DCS 500B Software Application

Winder 1 with Fieldbus Control

Update Information

Important notes

Safety note:

For the use of this application software, the safety notes contained in the documentation for the DCS 500B units (System Description, Technical Data, Operating Instructions) apply in their entirety.

Properly trained personnel may use this application software only. Users have to be sufficiently familiar with the requisite tools and the system conditions involved enabling then to assess the suitability of this software for the actual application concerned.

This application software is a non-binding example, which will not meet all system conditions in every individual case. We accept no responsibility for the use of this software.

Update information

This documentation describes the update of Winder 1 application example. This updated version contains the function blocks and connections for fieldbus communication. Therefore some terminals of CON-2 are disconnected and option SDCS-IOE-1 (additional digital and analogue inputs) is not used.

This documentation is using the following sign, which shows the page number of application diagrams.

Diagram page number X

Contents of zipped file Winder1+Fieldbus

Filename	*for using*
Winder1+Fieldbus	this documentation
WINFLDB1.QOA	Application file for downloading by using DDCTool. Don't forget to set param. 2504 = 1 after downloading.
WINFLDB1.QOD	Diagram file for opening by using DDCTool
WINFLDB1.PDF	Diagrams for printing
WINFLDB1.QOP	Parameter file with default parameter settings and application blocks for downloading by using DDCTool. Don't forget to set param. 2504 = 1 after downloading.
\GAD*.*	Subdirectory GAD with files of this application for using with GAD Tool

Fieldbus communication

Independent of the kind of fieldbus, e.g. PROFIBUS, CANopen, ControlNet or DeviceNet, the connection points of incoming and outgoing data words are to be connected with winder application, which is been done with this updated application, called WINFLDB1.

Connected words and bits and disconnected terminals will be found in tables below.

Incoming data words and converting control word into bits are shown on page 13 of diagrams.

Outgoing data words and converting status bits into word are shown on page 14 of diagrams.

Command location

In remote mode, which means “not local“, winder drive can be controlled with control word via plc. 

Local mode can be selected by using the CDP312 panel or pc-tool DDCTool (CMTDCS500).

Local mode

With CDP312 panel or PC tool DDCTool the drive can be set into local mode.

Please note: In local mode the complete control word of plc is disconnected, which means, that all command of control word, like E Stop (or Emergency Stop), Emergency off, winder/unwinder, are not relevant. Emergency Stop command, which is connected to terminal, is still active.

In local mode the drive can be started and stopped by using push buttons of CDP312 panel or DDCTool. All other commands (bits), which are also necessary in addition, are given via parameter 3295 as integer value.
With parameter **3295 = 118** the drive will run as unwinder in velocity control mode with local speed reference. The local reference contains not the sign according winder/unwinder or winder direction; so a positive local reference can give another direction of motor rotation as a positive line reference of plc.

Please note:
For observing that anybody can set winder drive in local mode by mistake, activating of local mode is disabled, if drive is running in winding mode.
If general disabling is desired, please set parameter **909 = 12502** (parameter 12502 is logical value of –1).

Remote mode

If local mode is not active, the drive is controlled via data words of plc.

Examples of control word

The following values are examples of control words and shows not the queue of control words.

Integ.	Hex.	Remark
1142	476h	Normal switched off mode
1270	4F6h	Reset
1143	477h	Drive On as unwinder
3191	C77h	Drive On as unwinder and preset diameter
7287	1C77h	Drive On as winder and preset diameter
21631	547Fh	Winding mode as winder
17535	447Fh	Winding mode as unwinder
1147	47Bh	E Stop as unwinder
5366	14F6h	Reset as winder

Resolutions

The following resolution are given:

- Line speed: 20000 => 100% of max. line speed.
- Tension ref.: 20000 => 100% of maximal tension
- Diameter : 4000 => 100% of max. diameter

