

RIGHT FROM
THE START



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Product Compatibility

The Modbus TCP Interface is compatible with the following AuCom soft starters:

- CSX – 24 VAC/VDC and 110/240 VAC control voltage.
The Modbus TCP Interface is not suitable for use with CSX starters using 380/440 VAC control voltage.
- EMX3 – all models.
- MV – all models.

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 completely from mains voltage before attaching or removing accessories.



WARNING

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

2. Important User Information

2.1 Safety

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

Close attention is required to the electrical installation and the system design to avoid hazards either in normal operation or in the event of equipment malfunction. System design, installation, commissioning and maintenance must be carried out by personnel who have the necessary training and experience. They must read this safety information and this guide carefully.

2.2 Product Design

The Modbus TCP Interface 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.

3. Installation

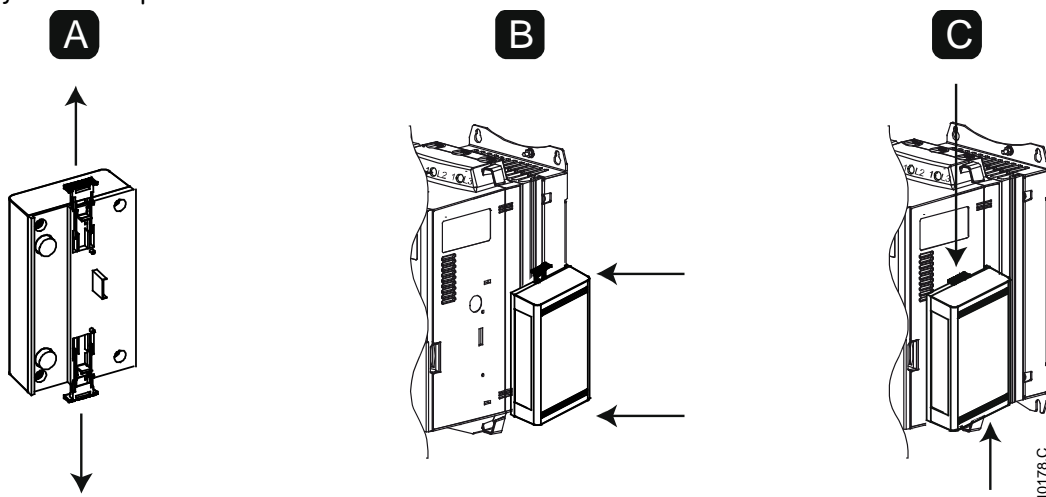


CAUTION

Remove mains and control voltage from the soft starter before attaching or removing accessories. Failure to do so may damage the equipment.

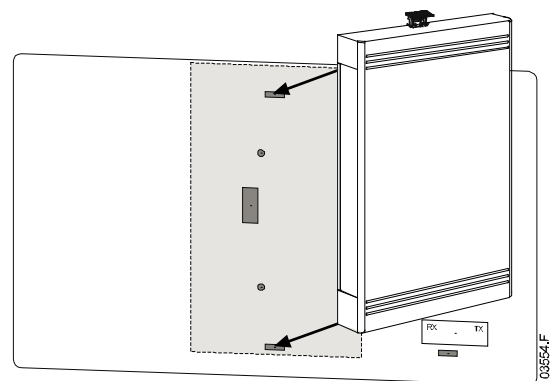
3.1 Installation Procedure

1. Remove control power and mains supply from the soft starter.
2. Fully pull out the top and bottom retaining clips on the interface. [A]
3. Line up the interface with the comms port slot. [B]
4. Push in the top and bottom retaining clips to secure the interface to the starter. [C]
5. Connect Ethernet Port 1 or Port 2 on the Modbus TCP Interface to the network.
6. Apply control power to the soft starter.



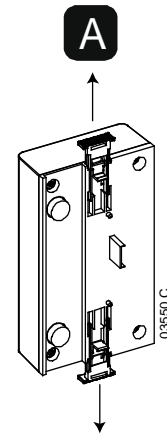
MV:

Plug the interface onto the back of the controller.



To remove the interface:

1. Remove control power and mains supply from the soft starter.
2. Disconnect all external wiring from the interface.
3. Fully pull out the top and bottom retaining clips on the interface. [A]
4. Pull the interface away from the soft starter.



