

GUIDE FOR CONFIGURING THE ACS880 FOR MODBUS RTU USING CSA 2.8/3.0 PROFILE

Scope:

The ACS880 does not support the CSA profile that the ACS600/ACS800 supported on Modbus. This guide will show how to use Transparent mode in the ACS880 to create the CSA control and status words to mimic the CSA profile.

Explanation:

The ACS880 should be first be configured for standard Modbus RTU operation and the parameters below need to be set to enable the embedded Modbus and to tell the drive that the start/stop and speed references will come from communications if Modbus is being used for control and reference.

20.01 EXT1 command	= Embedded Fieldbus (If using Modbus for control)
22.11 Speed ref source	= EFB ref1 (If using Modbus for control)
58.01 Protocol enable	= Modbus RTU
58.03 Node Address	= Node address 1...247
58.04 Baud Rate	= Network Baud rate
58.05 Parity	= Parity type and stop bits
58.06 Communication Control	= Refresh settings to save EFB parameters
58.25 Control Profile	= Transparent

When the profile is set to Transparent, the drive does NOT do any data conversion on the CW or SW. Speed Reference and Actual values are treated separately and can be handled/scaled in their usual way. The raw control word sent from the PLC will come into the drive and be visible in par 06.05 EFB Transparent Control Word. The bit structure is below:

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CONTROL WORD for the CSA 2.8/3.0 communication profile

Bit	Name	Value	Description
0	Reserved		
1	ENABLE	1	Enabled.
		0	Coast to stop.
2	Reserved		
3	START/STOP	0 ⇒ 1	Start.
		0	Stop according to parameter 21.03 STOP FUNCTION.
4	Reserved		
5	CNTRL_MODE	1	Select control mode 2.
		0	Select control mode 1.
6	Reserved		
7	Reserved		
8	RESET_FAULT	0 ⇒ 1	Reset drive fault.
9 ... 15	Reserved		

What we will do is point our drive control parameters (like enable and start) to the corresponding bits in this CW. For example:

- 20.12 Run Enable 1 Source = 6.05.1**
- 20.03 Ext1 In1 Source = 6.05.3**
- 19.11 Ext1/Ext2 Selection = 6.05.5**
- 31.11 Fault Reset Selection = 6.05.8**

Now, on to the status word. The ACS880 allows us to build a status word bit by bit using par 6.50. We will use this parameter as the source of our CSA status word:

58.30 EFB Status Word Transparent Source = 6.50

No.	Name/Value	Description	Def/FbEq16															
06.50	User status word 1	User-defined status word. This word shows the status of the binary sources selected by parameters 06.60...06.75. This parameter is read-only.	-															
<table border="1" style="width: 100%;"> <thead> <tr> <th>Bit</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>User status bit 0</td> <td>Status of source selected by parameter 06.60</td> </tr> <tr> <td>1</td> <td>User status bit 1</td> <td>Status of source selected by parameter 06.61</td> </tr> <tr> <td>...</td> <td>...</td> <td>...</td> </tr> <tr> <td>15</td> <td>User status bit 15</td> <td>Status of source selected by parameter 06.75</td> </tr> </tbody> </table>				Bit	Name	Description	0	User status bit 0	Status of source selected by parameter 06.60	1	User status bit 1	Status of source selected by parameter 06.61	15	User status bit 15	Status of source selected by parameter 06.75
Bit	Name	Description																
0	User status bit 0	Status of source selected by parameter 06.60																
1	User status bit 1	Status of source selected by parameter 06.61																
...																
15	User status bit 15	Status of source selected by parameter 06.75																
0000h...FFFFh		User-defined status word.	1 = 1															

The status word is in par 06.05 EFB Transparent Control Word. The bit structure is below:

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STATUS WORD for the CSA 2.8/3.0 communication profile

Bit	Name	Value	Description
0	READY	1	Ready to start.
		0	Initialising, or initialising error.
1	ENABLE	1	Enabled.
		0	Coast to stop.
2	Reserved		
3	RUNNING	1	Running with selected reference.
		0	Stopped.
4	Reserved		
5	REMOTE	1	Drive in Remote mode
		0	Drive in Local mode
6	Reserved		
7	AT_SETPOINT	1	Drive at reference
		0	Drive not at reference
8	FAULTED	1	A fault is active.
		0	No active faults
9	WARNING	1	A warning is active.
		0	No active warnings
10	LIMIT	1	Drive at a limit
		0	Drive at no limit
11 ... 15	Reserved		

The reference and actual scaling is equal to that of the ABB Drives profile.

Parameters 6.60 to 6.75 are used to assign each bit to match the functionality of the CSA status word:

- 6.60 User status word 1 bit 0 sel = 6.11.1 (RDY_RUN)**
- 6.61 User status word 1 bit 1 sel = 6.11.4 (OFF_2_STA)**
- 6.62 User status word 1 bit 2 sel = False**
- 6.63 User status word 1 bit 3 sel = 6.11.2 (RDY_REF)**
- 6.64 User status word 1 bit 4 sel = False**
- 6.65 User status word 1 bit 5 sel = 6.11.9 (REMOTE)**
- 6.66 User status word 1 bit 6 sel = False**
- 6.67 User status word 1 bit 7 sel = 6.11.8 (AT_SETPOINT)**
- 6.68 User status word 1 bit 8 sel = 6.11.3 (TRIPPED)**
- 6.69 User status word 1 bit 9 sel = 6.11.7 (ALARM)**
- 6.70 User status word 1 bit 10 sel = 6.11.10 (ABOVE_LIMIT)**

The Modbus register addresses for control and status word remain the same as they were and are shown below:

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Address	Contents	Address	Contents
40001	Control Word	40004	Status Word
40002	REF1	40005	ACT1
40003	REF2	40006	ACT2
40007	REF3	40010	ACT3
40008	REF4	40011	ACT4
40009	REF5	40012	ACT5

Documents or other reference material:

ACS880 primary control program Firmware manual 3AUA0000085967

ACS800 Standard Control Program 7.X 3AFE64527592

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