Anybus PROFINET IO

SSW900-CPN-IO-N

User's Guide
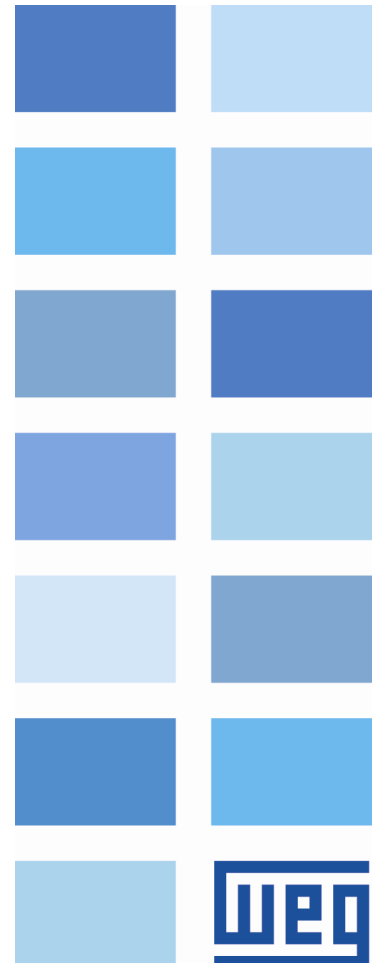
Anybus PROFINET IO User's Guide

The information below describes the reviews made in this manual.

Version	Revision	Description
V1.0X	R00	First edition
V1.1X	R01	General revision
V1.2X	R02	General revision

CONTENTS

ABOUT THE MANUAL

This manual supplies the necessary information for the operation of the SSW900 soft-starter using the Anybus PROFINET IO interface. This manual must be used together with the SSW900 user's manual and programming manual.

ABBREVIATIONS AND DEFINITIONS

ASCII	American Standard Code for Information Interchange
EIA	Electronic Industries Alliance
HMI	Human-Machine Interface
I/O	Input/Output
PLC	Programmable Logic Controller
ro	Read only
rw	Read/write
TIA	Telecommunications Industry Association

NUMERICAL REPRESENTATION

Decimal numbers are represented by means of digits without suffix. Hexadecimal numbers are represented with the letter 'h' after the number. Binary numbers are represented with the letter 'b' after the number.

1 MAIN CHARACTERISTICS

Below are the main characteristics for communication of the soft-starter SSW900 with Anybus PROFINET IO accessory.

- The interface follows the Fast Ethernet 100BASE-TX standard.
- It allows communication using 100 Mbps rate in full duplex mode.
- It has a built-in, two-port Ethernet switch.
- The Ethernet ports work with Auto-MDIX (automatic medium-dependent interface crossover), a technology which automatically detects the type of cable used and configures the connection accordingly, eliminating the need of cross-over cables.
- It is supplied with a GSDML file for the network master configuration.
- Allows up to 64 input and output words for cyclic data communication, and may be configured up to 50 input words and 20 output words.
- Acyclic data available for parameterization.
- Ring and linear network topology supported.
- It features up to 2 Modbus TCP connections.

2 INTERFACE DESCRIPTION

The SSW900 soft-starter has two Slots for accessories (Figura 2.1). Parameters S3.5.1 and S3.5.2 present which accessory was recognized by Slot.

The accessories can be connected to any Slot, but only one type of each communication accessory is allowed. The Anybus-CC communication accessories (regardless of the protocol implanted) are identified on these parameters as *Anybus-CC*.

Read the user's manual of the SSW900 soft-starter before installing or using this accessory.

Slot 1

Slot 2
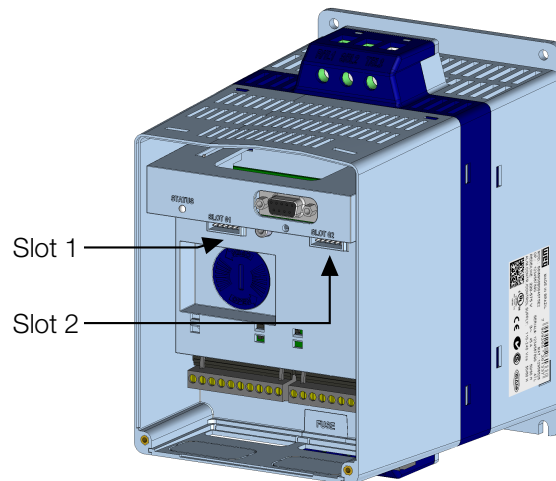
Figure 2.1: *Slots for accessories*

> **NOTE!**
> Only one Anybus-CC communication accessory can be connected to the SSW900 soft-starter, even if they are different protocols.

2.1 ANYBUS PROFINET IO ACCESSORY
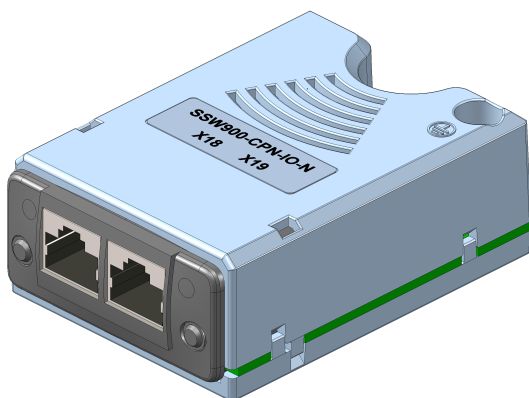
SSW900-CPN-IO-N:

- Supplied items:
    - Installation guide.
    - Anybus PROFINET IO communication module.
    - "torx" screw driver for fixing the module.

2.2 CONNECTORS

The accessory for PROFINET IO communication has two RJ45 connectors for network connection. The connector pin out follows the Fast Ethernet 100BASE-TX standard, using two pairs of cables for data transmission and reception.

The housings of the Ethernet connectors, which are normally connected to the cable shield, have connections between themselves and to the protective earth via an RC circuit.

2.3   INDICATION LEDS

The PROFINET IO accessory has an LED indicator for the Link status in each Ethernet connector (❶ and ❷), and two LEDs for state indication, one for the communication module (MS) and another for the network (NS). These LEDs have the following functions and indications.
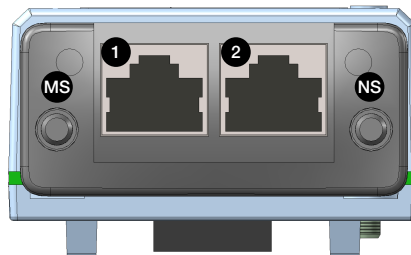
Table 2.1: LED Link

State	Description
Off	No link or powered off.
Green, solid	Link up, no activity.
Green, flashing	Link up and activity.

The MS LED indicates the conditions of the module itself. That is, whether it is able to work or not. The table below shows the possible states:

Table 2.2: State of the PROFINET IO module

Status	Description	Comments
Off	No power or initializing	-
Green, solid	Normal operation	-
Green, flashing	Used by engineering tools to identify the node on the nerwork	-
Red, solid	Module in error	Reinitializing the equipment is required.
Red, flashing (1 flash)	Configuration error	Expected identification differs from real identification.
Red, flashing (2 flashes)	IP address not set	-
Red, flashing (3 flashes)	Station name not set	-
Red, flashing (4 flashes)	Internal error	Reinitializing the equipment is required.

The NS LED provides information about the state of the PROFINET IO network. The table below presents the description of those states.

Table 2.3: State of the PROFINET IO network

Status	Description	Comments
Off	No power or no connection with controller	-
Green, solid	*Online*, connection with controller established, controller in *RUN* mode	-
Green, flashing	*Online*, connection with controller established, controller in *STOP* mode	-

3   PROFINET IO NETWORK INSTALLATION

This chapter presents recommendations related to equipment installation in an PROFINET IO network.

3.1   IP ADDRESS

Every equipment in an Ethernet network needs an IP address and subnet mask.

The IP addressing is unique in the network, and each equipment must have a different IP. The subnet mask is used to define which IP address range is valid in the network.

The SSW900 soft-starter allows the use of two methods for programming these features, programmable via C8.3.4:

▪ Parameters: uses the configurations of IP address, mask and gateway as programmed on equipment parameters.
▪ DHCP: enable the configuration of the SSW900 via DHCP server. The DHCP can automatically assign IP addresses, subnet mask, etc. to the devices on the network. The configurations performed via parameters are disregarded.

NOTE!
▪ After changing these properties, for the changes to take effect, the equipment must be turned off and on again, or requesting the settings update via C8.3.1.
▪ Besides the IP address, for the PROFINET IO network, it is also necessary to program a name for the device. The network master, by means of the configuration tool, normally has the capacity to assign a name, as well as the IP address for the slave.

3.2   COMMUNICATION RATE

The Ethernet interfaces of the SSW900 soft-starter for the PROFINET IO protocol can communicate using the 100 Mbps rate in full duplex mode, as required by the protocol.

3.3   CABLE

Recommended characteristics for the cable:

▪ Standard Ethernet cable, 100Base-TX (FastEthernet), CAT 5e or higher.
▪ Shielded cable.
▪ Maximum length between devices: 100 m.

For installation, it is recommended the use of shielded Ethernet cables specific for use in industrial environment.

3.4   NETWORK TOPOLOGY

To connect SSW900 soft-starter in an PROFINET IO network, usually the star connection is made using an industrial switch.
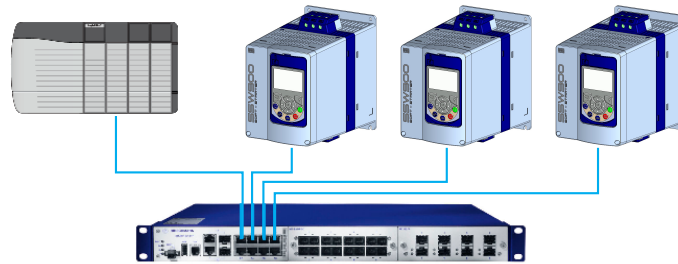
Figure 3.1: *Star topology*

It is also possible to make the connection in daisy chain, allowing a topology equivalent to a bus.

Figure 3.2: *Daisy chain topology*

> ✓ **NOTE!**
> When the equipment is turned off, the built-in switch is also deactivated, preventing communication with the subsequent equipment.

3.5   RECOMMENDATIONS FOR GROUNDING CONNECTION AND CABLE ROUTING

The correct connection with the ground decreases problems caused by interference in an industrial environment. The following are some recommendations about grounding and cable routing:

- Always use shielded twisted pair Ethernet cables and connectors with metallic housing.
- Connect the equipment grounding via grounding terminal. Avoid the cable connection on multiple grounding points, especially where there are grounds with different potentials.
- Pass signal cables and communication cables in dedicated pathways. Prevent laying these cables next to power cables.

4   S STATUS

Allows viewing of the SSW reading variables.

S5 COMMUNICATIONS

HMI monitoring parameters of the communication interfaces.

For a detailed description, refer to the Anybus-CC, CANopen, DeviceNet and Modbus RTU User's Manuals of the SSW according to the interface used.

S5.1 Status Word

.1 SSW	0 ... 15 Bit

Description:
Word of SSW status.

.1 SSW Word of SSW status.

Bit	Value/Description
Bit 0 Running	0: The motor is not enabled. 1: The motor is enabled.
Bit 1 Gener. Enabled	0: When it is general disabled by any mean. 1: When it is general enabled by all the means.
Bit 2 JOG	0: The JOG function is inactive. 1: The JOG function is active.
Bit 3 Initial Test	0: None. 1: During the initial tests before the motor starting.
Bit 4 Ramp Up	0: It is not accelerating. 1: During the whole acceleration.
Bit 5 Full Voltage	0: There is no full voltage applied to the motor. 1: Full voltage is being applied to the motor.
Bit 6 Bypass	0: With open bypass. 1: With closed bypass.
Bit 7 Ramp Down	0: It is not decelerating. 1: During the whole deceleration.
Bit 8 Remote	0: Local. 1: Remote.
Bit 9 Braking	0: It is not executing braking. 1: During the braking process.
Bit 10 FWD/REV	0: It is not reverting the rotation direction. 1: During the rotation reversion process.
Bit 11 Reverse	0: Forward rotation. 1: Reverse rotation.
Bit 12 Ton	0: None. 1: Time before start (C5.7.2).
Bit 13 Toff	0: None. 1: Time after stop (C5.7.3).
Bit 14 Alarm	0: The SSW is not in alarm condition. 1: The SSW is in alarm condition. Note: The active alarm codes can be read by means of the menu D2.1.
Bit 15 Fault	0: The SSW is not in fault condition. 1: The SSW is in fault condition. Note: The active fault code can be read by means of the menu D1.1.

S5.2 Command Word

.5 Slot1	0 ... 15 Bit
.6 Slot2	0 ... 15 Bit

Description:

Command word of all sources of the SSW. The RUN/STOP and JOG commands of the sources which are not active will be reset.

.5 Slot1 Control word via any communication accessory connected to Slot 1.

.6 Slot2 Command word via any communication accessory connected to Slot 2.

Bit	Value/Description
Bit 0 Start/Stop	**0**: stopping by ramp. **1**: starting by ramp.
Bit 1 Gener. Enabled	**0**: general disable. **1**: general enable.
Bit 2 JOG	**0**: no JOG. **1**: with JOG.
Bit 3 FWD/REV	**0**: clockwise CW. **1**: counterclockwise CCW.
Bit 4 LOC/REM	**0**: local. **1**: remote.
Bit 5 … 6 Reserved	
Bit 7 Reset	**0 → 1**: execute fault reset (if a fault is active). Note: Only in the 0 to 1 transition command.
Bit 8 … 15 Reserved	

✓ **NOTE!**

If the RUN/STOP and JOG commands are by a certain source and it is active, only these commands can be viewed in S5.2. For security reasons, all the other commands of the other sources which are not active will be reset.

