# **Operation on CANopen network** using PLC300

SSW900-CAN-W

**Application Note** 





## SSW900-CAN-W CANopen Application Note

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#### **1 DESCRIPTION**

This application note is intended to provide a description of how to program a soft-starter SSW900 with accessory SSW900-CAN-W to communicate in CANopen network using PLC300.

This document is meant for trained personnel working with the equipment described and CANopen network installation, besides a good knowledge of automation and programmable logic controllers, in particular about WPS software.

#### 1.1 REFERENCED DOCUMENTS

This application note was developed based on the following documents and tools:

Document	Version	Source
SSW900 User's Manual	10005616165 / 04	WEG
SSW900 Soft-Starter Programming Manual	10003989140 / 03 (1.2X)	WEG
SSW900-CAN-W CANopen User's Guide	10006223748 / 00 (1.2X)	WEG
WPS	2.40	WEG
Planning and Installation Manual - DeviceNet Cable System	PUB00027R1	ODVA

#### **1.2 ARCHITECTURE**



Figure 1.1: Network components for this application

#### 1.3 SSW900

- Equipment: SSW900 with accessory SSW900-CAN-W installed at slot 1.
- Version: 1.20.
- EDS file: CO\_SSW900\_V12X.eds.
- Programming tools:
  - WPS version 2.40.

#### 1.4 PLC300

CPU: PLC300HP version 4.11.



Programming tools:
 - WPS version 2.40.

#### 1.5 PASSIVE NETWORK COMPONENTS

For passive network components - cables, connectors, terminating resistors, power supply - we recommend using certified components for DeviceNet network. Please refer to the product documentation for information about the proper network installation.

UPC

## 2 SLAVE CONFIGURATION

This section describes the main configurations for soft-starter SSW900 operation with accessory SSW900-CAN-W in CANopen network. Some of the described configurations are only available if SSW900-CAN-W accessory is properly installed.

Refer to the SSW900 programming manual for the necessary configurations related to other device functions, like motor configuration, protections, etc.

#### 2.1 CANOPEN INTERFACE

For soft-starter SSW900 operation in the CANopen network, it is necessary to program the protocol, address (or Node-ID), and baud rate. For this application, the following configurations have been done:

- C8.4.1 CANopen/DeviceNet Protocol: CANopen. •
- C8.4.2 CANopen/DeviceNet Address: 2. 2
- C8.4.3 CANopen/DeviceNet Baud Rate: 500 Kbps. Image: 500 Kbps.



Figure 2.1: WPS - CAN accessory configuration

#### 2.2 LOCAL/REMOTE

SSW900 has two operation modes: local and remote. For each operation mode, it is necessary to define the source that it will use to receive commands, like start/stop, error reset. For this application, considering SSW900-CAN-W accessory installed at slot 1, the following control sources have been defined:

- Local: keypad will control SSW900 in local mode.
- Remote: slot 1 (SSW900-CAN-W) will control SSW900 in remote mode.

Local/Remote transition: the definition if the device is in local or remote mode will be controlled by slot 1 commands also, in remote mode by default (at power on).

Based on this, the following configurations have been programmed:

- C3.1 LOC/REM Selection Mode: Slot 1 REM. 1
- C3.2 LOC/REM Selection LOC Command: HMI Keys. 2
- C3.3 LOC/REM Selection REM Command: Slot 1. Image: Slot 1.

