Ethernet/IP Card

INSTRUCTIONS

For ASA 4.0 Basic/ASA 4.0 Advanced

Issued on 01/03/19

R. 01

- This manual is integrant and essential to the product. Carefully read the instructions contained herein as they provide important hints for use and maintenance safety.

- This device is to be used only for the purposes it has been designed to. Other uses should be considered improper and dangerous. The manufacturer is not responsible for possible damages caused by improper, erroneous and irrational uses.

- Enertronica Santerno is responsible for the device in its original setting.

- Any changes to the structure or operating cycle of the device must be performed or authorized by the Engineering Department of Enertronica Santerno.

- Enertronica Santerno assumes no responsibility for the consequences resulting by the use of non-original spareparts.

- Enertronica Santerno reserves the right to make any technical changes to this manual and to the device without prior notice. If printing errors or similar are detected, the corrections will be included in the new releases of the manual.

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Product Compatibility

This communications expansion card is suitable for use with ASA 4.0 Basic and ASA 4.0 Advanced soft starters.

Product description	Soft starter name
Basic model	ASA 4.0 Basic
Advanced model	ASA 4.0 Advanced

Parameter Management

Parameter lists vary according to the model and version of soft starter. Refer to Parameter Lists for a complete parameter list.

For the latest manuals and software, please visit our website.

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1   Disclaimer

The examples and diagrams in this manual are included solely for illustrative purposes. The information contained in this manual is subject to change at any time and without prior notice. In no event will responsibility or liability be accepted for direct, indirect or

2   Warnings

WARNING

For your safety, isolate the soft starter from mains voltage before attaching or removing accessories.

WARNING

Inserting foreign objects or touching the inside of the starter while the expansion port cover is open may endanger personnel, and can damage the starter.

3   Important User Information

Observe all necessary safety precautions when controlling the soft starter remotely. Alert personnel that machinery may start without warning.

It is the installer's responsibility to follow all instructions in this manual and to follow correct electrical practice.

3.1   Product Design

The Ethernet/IP Card allows the soft starter to connect to an Ethernet network and be controlled or monitored using an Ethernet communication model.

Familiarity with Ethernet protocols and networks is required to operate the device successfully. For difficulties using this device with third party products, including PLCs, scanners and commissioning tools, contact the relevant supplier.

4   Installation

4.1   Installing the Expansion Card

1. Push a small flat-bladed screwdriver into the slot in the centre of the expansion port cover, and ease the cover away from the starter.
2. Line up the card with the expansion port. Gently push the card along the guide rails until it clicks into the starter.
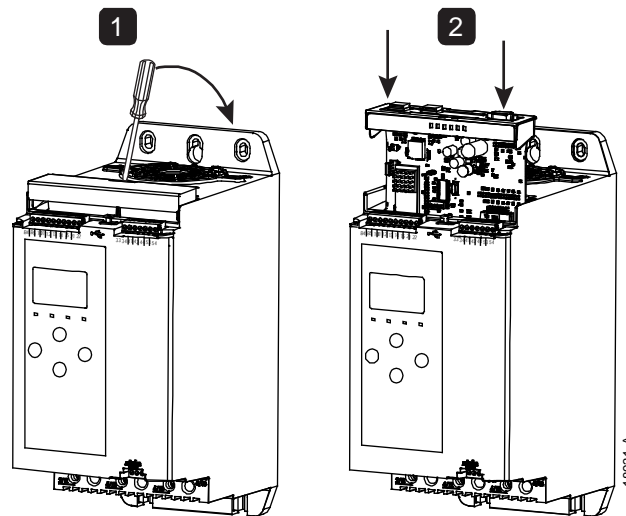
4.2   Network Connection

Ethernet Ports

The device has two Ethernet ports. If only one connection is required, either port can be used.

Cables

Use Category 5, 5e, 6 or 6e cable to connect to the device.

EMC Precautions

To minimise electromagnetic interference, Ethernet cables should be separated from motor and mains cables by 200 mm.

If the Ethernet cable must cross motor or mains cables, the crossing should be at an angle of 90°.

4.3   Network Establishment

The controller must establish communications directly with each device before the device can participate in the network.

4.4   Addressing

Each device in a network is addressed using a MAC address and an IP address.

- The device can be assigned a static IP address during configuration, or can be configured to accept a dynamic IP address (via DHCP).
- The MAC address is fixed within the device and is printed on a label on the front of the device.

5   Device Configuration

> **NOTE**
> The Error LED flashes whenever the device is receiving power but is not
> connected to a network. The Error LED will flash occasionally during the
> configuration process.

5.1   Configuration Methods

Network communication parameters for the card should be set via the soft starter (via the
Main Menu or by uploading a configuration file via USB Save & Load).

- If physical access to the starter is not possible, Ethernet attributes can be
  configured directly in the card using the on-board web server. The default address
  for a new card is 192.168.0.2. The default subnet mask is 255.255.255.0. The web
  server will only accept connections from within the same subnet domain.
  Changes made via the on-board web server are not stored permanently and will be
  lost when control power is cycled.

- If the subnet domain of the card is different from the controller, or if the IP address
  has been changed and is no longer known, use the Ethernet Device Configuration
  Tool to scan the network and identify the device. Changes made via the Ethernet
  Device Configuration Tool cannot be stored permanently in the device and will be
  lost when control power is cycled.