S5.3 Value for Outputs

.1 DO Value	0 ... 15 Bit

Description:

Value for digital and analog outputs via serial communication.

.1 DO Value Value for the digital outputs via network interfaces.

Bit	Value/Description
Bit 0 DO1	**0**: Inactive. **1**: Active.
Bit 1 DO2	**0**: Inactive. **1**: Active.
Bit 2 DO3	**0**: Inactive. **1**: Active.
Bit 3 … 15 Reserved	

S5.3.2 Value for AO

.1 AO in 10 bits	0 ... 1023

Description:

Value for the analog output via network interfaces.

.1 AO in 10 bits Value for the analog output via network interfaces: 0...1023. 0=0% and 1023=100%.

S5.5 Anybus-CC

.1 Identification	0 ... 25
.2 Comm. Status	0 ... 8

Description:
Status of the Anybus communication accessory and the protocols that use this interface.

.1 Identification It allows identifying the connected Anybus module.

Indication	Description
0 = Disabled	Communication module not installed.
1 ... 15 = Reserved	
16 = Profibus DP	Profibus DP module.
17 = DeviceNet	DeviceNet Module.
18 = Reserved	
19 = EtherNet/IP	EtherNet/IP module.
20 = Reserved	
21 = Modbus TCP	Modbus TCP module.
22 = Reserved	
23 = PROFINET IO	PROFINET IO module.
24 ... 25 = Reserved	

.2 Comm. Status It informs the communication module status.

Indication	Description
0 = Setup	Module identified, waiting for configuration data (automatic).
1 = Init	Module executing the interface initialization (automatic).
2 = Wait Comm	Module initialized, but without communication with the network master.
3 = Idle	Communication with the network master established, but in idle or programming mode.
4 = Data Active	Communication with the network master established, and I/O data being communicated successfully. "Online".
5 = Error	Not available.
6 = Reserved	
7 = Exception	Serious error on the communication interface. The interface requires reinitialization.
8 = Access Error	Access error between the equipment and Anybus interface. Requires interface reset.

5   C CONFIGURATIONS

This menu allows the programming of all SSW configuration parameters.

C8 COMMUNICATION

To change information via communication network, the SSW has several standard protocols.

The following necessary accessories and protocols are available:

Protocol	Accessory
CANopen	SSW900-CAN-W
DeviceNet	SSW900-CDN-N, SSW900-CAN-W
EtherNet/IP	SSW900-CETH-IP-N
Modbus RTU	SSW900-CRS485-W
Modbus TCP	SSW900-CMB-TCP-N
Profibus DP	SSW900-CPDP-N
PROFINET IO	SSW900-CPN-IO-N

For further details regarding the SSW configuration to operate these protocols, refer to the SSW Communication Manual.

C8.1 I/O Data

Configure network data exchange area.

Use this for cyclic communication over SSW900-CAN-W module (DeviceNet), SSW900-CPDP-N, SSW900-CDN-N, SSW900-CETH-IP-N and SSW900-CPN-IO-N. For SSW900-CRS485-W using Modbus RTU protocol or SSW900-CMB-TCP-N module, a contiguous area of holding registers (@1500-@1549 and @1600-@1619) can be accessed using standard Modbus functions.
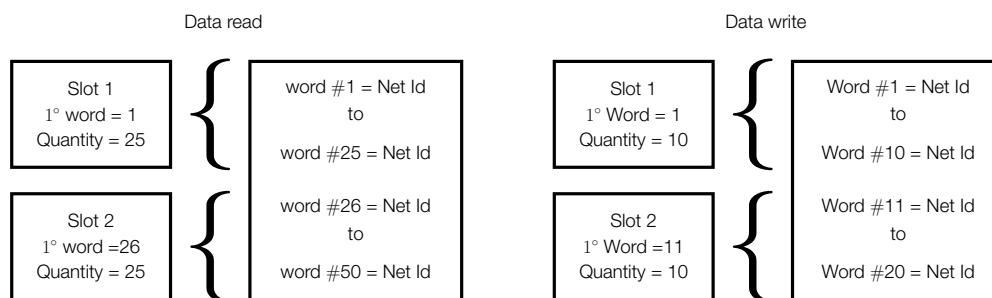
Figure 5.1: Example of data setting

C8.1.1 Data Read

Configure a set of 16 bit parameters to read over the network.

C8.1.1 Data Read		
C8.1.1.1 Slot 1 1st Word		
Range:	1 ... 50	**Default:** 1
Properties:	Stopped	

Description:

It sets the index of the first programmable read word for data communication (inputs for master).

C8.1.1 Data Read		
C8.1.1.2 Slot 1 Quantity		
Range:	1 ... 50	**Default:** 1
Properties:	Stopped	

Description:

It sets the number of read words for data communication (inputs for master), from the first word on.

C8.1.1 Data Read		
C8.1.1.3 Slot 2 1st Word		
Range:	1 ... 50	**Default:** 26
Properties:	Stopped	

Description:

It sets the index of the first programmable read word for data communication (inputs for master).

C8.1.1 Data Read		
C8.1.1.4 Slot 2 Quantity		
Range:	1 ... 50	**Default:** 1
Properties:	Stopped	

Description:

It set the number of read words for data communication (inputs for master), from the first word on.

C8.1.1 Data Read		
C8.1.1.5 Word #1		

C8.1.1.5 to C8.1.1.54

C8.1.1 Data Read		
C8.1.1.54 Word #50		
Range:	0 ... 65535	**Default:** 0
Properties:	Stopped	

Description:

Select the net address of other parameter, which content will be available as reading data for fieldbus interfaces (inputs: sent to master).

The data size of the referenced parameter must be considered. If data size is bigger than 16 bits, the next data read word configuration must be set to the same net address.

C8.1.2 Data Write

Configure a set of 16 bit parameters to write over the network.

C8.1.2 Data Write		
C8.1.2.1 Slot 1 1st Word		
Range:	1 ... 20	**Default:** 1
Properties:	Stopped	

Description:

It sets the index of the first programmable write word for data communication (outputs for master).

C8.1.2 Data Write

C8.1.2.2 Slot 1 Quantity

Range:	1 ... 20	**Default:** 1
Properties:	Stopped	

Description:

It sets the number of write words for data communication (outputs for master), from the first word on.

C8.1.2 Data Write

C8.1.2.3 Slot 2 1st Word

Range:	1 ... 20	**Default:** 11
Properties:	Stopped	

Description:

It sets the index of the first programmable write word for data communication (outputs for master).

C8.1.2 Data Write

C8.1.2.4 Slot 2 Quantity

Range:	1 ... 20	**Default:** 1
Properties:	Stopped	

Description:

It sets the number of write words for data communication (outputs for master), from the first word on.

C8.1.2 Data Write

C8.1.2.5 Update Delay

Range:	0.0 ... 999.9 s	**Default:** 0.0
Properties:		

Description:

Whenever there is a transition from offline (without cyclic data) to online (with cyclic write data), the data received via communication networks (write words) is ignored during this programmed time, remaining in the state it was before the beginning of the reception.
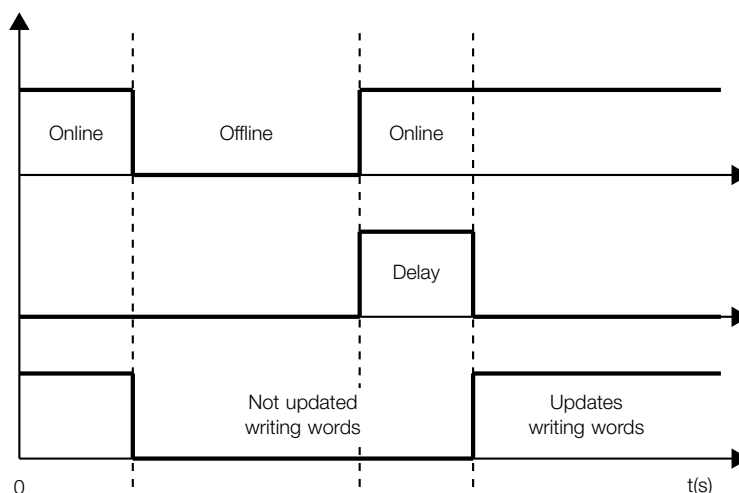
Figure 5.2: Delay in the update of the I/O words

C8.1.2 Data Write

C8.1.2.6 Word #1

C8.1.2.6 to C8.1.2.25

C8.1.2 Data Write

C8.1.2.25 Word #20

Range:	0 ... 65535	Default: 0
Properties:	Stopped	

Description:

Select the net address of other parameter, which content will be available as writing data for fieldbus interfaces (outputs: received from master).

The data size of the referenced parameter must be considered. If data size is bigger than 16 bits, the next data write word configuration must be set to the same net address.

C8.3 Anybus-CC

Configuration for the Anybus-CC communication and protocols that use this interface.

For a detailed description, refer to the SSW900 Anybus-CC User's Manual specific for the desired protocol, supplied in electronic format.

C8.3 Anybus-CC

C8.3.1 Update Configuration

Range:	0 ... 1	Default: 0
Properties:	Stopped	

Description:

It allows forcing a reinitialization of the Anybus-CC communication module for the configurations done in the parameters of menus C8.1 and C8.3 to be applied.

The reinitialization implies communication loss. After the process is completed, this parameter automatically goes back to Regular Operation.

Indication	Description
0 = Normal Operation	No action.
1 = Update configuration	Reinitializes the Anybus module.

C8.3 Anybus-CC

C8.3.4 IP Address Configuration

Range:	0 ... 2	Default: 1
Properties:		

Description:

It allows to choose how to set the IP address for the modules Anybus-CC EtherNet/IP, Modbus TCP and PROFINET IO.

Indication	Description
0 = Parameters	The programming of the IP address, configurations of the subnet mask and gateway must be done through parameters C8.3.5, C8.3.6 and C8.3.7.
1 = DHCP	Enables the DHCP function. The IP address and other network configurations are received from a DHCP server via network.
2 = DCP	The IP address and other network configurations are received via DCP (PROFINET IO).

NOTE!
After changing this configuration, for the modification to be effective, the equipment must be turned off and then turned on again, or the configurations must be updated through C8.3.1.

C8.3 Anybus-CC

C8.3.5 IP Address

Range:	0.0.0.0 ... 255.255.255.255	**Default:** 192.168.0.10
Properties:		

Description:

It allows programming the IP address of the module Anybus-CC EtherNet/IP, Modbus TCP or PROFINET IO. It is only effective if C8.3.4 = Parameters.

> ✓ **NOTE!**
> After changing this configuration, for the modification to be effective, the equipment must be turned off and then turned on again, or the configurations must be updated through C8.3.1.

C8.3 Anybus-CC

C8.3.6 CIDR

Range:	0 ... 31	**Default:** 24
Properties:		

Description:

It allows programming the subnet mask used by the module Anybus-CC EtherNet/IP, Modbus TCP or PROFINET IO. It is only effective if C8.3.4 = Parameters.

Indication	Description
0 = Reserved	
1 = 128.0.0.0	Subnet mask.
2 = 192.0.0.0	Subnet mask.
3 = 224.0.0.0	Subnet mask.
4 = 240.0.0.0	Subnet mask.
5 = 248.0.0.0	Subnet mask.
6 = 252.0.0.0	Subnet mask.
7 = 254.0.0.0	Subnet mask.
8 = 255.0.0.0	Subnet mask.
9 = 255.128.0.0	Subnet mask.
10 = 255.192.0.0	Subnet mask.
11 = 255.224.0.0	Subnet mask.
12 = 255.240.0.0	Subnet mask.
13 = 255.248.0.0	Subnet mask.
14 = 255.252.0.0	Subnet mask.
15 = 255.254.0.0	Subnet mask.
16 = 255.255.0.0	Subnet mask.
17 = 255.255.128.0	Subnet mask.
18 = 255.255.192.0	Subnet mask.
19 = 255.255.224.0	Subnet mask.
20 = 255.255.240.0	Subnet mask.
21 = 255.255.248.0	Subnet mask.
22 = 255.255.252.0	Subnet mask.
23 = 255.255.254.0	Subnet mask.
24 = 255.255.255.0	Subnet mask. Factory setting.
25 = 255.255.255.128	Subnet mask.
26 = 255.255.255.192	Subnet mask.
27 = 255.255.255.224	Subnet mask.
28 = 255.255.255.240	Subnet mask.
29 = 255.255.255.248	Subnet mask.
30 = 255.255.255.252	Subnet mask.
31 = 255.255.255.254	Subnet mask.

> **NOTE!**
> After changing this configuration, for the modification to be effective, the equipment must be turned off and then turned on again, or the configurations must be updated through C8.3.1.

C8.3 Anybus-CC
C8.3.7 Gateway

Range:	0.0.0.0 ... 255.255.255.255	Default: 0.0.0.0
Properties:		

Description:

It allows programming the IP address of the standard gateway used by the module Anybus-CC EtherNet/IP, Modbus TCP or PROFINET IO. It is only effective if C8.3.4 = Parameters.

> **NOTE!**
> After changing this configuration, for the modification to be effective, the equipment must be turned off and then turned on again, or the configurations must be updated through C8.3.1.

C8.3 Anybus-CC
C8.3.8 Station Name Suffix

Range:	0 ... 254	Default: 0
Properties:		

Description:

Alolws defining the PROFINET IO Station Name suffix. The Station Name has the format SSW900-xxx, where xxx is the number set in this parameter. Example: C8.3.8 = 42 – Station Name = SSW900-042.

The value 0 (zero) disables the assignment of the Station Name, allowing the Station Name to be assigned via DCP.

