# 1 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 Installation

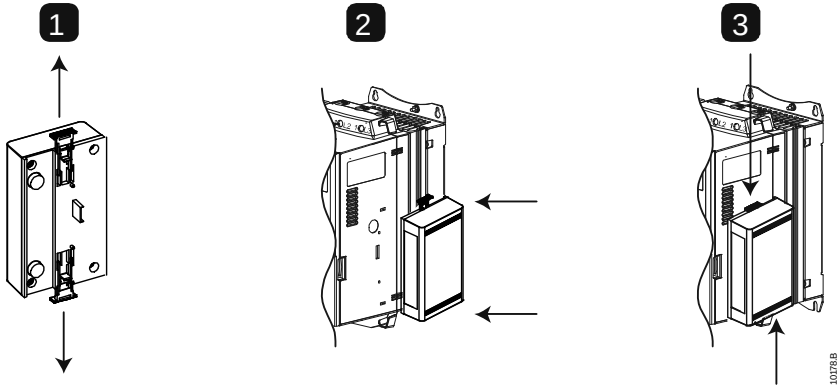
CAUTION
Remove mains and control voltage from the soft starter before attaching or removing accessories. Failure to do so may damage the equipment.

## Installation Procedure

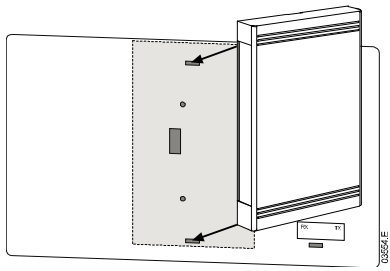
1. Remove control power and mains supply from the soft starter.
2. Attach the interface to the soft starter as illustrated.
3. Set the DeviceNet Interface Node Address (MAC ID) and Data Rate.
4. Apply control power to the soft starter.
5. Insert the network connector into the interface and power up the DeviceNet network.

## Physical installation

1. Fully pull out the top and bottom retaining clips on the interface.
2. Line up the interface with the comms port slot.
3. Push in the top and bottom retaining clips to secure the interface to the starter.




MVS and MVX:
Plug the interface onto the back of the controller.



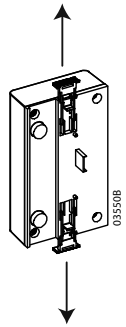
CAUTION

Network designs must decrease the maximum allowable cumulative dropline length by 400 mm for every interface installed on the network. Failure to do so may result in network communication errors and decreased reliability.

Example: ODVA specifies a maximum cumulative dropline length of 156 m on a network operating at 125 kb/s. If six interfaces were installed on this network, the total cumulative dropline length would need to be decreased to 153.6 m.

Remove the interface using the following procedure:

1. Take the interface off-line.
2. Remove the DeviceNet connector.
3. Remove control power and mains supply from the soft starter.
4. Fully pull out the top and bottom retaining clips on the interface.
5. Pull the interface away from the soft starter.




# 3 Configuration

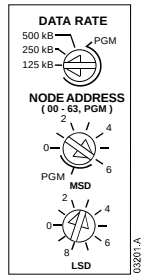
The DeviceNet Interface is a Group 2 slave device, using a predefined master/slave connection set. I/O data is produced and consumed using polled I/O messaging.

The soft starter must be added to the DeviceNet manager project using the EDS file and configuration/management software tool. This file is available from www.aucom.com. In order to operate successfully, the correct EDS file must be used. An on-screen graphics bitmap file (device.bmp) is also available.

# 4 Adjustment

Changes to the rotary switch settings take effect when the DeviceNet network is next powered up.

The factory default settings for the rotary adjustment switches are:

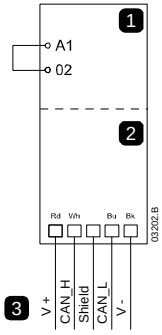
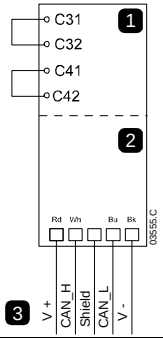



NOTE

The Data Rate and Node Address (MAC ID) must be set locally on the interface. These cannot be set using DeviceNet management software.

When the Data Rate and MSD Node Address (MAC ID) rotary switches are set on PGM position, the interface uses the previously used valid on-line Data Rate and Node Address (MAC ID).

# 5 Connections

| CSX | | EMX3 or MVS/MVX | |
|---|---|---|---|
|  | |  | |
| 1 | CSX | 1 | EMX3 or MVS/MVX (Remote mode)<br>C31, C32: Stop<br>C41, C42: Reset |
| 2 | DeviceNet Interface | 2 | DeviceNet Interface |
| 3 | Standard connection onto DeviceNet network | 3 | Standard connection onto DeviceNet network |

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

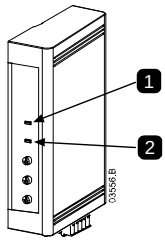
EMX3 and MVS/MVX: Input links are required across the stop and reset inputs if the soft starter is being operated in Remote mode. In Local mode, links are not required.