5.2   Configure Network Settings via the Starter

Use parameters 12H~12U to configure the network address.

Parameter	Parameter name	Default
12H	*Gateway Address*	192
12I	*Gateway Address* 2	168
12J	*Gateway Address* 3	0
12K	*Gateway Address* 4	100
12L	*IP Address*	192
12M	*IP Address* 2	168
12N	*IP Address* 3	0
12O	*IP Address* 4	2
12P	*Subnet Mask*	255
12Q	*Subnet Mask* 2	255
12R	*Subnet Mask* 3	255
12S	*Subnet Mask* 4	0
12T	*DHCP*	Disable
12U	*Location ID*	0

5.3   Enabling Network Control

The soft starter will only accept commands from the Ethernet/IP Card if parameter 1A
Command Source is set to 'Network'.

> **NOTE**
> If the reset input is active, the starter will not operate. If a reset switch is not
> required, use parameter 7I to set the reset input to normally open or fit a link
> across terminals 10, 11 on the soft starter.

5.4   On-board Web Server

To configure settings using the on-board web server, the card must be installed in a soft starter, control power must be available, and the card and computer must both be connected to the Ethernet network.

> **NOTE**
> If prompted to enter a username and password:
> username: admin
> password: admin

To configure the device using the on-board web server:

1. The network adapter settings on the computer must be fixed IP address (not DHCP) and the same subnet as the card. The default subnet mask is 255.255.255.0.
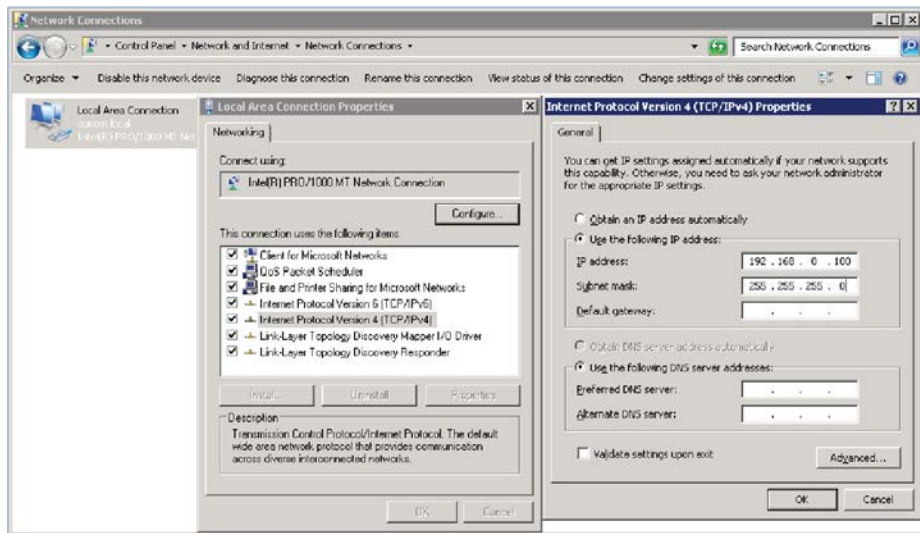
2. Start a browser and enter the device address, followed by /ipconfig. The default address for a new card is 192.168.0.2.
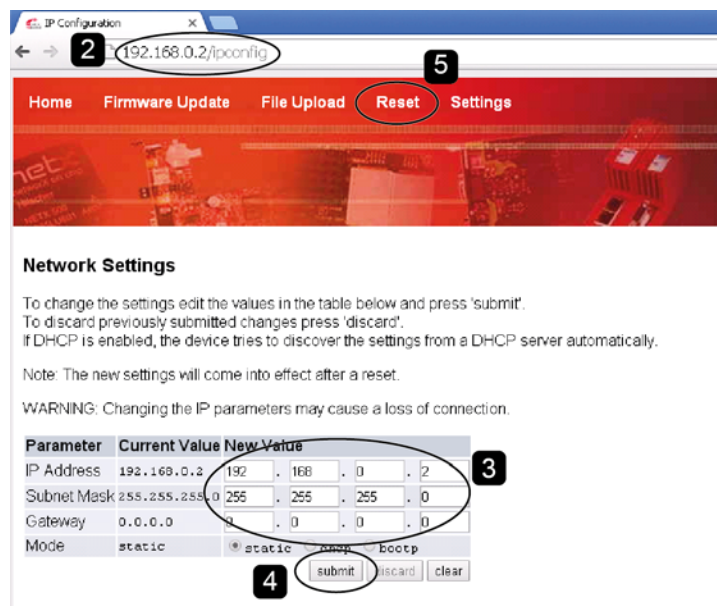
3. Edit the settings as required.
4. Click "Submit" to send the new settings to the device.
5. Click "Reset" then follow the on-screen instructions to activate the settings in the device.

NOTE: Changes made via the on-board web server are not stored permanently and will be lost when control power is cycled.

NOTE
If you change the subnet mask, the web server will not be able to communicate with the device after the new settings are saved.

NOTE
Changing the IP address via the web server does not change the address settings saved in the soft starter.

5.5 Ethernet Device Configuration Tool

Use the Ethernet Device Configuration Tool to connect to the device if you do not know the IP address, or if the subnet mask of the web server does not match.

The Ethernet Device Configuration Tool is available from your local supplier.

NOTE
If your PC has a firewall enabled, you must add the tool to the list of authorised programs.

