DCS800 12-pulse parallel & excitation parameters e j.DOC

1 DCS800 parameters 12-pulse parallel

Before starting with the commissioning set all parameters to default by means of *ApplMacro (99.08)* = **Factory** and *ApplRestore (99.07)* = **Yes**. Check with *MacroSel (8.10)*.

Parameter	Master	Slave	Comments
CommandSel (10.01)	0 = **Local I/O** (def.), 1 = **MainCtrlWord**	3 = **12PLink**	
E Stop (10.09)	5 = **DI5** (def.)	0 = **NotUsed**	Slave = **NotUsed** (otherwise the E Stop works only as coast stop)
SpeedFbFltSel (30.17)	1 = **Fault** (def.)	0 = **NotUsed**	Slave = **NotUsed** to suppress **F522 SpeedFb**
OperModeSel (43.01)	2 = **12PParMaster**	3 = **12PParSlave**	
12P Mode (47.01)	0 = **Normal** (def.)	0 = **Normal** (def.)	
M1SpeedScale (50.01)	xxx rpm	xxx rpm	n_{max} = xxx rpm; set to maximum absolute motor speed
M1SpeedFbSel (50.03)	0 = **EMF** (def.), 1 = **Encoder**, 2 = **Tacho**	3 = **External**	Slave = **External** to suppress **F532 MotOverSpeed**
M1EncPulseNo (50.04)	xxx ppr	n.a.	
12P TimeOut (94.03)	≥ 15 ms	≥ 15 ms	
AdjUDC (97.23)	100 % (def.)	100 % (def.)	do not change for 12-pulse parallel
M1NomVolt (99.02)	xxx V	xxx V	U_{MotN} = xxx V* or 2 * U_{MotN} = xxx V*; used for EMF speed feedback
M1NomCur (99.03)	xxx A	xxx A	0.5 * I_{MotN} = xxx A* or I_{MotN} = xxx A*
M1BaseSpeed (99.04)	xxx rpm	xxx rpm	n_{Base} = xxx rpm; set to motor base speed
NomMainsVolt (99.10)	xxx V	xxx V	U_{NetN} = xxx V; nominal supply voltage (AC)

* depends on the motor configuration (see presentation DCS800 12-pulse)

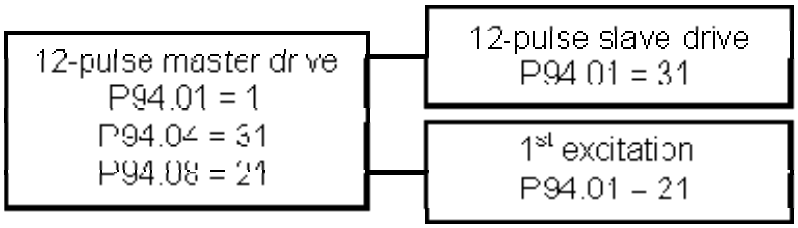
2 Following parameters must match in master and slave

Parameter	Master	Slave	Comments
M1CurLimBrdg1 (20.12)	xxx %	xxx %	
M1CurLimBrdg2 (20.13)	xxx %	xxx %	
ArmAlphaMax (20.14)	150° (def.)	150° (def.)	
ArmAlphaMin (20.15)	15° (def.)	15° (def.)	
CurRefSlope (43.04)	10 %/ms (def.)	10 %/ms (def.)	
ControlModeSel (43.05)	0 (def.)	0 (def.)	both = **Standard**
M1KpArmCur (43.06)	xxx	xxx	
M1TiArmCur (43.07)	xxx ms	xxx ms	
M1DiscontCurLim (43.08)	xxx %	xxx %	
M1ArmL (43.09)	xxx mH	xxx mH	
M1ArmR (43.10)	xxx mΩ	xxx mΩ	
RevDly (43.14)	20 ms	20 ms	after a command to change current direction the opposite current has to be reached before *ZeroCurTimeOut (97.19)* has been elapsed, (47.05) > (97.19) > (43.14)
RevVoltMargin (44.21)	xxx %	xxx %	must match in master and slave for firmware version **1.70 and higher**
	xxx %	xxx % -3 %	for firmware version **1.50 and lower** always set value in slave 3 % lower than in master
ZeroCurTimeOut (97.19)	70 ms	70 ms	after a command to change current direction the opposite current has to be reached before *ZeroCurTimeOut (97.19)* has been elapsed, (47.05) > (97.19) > (43.14)

3 DCSLink

Parameter	Master	Slave	Comments
DCSLinkNodeID (94.01)	1	31	
12P Slave Node (94.04)	31 (def.)	n.a.	

