



## INSTALLATION GUIDE FOR THE E-ACDCLM AC & DC Voltage and Current Monitor

### INTRODUCTION

The NTI E-ACDCLM AC & DC Voltage and Current Monitor monitors AC and DC voltage sources and current levels when connected to an E-16D, E-5D or E-2D Server Environment Monitoring System(SYSTEM). The voltage sources can be anything with a range between -60 to +60VDC or 0-240VAC. Current measurements can be taken on AC and DC loads and with the use of hall effect sensors (sold separately) loads can be as much as 500A. When connected to a SYSTEM via 18-24AWG CAT5/5e/6 cable (up to 1,000 feet away), the voltage and/or current source(s) can be monitored and the SYSTEM can be configured to alert users as to variations in the voltage and current levels.

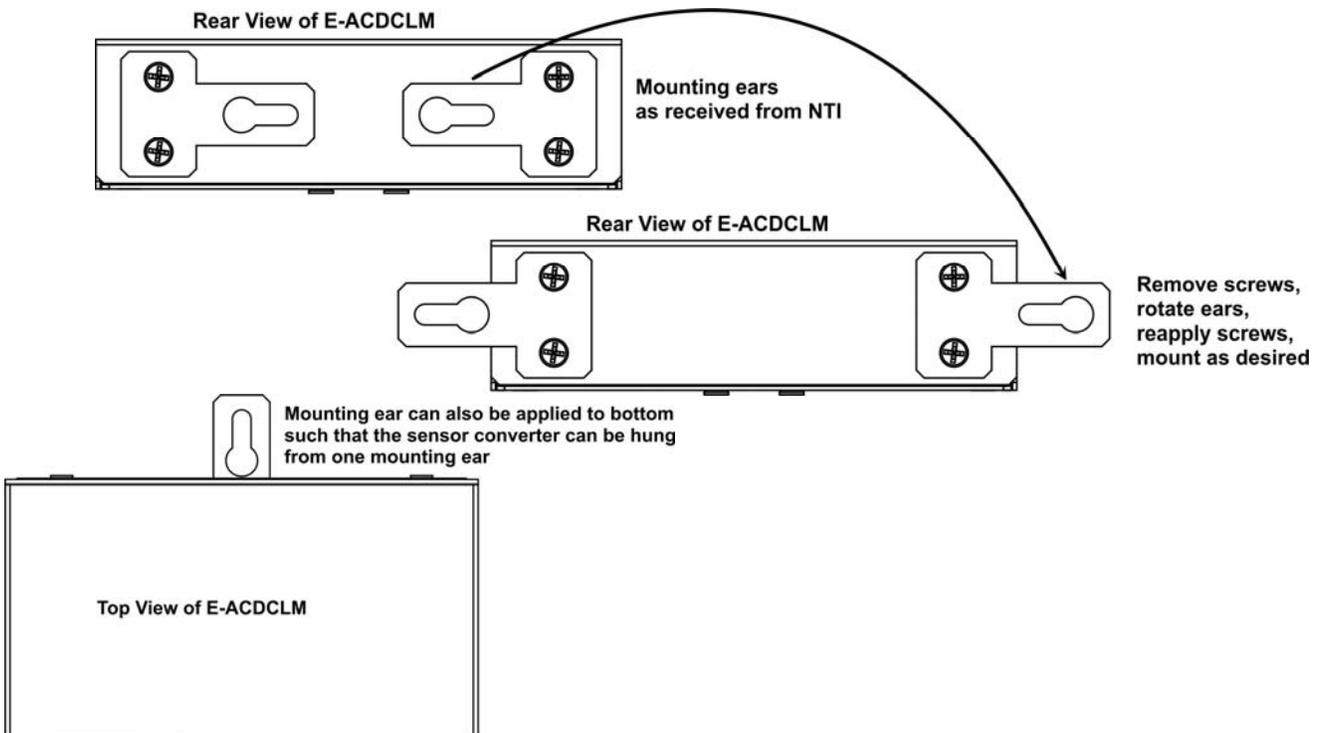
### Features:

- Detects and monitors up to two voltages, one AC (up to 240VAC) and the other DC (-60 to +60VDC)
- Current measurements (AC and DC) up to 500A using hall-effect transducers (sold separately)
- 2 and 4-position screw-terminal connections
- Supports 18-24AWG CAT5/5e/6 cable up to 1,000 ft. (305M) (not included)
- Includes Mounting Ears
- CE certified and RoHS compliant
- Powered by E-2D/5D/16D
- Dimensions WxDxH (in): 6.2x2.3x1.6
- Accuracy and range are transducer-dependent (sold separately).
- Compatible with E-FSC Fiber Converter/Extender
  - Use to extend sensor up to 1.2 miles (2km) from the ENVIROMUX unit.

