

## **SE-330/SE-330AU/SE-330HV PROFIBUS-DP INTERFACE**

**March 16, 2010**

**REVISION 2**

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**1. GENERAL**

The Profibus-DP slave interface on the SE-330/SE-330AU/SE-330HV is used to access meter data and provide reset functions. Set points can be read but not written.

**2. HARDWARE**

The SE-330/SE-330AU/SE-330HV uses a Profibus communications modules manufactured by HMS Industrial Networks (www.anybus.com).

**2.1 INTERFACE CONNECTOR**

A 6-pin plug-in terminal block provides connection to the Profibus network. See Table 2.1

TABLE 2.1 Terminal Pin Function

PIN	FUNCTION
1	+5
2	GND BUS
3	A-Line, RS-485
4	B-Line, RS-485
5	Shield
6	RTS

**2.2 NETWORK TERMINATION**

The end nodes of the Profibus-DP network require termination devices. Set the termination switch to ON to enable termination and OFF to disable termination.

**2.3 SETTINGS**

Two rotary switches are used to set the slave address. The setting range is 1 to 99. Address switches are read on

power up only. Cycle supply voltage after the address is set.

No baud rate selection is required because the Profibus interface has automatic baud rate detection for the following baud rates.

TABLE 2.2 Baud Rate

BAUD RATES
9.6 kbits/s
19.2 kbits/s
93.75 kbits/s
187.5 kbits/s
500 kbits/s
1.5 Mbits/s
3 Mbits/s
6 Mbits/s
12 Mbits/s

**2.4 STATUS DISPLAY LED'S**

Two LED's on the Profibus module indicate module status; "ON LINE" (green), "OFF LINE" (red), see Fig. 2.1.

**3. CONFIGURATION FILE**

A configuration tool uses the standard Anybus GSD file to configure the master to access the interface module on the SE-330/SE-330AU/SE-330HV. The input and output area sizes defined by the SE-330/SE-330AU/SE-330HV meter data and reset commands must be setup within the configuration phase. Setup the configuration such that the total INPUT size is 64 bytes (meter data from the SE-330/SE-330AU/SE-330HV into the network) and the total OUTPUT size is 2 bytes.

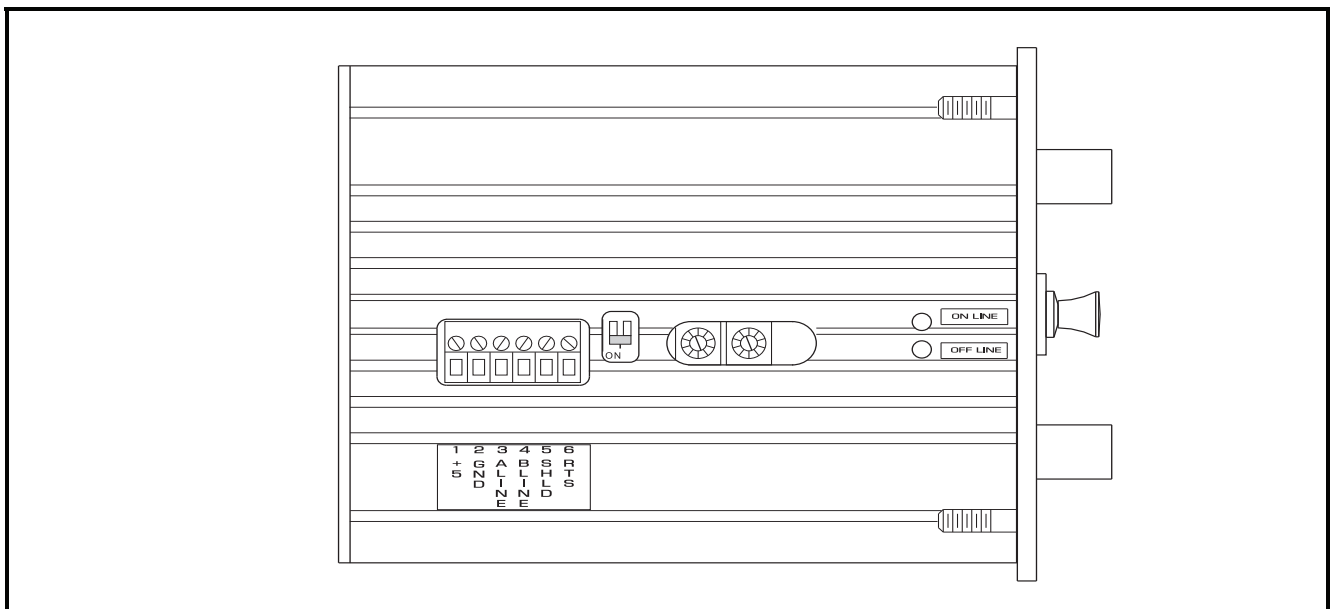


FIGURE 2.1 SE-330/SE-330AU/SE-330HV Top View

#### 4. CYCLIC I/O

Cyclic I/O data listed in Sections 4.1 and 4.2 use attributes defined in the following table.