3.2 Soft Starter Connection

The device is powered from the soft starter.

CSX: For the Modbus TCP Interface to accept fieldbus commands, a link must be fitted across terminals A1-02 on the soft starter.

The Modbus TCP Interface is not suitable for use with CSX starters using 380/440 VAC control voltage.

EMX3 and MV: Input links are required across the stop and reset inputs if the soft starter is being operated in Remote mode. In Local mode, links are not required.



NOTE

EMX3 and MV: Control via the fieldbus communication network is always enabled in local control mode, and can be enabled or disabled in remote control mode (parameter *6R Comms in Remote*). Refer to the soft starter user manual for parameter details.

| CSX | | EMX3 or MV | |
|-----|------------------------------------|------------|---|
| | | | |
| 1 | Soft starter A1, 02: Stop input | 1 | Soft starter (remote mode) C31, C32: Stop input C41, C42: Reset input |
| 2 | Modbus TCP Interface | 2 | Modbus TCP Interface |
| 3 | RJ45 Ethernet ports | 3 | RJ45 Ethernet ports |

3.3 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°.

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.

- 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.

4. 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.

4.1 Overview

The Modbus TCP Interface is configured with a static IP address as default. To avoid IP address conflicts and to ensure successful deployment, we recommend that the device is connected directly to a PC or laptop to configure the IP address, before connecting to the network.

4.2 Configuration Methods

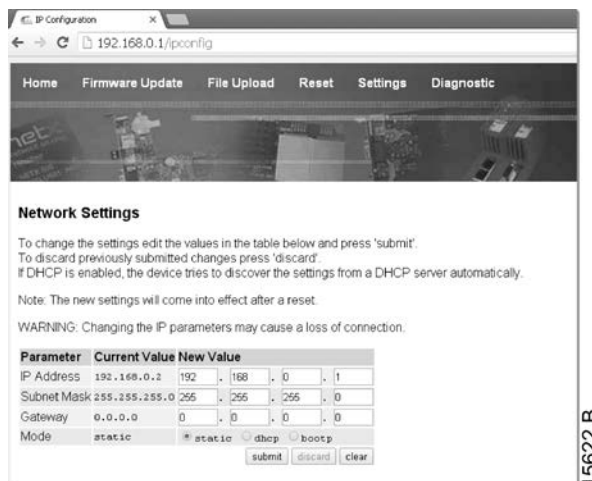
- Ethernet attributes can be configured directly in the device using the on-board web server. The default address for a new Modbus TCP Interface is 192.168.0.1. The default subnet mask is 255.255.255.0. The web server will only accept connections from within the same subnet domain.
Changes made via the on-board web server are stored permanently in the device.
- If the subnet domain of the device 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.

4.3 On-board Web Server

To configure settings using the on-board web server, the module must be installed on a soft starter, control power must be available, and the device and computer must be connected to each other or to the same Ethernet network.

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

1. Start a browser on the PC and enter the device address, followed by /ipconfig. The default address for a new Modbus TCP Interface is 192.168.0.1.



2. Edit the settings as required. Click "Submit" to save the new settings. To store the settings permanently in the device, tick "Static".
3. If prompted to enter a username and password:
 username: admin
 password: admin



NOTE

If you change the IP address and lose your record of it, use the Ethernet Device Configuration Tool to scan the network and identify the interface.



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.

4.4 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.

To configure settings using the Ethernet Device Configuration Tool, the device must be installed in a soft starter, control power must be available, and the device and PC must both be connected to the Ethernet network.

The Ethernet Device Configuration Tool can be downloaded from www.aucom.com.

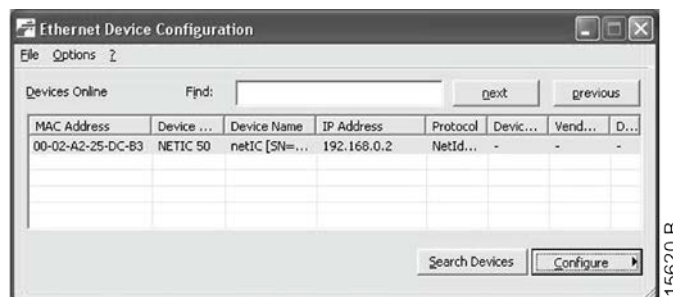


NOTE

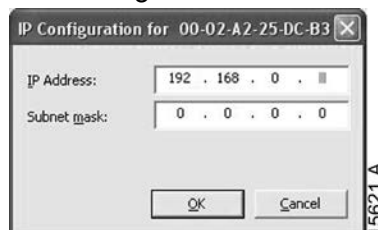
If your PC has a firewall enabled, you must add the tool to the list of authorised programs.