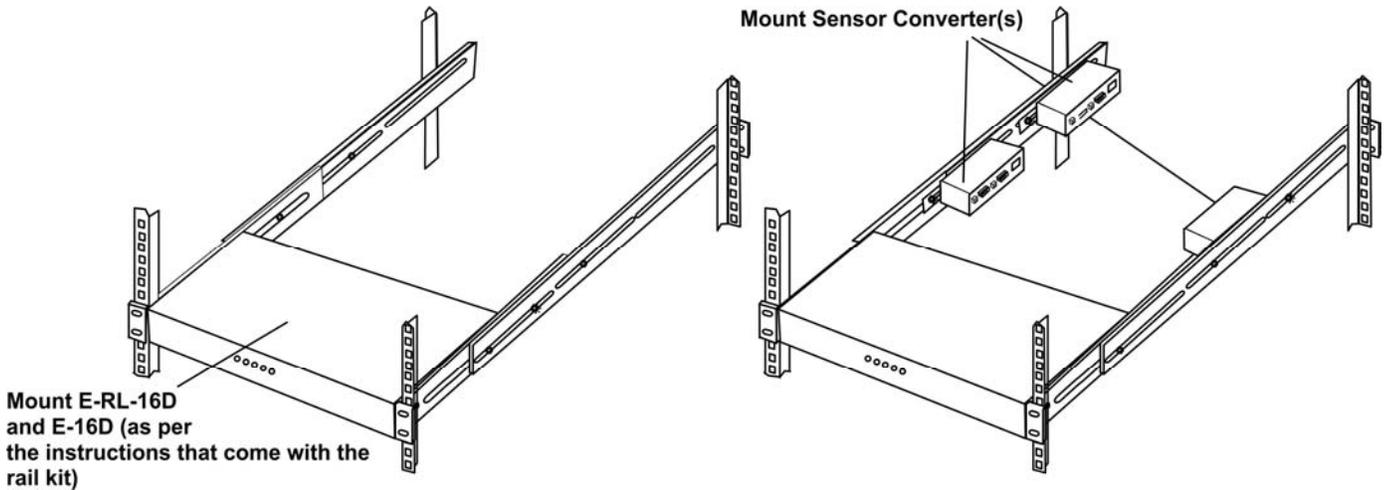
**Note: The E-xD must be running firmware version 2.31 or later in order to use the E-ACDCLM with it. Refer to the E-xD manual for firmware upgrade instructions as needed.**

### INSTALLATION

Mount the E-ACVDCLM using the mounting ears provided. To use the ears, remove the screws securing the ears to the rear of the E-ACDCLM, turn the ears around, and reapply the screws. Alternatively, secure one ear to holes on the bottom of the unit so that it can be hung as shown in the image below.



To mount multiple E-ACDCLM in close proximity to the E-16D, install an extension rail kit (NTI E-RL-16D - sold separately) and mount E-ACDCLM as seen in the illustration below.