NOTE
EMX3 and MVS/MVX: Parameter *Comms in Remote* selects whether the soft starter will accept Start and Stop commands from the Serial Network Master while in Remote Mode. Refer to the soft starter user manual for parameter details.

# 6 LEDs

The Module LED indicates the condition of the power supply and interface operation.

The Network LED indicates status of the communication link between the DeviceNet Interface and the network Master.




| LED | State | Description |
|---|---|---|
| 1 (Module) | Off | Network power off |
| | Green | Normal operation |
| | Red | Unrecoverable fault |
| | Red/Green flashing | Self Test mode |
| 2 (Network) | Off | Duplicate MAC ID test has not been completed |
| | Green flashing | Online but no connection with Master |
| | Green | Online and allocated to a Master |
| | Red flashing | One or more timed out I/O connections |
| | Red | Failed communication between interface and Master |
| | Red/Green flashing | Communication faulted and received an Identity communication faulted request |

NOTE
When a communications failure occurs, the soft starter may trip if the Communication Timeout parameter for the network is set greater than zero. When communication is restored, the soft starter must be reset.

# 7 DeviceNet Polled I/O Structure

Once the EDS file has been loaded, the DeviceNet Interface must be added to the scanner list with parameters shown in the following table:

| Parameter | Value |
|---|---|
| I/O connection type | Polled |
| Poll receive size | 14 bytes |
| Poll transmit size | 2 bytes |

Once the soft starter, interface and Master have been set up, configured and powered up, the Master will transmit 2 bytes of data to the interface and receive 14 bytes of data from the interface.

Master > Slave polled I/O output data is as follows:

| Byte | Bit | Function |
|---|---|---|
| 0 | 0 | 0 = Stop command<br>1 = Start command |
| | 1 | 0 = Enable Start or Stop command<br>1 = Quick Stop (ie coast to stop) and disable Start command |
| | 2 | 0 = Enable Start or Stop command<br>1 = Reset command and disable Start command |
| | 3 to 7 | *Reserved* |
| 1 | 0 to 1 [1] | 0 = Use soft starter remote input to select motor set<br>1 = Use primary motor set when starting [2]<br>2 = Use secondary motor set when starting [2]<br>3 = *Reserved* |
| | 2 to 7 | *Reserved* |

[1] Only available on EMX3 and MVS/MVX soft starters.
[2] Ensure that the programmable input is not set to Motor Set Select before using this function.

Slave > Master polled I/O input data is as follows:

NOTE
Some soft starters do not support some functions.

| Byte | Bit | Function | Value |
|---|---|---|---|
| 0 | 0 | Trip | 1 = Tripped |
| | 1 | Warning | 1 = Warning |
| | 2 | Running | 0 = Unknown, not ready, ready to start or tripped<br>1 = Starting, running, stopping or jogging |
| | 3 | *Reserved* | |
| | 4 | Ready | 0 = Start or stop command not acceptable<br>1 = Start or stop command acceptable |
| | 5 | Control from Net | 1 = Always except in Program mode |
| | 6 | Local/remote | 0 = Local control<br>1 = Remote control |
| | 7 | At reference | 1 = Running (full voltage at the motor) |
| 1 | 0 to 7 | Status | 0 = Unknown (menu open)<br>2 = Starter not ready (restart delay, thermal delay or run simulation) |

| | | | |
|---|---|---|---|
| | | | 3 = Ready to start (including warning state)<br>4 = Starting or running<br>5 = Soft stopping<br>7 = Trip<br>8 = Jog forward<br>9 = Jog reverse |
| 2 | 0 to 7 | Trip/Warning code | Refer to trip code table |
| 3 | 0 | Initialised | 1 = Phase sequence bit is valid (bit 1) after 1st start |
| | 1 | Phase sequence | 1 = Positive phase sequence detected |
| | 2 to 7 | *Reserved* | |
| 4 [1] | 0 to 7 | Motor current (low byte) | Current (A) |
| 5 [1] | 0 to 7 | Motor current (high byte) | |
| 6 | 0 to 7 | Current %FLC (low byte) | Current as a percentage of soft starter FLC setting (%) |
| 7 | 0 to 7 | Current %FLC (high byte) | |
| 8 | 0 to 7 | % Motor 1 temperature | Motor 1 thermal model |
| 9 | 0 to 7 | % Motor 2 temperature | Motor 2 thermal model |
| 10 | 0 to 7 | % Power factor | Percentage power factor<br>(100 = power factor of 1) |
| 11 | 0 to 7 | Power (low byte) | Power low byte, scaled by power scale |
| 12 | 0 to 3 | Power (high nibble) | Power high nibble, scaled by power scale |
| | 4 to 5 | Power scale | 0 = Multiply power by 10 to get W<br>1 = Multiply power by 100 to get W<br>2 = Power (kW)<br>3 = Multiply power by 10 to get kW |
| | 6 to 7 | *Reserved* | |
| 13 | 0 to 7 | Digital input state | 0 = Start (0 = open, 1 = closed)<br>1 = Stop<br>2 = Reset<br>3 = Input A<br>4 = Input B<br>5 = Input C<br>6 = Input D<br>7 = not used |

[1] For models EMX3-0053B and smaller this value will be 10 times greater than the value displayed on the keypad.

