

Instructions

Ethernet/IP Card

(WSIQ-COM-ETHIP)

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Product Compatibility

The Ethernet/IP Card is suitable for use with WSB and WSIQ soft starters.

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 consequential damages resulting from the use or application of this equipment.

1 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.

2 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.

2.1 Product Design

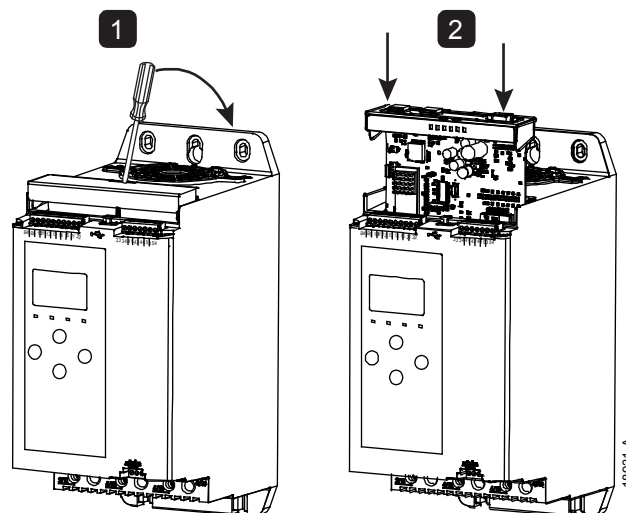
The Ethernet/IP Card allows a WorldWide Electric soft starter to connect to an Ethernet network and be controlled or monitored using an Ethernet communication model.

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

3 Installation

3.1 Installation Procedure

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.



3.2 Network Connection

Ethernet Ports

The Ethernet/IP Card 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 Ethernet/IP Card.

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°.

3.3 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, fit a link across terminals 10, 11 on the soft starter.

3.4 Network Establishment

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

3.5 Addressing

Each device in a network is addressed using a MAC address and an IP address, and can be assigned a symbolic name associated with the MAC 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 symbolic name is optional and must be configured within the device.
- The MAC address is fixed within the device and is printed on a label on the front of the module.

4 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.

4.1 Device Classification

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

4.2 Device Configuration

Network communication parameters for the card must be set via the soft starter.



NOTE

The Error LED flashes whenever the device is receiving power but is not connected to a network. The Error LED will flash throughout the configuration process.

Parameter	Parameter name	Default
11H	<i>Gateway Address</i>	192
11I	<i>Gateway Address 2</i>	168
11J	<i>Gateway Address 3</i>	0
11K	<i>Gateway Address 4</i>	100
11L	<i>IP Address</i>	192
11M	<i>IP Address 2</i>	198
11N	<i>IP Address 3</i>	0
11O	<i>IP Address 4</i>	2
11P	<i>Subnet Mask</i>	255
11Q	<i>Subnet Mask 2</i>	255
11R	<i>Subnet Mask 3</i>	255
11S	<i>Subnet Mask 4</i>	0
11T	<i>DHCP</i>	Disable
11U	<i>Location ID</i>	0

4.3 Scanner Configuration

EDS File

An EDS file is available from www.worldwideelectric.net. The EDS file contains all required attributes of the Ethernet/IP Card.

Once the EDS file has been loaded, the individual device must be defined. The Ethernet/IP Card must be configured with 12 input bytes and 4 output bytes.

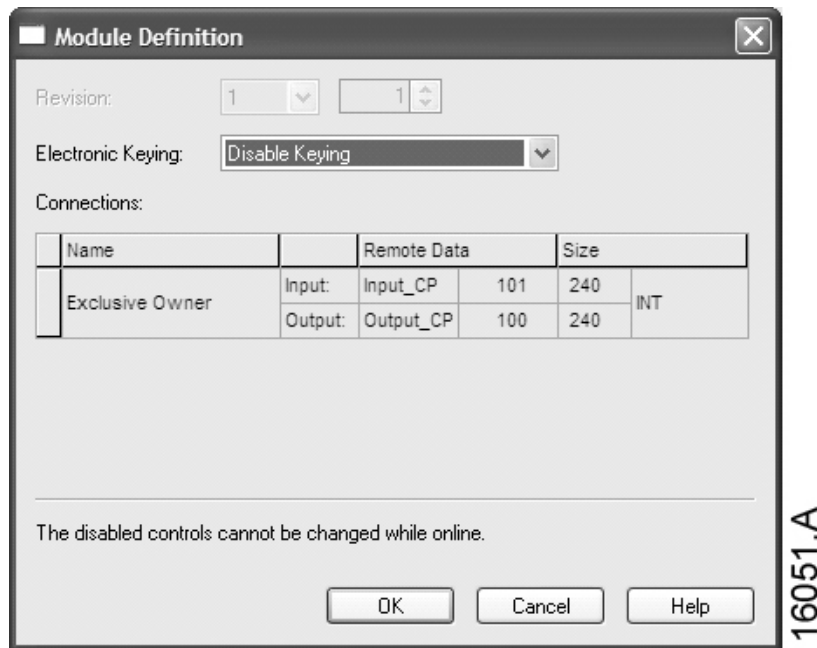
Assembly Objects

The Ethernet/IP Card supports two assembly objects.