To identify the device using the Ethernet Device Configuration Tool:

1. Start the Ethernet Device Configuration Tool.
2. Click on Search Devices. The software will search for connected devices.
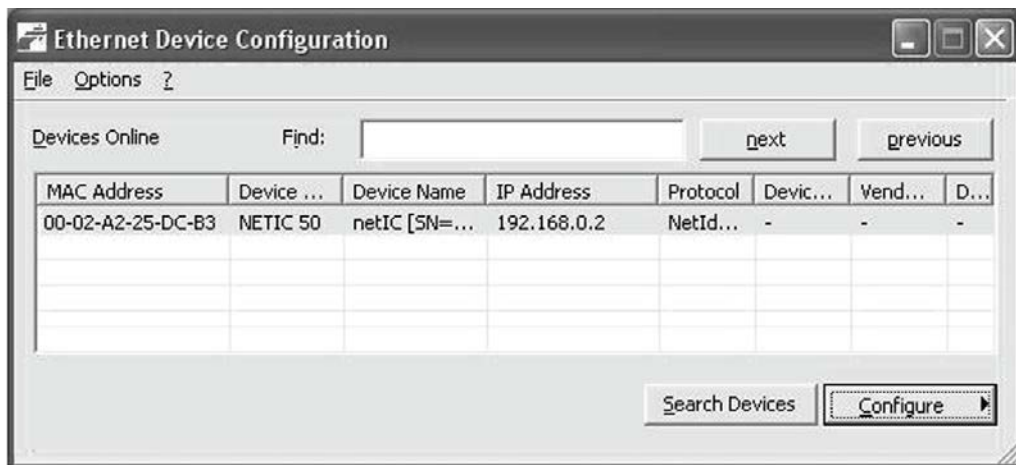
3. Use the IP address to connect to the device via the web server.

6 Scanner Configuration

6.1 EDS File

An EDS file that contains all required attributes of the device is available from your supplier.

Once the EDS file has been loaded, the individual device must be defined.

6.2 Assembly Objects

The device supports two assembly objects.

Description	Class	Instance	Type	Maximum Size
Output (scanner -> starter)	04d (0x04)	100d (0x64)	Integer	2 (4 bytes)
Input (starter -> scanner)	04d (0x04)	101d (0x65)	Integer	6 (12 bytes)

7 Operation

The Ethernet/IP Card is conformance tested to ODVA. For successful operation, the scanner must also support all functions and interfaces described in this document.

📄	**NOTE** The available features and parameter details may vary according to the model and software version of the starter. Refer to the soft starter user manual for details of parameters and supported features.

7.1 Device Classification

The Ethernet/IP Card is an I/O Adapter and must be managed by an I/O Scanner over Ethernet.

The Ethernet/IP Card supports both implicit (cyclic) and explicit (acyclic) messaging.

7.2 Ensuring Safe and Successful Control

Data written to the device will remain in its registers until the data is overwritten or the device is reinitialised.

If the soft starter may be controlled via Command Override (parameter 7A) or may be disabled via the reset input (terminals 10, 11) fieldbus commands should be cleared from the registers. If a command is not cleared, it will be re-sent to the starter once fieldbus control resumes.

7.3 Feedback LEDs
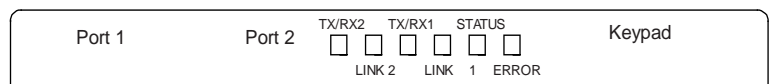
LED name	LED Status	Description
Error	Off	Device is not powered up or has received an IP address.
	Flashing	Connection timeout.
	On	Duplicate IP address.
Status	Off	Device is not powered up or does not have an IP address.
	Flashing	Device has obtained an IP address but has not established any network connections.
	On	Communication has been established.
Link x	Off	No network connection.
	On	Connected to a network.
TX/RX x	Flashing	Transmitting or receiving data.

8   Implicit Messaging (Cyclic Operation)

This section lists requirements related to cyclic (implicit messaging) services for the Ethernet/IP Card.

The minimum cyclic interval is 1 ms.

All data is in little endian format.

8.1   Assembly Objects

The device supports two assembly objects.

Description	Class	Instance	Type	Maximum Size
Output (scanner -> starter)	04d (0x04)	100d (0x64)	Integer	2 (4 bytes)
Input (starter -> scanner)	04d (0x04)	101d (0x65)	Integer	6 (12 bytes)

8.2   Control Commands (Assembly Instance 100d)

To send control data from the scanner to the starter, use assembly class 04d (0x04), assembly instance 100d (0x64), attribute 03d (0x03).

Bytes 0-1: Command

Bits	Function	Details
0 to 5	*Reserved*	Must be zero
6	Run	0 = Stop command 1 = Start command
7	Reset	Changing this bit from 0 to 1 will reset a trip.
8 to 12	*Reserved*	Must be zero
13	Motor set select	0 = Use primary motor set when starting 1 = Use secondary motor set when starting
14 to 15	*Reserved*	Must be zero

Bytes 2-3: Reserved

Bits	Function	Details
0 to 15	*Reserved*	Must be zero

Command Examples

Byte	Value	Description
0	0b01000000 (64d, 0x40)	Command: Start the soft starter
1		Command: Select primary or secondary motor settings
	0b00000000 (00d, 0x00) or 0b00100000 (32d, 0x20)	Use primary motor set when starting. Use secondary motor set when starting.
0	0b10000000 (128d, 0x80)	Command: Reset the soft starter The reset only occurs when the previous reset bit is zero, otherwise the value of 1 will be ignored.
0	0b11000000 (192d, 0xC0)	Command: Reset and start the soft starter
0	0bX0000000 (00d, 0x00)	Command: Stop the soft starter

8.3 Status Information (Assembly Instance 101d)

To retrieve status data from the starter, use assembly class 04d (0x04), assembly instance 101d (0x65), attribute 03d (0x03).