Parameter	Master	Excitation	Comments
DCSLinkNodeID (94.01)	1	21	
M1FexNode (94.08)	21 (def.)	n.a.	



4 Limits

Parameter	**Armature**	**Comments**
Speed		
M1SpeedMin (20.01)	xxx rpm	
M1SpeedMax (20.02)	xxx rpm	
ZeroSpeedLim (20.03)	xxx rpm	typical 1 % of n_{max} (maximum absolute motor speed)
Torque		
TorqMax (20.05)	xxx %	
TorqMin (20.06)	xxx %	
Current		
M1CurLimBrdg1 (20.12)	xxx %	
M1CurLimBrdg2 (20.13)	xxx %	
Firing angle		
ArmAlphaMax (20.14)	150° (def.)	
ArmAlphaMin (20.15)	15° (def.)	
Current rise		
CurRefSlope (43.04)	10 %/ms (def.)	

5 Converter protections

Parameter	**Armature**	**Comments**
Armature Overcurrent		Firmware manual chapter Fault tracing
ArmOvrCurLev (30.09)	xxx %	I_{LIM} = xxx A
Reversal fault		Firmware manual chapter Fault tracing
RevDly (43.14)	20 ms	after a command to change current direction the opposite current has to be reached before *ZeroCurTimeOut (97.19)* has been elapsed, (47.05) > (97.19) > (43.14)
12P RevTimeOut (47.05)	100 ms	active only in 12-pulse master (47.05) > (97.19) > (43.14)
ZeroCurTimeOut (97.19)	70 ms	after a command to change current direction the opposite current has to be reached before *ZeroCurTimeOut (97.19)* has been elapsed, (47.05) > (97.19) > (43.14)
Current difference		Firmware manual chapter 12-pulse
DiffCurLim (47.02)	20 %	active only in 12-pulse master
DiffCurDly (47.03)	500 ms	active only in 12-pulse master

6 Motor protections

Parameter	**Armature**	**Comments**
Stall protection		Firmware manual chapter Fault tracing
StallTime (30.01)		
StallSpeed (30.02)		
StallTorq (30.03)		
Armature overvoltage		Firmware manual chapter Fault tracing
ArmOvrVoltLev (30.08)		
Overspeed protection		Firmware manual chapter Fault tracing
M1OvrSpeed (30.16)	xxx rpm	typical 110 % of n_{max} (maximum absolute motor speed)
Motor thermal model		Firmware manual chapter Fault tracing
M1ModelTime (31.01)		
M1AlarmLimLoad (31.03)		
M1FaultLimLoad (31.04)		
Measured motor temperature		Firmware manual chapter Fault tracing
M1TempSel (31.05)		
M1AlarmLimTemp (31.06)		
M1FaultLimTemp (31.07)		
Klixon		Firmware manual chapter Fault tracing
M1KlixonSel (31.08)		

7 D6 / D7 settings

Parameter	**Armature**	**Comments**
TypeCode (97.01)		normally set by the factory, to change use *ServiceMode (99.06)* = **SetTypeCode**
S ConvScaleCur (97.02)		automatically taken from type code
S ConvScaleVolt (97.03)		automatically taken from type code
S MaxBrdgTemp (97.04)		automatically taken from type code, air entry temperature can be set to 55 °C in hot motor rooms
S BlockBridge2 (97.07)		automatically taken from type code and thus **Auto**
ServiceMode (99.06)		10 = **SetTypeCode**
Galvanic isolation		
DC / DC transducer	xxx V	e.g. 6 ≡ 810 V for incoming voltage 270 V to 600 V details see Hardware Manual
AC / AC transducer	xxx A	e.g. 2U2, 2V2, 2W2 for incoming voltage 270 V to 600 V details see Hardware Manual

8 Additional settings

Parameter	**Armature**	**Comments**
RevVoltMargin (44.21)	6 % (def.)	safety margin for the motor voltage during regenerative mode
MainsCompTime (97.09)	10 ms (def.)	set to 1100 ms when the current is distributed differently on the thyristors (fast disturbances in current)
CompUkPLL (97.12)	0 % (def.)	set slowly to higher values (e.g. 4), if sync. voltage is disturbed by commutation notches, to be used only with dedicated incoming transformer
KpPLL (97.14)	3.75 (def.)	set to 1 when slow disturbances occur in current
Ch0 NodeAddr (70.01)	<number>	AC 800M
Ch3 NodeAddr (70.22)	<number>	DriveWindow
DeviceNumber (99.09)	<name>	DriveWindow, e.g. name 12-pulse master MASTER and 12-pulse slave SLAVE