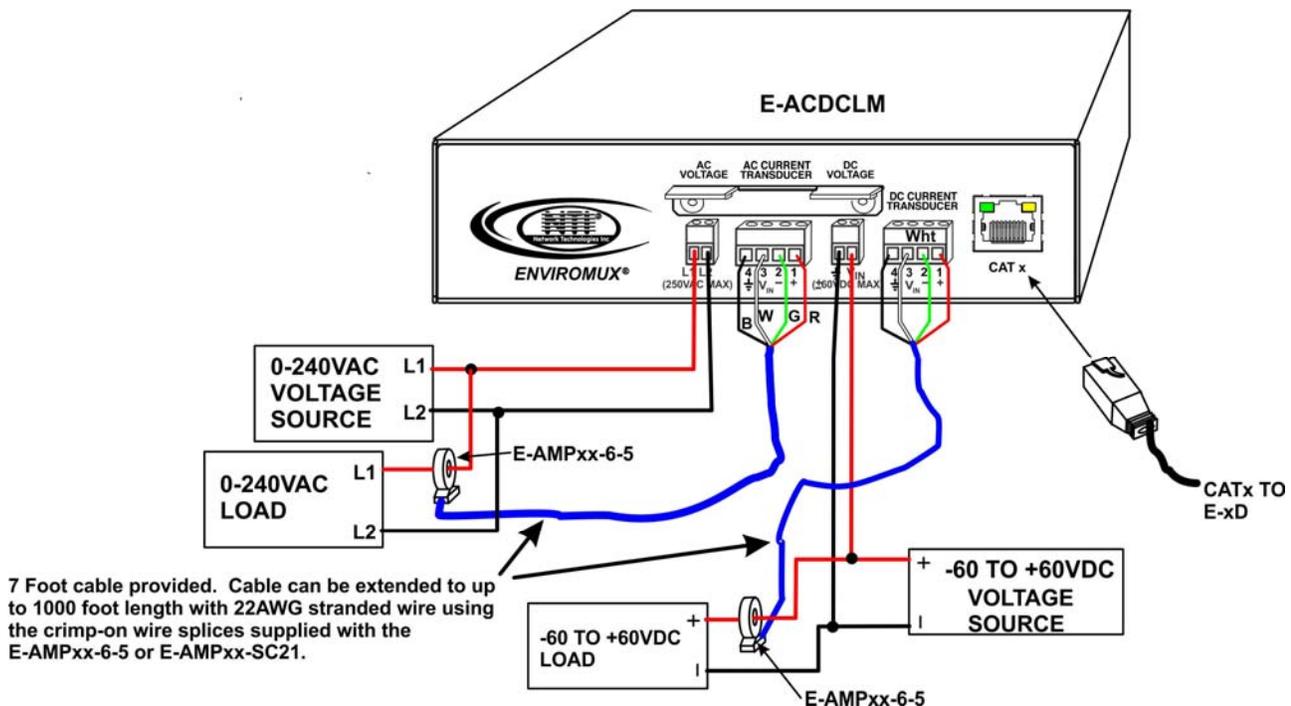
## CONNECTION

**Note: To prevent damage to the voltage source or the Sensor Adapter proper polarity must be observed when making connections.**

1. At the "AC VOLTAGE" terminal block, connect an AC voltage source to be monitored between 0 and 240VAC.
2. At the "DC VOLTAGE" terminal block, connect a -60 to +60VDC voltage source to be monitored to the "Vin" and "0" (earth ground) connections using the removable terminal block.
3. If current sensing is desired, install a hall effect sensor to the AC or DC circuit to be monitored. Then connect the supplied 4-wire cable to the sensor. Connect the 4 wires at the end of the cable to the AC or DC CURRENT TRANSDUCER (depending upon the type of circuit being sensed) terminals on the E-ACDCLM.

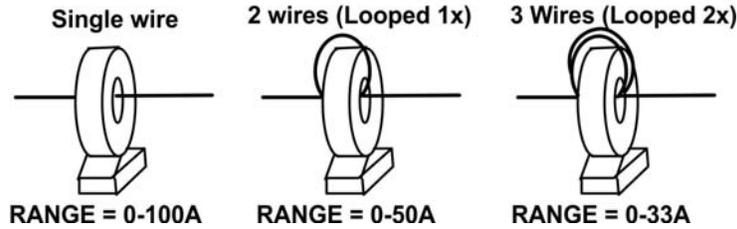
**Note: If a hall-effect sensor is installed on a DC circuit and then the sensing cable is connected to the "AC CURRENT TRANSDUCER" side of the E-ACDCLM, no reading will be displayed for that sensor.**

**Note: The wire connection terminal block is easily removed from the Sensor Adapter for convenient wire termination.**

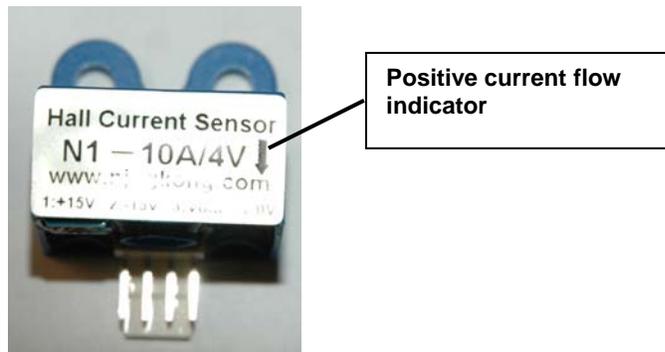


**TIP:** A single hall effect sensor can be used to measure current at different ranges. By passing a wire through the sensor loop repeatedly (looping the wire around), the range of the sensor will be divided by the number of times the wire passes through. For a 100A AC sensor, for example, two passes will reduce it by 100/2 (range of 0-50A), three passes will reduce it by 100/3 (range of 0-33A), and so on. See example below. If you need to increase the sensitivity of your sensor, this is a way to do so.