Bytes 0-1: Starter state

Bits	Function	Details
0	Ready	0 = Not ready 1 = Ready to start
1	Operating mode	0 = Program mode 1 = Operating mode
2	Running	0 = Not ready, Ready to start or Tripped 1 = Starting, Running, Stopping or Jogging
3	Trip	0 = Not tripped 1 = Tripped
4	Jog forward	1 = Jog forward
5	Jog reverse	1 = Jog reverse
6	*Reserved*	
7	Warning	0 = No warning 1 = Warning
8	Ramping	1 = Running (full voltage at the motor)
9	Command source	0 = Remote Keypad, Digital Input, Clock 1 = Network
10	*Reserved*	
11	*Reserved*	
12	*Reserved*	
13	*Reserved*	
14	*Reserved*	
15	Temperature limit	0 = Motor operating within thermal capacity (thermal model) 1 = Motor operating above thermal capacity (thermal model)

Bytes 2-3: Reserved

Bits	Function	Details
0 to 15	*Reserved*	

Bytes 4-7: Motor current

Bits	Function	Details
0 to 31	Motor current	Average rms current across all three phases. Measured current is represented as a 32-bit value to 2 decimal places. 10d (0x0A) = 0.10 A 3450d (0xD7A) = 34.50 A 68930d (0x10D42) = 689.30 A

Bytes 8-9: Trip code

Bits	Function	Details
0 to 15	Trip code	See *Trip Codes* on page 12.

Bytes 10-11: Reserved

Bits	Function	Details
0 to 15	*Reserved*	

9 Explicit Messaging (Acyclic Operation)

This section provides information on objects, instances, attributes and services for acyclic operation (explicit messaging).

All data is in little endian format.

9.1 Identity Object (Class 0x01)

The Ethernet/IP Card supports the following attributes for identity objects:

Attribute	Function	Value
1	Vendor	204d (0xCC)
2	Device type	12d (0x0C)
3	Product code	269d (0x10D)
4	Revision: Major, Minor	EDS file version
5	Status	Supported
6	Serial number	Supported
7	Product name	Supported

9.2 Vendor-specific Objects

The Ethernet/IP Card supports vendor-specific classes 100, 101, 103 and 104.

Class 100 and 101 Objects (Read/Write)

Class 100 and 101 objects allow parameter values to be read from and written to the soft starter.

- Class 100d (0x6o4): parameters 1~99
- Class 101d (0x65): parameters 100~199

See *Parameter Lists* on page 14 for details.

Class 103 Objects (Read Only)

Class 103d (0x67) allows starter state information to be read from the soft starter.

📄 **NOTE**
For models 0064B and smaller, current reported via communications is 10 times greater than the actual value (displayed on the keypad).

Object Name	Class	Instance	Attribute
Binary protocol version	103	100	100
Product type code	103	101	100
Reserved	103	102	100
Reserved	103	103	100

Object Name	Class	Instance	Attribute
Soft starter model	103	104	100
Changed parameter number	103	105	100
Num Parameters	103	106	100
Changed parameter value	103	107	100
Reserved	103	108	100
Starter state 1 = Ready 2 = Starting 3 = Running 4 = Stopping (including braking) 5 = Restart delay (including temperature check) 6 = Tripped 7 = Programming mode 8 = Jog forward 9 = Jog reverse	103	109	100
Warning 1 = Warning, 0 = No warning	103	110	100
Initialised 1 = Phase sequence is valid	103	111	100
Phase sequence (1 = Positive phase sequence, only valid if Initialised =1)	103	112	100
Reserved	103	113	100
Reserved	103	114	100
Trip/Warning code (see *Trip Codes* on page 12)	103	115	100
Average rms current across all three phases	103	116	100
Current (% motor FLC)	103	117	100
Motor temperature	103	118	100
Reserved	103	119	100
Power	103	120	100
Power scale 0 = Multiply power by 10 to get W 1 = Multiply power by 100 to get W 2 = Power (kW) 3 = Multiply power by 10 to get kW	103	121	100
% Power factor	103	122	100
Average rms voltage across all three phases	103	123	100
Phase 1 current	103	124	100
Phase 2 current	103	125	100
Phase 3 current	103	126	100
Phase 1 voltage	103	127	100
Phase 2 voltage	103	128	100
Phase 3 voltage	103	129	100
Parameter list minor revision	103	130	100
Parameter list major version	103	131	100

Object Name	Class	Instance	Attribute
Digital input state For all inputs, 0 = open, 1 = closed (shorted) Start/stop input = 01h, Reset = 04h, Programmable input A = 08h, Programmable input B = 10h	103	132	100

Class 104 Objects (Read Only)

Class 104d (0x68) allows extended information to be read from the soft starter.

