

SE-330 SERIES (NEW REVISION) DEVICENET INTERFACE

Revision 0-B-071514



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1. GENERAL

This document describes the DeviceNet features supported by the new revision SE-330, SE-330AU, and SE-330HV. Unless otherwise indicated, “SE-330” refers to all three monitor series in general. The SE-330 supports Explicit and Polled I/O messaging as part of the master/slave connection set defined by the ODVA DeviceNet Specification.

There are some operational differences between the new revision SE-330 DeviceNet interface and the previous revision SE-330 DeviceNet interface that require registering a new EDS file. The operational differences are as follows:

- Baud rate and MAC ID are now set using SE-MON330 (version 3.2 or later) or through the DeviceNet network
- Only one Input and one Output assembly is supported
- Assembly Class 4, Instance 100 (Input) is identical except for additional status bits to support new features
- Assembly Class 4, Instances 101 and 102 are no longer supported
- Assembly Class 4, Instance 150 (Output) is identical except the “Clear Event Records” bit has been removed and the “Remote Calibration” bit was added
- Bit Strobe and Change-of-State (COS) connections are no longer supported

No PLC-Scanner mapping changes are required if Assembly Class 4, Instance 100, or Assembly Class 4 Instance 150 were previously selected.

2. DEVICENET CONFIGURATION

2.1 DEVICENET CONNECTIONS

TABLE 1. SE-330 DEVICENET CONNECTIONS

TERMINAL	DESCRIPTION
1	V -
2	CAN_L
3	SHIELD/DRAIN
4	CAN_H
5	V +

2.2 CONFIGURATION SETTINGS

The baud rate and MAC ID are set using SE-MON330 configuration software through the front-panel USB interface or the DeviceNet network. To download SE-MON330, visit www.littelfuse.com/se-330. Settings are stored in non-volatile memory.

The SE-330 supports 125, 250, and 500 Kbit/s (SE-MON330 settings 0, 1, and 2 respectively).

The MAC ID is adjustable from 0 to 63.

NOTE: Setting the baud rate or MAC ID using the front-panel USB interface will re-initialize the DeviceNet driver with the new settings.

2.3 LED INDICATION

The module contains two LED indicators.

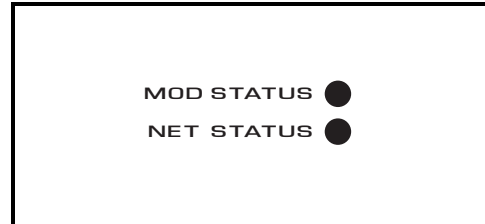


FIGURE 1. LED Indicators.

TABLE 2. MODULE STATUS

MODULE STATUS LED	DESCRIPTION
Off	No Power
Steady Red	Unrecoverable Fault
Steady Green	Device Operational
Flashing Red	Minor Fault

TABLE 3. NETWORK STATUS

NET STATUS LED	DESCRIPTION
Off	Not Powered/Not On Line
Steady Green	Link OK/On line/Connected
Steady Red	Link Failure
Flashing Green	On Line/Not Connected
Flashing Red	Connection Timed Out

2.4 TERMINATION

DeviceNet requires a 120 Ω resistor at each end of the network.

2.5 POWER CONSUMPTION

The DeviceNet module requires 30 mA from the 24 Vdc supply to power the driver circuits.

2.6 EDS FILE

The EDS file is an Electronic Datasheet file that defines the characteristics of the SE-330. It is used by configuration software such as RSNetWorx to setup the SE-330 on the network and allows DeviceNet scanners to map SE-330 I/O Data to PLC/PAC memory.

Only one I/O Polling assembly is supported, consisting of one byte for output and nine bytes for input. See Section 3.2.