C8.3.10 Off Line Error

Protection against interruption in the communication with the network master.

If for some reason there is an interruption in the communication between the product and the network master, a communication error will be indicated, alarm A129 or fault F129 will be shown on the HMI, depending on the programming of C8.3.9.1, and the action programmed in C8.3.9.2 will be executed.

It only occurs after the equipment is online. This error is generated for the modules Anybus-CC DeviceNet, EtherNet/IP, Profibus DP and PROFINET IO.

C8.3.10 Off Line Error
C8.3.10.1 Mode

Range:	0 ... 2	Default: 0
Properties:		

Description:

It allows configuring the tripping mode of the protection against interruption in the communication with the network master.

Indication	Description
0 = Inactive	No tripping.
1 = Fault F129	Trips as fault. Disables the motor.
2 = Alarm A129	Trips as alarm. Action described in C8.3.10.2.

C8.3.10 Off Line Error

C8.3.10.2 Alarm Action

Range:	0 ... 4	**Default:** 3
Properties:		

Description:

Action for the Anybus-CC Offline communication alarm.

The actions described in this parameter are executed through the writing of the respective bits in the control word of the SLOT to which the accessory Anybus-CC DeviceNet, EtherNet/IP, Profibus DP or PROFINET IO is connected. Thus, for the commands to be effective, the equipment must be programmed to be controlled by the network interface used. This programming is done through menu C3.

Indication	Description
0 = Indicates Only	No action is taken; the equipment remains in the current state.
1 = Ramp Stop	The stop by ramp command is executed, and the motor stops according to the programmed deceleration ramp.
2 = General Disable	The equipment is general disabled, and the motor stops by inertia.
3 = Change to LOC	The equipment is commanded to local mode.
4 = Change to REM	The equipment is commanded to remote mode.

NOTE!

The alarm action will only have a function if the error tripping mode C8.3.9.1 is programmed for Alarm A129.

6 OPERATION IN THE PROFINET IO NETWORK

6.1 CYCLIC DATA

Cyclic data is the data normally used for status monitoring and equipment control. For PROFINET IO protocol, the interface supports an I/O connection that allows communication up to 50 input words and 20 output words. However, the number of input words added to the output words can not be greater than 64 words.

It is necessary the configuration to be made both at the slave and master.

6.1.1 Input words

The SSW900 soft-starter has a reading area with 50 16-bit words available for cyclic data exchange of communication networks. The data available in the reading area (Input) is sent to the master of the network. This area is shared between the two Slots.

To map an object in the reading area, follow the steps below.

1. Configure parameter C8.1.1.1 (Slot 1) or C8.1.1.3 (Slot 2). Those parameters indicate which of the reading words starts the input area for the specific Slot.

2. Configure on parameter C8.1.1.2 (Slot 1) or C8.1.1.4 (Slot 2) the quantity of input words which must be transmitted via network.

3. Parameters C8.1.1.5 to C8.1.1.54 enable to configure the data that must be provided on the reading words. Those parameters must contain the network addresses (Net Id) of the data that must be transmitted on the respective reading words. The Net Id list is available on the table A.2. Consider the size of each parameter mentioned in this list when programming each word.

Example

The example below presents a configuration for Slot 2. Considering the following parameters to be mapped:

- S5.1.1 Status Word SSW.
- S1.2.4 Main Line Voltage Average.
- S1.1.4 Current Average.
- S1.5.4 Output Power & P.F. P. F..

Searching parameter information on the table A.2:

Mapped Parameter	Net Id	Size	Qty Mapped Words	Example Value
S5.1.1 Status Word SSW	680	16bit	1	99 = 0063h
S1.2.4 Main Line Voltage Average	4	16bit	1	2186 = 088Ah
S1.1.4 Current Average	24	32bit	2	23 = 00000017h
S1.5.4 Output Power & P.F. P. F.	8	8bit	1	14 = 0Eh

Therefore, the configuration must be performed as shown below:

1. C8.1.1.3 Data Read Slot 2 1st Word = 26 → first word transmitted via network is the word #26.

2. C8.1.1.4 Data Read Slot 2 Quantity = 5 → sum of the column "Qty mapped words".

3. Table 6.1 presents the configuration parameters of the words and the content of the reading words.

Table 6.1: Example of configuration of the writing words.

Configuration Parameter	Mapped Parameter	Net Id	Input Area Value
C8.1.1.30 Data Read Word #26	S5.1.1	680	0063h
C8.1.1.31 Data Read Word #27	S1.2.4	4	088Ah
C8.1.1.32 Data Read Word #28	S1.1.4	24	0017h (S1.1.4 low word)
C8.1.1.33 Data Read Word #29	S1.1.4	24	0000h (S1.1.4 high word)
C8.1.1.34 Data Read Word #30	S1.5.4	8	000Eh

NOTE!
- Mapping of invalid parameters or not available will return zero value.
- The data is transmitted as an integer value, without the indication of the decimal places.
- To obtain the network address (Net Id) of the parameters, refer to Appendix A.

6.1.2 Output Words

The SSW900 soft-starter has a writing area with 20 16-bit words available for cyclic data exchange of communication networks. The data available in the write area (Output) is received from the network master. This area is shared between the two Slots.

To map an object in the writing area, follow the steps below.

1. Configure parameter C8.1.2.1 (Slot 1) or C8.1.2.3 (Slot 2). Those parameters indicate which of the writing words starts the output area for the specific Slot.

2. Configure on parameter C8.1.2.2 (Slot 1) or C8.1.2.4 (Slot 2) the quantity of reading words which must be transmitted via network.

3. Parameters C8.1.2.6 to C8.1.2.25 enable to configure the data that must be provided on the writing words. Those parameters must contain the network address (Net Id) of the data that must be transmitted on the respective writing words. The Net Id list is available on the table A.2. Consider the size of each parameter mentioned in list when programming each word.

Exemplo

The example below presents a configuration for Slot 1. Considering the following parameters to be mapped:

- S5.2.5 Command Word Slot1.
- S5.3.1 Value for Outputs DO Value.
- S5.3.2.1 Value for AO AO in 10 bits.

Searching parameter information on the table A.2:

Mapped Parameter	Net Id	Size	Qty Mapped Words	Example Value
S5.2.5 Command Word Slot1	685	16bit	1	19 = 0013h
S5.3.1 Value for Outputs DO Value	695	16bit	1	7 = 0007h
S5.3.2.1 Value for AO AO in 10 bits	696	16bit	1	1023 = 03FFh

Therefore, the configuration must be performed as shown below:

1. C8.1.2.1 Data Write Slot 1 1st Word = 1 → first word transmitted via network is the word #1.

2. C8.1.2.2 Data Write Slot 1 Quantity = 3 → sum of column "Qty mapped words".

3. The table 6.2 presents the configuration parameters of the words and the content of the writing words.

Table 6.2: Example of configuration of the writing words.

Configuration Parameter	Mapped Parameter	Net Id	Output Area Value
C8.1.2.6 Data Write Word #1	S5.2.5	685	0013h
C8.1.2.7 Data Write Word #2	S5.3.1	695	0007h
C8.1.2.8 Data Write Word #3	S5.3.2.1	696	03FFh

✓ **NOTE!**
- Mapping of readonly parameters (status, diagnostics) or invalid parameters will have no effect.
- Parameters that have the property *Stopped*, when mapped on the writing words, are only changed when the motor is stopped.
- The parameters written using these words are not saved in non-volatile memory. Thus, if the equipment is turned off and back on, these parameters will return to their original value.
- The data is transmitted as an integer value, without the indication of the decimal places.
- To obtain the network address (Net Id) of the parameters, refer to Appendix A.

6.2 ACYCLIC DATA

In addition to the cyclic data, the interface also provides acyclic data, mainly used to communicate diagnoses data, parameterization and configuration. For the SSW900 soft-starter using the Anybus PROFINET IO module, the parameter list is available using this communication method.

The PROFINET IO protocol defines the following structure to address the components for network configuration:

- AR (Application Relation).
- API (Application Process Identifier).
- Slot.
- Subslot.

The AR and API are used to identify the PROFINET IO module during the network configuration steps. Slot/subslot are not relevant for accessing acyclic data. Once the module is identified, the parameters are accessed indicating the index and the data length:

- Index: represents the parameter net address (Net Id).
- Length: the length of data, in bytes.

✓ **NOTE!**
- The data is transmitted as an integer value, without the indication of the decimal places.
- To obtain the network address (Net Id) used to identify *Index* and *Length* for the parameters, refer to Appendix A.

6.3 STATION NAME

A name must be assigned to each device on the PROFINET IO network. Such name, which remains stored on the communication accessory, is used to identify and establish an address for the device on the network. For the SSW900 soft-starter, this name can be assigned by the PROFINET IO configuration tool, or using parameter C8.3.8.

6.4 XML FILE – GSDML

Each device on an PROFINET IO network has an GSDML configuration file, which contains information about the device functions on the network. This file is used by a master or configuration software to program devices present at PROFINET IO network.

The GSDML file is available from WEG website (http://www.weg.net). It is important to note if the GSDML configuration file is compatible with the firmware version of the SSW900 soft-starter.

6.5 MODBUS TCP CONNECTIONS

The accessory for PROFINET IO also provides up to 2 Modbus TCP connections. These connections can be used for parameterization.

7   STARTUP GUIDE

The main steps to start up the SSW900 soft-starter in PROFINET IO network are described below. These steps represent an example of use. Check out the specific chapters for details on the indicated steps.

7.1   INSTALLING THE ACCESSORY

1. Install the communication accessory, as indicated in the installation guide supplied with the accessory.

2. With the module installed the MS LED must turn on in green.

3. Observe the content of parameter S5.5.1. Check if the module was recognized. The detection is done automatically and does not require the user's intervention.

4. Connect the cables, considering the recommended instructions in network installation, as described in item 3.5:
   - Use shielded cable.
   - Properly ground network equipment.
   - Avoid laying communication cables next to power cables.

7.2   CONFIGURING THE EQUIPMENT

1. Follow the recommendations described in the user manual to program the device parameters related to the motor parameterization, desired functions for the I/O signals, etc.

2. Program the command sources as desired for the application in menu C3.

3. Configure communication parameters, such as DHCP, IP address, communication rate, etc. in C8.3.

4. Configure the Station Name from the configuration tool or using parameter C8.3.8.

5. Program the desired action for the equipment in case of communication fault in C8.3.10.

6. Define which data will be read and written at soft-starter SSW900 using menu C8.1. Among the main parameters that can be used to control the device, we can mention:
   - S5.1.1 Status Word SSW (read).
   - S5.2.5 Command Word Slot1 (write).
   - S5.2.6 Command Word Slot2 (write).

7. Once the parameters are set, if any of the parameters described in the previous steps were changed, the equipment must be powered off and on again, or an update must be performed by C8.3.1.

7.3   CONFIGURING THE MASTER

The way the network configuration is done depends greatly on the used client and the configuration tool. It is essential to know the tools used to perform this activity. In general, the following steps are necessary to perform the network configuration.

1. Load the GSDML file[1] to the list of devices in the network configuration tool.

2. Select SSW900 soft-starter from the available list of devices on the network configuration tool. This can be done manually or automatically, if allowed by the tool. The PROFINET IO module is recognized as "SSW900 Anybus-CC", at the "General" category.

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[1] The GSDML file is available from WEG website (http://www.weg.net). It is important to note if the GSDML configuration file is compatible with the firmware version of the SSW900 soft-starter.

3. For the master configuration, in addition to the IP address and name used by the PROFINET IO module, you must indicate the number of I/O words exchanged with the master. It is necessary to select word by word, first selecting all input words and then all output words. The network topology must be informed, indicating exactly the connections between the PROFINET IO devices.

Once configured, the NS LED will be on in green. It is in this condition that cyclic data exchange effectively occurs between the slave and the master of the network.

7.4   COMMUNICATION STATUS

Once the network is assembled and the master programmed, it is possible to use the LEDs and parameters of the equipment to identify some status related to the communication.

▪   The MS, NS and Link LEDs provide information about the status of the interface and communication.
▪   The parameter S5.5.2 indicates the status of communication between the device and the network master.

The master of the network must also supply information about the communication with the slave.

7.5   OPERATION USING PROCESS DATA

Once the communication is established, the data mapped in the I/O area is automatically updated between master and slave. Among the main parameters that can be used to control the device, we can mention:

▪   S5.1.1 Status Word SSW.
▪   S5.2.5 Command Word Slot1.
▪   S5.2.6 Command Word Slot2.

It is important to know these parameters to program the master as desired for the application.
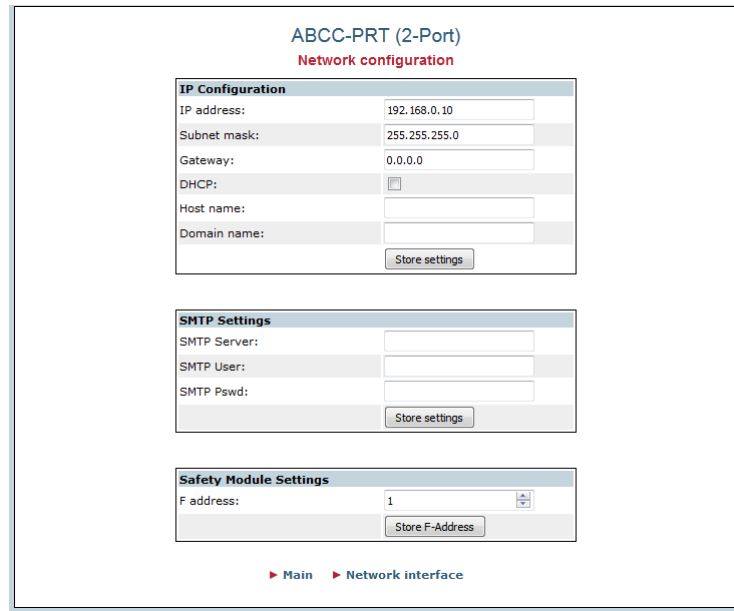
7.6   ACCESS TO PARAMETERS – ACYCLIC MESSAGES

Besides the I/O data (cyclic) communication, the PROFINET IO protocol also provides acyclic data requests used especially in asynchronous tasks, such as parameter setting and configuration of the equipment.

