Control board SDCS-CON-H01 (H1 ... H8)

The control circuit terminals are common for all sizes H1 … H8.

Location of the control circuit board SDCS-CON-H01

The SDCS-CON-H01 is mounted on an electronic tray. The electronic tray is attached in the housing by means of two hinges.

Watchdog function

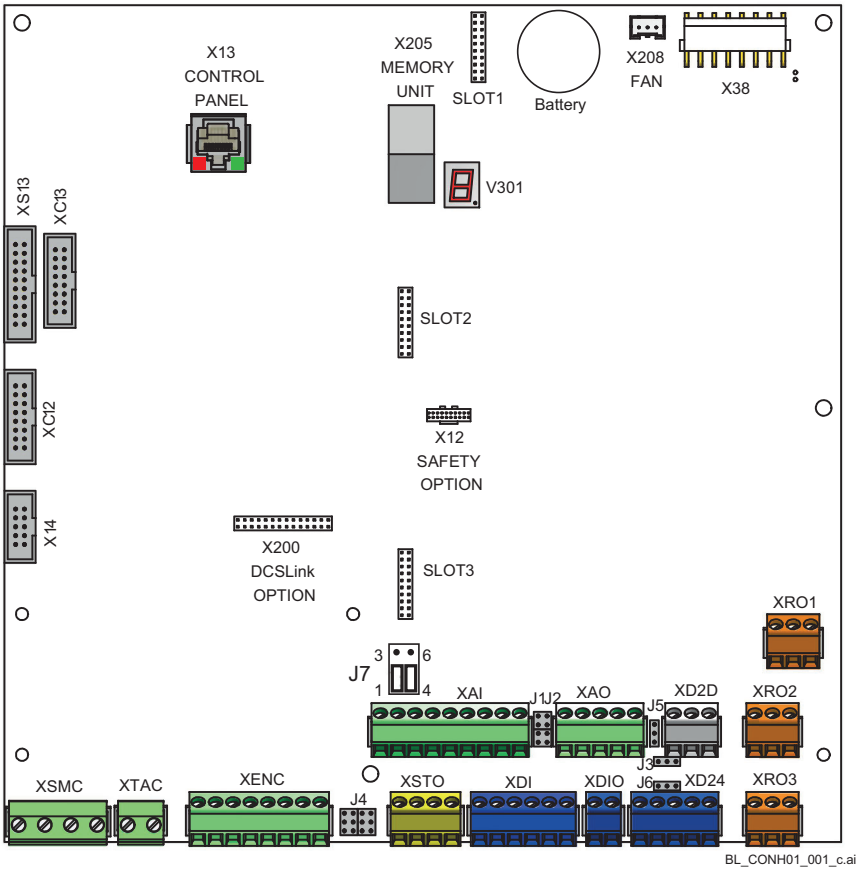
The SDCS-CON-H01 has an internal watchdog. The watchdog controls the proper function of the SDCS-CON-H01 and the firmware. If the watchdog trips, it has the following effects:

– The thyristor firing control is reset and disabled.
– All DI's will not be processed.
– All DO's are frozen in the actual state.
– All AI's will not be processed.
– All programmable AO's are frozen in the actual state.