Object Name	Class	Instance	Attribute
Major Software Version – User interface	104	101	100
Minor Software Version – User interface	104	102	100
Major Software Version – Motor control	104	103	100
Minor Software Version – Motor control	104	104	100
Major Software Version – Remote keypad (if installed)	104	105	100
Minor Software Version – Remote keypad (if installed)	104	106	100
Major Software Version – Expansion card (if installed)	104	107	100
Minor Software Version – Expansion card (if installed)	104	108	100

9.3   Supported Services for Vendor-specific Objects

This section describes the operational instructions to carry out acyclic services on class objects 100, 101, 103 and 104.

Service Codes for Acyclic Operation

The device supports the following services for vendor-specific objects:

Service Code	Function	Description
01d (0x01)	Get Attribute All	Only supported for class 0x01 identity object
10d (0x10)	Set Attribute Single	Supported
15d (0x0E)	Get Attribute Single	Supported

Service Codes for Acyclic Operation

The device will return the following status codes in response to Get/Set Attribute Single:

Status code	Status name	Details
00d (0x00)	Success	This code is returned when: • the register mapped for service 'Get Attribute Single' is successfully read • the register mapped for service 'Set Attribute Single' is successfully set
03d (0x03)	Invalid parameter value	
05d (0x05)	Path destination unknown	The mapped register does not exist.
08d (0x08)	Service not supported	The requested service is not available for this Object Class/Instance.

Status code	Status name	Details
09d (0x09)	Invalid attribute value	This code only applies to the service 'Set Attribute Single'. It is returned if the value is out of range for the mapped register.
15d (0x0E)	Attribute not settable	This code only applies to the service 'Set Attribute Single'. It is returned if the mapped register is read-only.
20d (0x14)	Attribute not supported	The attribute specified in the request is not supported.
22d (0x16)	Object does not exist	The object specified does not exist in the device.

10   Attributes

10.1 Trip Codes

Code	Trip Type
0	No trip
11	Input A trip
20	Motor overload
21	Heatsink overtemperature
23	L1 phase loss
24	L2 phase loss
25	L3 phase loss
26	Current imbalance
28	Overcurrent
29	Undercurrent
50	Power loss
51	Undervoltage
52	Overvoltage
54	Phase sequence
55	Frequency
60	Incorrect control card
61	FLC out of range
62	EEPROM fail (Parameter out of range)
75	Motor thermistor
101	Excess start time
102	Motor connection
104	Internal fault
110	Input B trip
113	Communications card fault
114	Forced network trip
115	L1-T1 shorted
116	L2-T2 shorted
117	L3-T3 shorted
119	Bypass overload
120	SCR overtemperature

Code	Trip Type
121	Battery/clock
122	Thermistor circuit
124	RTD/PT100 B
133	Overpower
134	Underpower
142	Keypad disconnected
143	Zero Speed Detect
144	SCR Itsm
145	Instantaneous overcurrent
146	Rating Capacity
156	Current Read Err L1
157	Current Read Err L2
158	Current Read Err L3
159	Remove Mains Volts (mains voltage connected in run simulation)
160	Motor Connection T1
161	Motor Connection T2
162	Motor Connection T3
163	Firing Fail P1
164	Firing Fail P2
165	Firing Fail P3
166	VZC Fail P1
167	VZC Fail P2
168	VZC Fail P3
169	Low Control Volts
170~182	Internal fault x. Contact your local supplier with the fault code (X).

10.2 Parameter Lists

📄 **NOTE**
The numbering of parameter options via communications starts at 0 (zero). For *Phase Sequence*, 0=Any Sequence, 1=Positive Only, 2=Negative Only.

Advanced model

Class 100 Objects (Read/Write)

Object Name	Class	Instance	Attribute	Object Name	Class	Instance	Attribute
Motor Details				Current Limit-2	100	131	100
Command Source	100	101	100	Adaptive Start Profile-2	100	132	100
Motor Full Load Current	100	102	100	Kickstart Time-2	100	133	100
Motor kW	100	103	100	Kickstart Level-2	100	134	100
Locked Rotor Time	100	104	100	Jog Torque-2	100	135	100
Locked Rotor Current	100	105	100	Stop Mode-2	100	136	100
Motor Service Factor	100	106	100	Stop Time-2	100	137	100
Reserved	100	107	100	Adaptive Stop Profile-2	100	138	100
Motor Start/Stop				Adaptive Control Gain-2	100	139	100
Start Mode	100	108	100	Multi Pump-2	100	140	100
Start Ramp Time	100	109	100	Start Delay-2	100	141	100
Initial Current	100	110	100	DC Brake Torque-2	100	142	100
Current Limit	100	111	100	DC Brake Time-2	100	143	100
Adaptive Start Profile	100	112	100	Brake Current Limit-2	100	144	100
Kickstart Time	100	113	100	Soft Brake Delay-2	100	145	100
Kickstart Level	100	114	100	**Auto-Start/Stop**			
Jog Torque	100	115	100	Auto-Start/Stop Mode	100	146	100
Stop Mode	100	116	100	Run Time	100	147	100
Stop Time	100	117	100	Stopped Time	100	148	100
Adaptive Stop Profile	100	118	100	Sunday Mode	100	149	100
Adaptive Control Gain	100	119	100	Sunday Start Time	100	150	100
Multi Pump	100	120	100	Sunday Stop Time	100	151	100
Start Delay	100	121	100	Monday Mode	100	152	100
DC Brake Torque	100	122	100	Monday Start Time	100	153	100
DC Brake Time	100	123	100	Monday Stop Time	100	154	100
Brake Current Limit	100	124	100	Tuesday Mode	100	155	100
Soft Brake Delay	100	125	100	Tuesday Start Time	100	156	100
Motor Start/Stop 2				Tuesday Stop Time	100	157	100
Motor Full Load Current-2	100	126	100	Wednesday Mode	100	158	100
Motor kW-2	100	127	100	Wednesday Start Time	100	159	100
Start Mode-2	100	128	100	Wednesday Stop Time	100	160	100
Start Ramp Time-2	100	129	100	Thursday Mode	100	161	100
Initial Current-2	100	130	100	Thursday Start Time	100	162	100