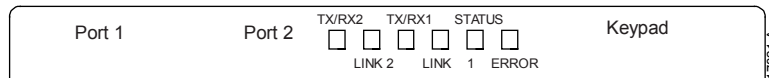
Assembly Instances	Description	Maximum Size	Type
100	Originator -> Target	2 (4) bytes	Byte
101	Target -> Originator	6 (12) bytes	Byte

Module Definition Example

Module definition of the Ethernet/IP Module, using RSLogix 5000



4.4 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.

5 Packet Structures



NOTE

All references to registers mean the registers within the module unless otherwise stated.

5.1 Ensuring Safe and Successful Control

Data written to the Ethernet/IP Card will remain in its registers until the data is overwritten or the device is reinitialized.

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.

5.2 Cyclic Operation

This section lists requirements related to cyclic services for the Ethernet/IP Card. The Ethernet/IP Card uses both implicit (I/O) and explicit messaging, with a cyclic trigger (minimum cyclic interval 1 ms).

Assembly Objects

The Ethernet/IP Card supports two assembly objects.

Assembly Instances	Description	Maximum Size	Type
100	Originator -> Target	2 (4) bytes	Byte
101	Target -> Originator	6 (12) bytes	Byte

Control Commands

- **Receiving Control Data from the Controller (Output Assembly Instance 100d)**

The Ethernet/IP Card uses output assembly instance 100d in assembly class 0x04 to receive control data from the controller. This is the only valid assembly instance.

Byte	Function ¹	Details
0	Control Word	Refer to <i>Control Commands (Write Only)</i> on page 6.
1		
2	<i>Reserved</i>	Must be zero
3		

¹ All fields are in little endian format.

- **Control Word (Write Only)**

Use the following structures to send a control command to the soft starter:

Byte	Bit	Function	
0	0 to 5	<i>Reserved</i>	Must be zero
	6	Run	0 = Stop command 1 = Start command
	7	Reset	Changing this bit from 0 to 1 will reset a trip.
1	0 to 4	<i>Reserved</i>	Must be zero
	5	Motor set select	0 = Use primary motor set when starting ¹ 1 = Use secondary motor set when starting ¹
	6 to 7	<i>Reserved</i>	Must be zero

¹ Ensure that the programmable input is not set to Motor Set Select before using this function.

- **Command Examples**

Byte	Value	Description
Command: Start a soft starter		
0	<ul style="list-style-type: none"> • 0b11000000 (0XC0) or • 0b01000000 (0X40) 	0bX1000000, where X represents 0 or 1 on the reset field.
Command: Select primary or secondary motor settings		
1	<ul style="list-style-type: none"> • 0b00000000 (0x0) or • 0b00100000 (0x20) 	Select primary motor settings. Select secondary motor settings.
Command: Reset a soft starter		
0	<ul style="list-style-type: none"> • 0b11000000 (0XC0) or • 0b10000000 (0X80) 	The reset only occurs when the previous reset bit is zero, otherwise the value of 1 will be ignored.
Command: Stop a soft starter		
0	0bX0000000	

Status Information

- **Reading Status Information from the Starter (Input Assembly Instance 101d)**

The Ethernet/IP Card uses input assembly instance 101d in assembly class 0x04 to send status information to the controller. This is the only valid assembly instance.

Byte	Function	Details
0	Status word	Refer to <i>Status Commands (Read Only)</i> on page 8.
1		
2	<i>Reserved</i>	<i>Reserved</i>
3		
4	Motor current	Measured current is represented as a 32-bit value to 2 decimal places: 0000001 hex = 0.01 A 0000064 hex = 1.00 A 00010D47 hex = 689.35 A
5		
6		
7		
8	Trip code	Refer to <i>Trip Codes</i> on page 8.
9		
10	<i>Reserved</i>	<i>Reserved</i>
11		

- **Status Word (Read Only)**

Use the following structures to query the soft starter's status:

Bit	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	<i>Reserved</i>	
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, Smart Card, Smart Card + Clock
10	<i>Reserved</i>	
11	<i>Reserved</i>	
12	<i>Reserved</i>	
13	<i>Reserved</i>	
14	<i>Reserved</i>	
15	Temperature limit	0 = Motor operating within thermal capacity (thermal model) 1 = Motor operating above thermal capacity (thermal model)

- 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 circuit
54	Phase sequence
55	Frequency
60	Incorrect control card
61	FLC out of range
62	EEPROM fail (Parameter out of range)
70	Miscellaneous
75	Motor thermistor
101	Excess start time
104	Internal fault x (where x is the fault code detailed in the table below)
110	Input B trip
113	Communications card fault
114	Forced network trip (Network communication (between device and network))
115	L1-T1 shorted
116	L2-T2 shorted
117	L3-T3 shorted
119	Bypass overload
120	SCR overtemperature
121	Battery/clock
122	Thermistor circuit
142	Keypad disconnected
143	Zero Speed Detect
144	SCR Itsm
145	Instantaneous overcurrent
146	Rating Capacity

The table below details the internal fault code associated with trip code 104.

Internal fault	Message displayed on the keypad
70 ~ 72	Current Read Err Lx
73	ATTENTION! Remove Mains Volts
74 ~ 76	Motor Connection Tx
77 ~ 79	Firing Fail Px
80 ~ 82	VZC Fail Px
83	Low Control Volts
84 ~ 98	Internal fault X Contact your local supplier with the fault code (X).