WEG Programming Suite 2.40		
<u>File Edit Online Tools Window H</u> elp		
	11 😌 😑 🕄 🕨 🔲 🖥 🍁	
Configurations %	Basic Programming of SSW900 at	
ssw900_canopen_app_note		
Ssw900 (SSW900 v1.20)		
	C1 Starting and Stopping C2 Motor Data C3 LOC/REM Selection C4 I/O C9 SSW900	
Diagnostic		
🖨 🦙 Wizards	Configuration of the SSW900 Command Source	<u>Ш</u>
Basic Programming of SSW900	C3.1 LOC/REM Selection Mode Digital Input to LOC/REM Selection	
C7 Special Functions	Slot 1 REM -	
C8 Communication	C3.4 Commands Copy	
Protections	No -	
	C3.2 LOC Command C3.3 REM Command Function to Command via DI	
	② HMI Keys ▼ Slot 1 ▼	
		E

Figure 2.2: WPS - Local/Remote configuration

#### 2.3 COMMUNICATION ERROR

It is important to define the action SSW900 must take in case of communication error. For this application, a communication error should lead to an alarm indication. If SSW900 was running the motor via network command, SSW900 should also perform a general disable.

Based on this, the following configurations have been programmed (refer to figure 2.1):

- C8.4.5.1 CAN Error Mode: Alarm.
- C8.4.5.2 CAN Error Alarm Action: General Disable. Image: Im



#### **3 CANOPEN NETWORK CONFIGURATION**

For CANopen configuration, use WPS software. The main steps are described below.

#### 3.1 CREATE WPS RESOURCE FOR PLC300

Add a new resource for the PLC300 CANopen master to the WPS Configuration. Then select the CANopen folder and open WPSCAN by double-clicking the CANopen configuration file.

- Select "PLC300 (Rev. 4.10)" as the network master.
- Change baudrate to 500 kbit/s and click OK.

#### 3.2 ADD SSW900 TO THE NETWORK CONFIGURATION

Add the slave device by dragging and dropping the "SSW900 (Rev. 120)" available on the list of devices into the network structure area.

CANopen.bcn - WPSCAN CANopen Config		23
File Edit View Configuration Communica	ation Tools Help	
- PLC300 (Rev. 170) - PLC300 (Rev. 200) - PLC300 (Rev. 210) - PLC300 (Rev. 230)	Master ID # : 1 < Master1 > Baudrate : 500 Kbit/s PLC300 ( Rev. 410 )	II
- PLC300 (Rev. 240) - PLC300 (Rev. 250) - PLC300 (Rev. 300) - PLC300 (Rev. 320) - PLC300 (Rev. 330) - PLC300 (Rev. 340) - PLC300 (Rev. 350)	Device properties	
- PLC300 (Rev. 400) - PLC300 (Rev. 410) - PLC300 (Rev. 420) - PLC500 (Rev. 100) - POS2 (Rev. 100) - RUW01 (Rev. 120) - RUW02 (Rev. 140) - RUW04 (Rev. 140) - RUW04 (Rev. 140)	Vendor:         WEG           Revision:         120           EDS File:         [CD_SSW/900_V12X eds]           Address:         2           Picture         [SSW/900.ico]	•
- RUW05 (Rev. 140) - RUW05 (Rev. 140) - SCA-05 220 320 / 24-484 / Re- - SCA-05 220 320 / 24-484 / Re- - SCA-05 220 320 / 544 (Rev - SCA-05 220 320 / 544 (Rev - SCA-05 (Rev. 120) - SCA-05 (Rev. 200) - SCA-05 (Rev	OK Cancel Help	*
SSW900 (Rev. 120)	gs_Errors_	*
Ready	NUM	

Figure 3.1: Add slave device

#### 3.3 CONFIGURE SLAVE PDOS

SSW900 has a set of PDOs where it is possible to define any device data to exchange within the network. There is an appendix at CANopen User's Guide describing the entire list of device data which can be programmed to PDOs.