The GSDML file provides the full parameter list of the equipment. The item 6.2 describes how to address the parameters of the soft-starter SSW900 via acyclic messages.

8 WEB SERVER

Besides the communication protocol, the Ethernet interface also provides a WEB server with a simple HTML page to access SSW900 soft-starter data. If the IP address is known, you can use a web browser by typing the IP address in the browser address bar, and it will present a web page with links to interface settings and device data.

Figure 8.1: *WEB page for interface configuration*

In the interface settings, it presents several fields for programming the IP address, subnet, DHCP, among others. The parameter list of the equipment can also be accessed through the WEB browser via "Parameter Data" link. This list is presented in a simplified format, with only the integer values, with no indication of decimal places.

9   FAULTS AND ALARMS

Fault/Alarm	Description	Possible Causes
F129/A129: Anybus Offline	It indicates communication interruption of Anybus-CC accessory with network master.	- The master PLC went to the idle or programming state. - Programming error, the number of programmed I/O words in the slave differs from the number adjusted in the master. - Lose of communication with the master (broken cable, disconnected connector etc.).
F130: Anybus Access Fault	It indicates access error to the Anybus-CC communication module. It actuates when the SSW cannot exchange data with the Anybus-CC accessory, when the Anybus module identifies some internal fault, or when there is a hardware incompatibility. In order to remove this fault, it is necessary to power the SSW off and on again.	- Check that the accessory is properly fitted. - Check that the equipment firmware version supports the Anybus accessory. - Hardware errors due to improper handling or installation of the accessory, for example, may cause this error. - If possible, carry out tests by replacing the communication accessory.
F132/A132: Anybus Idle	It indicates that network master changed to idle or programming state.	- How to detect this condition depends on the communication protocol and the network master.

APPENDIX A

Table A.2: *Characteristics of the parameters for the communication protocol*

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
			S1 Status\Measurements					
S1.1	Current							
S1.1.1	R Phase	0.0 to 14544.0 A	1	26	4	26	32bit	2
S1.1.2	S Phase	0.0 to 14544.0 A	1	28	4	28	32bit	2
S1.1.3	T Phase	0.0 to 14544.0 A	1	30	4	30	32bit	2
S1.1.4	Average	0.0 to 14544.0 A	1	24	4	24	32bit	2
S1.1.5	Motor %In	0.0 to 999.9 %	1	2	2	2	16bit	1
S1.1.6	SSW %In	0.0 to 999.9 %	1	1	2	1	16bit	1
S1.2	Main Line Voltage							
S1.2.1	R-S Line	0.0 to 999.9 V	1	33	2	33	16bit	1
S1.2.2	S-T Line	0.0 to 999.9 V	1	34	2	34	16bit	1
S1.2.3	T-R Line	0.0 to 999.9 V	1	35	2	35	16bit	1
S1.2.4	Average	0.0 to 999.9 V	1	4	2	4	16bit	1
S1.2.5	Motor %Vn	0.0 to 999.9 %	1	3	2	3	16bit	1
S1.2.6	SSW %Vn	0.0 to 999.9 %	1	5	2	5	16bit	1
S1.3	Output Voltage							
S1.3.1	Average	0.0 to 999.9 V	1	7	2	7	16bit	1
S1.3.2	Motor %Vn	0.0 to 999.9 %	1	6	2	6	16bit	1
S1.4	SCR Blocking Voltage							
S1.4.1	R-U Blocking	0.0 to 999.9 V	1	21	2	21	16bit	1
S1.4.2	S-V Blocking	0.0 to 999.9 V	1	22	2	22	16bit	1
S1.4.3	T-W Blocking	0.0 to 999.9 V	1	23	2	23	16bit	1
S1.5	Output Power & P.F.							
S1.5.1	Active	0.0 to 11700.0 kW	1	10	4	10	32bit	2
S1.5.2	Apparent	0.0 to 11700.0 kVA	1	12	4	12	32bit	2
S1.5.3	Reactive	0.0 to 11700.0 kVAr	1	14	4	14	32bit	2
S1.5.4	P. F.	0.0 to 1.0	2	8	1	8	8bit	1
S1.6	P.L.L.							
S1.6.1	Status	0 = Off 1 = Ok		16	1	16	enum	1
S1.6.2	Frequency	0.0 to 99.9 Hz	1	17	2	17	16bit	1
S1.6.3	Sequence	0 = Invalid 1 = RST / 123 2 = RTS / 132		18	1	18	enum	1
S1.7	Motor Torque							
S1.7.1	Motor %Tn	0.0 to 999.9 %	1	9	2	9	16bit	1
S1.8	Control Voltage							
S1.8.1	Input	0.0 to 999.9 V	1	71	2	71	16bit	1
S1.8.2	+5V	0.0 to 9.99 V	2	72	2	72	16bit	1
S1.8.3	+12V	0.0 to 99.9 V	1	73	2	73	16bit	1
S1.8.4	+Vbat	0.0 to 9.99 V	2	75	2	75	16bit	1
S1.8.5	+48V	0.0 to 99.9 V	1	76	2	76	16bit	1
			S2 Status\I/O					
S2.1	Digital							

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
S2.1.1	Inputs	Bit 0 = DI1 Bit 1 = DI2 Bit 2 = DI3 Bit 3 = DI4 Bit 4 = DI5 Bit 5 = DI6 Bit 6 ... 15 = Reserved		677	2	677	16bit	1
S2.1.2	Outputs	Bit 0 = DO1 Bit 1 = DO2 Bit 2 = DO3 Bit 3 ... 15 = Reserved		678	2	678	16bit	1
S2.2	Analog Output							
S2.2.1	Percent	0.0 to 100.0 %	2	673	2	673	16bit	1
S2.2.2	Current	0.0 to 20.0 mA	3	674	2	674	16bit	1
S2.2.3	Voltage	0.0 to 10.0 V	3	675	2	675	16bit	1
S2.2.4	10 bits	0 to 1023	0	676	2	676	16bit	1
S3 Status\SSW900								
S3.1	SSW Status							
S3.1.1	Actual	0 = Ready 1 = Initial Test 2 = Fault 3 = Ramp Up 4 = Full Voltage 5 = Bypass 6 = Reserved 7 = Ramp Down 8 = Braking 9 = FWD/REV 10 = Jog 11 = Start Delay 12 = Re-start Delay 13 = General Disabled 14 = Configuration		679	1	679	enum	1
S3.1.2	Active Command Source	0 = HMI Keys LOC 1 = HMI Keys REM 2 = DIx LOC 3 = DIx REM 4 = USB LOC 5 = USB REM 6 = SoftPLC LOC 7 = SoftPLC REM 8 = Slot 1 LOC 9 = Slot 1 REM 10 = Slot 2 LOC 11 = Slot 2 REM		232	1	232	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
S3.1.3	Status Word							
S3.1.3.1	SSW	Bit 0 = Running Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = Initial Test Bit 4 = Ramp Up Bit 5 = Full Voltage Bit 6 = Bypass Bit 7 = Ramp Down Bit 8 = Remote Bit 9 = Braking Bit 10 = FWD/REV Bit 11 = Reverse Bit 12 = Ton Bit 13 = Toff Bit 14 = Alarm Bit 15 = Fault		680	2	680	16bit	1
S3.1.4	Configuration Mode							
S3.1.4.1	Status	Bit 0 = System Initialization Bit 1 = Firmware Download Bit 2 = Oriented Start-Up Bit 3 = Incompatible Bit 4 = Reset Needs Bit 5 = Copy HMI Bit 6 ... 15 = Reserved		692	2	692	16bit	1
S3.2	Software Version							
S3.2.1	Package	0.0 to 99.99	2	328	2	328	16bit	1
S3.2.2	Details							
S3.2.2.1	Control 1 V	0.0 to 99.99	2	330	2	330	16bit	1
S3.2.2.2	Control 1 rev.	-32768 to 32767	0	327	2	327	s16bit	1
S3.2.2.3	Bootloader V	0.0 to 99.99	2	329	2	329	16bit	1
S3.2.2.4	Bootloader rev.	-32768 to 32767	0	323	2	323	s16bit	1
S3.2.2.5	HMI rev.	-32768 to 32767	0	322	2	322	s16bit	1
S3.2.2.6	Control 2 V	0.0 to 99.99	2	331	2	331	16bit	1
S3.2.2.7	Control 2 rev.	-32768 to 32767	0	326	2	326	s16bit	1
S3.2.2.8	Accessory 1 V	0.0 to 99.99	2	333	2	333	16bit	1
S3.2.2.9	Accessory 1 rev.	-32768 to 32767	0	324	2	324	s16bit	1
S3.2.2.10	Accessory 2 V	0.0 to 99.99	2	334	2	334	16bit	1
S3.2.2.11	Accessory 2 rev.	-32768 to 32767	0	325	2	325	s16bit	1
S3.3	SSW Model							
S3.3.1	Current	0 = 10 to 30 A 1 = 45 to 105 A 2 = 130 to 200 A 3 = 255 to 412 A 4 = 480 to 670 A 5 = 820 to 950 A		294	1	294	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		6 = 1100 to 1400 A						
S3.3.2	Voltage	0 = 220 to 575 V 1 = 400 to 690 V		296	1	296	enum	1
S3.3.3	Control Voltage	0 = 110 to 240 V 1 = 110 to 130 V 2 = 220 to 240 V 3 = 24 Vcc		297	1	297	enum	1
S3.3.4	Serial Number	0 to 4294967295	0	298	4	298	32bit	2
S3.4	Fan Status							
S3.4.1	Actual	0 = Off 1 = On		293	1	293	enum	1
S3.5	Accessories							
S3.5.1	Slot 1	0 = Without 1 = Anybus-CC 2 = RS-485 3 = PT100 4 = I/Os Exp. 5 = Profibus 6 = CAN 7 = Ethernet 8 = External Current Acqu.		335	1	335	enum	1
S3.5.2	Slot 2	0 = Without 1 = Anybus-CC 2 = RS-485 3 = PT100 4 = I/Os Exp. 5 = Profibus 6 = CAN 7 = Ethernet 8 = External Current Acqu.		336	1	336	enum	1
S4 Status\Temperatures								
S4.1	SCRs Temperature							
S4.1.1	Actual	-22 to 260 °C	0	60	2	60	s16bit	1
S4.2	Thermal Class Status							
S4.2.1	Of Maximum	0.0 to 100.0 %	1	50	2	50	16bit	1
S4.3	Motor Temperature							
S4.3.1	Channel 1	-20 to 260 °C	0	63	2	63	s16bit	1
S4.3.2	Channel 2	-20 to 260 °C	0	64	2	64	s16bit	1
S4.3.3	Channel 3	-20 to 260 °C	0	65	2	65	s16bit	1
S4.3.4	Channel 4	-20 to 260 °C	0	66	2	66	s16bit	1
S4.3.5	Channel 5	-20 to 260 °C	0	67	2	67	s16bit	1
S4.3.6	Channel 6	-20 to 260 °C	0	68	2	68	s16bit	1
S5 Status\Communications								