5.3 Acyclic Operation

This section provides information on objects, instances and attributes for acyclic operation. It also lists the requirements related to acyclic services for the Ethernet/IP Module.

Class 0x01 Identity Object

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

Attribute	Function	Description
1	Vendor	Supported
2	Device type	This attribute's value is 12d.
3	Product code	Supported
4	Revision: Major, Minor	Revision value set in the EDS file
5	Status	netIC module's status
6	Serial number	netIC module's serial number
7	Product name	Supported

Vendor-specific Objects

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

- **Class 100 and Class 101 Objects (Read/Write)**

Class 100 and Class 101 objects allow parameter values to be read from and written to the soft starter. Class 100 is used to manage the first 99 parameters in the starter. Class 101 is used to manage parameters 100 onwards. Refer to *Parameter Lists* on page 16 for details.

- **Class 103 Objects (Read Only)**

Object Name	Class	Instance	Attribute
Binary protocol version	103	100	100
Product type code	103	101	100
<i>Reserved</i>	103	102	100
<i>Reserved</i>	103	103	100
Soft starter model	103	104	100
<i>Reserved</i>	103	105	100

Object Name	Class	Instance	Attribute
Num Parameters	103	106	100
<i>Reserved</i>	103	107	100
Access Type	103	108	100
Starter state	103	109	100
Warning (1 = 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
<i>Reserved</i>	103	113	100
<i>Reserved</i>	103	114	100
Trip/Warning code	103	115	100
Current	103	116	100
Current (% motor FLC)	103	117	100
Motor temperature	103	118	100
<i>Reserved</i>	103	119	100
<i>Reserved</i>	103	120	100
<i>Reserved</i>	103	121	100
% Power factor	103	122	100
<i>Reserved</i>	103	123	100
Phase 1 current	103	124	100
Phase 2 current	103	125	100
Phase 3 current	103	126	100
<i>Reserved</i>	103	127	100
<i>Reserved</i>	103	128	100
<i>Reserved</i>	103	129	100
Parameter list minor revision	103	130	100
Parameter list major version	103	131	100
Digital Input state (Start/stop input = 01h, Reset = 04h, Programmable input A = 08h, Programmable input B = 10h)	103	132	100
Register 27	103	133	100
Register 28	103	134	100
Register 29	103	135	100
Register 30	103	136	100
Register 31	103	137	100

- **Class 104 Objects (Read Only)**

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
<i>Reserved</i>	104	107	100
<i>Reserved</i>	104	108	100
Model rating ¹	104	109	100
Control Variant	104	110	100
Backplane Variant	104	111	100
<i>Reserved</i>	104	112	100
Frame size	104	113	100
Customer	104	114	100

¹ Models up to 60 A will report 10 times greater than the actual rating.

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.

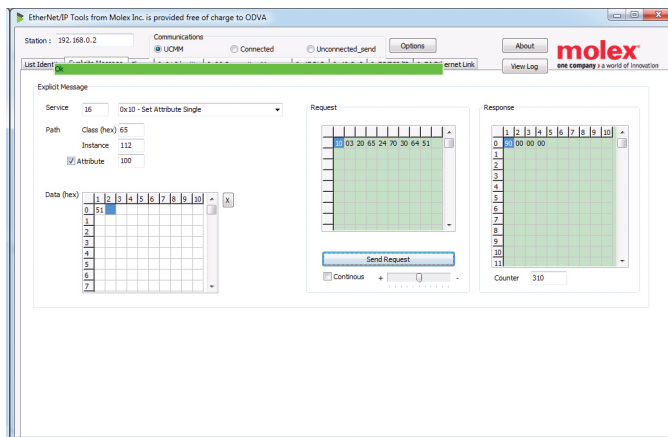
The Ethernet/IP Card supports the following services for vendor-specific objects:

Service Code	Function	Description
0x01	Get Attribute All	Only supported for class 0x01 identity object
0x10	Set Attribute Single	Supported
0x0E	Get Attribute Single	Supported

- **Set Attribute Single**

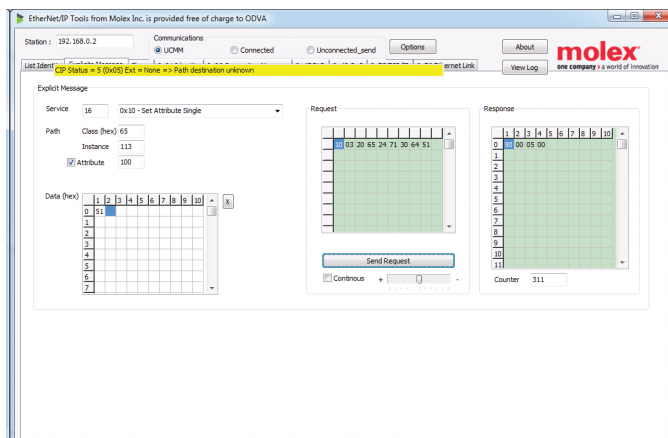
To set an attribute, use the service code 0x10 (Set Attribute Single). For details on returned status codes, refer to Status Codes for Acyclic Services: Get/Set Attribute Single.