Parameter	Descri	ption	Range of values	Decimal places	Index	Net Id	Size
S5.1	Status Word						
S5.1.1	SSW				22A8h	680	16blt
			Bit 0 = Running           Bit 1 = Genet. Enabled           Bit 2 = JOG           Bit 3 = Initial Test           Bit 4 = Ramp Up           Bit 5 = Fit Voltage           Bit 6 = Bypass           Bit 7 = Ramp Down           Bit 8 = Remote           Bit 10 = PWD/FEV           Bit 11 = Reverse           Bit 12 = For           Bit 13 = Toft           Bit 14 = Alarm           Bit 15 = Fault				

Figure 3.2: List of available data described at SSW900-CAN-W CANopen User's Guide

For each application, it is necessary to look at this appendix and define which data to communicate. Considering SSW900-CAN-W accessory installed at slot 1, for this application, SSW900 will exchange the following data:

Mapped Inputs	Net Id	Size	Index
S5.1.1 Status Word SSW	680	16bit	22A8h
S1.1.4 Current Average	24	32bit	2018h
S1.2.4 Main Line Voltage Average	4	16bit	2004h

Mapped Outputs	Net Id	Size	Index
S5.2.5 Command Word Slot1	685	16bit	22ADh

After choosing the data, we have selected the PDOs indicated below for a transfer of data every 100 ms.





Based on these data, the following configurations have been programmed on the slave node:

Receive PDO configuration:

- In the PDOs configuration window, set 181h as the COB-ID for Receive PDO 1. This is the master's Transmit PDO 1 COB-ID. ●
- Disable Receive PDO 2 to 4.

PD0	
Beceive PD0	✓ Enable COB-ID (hexa): 0181     ✓ RTR Allowed
- Receive PDO 2	Transmission Type : 254 : asynchronous (Manuf. E 🗨 SYNC Rate : 1
Receive PDO 4	Event Timer : 0 👘 ms
Transmit PDO 1	Inhibit Time : 0 (x100us) Compatibility : 0
Transmit PD0 2	Availables Objects Mapped Objects
└─ Transmit PDO 4	Durmny (INTEGER8) Durmny (INTEGER16) Durmny (INTEGER12) Durmny (INSIGNED8) Durmny (INSIGNED16) Durmny (INSIGNED16) Durmny (INSIGNED16) 22AE 55.2 & Command Word Stot1 (INSIGNE 22AE 55.2 & Command Word Stot2 (INSIGNE 22AE 55.2 & Command Word Stot2 (INSIGNE 22BF 55.5 & Command Word Stot2 (INSIGNE 25BF 55.5 & Command Word Stot2 (INSIGNE 25BF 55.5 & Command Word Stot2 (INSIGNE 25BF 55.5 & Command Word Stot2

Figure 3.4: Slave's Receive PDO Configuration

Transmit PDO configuration:

- Set 100 ms as the Transmit PDO 3 Event Timer. ①
- Disable Transmit PDO 1, 2 and 4.

Reverse PD0 1     Receive PD0 1     Receive PD0 2     Receive PD0 3     Receive PD0 4     Tersmit PD0 1     Transmit PD0 2     Transmit PD0 2     Transmit PD0 3	✓ Enable       COB+D (hexa):       0382       ✓ RTR Allowed         Transmission Type:       254: asynchronous (Manuf, E, SYNC Rate:       1         Event Timer:       100       ms         Inhibit Time:       0       (k100us)       Compatibility:       0       ms         Availables Objects       (k100us)       Compatibility:       0       ms         2001 511.5 Current Motor %In (UNSIGNED16       0       22045 31.3 15 tabus Word SSW (UNSIGNED16)         2003 51.2 Stanic Line Voltage Motor %/n (UN)       2006 51.2 Advantine Voltage Motor %/n (UN)       2006 51.2 Advantine Voltage Motor %/n (UNSIGNED16)         2005 51.2 Advantine Voltage Motor %/n (UN)       2006 51.3 2 Unput Voltage Motor %/n (UNSIGNED16)       0         2005 51.2 Advantine Voltage Motor %/n (UNSIGNED16)       0       2004 51.2 4 Main Line Voltage Average (UNSIGNED2)         2005 51.2 Advantine Voltage Motor %/n (UN)       2006 51.2 Unput Voltage Motor %/n (UN)       0         2005 51.2 Advantine Voltage Motor %/n (UN)       0       0         2005 51.2 Unput Voltage Motor %/n (UN)       0       0         2005 51.5 Li Unput Power & P.F. P. (LINSIGNED16)       0       0         2005 51.5 Li Unput Power & P.F. P. Active UNS       0       0         4       IIII       0       IIII       0         2005
L	OK Cancel Help

Figure 3.5: Slave's Transmit PDO Configuration

#### 3.4 CONFIGURE MASTER PDOS

Now configure the master's PDOs to receive information from the slave's Transmit PDO and send commands to the slave's Receive PDO.