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
S5.1	Status Word							
S5.1.1	SSW	Bit 0 = Running Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = Initial Test Bit 4 = Ramp Up Bit 5 = Full Voltage Bit 6 = Bypass Bit 7 = Ramp Down Bit 8 = Remote Bit 9 = Braking Bit 10 = FWD/REV Bit 11 = Reverse Bit 12 = Ton Bit 13 = Toff Bit 14 = Alarm Bit 15 = Fault		680	2	680	16bit	1
S5.2	Command Word							
S5.2.1	Dlx	Bit 0 = Start/Stop Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = FWD/REV Bit 4 = LOC/REM Bit 5 ... 6 = Reserved Bit 7 = Reset Bit 8 = Brake Bit 9 = Emergency Start Bit 10 ... 15 = Reserved		683	2	683	16bit	1
S5.2.2	HMI Key	Bit 0 = Start/Stop Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = FWD/REV Bit 4 = LOC/REM Bit 5 ... 6 = Reserved Bit 7 = Reset Bit 8 ... 15 = Reserved		681	2	681	16bit	1
S5.2.3	USB	Bit 0 = Start/Stop Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = FWD/REV Bit 4 = LOC/REM Bit 5 ... 6 = Reserved Bit 7 = Reset Bit 8 ... 15 = Reserved		682	2	682	16bit	1
S5.2.4	SoftPLC	Bit 0 = Start/Stop		684	2	684	16bit	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = FWD/REV Bit 4 = LOC/REM Bit 5 ... 6 = Reserved Bit 7 = Reset Bit 8 ... 15 = Reserved						
S5.2.5	Slot1	Bit 0 = Start/Stop Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = FWD/REV Bit 4 = LOC/REM Bit 5 ... 6 = Reserved Bit 7 = Reset Bit 8 ... 15 = Reserved		685	2	685	16bit	1
S5.2.6	Slot2	Bit 0 = Start/Stop Bit 1 = Gener. Enabled Bit 2 = JOG Bit 3 = FWD/REV Bit 4 = LOC/REM Bit 5 ... 6 = Reserved Bit 7 = Reset Bit 8 ... 15 = Reserved		686	2	686	16bit	1
S5.3	Value for Outputs							
S5.3.1	DO Value	Bit 0 = DO1 Bit 1 = DO2 Bit 2 = DO3 Bit 3 ... 15 = Reserved		695	2	695	16bit	1
S5.3.2	Value for AO							
S5.3.2.1	AO in 10 bits	0 to 1023	0	696	2	696	16bit	1
S5.4	RS485 Serial							
S5.4.1	Interface Status	0 = Off 1 = On 2 = Timeout Error		735	1	735	enum	1
S5.4.2	Received Telegram	0 to 65535	0	736	2	736	16bit	1
S5.4.3	Transmitted Telegram	0 to 65535	0	737	2	737	16bit	1
S5.4.4	Telegram with Error	0 to 65535	0	738	2	738	16bit	1
S5.4.5	Reception Errors	0 to 65535	0	739	2	739	16bit	1
S5.5	Anybus-CC							
S5.5.1	Identification	0 = Disabled 1 ... 15 = Reserved 16 = Profibus DP 17 = DeviceNet 18 = Reserved		750	1	750	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		19 = EtherNet/IP 20 = Reserved 21 = Modbus TCP 22 = Reserved 23 = PROFINET IO 24 ... 25 = Reserved						
S5.5.2	Comm. Status	0 = Setup 1 = Init 2 = Wait Comm 3 = Idle 4 = Data Active 5 = Error 6 = Reserved 7 = Exception 8 = Access Error		751	1	751	enum	1
S5.6	Configuration Mode							
S5.6.1	Status	Bit 0 = System Initialization Bit 1 = Firmware Download Bit 2 = Oriented Start-Up Bit 3 = Incompatible Bit 4 = Reset Needs Bit 5 = Copy HMI Bit 6 ... 15 = Reserved		692	2	692	16bit	1
S5.6.2	Control	Bit 0 = Abort Startup Bit 1 ... 15 = Reserved		693	2	693	16bit	1
S5.7	CANopen/DeviceNet							
S5.7.1	CAN Controller Status	0 = Disabled 1 = Auto-baud 2 = CAN Enabled 3 = Warning 4 = Error Passive 5 = Bus Off 6 = No Bus Power		705	1	705	enum	1
S5.7.2	Received Telegram	0 to 65535	0	706	2	706	16bit	1
S5.7.3	Transmitted Telegram	0 to 65535	0	707	2	707	16bit	1
S5.7.4	Bus Off Counter	0 to 65535	0	708	2	708	16bit	1
S5.7.5	Lost Messages	0 to 65535	0	709	2	709	16bit	1
S5.7.6	CANopen Comm. Status	0 = Disabled 1 = Reserved 2 = Comm. Enabled 3 = ErrorCtrl.Enab 4 = Guarding Error 5 = HeartbeatError		721	1	721	enum	1
S5.7.7	CANopen Node State	0 = Disabled		722	1	722	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		1 = Initialization 2 = Stopped 3 = Operational 4 = PreOperational						
S5.7.8	DNet Network Status			716	1	716	enum	1
		0 = Offline 1 = OnLine,NotConn 2 = OnLine,Conn 3 = Conn.Timed-out 4 = Link Failure 5 = Auto-Baud						
S5.7.9	DeviceNet Master Status			717	1	717	enum	1
		0 = Run 1 = Idle						
S5.9	Bluetooth							
S6 Status\SoftPLC								
S6.1	SoftPLC Status							
S6.1.1	Actual			1100	1	1100	enum	1
		0 = No Application 1 = Install. App. 2 = Incompat. App. 3 = App. Stopped 4 = App. Running						
S6.2	Scan Cycle Time							
S6.2.1	Actual	0 to 65535 ms	0	1102	2	1102	16bit	1
S6.3	Value for Outputs							
S6.3.1	DO Value			697	2	697	16bit	1
		Bit 0 = DO1 Bit 1 = DO2 Bit 2 = DO3 Bit 3 ... 15 = Reserved						
S6.3.2	AO Value							
S6.3.2.1	AO in 10 bits	0 to 1023	0	698	2	698	16bit	1
S6.4	Parameter							
S6.4.1	User #1	-10000 to 10000	0	1110	4	1110	s32bit	2
S6.4.2	User #2	-10000 to 10000	0	1112	4	1112	s32bit	2
S6.4.3	User #3	-10000 to 10000	0	1114	4	1114	s32bit	2
S6.4.4	User #4	-10000 to 10000	0	1116	4	1116	s32bit	2
S6.4.5	User #5	-10000 to 10000	0	1118	4	1118	s32bit	2
S6.4.6	User #6	-10000 to 10000	0	1120	4	1120	s32bit	2
S6.4.7	User #7	-10000 to 10000	0	1122	4	1122	s32bit	2
S6.4.8	User #8	-10000 to 10000	0	1124	4	1124	s32bit	2
S6.4.9	User #9	-10000 to 10000	0	1126	4	1126	s32bit	2
S6.4.10	User #10	-10000 to 10000	0	1128	4	1128	s32bit	2
S6.4.11	User #11	-10000 to 10000	0	1130	4	1130	s32bit	2
S6.4.12	User #12	-10000 to 10000	0	1132	4	1132	s32bit	2
S6.4.13	User #13	-10000 to 10000	0	1134	4	1134	s32bit	2
S6.4.14	User #14	-10000 to 10000	0	1136	4	1136	s32bit	2
S6.4.15	User #15	-10000 to 10000	0	1138	4	1138	s32bit	2

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
S6.4.16	User #16	-10000 to 10000	0	1140	4	1140	s32bit	2
S6.4.17	User #17	-10000 to 10000	0	1142	4	1142	s32bit	2
S6.4.18	User #18	-10000 to 10000	0	1144	4	1144	s32bit	2
S6.4.19	User #19	-10000 to 10000	0	1146	4	1146	s32bit	2
S6.4.20	User #20	-10000 to 10000	0	1148	4	1148	s32bit	2
S6.4.21	User #21	-10000 to 10000	0	1150	4	1150	s32bit	2
S6.4.22	User #22	-10000 to 10000	0	1152	4	1152	s32bit	2
S6.4.23	User #23	-10000 to 10000	0	1154	4	1154	s32bit	2
S6.4.24	User #24	-10000 to 10000	0	1156	4	1156	s32bit	2
S6.4.25	User #25	-10000 to 10000	0	1158	4	1158	s32bit	2
S6.4.26	User #26	-10000 to 10000	0	1160	4	1160	s32bit	2
S6.4.27	User #27	-10000 to 10000	0	1162	4	1162	s32bit	2
S6.4.28	User #28	-10000 to 10000	0	1164	4	1164	s32bit	2
S6.4.29	User #29	-10000 to 10000	0	1166	4	1166	s32bit	2
S6.4.30	User #30	-10000 to 10000	0	1168	4	1168	s32bit	2
S6.4.31	User #31	-10000 to 10000	0	1170	4	1170	s32bit	2
S6.4.32	User #32	-10000 to 10000	0	1172	4	1172	s32bit	2
S6.4.33	User #33	-10000 to 10000	0	1174	4	1174	s32bit	2
S6.4.34	User #34	-10000 to 10000	0	1176	4	1176	s32bit	2
S6.4.35	User #35	-10000 to 10000	0	1178	4	1178	s32bit	2
S6.4.36	User #36	-10000 to 10000	0	1180	4	1180	s32bit	2
S6.4.37	User #37	-10000 to 10000	0	1182	4	1182	s32bit	2
S6.4.38	User #38	-10000 to 10000	0	1184	4	1184	s32bit	2
S6.4.39	User #39	-10000 to 10000	0	1186	4	1186	s32bit	2
S6.4.40	User #40	-10000 to 10000	0	1188	4	1188	s32bit	2
S6.4.41	User #41	-10000 to 10000	0	1190	4	1190	s32bit	2
S6.4.42	User #42	-10000 to 10000	0	1192	4	1192	s32bit	2
S6.4.43	User #43	-10000 to 10000	0	1194	4	1194	s32bit	2
S6.4.44	User #44	-10000 to 10000	0	1196	4	1196	s32bit	2
S6.4.45	User #45	-10000 to 10000	0	1198	4	1198	s32bit	2
S6.4.46	User #46	-10000 to 10000	0	1200	4	1200	s32bit	2
S6.4.47	User #47	-10000 to 10000	0	1202	4	1202	s32bit	2
S6.4.48	User #48	-10000 to 10000	0	1204	4	1204	s32bit	2
S6.4.49	User #49	-10000 to 10000	0	1206	4	1206	s32bit	2
S6.4.50	User #50	-10000 to 10000	0	1208	4	1208	s32bit	2
D1 Diagnostics\Fault								
D1.1	Actual							
D1.1.1	Fxxx	0 to 999	0	90	2	90	16bit	1
D1.2	Fault History							
D2 Diagnostics\Alarms								
D2.1	Actual							
D2.1.1	Axxx 1	0 to 999	0	91	2	91	16bit	1
D2.1.2	Axxx 2	0 to 999	0	92	2	92	16bit	1
D2.1.3	Axxx 3	0 to 999	0	93	2	93	16bit	1
D2.1.4	Axxx 4	0 to 999	0	94	2	94	16bit	1
D2.1.5	Axxx 5	0 to 999	0	95	2	95	16bit	1
D2.2	Alarm History							
D3 Diagnostics\Events								
D4 Diagnostics\Motor On								

