

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ABB

SDCS-CON-H01 3ADT320000R1501

DC DRIVE CONTROL BOARD

Used with the applicable DCS880 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: ABB DCS880 Hardware manual 3ADW000462R0401; SDCS-CON-H01 pp.83 to 88

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

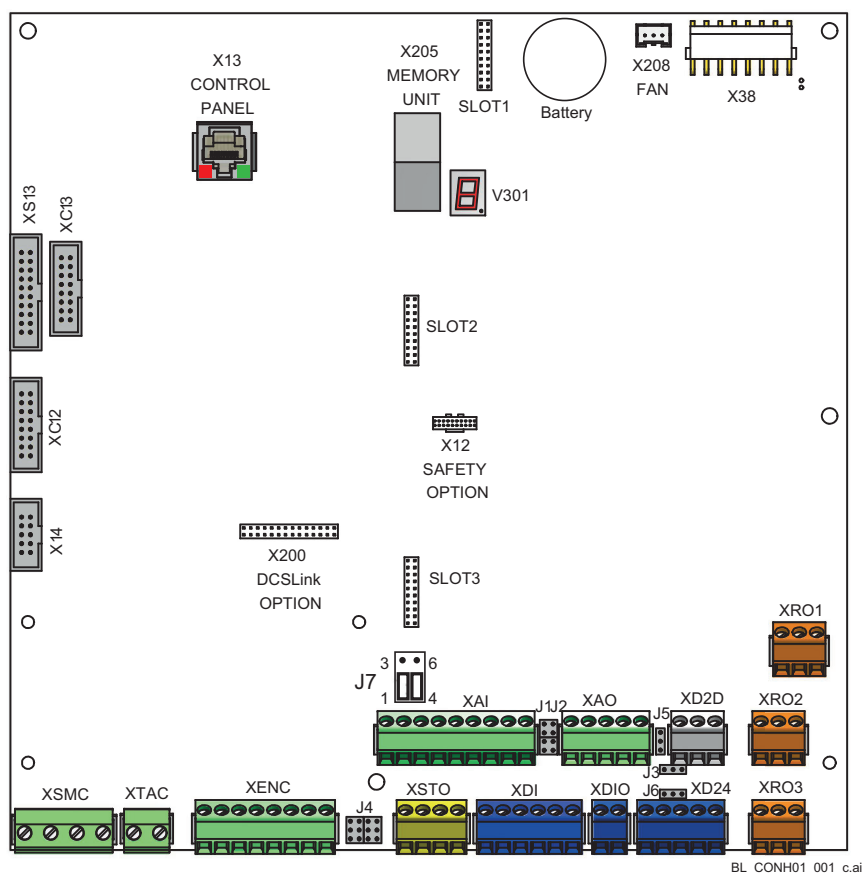
The SDCS-CON-H01 has an internal watchdog. The watchdog controls the proper function of the SDCS-CON-H01 and the firmware. If the watchdog trips, it has the following effects:

- 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.