Use the PLC300 Manufacturer Specific objects to configure the PDOs. For this application, the following PLC300 objects were used to link the SSW900 objects:

Slave data	Master Data
22A8 S5.1.1 Status Word SSW	3400 IW2000 - Network Input Word
2018 S1.1.4 Current Average	3804 ID2004 - Network Input Double Word
2004 S1.2.4 Main Line Voltage Average	3408 IW2008 - Network Input Word
22AD S5.2.5 Command Word Slot1	4400 QW2000 - Network Output Word

#### Table 3.1: Master/Slave Object relationship



The PLC300 CANopen master configurations were programmed as follows:

Receive PDO configuration:

- In the PDOs configuration window, set 382h as the COB-ID for Receive PDO 1. This is the slave's Transmit PDO 3 COB-ID. ①
- The RPDO1 configuration for the mapped objects is: "3400 IW2000 - Network Input Word".
   "3804 ID2004 - Network Input Double Word".
   "3408 IW2008 - Network Input Word".
- Disable Receive PDO 2 to 4.

PDU	
□ RsPD0 ■ Receive PD0 1 ■ Receive PD0 2 ■ Receive PD0 3 ■ Receive PD0 4 ■ Receive PD0 6 ■ Receive PD0 6	F Enable COB-ID (hexa): 0382     F RTR Allowed      Transmission Type: 254: asynchronous (Manuf, E SYNC Rate: 1     F For timer: 0     f for
- Receive PD0 7 - Receive PD0 8 - Receive PD0 9 - Receive PD0 10 - Receive PD0 11 - Receive PD0 12 - Receive PD0 13 - Receive PD0 13 - Receive PD0 15 - Receive PD0 16 - Receive PD0 16	Availables Objects  3400 IV/2000 - Network Input Word (UNSIGN 3404 IV/2004 - Network Input Word (UNSIGN 3404 IV/2004 - Network Input Word (UNSIGN 3406 IV/2008 - Network Input Word IV/2008 - Network Inpu
- Receive PD0 17 Receive PD0 18 Receive PD0 19 Receive PD0 19	312 W2019 * Rework mput word DWS18W

Figure 3.6: Master's Receive PDO Configuration

Transmit PDO configuration:

- Set 100 ms as the Transmit PDO 1 Event Timer. 1
- TPDO1 configuration for the mapped objects is: "4400 QW2000 - Network Output Word".
- Disable Transmit PDO 2 and 3.

PDOs configuration < Master1 >	X
PD0           ☐ Transmit PD0 1           — Transmit PD0 2           — Transmit PD0 3           — Transmit PD0 4           — Transmit PD0 5           — Transmit PD0 6           — Transmit PD0 7           — Transmit PD0 8           — Transmit PD0 10           — Transmit PD0 11           — Transmit PD0 11           — Transmit PD0 12           — Transmit PD0 13           — Transmit PD0 14           — Transmit PD0 15           — Transmit PD0 16           — Transmit PD0 17           — Transmit PD0 18           — Transmit PD0 19	Image: Cooler Lo (hexa):       [0181       Image: RTR Allowed         Transmission Type:       254: asynchronous (Manuf. E )       SYNC Rate:       1         Event Timer:       100       ms       Image: Cooler Lo (La
	OK Cancel Help

Figure 3.7: Master's Transmit PDO Configuration

Verify the PDO connections in the menu "Tools / PDOs Connections", press the "List Connections" button.