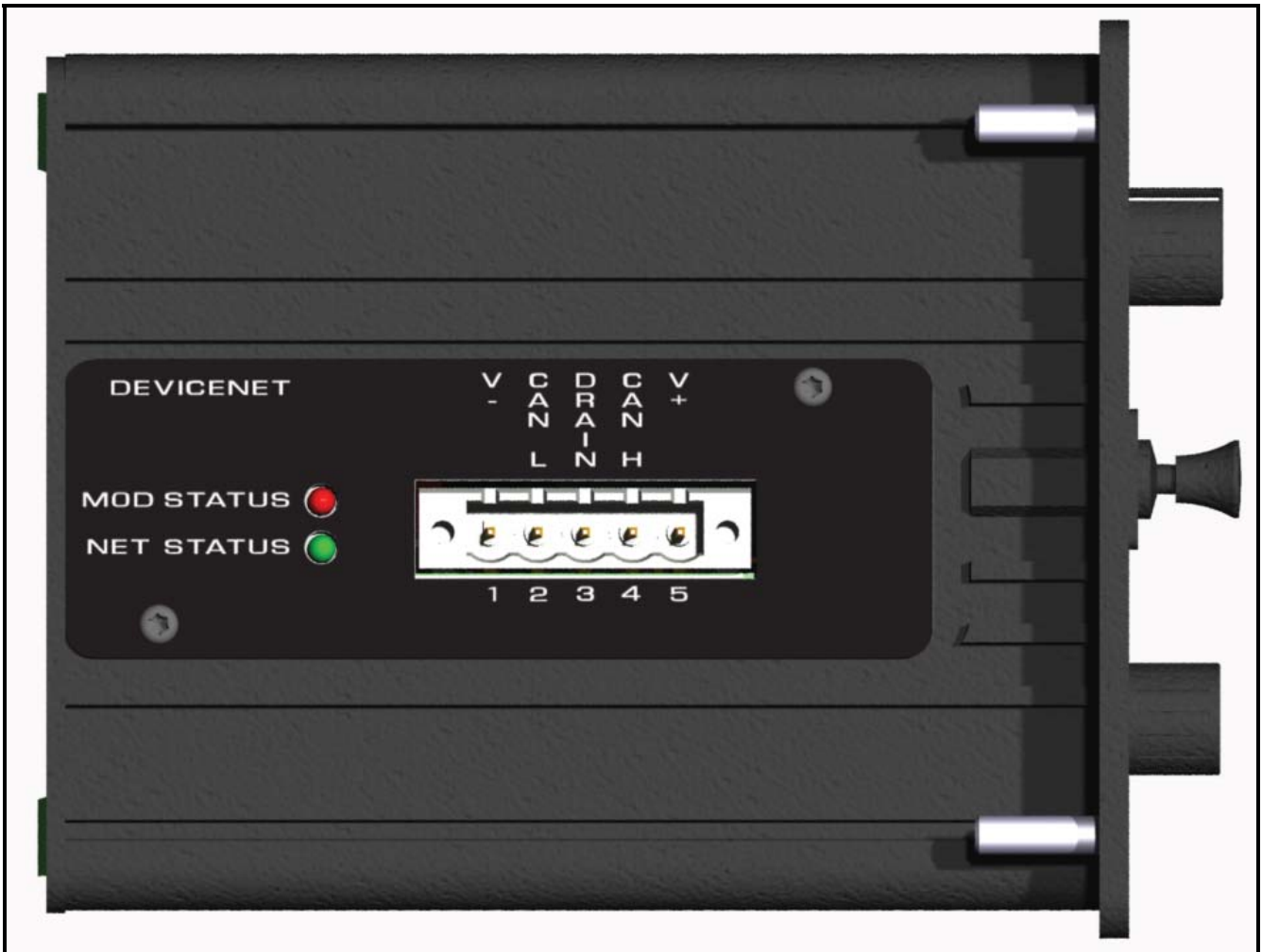


FIGURE 2. Top View of SE-330 (SE-330-X1-XX) with DeviceNet Communications.

3. DEVICENET OBJECTS (In Order of Class Number)

The module supports the following objects:

TABLE 4. CLASS OBJECTS

CLASS	ATTRIBUTE
0x01	Identity
0x02	Message Router
0x03	DeviceNet
0x04	Assembly
0x05	Connection

Only the Identity and Assembly objects are discussed in detail in this manual. See Sections 3.1 and 3.2.

3.1 IDENTITY OBJECT

The Identity object is used by configuration software to match the EDS file to the device (SE-330). If the configuration does not match, an error is generated in the configuration software.

Identity Object Class Services

Get_Attribute_Single: Returns contents of specified attribute.

Identity Class 1, Instance 0 Attributes

ATTRIBUTE NUMBER	ATTRIBUTE NAME	SERVICES	DESCRIPTION	DEFAULT, MINIMUM, MAXIMUM	DATA TYPE
1	Revision	Get	Revision of this object.	1	UINT
2	Max Instance	Get	Maximum number of instances.	1	UINT

Identity Object Instance Services

Get_Attribute_Single: Returns contents of specified attribute.

Set_Attribute_Single: Modify the specified attribute.

Reset: Performs reset services based on the parameter.

In addition to the Get_Attribute_Single service, the Identity Object supports the Reset service. Reset service with parameter 0 results in a driver reset with the existing MAC ID and baud rate. Reset service with parameter 1 will restart the driver with MAC ID = 63 and baud rate of 125 kbit/s.