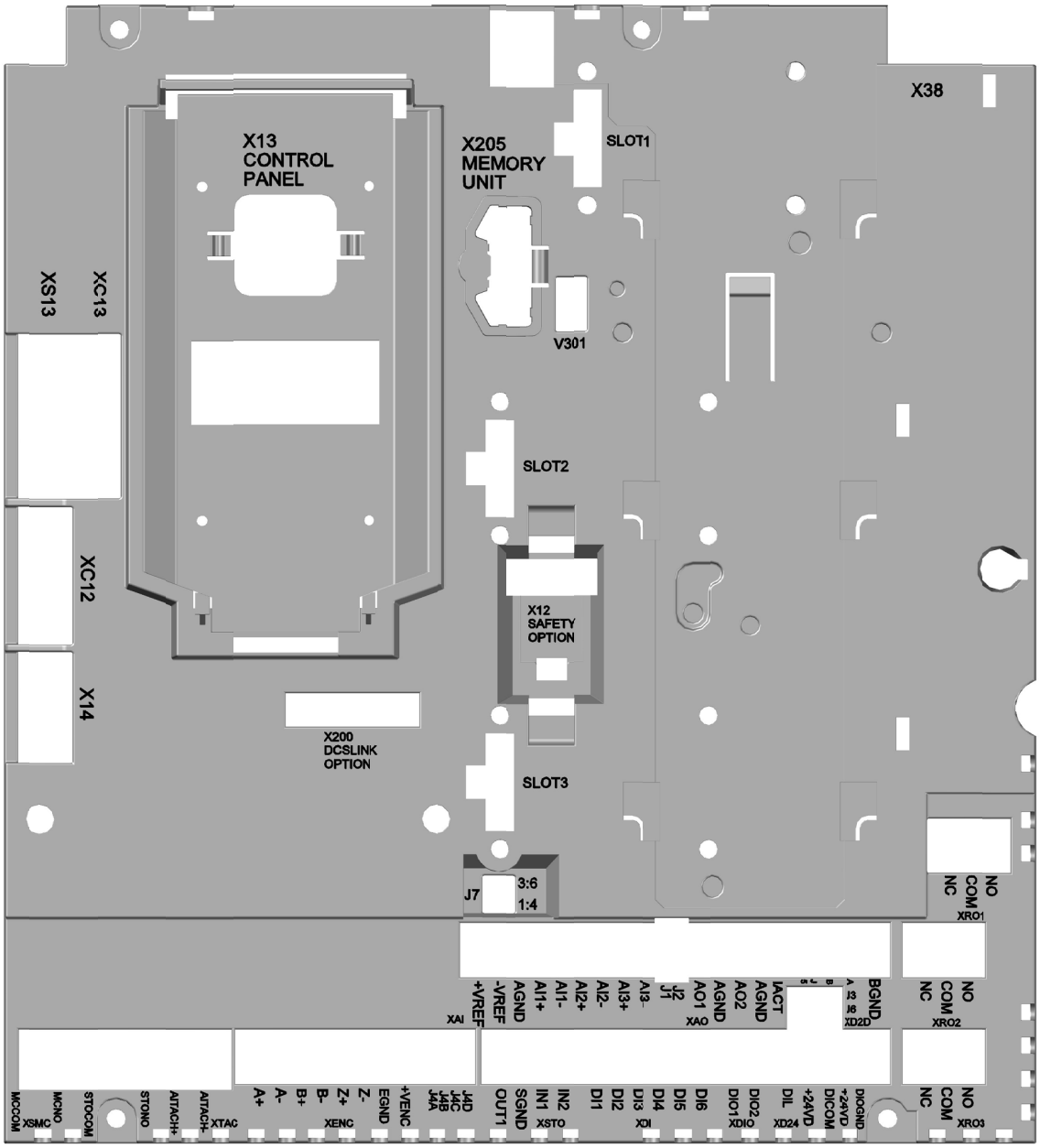
Recommended wire size - Tightening torques

Control cables:

Wire sizes:	Tightening torques:
0.5 … 2.5 mm^2 (24 … 12 AWG)	0.5 Nm (5 lbf·in) for both stranded and solid wiring



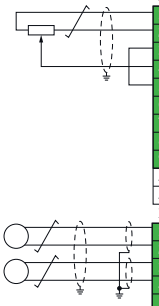
Intermediate cover



Control circuit terminal layout

Internal 24 V_{DC} used

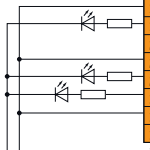
DCS880



XAI	Reference voltage and analog inputs	
1	+VREF	+10 V_{DC}
2	-VREF	-10 V_{DC}
3	AGND	Common ground (connected to frame)
4	AI1+	±10 V or 0 (4) ... 20 mA depending on J1
5	AI1-	
6	AI2+	±10 V or 0 (4) ... 20 mA depending on J2
7	AI2-	
8	AI3+	±10 V
9	AI3-	
J1	J1	AI1 current / voltage selection jumper
J2	J2	AI2 current / voltage selection jumper

