied, but no measured component is in simulation.

{0} [{1}] AMS [{3}] in simulation / with reference material

{3} Designation of AMS

At least one measured component is in simulation. Reference material is applied.

{0} [{1}] Update Incorrect new program version

Files of a new version were not properly transmitted.

{0} [{1}] Update Can not start up new program version

New version is corrupted or terminates.

{0} [{1}] Update Can not start up new DAA version

New version is corrupted or terminates.

{0} [{1}] Replacement device {3} is NOT being used for device {4}

{3} Designation of the replacement device

{4} Designation of the TALAS/7-IO module

A prepared and configured device cannot be replaced for the faulty TALAS/7-IO module.

7.2 System status

Internal system statuses (life signals) are generated in DAA. During parameterization, these can be put out to any digital output of a TALAS/7-IO module. For all system statuses, the “OK” status (i.e. no error, no fault etc.) is put out as 1 (DO set). Hence if no DO is set (0), there is an error or a fault in DAA or CEM-DAS. The following system statuses are available for DAA:

System status	Meaning
CEM-DAS-LDA1 CEM-DAS-LDA2 ... CEM-DAS-LDA8	Life signal of CEM-DAS (always parameterized) The significance of these system statuses of CEM-DAS depend on the parameterization of CEM-DAS. They can be used for monitoring the communication with a DAA, for remote emissions monitoring or the backup monitoring. These system statuses of CEM-DAS are cyclically transmitted to and evaluated by DAA.
CEM-DAS-OK	This system status is 1 when all parameterized system statuses CEM-DAS-LDA1 to CEM-DAS-LDA8 are set to 1. Non-parameterized CEM-DAS system statuses are ignored. This system status is set to 0 if no more new system statuses arrive from CEM-DAS for 5 minutes, since there is no longer a connection to CEM-DAS. Also in this case all CEM-DAS system statuses CEM-DAS-LDA1 to CEM-DAS-LDA8 are set to 0.
RUN-OK	All program units ⁵ of DAA have identified no errors or faults.
PAR-OK	This system status is 1 under the following conditions: <ul style="list-style-type: none"> - Parameters are available - The parameters originate from a released revision - There are no new parameters (complete state of the DAA parameters) from a released revision in CEM-DAS.
DEV-OK	This system status is 1 under the following conditions: <ul style="list-style-type: none"> - The data are received by all TALAS/7-IO modules - No errors were detected when checking all control points (DO, AO)
TALAS-OK	This system status is 1 under the following conditions: <ul style="list-style-type: none"> - DEV-OK = 1 - RUN-OK = 1 - Parameters are available - DAA does not run in standby mode⁶ - DAA does not run in test mode⁷
SYSTEM-OK	This system status is 1 under the following conditions: <ul style="list-style-type: none"> - DAA-OK = 1 - PAR-OK = 1 - CEM-DAS-OK = 1 - DAA does not run in simulation mode⁸ - DAA does not run in inspection mode⁹

If a fatal error occurs during startup of DAA, the program will be stopped. This may occur due to hard disk errors or other problems related to the operating system.

⁵ See Section 3

⁶ If an error occurred during startup of DAA or if no parameters could be read in, DAA will start in standby mode.

⁷ DAA is in test mode if the available parameters originate from a non-released revision.

⁸ DAA is in simulation mode if inputs (AIN, BIN) or outputs (AOUT, BOUT) have simulated values.

⁹ DAA is in inspection mode if individual measuring points (AMS) are reviewed by a surveyor (with simulated values, as appropriate).

In standby mode no measured values are acquired and no last slow averages are generated. However, DAA can be accessed via the network and parameters can be loaded.

In general, the TALAS/7-IO modules maintain their control points (DO, AO) and do not automatically reset them. For this reason, one DO that is used for output of a system status should be set to MONOFLOP mode.

7.3 Replacement devices

The parameterization of DAA allows for determining a replacement device with a defined IP4 address.

If a TALAS/7-IO module fails, DAA will search for a suitable and parameterized replacement device that was installed for the defective module. If it finds such a replacement device, the IP4 address of the replacement device will be switched to the address of the defective module. After that, the values of the replacement device are used in DAA.

If several TALAS/7-IO modules of the same type fail, the module with the “lowest” IP4 address will be switched first.

A maximum of one replacement device may be installed, since otherwise DAA would not be able to decide which replacement device to use.

TALAS/7-IO modules must be located in a private network (see Annex C).

8 Installation

8.1 Introduction

This chapter describes initial installation of DAA. For a system update only Section 8.5 has to be performed.

If DAA is installed on an CEM-DAS PC, one may jump directly to Section 8.5.

8.2 Preparation

A PC with one hard disk with a C partition is sufficient for DAA.

8.3 Windows

After configuration of the hard disks the operating system is installed on partition C.

After that a user profile “CEM-DAS” is created. All subsequent installations are to be performed with this user profile. The password is marked as “always valid”. The user is allocated to the group of administrators.

8.4 Firewall

In order to allow receipt of the UDP telegrams of the TALAS/7-IO modules by DAA, a rule has to be parameterized in the Windows firewall. By default, the TALAS/7-IO modules send their UDP to port 49153.

If DAA is installed on a separate PC, the firewall must also allow the TCP requests from CEM-DAS on ports 5000 – 5010. For this reason, another incoming rule must be parameterized. This rule is not required if DAA is installed on the CEM-DAS PC.

By default, remote desktop access is not possible via “public” networks in Windows. The incoming rule “Properties of remote desktop (TCP incoming)” is only enabled for domain and private networks. For security reasons this rule should also be enabled for a public network.

See Annex D for configuration of the firewall.