To configure 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.



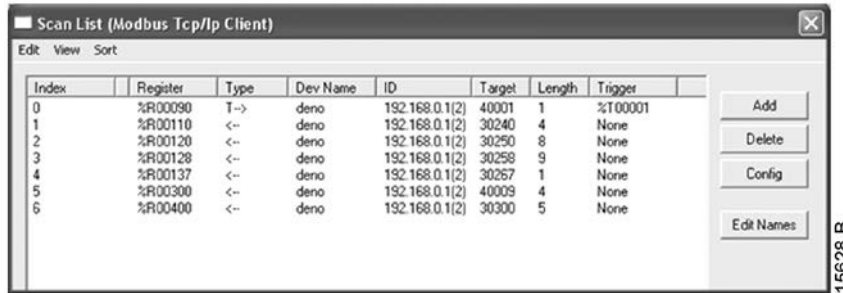
3. To set a static IP address, click Configure then select Set IP address.



5. PLC Configuration

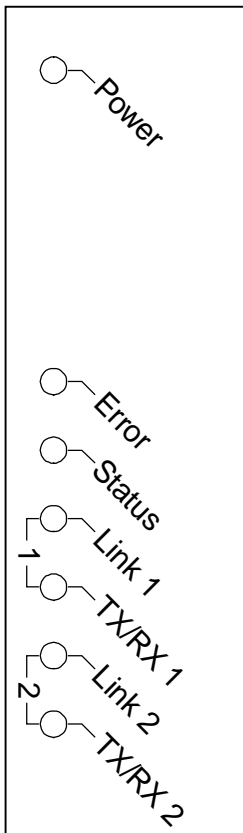
The PLC must be configured to map registers within the interface to addresses within the PLC.

Example mapping of PLC registers to registers within the Modbus TCP Interface (Target):



The device must be configured directly in the PLC. No additional files are required.

6. Feedback LEDs



14702.B

| LED name | LED Status | Description |
|----------|------------|---|
| Power | Off | Device is not powered up. |
| | On | Device is receiving power. |
| Error | Off | No error. |
| | Flashing | System error. |
| | On | Communication error. |
| Status | Off | Not ready. |
| | Slow flash | Ready but not configured. |
| | Fast flash | Configured and waiting for communication. |
| Link x | On | Communication has been established. |
| | Off | No network connection. |
| TX/RX x | On | Connected to a network. |
| | Flashing | Establishing connection. |
| | On | Operating normally. |

7. Operation

The Modbus TCP Interface must be controlled by a Modbus client (such as a PLC) which complies with the Modbus Protocol Specification. For successful operation, the client must also support all functions and interfaces described in this document.

7.1 Device Classification

The Modbus TCP Interface is a Modbus server and must be managed by a Modbus client over Ethernet.

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. The device will not transfer successive duplicate commands to the soft starter.

- If the soft starter is started via fieldbus communications but stopped via the keypad or a remote input, an identical start command cannot be used to restart the starter.
- If the soft starter may also be controlled via the keypad or the remote inputs (as well as via fieldbus communications), a control command should be immediately followed by a status query to confirm the command has been actioned.

8. Modbus Registers



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.



NOTE

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

8.1 Compatibility

The Modbus TCP Interface supports two modes of operation.

- In Standard Mode, the interface uses registers defined in the Modbus Protocol Specification.
- In Legacy Mode, the interface uses the same registers as AuCom's Modbus Interface. Some registers differ from those specified in the Modbus Protocol Specification.

The mode of operation is determined by the values of bit 15 in register 40001.

- Standard Mode: set Bit 15 = 1. Bits 0~7 of register 40001 are used for command.
- Legacy Mode: set Bit 15 = 0. The remaining bits of register 40001 are reserved.