##### Attribute Definitions

ATTRIBUTE NAME	DESCRIPTION
Trip Status Pre-Trip Status	Bit string of fault bits Bit 0, EF/GF: 1 = Earth/Ground Fault Trip 0 = No Trip Bit 1, RF: 1 = Resistor Fault Trip 0 = No Trip Bit 2, CAL: 1 = Calibration Error <sup>(1)</sup> 0 = No Error Bit 3, ADC: 1 = A/D Error <sup>(1)</sup> 0 = No Error Bit 4, GRV: 1 = Voltage Trip 0 = No Trip Bit 5, EE: 1 = EEPROM Error 0 = No Error Bit 6, SYS: 1 = Internal Fault 0 = No Internal Fault (Will cause a EF/GF and RF trip) Bit 7, RMT: 1 = Remote Trip 0 = No Trip (Will cause a EF/GF and RF trip)  <sup>(1)</sup> These bits do not activate the EF/GF indication relay.
Pending Trips	Bit string of status bits Bit 0, EF/GF: 1 = EF/GF Current > Set Point 0 = EF/GF Current < Set Point Bit 1, RF: 1 = NER/NGR Resistance Exceeding Limits 0 = NER/NGR Resistance Within Limits
Relay Status	Bit string indicating the state of output relays Bit 1, K3: 1 = RF Indication Relay Energized 0 = Not Energized Bit 2, K2: 1 = EF/GF Indication Relay Energized 0 = Not Energized Bit 3, K1: 1 = Trip/Pulse Relay Energized 0 = Not Energized
Switches	Bit string indicating the state of the configuration switches Bit 0, S4: 1 = RF Latch 0 = RF Not Latched Bit 1, S3: 1 = EF/GF Latched 0 = EF/GF Not Latched Bit 2, S5: 1 = 20 k Sensor (200 k for SE-330HV) 0 = 100 k Sensor Bit 3, S6: 1 = 50 Hz 0 = 60 Hz Bit 4, S2: 1 = Fail Safe Trip-Relay Operation 0 = Non Fail Safe Operation S2 not used with SE-330AU Bit 5, S1: 1 = Trip Configuration (K1) 0 = Pulsing Configuration (K1) S1 not used with SE-330HV and SE-330AU
Record x (x = 0 to 9)	A trip record consists of the following: Trip Status Current Voltage Delta Ohms



#### 4.1 METER AND PRE-TRIP DATA (INPUT)

##### I/O Input

BYTE	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	1-SE-330HV	1-SE-330AU	0	0	Firmware Revision			
1	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
2	0	0	0	0	0	0	RF Detect	EF/GF Detect
3	EF/GF Trip Time Setting (Detent 0 to 10)							
4	EF/GF Level Setting (Detent 0 to 10)							
5	Pulse Time Setting (Detent 0 to 10), Not Applicable to SE-330HV or SE-330AU							
6	NER/NGR Current (% of CT Rating)							
7	NER/NGR Voltage (% of Setting)							
8	Delta Ohms (High) (ohms)							
9	Delta Ohms (Low) (ohms)							
10	0	0	0	0	K1	K2	K3	0
11	0	S7	S1	S2	S6	S5	S3	S4
12	Reserved							
13	Record Head							
<b>Record 0</b>								
14	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
15	NER/NGR Current (% of CT Rating)							
16	NER/NGR Voltage (% of Setting)							
17	Delta Ohms (High) (ohms)							
18	Delta Ohms (Low) (ohms)							
<b>Record 1</b>								
19	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
20	NER/NGR Current (% of CT Rating)							
21	NER/NGR Voltage (% of Setting)							
22	Delta Ohms (High) (ohms)							
23	Delta Ohms (Low) (ohms)							
<b>Record 2</b>								
24	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
25	NER/NGR Current (% of CT Rating)							
26	NER/NGR Voltage (% of Setting)							
27	Delta Ohms (High) (ohms)							
28	Delta Ohms (Low) (ohms)							
<b>Record 3</b>								
29	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
30	NER/NGR Current (% of CT Rating)							
31	NER/NGR Voltage (% of Setting)							
32	Delta Ohms (High) (ohms)							
33	Delta Ohms (Low) (ohms)							
<b>Record 4</b>								
34	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
35	NER/NGR Current (% of CT Rating)							
36	NER/NGR Voltage (% of Setting)							
37	Delta Ohms (High) (ohms)							
38	Delta Ohms (Low) (ohms)							

**I/O Input (Continued)**

BYTE	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
<b>Record 5</b>								
39	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
40	NER/NGR Current (% of CT Rating)							
41	NER/NGR Voltage (% of Setting)							
42	Delta Ohms (High) (ohms)							
43	Delta Ohms (Low) (ohms)							
<b>Record 6</b>								
44	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
45	NER/NGR Current (% of CT Rating)							
46	NER/NGR Voltage (% of Setting)							
47	Delta Ohms (High) (ohms)							
48	Delta Ohms (Low) (ohms)							
<b>Record 7</b>								
49	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
50	NER/NGR Current (% of CT Rating)							
51	NER/NGR Voltage (% of Setting)							
52	Delta Ohms (High) (ohms)							
53	Delta Ohms (Low) (ohms)							
<b>Record 8</b>								
54	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
55	NER/NGR Current (% of CT Rating)							
56	NER/NGR Voltage (% of Setting)							
57	Delta Ohms (High) (ohms)							
58	Delta Ohms (Low) (ohms)							
<b>Record 9</b>								
59	Remote Trip	Internal Error	EEPROM Error	NER/NGR Volts	ADC Error	CAL Error	RF Trip	EF/GF Trip
60	NER/NGR Current (% of CT Rating)							
61	NER/NGR Voltage (% of Setting)							
62	Delta Ohms (High) (ohms)							
63	Delta Ohms (Low) (ohms)							

**4.2 RESET AND REMOTE TRIP (OUTPUT)**

BYTE	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	0	0	0	0	0	Clear Event Records	Remote Trip	Fault Reset
1	0	0	0	0	0	0	0	0

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