8.5 DAA

DAA is delivered in an installation file that includes the version in its name. For example, the installation file for version 1.2(004) is “cem-daa-1.2(004).exe”.

For installation this file must be executed and the files must be installed to “C:\CEM-DAA”. This directory should be set by default.

Installation can also be performed when DAA is executed as a program or a service. After installation of the new program files DAA will be stopped and immediately restarted. Before restart of DAA the new program file will be copied to “daa.exe”.

The following message is displayed after the installation file is called up.

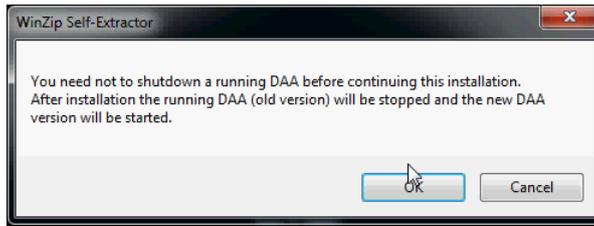


Figure 13 Advice for installation

After closing the dialog with OK the next dialog will be shown.

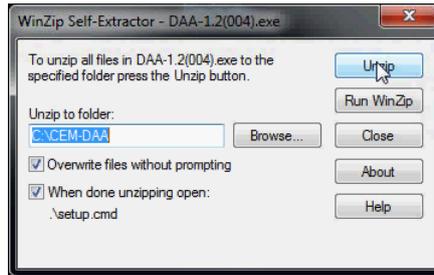


Figure 14 Installation of DAA

Installation starts by clicking UNZIP. The two options “Overwrite files without prompting” and “When done unzipping ...” must not be disabled, since otherwise the installation cannot be executed correctly .

Further steps will be executed after installation. These are displayed in messages, which require keyboard entries at certain points.

When installing DAA on an CEM-DAS PC, several icons for DAA are created in the folder “CEM-DAS”. On a separate PC, these icons will be created directly on the desktop.

DAA can be started as a Windows service upon system startup, or as a program after user registration.

During the installation the required Windows service (CEM-DAA ...) is already registered, but not yet automatically started during system startup (set to “manual”). If DAA shall be started as a Windows service, the start type must be set to “automatic”.

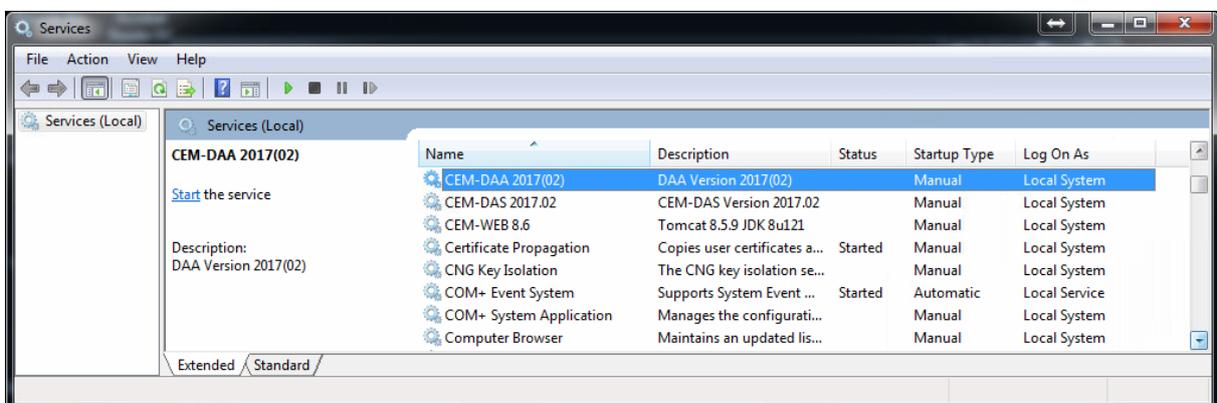


Figure 15 Installed service for DAA

If DAA shall be executed under the user “CEM-DAS”, then this user must be automatically logged in during system startup. Also, the icon “DAA startup” must be stored in its autostart folder.

As the DAA program requires administrator rights, user access control must be disabled.

After startup of DAA the PC can be automatically locked¹⁰, so that no access to the PC is possible after an automatic restart of the system.

8.6 Parameterization

Parameterization of DAA is described in the CEM-DAS user manual /1/. The parameterization interface is integrated into CEM-DAS and can be operated via the web browser.

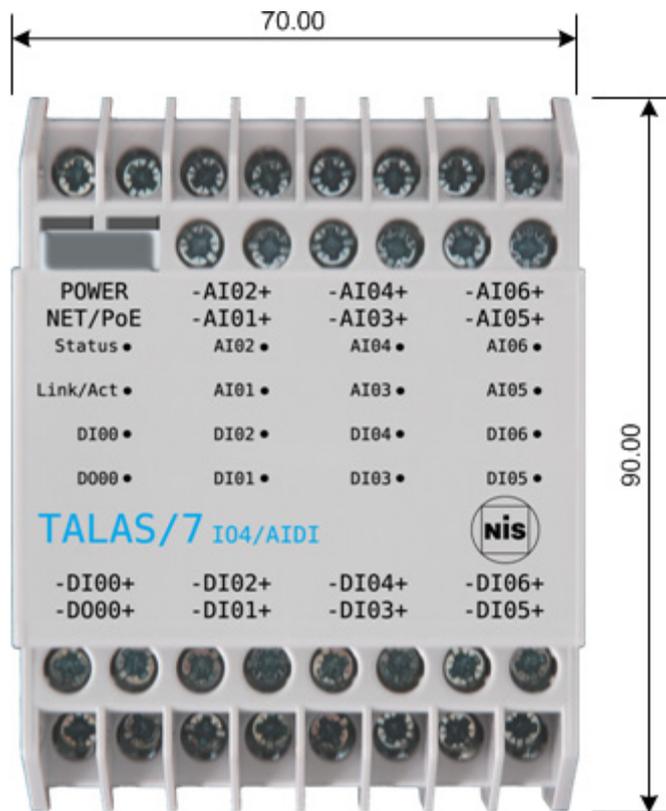
¹⁰Set environment variable CEMDAA_LOCK_STATION=TRUE