XAO	Analog outputs	
1	AO1	±10 V or 0 (4) ... 20 mA depending on J5
2	AGND	Common ground (connected to frame)
3	AO2	±10 V
4	AGND	Common ground (connected to frame)
5	IACT	Connection point for a scope (H1 ... H6 only) ①
J5	J5	AO1 current / voltage selection switch

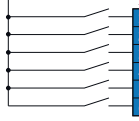
XD2D	Drive-to-drive link	
1	B	Drive-to-drive link
2	A	(master-follower or embedded fieldbus)
3	BGND	Isolated ground 2
J3	J3	Drive-to-drive link termination switch



XRO1, XRO2, XRO3	Relay outputs		
11	NC	250 V_{AC} / 30 V_{DC} 2 A	
12	COM		
13	NO		
21	NC	250 V_{AC} / 30 V_{DC} 2 A	
22	COM		
23	NO		
31	NC	250 V_{AC} / 30 V_{DC} 2 A	
32	COM		
33	NO		

XD24	Digital interlock	
1	DIL	Digital interlock, ground: DICOM
2	+24VD	+24 V_{DC}, 200 mA, ground : DIOGND
3	DICOM	Isolated digital input ground for DI1 ... DI5 and DIL
4	+24VD	+24 V_{DC}, 200 mA, ground : DIOGND
5	DIOGND	Isolated digital input / output ground for DI6, DIO1, DIO2
J6	J6	Digital ground selection switch (DIOGND and DICOM)

XDIO	Digital inputs / outputs	
1	DIO1	max. +24 V_{DC} 2k 100n Relay driver +24 V_{DC} DO +3.3 V_{DC} DI DIOGND
2	DIO2	

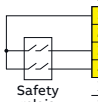


XDI	Digital inputs	
1	DI1	DI1 ... DI5 and DIL: max. +24 V_{DC} 2k 100n +3.3 V_{DC} DI DICOM
2	DI2	
3	DI3	
4	DI4	DI6: max. +24 V_{DC} 2k 100n +3.3 V_{DC} DI DIOGND
5	DI5	
6	DI6	

XENC	Encoder	
1	A+	Channel A+ function depending on J4A
2	A-	Channel A- function depending on J4A
3	B+	Channel B+ function depending on J4B
4	B-	Channel B- function depending on J4B
5	Z+	Channel Z+ function depending on J4C
6	Z-	Channel Z- function depending on J4C
7	EGND	Common ground (connected to frame)
8	+VENC	Encoder supply 5 V_{DC} or 24 V_{DC} depending on J4D, 250 mA
J4A	J4A	Differential or single ended (10 k pull up)
J4B	J4B	selection jumpers
J4C	J4C	
J4D	J4D	Encoder supply 5 V_{DC} or 24 V_{DC} selection jumper
J7A	J7A	Not in use for DCS880
J7B	J7B	

XTAC	Analog tacho	
1	AITACH+	±8 ... 270 V_{DC}
2	AITACH-	

XSMC	Mains contactor		
1	MCCOM	250 V_{AC} / 30 V_{DC} 2 A	Fixed output for the mains contactor
2	MCNO		
3	STOCOM	250 V_{AC} / 30 V_{DC} 2 A	Fixed output for safe torque off (STO) zero current monitor
4	STONO		

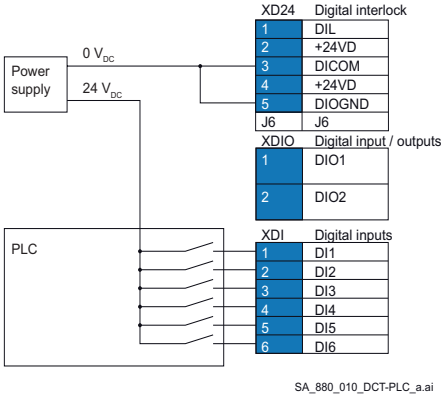


XSTO	Safe torque off (STO)	
1	OUT1	24 V_{DC} for STO circuit
2	SGND	Common ground (connected to frame)
3	IN1	Both circuits must be closed for drive to start
4	IN2	Open circuits block the firing pulses
X12	Safety functions module connection	
X13	Control panel connection	
X205	Memory unit connection	

① For H7 and H8 see SDCS-OPL-H01.