Examples

10000000 00000001 = start the motor (Standard Mode).

10000000 00000000 = stop the motor (Standard Mode).

00000000 xxxxxxxx = switch to Legacy Mode. The interface will ignore the remaining bits in register 40001 and will check the value in register 40002.

8.2 Parameter Management

Parameters can be read from and written to the starter. When writing parameters to the soft starter, every parameter will be updated to match the values in the PLC.



CAUTION

Do not change the default values of the Factory parameters (parameter group 20). Changing these values may cause unpredictable behaviour in the soft starter.

8.3 Standard Mode

Command and Configuration Registers (Read/Write)

| Register | Description | Bits | Details |
|--------------------|--|---------|--|
| 40001 | Command (single write) | 0 to 7 | To send a command to the starter, write the required value: 00000000 = Stop 00000001 = Start 00000010 = Reset 00000100 = Quick stop (coast to stop) 00001000 = Forced communication trip 00010000 = Start using Parameter Set 1 ¹ 00100000 = Start using Parameter Set 2 ¹ 01000000 = Local control 10000000 = Remote control |
| | | 8 to 14 | <i>Reserved</i> |
| | | 15 | Must = 1 |
| 40002 | <i>Reserved</i> | | |
| 40003 | <i>Reserved</i> | | |
| 40004 | <i>Reserved</i> | | |
| 40005 | <i>Reserved</i> | | |
| 40006 | <i>Reserved</i> | | |
| 40007 | <i>Reserved</i> | | |
| 40008 | <i>Reserved</i> | | |
| 40009 ² | Parameter management (single/multiple read or multiple write) | 0 to 15 | Manage soft starter programmable parameters |

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

² Refer to the relevant soft starter literature for a complete parameter list. The first product parameter is always allocated to register 40009. The last product parameter is allocated to register 40XXX, where XXX = 008 plus total number of available parameters in the product. The Modbus TCP protocol limits read/write operations to a maximum of 123 registers at one time. The registers must be consecutive. These registers support multiple write (Modbus function code 16). Attempting to write to a single register will return an error code 01 (Illegal function code).

Status Reporting Registers (Read Only)



NOTE

For models EMX3-0053B and smaller, current reported via communications is 10 times greater than the actual value (displayed on the keypad).

| Register | Description | Bits | Details | | |
|---------------|-------------------|---------|--|-----------------|--|
| 30240 | Starter state | 0 to 3 | 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 | | |
| | | 4 | 1 = Positive phase sequence (only valid if bit 6 = 1) | | |
| | | 5 | 1 = Current exceeds FLC | | |
| | | 6 | 0 = Uninitialised 1 = Initialised | | |
| | | 7 to 15 | <i>Reserved</i> | | |
| | | 30241 | Trip code | 0 to 7 | Refer to <i>Trip Codes</i> on page 19. |
| | | 8 to 15 | | <i>Reserved</i> | |
| 30242 | Motor current | 0 to 7 | Average 3-phase motor current (A) | | |
| | | 8 to 15 | <i>Reserved</i> | | |
| 30243 | Motor temperature | 0 to 7 | Motor 1 thermal model (%) | | |
| | | 8 to 15 | <i>Reserved</i> | | |
| 30244 ~ 30249 | <i>Reserved</i> | | | | |
| 30250 | Version | 0 to 5 | <i>Reserved</i> | | |
| | | 6 to 8 | Product parameter list version | | |
| | | 9 to 15 | Product type code: 4 = CSX 6 = EMX3 11 = MV | | |
| 30251 | Model number | 0 to 7 | <i>Reserved</i> | | |
| | | 8 to 15 | Soft starter model ID | | |
| 30252 | <i>Reserved</i> | | | | |
| 30253 | <i>Reserved</i> | | | | |