# 8 Trip/Warning Codes

| Code | Trip Type | CSX | CSXi | EMX3 | MVS/ MVX |
|---|---|---|---|---|---|
| 0 | No trip | ● | ● | ● | ● |
| 11 | Input A trip/Auxiliary Trip A | | | ● | ● |
| 20 | Motor overload (thermal model) | | ● | ● | ● |
| 21 | Heatsink overtemperature | | | ● | ● |
| 23 | L1 phase loss | | | ● | ● |
| 24 | L2 phase loss | | | ● | ● |
| 25 | L3 phase loss | | | ● | ● |
| 26 | Current imbalance | | ● | ● | ● |
| 27[1] | Ground fault | | | ● | ● |
| 28 | Instantaneous overcurrent | | | ● | ● |
| 29 | Undercurrent | | | ● | ● |
| 50 | Power loss/Power circuit | ● | ● | ● | ● |
| 54 | Phase sequence | | ● | ● | ● |
| 55 | Frequency | ● | ● | ● | ● |
| 60 | Unsupported option (function not available in inside delta) | | | ● | ● |
| 61 | FLC too high/FLC out of range | | | ● | ● |
| 62 | Parameter out of Range | | | ● | ● |
| 70 | Miscellaneous | | | ● | ● |
| 75 | Motor thermistor | | ● | ● | ● |
| 101 | Excess start time | | ● | ● | ● |
| 102 | Motor connection | | | ● | ● |
| 104 | Internal fault x (where x is the fault code detailed in the table below). | | | ● | ● |
| 105 | Bypass fail (bypass contactor) | | | ● | ● |
| 110 | Input B trip/Auxiliary Trip B | | | ● | ● |
| 113 | Starter communication (between interface and soft starter) | ● | ● | ● | ● |
| 114 | Network communication (between interface and network) | ● | ● | ● | ● |
| 115 | L1-T1 shorted | | | ● | ● |
| 116 | L2-T2 shorted | | | ● | ● |
| 117 | L3-T3 shorted | | | ● | ● |
| 118 | Motor 2 overload (thermal model) | | | ● | ● |
| 119[2] | Time-overcurrent (Bypass overload) | | ● | ● | |
| 120 | SCR overtemperature | | | | ● |
| 121 | Battery/clock | | | ● | ● |
| 122 | Thermistor circuit | | | ● | |
| 123 | RTD A overtemperature | | | ● | |
| 124[1] | RTD B overtemperature | | | ● | |
| 125[1] | RTD C overtemperature | | | ● | |
| 126[1] | RTD D overtemperature | | | ● | |
| 127[1] | RTD E overtemperature | | | ● | |
| 128[1] | RTD F overtemperature | | | ● | |

| | | | | | |
|---|---|---|---|---|---|
| 129[1] | RTD G overtemperature | | | ● | |
| 131 | RTD circuit fail | | | ● | |
| 132 | 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 104.

| Internal fault | Message displayed on the keypad |
|---|---|
| 70 ~ 72 | Current Read Err Lx |
| 73 | Power On in Simulation mode |
| 74 ~ 76 | Motor connection Tx |
| 77 ~ 79 | Firing fail SCRx |
| 80 ~ 82 | VZC Fail Px |
| 83 | Low Control Volts |
| 84 ~ 98 | Internal fault X<br>Contact your local supplier with the fault code (X). |

# 9 Parameter Object

The DeviceNet Interface supports parameter objects through explicit messaging. Soft starter parameters can be uploaded (written) and downloaded (read) using DeviceNet management software. When the DeviceNet Interface is powered up, it automatically obtains parameter information from the soft starter.

| Detail | Value (Hex) | Comment |
|---|---|---|
| Class | 0F | Parameter object address |
| Instance | 1 ~ xxx | xxx = maximum soft starter parameter number |
| Attribute ID | 01 | Always 0x01 |
| Get Service | 0E | Read single soft starter parameter value |
| Set Service | 10 | Write single soft starter parameter value |

NOTE
Only available on EMX3 and MVS/MVX soft starters. For parameter details, refer to the soft starter User Manual.

# 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
Network ..... 5-way male and unpluggable female connector (supplied)
Maximum cable size ..... 2.5 mm2
Contacts ..... Gold flash

**Settings**

Node address (MAC ID)
- Setting ..... Rotary switches
- Range ..... 0 to 63 (63, factory default)

Data rate
- Setting ..... Rotary switch
- Options ..... 125 kB, 250 kB, 500 kB (125 kB, factory default)

**Power**

Consumption
- steady state ..... 19 mA at 25 VDC
  ..... 31 mA at 11 VDC
- in-rush (at 24 VDC) ..... 1.8 A maximum for 2 ms

Galvanically isolated

**Certification**

CE ..... IEC 60947-4-2
C✓ ..... IEC 60947-4-2
ODVA ..... DeviceNet Conformance Tested ®


710-02872-00K