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
D4.1	Start Current							
D4.1.1	Maximum	0.0 to 14544.0 A	1	36	4	36	32bit	2
D4.1.2	Average	0.0 to 14544.0 A	1	38	4	38	32bit	2
D4.2	Real Start Time							
D4.2.1	Actual	0 to 999 s	0	48	2	48	16bit	1
D4.2.2	Final	0 to 999 s	0	49	2	49	16bit	1
D4.3	Current Full Voltage							
D4.3.1	Maximum	0.0 to 14544.0 A	1	40	4	40	32bit	2
D4.4	Main Line Voltage							
D4.4.1	Maximum	0.0 to 999.9 V	1	54	2	54	16bit	1
D4.4.2	Minimun	0.0 to 999.9 V	1	55	2	55	16bit	1
D4.5	Main Line Frequency							
D4.5.1	Maximum	0.0 to 99.9 Hz	1	56	2	56	16bit	1
D4.5.2	Minimum	0.0 to 99.9 Hz	1	57	2	57	16bit	1
D4.6	kWh Counter							
D4.6.1	Total	0.0 to 214748364.7 kWh	1	52	4	52	32bit	2
D4.7	Number Start							
D4.7.1	Total	0 to 65535	0	59	2	59	16bit	1
D5 Diagnostics\Temperatures								
D5.1	SCRs Maximum							
D5.1.1	Total	-22 to 260 °C	0	77	2	77	s16bit	1
D5.2	Motor Maximum							
D5.2.1	Channel 1	-20 to 260 °C	0	80	2	80	s16bit	1
D5.2.2	Channel 2	-20 to 260 °C	0	81	2	81	s16bit	1
D5.2.3	Channel 3	-20 to 260 °C	0	82	2	82	s16bit	1
D5.2.4	Channel 4	-20 to 260 °C	0	83	2	83	s16bit	1
D5.2.5	Channel 5	-20 to 260 °C	0	84	2	84	s16bit	1
D5.2.6	Channel 6	-20 to 260 °C	0	85	2	85	s16bit	1
D6 Diagnostics\Hours Control								
D6.1	Powered	0 to 4294967295 s	0	42	4	42	TIME	2
D6.2	Enabled	0 to 4294967295 s	0	44	4	44	TIME	2
D6.3	Fan ON	0 to 4294967295 s	0	46	4	46	TIME	2
D7 Diagnostics\Changed Parameters								
C1 Configurations\Starting and Stopping								
C1.1	Types of Control			202	1	202	enum	1
		0 = Voltage Ramp 1 = Voltage Ramp + Current Limit 2 = Current Limit 3 = Current Ramp 4 = Pump Control 5 = Torque Control 6 = D.O.L. SCR						
C1.2	Initial Start Voltage	25 to 90 %	0	101	1	101	8bit	1
C1.3	Maximum Start Time	1 to 999 s	0	102	2	102	16bit	1
C1.4	Start End Detection			106	1	106	enum	1
		0 = Time 1 = Automatic						
C1.5	Initial Current Ramp	150 to 500 %	0	111	2	111	16bit	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C1.6	Current Ramp Time	1 to 99 %	0	112	1	112	8bit	1
C1.7	Current Limit	150 to 500 %	0	110	2	110	16bit	1
C1.8	Start Torque Chara.	1 = Constant 2 = Linear 3 = Square		120	1	120	enum	1
C1.9	Initial Start Torque	10 to 300 %	0	121	2	121	16bit	1
C1.10	End Start Torque	10 to 300 %	0	122	2	122	16bit	1
C1.11	Minimun Start Torque	10 to 300 %	0	123	2	123	16bit	1
C1.12	Min.Start Torq. Time	1 to 99 %	0	124	1	124	8bit	1
C1.13	Stop Time	0 to 999 s	0	104	2	104	16bit	1
C1.14	Step Down Volt. Stop	60 to 100 %	0	103	1	103	8bit	1
C1.15	End Voltage Stop	30 to 55 %	0	105	1	105	8bit	1
C1.16	Stop Torque Characte.	1 = Constant 2 = Linear 3 = Square		125	1	125	enum	1
C1.17	End Stop Torque	10 to 100 %	0	126	1	126	8bit	1
C1.18	Minimum Stop Torque	10 to 100 %	0	127	1	127	8bit	1
C1.19	Min. Stop Torque Time	1 to 99 %	0	128	1	128	8bit	1
C2 Configurations\Nominal Motor Data								
C2.1	Voltage	1 to 999 V	0	400	2	400	16bit	1
C2.2	Current	0.1 to 2424.0 A	1	401	2	401	16bit	1
C2.3	Speed	1 to 3600 rpm	0	402	2	402	16bit	1
C2.4	Power	0.1 to 1950.0 kW	1	404	2	404	16bit	1
C2.5	P.F. Power Factor	0.01 to 1.0	2	405	1	405	8bit	1
C2.6	S.F. Service Factor	0.01 to 1.5	2	406	1	406	8bit	1
C3 Configurations\LOC/REM Selection								
C3.1	Mode	0 = Always LOC 1 = Always REM 2 = HMI LR Key LOC 3 = HMI LR Key REM 4 = DIx 5 = USB LOC 6 = USB REM 7 = SoftPLC LOC 8 = SoftPLC REM 9 = Slot 1 LOC 10 = Slot 1 REM 11 = Slot 2 LOC 12 = Slot 2 REM		220	1	220	enum	1
C3.2	LOC Command	0 = HMI Keys 1 = DIx 2 = USB 3 = SoftPLC 4 = Slot 1 5 = Slot 2		229	1	229	enum	1
C3.3	REM Command			230	1	230	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		0 = HMI Keys 1 = DIx 2 = USB 3 = SoftPLC 4 = Slot 1 5 = Slot 2						
C3.4	Commands Copy	0 = No 1 = Yes		231	1	231	enum	1
C4 Configurations\I/O								
C4.1	Digital Inputs							
C4.1.1	DI1	0 = Not Used 1 = Start / Stop 2 = Start (3 Wires) 3 = Stop (3 Wires) 4 = General Enable 5 = LOC / REM 6 = JOG 7 = FWD / REV 8 = No External Fault 9 = No External Alarm 10 = Brake 11 = Reset 12 = Load User 1/2 13 ... 16 = Reserved		263	1	263	enum	1
C4.1.2	DI2	0 = Not Used 1 = Start / Stop 2 = Start (3 Wires) 3 = Stop (3 Wires) 4 = General Enable 5 = LOC / REM 6 = JOG 7 = FWD / REV 8 = No External Fault 9 = No External Alarm 10 = Brake 11 = Reset 12 = Load User 1/2 13 ... 16 = Reserved		264	1	264	enum	1
C4.1.3	DI3	0 = Not Used 1 = Start / Stop 2 = Start (3 Wires) 3 = Stop (3 Wires) 4 = General Enable 5 = LOC / REM 6 = JOG 7 = FWD / REV		265	1	265	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		8 = No External Fault 9 = No External Alarm 10 = Brake 11 = Reset 12 = Load User 1/2 13 = Reserved 14 = Emergency Start 15 ... 16 = Reserved						
C4.1.4	DI4	0 = Not Used 1 = Start / Stop 2 = Start (3 Wires) 3 = Stop (3 Wires) 4 = General Enable 5 = LOC / REM 6 = JOG 7 = FWD / REV 8 = No External Fault 9 = No External Alarm 10 = Brake 11 = Reset 12 = Load User 1/2 13 ... 16 = Reserved		266	1	266	enum	1
C4.1.5	DI5	0 = Not Used 1 = Start / Stop 2 = Start (3 Wires) 3 = Stop (3 Wires) 4 = General Enable 5 = LOC / REM 6 = JOG 7 = FWD / REV 8 = No External Fault 9 = No External Alarm 10 = Brake 11 = Reset 12 = Load User 1/2 13 ... 16 = Reserved		267	1	267	enum	1
C4.1.6	DI6	0 = Not Used 1 = Start / Stop 2 = Start (3 Wires) 3 = Stop (3 Wires) 4 = General Enable 5 = LOC / REM 6 = JOG 7 = FWD / REV 8 = No External Fault 9 = No External Alarm 10 = Brake 11 = Reset		268	1	268	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		12 = Load User 1/2 13 ... 14 = Reserved 15 = Mot. Thermistor A032 16 = Mot. Thermistor F032						
C4.2	Digital Outputs							
C4.2.1	DO1	0 = Not Used 1 = Running 2 = Full Voltage 3 = Bypass 4 = FWD / REV K1 5 = DC Braking 6 = Without Fault 7 = With Fault 8 = Without Alarm 9 = With Alarm 10 = No Fault / Alarm 11 = SoftPLC 12 = Communication 13 = I motor % > Value 14 = Breaker Shunt Trip		275	1	275	enum	1
C4.2.2	DO2	0 = Not Used 1 = Running 2 = Full Voltage 3 = Bypass 4 = FWD / REV K2 5 = DC Braking 6 = Without Fault 7 = With Fault 8 = Without Alarm 9 = With Alarm 10 = No Fault / Alarm 11 = SoftPLC 12 = Communication 13 = I motor % > Value 14 = Breaker Shunt Trip		276	1	276	enum	1
C4.2.3	DO3	0 = Not Used 1 = Running 2 = Full Voltage 3 = Bypass 4 = Not Used 5 = DC Braking 6 = Without Fault 7 = With Fault 8 = Without Alarm 9 = With Alarm 10 = No Fault / Alarm 11 = SoftPLC		277	1	277	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		12 = Communication 13 = I motor % > Value 14 = Breaker Shunt Trip						
C4.2.4	DO Comparison Value	10.0 to 500.0 %	1	278	2	278	16bit	1
C4.3	Analog Output							
C4.3.1	Function	0 = Not Used 1 = SSW Current % 2 = Line Voltage % 3 = Output Voltage % 4 = Power Factor 5 = Thermal Class Prot. 6 = Output Power W 7 = Output Power VA 8 = Motor Torque % 9 = Value to AO 10 = SCRs Temperature 11 = SoftPLC		251	1	251	enum	1
C4.3.2	Gain	0.0 to 9.999	3	252	2	252	16bit	1
C4.3.3	Signal	0 = 0 to 20mA 1 = 4 to 20mA 2 = 20mA to 0 3 = 20 to 4mA 4 = 0 to 10V 5 = 10V to 0		253	1	253	enum	1
C5 Configurations\Protections								
C5.1	Voltage Protections							
C5.1.1	Motor Undervoltage							
C5.1.1.1	Mode	0 = Inactive 1 = Fault F002 2 = Alarm A002		900	1	900	enum	1
C5.1.1.2	Level	0 to 30 %Vn	0	901	1	901	8bit	1
C5.1.1.3	Time	0.1 to 10.0 s	1	902	1	902	8bit	1
C5.1.2	Motor Overvoltage							
C5.1.2.1	Mode	0 = Inactive 1 = Fault F016 2 = Alarm A016		903	1	903	enum	1
C5.1.2.2	Level	0 to 20 %Vn	0	904	1	904	8bit	1
C5.1.2.3	Time	0.1 to 10.0 s	1	905	1	905	8bit	1
C5.1.3	Motor Voltage Imbalance							
C5.1.3.1	Mode	0 = Inactive 1 = Fault F001 2 = Alarm A001		906	1	906	enum	1
C5.1.3.2	Level	0 to 30 %Vn	0	907	1	907	8bit	1
C5.1.3.3	Time	0.1 to 10.0 s	1	908	1	908	8bit	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C5.2	Current Protections							
C5.2.1	Motor Undercurrent							
C5.2.1.1	Mode	0 = Inactive 1 = Fault F065 2 = Alarm A065		910	1	910	enum	1
C5.2.1.2	Level	0 to 99 %In	0	911	1	911	8bit	1
C5.2.1.3	Time	1 to 99 s	0	912	1	912	8bit	1
C5.2.2	Motor Overcurrent							
C5.2.2.1	Mode	0 = Inactive 1 = Fault F066 2 = Alarm A066		913	1	913	enum	1
C5.2.2.2	Level	0 to 99 %In	0	914	1	914	8bit	1
C5.2.2.3	Time	1 to 99 s	0	915	1	915	8bit	1
C5.2.3	Current Imbalance							
C5.2.3.1	Mode	0 = Inactive 1 = Fault F074 2 = Alarm A074		916	1	916	enum	1
C5.2.3.2	Level	0 to 30 %In	0	917	1	917	8bit	1
C5.2.3.3	Time	1 to 99 s	0	918	1	918	8bit	1
C5.3	Torque Protections							
C5.3.1	Undertorque							
C5.3.1.1	Mode	0 = Inactive 1 = Fault F078 2 = Alarm A078		950	1	950	enum	1
C5.3.1.2	Level	0 to 99 %Tn	0	951	1	951	8bit	1
C5.3.1.3	Time	1 to 99 s	0	952	1	952	8bit	1
C5.3.2	Overtorque							
C5.3.2.1	Mode	0 = Inactive 1 = Fault F079 2 = Alarm A079		953	1	953	enum	1
C5.3.2.2	Level	0 to 99 %Tn	0	954	1	954	8bit	1
C5.3.2.3	Time	1 to 99 s	0	955	1	955	8bit	1
C5.4	Power Protections							
C5.4.1	Underpower							
C5.4.1.1	Mode	0 = Inactive 1 = Fault F080 2 = Alarm A080		960	1	960	enum	1
C5.4.1.2	Level	0 to 99 %Pn	0	961	1	961	8bit	1
C5.4.1.3	Time	1 to 99 s	0	962	1	962	8bit	1
C5.4.2	Overpower							
C5.4.2.1	Mode			963	1	963	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		0 = Inactive 1 = Fault F081 2 = Alarm A081						
C5.4.2.2	Level	0 to 99 %Pn	0	964	1	964	8bit	1
C5.4.2.3	Time	1 to 99 s	0	965	1	965	8bit	1
C5.5	Phase Sequence							
C5.5.1	Mode			930	1	930	enum	1
		0 = Inactive 1 = RST - Fault F067 2 = RTS - Fault F068						
C5.6	Bypass Protections							
C5.6.1	Undercurrent			919	1	919	enum	1
		0 = Inactive 1 = Fault F076						
C5.6.2	Overcurrent			920	1	920	enum	1
		0 = Inactive 1 = Fault F063						
C5.6.3	Closed			921	1	921	enum	1
		0 = Inactive 1 = Fault F077						
C5.7	Time Protections							
C5.7.1	Before Start	0.5 to 999.9 s	1	931	2	931	16bit	1
C5.7.2	After Stop	2.0 to 999.9 s	1	932	2	932	16bit	1
C5.7.3	Between Start	2 to 9999 s	0	933	2	933	16bit	1
C5.8	Motor Thermal Protection							
C5.8.1	Ch1 Installed Sensor							
C5.8.1.1	Mode			1006	1	1006	enum	1
		0 = Off 1 = On 2 = On Stator						
C5.8.2	Ch1 Sensor Fault							
C5.8.2.1	Mode			998	1	998	enum	1
		0 = Fault F109 and F117 1 = Alarm A109 and A117						
C5.8.3	Ch1 Overtemperature							
C5.8.3.1	Mode			966	1	966	enum	1
		0 = Fault F101 1 = Alarm A101 2 = F101 and A101						
C5.8.3.2	Fault Level	0 to 250 °C	0	967	1	967	8bit	1
C5.8.3.3	Alarm Level	0 to 250 °C	0	968	1	968	8bit	1
C5.8.3.4	Alarm Reset	0 to 250 °C	0	969	1	969	8bit	1
C5.8.4	Ch2 Installed Sensor							
C5.8.4.1	Mode			1007	1	1007	enum	1
		0 = Off 1 = On 2 = On Stator						

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C5.8.5	Ch2 Sensor Fault							
C5.8.5.1	Mode	0 = Fault F110 and F118 1 = Alarm A110 and A118		999	1	999	enum	1
C5.8.6	Ch2 Overtemperature							
C5.8.6.1	Mode	0 = Fault F102 1 = Alarm A102 2 = F102 and A102		970	1	970	enum	1
C5.8.6.2	Fault Level	0 to 250 °C	0	971	1	971	8bit	1
C5.8.6.3	Alarm Level	0 to 250 °C	0	972	1	972	8bit	1
C5.8.6.4	Alarm Reset	0 to 250 °C	0	973	1	973	8bit	1
C5.8.7	Ch3 Installed Sensor							
C5.8.7.1	Mode	0 = Off 1 = On 2 = On Stator		1008	1	1008	enum	1
C5.8.8	Ch3 Sensor Fault							
C5.8.8.1	Mode	0 = Fault F111 and F119 1 = Alarm A111 and A119		1000	1	1000	enum	1
C5.8.9	Ch3 Overtemperature							
C5.8.9.1	Mode	0 = Fault F103 1 = Alarm A103 2 = F103 and A103		974	1	974	enum	1
C5.8.9.2	Fault Level	0 to 250 °C	0	975	1	975	8bit	1
C5.8.9.3	Alarm Level	0 to 250 °C	0	976	1	976	8bit	1
C5.8.9.4	Alarm Reset	0 to 250 °C	0	977	1	977	8bit	1
C5.8.10	Ch4 Installed Sensor							
C5.8.10.1	Mode	0 = Off 1 = On 2 = On Stator		1009	1	1009	enum	1
C5.8.11	Ch4 Sensor Fault							
C5.8.11.1	Mode	0 = Fault F112 and F120 1 = Alarm A112 and A120		1001	1	1001	enum	1
C5.8.12	Ch4 Overtemperature							
C5.8.12.1	Mode	0 = Fault F104 1 = Alarm A104 2 = F104 and A104		978	1	978	enum	1
C5.8.12.2	Fault Level	0 to 250 °C	0	979	1	979	8bit	1
C5.8.12.3	Alarm Level	0 to 250 °C	0	980	1	980	8bit	1
C5.8.12.4	Alarm Reset	0 to 250 °C	0	981	1	981	8bit	1
C5.8.13	Ch5 Installed Sensor							