**100A Hall Effect Sensor**

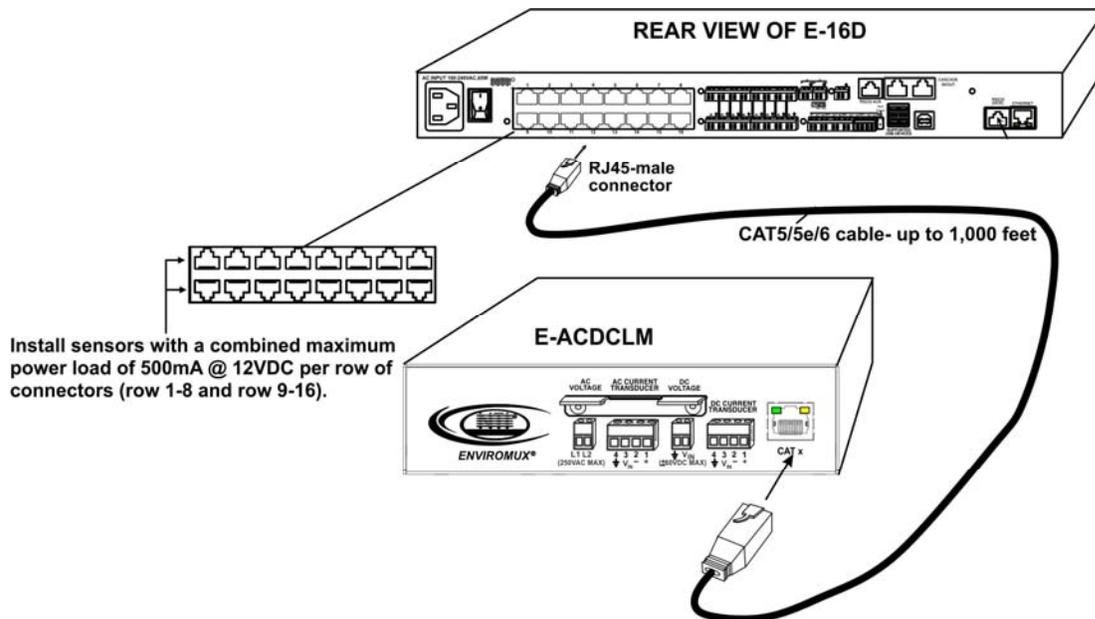


**Installation Note:** Hall Effect sensors can be rated AC Current-only, DC Current-only, or AC/DC current compatible. Sensors rated for DC current will include a directional current flow arrow either on the label or on the body of the sensor, indicating that current flowing in that direction will be reported by the sensor as positive current flow. When installing a hall effect sensor to a DC circuit, you will want to install it oriented such that the arrow points in the direction you want represented as positive current flow on the status page for that sensor.



3. Connect a 18-24AWG CAT5/5e/6 patch cable (up to 1,000 feet long) between the “Cat x” port on the E-ACDCLM and an “RJ45 Sensor” port on the SYSTEM. (The use of smaller gauge CATx cabling will result in shorter distances that can be spanned.)

**Note:** Each row of RJ45 Sensor connectors (1-8 and 9-16) is rated for a combined load of 500mA at 12VDC. Each E-ACDCLM uses 66mA. When applying sensors, be sure that the total load on each row does not exceed 500mA at 12VDC or failure of the SYSTEM or may result.



4. Configure the SYSTEM to react to changes in the voltage and/or current from the source(s), as desired. See examples on the following pages.