| Register | Description | Bits | Details | | |
|----------|-------------------|----------|--|----------|---|
| 30254 | Starter state | 0 to 4 | 0 = <i>Reserved</i> 1 = Ready 2 = Starting 3 = Running 4 = Stopping 5 = Not ready (restart delay, restart temperature check, run simulation) 6 = Tripped 7 = Programming mode 8 = Jog forward 9 = Jog reverse | | |
| | | 5 | 1 = Warning | | |
| | | 6 | 0 = Uninitialised 1 = Initialised | | |
| | | 7 | 0 = Local control 1 = Remote control | | |
| | | 8 | <i>Reserved</i> | | |
| | | 9 | 0 = Negative phase sequence 1 = Positive phase sequence | | |
| | | 10 to 15 | Refer to <i>Trip Codes</i> on page 19. | | |
| | | 30255 | Current | 0 to 13 | Average rms current across all three phases |
| | | | | 14 to 15 | <i>Reserved</i> |
| | | 30256 | Current | 0 to 9 | Current (% motor FLC) |
| 10 to 15 | <i>Reserved</i> | | | | |
| 30257 | Motor temperature | 0 to 7 | Motor 1 thermal model (%) | | |
| | | 8 to 15 | Motor 2 thermal model (%) | | |
| 30258 | Power | 0 to 11 | Power | | |
| | | 12 to 13 | 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 | | |
| | | 14 to 15 | <i>Reserved</i> | | |
| | | 30259 | % Power factor | 0 to 7 | 100% = power factor of 1 |
| | | 8 to 15 | <i>Reserved</i> | | |
| 30260 | Voltage | 0 to 13 | Average rms voltage across all three phases (medium voltage products only) | | |
| | | 14 to 15 | <i>Reserved</i> | | |
| 30261 | Current | 0 to 13 | Phase 1 current (rms) | | |
| | | 14 to 15 | <i>Reserved</i> | | |

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| Register | Description | Bits | Details |
|-----------------|----------------------------------|----------|---|
| 30262 | Current | 0 to 13 | Phase 2 current (rms) |
| | | 14 to 15 | <i>Reserved</i> |
| 30263 | Current | 0 to 13 | Phase 3 current (rms) |
| | | 14 to 15 | <i>Reserved</i> |
| 30264 | Voltage | 0 to 013 | Phase 1 voltage, rms (medium voltage products only) |
| | | 14 to 15 | <i>Reserved</i> |
| 30265 | Voltage | 0 to 13 | Phase 2 voltage, rms (medium voltage products only) |
| | | 14 to 15 | <i>Reserved</i> |
| 30266 | Voltage | 0 to 13 | Phase 3 voltage, rms (medium voltage products only) |
| | | 14 to 15 | <i>Reserved</i> |
| 30267 | Parameter list version number | 0 to 7 | Parameter list minor revision |
| | | 8 to 15 | Parameter list major version |
| 30268 | Digital input state | 0 to 15 | For all inputs, 0 = open, 1 = closed (shorted) 0 = Start 1 = Stop 2 = Reset 3 = Input A 4 = Input B 5 = Input C, if fitted 6 = Input D, if fitted 7 to 15 = <i>Reserved</i> |
| 30269~ 30281 | <i>Reserved</i> | | |

8.4 Legacy Mode

Registers



NOTE

For models EMX3-0053B and smaller, current reported via communications is 10 times greater than the actual value (displayed on the keypad).



NOTE

Legacy Mode reports read-only status information in registers 40003 onwards, to match the register definitions of the clip-on Modbus Module for use with older soft starters. Identical data is also available via registers 30003 onwards.

| Register | Description | Bits | Details | | |
|----------|--|---------|--|-----------------|--|
| 40001 | <i>Reserved</i> | 0 to 14 | <i>Reserved</i> | | |
| | | 15 | Must be zero | | |
| 40002 | Command (single write) | 0 to 2 | To send a command to the starter, write the required value: 1 = Start 2 = Stop 3 = Reset 4 = Quick stop (coast to stop) 5 = Forced communication trip 6 = Start using Parameter Set 1 7 = Start using Parameter Set 2 | | |
| | | | 3 to 15 | <i>Reserved</i> | |
| | | | 40003 | Starter state | 0 to 3 |
| 4 | 1 = Positive phase sequence (only valid if bit 6 = 1) | | | | |
| 5 | 1 = Current exceeds FLC | | | | |
| 6 | 0 = Uninitialised 1 = Initialised | | | | |
| 7 to 15 | <i>Reserved</i> | | | | |
| 40004 | Trip code | 0 to 7 | | | Refer to <i>Trip Codes</i> on page 19. |
| | | 8 to 15 | | | <i>Reserved</i> |