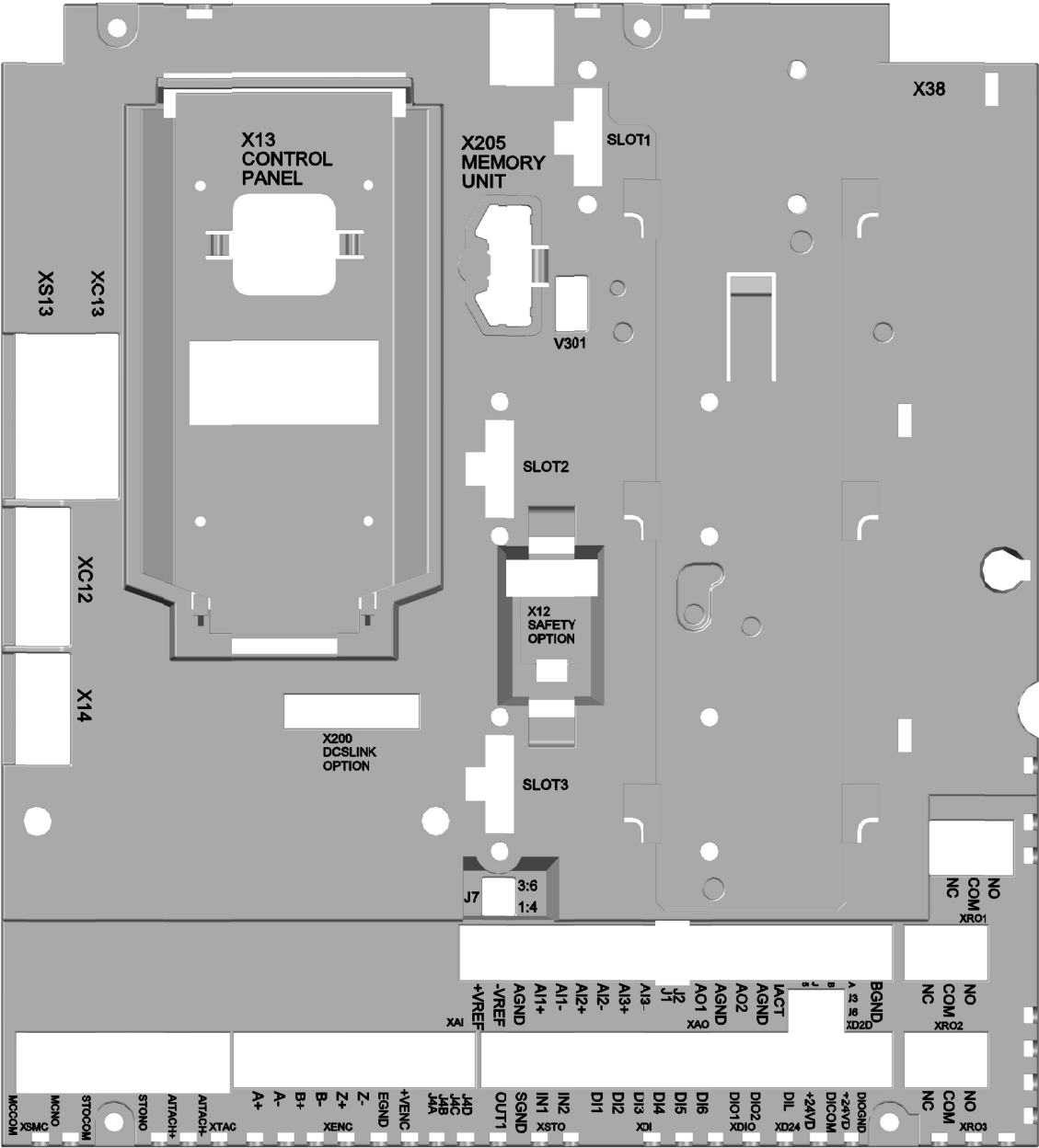
Recommended wire size - Tightening torques

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

External 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	IACF	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	
12	COM	250 V _{AC} / 30 V _{DC}
13	NO	2 A
21	NC	
22	COM	250 V _{AC} / 30 V _{DC}
23	NO	2 A
31	NC	
32	COM	250 V _{AC} / 30 V _{DC}
33	NO	2 A

XD24 Digital interlock

1	DIL	Digital interlock, ground: DIOCOM
2	+24VD	+24 V _{DC} , 200 mA, ground: DIOGND
3	DIOCOM	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 DIOCOM)

XDIO Digital inputs / outputs

1	DIO1	
2	DIO2	

XDI Digital inputs

1	DI1	
2	DI2	
3	DI3	
4	DI4	
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 tach

1	AI TACH+	±8 ... 270 V _{DC}
2	AI TACH-	

XSMC Mains contactor

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

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

XD24 Digital interlock

1	DIL	
2	+24VD	
3	DIOCOM	
4	+24VD	
5	DIOGND	
J6	J6	

XDIO Digital input / outputs

1	DIO1	
2	DIO2	

XDI Digital inputs

1	DI1	
2	DI2	
3	DI3	
4	DI4	
5	DI5	
6	DI6	

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J4	A	B	C		J4	D	Encoder supply
1	4	7	10	10 kΩ pull up	10		24 V
3	6	9	12	120 Ω differential default	12		5 V default