Example: Setting the value to Class 0x65 - Successful



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Example: Setting the value to Class 0x65 - Error

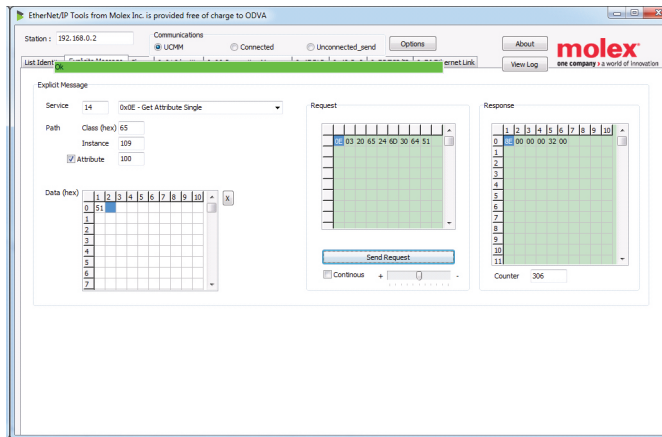


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- **Get Attribute Single**

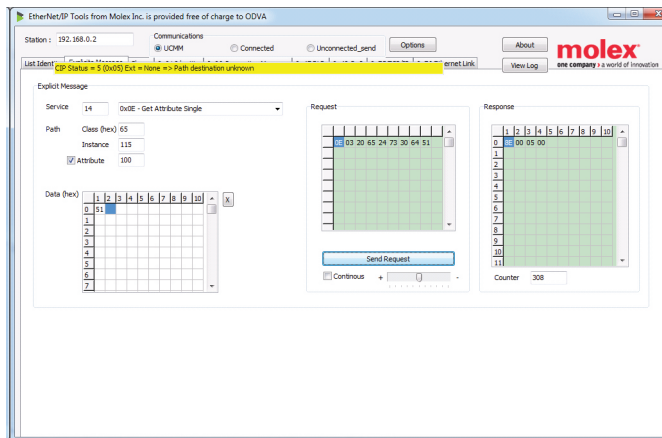
To get an attribute, use the service code 0x0E (Get Attribute Single). For details on returned status codes, refer to Status Codes for Acyclic Services: Get/Set Attribute Single.

Example: Retrieving the value of Class 0x65 - Successful



18377-A

Example: Retrieving the value of Class 0x65 - Error



18378-A

- **Status Codes for Acyclic Services: Get/Set Attribute Single**

Status codes for acyclic services Get/Set Attribute Single

Status code	Status name	Details
0x00	Success	This code is returned upon successful execution of the service, that is <ul style="list-style-type: none"> • when the register mapped for service 'Get Attribute Single' is successfully read • when the register mapped for service 'Set Attribute Single' is successfully set.
0x03	Invalid parameter value	
0x05	Path destination unknown	The mapped register does not exist.
0x08	Service not supported	The requested service is not available for this Object Class/Instance.
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.
0x0E	Attribute not settable	This code only applies to the service 'Set Attribute Single'. It is returned if the mapped register is read-only.
0x14	Attribute not supported	The attribute specified in the request is not supported.
0x16	Object does not exist	The object specified does not exist in the device.

5.4 Parameter Lists

WSIQ

Class 100 and Class 101 Objects (Read/Write)

Object Name	Class	Instance	Attribute
<i>Command Source</i>	100	101	100
<i>Motor Full Load Current</i>	100	102	100
<i>Locked Rotor Time</i>	100	103	100
<i>Locked Rotor Current</i>	100	104	100
<i>Motor Service Factor</i>	100	105	100
<i>Start Mode</i>	100	106	100
<i>Start Ramp Time</i>	100	107	100
<i>Initial Current</i>	100	108	100
<i>Current Limit</i>	100	109	100
<i>Adaptive Start Profile</i>	100	110	100
<i>Kickstart Time</i>	100	111	100
<i>Kickstart Level</i>	100	112	100
<i>Jog Torque</i>	100	113	100
<i>Stop Mode</i>	100	114	100
<i>Stop Time</i>	100	115	100
<i>Adaptive Stop Profile</i>	100	116	100
<i>Adaptive Control Gain</i>	100	117	100
<i>Multi Pump</i>	100	118	100
<i>Start Delay</i>	100	119	100
<i>DC Brake Torque</i>	100	120	100
<i>DC Brake Time</i>	100	121	100
<i>Brake Current Limit</i>	100	122	100
<i>Soft Brake Delay</i>	100	123	100
<i>Start Mode-2</i>	100	124	100
<i>Start Ramp Time-2</i>	100	125	100
<i>Initial Current-2</i>	100	126	100
<i>Current Limit-2</i>	100	127	100
<i>Adaptive Start Profile-2</i>	100	128	100
<i>Kickstart Time-2</i>	100	129	100
<i>Kickstart Level-2</i>	100	130	100