Object Name	Class	Instance	Attribute
Auto-Start/Stop (continued)			
Thursday Stop Time	*100*	*163*	*100*
Friday Mode	100	164	100
Friday Start Time	100	165	100
Friday Stop Time	100	166	100
Saturday Mode	100	167	100
Saturday Start Time	100	168	100
Saturday Stop Time	100	169	100
Protection Levels			
Current Imbalance	100	170	100
Current Imbalance Delay	100	171	100
Undercurrent	100	172	100
Undercurrent Delay	100	173	100
Overcurrent	100	174	100
Overcurrent Delay	100	175	100
Undervoltage	100	176	100
Undervoltage Delay	100	177	100
Overvoltage	100	178	100
Overvoltage Delay	100	179	100
Underpower	100	180	100

Object Name	Class	Instance	Attribute
Underpower Delay	100	181	100
Overpower	100	182	100
Overpower Delay	100	183	100
Excess Start Time	100	184	100
Restart Delay	100	185	100
Starts per Hour	100	186	100
Phase Sequence	100	187	100
Auto-Reset Count	100	188	100
Auto-Reset Delay	100	189	100
Protection Actions			
Current Imbalance	100	190	100
Undercurrent	100	191	100
Overcurrent	100	192	100
Undervoltage	100	193	100
Overvoltage	100	194	100
Underpower	100	195	100
Overpower	100	196	100
Excess Start Time	100	197	100
Input A Trip	100	198	100
Input B Trip	100	199	100

Class 101 Objects (Read/Write)

Object Name	Class	Instance	Attribute
Protection Actions (continued)			
Network Communications	101	100	100
Remote Keypad Fault	101	101	100
Frequency	101	102	100
Phase Sequence	101	103	100
Motor Overtemperature	101	104	100
Motor Thermistor Circuit	101	105	100
Shorted SCR Action	101	106	100
Battery/Clock	101	107	100
Inputs			
Input A Function	101	108	100
Input A Trip	101	109	100
Input A Trip Delay	101	110	100
Input A Initial Delay	101	111	100
Input B Function	101	112	100
Input B Trip	101	113	100
Input B Trip Delay	101	114	100
Input B Initial Delay	101	115	100
Reset/Enable Logic	101	116	100
Input A Name	101	117	100
Input B Name	101	118	100
Relay Outputs			
Relay A Function	101	119	100
Relay A On Delay	101	120	100
Relay A Off Delay	101	121	100
Relay B Function	101	122	100
Relay B On Delay	101	123	100
Relay B Off Delay	101	124	100
Low Current Flag	101	125	100
High Current Flag	101	126	100
Motor Temperature Flag	101	127	100
Main Contactor Time	101	128	100
Analog Output			
Analog Output A	101	129	100
Analog A Scale	101	130	100
Analog A Max Adjustment	101	131	100
Analog A Min Adjustment	101	132	100

Object Name	Class	Instance	Attribute
Display			
Language	101	133	100
Temperature Scale	101	134	100
Graph Timebase	101	135	100
Graph Maximum Adjustment	101	136	100
Graph Minimum Adjustment	101	137	100
Current Calibration	101	138	100
Adjustment Lock	101	139	100
User Parameter 1	101	140	100
User Parameter 2	101	141	100
User Parameter 3	101	142	100
User Parameter 4	101	143	100
User Parameter 5	101	144	100
User Parameter 6	101	145	100
Pump Clean			
Reverse Torque	101	146	100
Reverse Time	101	147	100
Forward Current Limit	101	148	100
Forward Time	101	149	100
Pump Stop Mode	101	150	100
Pump Stop Time	101	151	100
Pump Clean Cycles	101	152	100
Communications Card			
Modbus Address	101	153	100
Modbus Baud Rate	101	154	100
Modbus Parity	101	155	100
Modbus Timeout	101	156	100
Devicenet Address	101	157	100
Devicenet Baud Rate	101	158	100
Profibus Address	101	159	100
Gateway Address	101	160	100
Gateway Address 2	101	161	100
Gateway Address 3	101	162	100
Gateway Address 4	101	163	100
IP Address	101	164	100
IP Address 2	101	165	100
IP Address 3	101	166	100
IP Address 4	101	167	100

Object Name	Class	Instance	Attribute	Object Name	Class	Instance	Attribute
Communications Card (continued)				**Advanced**			
Subnet Mask	101	168	100	*Tracking Gain*	101	174	100
Subnet Mask 2	101	169	100	*Pedestal Detect*	101	175	100
Subnet Mask 3	101	170	100	*Bypass Contactor Delay*	101	176	100
Subnet Mask 4	101	171	100	*Model Rating*	101	177	100
DHCP	101	172	100	*Screen Timeout*	101	178	100
Location ID	101	173	100	*Motor Connection*	101	179	100