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| Register | Description | Bits | Details |
|-------------------------|--|----------|--|
| 40005 | Motor current | 0 to 7 | Average 3-phase motor current (A) |
| | | 8 to 15 | <i>Reserved</i> |
| 40006 | Motor temperature | 0 to 7 | Motor 1 thermal model (%) |
| | | 8 to 15 | <i>Reserved</i> |
| 40007 | <i>Reserved</i> | | |
| 40008 | <i>Reserved</i> | | |
| 40009 ¹ ~ | Parameter management (single/multiple read or multiple write) | 0 to 7 | Manage soft starter programmable parameters |
| 40200 | | 8 to 15 | <i>Reserved</i> |
| 40600 | Version | 0 to 5 | Binary protocol version |
| | | 6 to 8 | Parameter list version number |
| | | 9 to 15 | Product type code: 4 = CSX 6 = EMX3 11 = MV |
| 40601 | <i>Reserved</i> | | |
| 40602 | <i>Reserved</i> | | |
| 40603 | <i>Reserved</i> | | |
| 40604 | Starter state | 0 to 4 | 0 = <i>Reserved</i> 1 = Ready 2 = Starting 3 = Running 4 = Stopping 5 = Not ready (restart delay, restart temperature check, run simulation) 6 = Tripped 7 = Programming mode 8 = Jog forward 9 = Jog reverse |
| | | 5 | 1 = Warning |
| | | 6 | 0 = Uninitialised 1 = Initialised |
| | | 7 | Local/Remote 0 = Local control 1 = Remote control |
| | | 8 | <i>Reserved</i> |
| | | 9 | 0 = Negative phase sequence 1 = Positive phase sequence |
| | | 10 to 15 | <i>Reserved</i> |

| Register | Description | Bits | Details |
|----------|-------------------------------|----------|--|
| 40605 | Current | 0 to 13 | Average rms current across all three phases |
| | | 14 to 15 | <i>Reserved</i> |
| 40606 | Current | 0 to 9 | Current (% motor FLC) |
| | | 10 to 15 | <i>Reserved</i> |
| 40607 | Motor temperature | 0 to 7 | Motor 1 thermal model (%) |
| | | 8 to 15 | <i>Reserved</i> |
| 40608 | Power | 0 to 11 | Power |
| | | 12 to 13 | 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 |
| | | 14 to 15 | <i>Reserved</i> |
| | | | |
| 40609 | % Power factor | 0 to 7 | 100% = power factor of 1 |
| | | 8 to 15 | <i>Reserved</i> |
| 40610 | Voltage | 0 to 13 | Average rms voltage across all three phases (medium voltage products only) |
| | | 14 to 15 | <i>Reserved</i> |
| 40611 | Current | 0 to 13 | Phase 1 current (rms) |
| | | 14 to 15 | <i>Reserved</i> |
| 40612 | Current | 0 to 13 | Phase 2 current (rms) |
| | | 14 to 15 | <i>Reserved</i> |
| 40613 | Current | 0 to 13 | Phase 3 current (rms) |
| | | 14 to 15 | <i>Reserved</i> |
| 40614 | Voltage | 0 to 13 | Phase 1 voltage, rms (medium voltage products only) |
| | | 14 to 15 | <i>Reserved</i> |
| 40615 | Voltage | 0 to 13 | Phase 2 voltage, rms (medium voltage products only) |
| | | 14 to 15 | <i>Reserved</i> |
| 40616 | Voltage | 0 to 13 | Phase 3 voltage, rms (medium voltage products only) |
| | | 14 to 15 | <i>Reserved</i> |
| 40617 | Parameter list version number | 0 to 7 | Parameter list minor revision |
| | | 8 to 15 | Parameter list major version |

| Register | Description | Bits | Details |
|-----------------|---------------------|---------|---|
| 40618 | Digital input state | 0 to 15 | For all inputs, 0 = open, 1 = closed (shorted) 0 = Start 1 = Stop 2 = Reset 3 = Input A 4 = Input B 5 = Input C, if fitted 6 = Input D, if fitted 7 to 15 = <i>Reserved</i> |
| 40619~ 40631 | <i>Reserved</i> | | |

¹ Refer to the relevant soft starter literature for a complete parameter list. The first product parameter is always allocated to register 40009. The last product parameter is allocated to register 40XXX, where XXX = 008 plus total number of available parameters in the product. The Modbus TCP protocol limits read/write operations to a maximum of 123 registers at one time. The registers must be consecutive. These registers support multiple write (Modbus function code 16). Attempting to write to a single register will return an error code 01 (Illegal function code).