Object Name	Class	Instance	Attribute
<i>Input B Trip</i>	101	100	100
<i>Input B Trip Delay</i>	101	101	100
<i>Input B Initial Delay</i>	101	102	100
<i>Reset/Enable Logic</i>	101	103	100
<i>Input A Name</i>	101	104	100
<i>Input B Name</i>	101	105	100
<i>Relay A Function</i>	101	106	100
<i>Relay A On Delay</i>	101	107	100
<i>Relay A Off Delay</i>	101	108	100
<i>Relay B Function</i>	101	109	100
<i>Relay B On Delay</i>	101	110	100
<i>Relay B Off Delay</i>	101	111	100
<i>Low Current Flag</i>	101	112	100
<i>High Current Flag</i>	101	113	100
<i>Motor Temperature Flag</i>	101	114	100
<i>Main Contactor Time</i>	101	115	100
<i>Analog Output A</i>	101	116	100
<i>Analog A Scale</i>	101	117	100
<i>Analog A Maximum Adjustment</i>	101	118	100
<i>Analog A Minimum Adjustment</i>	101	119	100
<i>Language</i>	101	120	100
<i>Temperature Scale</i>	101	121	100
<i>Graph Timebase</i>	101	122	100
<i>Graph Maximum Adjustment</i>	101	123	100
<i>Graph Minimum Adjustment</i>	101	124	100
<i>Current Calibration</i>	101	125	100
<i>Adjustment Lock</i>	101	126	100
<i>User Parameter 1</i>	101	127	100
<i>User Parameter 2</i>	101	128	100
<i>Modbus Address</i>	101	129	100

Object Name	Class	Instance	Attribute
<i>Jog Torque-2</i>	100	131	100
<i>Stop Mode-2</i>	100	132	100
<i>Stop Time-2</i>	100	133	100
<i>Adaptive Stop Profile-2</i>	100	134	100
<i>Adaptive Control Gain-2</i>	100	135	100
<i>Multi Pump-2</i>	100	136	100
<i>Start Delay-2</i>	100	137	100
<i>DC Brake Torque-2</i>	100	138	100
<i>DC Brake Time-2</i>	100	139	100
<i>Brake Current Limit-2</i>	100	140	100
<i>Soft Brake Delay-2</i>	100	141	100
<i>Auto-Start/Stop Mode</i>	100	142	100
<i>Sunday Mode</i>	100	143	100
<i>Sunday Start Time</i>	100	144	100
<i>Sunday Stop Time</i>	100	145	100
<i>Monday Mode</i>	100	146	100
<i>Monday Start Time</i>	100	147	100
<i>Monday Stop Time</i>	100	148	100
<i>Tuesday Mode</i>	100	149	100
<i>Tuesday Start Time</i>	100	150	100
<i>Tuesday Stop Time</i>	100	151	100
<i>Wednesday Mode</i>	100	152	100
<i>Wednesday Start Time</i>	100	153	100
<i>Wednesday Stop Time</i>	100	154	100
<i>Thursday Mode</i>	100	155	100
<i>Thursday Start Time</i>	100	156	100
<i>Thursday Stop Time</i>	100	157	100
<i>Friday Mode</i>	100	158	100
<i>Friday Start Time</i>	100	159	100
<i>Friday Stop Time</i>	100	160	100
<i>Saturday Mode</i>	100	161	100
<i>Saturday Start Time</i>	100	162	100
<i>Saturday Stop Time</i>	100	163	100
<i>Current Imbalance</i>	100	164	100
<i>Current Imbalance Delay</i>	100	165	100

Object Name	Class	Instance	Attribute
<i>Modbus Baud Rate</i>	101	130	100
<i>Modbus Parity</i>	101	131	100
<i>Modbus Timeout</i>	101	132	100
<i>Devicenet Address</i>	101	133	100
<i>Devicenet Baud Rate</i>	101	134	100
<i>Profibus Address</i>	101	135	100
<i>Gateway Address</i>	101	137	100
<i>Gateway Address 2</i>	101	138	100
<i>Gateway Address 3</i>	101	138	100
<i>Gateway Address 4</i>	101	139	100
<i>IP Address</i>	101	140	100
<i>IP Address 2</i>	101	141	100
<i>IP Address 3</i>	101	142	100
<i>IP Address 4</i>	101	143	100
<i>Subnet Mask</i>	101	144	100
<i>Subnet Mask 2</i>	101	145	100
<i>Subnet Mask 3</i>	101	146	100
<i>Subnet Mask 4</i>	101	147	100
<i>DHCP</i>	101	148	100
<i>Location ID</i>	101	149	100
<i>Auto-Reset Count</i>	101	150	100
<i>Auto-Reset Delay</i>	101	151	100
<i>Pressure Sensor Type</i>	101	152	100
<i>Pressure Units</i>	101	153	100
<i>Pressure at 4 mA</i>	101	154	100
<i>Pressure at 20 mA</i>	101	155	100
<i>Flow Sensor Type</i>	101	156	100
<i>Flow Units</i>	101	157	100
<i>Flow at 4 mA</i>	101	158	100
<i>Flow at 20 mA</i>	101	159	100
<i>Units per Minute at Max Flow</i>	101	160	100
<i>Pulses per Minute at Max Flow</i>	101	161	100
<i>Units per Pulse</i>	101	162	100
<i>Depth Sensor Type</i>	101	163	100
<i>Depth Units</i>	101	164	100