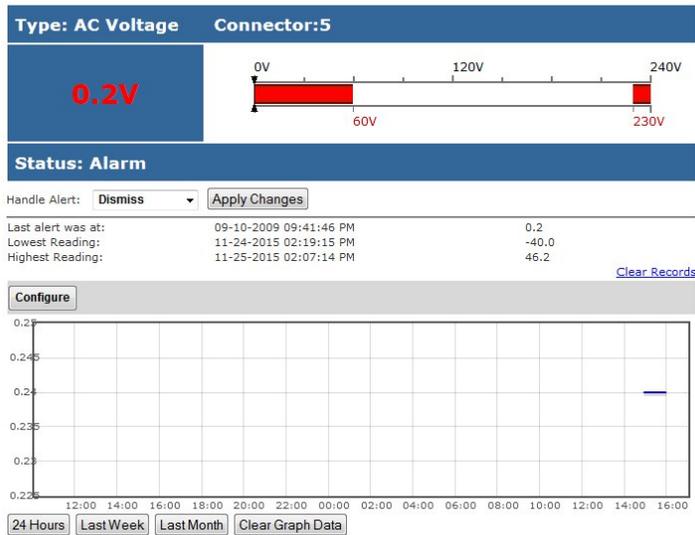
# CONFIGURATION

## Sensors

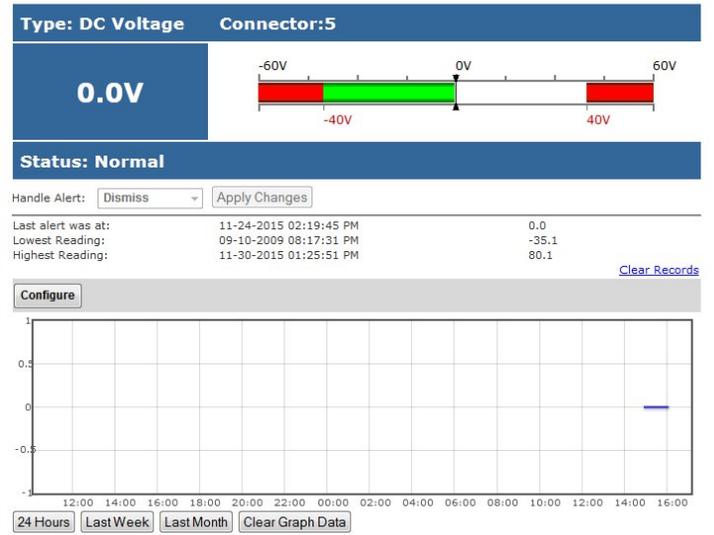
Conn.	Description	Type	Value	Status	Action
5	<a href="#">Sensor #5.1</a>	AC Voltage	0.2V	Alarm	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
5	<a href="#">Sensor #5.2</a>	AC Current	0.2amp	Alarm	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
5	<a href="#">Sensor #5.3</a>	DC Voltage	0.0V	Normal	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
5	<a href="#">Sensor #5.4</a>	DC Current	0.0A	Alarm	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>

When an E-ACDCLM is connected to the ENVIROMUX, the summary page (above) will update with 4 different sensor types, AC Voltage, AC Current, DC Voltage and DC Current. The sensor is plugged into RJ45 Sensor port #5 in this example. Click on the Sensor in the Description column (or "View" under Action) and display the status page for each sensor. (Below). In order to better define the sensor on the Summary Page, in SNMP traps, or in an MIB browser, click on the "Edit" link to open the sensor configuration page and configure the sensor.