Figure 3.8: Master/Slave PDO Connections

The PLC300 Manufacturer Specific objects are mapped to the GLOBAL\_NETWORK memory area. Using these data, it is possible to design a PLC program, creating variables representing device information, and a PLC logic to manipulate such data according to desired to the application.

Varia	Jariáveis 🕷									
+	GLOBAL GLOBAL RETAIN GLOBAL_SYSTEM GLOBAL_IO GLOBAL_INETWORK CONSTANT									
	Tag	Size	Datatype	At	Address	Bit	Initial Value	Comment	Modbus	
	STATUS_WORD_SSW	0	WORD	%IW	2000		0		6000	
T		0	UDINT	%ID	2004		0		6002	
*	MAIN_LINE_VOLTAGE_AVERAGE	0	UINT	%IW	2008		0		6004	
AI	COMMAND_WORD_SLOT1	0	WORD	%QW	2000		0		6000	
									1	
<b>3</b>	GLOBAL LOCAL									

Figure 3.9: Location of communication data

#### 3.5 CONFIGURE ERROR CONTROL

Click on the slave and select "Configuration". At tab "NODE GUARDING" enable the node guarding service. This service is used to identify interruptions in the communication both by the master and the slave as well.

Node Configuration <node2></node2>	×
NMT NODE GUARDING PROD. HEARTBE	AT ]
OK Cancelar Ap	licar Ajuda

Figure 3.10: Node guarding service

#### 3.6 DOWNLOAD CONFIGURATION

Once the configuration is finished, download it to PLC from the WPS software. Go to the "Download Resource" option under the "Online" menu.

ssw900_canopen_app_note	
Resource canopen_master	
Device PLC300	Version
Options	
Stop/Run program automatically	Download source code
Initialize variables	Download recipe in the internal memory
Clean alarm history	Download setup configuration
J Disable CANopen master during download	Download CANopen configuration
Internal memory files	Download monitoring values
liesystem bin - 21 Dec 2018 03:52:18 vfo.bin - 21 Dec 2018 03:52:22 etani.bin - 21 Dec 2018 03:52:22 ource.bin - 21 Dec 2018 03:52:23 vamap.bin - 21 Dec 2018 03:52:23 volatie.bin - 21 Dec 2018 03:52:22 adder.bin - 21 Dec 2018 03:52:20	Select

Figure 3.11: Downloading WPS Configuration to the PLC300

After transmitting the master configuration, monitor the devices to check if the device is connected to the network and effectively communicating. The indicators of all devices should be green, meaning that communication is active and without errors.

Go to the "Online Monitoring" option under the "Communication" menu.

File       Edit       View       Configuration       Communication       Tools       Help         D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D	
Device Tree       B: WEG         Master ID # : 1         Master ID # : 1	
B-WEG	
CFW-08 (Rev. 450)     CFW-11 (Rev. 50)     CFW-11 (Rev. 50)     CFW-300 (Rev. 120)     CFW-300 (Rev. 120)     CFW-500 (Rev. 200)     PLC1 42 (Rev. 170)     PLC1 42 (Rev. 170)     PLC1 42 (Rev. 170)     PLC300 (Rev. 150)     PLC300 (Rev. 150)     PLC300 (Rev. 200)     PLC300 (Rev.	
[Ready   NUM	_//

Figure 3.12: Online monitoring

#### **4 CONTROL AND MONITORING**

Once network configuration is done, use WPS to access device data. The main steps are described below.

#### 4.1 VIEW AND EDIT CYCLIC DATA

Under the "Configurations" tab, right-click "ssw900\_canopen\_app\_note/canopen\_master/Diagnostic/Monitoring Variable" and add a new file. Click at the plus sign, select the GLOBAL\_NETWORK variables and press OK to add them to the monitoring file.