OnBoard Encoder Feedback 24 V ↓ 5 V

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+	±10 V [R _{in} ≥ 200 kΩ], 0 (4) ... 20 mA or ±20 mA [R _{in} = 100 Ω] depending on J1
AI1-	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+	±10 V [R _{in} ≥ 200 kΩ], 0 (4) ... 20 mA or ±20 mA [R _{in} = 100 Ω] depending on J2
AI2-	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+	±10 V [R _{in} ≥ 200 kΩ]
AI3-	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
IAC	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

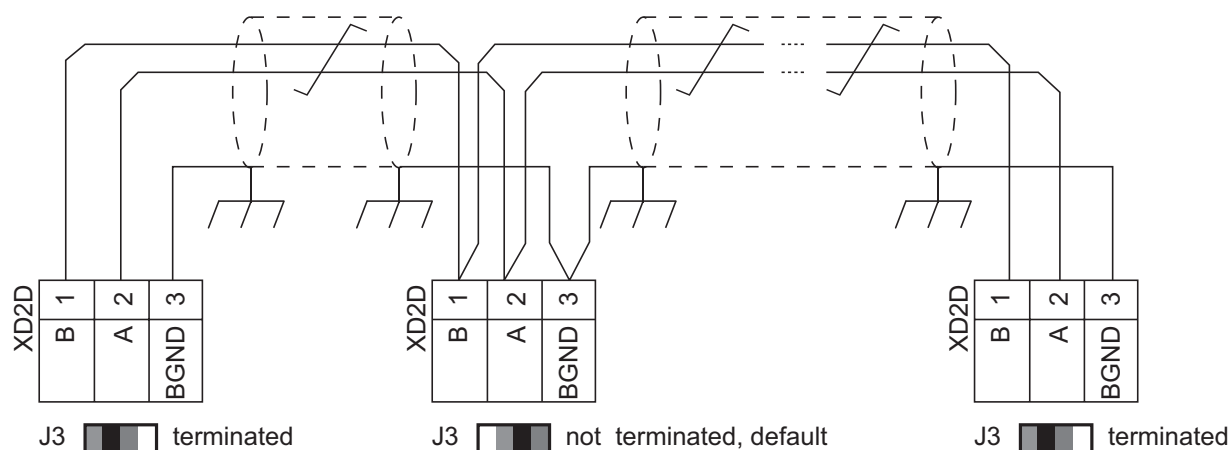
XD2D: Drive-to-drive link

B	Maximum wire size 2.5 mm ²
A	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 ($\sim 100 \Omega$, 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.



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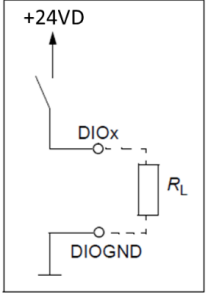
RO1, RO2, RO3: Relay outputs

NC	250 V _{AC} / 30 V _{DC} , 2 A
COM	Maximum wire size 2.5 mm ²
NO	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 mm² +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 mm² Related ground is DIOGND
	Parameter settings see DCS880 Firmware manual Group 10 Standard DI, RO

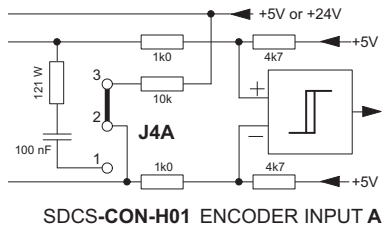
XDIO: Digital inputs / outputs

DIO1	Maximum wire size 2.5 mm ²
DIO2	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	Maximum wire size 2.5 mm ²
DI2	+24 V _{DC} logic levels: low < 5 V _{DC} , high > 15 V _{DC}
DI3	R _{in} = 2 kΩ
DI4	Hardware filter: 0.04 ms
DI5	Digital filter up to 8 ms
DI6	DI1 ... DI5: Related ground is DICOM
DI6	DI6: Related ground is DIOGND
Parameter settings see DCS880 Firmware manual Group 10 Standard DI, RO	

XENC: Encoder

A+	OnBoard encoder interface supply voltage 5 V or 24 V (non isolated) depending on J4D, 250 mA
A-	OnBoard encoder interface type differential or single ended depending on J4A ... J4C
B+	Maximum wire size 2.5 mm ²
B-	
Z+	
Z-	
EGND	
+VENC	

XTAC: Analog tacho

AITACH+	OnBoard tacho interface
AITACH-	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	