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C5.8.13.1	Mode	0 = Off 1 = On 2 = On Stator		1010	1	1010	enum	1
C5.8.14	Ch5 Sensor Fault							
C5.8.14.1	Mode	0 = Fault F113 and F121 1 = Alarm A113 and A121		1002	1	1002	enum	1
C5.8.15	Ch5 Overtemperature							
C5.8.15.1	Mode	0 = Fault F105 1 = Alarm A105 2 = F105 and A105		982	1	982	enum	1
C5.8.15.2	Fault Level	0 to 250 °C	0	983	1	983	8bit	1
C5.8.15.3	Alarm Level	0 to 250 °C	0	984	1	984	8bit	1
C5.8.15.4	Alarm Reset	0 to 250 °C	0	985	1	985	8bit	1
C5.8.16	Ch6 Installed Sensor							
C5.8.16.1	Mode	0 = Off 1 = On 2 = On Stator		1011	1	1011	enum	1
C5.8.17	Ch6 Sensor Fault							
C5.8.17.1	Mode	0 = Fault F114 and F122 1 = Alarm A114 and A122		1003	1	1003	enum	1
C5.8.18	Ch6 Overtemperature							
C5.8.18.1	Mode	0 = Fault F106 1 = Alarm A106 2 = F106 and A106		986	1	986	enum	1
C5.8.18.2	Fault Level	0 to 250 °C	0	987	1	987	8bit	1
C5.8.18.3	Alarm Level	0 to 250 °C	0	988	1	988	8bit	1
C5.8.18.4	Alarm Reset	0 to 250 °C	0	989	1	989	8bit	1
C5.9	Motor Thermal Class							
C5.9.1	Programming Mode	0 = Standard 1 = Custom		934	1	934	enum	1
C5.9.2	Action Mode	0 = Inactive 1 = Fault F005 2 = Alarm A005 3 = F005 and A005		935	1	935	enum	1
C5.9.3	Alarm Level	0 to 100 %	0	936	1	936	8bit	1
C5.9.4	Alarm Reset	0 to 100 %	0	937	1	937	8bit	1
C5.9.5	Motor Temperature	0 = T.C. + PT100 1 = T.C. + Th.lm.		938	1	938	enum	1
C5.9.6	Thermal Class			939	1	939	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		0 = Automatic 1 = Class 10 2 = Class 15 3 = Class 20 4 = Class 25 5 = Class 30 6 = Class 35 7 = Class 40 8 = Class 45						
C5.9.7	Motor Data							
C5.9.7.1	Insulation Class	0 = Class A 105°C 1 = Class E 120°C 2 = Class B 130°C 3 = Class F 155°C 4 = Class H 180°C 5 = Class N 200°C 6 = Class R 220°C 7 = Class S 240°C 8 = Class 250°C		940	1	940	enum	1
C5.9.7.2	Temperature Rise	0 to 200 °C	0	942	1	942	8bit	1
C5.9.7.3	Ambient Temperature	0 to 200 °C	0	941	1	941	8bit	1
C5.9.7.4	Locked Rotor Time	1 to 100 s	0	943	1	943	8bit	1
C5.9.7.5	Locked Rotor Current	2.0 to 10.0 x	1	944	1	944	8bit	1
C5.9.7.6	Heating Time Constant	1 to 2880 min	0	945	2	945	16bit	1
C5.9.7.7	Cooling Time Constant	1 to 8640 min	0	946	2	946	16bit	1
C5.9.8	Thermal Image							
C5.9.8.1	Reset	0 to 8640 min	0	947	2	947	16bit	1
C5.10	SSW Short Circuit							
C5.10.1	Motor Off	0 = Inactive 1 = Fault F019		922	1	922	enum	1
C5.10.2	Motor On	0 = Inactive 1 = Fault F020		923	1	923	enum	1
C5.11	Fault Auto-Reset							
C5.11.1	Mode	0 = Off 1 = On		207	1	207	enum	1
C5.11.2	Time	3 to 600 s	0	208	2	208	16bit	1
C6 Configurations\HMI								
C6.1	Password							
C6.1.1	Password	0 to 9999	0	210	2	210	16bit	1
C6.1.2	Password Options	0 = Off 1 = On 2 = Change Password		200	1	200	enum	1
C6.2	Language							

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C6.2.1	Language			201	1	201	enum	1
		0 = Português 1 = English 2 = Español						
C6.3	Date and Time							
C6.3.1	Date and Time	yy/mm/dd and hh:mm:ss		196	1	196	date	4
C6.3.2	Day of the Week			195	1	195	enum	1
		0 = Sunday 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday						
C6.4	Main Screen							
C6.5	LCD Backlight							
C6.5.1	Level	1 to 15	0	218	1	218	8bit	1
C6.6	Communication Timeout							
C6.6.1	Mode			190	1	190	enum	1
		0 = Inactive 1 = Fault F127 2 = Alarm A127						
C6.6.2	Alarm Action			191	1	191	enum	1
		0 = Indicates Only 1 = Ramp Stop 2 = General Disable 3 = Change to LOC 4 = Change to REM						
C6.6.3	Time	1 to 999 s	0	192	2	192	16bit	1
C7 Configurations\Special Functions								
C7.1	Forward/Reverse							
C7.1.1	Mode			228	1	228	enum	1
		0 = Inactive 1 = By Contactor 2 = Only for JOG						
C7.2	Kick Start							
C7.2.1	Mode			520	1	520	enum	1
		0 = Off 1 = On						
C7.2.2	Time	0.1 to 2.0 s	1	521	1	521	8bit	1
C7.2.3	Voltage	70 to 90 %	0	522	1	522	8bit	1
C7.2.4	Current	300 to 700 %	0	523	2	523	16bit	1
C7.3	Jog							
C7.3.1	Mode			510	1	510	enum	1
		0 = Off 1 = On						
C7.3.2	Level	10 to 100 %	0	511	1	511	8bit	1
C7.4	Braking							

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C7.4.1	Mode			500	1	500	enum	1
		0 = Inactive						
		1 = Reverse						
		2 = Optimal						
		3 = DC						
C7.4.2	Time	1 to 299 s	0	501	2	501	16bit	1
C7.4.3	Level	30 to 70 %	0	502	1	502	8bit	1
C7.4.4	End			503	1	503	enum	1
		0 = Inactive						
		1 = Automatic						
C8 Configurations\Communication								
C8.1	I/O Data							
C8.1.1	Data Read							
C8.1.1.1	Slot 1 1st Word	1 to 50	0	712	1	712	8bit	1
C8.1.1.2	Slot 1 Quantity	1 to 50	0	713	1	713	8bit	1
C8.1.1.3	Slot 2 1st Word	1 to 50	0	753	1	753	8bit	1
C8.1.1.4	Slot 2 Quantity	1 to 50	0	754	1	754	8bit	1
C8.1.1.5	Word #1	0 to 65535	0	1300	2	1300	16bit	1
C8.1.1.6	Word #2	0 to 65535	0	1301	2	1301	16bit	1
C8.1.1.7	Word #3	0 to 65535	0	1302	2	1302	16bit	1
C8.1.1.8	Word #4	0 to 65535	0	1303	2	1303	16bit	1
C8.1.1.9	Word #5	0 to 65535	0	1304	2	1304	16bit	1
C8.1.1.10	Word #6	0 to 65535	0	1305	2	1305	16bit	1
C8.1.1.11	Word #7	0 to 65535	0	1306	2	1306	16bit	1
C8.1.1.12	Word #8	0 to 65535	0	1307	2	1307	16bit	1
C8.1.1.13	Word #9	0 to 65535	0	1308	2	1308	16bit	1
C8.1.1.14	Word #10	0 to 65535	0	1309	2	1309	16bit	1
C8.1.1.15	Word #11	0 to 65535	0	1310	2	1310	16bit	1
C8.1.1.16	Word #12	0 to 65535	0	1311	2	1311	16bit	1
C8.1.1.17	Word #13	0 to 65535	0	1312	2	1312	16bit	1
C8.1.1.18	Word #14	0 to 65535	0	1313	2	1313	16bit	1
C8.1.1.19	Word #15	0 to 65535	0	1314	2	1314	16bit	1
C8.1.1.20	Word #16	0 to 65535	0	1315	2	1315	16bit	1
C8.1.1.21	Word #17	0 to 65535	0	1316	2	1316	16bit	1
C8.1.1.22	Word #18	0 to 65535	0	1317	2	1317	16bit	1
C8.1.1.23	Word #19	0 to 65535	0	1318	2	1318	16bit	1
C8.1.1.24	Word #20	0 to 65535	0	1319	2	1319	16bit	1
C8.1.1.25	Word #21	0 to 65535	0	1320	2	1320	16bit	1
C8.1.1.26	Word #22	0 to 65535	0	1321	2	1321	16bit	1
C8.1.1.27	Word #23	0 to 65535	0	1322	2	1322	16bit	1
C8.1.1.28	Word #24	0 to 65535	0	1323	2	1323	16bit	1
C8.1.1.29	Word #25	0 to 65535	0	1324	2	1324	16bit	1
C8.1.1.30	Word #26	0 to 65535	0	1325	2	1325	16bit	1
C8.1.1.31	Word #27	0 to 65535	0	1326	2	1326	16bit	1
C8.1.1.32	Word #28	0 to 65535	0	1327	2	1327	16bit	1
C8.1.1.33	Word #29	0 to 65535	0	1328	2	1328	16bit	1
C8.1.1.34	Word #30	0 to 65535	0	1329	2	1329	16bit	1
C8.1.1.35	Word #31	0 to 65535	0	1330	2	1330	16bit	1
C8.1.1.36	Word #32	0 to 65535	0	1331	2	1331	16bit	1
C8.1.1.37	Word #33	0 to 65535	0	1332	2	1332	16bit	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C8.1.1.38	Word #34	0 to 65535	0	1333	2	1333	16bit	1
C8.1.1.39	Word #35	0 to 65535	0	1334	2	1334	16bit	1
C8.1.1.40	Word #36	0 to 65535	0	1335	2	1335	16bit	1
C8.1.1.41	Word #37	0 to 65535	0	1336	2	1336	16bit	1
C8.1.1.42	Word #38	0 to 65535	0	1337	2	1337	16bit	1
C8.1.1.43	Word #39	0 to 65535	0	1338	2	1338	16bit	1
C8.1.1.44	Word #40	0 to 65535	0	1339	2	1339	16bit	1
C8.1.1.45	Word #41	0 to 65535	0	1340	2	1340	16bit	1
C8.1.1.46	Word #42	0 to 65535	0	1341	2	1341	16bit	1
C8.1.1.47	Word #43	0 to 65535	0	1342	2	1342	16bit	1
C8.1.1.48	Word #44	0 to 65535	0	1343	2	1343	16bit	1
C8.1.1.49	Word #45	0 to 65535	0	1344	2	1344	16bit	1
C8.1.1.50	Word #46	0 to 65535	0	1345	2	1345	16bit	1
C8.1.1.51	Word #47	0 to 65535	0	1346	2	1346	16bit	1
C8.1.1.52	Word #48	0 to 65535	0	1347	2	1347	16bit	1
C8.1.1.53	Word #49	0 to 65535	0	1348	2	1348	16bit	1
C8.1.1.54	Word #50	0 to 65535	0	1349	2	1349	16bit	1
C8.1.2	Data Write							
C8.1.2.1	Slot 1 1st Word	1 to 20	0	714	1	714	8bit	1
C8.1.2.2	Slot 1 Quantity	1 to 20	0	715	1	715	8bit	1
C8.1.2.3	Slot 2 1st Word	1 to 20	0	755	1	755	8bit	1
C8.1.2.4	Slot 2 Quantity	1 to 20	0	756	1	756	8bit	1
C8.1.2.5	Update Delay	0.0 to 999.9 s	1	899	2	899	16bit	1
C8.1.2.6	Word #1	0 to 65535	0	1400	2	1400	16bit	1
C8.1.2.7	Word #2	0 to 65535	0	1401	2	1401	16bit	1
C8.1.2.8	Word #3	0 to 65535	0	1402	2	1402	16bit	1
C8.1.2.9	Word #4	0 to 65535	0	1403	2	1403	16bit	1
C8.1.2.10	Word #5	0 to 65535	0	1404	2	1404	16bit	1
C8.1.2.11	Word #6	0 to 65535	0	1405	2	1405	16bit	1
C8.1.2.12	Word #7	0 to 65535	0	1406	2	1406	16bit	1
C8.1.2.13	Word #8	0 to 65535	0	1407	2	1407	16bit	1
C8.1.2.14	Word #9	0 to 65535	0	1408	2	1408	16bit	1
C8.1.2.15	Word #10	0 to 65535	0	1409	2	1409	16bit	1
C8.1.2.16	Word #11	0 to 65535	0	1410	2	1410	16bit	1
C8.1.2.17	Word #12	0 to 65535	0	1411	2	1411	16bit	1
C8.1.2.18	Word #13	0 to 65535	0	1412	2	1412	16bit	1
C8.1.2.19	Word #14	0 to 65535	0	1413	2	1413	16bit	1
C8.1.2.20	Word #15	0 to 65535	0	1414	2	1414	16bit	1
C8.1.2.21	Word #16	0 to 65535	0	1415	2	1415	16bit	1
C8.1.2.22	Word #17	0 to 65535	0	1416	2	1416	16bit	1
C8.1.2.23	Word #18	0 to 65535	0	1417	2	1417	16bit	1
C8.1.2.24	Word #19	0 to 65535	0	1418	2	1418	16bit	1
C8.1.2.25	Word #20	0 to 65535	0	1419	2	1419	16bit	1
C8.2	RS485 Serial							
C8.2.1	Serial Protocol	0 ... 1 = Reserved 2 = Modbus RTU		730	1	730	enum	1
C8.2.2	Address	1 to 247	0	731	1	731	8bit	1
C8.2.3	Baud Rate	0 = 9600 bits/s		732	1	732	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C8.2.4	Bytes Config.	1 = 19200 bits/s 2 = 38400 bits/s 3 = 57600 bits/s 0 = 8 bits, no, 1 1 = 8 bits, even,1 2 = 8 bits, odd, 1 3 = 8 bits, no, 2 4 = 8 bits, even,2 5 = 8 bits, odd, 2		733	1	733	enum	1
C8.2.5	Timeout							
C8.2.5.1	Mode	0 = Inactive 1 = Fault F128 2 = Alarm A128		740	1	740	enum	1
C8.2.5.2	Alarm Action	0 = Indicates Only 1 = Ramp Stop 2 = General Disable 3 = Change to LOC 4 = Change to REM		741	1	741	enum	1
C8.2.5.3	Timeout	0.0 to 999.9 s	1	734	2	734	16bit	1
C8.3	Anybus-CC							
C8.3.1	Update Configuration	0 = Normal Operation 1 = Update configuration		749	1	749	enum	1
C8.3.2	Address	0 to 255	0	757	1	757	8bit	1
C8.3.3	Baud Rate	0 = 125 kbps 1 = 250 kbps 2 = 500 kbps 3 = Autobaud		758	1	758	enum	1
C8.3.4	IP Address Configuration	0 = Parameters 1 = DHCP 2 = DCP		760	1	760	enum	1
C8.3.5	IP Address	0.0.0.0 to 255.255.255.255		762	4	762	ip_address	2
C8.3.6	CIDR	0 = Reserved 1 = 128.0.0.0 2 = 192.0.0.0 3 = 224.0.0.0 4 = 240.0.0.0 5 = 248.0.0.0 6 = 252.0.0.0 7 = 254.0.0.0 8 = 255.0.0.0 9 = 255.128.0.0 10 = 255.192.0.0		761	1	761	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		11 = 255.224.0.0						
		12 = 255.240.0.0						
		13 = 255.248.0.0						
		14 = 255.252.0.0						
		15 = 255.254.0.0						
		16 = 255.255.0.0						
		17 = 255.255.128.0						
		18 = 255.255.192.0						
		19 = 255.255.224.0						
		20 = 255.255.240.0						
		21 = 255.255.248.0						
		22 = 255.255.252.0						
		23 = 255.255.254.0						
		24 = 255.255.255.0						
		25 = 255.255.255.128						
		26 = 255.255.255.192						
		27 = 255.255.255.224						
		28 = 255.255.255.240						
		29 = 255.255.255.248						
		30 = 255.255.255.252						
		31 = 255.255.255.254						
C8.3.7	Gateway	0.0.0.0 to 255.255.255.255		766	4	766	ip_address	2
C8.3.8	Station Name Suffix	0 to 254	0	770	1	770	8bit	1
C8.3.9	Modbus TCP Timeout							
C8.3.9.1	Mode	0 = Inactive 1 = Fault F131 2 = Alarm A131		771	1	771	enum	1
C8.3.9.2	Alarm Action	0 = Indicates Only 1 = Ramp Stop 2 = General Disable 3 = Change to LOC 4 = Change to REM		772	1	772	enum	1
C8.3.9.3	Modbus TCP Timeout	0.0 to 999.9 s	1	759	2	759	16bit	1
C8.3.10	Off Line Error							
C8.3.10.1	Mode	0 = Inactive 1 = Fault F129 2 = Alarm A129		897	1	897	enum	1
C8.3.10.2	Alarm Action	0 = Indicates Only 1 = Ramp Stop 2 = General Disable 3 = Change to LOC 4 = Change to REM		898	1	898	enum	1
C8.4	CANopen/DeviceNet							
C8.4.1	Protocol	0 = Disabled		700	1	700	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		1 = CANopen 2 = DeviceNet						
C8.4.2	Address	0 to 127	0	701	1	701	8bit	1
C8.4.3	Baud Rate			702	1	702	enum	1
		0 = 1 Mbps/Auto 1 = Reserved 2 = 500 Kbps 3 = 250 Kbps 4 = 125 Kbps 5 = 100 Kbps/Auto 6 = 50 Kbps/Auto 7 = 20 Kbps/Auto 8 = 10 Kbps/Auto						
C8.4.4	Bus Off Reset			703	1	703	enum	1
		0 = Manual 1 = Automatic						
C8.4.5	CAN Error							
C8.4.5.1	Mode			723	1	723	enum	1
		0 = Inactive 1 = Fault 2 = Alarm						
C8.4.5.2	Alarm Action			724	1	724	enum	1
		0 = Indicates Only 1 = Ramp Stop 2 = General Disable 3 = Change to LOC 4 = Change to REM						
C8.6	Bluetooth							
C8.6.1	Mode			800	1	800	enum	1
		0 = Off 1 = On						
C9 Configurations\SSW900								
C9.1	Nominal Data							
C9.1.1	Current			295	1	295	enum	1
		0 = 10 A 1 = 17 A 2 = 24 A 3 = 30 A 4 = 45 A 5 = 61 A 6 = 85 A 7 = 105 A 8 = 130 A 9 = 171 A 10 = 200 A 11 = 255 A 12 = 312 A 13 = 365 A 14 = 412 A						