9 Related documents

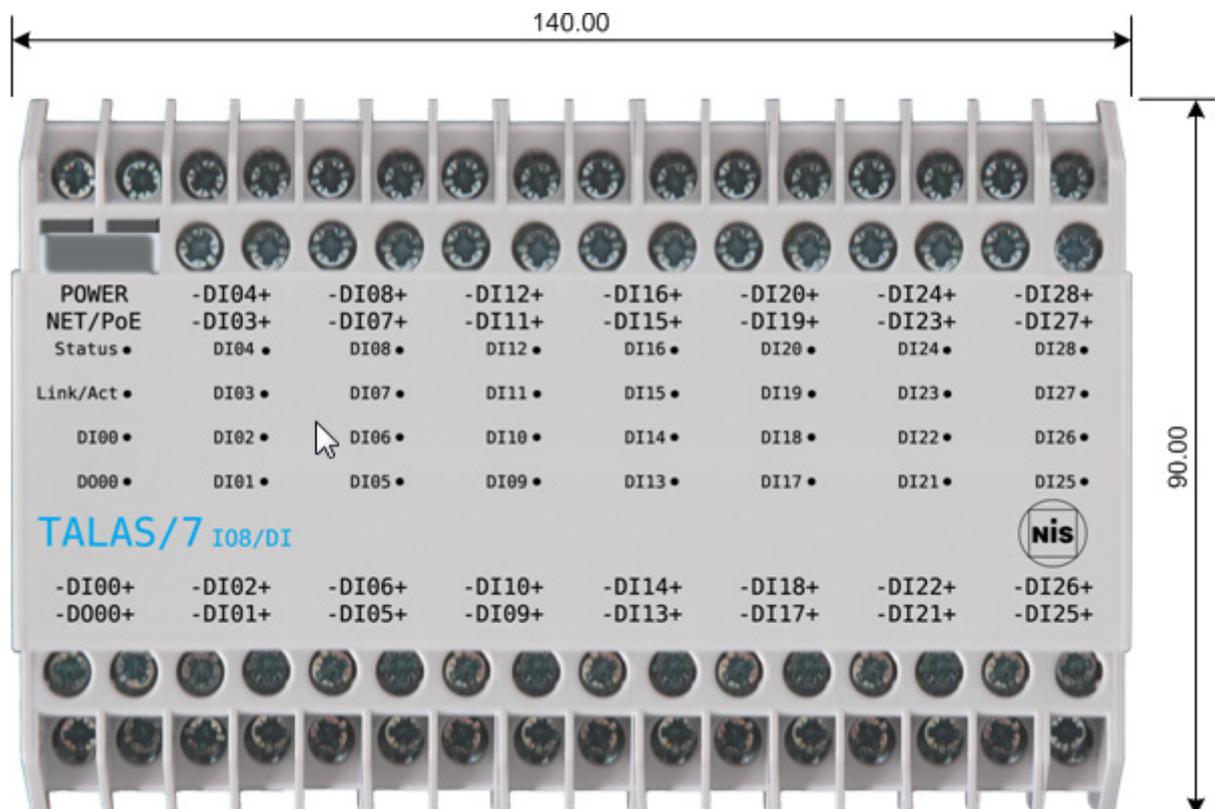
No.	Document No.	Title
/1/	OI/CEM-DAS-EN	CEM-DAS User's manual
/2/	TD/DAA-MI-EN	DAA Modbus interface manual
/3/	TD/CEM-DAS-DI-EN	CEM-DAS Digital interface manual