Object Name	Class	Instance	Attribute
<i>Undercurrent</i>	100	166	100
<i>Undercurrent Delay</i>	100	167	100
<i>Overcurrent</i>	100	168	100
<i>Overcurrent Delay</i>	100	169	100
<i>Excess Start Time</i>	100	170	100
<i>Restart Delay</i>	100	171	100
<i>Current Imbalance</i>	100	172	100
<i>Undercurrent</i>	100	173	100
<i>Overcurrent</i>	100	174	100
<i>Excess Start Time</i>	100	175	100
<i>Input A Trip</i>	100	176	100
<i>Input B Trip</i>	100	177	100
<i>Network Communications</i>	100	178	100
<i>Remote Keypad Fault</i>	100	179	100
<i>Frequency</i>	100	180	100
<i>Motor Overtemperature</i>	100	181	100
<i>Motor Thermistor Circuit</i>	100	182	100
<i>Shorted SCR Action</i>	100	183	100
<i>Battery/Clock</i>	100	184	100
<i>Pressure Sensor</i>	100	185	100
<i>Flow Sensor</i>	100	186	100
<i>Depth Sensor</i>	100	187	100
<i>High Pressure</i>	100	188	100
<i>Low Pressure</i>	100	189	100
<i>High Flow</i>	100	190	100
<i>Low Flow</i>	100	191	100
<i>Flow Switch</i>	100	192	100
<i>Well Depth</i>	100	193	100
<i>RTD/PT100 B</i>	100	194	100
<i>Input A Function</i>	100	195	100
<i>Input A Trip</i>	100	196	100
<i>Input A Trip Delay</i>	100	197	100
<i>Input A Initial Delay</i>	100	198	100
<i>Input B Function</i>	100	199	100

Object Name	Class	Instance	Attribute
<i>Depth at 4 mA</i>	101	165	100
<i>Depth at 20 mA</i>	101	166	100
<i>High Flow Trip Level</i>	101	167	100
<i>Low Flow Trip Level</i>	101	168	100
<i>Flow Start Delay</i>	101	169	100
<i>Flow Response Delay</i>	101	170	100
<i>High Pressure Trip Level</i>	101	171	100
<i>High Pressure Start Delay</i>	101	172	100
<i>High Pressure Response Delay</i>	101	173	100
<i>Low Pressure Trip Level</i>	101	174	100
<i>Low Pressure Start Delay</i>	101	175	100
<i>Low Pressure Response Delay</i>	101	176	100
<i>Pressure Control Mode</i>	101	177	100
<i>Start Pressure Level</i>	101	178	100
<i>Start Response Delay</i>	101	179	100
<i>Stop Pressure Level</i>	101	180	100
<i>Stop Response Delay</i>	101	181	100
<i>Depth Trip Level</i>	101	182	100
<i>Depth Reset Level</i>	101	183	100
<i>Depth Start Delay</i>	101	184	100
<i>Depth Response Delay</i>	101	185	100
<i>Temperature Sensor Type</i>	101	186	100
<i>Temperature Trip Level</i>	101	187	100
<i>Tracking Gain</i>	101	188	100
<i>Pedestal Detect</i>	101	189	100
<i>Bypass Contactor Delay</i>	101	190	100
<i>Model Rating</i>	101	191	100
<i>Screen Timeout</i>	101	192	100

WSB*Class 100 and Class 101 Objects (Read/Write)*

Object Name	Class	Instance	Attribute
<i>Command Source</i>	100	101	100
<i>Motor Full Load Current</i>	100	102	100
<i>Locked Rotor Time</i>	100	103	100
<i>Locked Rotor Current</i>	100	104	100
<i>Motor Service Factor</i>	100	105	100
<i>Start Mode</i>	100	106	100
<i>Start Ramp Time</i>	100	107	100
<i>Initial Current</i>	100	108	100
<i>Current Limit</i>	100	109	100
<i>Adaptive Start Profile</i>	100	110	100
<i>Stop Mode</i>	100	111	100
<i>Stop Time</i>	100	112	100
<i>Adaptive Stop Profile</i>	100	113	100
<i>Adaptive Control Gain</i>	100	114	100
<i>Multi Pump</i>	100	115	100
<i>Start Delay</i>	100	116	100
<i>Current Imbalance</i>	100	117	100
<i>Current Imbalance Delay</i>	100	118	100
<i>Undercurrent</i>	100	119	100
<i>Undercurrent Delay</i>	100	120	100
<i>Overcurrent</i>	100	121	100
<i>Overcurrent Delay</i>	100	122	100
<i>Excess Start Time</i>	100	123	100
<i>Restart Delay</i>	100	124	100
<i>Current Imbalance</i>	100	125	100
<i>Undercurrent</i>	100	126	100
<i>Overcurrent</i>	100	127	100
<i>Excess Start Time</i>	100	128	100
<i>Input A Trip</i>	100	129	100
<i>Input B Trip</i>	100	130	100
<i>Network Communications</i>	100	131	100