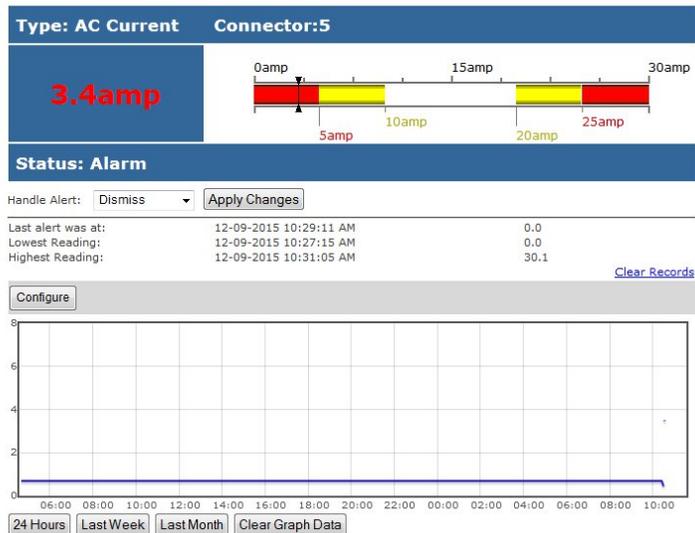
### Sensor #5.1 Status



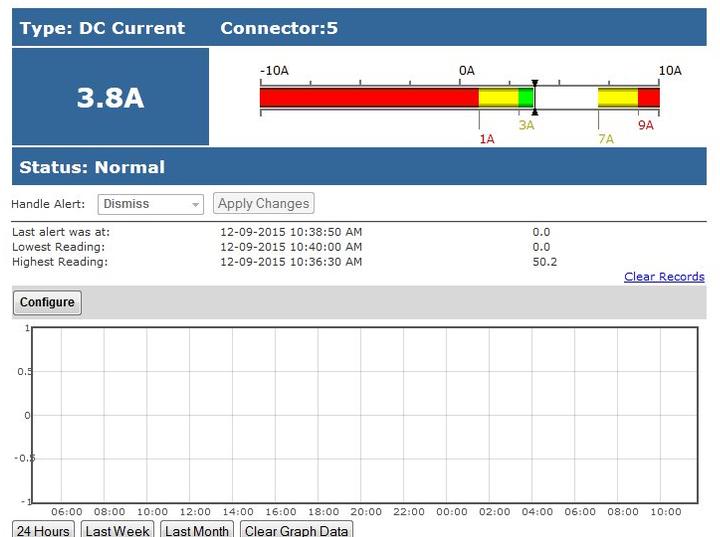
### Sensor #5.3 Status



### Sensor #5.2 Status



### Sensor #5.4 Status



Click on the “Configure” button on any Status Page to display the Configuration page for any sensor.

### Sensor #5.1 Configuration (Type: AC Voltage)

Sensor Settings	
Description	Sensor #5.1 Descriptive name for the sensor
Min. Level	0.0 Min. supported value for the sensor
Max. Level	240.0 Max. supported value for the sensor
Min. Non-Critical Threshold	60.0 Min. threshold below which indicates a non-critical alert condition
Max. Non-Critical Threshold	230.0 Max. threshold above which indicates a non-critical alert condition
Min. Critical Threshold	60.0 Min. threshold below which indicates an alert condition
Max. Critical Threshold	230.0 Max. threshold above which indicates an alert condition
Refresh Rate	10 Sec The refresh rate at which the sensor view is updated
Group Settings	
Schedule Settings	
Non-Critical Alert Settings	
Critical Alert Settings	
Data Logging	
Save	
Alert Simulation	
Simulate Alert Clear Alert	

### Sensor #5.3 Configuration (Type: DC Voltage)

Sensor Settings	
Description	Sensor #5.3 Descriptive name for the sensor
Min. Level	-60.0 Min. supported value for the sensor
Max. Level	60.0 Max. supported value for the sensor
Min. Non-Critical Threshold	-40.0 Min. threshold below which indicates a non-critical alert condition
Max. Non-Critical Threshold	40.0 Max. threshold above which indicates a non-critical alert condition
Min. Critical Threshold	-40.0 Min. threshold below which indicates an alert condition
Max. Critical Threshold	40.0 Max. threshold above which indicates an alert condition
Refresh Rate	10 Sec The refresh rate at which the sensor view is updated
Group Settings	
Schedule Settings	
Non-Critical Alert Settings	
Critical Alert Settings	
Data Logging	
Save	
Alert Simulation	
Simulate Alert Clear Alert	

### Sensor #5.2 Configuration (Type: AC Current)

Sensor Settings	
Description	Sensor #5.2 Descriptive name for the sensor
Min. Level	0.0 Min. supported value for the sensor
Max. Level	100.0 Max. supported value for the sensor
Associate Sensor	<input checked="" type="checkbox"/> Associate sensor to a customized sensor type
Associated Sensor Type	AC Current Type of the associated sensor
Associated Sensor Unit	amp Measurement unit for the associated sensor
SNMP Associated Type ID	32767 ID value for SNMP type of associated sensor
Min. Associated Level	0.000000 Sensor expected value corresponding to 0%
Max. Associated Level	30.000000 Sensor expected value corresponding to 100%
Min. Non-Critical Threshold	10.0 Min. threshold below which indicates a non-critical alert condition
Max. Non-Critical Threshold	20.0 Max. threshold above which indicates a non-critical alert condition
Min. Critical Threshold	5.0 Min. threshold below which indicates an alert condition
Max. Critical Threshold	25.0 Max. threshold above which indicates an alert condition
Refresh Rate	1 Sec The refresh rate at which the sensor view is updated
Group Settings	
Schedule Settings	
Non-Critical Alert Settings	
Critical Alert Settings	
Data Logging	
Save	
Alert Simulation	
Simulate Alert Clear Alert	