10 Annex A Dimensions of the TALAS/7-IO modules

10.1 TALAS/7-IO4



10.2 TALAS/7-IO8

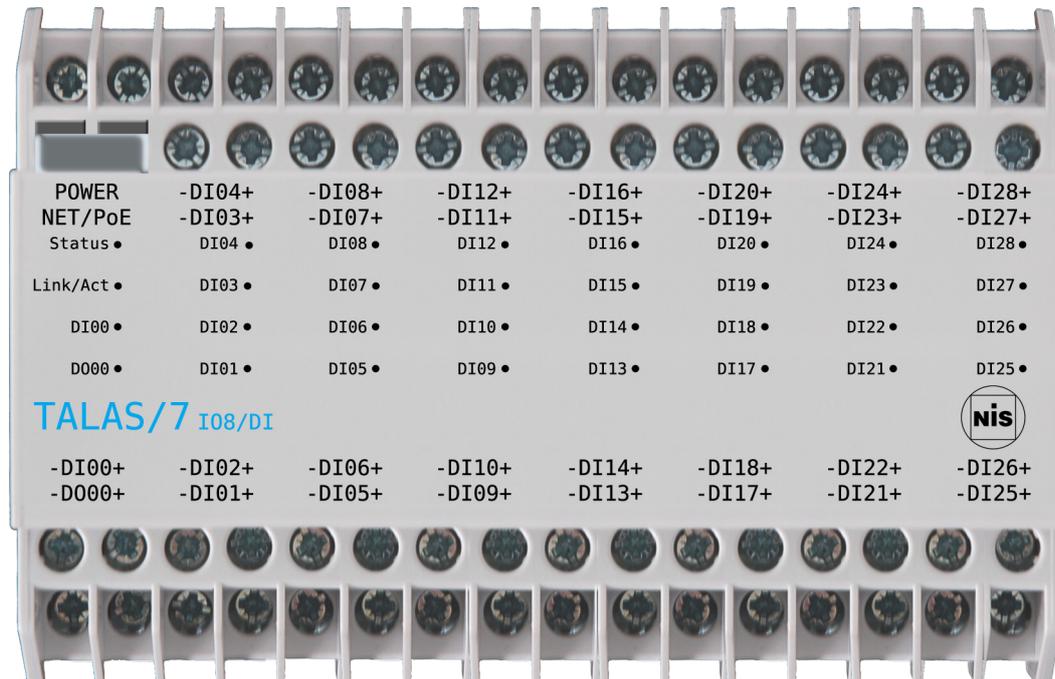


11 Annex B Layout of the TALAS/7-IO modules

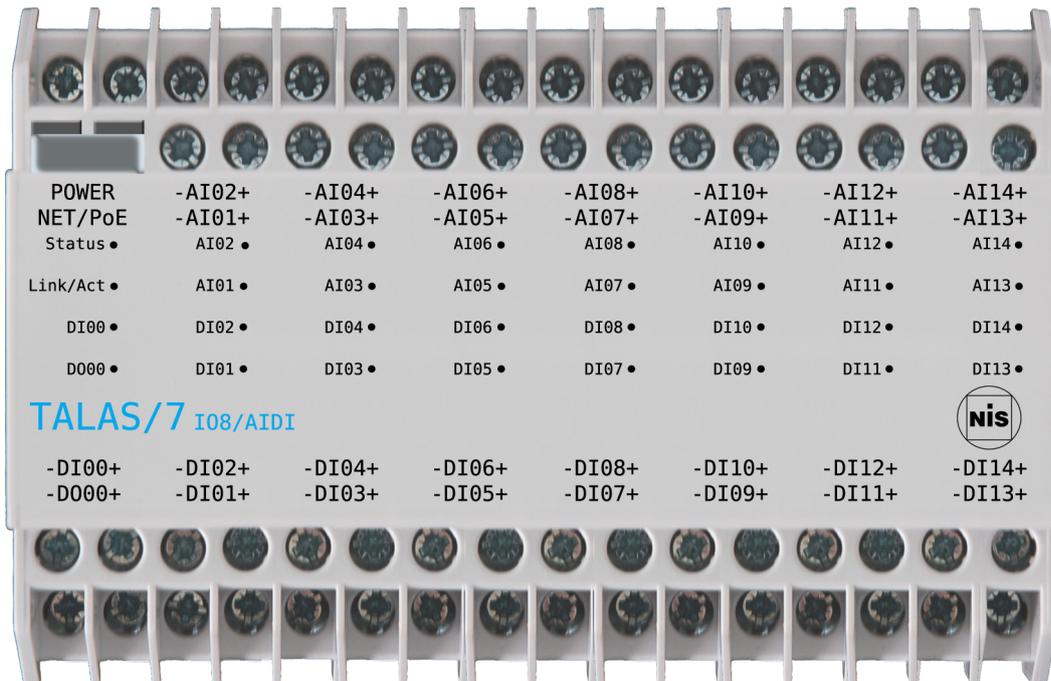
11.1 TALAS/7-IO8/AI



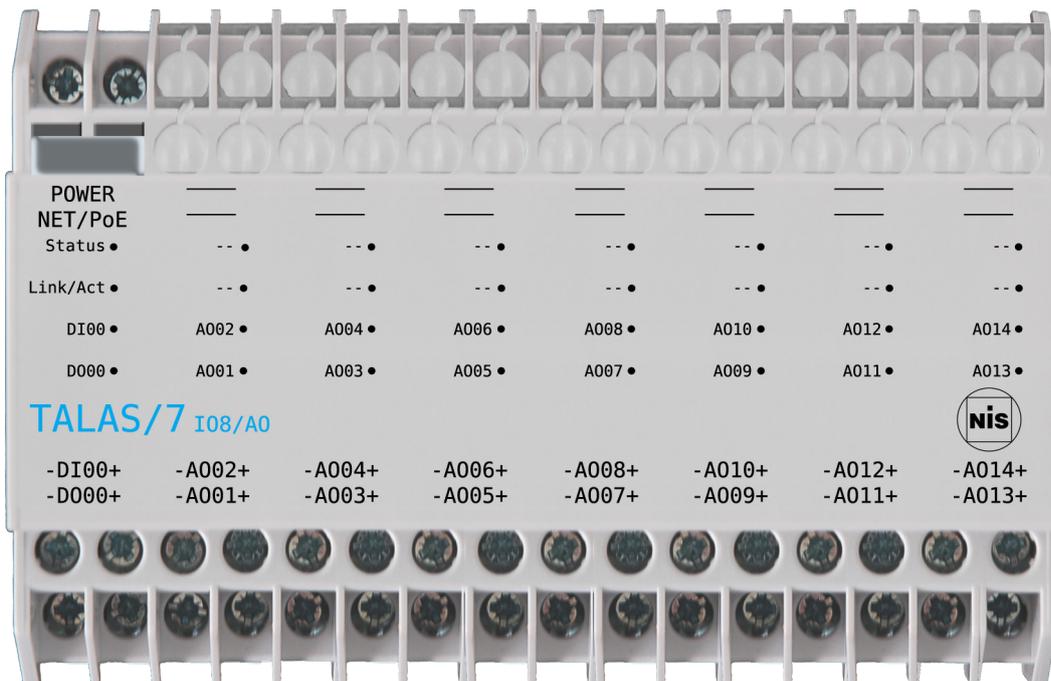
11.2 TALAS/7-IO8/DI



11.3 TALAS/7-IO8/AIDI



11.4 TALAS/7-IO8/AO



11.5 TALAS/7-IO4/AI, TALAS/7-IO4/DI



11.6 TALAS/7-IO4/AIDI, TALAS/7-IO4/DIDO



11.7 TALAS/7-IO4/AO, TALAS/7-IO4/DO



11.8 TALAS/7-IO4/AODO



12 Annex C Private network

The TALAS/7-IO modules should be connected to the DAA host system via a private network in order to avoid any possible interruption of the emissions monitoring process due to other devices on the network.