Object Name	Class	Instance	Attribute
<i>Location ID</i>	101	100	100
<i>Auto-Reset Count</i>	101	101	100
<i>Auto-Reset Delay</i>	101	102	100
<i>Pressure Sensor Type</i>	101	103	100
<i>Pressure Units</i>	101	104	100
<i>Pressure at 4 mA</i>	101	105	100
<i>Pressure at 20 mA</i>	101	106	100
<i>Flow Sensor Type</i>	101	107	100
<i>Flow Units</i>	101	108	100
<i>Flow at 4 mA</i>	101	109	100
<i>Flow at 20 mA</i>	101	110	100
<i>Units per Minute at Max Flow</i>	101	111	100
<i>Pulses per Minute at Max Flow</i>	101	112	100
<i>Units per Pulse</i>	101	113	100
<i>Depth Sensor Type</i>	101	114	100
<i>Depth Units</i>	101	115	100
<i>Depth at 4 mA</i>	101	116	100
<i>Depth at 20 mA</i>	101	117	100
<i>High Flow Trip Level</i>	101	118	100
<i>Low Flow Trip Level</i>	101	119	100
<i>Flow Start Delay</i>	101	120	100
<i>Flow Response Delay</i>	101	121	100
<i>High Pressure Trip Level</i>	101	122	100
<i>High Pressure Start Delay</i>	101	123	100
<i>High Pressure Response Delay</i>	101	124	100
<i>Low Pressure Trip Level</i>	101	125	100
<i>Low Pressure Start Delay</i>	101	126	100
<i>Low Pressure Response Delay</i>	101	127	100
<i>Pressure Control Mode</i>	101	128	100
<i>Start Pressure Level</i>	101	129	100
<i>Start Response Delay</i>	101	130	100

Object Name	Class	Instance	Attribute
<i>Remote Keypad Fault</i>	100	132	100
<i>Frequency</i>	100	133	100
<i>Motor Overtemperature</i>	100	134	100
<i>Motor Thermistor Circuit</i>	100	135	100
<i>Pressure Sensor</i>	100	136	100
<i>Flow Sensor</i>	100	137	100
<i>Depth Sensor</i>	100	138	100
<i>High Pressure</i>	100	139	100
<i>Low Pressure</i>	100	140	100
<i>High Flow</i>	100	141	100
<i>Low Flow</i>	100	142	100
<i>Flow Switch</i>	100	143	100
<i>Well Depth</i>	100	144	100
<i>RTD/PT100 B</i>	100	145	100
<i>Input A Function</i>	100	146	100
<i>Input A Trip</i>	100	147	100
<i>Input A Trip Delay</i>	100	148	100
<i>Input A Initial Delay</i>	100	149	100
<i>Input B Function</i>	100	150	100
<i>Input B Trip</i>	100	151	100
<i>Input B Trip Delay</i>	100	152	100
<i>Input B Initial Delay</i>	100	153	100
<i>Reset/Enable Logic</i>	100	154	100
<i>Input A Name</i>	100	155	100
<i>Input B Name</i>	100	156	100
<i>Relay A Function</i>	100	157	100
<i>Relay A On Delay</i>	100	158	100
<i>Relay A Off Delay</i>	100	159	100
<i>Relay B Function</i>	100	160	100
<i>Relay B On Delay</i>	100	161	100
<i>Relay B Off Delay</i>	100	162	100
<i>Low Current Flag</i>	100	163	100
<i>High Current Flag</i>	100	164	100
<i>Motor Temperature Flag</i>	100	165	100
<i>Main Contactor Time</i>	100	166	100
<i>Analog Output A</i>	100	167	100
<i>Analog A Scale</i>	100	168	100

Object Name	Class	Instance	Attribute
<i>Stop Pressure Level</i>	101	131	100
<i>Stop Response Delay</i>	101	132	100
<i>Depth Trip Level</i>	101	133	100
<i>Depth Reset Level</i>	101	134	100
<i>Depth Start Delay</i>	101	135	100
<i>Depth Response Delay</i>	101	136	100
<i>Temperature Sensor Type</i>	101	137	100
<i>Temperature Trip Level</i>	101	138	100
<i>Tracking Gain</i>	101	139	100
<i>Pedestal Detect</i>	101	140	100
<i>Bypass Contactor Delay</i>	101	141	100
<i>Model Rating</i>	101	142	100
<i>Screen Timeout</i>	101	143	100

Object Name	Class	Instance	Attribute
<i>Analog A Maximum Adjustment</i>	100	169	100
<i>Analog A Minimum Adjustment</i>	100	170	100
<i>Language</i>	100	171	100
<i>Temperature Scale</i>	100	172	100
<i>Graph Timebase</i>	100	173	100
<i>Graph Maximum Adjustment</i>	100	174	100
<i>Graph Minimum Adjustment</i>	100	175	100
<i>Current Calibration</i>	100	176	100
<i>Adjustment Lock</i>	100	177	100
<i>User Parameter 1</i>	100	178	100
<i>User Parameter 2</i>	100	179	100
<i>Modbus Address</i>	100	180	100
<i>Modbus Baud Rate</i>	100	181	100
<i>Modbus Parity</i>	100	182	100
<i>Modbus Timeout</i>	100	183	100
<i>Devicenet Address</i>	100	184	100
<i>Devicenet Baud Rate</i>	100	185	100
<i>Profibus Address</i>	100	186	100
<i>Gateway Address</i>	100	187	100
<i>Gateway Address 2</i>	100	188	100
<i>Gateway Address 3</i>	100	189	100
<i>Gateway Address 4</i>	100	190	100
<i>IP Address</i>	100	191	100
<i>IP Address 2</i>	100	192	100
<i>IP Address 3</i>	100	193	100
<i>IP Address 4</i>	100	194	100
<i>Subnet Mask</i>	100	195	100
<i>Subnet Mask 2</i>	100	196	100
<i>Subnet Mask 3</i>	100	197	100
<i>Subnet Mask 4</i>	100	198	100
<i>DHCP</i>	100	199	100