Basic model

Class 100 Objects (Read/Write)

Object Name	Class	Instance	Attribute	Object Name	Class	Instance	Attribute
Motor Details				*Input A Trip*	100	134	100
Command Source	100	101	100	*Input B Trip*	100	135	100
Motor Full Load Current	100	102	100	*Network Communications*	100	136	100
Locked Rotor Time	100	103	100	*Remote Keypad Fault*	100	137	100
Locked Rotor Current	100	104	100	*Frequency*	100	138	100
Motor Service Factor	100	105	100	*Phase Sequence*	100	139	100
Reserved	100	106	100	*Motor Overtemperature*	100	140	100
Motor Start/Stop				*Motor Thermistor Circuit*	100	141	100
Start Mode	100	107	100	**Inputs**			
Start Ramp Time	100	108	100	*Input A Function*	100	142	100
Initial Current	100	109	100	*Input A Trip*	100	143	100
Current Limit	100	110	100	*Input A Trip Delay*	100	144	100
Adaptive Start Profile	100	111	100	*Input A Initial Delay*	100	145	100
Stop Mode	100	112	100	*Input B Function*	100	146	100
Stop Time	100	113	100	*Input B Trip*	100	147	100
Adaptive Stop Profile	100	114	100	*Input B Trip Delay*	100	148	100
Adaptive Control Gain	100	115	100	*Input B Initial Delay*	100	149	100
Multi Pump	100	116	100	*Reset/Enable Logic*	100	150	100
Start Delay	100	117	100	*Input A Name*	100	151	100
Protection Levels				*Input B Name*	100	152	100
Current Imbalance	100	118	100	**Relay Outputs**			
Current Imbalance Delay	100	119	100	*Relay A Function*	100	153	100
Undercurrent	100	120	100	*Relay A On Delay*	100	154	100
Undercurrent Delay	100	121	100	*Relay A Off Delay*	100	155	100
Overcurrent	100	122	100	*Relay B Function*	100	156	100
Overcurrent Delay	100	123	100	*Relay B On Delay*	100	157	100
Excess Start Time	100	124	100	*Relay B Off Delay*	100	158	100
Restart Delay	100	125	100	*Low Current Flag*	100	159	100
Starts per Hour	100	126	100	*High Current Flag*	100	160	100
Phase Sequence	100	127	100	*Motor Temperature Flag*	100	161	100
Auto-Reset Count	100	128	100	*Main Contactor Time*	100	162	100
Auto-Reset Delay	100	129	100	**Analog Output**			
Protection Actions				*Analog Output A*	100	163	100
Current Imbalance	100	130	100	*Analog A Scale*	100	164	100
Undercurrent	100	131	100	*Analog A Max Adjustment*	100	165	100
Overcurrent	100	132	100	*Analog A Min Adjustment*	100	166	100
Excess Start Time	100	133	100				

Object Name	Class	Instance	Attribute
Display			
Language	100	167	100
Temperature Scale	100	168	100
Graph Timebase	100	169	100
Graph Maximum Adjustment	100	170	100
Graph Minimum Adjustment	100	171	100
Current Calibration	100	172	100
Adjustment Lock	100	173	100
User Parameter 1	100	174	100
User Parameter 2	100	175	100
User Parameter 3	100	176	100
User Parameter 4	100	177	100
User Parameter 5	100	178	100
User Parameter 6	100	179	100
Communications Card			
Modbus Address	100	180	100
Modbus Baud Rate	100	181	100
Modbus Parity	100	182	100

Object Name	Class	Instance	Attribute
Modbus Timeout	100	183	100
Devicenet Address	100	184	100
Devicenet Baud Rate	100	185	100
Profibus Address	100	186	100
Gateway Address	100	187	100
Gateway Address 2	100	188	100
Gateway Address 3	100	189	100
Gateway Address 4	100	190	100
IP Address	100	191	100
IP Address 2	100	192	100
IP Address 3	100	193	100
IP Address 4	100	194	100
Subnet Mask	100	195	100
Subnet Mask 2	100	196	100
Subnet Mask 3	100	197	100
Subnet Mask 4	100	198	100
DHCP	100	199	100

Class 101 Objects (Read/Write)

Object Name	Class	Instance	Attribute
Communications Card (continued)			
Location ID	101	100	100
Advanced			
Tracking Gain	101	101	100
Pedestal Detect	101	102	100

Object Name	Class	Instance	Attribute
Bypass Contactor Delay	101	103	100
Model Rating	101	104	100
Screen Timeout	101	105	100
Motor Connection	101	106	100

11   Network Design

The device supports star, line and ring topologies.
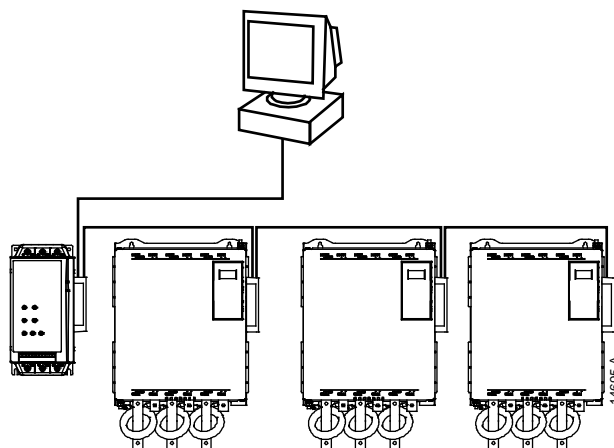
11.1 Star Topology