The private network IP ranges are preconfigured for the subnet 192.168.0.0/24. This corresponds to a useable address range of 192.168.0.1 to 192.168.0.254. These IP addresses are utilized as follows:

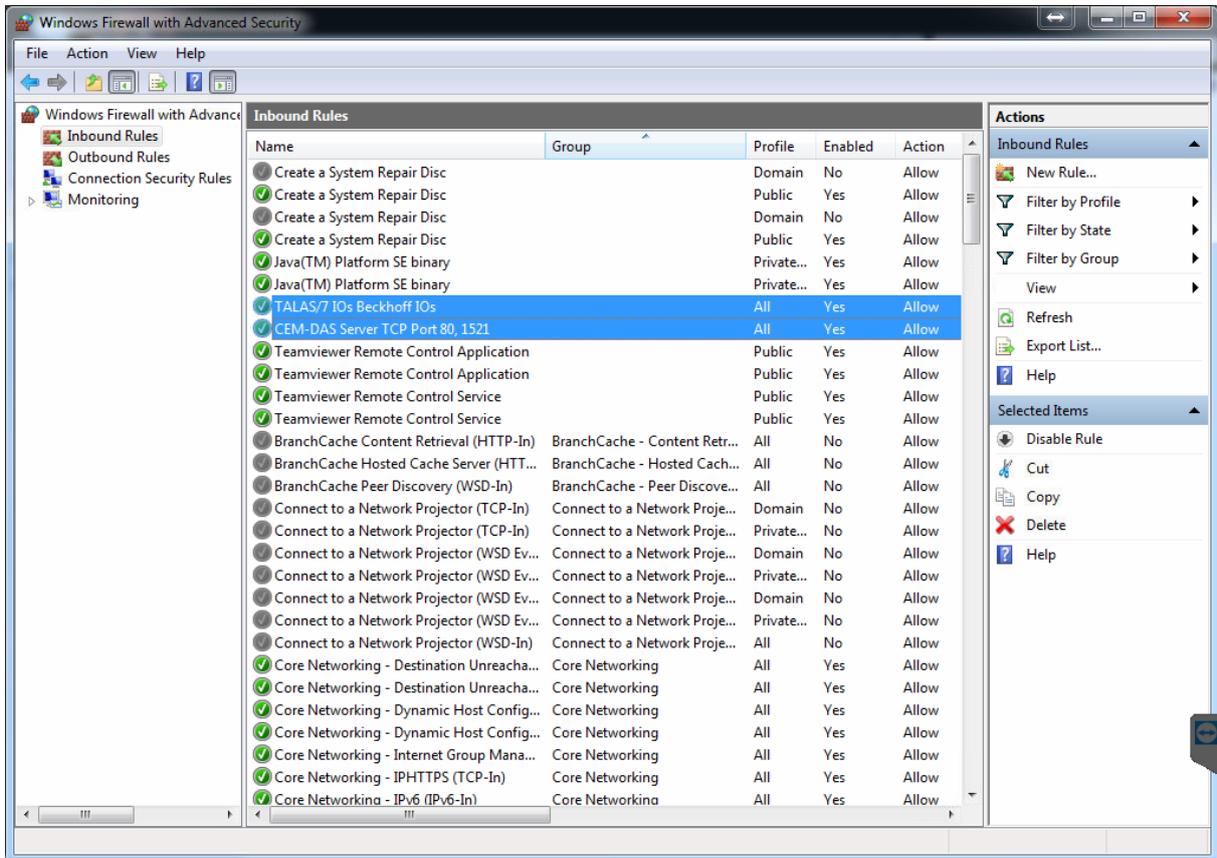
Host number	Usage
001	CEM-DAS (Master)
002	CEM-DAS (Backup)
003 – 024	DAA
025 – 049	TALAS/7-IO4/AI and -IO8/AI
050 – 074	TALAS/7-IO4/DI and -IO8/DI
075 – 099	TALAS/7-IO4/AO and -IO8/AO
100 – 124	TALAS/7-IO4/DO
125 – 149	TALAS/7-IO4/AIDI and -IO8/AIDI
150 – 174	TALAS/7-IO4/DIDO
175 – 199	TALAS/7-IO4/AODO
200 – 224	Reserved
225	NAS server
226	UNIGATE CL-FE / Anybus X-Gateway
227 – 249	Other systems (switch, converter, ...)
250 – 253	Reserved
254	TALAS/7-IO replacement device

If the DAA host und CEM-DAS systems are configured as described Variant 1 of the Figure 3, then the following private IP addresses, of the subnet 192.168.1.0/24, are to be used:

Host number	Usage
001	CEM-DAS (Master)
002	CEM-DAS (Backup)
003 – 024	DAA
025 – 224	Reserved
225	NAS server
226	UNIGATE CL-FE / Anybus X-Gateway
227 – 249	Other systems (switch, converter, ...)
250 – 254	Reserved

13 Annex D Setup of the firewall

After selecting the menu item “Advanced settings” the following window will appear. Select item “Inbound rules” in the left part of the window.