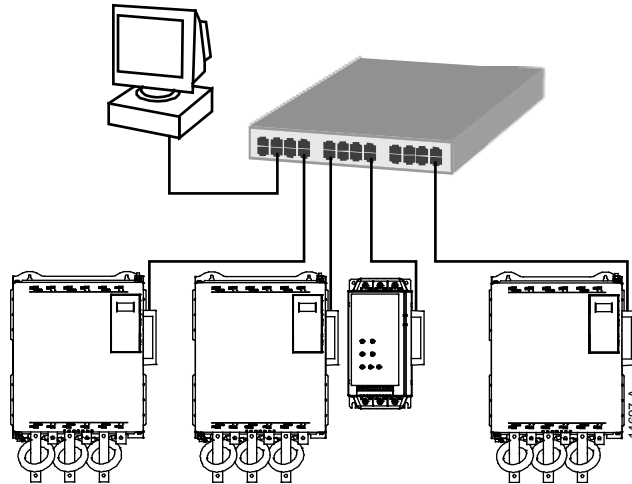
Object Name	Class	Instance	Attribute
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6 Network Design

The Ethernet/IP Card supports star, line and ring topologies.

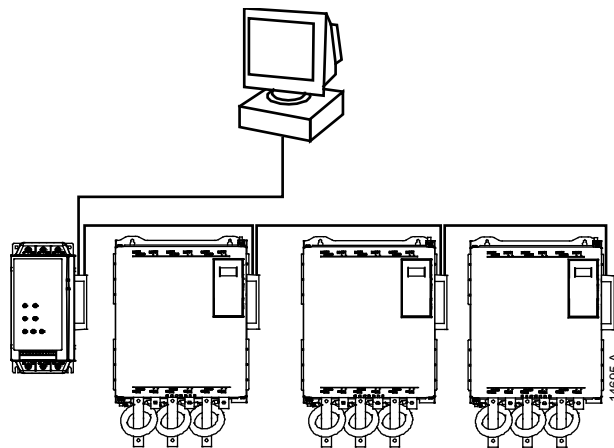
6.1 Star Topology

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



6.2 Line Topology

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



NOTE

The Ethernet/IP Card has an integrated switch to allow data to pass through in line topology. The Ethernet/IP Card 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.



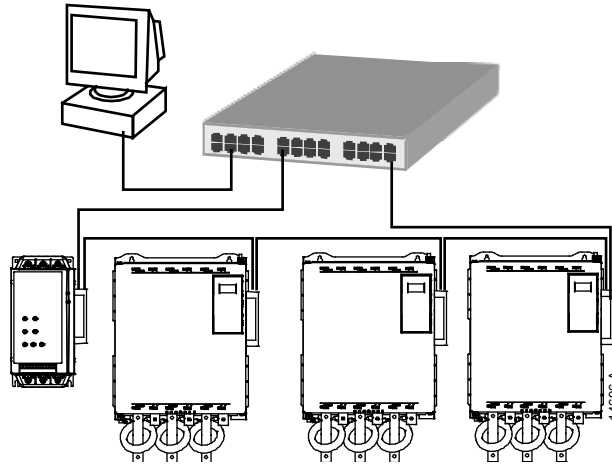
NOTE

Each connection adds a delay to communication with the next module. The maximum number of devices in a line network is 32. Exceeding this number may reduce the reliability of the network.

6.3 Ring Topology

In a ring topology network, the controller connects to the first Ethernet/IP Card, via a network switch. The second Ethernet port of the Ethernet/IP 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 Ethernet/IP Card supports beacon based ring node configuration.

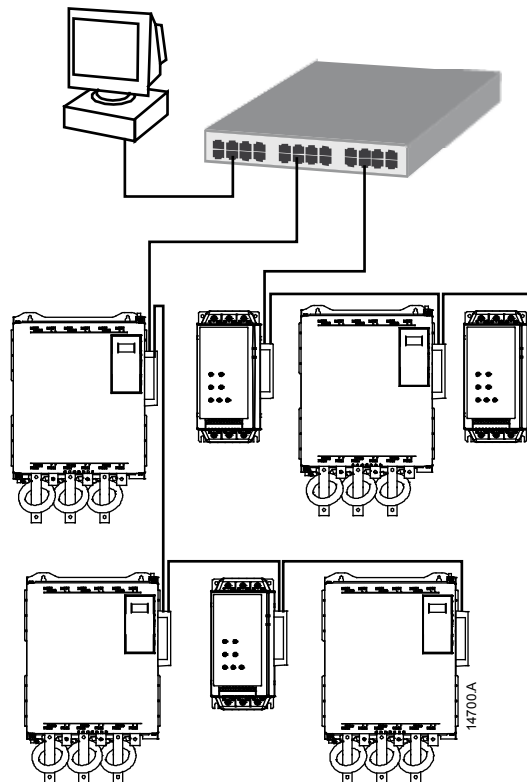


NOTE

The network switch must support loss of line detection.

6.4 Combined Topologies

A single network can include both star and line components.



7 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™ <small>conformance tested</small>



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