Tables of data words, bits and terminals

Digital Inputs

Serial communication			Terminal of SDCS-		Name of	Logical	Action	With Winder 1
Data set	**Data word**	**Bit**	**IOB-2x**	**CON-2 or IOB-1**	**In/Output**	**function**		**connected to (E => IOE-1)**
1	1	00				**AND**	1 => Drive ON	
			X6:7	X6:7	DI 7		0 => Drive Off	DI7
		01					1 => not Start inhibit 0 => Emergency OFF	not connected
		02				**AND**	1 => not E Stop	
			X6:5	X6:5	DI 5		0 => E Stop (Emergency Stop)	DI5
		03					1 => Run (no jogging) 0 => Stop	DI8 (X6:8)
		04					1 => not Reset output of ramp gener.	not connected
		05					1 => not Hold of ramp generator	not connected
		06					1 => not Reset input of ramp generator	not connected
		07				**OR**	1 => Reset (Quit)	
			X6:6	X6:6	DI 6		(0->1 sensitive)	DI6
		08					1 => Jog 1	DI11 (E: X1:3)
		09					1 => Jog 2	DI12 (E: X1:4)
		10					1 => for some fieldbus adapters	
		11					1 => Preset Diameter (DiaSet)	DI9 (E: X1:1)
		12					1 => (Re-)Winder 0 => Unwinder	DI1 (X6:1)
		13					1 => Winding direction (e.g. above) 0 => Winding direction (e.g. below)	DI2 (X6:2)
		14					1 => Winding mode 0 => Velocity mode	DI4 (X6:4)
		15					1 => Hold tension active	DI10 (E: X1:2)
			X6:1	X6:1	DI 1		Not used	
			X6:2	X6:2	DI 2		Not used	
			X6:3	X6:3	DI 3		Main contactor acknowledge	
			X6:4	X6:4	DI 4		Not used	
			X6:8	X6:8	DI 8		Not used	

Digital Outputs

Serial communication			Terminal of SDCS-		Name of	Source
Data set	Data word	Bit	IOB-2x	CON-2 or IOB-1	In/Output	
2	1	00				1 => Ready On
		01				1 => Ready running
			X4:7-8	X7:4	DO4	
		02				1 => Running
		03				1 => Fault
		04				not connected
		05				1 => E Stop not active
		06				not used
		07				1 => Alarm
		08				not used
		09				1 => Local mode not active
		10				1 => Speed higher than level 1
		11				not used
		12				not used
		13				not used
		14				not used
		15				(reserved for fieldbus adapter)
			X4:1-2	X7:1	DO1	1 => min. speed (zero speed)
			X4:3-4	X7:2	DO2	1 => Field contactor ON
			X4:5-6	X7:3	DO3	not used
			X5:1-2	X7:5	DO5	not used
			X5:3-4	X7:6	DO6	not used
			X5:5-6	X7:7	DO7	1 => diameter level reached
			X5:7-8	**-POW** X96:1-2	DO8	1 => Main contactor ON

Analogue Inputs

Serial communication Data set	Data word		Terminal of SDCS- IOB-3	CON-2 or IOB-1	Name of In/Output	Connected to	With Winder1 connected to (E => IOE-1)
1	2					Line speed (20000 = 100%)	AI1 (X3:6-5)
	3					Tension reference (20000 = 100%)	AI3 (X3:8-7)
3	1					Diameter set point (4000 = 100%)	Param. 3702
	2					not connected	
	3					not connected	
			PS5311 X1:1..4	X3:1..4	AITAC	Analogue tacho	
				X5:...		Encoder	
			X3:4-3	X3:6-5	AI1	not connected	
			X3:6-5	X3:8-7	AI2	not connected	
			X3:8-7	X3:10-9	AI3	not connected	
			X3:10-9	X4:2-1	AI4	not connected	

Analogue Outputs

Serial communication Data set	Data word	Bit	Terminal of SDCS- IOB-3	CON-2 or IOB-1	Name of In/Output	Connected to
2	2					Filtered speed feedback (20000 = 100%)
	3					Actual armature current (4096 = 100%)
4	1					Calculated diameter (4000 = 100%)
	2					not connected
	3					not connected
			X4:1-2	X4:7-6	AO1	Calculated diameter
			X4:3-4	X7:8-6	AO2	Armature voltage

ABB Automation Products GmbH
Postfach 1180
D-68619 Lampertheim
Tel: +49 (0) 62 06-5 03-0
Fax:+49 (0) 62 06-5 03-6 09
www.abb.com/dc

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