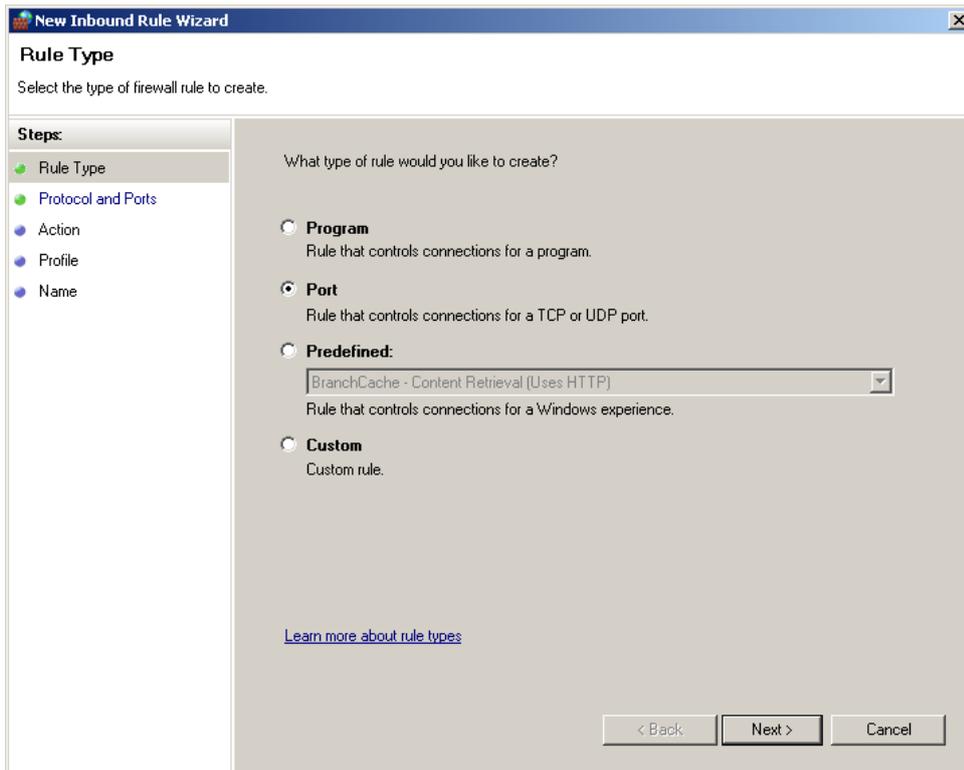


Two incoming rules are to be set via “Actions / Inbound Rules / New Rule ...” (right part of the window).

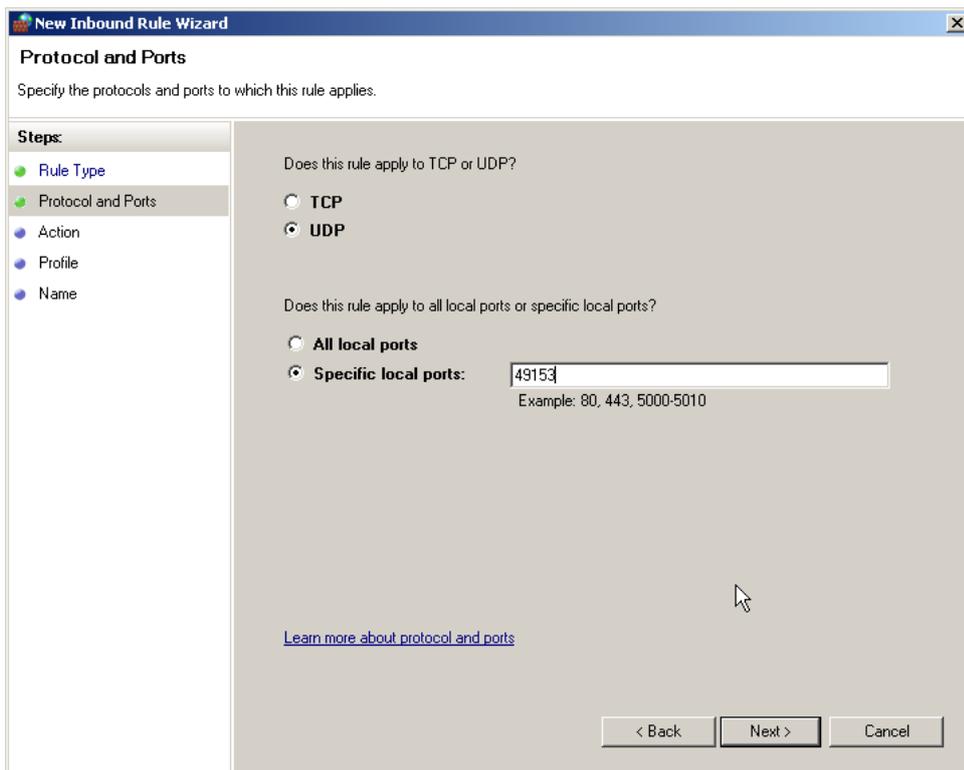
The first rule (R1) ensures that the UDP telegrams of the TALAS/7-IO modules are not blocked.

The second rule (R2) allows TCP request of the coupling program “dasdaa” from CEM-DAS.