In a star network, all controllers and devices connect to a central network switch.
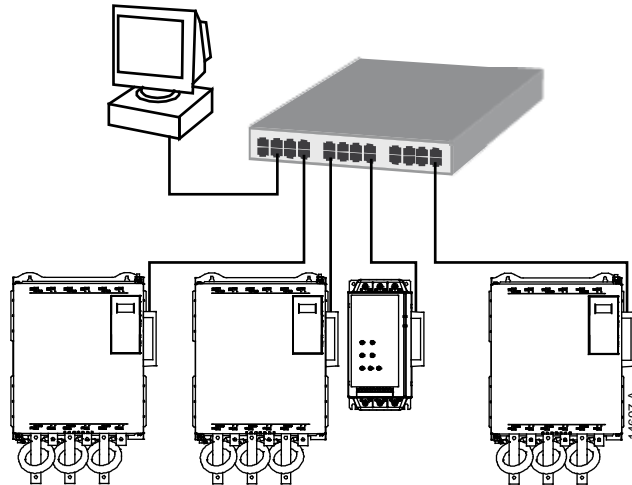
11.2 Line Topology

In a line network, the controller connects directly to one port of the first card. The second Ethernet port connects to another card, which in turn connects to another device until all devices are connected.

> **NOTE**
> The device has an integrated switch to allow data to pass through in line topology. The device must be receiving control power from the soft starter for the switch to operate.

> **NOTE**
> If the connection between two devices is interrupted, the controller cannot communicate with devices after the interruption point.
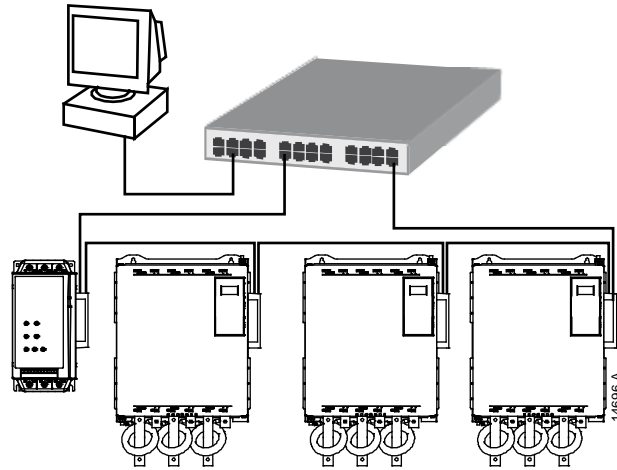
> **NOTE**
> Each connection adds a delay to communication with the next device.
> The maximum number of devices in a line network is 32. Exceeding this number may reduce the reliability of the network.

11.3 Ring Topology

In a ring topology network, the controller connects to the first card, via a network switch. The second Ethernet port of the card connects to another device, which in turn connects to another device until all devices are connected. The final device connects back to the switch.

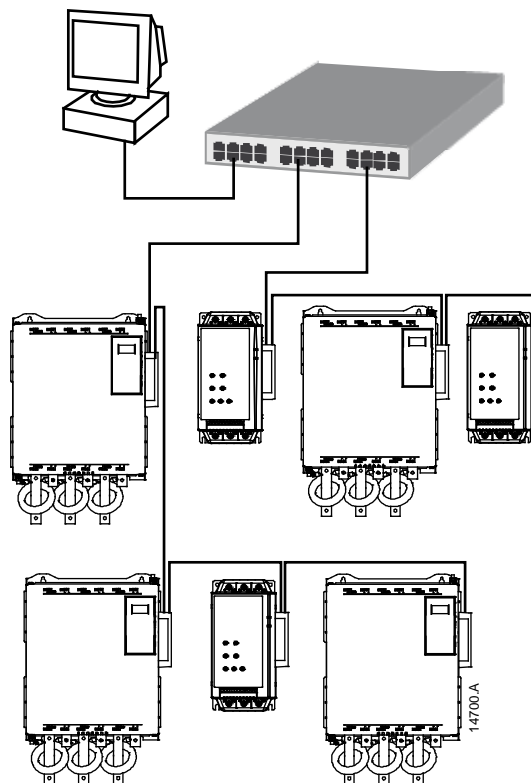The device supports beacon based ring node configuration.

	NOTE
	The network switch must support loss of line detection.

11.4 Combined Topologies

A single network can include both star and line components.

12   Specifications

Connections

Soft starter .... 6-way pin assembly
    Contacts .... Gold flash
Network RJ45

Settings

IP address .... Automatically assigned, configurable
Device name .... Automatically assigned, configurable

Network

Link speed .... 10 Mbps, 100 Mbps (auto-detect)
Full duplex
Auto crossover

Power

Consumption (steady state, maximum) .... 35 mA @ 24 VDC
Reverse polarity protected
Galvanically isolated

Certification

CE .... EN 60947-4-2

ODVA .... **EtherNet√IP**™
                                                                                           conformance tested