SA_880_005_DCS_d.ai

External 24 V_{DC} used



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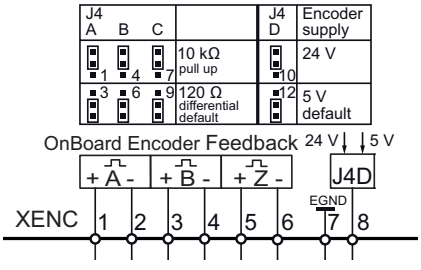


XAI: Reference voltages and analog inputs

+VREF	+10 V_{DC}, ±1 % R_L = 1 … 10 kΩ Maximum wire size 2.5 mm^2
-VREF	-10 V_{DC}, ±1 % R_L = 1 … 10 kΩ Maximum wire size 2.5 mm^2
AI1+ AI1-	±10 V [R_{in} ≥ 200 kΩ], 0 (4) ... 20 mA or ±20 mA [R_{in} = 100 Ω] depending on J1 Maximum wire size 2.5 mm^2 Differential inputs, common mode range ±30 V Sampling interval per channel: 0.25 ms Hardware filter: 0.25 ms Resolution: 15 bit + sign Inaccuracy: 1 % of full scale range
AI2+ AI2-	±10 V [R_{in} ≥ 200 kΩ], 0 (4) ... 20 mA or ±20 mA [R_{in} = 100 Ω] depending on J2 Maximum wire size 2.5 mm^2 Differential inputs, common mode range ±30 V Sampling interval per channel: 0.25 ms Hardware filter: 0.25 ms Resolution: 15 bit + sign Inaccuracy: 1 % of full scale range
AI3+ AI3-	±10 V [R_{in} ≥ 200 kΩ] Maximum wire size 2.5 mm^2 Differential inputs, common mode range ±30 V Sampling interval per channel: 0.25 ms Hardware filter: 0.25 ms Resolution: 15 bit + sign Inaccuracy: 1 % of full scale range
	Parameter settings see *DCS880 Firmware manual Group 12 Standard AI*

XAO: Analog outputs

AO1	±10 V [load current ≤ 10 mA] or 0 (4) ... 20 mA [R_L ≤ 500 Ω] depending on J5 Maximum wire size 2.5 mm^2 Frequency range: 0 … 300 Hz Resolution: 11 bit + sign Inaccuracy: 2 % of full scale range
AO2	±10 V [load current ≤ 10 mA] Maximum wire size 2.5 mm^2 Frequency range: 0 … 300 Hz Resolution: 11 bit + sign Inaccuracy: 2 % of full scale range
IACT	Connection point for a scope to measure the current directly over the burden resistor (H1 ... H6 only. For H7 and H8 see SDCS-OPL-H01). Scaling see 13.80 Scaling of fixed current output.
	Parameter settings see *DCS880 Firmware manual Group 13 Standard AO*