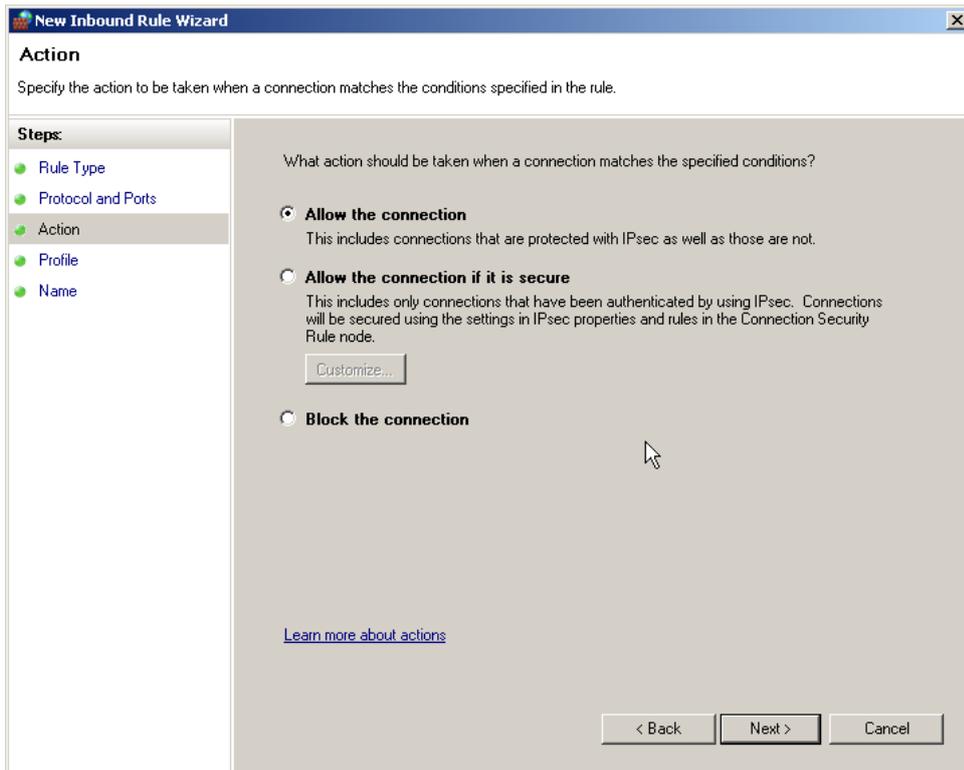
An assistant guides the user through the required inputs.



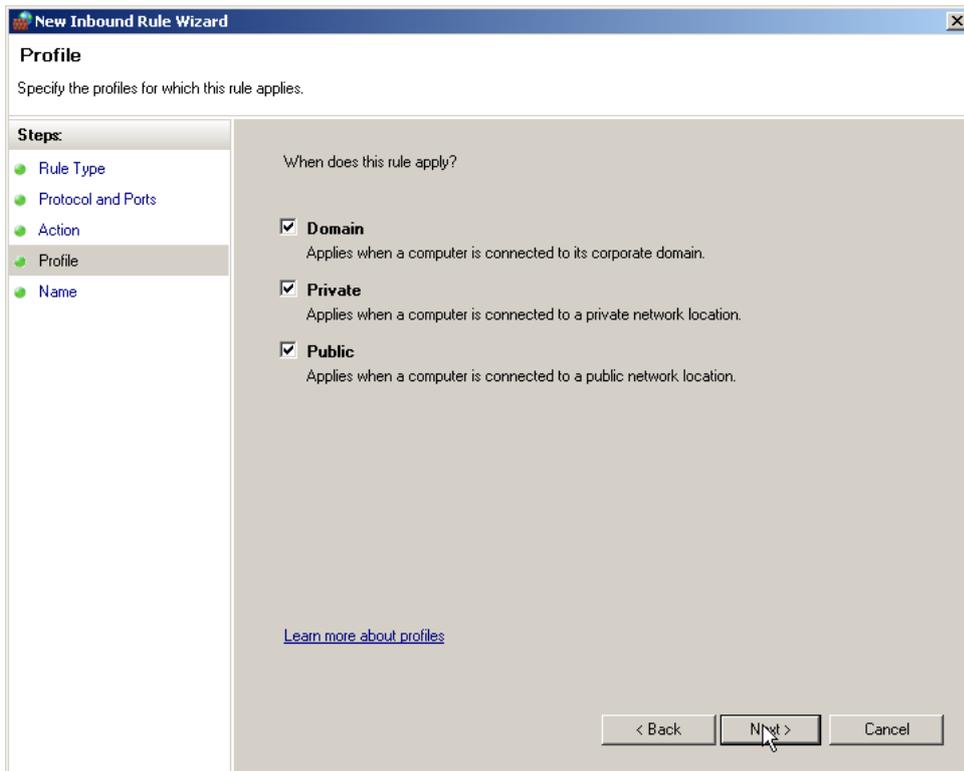
Select PORT and click NEXT>



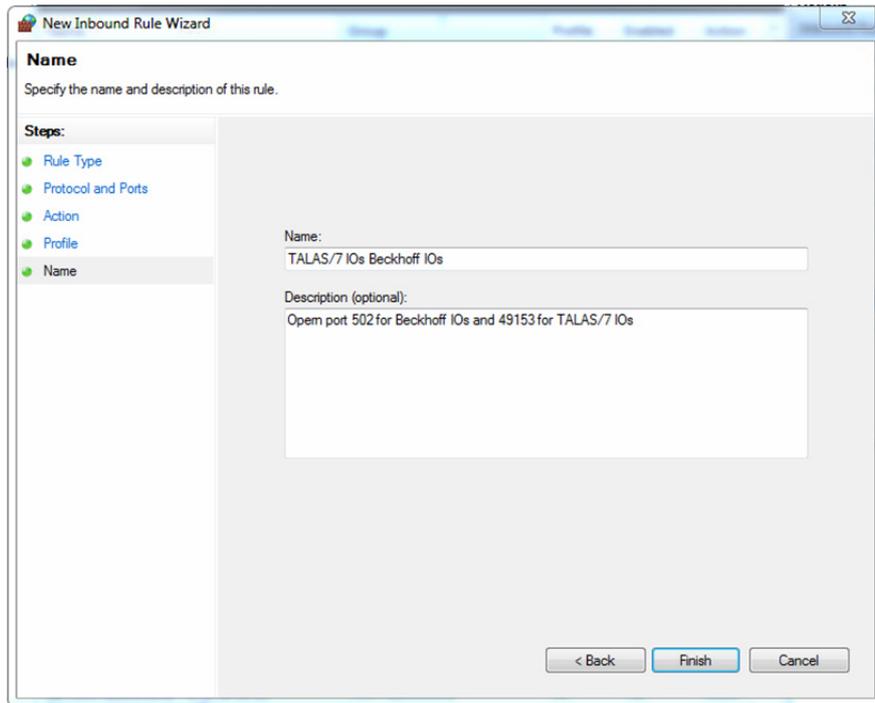
Select UDP for rule R1 and enter specific local port 49153. Select TCP for rule R2 and enter port range 5000 – 5010. Click NEXT>