9 Excitation parameters for field supplies using DCS800-S0x modules

9.1 In the 12-pulse master module:

Parameter	Master	Comments
M1FldMinTrip (30.12)	xxx %	sets level for **F541 M1FexLowCur**
FldCtrlMode (44.01)	1 = **EMF**	**EMF** controller released, field weakening active - depending on the application
FldMinTripDly (45.18)	2000 ms (def.)	delays **F541 M1FexLowCur**
DCSLinkNodeID (94.01)	1	
M1FexNode (94.08)	21 (def.)	Use the same node number as in *DCSLinkNodeID (94.01)* of the field exciter
FexTimeOut (94.07)	100 ms (def.)	causes **F516 M1FexCom**
M1NomFldCur (99.11)	xxx A	I_{FN} = xxx A, rated field current
M1UsedFexType (99.12)	8 = **DCS800-S01**, 9 = **DCS800-S02**	

9.2 In the excitation module (DCS800-S0x):

Before starting with the commissioning set all parameters to default by means of *ApplMacro (99.08)* = **Factory** and *ApplRestore (99.07)* = **Yes**. Check with *MacroSel (8.10)*.

Parameter	Excitation	Comments
CommandSel (10.01)	4 = **FexLink**	
MotFanAck (10.06)	0 = **NotUsed**	
OvrVoltProt (10.13)	2 = **DI2**	depending on hardware connection to DCF506
ArmOvrVoltLev (30.08)	500 %	to suppress **F503 ArmOverVolt** if this does not help, increase *M1NomVolt (99.02)*
OperModeSel (43.01)	1 = **FieldConv**	
CurSel (43.02)	8 = **FexCurRef**	
M1DiscontCurLim (43.08)	0 %	
RevDly (43.14)	50 ms	
FldCtrlMode (44.01)	0 = **Fix** (def.)	
DCSLinkNodeID (94.01)	21 (def.)	Use the same node number as in *M1FexNode (94.08)* of the armature module
DevLimPLL (97.13)	20 °	to suppress **F514 MainsNotSync**
M1NomVolt (99.02)	xxx V	U_{FN} = xxx V, rated field voltage
M1NomCur (99.03)	xxx A	I_{FN} = xxx A, rated field current
NomMainsVolt (99.10)	xxx V	U_{NetN} = xxx V; nominal supply voltage (AC)
M1UsedFexType (99.12)	0 = **NotUsed**	

10 Autotunings

10.1 Field current autotuning for field supplies using DCS800-S0x modules:

The field current autotuning has to be started directly in the excitation module if a DCS800-S0x is used:

Parameter	Excitation	Comments
ServiceMode (99.06)	2 = **FieldCurAuto**	Give the **On** and **Run** command within 20 s

Note:
This autotuning does not work when started from the DWL wizard.

10.2 Armature current autotuning:

The 12-pulse parallel drive has to be tuned as 6-pulse. Thus the 12-pulse slave and its contactors have to be kept off. Set in the 12-pulse master:

Parameter	Master	Comments
OperModeSel (43.01)	0 = **ArmConv**	After the autotuning is finished set *OperModeSel (43.01)* back to **12PParMaster**
ServiceMode (99.06)	1 = **ArmCurAuto**	Give the **On** and **Run** command within 20 s

After the successful autotuning copy parameters:

- *M1KpArmCur (43.06)*,
- *M1TiArmCur (43.07)* and
- *M1DiscontCurLim (43.08)*

from the 12-pulse master into the 12-pulse slave.
Multiply parameters:

- *M1ArmL (43.09)* and
- *M1ArmR (43.10)*

by two and write the values in both the 12-pulse master and the 12-pulse follower.

Attention:
In case an autotuning is not starting or interrupted **A121 AutotuneFail** is set. The reason for the alarm is shown in *Diagnosis (9.11)*.

11 DriveWindow monitor

Signal	**Unit**
MotSpeed (1.04)	rpm
ArmVoltAct (1.14)	V
ConvCurAct (1.16)	A
M1FieldCurRel (1.29)	100 % = I_{FN}
ArmCurActSl (1.33)	A
TorqRefUsed (2.13)	100 % = T_N
SpeedRef4 (2.18)	rpm