3.2 ASSEMBLY OBJECT

3.2.1 ASSEMBLY CLASS OBJECT

Assembly Class (4), Instance (0) Attributes

ATTRIBUTE NUMBER	ATTRIBUTE NAME	SERVICES	DESCRIPTION	DEFAULT, MINIMUM, MAXIMUM	DATA TYPE
1 0x01	Revision	Get_Attribute_Single	Revision of this object.	1, 1, 1	UINT

3.2.2 ASSEMBLY INSTANCE OBJECTS

3.2.2.1 INPUT ASSEMBLY

This assembly is read from the SE-330.

Assembly Class (4), Instance (100), Attribute (3) – Input 1 (9 Bytes)

BYTE	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
1	Hardware Trip	Upgrade Error	SD Card Error	NER/NGR Volts Detect	CT Fault Trip	CT Fault Detect	RF Detect	EF/GF Detect
2	EF/GF Trip Time Selector (Position 0 to 10) (See Table 5)							
3	EF/GF Trip Level Selector (Position 0 to 10) (See Table 6)							
4	Pulse Period Selector (Position 0 to 10), Not Applicable to SE-330HV or SE-330AU (See Table 7)							
5	NER/NGR Current (% of CT Rating)							
6	NER/NGR Voltage (% of Setting)							
7	Delta Ohms (Low) (Ohms)							
8	Delta Ohms (High) (Ohms)							

TABLE 5. EF/GF TRIP TIME

POSITION ⁽¹⁾	SE-330/ SE-330HV	SE-330AU
0	100 ms	100 ms
1	200 ms	120 ms
2	300 ms	140 ms
3	400 ms	160 ms
4	500 ms	180 ms
5	700 ms	200 ms
6	1 s	250 ms
7	2 s	300 ms
8	3 s	350 ms
9	5 s	400 ms
10	10 s	500 ms

⁽¹⁾ Positions on front-panel EF/GF Trip Time Selector.

TABLE 6. EF/GF TRIP LEVEL

POSITION ⁽¹⁾	SE-330/SE-330HV	SE-330AU EFCT-x	SE-330AU CS30-x
0	2% CT Rating	125 mA	0.75 A
1	4% CT Rating	250 mA	1.5 A
2	6% CT Rating	300 mA	1.8 A
3	8% CT Rating	400 mA	2.4 A
4	10% CT Rating	500 mA	3.0 A
5	20% CT Rating	1 A	6.0 A
6	40% CT Rating	2 A	12.0 A
7	60% CT Rating	3 A	18.0 A
8	80% CT Rating	4 A	24.0 A
9	100% CT Rating	5 A	30.0 A
10	MEM ⁽²⁾	MEM ⁽²⁾	MEM ⁽²⁾

⁽¹⁾ Positions on front-panel EF/GF Level Selector.

⁽²⁾ MEM: Non-volatile memory setting. Set using SE-MON330. Trip level in percent of CT Primary Rating. Default is 15%.

TABLE 7. PULSE TIME

POSITION ⁽¹⁾	SE-330 ⁽²⁾
0	1.0 s
1	1.2 s
2	1.4 s
3	1.6 s
4	1.8 s
5	2.0 s
6	2.2 s
7	2.4 s
8	2.6 s
9	2.8 s
10	3.0 s

⁽¹⁾ Positions on front-panel Pulse Period Selector.

⁽²⁾ Not applicable for SE-330HV or SE-330AU.

3.2.2.2 OUTPUT ASSEMBLY

This assembly is written to the SE-330. A 0 to 1 transition is required to initiate a Fault Reset, Remote Trip, or Remote Calibration. Bits 1 to 7 must remain zero for a Fault Reset or the request will not be processed. Bits 0, 1, and 3 to 7 must remain zero for a Remote Calibration or the request will not be processed.

Assembly Class (4), Instance (150), Attribute (3) – Output 1 (1 Byte)

BYTE	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	0	0	0	0	0	Remote Calibration	Remote Trip	Fault Reset

APPENDIX A
SE-330 SERIES (NEW REVISION) DEVICENET INTERFACE REVISION HISTORY

MANUAL RELEASE DATE	MANUAL REVISION
July 15, 2014	0-B-071514
January 15, 2014	0-A-011514

MANUAL REVISION HISTORY**REVISION 0-B-071514**

Remote calibration feature added.

SECTION 3

Remote calibration added to Assembly Class 4, Instance 150.

APPENDIX A

Revision history updated.

REVISION 0-A-011514

Initial release.