8.5 Trip Codes

| Trip Code | Description | CSX | CSX/i | EMX3 | MV |
|-----------------|--|-----|-------|------|----|
| 1 | Excess start time | | ● | ● | ● |
| 2 | Motor overload | | ● | ● | ● |
| 3 | Motor thermistor | | ● | ● | ● |
| 4 | Current imbalance | | ● | ● | ● |
| 5 | Frequency | ● | ● | ● | ● |
| 6 | Phase sequence | | ● | ● | ● |
| 7 | Instantaneous overcurrent | | | ● | ● |
| 8 | Power loss | ● | ● | ● | ● |
| 9 | Undercurrent | | | ● | ● |
| 10 | Heatsink (starter) overtemperature | | | ● | ● |
| 11 | Motor connection | | | ● | ● |
| 12 | Input A trip | | | ● | ● |
| 13 | FLC too high | | | ● | ● |
| 14 | Unsupported option (function not available in inside delta) | | | ● | |
| 15 | Starter communication (between device and soft starter) | ● | ● | ● | ● |
| 16 | Network communication (between device and network) | ● | ● | ● | ● |
| 17 | Internal fault x (where x is the fault code detailed in the table below) | | | ● | ● |
| 20 ¹ | Ground fault | | | ● | ● |
| 23 | Parameter out of range | | | ● | ● |
| 24 | Input B trip | | | ● | ● |
| 25 | Bypass fail (bypass contactor) | | | ● | ● |
| 26 | L1 phase loss | | | ● | ● |
| 27 | L2 phase loss | | | ● | ● |
| 28 | L3 phase loss | | | ● | ● |
| 29 | L1-T1 shorted | | | ● | ● |
| 30 | L2-T2 shorted | | | ● | ● |
| 31 | L3-T3 shorted | | | ● | ● |
| 32 | Motor 2 overload | | | ● | ● |
| 33 ² | Time-overcurrent (Bypass overload) | | ● | ● | |
| 34 | SCR overtemperature | | | | ● |
| 35 | Battery/clock | | | ● | ● |
| 36 | Thermistor circuit | | | ● | |
| 37 | RTD/PT100 A | | | ● | |
| 38 ¹ | RTD/PT100 B | | | ● | |

| Trip Code | Description | CSX | CSX <i>i</i> | EMX3 | MV |
|-----------------|-------------------|-----|--------------|------|----|
| 39 ¹ | RTD/PT100 C | | | ● | |
| 40 ¹ | RTD/PT100 D | | | ● | |
| 41 ¹ | RTD/PT100 E | | | ● | |
| 42 ¹ | RTD/PT100 F | | | ● | |
| 43 ¹ | RTD/PT100 G | | | ● | |
| 45 | RTD circuit fail | | | ● | |
| 46 | Analog input trip | | | ● | ● |

¹ Available with EMX3 only if the appropriate option card is fitted.

² For EMX3, time-overcurrent protection is only available on internally bypassed models.

Internal Fault X

The table below details the internal fault code associated with trip code 17.

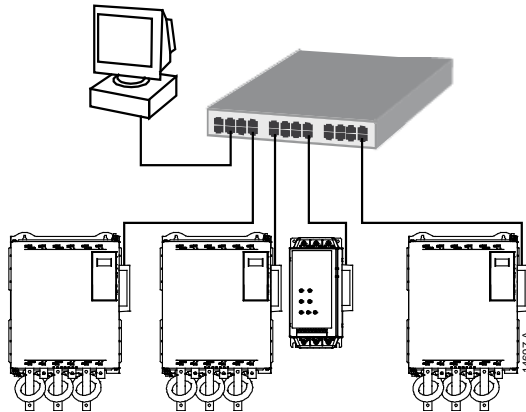
| Internal fault | Message displayed on the keypad |
|----------------|--|
| 70 ~ 72 | Current Read Err Lx |
| 73 | ATTENTION! Remove Mains Volts |
| 74 ~ 76 | Motor Connection Tx |
| 77 ~ 79 | Firing Fail Px |
| 80 ~ 82 | VZC Fail Px |
| 83 | Low Control Volts |
| 84 ~ 98 | Internal fault X Contact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

9. Network Design

The device supports star, line and ring topologies.