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		15 = 480 A 16 = 604 A 17 = 670 A 18 = 820 A 19 = 950 A 20 = 1100 A 21 = 1400 A						
C9.2	Types of Connections							
C9.2.1	Delta Inside	0 = Off 1 = On		150	1	150	enum	1
C9.2.2	External Bypass	0 = Without 1 = With		140	1	140	enum	1
C9.3	Accessories Config.							
C9.3.1	Slot 1	0 = Automatic 1 = Anybus-CC 2 = RS-485 3 = PT100 4 = I/Os Exp. 5 = Profibus 6 = CAN 7 = Ethernet 8 = External Current Acqu.		337	1	337	enum	1
C9.3.2	Slot 2	0 = Automatic 1 = Anybus-CC 2 = RS-485 3 = PT100 4 = I/Os Exp. 5 = Profibus 6 = CAN 7 = Ethernet 8 = External Current Acqu.		338	1	338	enum	1
C9.4	Fan Configuration							
C9.4.1	Mode	0 = Always Off 1 = Always On 2 = Controlled		203	1	203	enum	1
C10 Configurations\Load / Save Parameters								
C10.1	Load / Save User							
C10.1.1	Mode	0 = Not Used 1 = Load User 1 2 = Load User 2 3 = Reserved 4 = Save User 1 5 = Save User 2		206	1	206	enum	1

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
		6 = Reserved						
C10.2	Copy Function HMI							
C10.2.1	Mode	0 = Off 1 = SSW -> HMI 2 = HMI -> SSW		319	1	319	enum	1
C10.3	Erase Diagnostics							
C10.3.1	Mode	0 ... 1 = Not Used 2 = Fault 3 = Alarms 4 = Events 5 = Motor ON 6 = Temperaturas 7 = Hours Control 8 = Thermal Class Status		205	1	205	enum	1
C10.4	Load Factory Default							
C10.4.1	Mode	0 = No 1 = Yes		204	1	204	enum	1
C10.5	Save Changed Param.							
C10.5.1	Mode	0 = No 1 = Yes		209	1	209	enum	1
C11 Configurations\SoftPLC								
C11.1	Mode	0 = Stop Program 1 = Run Program		1101	1	1101	enum	1
C11.2	Action App. Not Running	0 = Inactive 1 = Alarm A708 2 = Fault F708		1103	1	1103	enum	1
C11.3	Parameter							
C11.3.1	User #1	-10000 to 10000	0	1110	4	1110	s32bit	2
C11.3.2	User #2	-10000 to 10000	0	1112	4	1112	s32bit	2
C11.3.3	User #3	-10000 to 10000	0	1114	4	1114	s32bit	2
C11.3.4	User #4	-10000 to 10000	0	1116	4	1116	s32bit	2
C11.3.5	User #5	-10000 to 10000	0	1118	4	1118	s32bit	2
C11.3.6	User #6	-10000 to 10000	0	1120	4	1120	s32bit	2
C11.3.7	User #7	-10000 to 10000	0	1122	4	1122	s32bit	2
C11.3.8	User #8	-10000 to 10000	0	1124	4	1124	s32bit	2
C11.3.9	User #9	-10000 to 10000	0	1126	4	1126	s32bit	2
C11.3.10	User #10	-10000 to 10000	0	1128	4	1128	s32bit	2
C11.3.11	User #11	-10000 to 10000	0	1130	4	1130	s32bit	2
C11.3.12	User #12	-10000 to 10000	0	1132	4	1132	s32bit	2
C11.3.13	User #13	-10000 to 10000	0	1134	4	1134	s32bit	2
C11.3.14	User #14	-10000 to 10000	0	1136	4	1136	s32bit	2
C11.3.15	User #15	-10000 to 10000	0	1138	4	1138	s32bit	2
C11.3.16	User #16	-10000 to 10000	0	1140	4	1140	s32bit	2

Parameter	Description	Range of values	Decimal places	Index	Length	Net Id	Size	Qty mapped words
C11.3.17	User #17	-10000 to 10000	0	1142	4	1142	s32bit	2
C11.3.18	User #18	-10000 to 10000	0	1144	4	1144	s32bit	2
C11.3.19	User #19	-10000 to 10000	0	1146	4	1146	s32bit	2
C11.3.20	User #20	-10000 to 10000	0	1148	4	1148	s32bit	2
C11.3.21	User #21	-10000 to 10000	0	1150	4	1150	s32bit	2
C11.3.22	User #22	-10000 to 10000	0	1152	4	1152	s32bit	2
C11.3.23	User #23	-10000 to 10000	0	1154	4	1154	s32bit	2
C11.3.24	User #24	-10000 to 10000	0	1156	4	1156	s32bit	2
C11.3.25	User #25	-10000 to 10000	0	1158	4	1158	s32bit	2
C11.3.26	User #26	-10000 to 10000	0	1160	4	1160	s32bit	2
C11.3.27	User #27	-10000 to 10000	0	1162	4	1162	s32bit	2
C11.3.28	User #28	-10000 to 10000	0	1164	4	1164	s32bit	2
C11.3.29	User #29	-10000 to 10000	0	1166	4	1166	s32bit	2
C11.3.30	User #30	-10000 to 10000	0	1168	4	1168	s32bit	2
C11.3.31	User #31	-10000 to 10000	0	1170	4	1170	s32bit	2
C11.3.32	User #32	-10000 to 10000	0	1172	4	1172	s32bit	2
C11.3.33	User #33	-10000 to 10000	0	1174	4	1174	s32bit	2
C11.3.34	User #34	-10000 to 10000	0	1176	4	1176	s32bit	2
C11.3.35	User #35	-10000 to 10000	0	1178	4	1178	s32bit	2
C11.3.36	User #36	-10000 to 10000	0	1180	4	1180	s32bit	2
C11.3.37	User #37	-10000 to 10000	0	1182	4	1182	s32bit	2
C11.3.38	User #38	-10000 to 10000	0	1184	4	1184	s32bit	2
C11.3.39	User #39	-10000 to 10000	0	1186	4	1186	s32bit	2
C11.3.40	User #40	-10000 to 10000	0	1188	4	1188	s32bit	2
C11.3.41	User #41	-10000 to 10000	0	1190	4	1190	s32bit	2
C11.3.42	User #42	-10000 to 10000	0	1192	4	1192	s32bit	2
C11.3.43	User #43	-10000 to 10000	0	1194	4	1194	s32bit	2
C11.3.44	User #44	-10000 to 10000	0	1196	4	1196	s32bit	2
C11.3.45	User #45	-10000 to 10000	0	1198	4	1198	s32bit	2
C11.3.46	User #46	-10000 to 10000	0	1200	4	1200	s32bit	2
C11.3.47	User #47	-10000 to 10000	0	1202	4	1202	s32bit	2
C11.3.48	User #48	-10000 to 10000	0	1204	4	1204	s32bit	2
C11.3.49	User #49	-10000 to 10000	0	1206	4	1206	s32bit	2
C11.3.50	User #50	-10000 to 10000	0	1208	4	1208	s32bit	2
A1 Assistant\Oriented Start-up								
A1.1	Mode	0 = No 1 = Yes		317	1	317	enum	1

Table A.3: Description of the parameter data types

Data Type	Description
enum	Enumerated type (unsigned 8-bit) contains a list of values with function description for each item.
8bit	Unsigned 8-bit integer, ranges from 0 to 255.
16bit	Unsigned 16-bit integer, ranges from 0 to 65,535.
s16bit	Signed 16-bit integer, ranges from -32,768 to 32,767.
32bit	Unsigned 32-bit integer, ranges from 0 to 4,294,967,295.
s32bit	Signed 32-bit integer, ranges from -2,147,483,648 to 2,147,483,647.
date	Displays the date and time value in the format below: second (1 byte) minute (1 byte) hour (1 byte) day (1 byte) month (1 byte) reserved (1 byte) year (2 bytes)
TIME	Displays the time in the format hh:mm:ss. For network protocols, this data type is transferred as an unsigned 32-bit integer value representing the number of seconds.
ip_address	Unsigned 32-bit integer representing the octets of the IP address.
MAC_ADDRESS	48-bit identifier displayed in XX:XX:XX:XX:XX:XX format.
STRING_ASCII	Text string. For network protocols, this data type is transferred as a string filled with zeros (\0) to the end (maximum parameter size plus one).