Select "ALLOW THE CONNECTION" and click NEXT>.



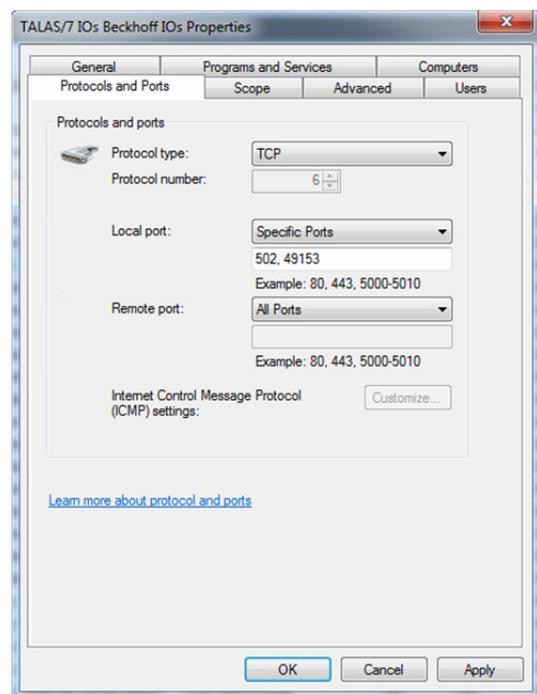
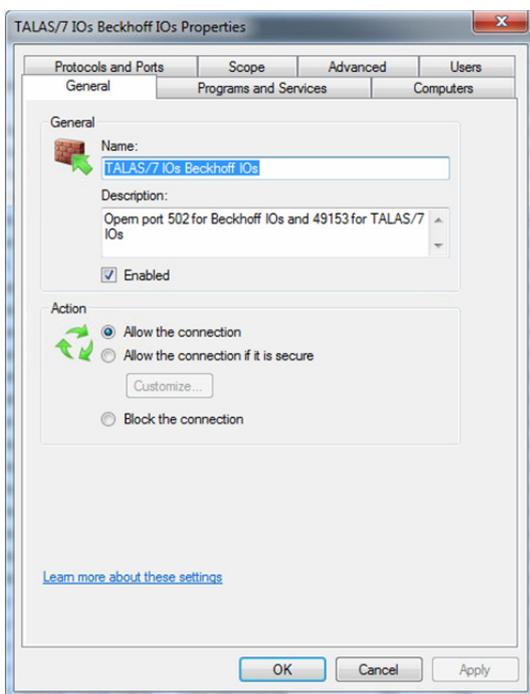
Select all three items and click NEXT>



Enter name and description and complete the rule by clicking FINISH.

For rule R1 enter the name and description as shown above.

For rule R2 enter “DAA – CEM-DAS” as the name and “Enable port range 5000-5010 for CEM-DAS” as description.



It is important that the rule is “active” and the connection is allowed. Name and description are for information only.

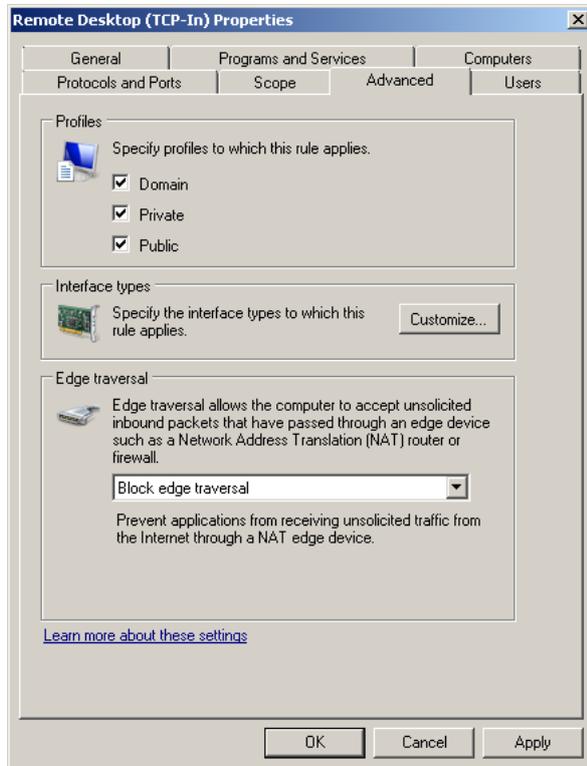
For rule R1 it is important that port 49153 and protocol UDP are entered. In addition, all remote ports (= TALAS/7-IO modules) must be selected.

For rule R2 it is important that port range 5000 – 5010 and protocol TCP are entered and that all remote ports (= CEM-DAS) are selected.

Setup for Remote Desktop Access

By default, the remote desktop is only enabled for a network of the type “domain” and “private”. If the network type is “public”, remote desktop access to the PC is not possible.

For this reason the incoming rule “Remote desktop properties (TCP incoming)” shall also be enabled for public networks.



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Sales



Service