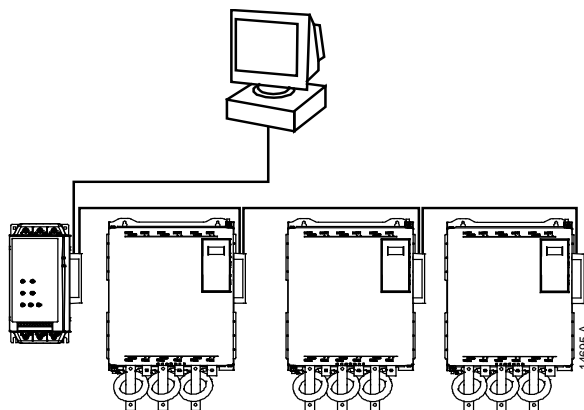
9.1 Star Topology

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



9.2 Line Topology

In a line network, the controller connects directly to one port of the first interface. The second Ethernet port connects to another interface, 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.



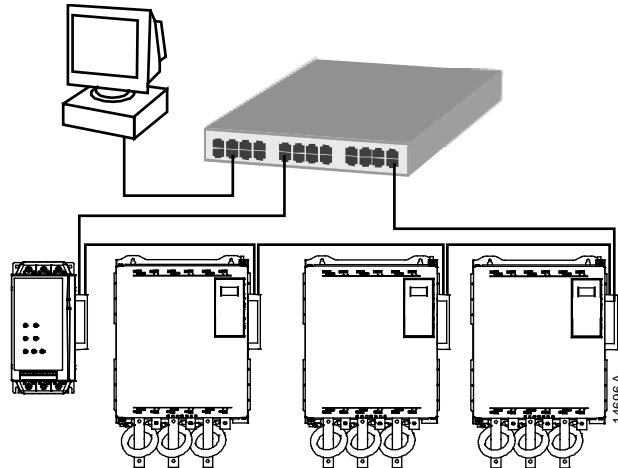
NOTE

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.

9.3 Ring Topology

In a ring topology network, the controller connects to the first interface, via a network switch. The second Ethernet port of the interface 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.

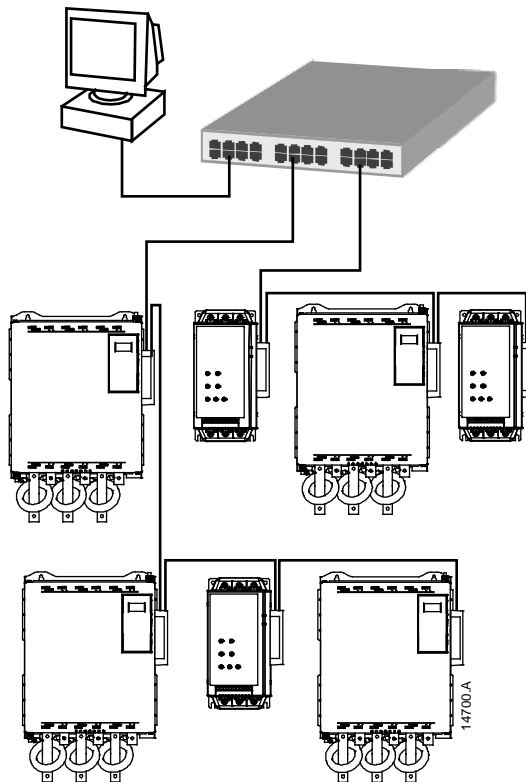


NOTE

The network switch must support loss of line detection.

9.4 Combined Topologies

A single network can include both star and line components.



10. Specifications

- **Enclosure**

Dimensions 40 mm (W) x 166 mm (H) x 90 mm (D)
 Weight 250 g
 Protection IP20

- **Mounting**

Spring-action plastic mounting clips (x 2)

- **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**

RCM IEC 60947-4-2
 CE EN 60947-4-2