### Sensor #5.4 Configuration (Type: DC Current)

Sensor Settings	
Description	Sensor #5.4 Descriptive name for the sensor
Min. Level	-100.0 Min. supported value for the sensor
Max. Level	100.0 Max. supported value for the sensor
Associate Sensor	<input checked="" type="checkbox"/> Associate sensor to a customized sensor type
Associated Sensor Type	DC Current Type of the associated sensor
Associated Sensor Unit	A Measurement unit for the associated sensor
SNMP Associated Type ID	32767 ID value for SNMP type of associated sensor
Min. Associated Level	-10.000000 Sensor expected value corresponding to -100%
Max. Associated Level	10.000000 Sensor expected value corresponding to 100%
Min. Non-Critical Threshold	3.0 Min. threshold below which indicates a non-critical alert condition
Max. Non-Critical Threshold	7.0 Max. threshold above which indicates a non-critical alert condition
Min. Critical Threshold	1.0 Min. threshold below which indicates an alert condition
Max. Critical Threshold	9.0 Max. threshold above which indicates an alert condition
Refresh Rate	1 Sec The refresh rate at which the sensor view is updated
Group Settings	
Schedule Settings	
Non-Critical Alert Settings	
Critical Alert Settings	
Data Logging	
Save	
Alert Simulation	
Simulate Alert Clear Alert	

Values shown here are for a 10Amp hall effect. A 30A DC voltage hall effect would use “-30” and “30” instead. (for example)

Most of the sensor settings are the same as any other sensor configuration (page 39 of the E-xD manual) but for the AC and DC Current Sensors there are some differences:

Sensor Settings	Description
Associate Sensor	Select if the Type "AC Current" or "DC Current" should be replaced by the sensor type to be entered in the next box
Associated Sensor Type	Enter the "Type" of sensor that should be displayed on the summary page and in all alert communications received regarding this sensor
Associated Sensor Unit	Enter between 1 and 3 alphabetical characters. These characters will be used by the ENVIROMUX to represent the unit of measure reported by the attached sensor. Leaving it empty will result in an empty string in the reported data.
SNMP Associated Type ID	Enter ID value from MIB file if SNMP traps will be used for alert notifications for this sensor (for more on this, see "SNMP Custom Type ID" below)
Min. Associated Level	The minimum range of the units to be associated with the current reading measured from the attached sensor.
Max. Associated Level	The maximum range of the units to be associated with the current reading measured from the attached sensor.

**SNMP Custom Type ID:** Use this field if SNMP traps will be used for alert notifications. The Type ID corresponds with a value defined in the MIB file under "extSensorType" (default value is 32767 for type "Custom"). Place the desired number in this box that represents the type of sensor to be reported in the MIB browser or SNMP trap.

To define a new type of sensor;

1. open the MIB file,
2. locate the section titled "extSensorType",
3. assign a description and a number not already in use (in the "SYNTAX" field) to associate with it ,
4. enter the number for the newly defined extSensorType in the SNMP Custom Type ID box.

If the Type ID is left blank, the value "0" will be assigned, which will be reported in the browser and SNMP trap as type "undefined".

## TECHNICAL SPECIFICATIONS

Description	Specification
Polling rate	1Sa/s
AC Voltage Range	600V isolated 0 to 247Vrms
AC Reporting Accuracy	2.5VAC (up to 240VAC)
AC Resolution	0.25VAC
DC Voltage Range	Non-isolated -60 to +60V DC
DC Reporting Accuracy	1.2VDC
DC Resolution	0.12VDC
Current Measurement	Requires Hall-Effect transducer (sold separately)
Power	Powered by the SYSTEM
Current Draw	12V @ 66mA / 5V @ 8mA
Size (In.) W x D x H	6.2 x 2.3 x 1.6
Regulatory Approvals	CE, RoHS

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