SLOBAL	*		4
Variable	Data Type	Group	Ladder
COMMAND_WORD_SLOT1	WORD	GLOBAL_NETWORK	GLOBAL
CURRENT_AVERAGE		GLOBAL_NETWORK	
IAIN_LINE_VOLTAGE_AVERAGE		GLOBAL_NETWORK	
STATUS_WORD_SSW		GLOBAL_NETWORK	
+			OK Cancel

Figure 4.1: Monitoring Variable file

It is now possible to check input and write output data directly at controller memory.

cyclic_data %					
+ Variable	Datatype	User	Monitoring	View as	Sta
💳 🖃 퉲 Global Variables					
COMMAND_WORD_SLOT1	WORD	0	13	Hexadecimal	ОК
CURRENT_AVERAGE	UDINT	0	20	Decimal	ОК
MAIN_LINE_VOLTAGE_AVERAGE	UINT	0	2173	Decimal	ОК
STATUS_WORD_SSW	WORD		163	Hexadecimal	ОК
	S5.1 Status Word				
	1 \$\$W	0 15	Rit		
	.1000	0 10	Dit		
N N	Nord of SSW status.	Vietatue			
	Bit	v status.	Value	e/Description	
	Bit 0 Bupping	0: The motor is no 1: The motor is en	t enabled.		
	Bit 1	0: When It is gener	ral disabled by any mean.		
	Gener. Enabled	1: When It Is gener	ral enabled by all the means.		
	JOG	0: The JOG function 1: The JOG function	on is inactive. on is active.		
	Blt 3 Initial Test	0: None. 1: During the Initial	I tests before the motor starting	l	
	Blt 4 Ramp Up	0: It is not accelera 1: During the whole	ating. le acceleration.		
	Blt 5 Full Voltage	0: There Is no full v 1: Full voltage Is be	voltage applied to the motor. eing applied to the motor.		
	Blt 6 Bypass	0: With open bypa 1: With closed byp	ass. Dass.		
	Blt 7	0: It is not decelera	ating.		
	Ramp Down	1: During the whole	le deceleration.		
	Remote	1: Remote.			
	1	<ol> <li>O: It is not executive</li> </ol>	ng braking.		
	Blt 9 Braking	1: During the brak	ing process.		
	Bit 9 Braking Bit 10	1: During the brake 0: It is not reverting	Ing process. g the rotation direction.		
	Blt 9 Braking Bit 10 FWD/REV	0: It is not executin 1: During the braking 0: It is not reverting 1: During the rotation	Ing process. g the rotation direction. Ion reversion process.		
	Bit 9 Braking Bit 10 FWD/REV Bit 11 Reverse	0: It is not executin 1: During the braiki 0: It is not reverting 1: During the rotati 0: Forward rotation 1: Reverse rotation	Ing process. g the rotation direction. ilon reversion process. n. n.		
	Bit 9 Braking Bit 10 FWD/REV Bit 11 Reverse Bit 12 Top	C: It is not executin     1: During the braki     0: It is not reverting     1: During the rotati     0: Forward rotation     1: Reverse rotation     0: None.     1: Time before store	Ing process. g the rotation direction. ion reversion process. n. n.		
	Bit 9           Braking           Bit 10           FWD/REV           Bit 11           Reverse           Bit 12           Ton           Bit 13	C. It's not reverting     To Juring the brack     C: It is not reverting     T: During the rotati     C: Forward rotation     T: Reverse rotation     C: None.     T: Time before stat     O: None.	Ing process. g the rotation direction. ilon reversion process. n. n. rt (C5.7.2).		
	Bit 9           Braking           Bit 10           FWD/REV           Bit 11           Reverse           Bit 12           Ton           Bit 13           Toff           Dit 4	C. It's Notesboard     To During the braid     C: It is not reverting     T: During the rotat     C: Forward rotation     C: None.     T: Time before stat     C: None.     T: Time after stop     O. Doce	Ing process. g the rotation direction. ion reversion process. n. n. rt (C5.7.2). (C5.7.3).		
	Bit 9         Bit 10           Bit 10         FWD/NEV           Bit 11         Reverse           Bit 12         Ton           Bit 13         Toff           Bit 14         Alarm	<ul> <li>C. It is not even to the braid</li> <li>During the braid</li> <li>C. It is not revening</li> <li>During the rotation</li> <li>Forward rotation</li> <li>Forward rotation</li> <li>None.</li> <li>Time after stop.</li> <li>O: The SSW is not</li> <li>The strike stow is not</li> <li>The active ai</li> </ul>	Ing process. g the rotation direction. ion reversion process. n. rt (C5.7.2). (C5.7.3). in atarm condition. Iarm condition.	ans of the menu D2.1.	
	Bit 9         Bit 10           Bit 10         FWD/REV           Bit 11         Reverse           Bit 12         Ton           Bit 13         Toff           Bit 14         Alarm           Bit 15         Fre 15	C. The for been set of the formation of the formatio	Ing process. g the rotation direction. Ion reversion process. n. n. (C5.7.2). (C5.7.3). In alarm condition. alarm condition. Iarm condition.	ans of the menu D2.1.	