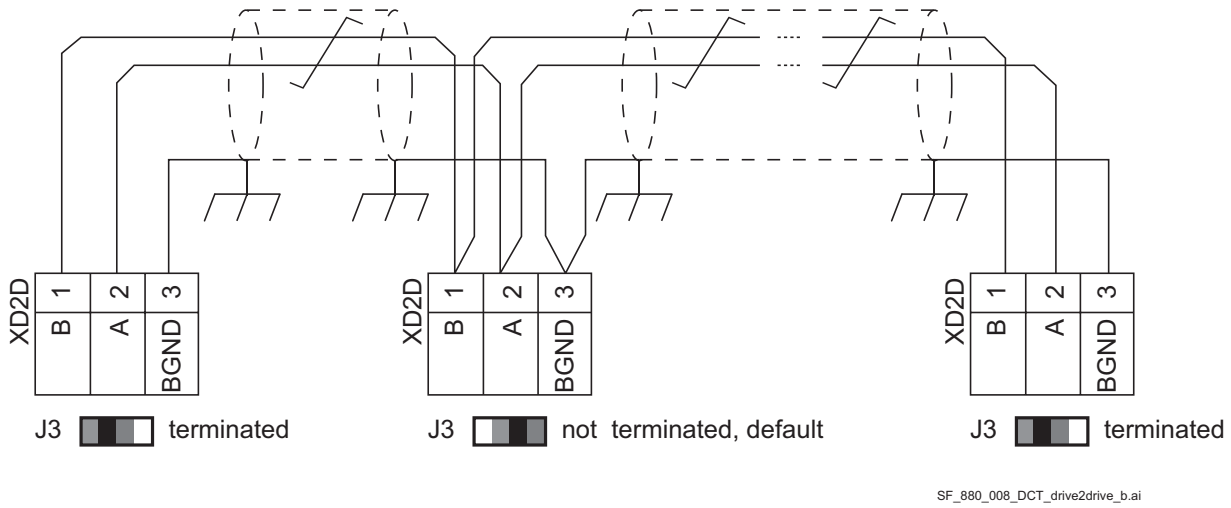
XD2D: Drive-to-drive link

B A	Maximum wire size 2.5 mm^2 Physical layer: RS-485 Termination by switch J3
	Parameter settings see *DCS880 Firmware manual Group 60 DDCS communication*

The drive-to-drive link is a daisy-chained RS-485 transmission line that allows basic master-follower communication with one master and multiple followers. It is also used for the embedded fieldbus.

Set the termination switch J3 (see *Jumpers and switches*) next to terminal block XD2D to terminated (▮▮▯) at the two physical ends of the drive-to-drive link. All intermediate switches have to be set to not terminated (▯▮▮).

Use double shielded twisted-pair cable (~ 100 Ω, for example, PROFIBUS compatible cable) for the wiring. For best immunity, high quality cable is recommended. Keep the cable as short as possible. The maximum complete length of the link is 50 meters. Avoid unnecessary loops and running the link near power cables. The following diagram shows the wiring of the drive-to-drive link.



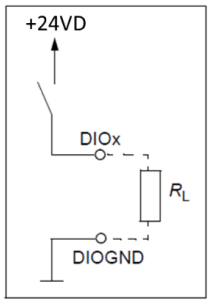
RO1, RO2, RO3: Relay outputs

NC COM NO	250 V_{AC} / 30 V_{DC}, 2 A Maximum wire size 2.5 mm^2 Varistor protected
	Parameter settings see *DCS880 Firmware manual Group 10 Standard DI, RO*

XD24: Digital interlock

DIL	The digital interlock works like a normal digital input and has no special function in the DCS880. It can be selected for example as the source for an emergency stop command or any other external event. See the *DCS880 Firmware manual* for more information. Maximum wire size 2.5 mm^2 +24 V_{DC} logic levels: low < 5 V_{DC}, high > 15 V_{DC} R_{in} = 2 kΩ Hardware filter: 0.04 ms Digital filter up to 8 ms Related ground is DICOM
+24VD	+24 V_{DC}, 200 mA Total load power of these outputs is 4.8 W (200 mA, 24 V_{DC}) minus the power taken by DIO1 and DIO2 Maximum wire size 2.5 mm^2 Related ground is DIOGND
	Parameter settings see *DCS880 Firmware manual Group 10 Standard DI, RO*

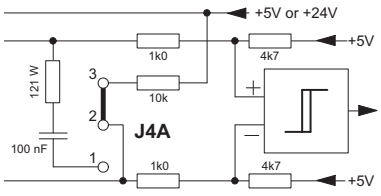
XDIO: Digital inputs / outputs

DIO1 DIO2	Maximum wire size 2.5 mm^2 As input: +24 V_{DC} logic levels: low < 5 V_{DC}, high > 15 V_{DC} R_{in} = 2 kΩ Filter: 0.25 ms As output: Total output current from +24VD is limited to 200 mA  Filter: 0.04 ms Related ground is DIOGND
	Parameter settings see *DCS880 Firmware manual Group 11 Standard DIO, FI, FO*