Figure 4.2: Read data, with highlight to status word as described at SSW900 CANopen documentation



For inputs, as described at table 3.1, it is programmed to read the following information:

- STATUS\_WORD\_SSW: value 163h. .
  - Bit 0 = 1 (running).
  - Bit 1 = 1 (general enabled).
    Bit 5 = 1 (at full voltage).

  - Bit 6 = 1 (bypass active). - Bit 8 = 1 (at remote mode).
- MAIN LINE VOLTAGE AVERAGE: value 2173 (217.3V).
- CURRENT\_AVERAGE: value 20 (2.0A).



Figure 4.3: Write data, with highlight to command word as described at SSW900 CANopen documentation

For output, as described at table 3.1, it is programmed to write the following information:

- COMMAND WORD SLOT1: value 13h.
  - Bit 0 = 1 (ramp enable).
  - Bit 1 = 1 (general enable). Bit 4 = 1 (remote mode).

#### LADDER LOGIC FOR ACYCLIC DATA TRANSFER 4.2

There is an appendix at CANopen User's Guide describing the entire list of device data that is possible to access via CANopen Interface. This list also indicates the Index of each data.

For this example, we will read the value of D1.1.1 - Actual fault FXXX.

Parameter	Description	Range of values	Decimal places	Index	Net Id	Size
		D1 Dlagnostics\Fault				
D1.1 D1.1.1	Actual Fxxx	0 to 999	0	205Ah	90	16blt
D1.2	Fault History		_			
		D2 Dlagnostics\Alarms				
D2.1	Actual					
D2.1.1	Axxx 1	0 to 999	0	205Bh	91	16blt
D2.1.2	Axxx 2	0 to 999	0	205Ch	92	16blt
D2.1.3	Axxx 3	0 to 999	0	205Dh	93	16blt

Figure 4.4: SSW900 CANopen documentation describing Index for acyclic access

Once defined the information for acyclic access, add a CO\_SDORead block to the PLC logic. It will be necessary to configure the following information:

- NodelD#: slave address (for this example, SSW900 at address 2). 0
- Index# as described by SSW900 CANopen documentation. ②
- SubIndex# is always 0 (zero) for the SSW900. 3

UPD

- Size#: size in bytes of the Value output variable. 4
- Timeout#: waiting time in ms for the arrival of data starting from the beginning of the request. Image: Image:
- Value: a variable to store the read value (must be compatible with the data size of the reading object). Image: Object the reading object of the readin



Figure 4.5: Acyclic message configuration

Activate CO\_SDOREAD\_INST\_0 block Execute input ● to send an acyclic request to slave. For this example, the value read from D1.1.1 is "3" ②, representing the active fault code (3 = Motor Start Phase Loss).





Figure 4.6: Main ladder sending an acyclic message to the slave



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