XDI: Digital inputs

DI1 DI2 DI3 DI4 DI5 DI6	Maximum wire size 2.5 mm^2 +24 V_{DC} logic levels: low < 5 V_{DC}, high > 15 V_{DC} R_{in} = 2 kΩ Hardware filter: 0.04 ms Digital filter up to 8 ms DI1 ... DI5: Related ground is DICOM DI6: Related ground is DIOGND
	Parameter settings see *DCS880 Firmware manual Group 10 Standard DI, RO*

XENC: Encoder

A+ A- B+ B- Z+ Z- EGND +VENC	OnBoard encoder interface supply voltage 5 V or 24 V (non isolated) depending on J4D, 250 mA OnBoard encoder interface type differential or single ended depending on J4A ... J4C Maximum wire size 2.5 mm^2  SDCS-**CON-H01** ENCODER INPUT **A**
	Parameter settings see *DCS880 Firmware manual Group 94 OnBoard speed feedback configuration*

XTAC: Analog tacho

AITACH+ AITACH-	OnBoard tacho interface Maximum wire size 2.5 mm^2 Differential input max. voltage 8 ... 270 V
	Parameter settings see *DCS880 Firmware manual Group 94 OnBoard speed feedback configuration*

XSMC: Mains contactor

MCCOM MCNO	Fixed output for the mains contactor 250 V_{AC} / 30 V_{DC}, 2 A Maximum wire size 2.5 mm^2 Varistor protected
STOCOM STONO	Fixed output for safe torque off (STO) zero current monitor 250 V_{AC} / 30 V_{DC}, 2 A Maximum wire size 2.5 mm^2 Varistor protected
	Mains contactor ON command: 06.24.b07 Current controller status word 1

XSTO: Safe torque off

OUT1 IN1 IN2	For the drive to start, both connections (OUT1 to IN1 and IN2) must be closed. By default, the terminal block has wires to close the circuit. Removing the wires will block the firing pulses. Maximum wire size 2.5 mm^2 Current consumption per channel: 55 mA (continuous)

X205 Memory unit connection

The drive is equipped with a memory unit that is plugged into X205 on the SDCS-CON-H01. The memory unit contains the firmware, the parameters and the application program (as option). It is possible to handle the parameters by control panel, PC tool or overriding control. Changed parameters are stored immediately in the memory unit.

In addition, the fault logger entries are stored in the memory unit during de-energizing the auxiliary power.

When a drive is replaced, the parameter settings can be retained by transferring the memory unit from the defective drive to the new drive.

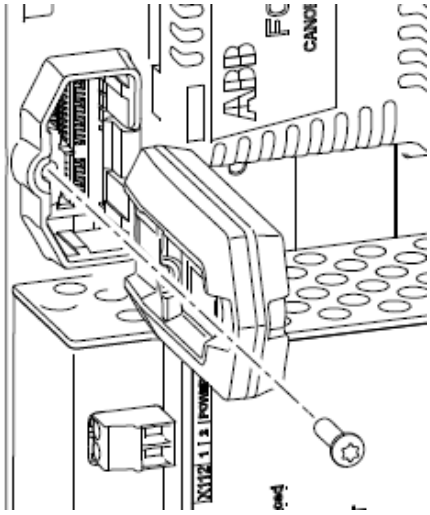
WARNING

Do not remove or insert a memory unit when the drive is powered.

After power-up, the drive will scan the memory unit. If different parameter settings are detected, they are copied to the drive. This may take several minutes.

Replacing the memory unit

Make sure, that the auxiliary power is off. Unscrew the memory unit and pull it out. Replace the memory unit in reverse order.



Additional terminals

– Use connectors Slot1 … Slot3 for F-type I/O extension modules and F-type fieldbus adapters.
– Connectors XC12, XS13, X14 and X38 connect the SDCS-CON-H01 to the SDCS-PIN-H01 or SDCS-POW-H01 for voltage, current, temperature measurement and safety.
– Use connector X13 to connect the control panel either directly via a jack plug or via a CAT 1:1 cable (< 3 m) with RJ-45 plugs.