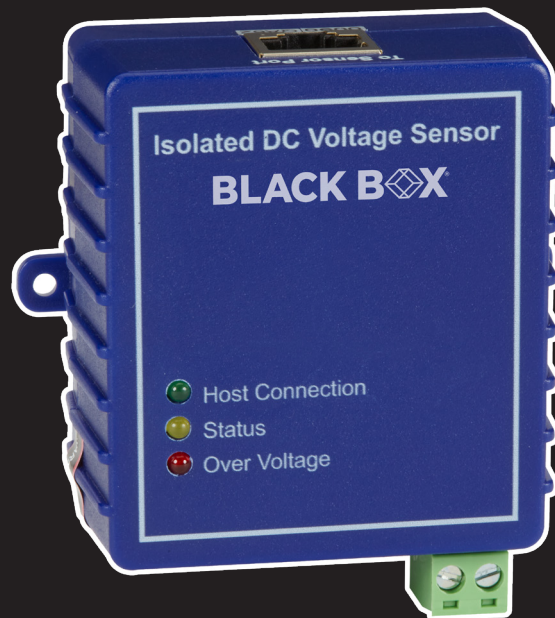


USER MANUAL

EME1D1-005-R2

ISOLATED DIGITAL VOLTMETER

24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT BLACKBOX.COM



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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

The EME1D1-005-R2 is an isolated digital DC volt meter which can be used to monitor and log DC voltage readings from batteries and other equipment. It can also be used to integrate third-party sensors that have DC voltage output.

The Isolated Digital Voltmeter can be used to create custom data collection systems. The user can input a DC voltage range from -60 to 0 volts or from 0 to +60 volts DC.

The sensor incorporates an isolated ground for better safety and protection against overvoltages and short circuits. Readings are available in both an absolute value and a percentage of full scale. Full scale is user programmable with both the base and top voltages from -60 to +60 volts DC. All readings are given with a resolution of one decimal point.

Our Digital Voltmeter can measure DC voltage in the range 0 to 60 volts or -60 to 0 volts, and the web interface is both flexible and easy to use.

If you want to measure a DC voltage greater than +/-60V, you can find a DC Voltage Transducer that suits your purpose and integrate it into the unit as a "custom sensor." You can use a transducer with a 4-20mA output and connected to our 4-20mA converter, or you can use it with an analogue DC output signal connected to our Isolated DC Voltage Sensor. Once connected, our web interface allows you to display the readings as their measured values, for example, 0 -1000V.

A popular OID for the Digital Voltmeter is the current reading. For the Isolated Digital Voltmeter plugged into Sensor Port #1 that OID is .1.3.6.1.4.1.3854.1.2.2.1.17.1.3.0

1.2 HOW TO USE THIS MANUAL

This manual provides the user with a step-by-step guide on how to configure and set up the sensor. It contains sections that form "mini tutorials." These cover the basic set up and common unit configurations, and they provide an introduction to the sensor's most useful features.

If you need any further information or help with using your unit, contact us at techsupport@blackbox.com.



2.1 SPECIFICATIONS

TABLE 2-1. GENERAL SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Measurement Range	0 to +60V or -60 to 0VDC
Ground	Isolated ground for protection against a differential ground between the target device and the sensor
Range	Full auto ranging from -60VDC to +60VDC and from -5VDC to +5VDC
Status Range	High Warning, Low Warning, High Critical, and Low Critical
Communications Cable	RJ-45 jack to sensor using UTP Cat 5 wire Maximum extension cable length 60 feet with approved low capacitance shielded cable or UTP
Hardware setting modes	Wide Range Mode is -60 to +60 VDC with 0.01 V resolution and 1% accuracy. High Resolution Mode is -5 to +5 VDC with 0.001 V resolution and 1% accuracy.
Accuracy	±1%. o Input Impedance: 1.6 Mohm when set at the High Scale (60 Volts maximum) and 1.1 Mohm when set at the High Resolution Mode (5 volts maximum).
Power Source	Unit provides power, so no additional power is needed.
Power Supply	12V/3A DC (US/EU standards, CE/FCC/UL certified)
Voltmeter auto detection?	The unit auto detects the presence of the Isolated Digital Voltmeter.
Measurement Rate	Multiple readings every second
Autosensing?	Full Autosense including disconnect alarm

CHAPTER 3: PRODUCT USE

3.1 SENSOR LEDs

TABLE 3-1. SENSOR LEDs

LED	DESCRIPTION
Host Connection LED	LED will be GREEN when connected successfully to your base unit.
Status LED	LED will be blinking YELLOW when in an alert state.
Over Voltage LED	LED will be solid RED if overvoltage is connected to the sensor.

3.2 CONFIGURING THE ISOLATED DIGITAL VOLTMETER

Follow these instructions to configure your isolated digital voltmeter:

1. Plug the sensor into one of the RJ-45 ports on the rear panel of the unit.
2. Point your browser to the IP address of the unit (default, 192.168.0.100) and then log in as the administrator using your administrator password (default is "public"). You will then be taken to the summary page.
3. Select the sensor's tab from the summary page. The layout of the next page will vary depending on your unit, so refer to your unit's manual for more information.
4. Set up the sensor thresholds. The low critical, low warnings, normal, high warnings, and high critical values can be set from this page.

Next, we will cover the settings that are specific to your sensor.

3.3 5V 60V SWITCH SETTING

The Isolated Digital Voltmeter has a two-way switch located next to the voltage input connection. This switch is used for selecting either of the two hardware setting modes. When set to the 60V setting, the sensor will be in the Wide Range Mode, which would be selected when applying -60 to +60 VDC. When the switch is set to the 5V setting, the sensor will be in the High Resolution Mode, which would be selected when applying -5 to +5 VDC.

3.4 WEB INTERFACE READINGS AND STATUS

Current Reading:

The percentage or absolute value of DC voltage is displayed in this field. This is a read-only field. This value can be polled via SNMP, and the data can be used for graphing. The value range is set by the base and max scale fields in the Custom Digital Voltmeter Settings Section.

Status:

The current reading is compared to the thresholds of Critical High, Warning High, Critical Low, and Warning Low that the user has set. From this, the status is then formed, and emails or traps are sent if necessary.

Critical High, Warning High, Warning Low, and Critical Low:

These thresholds should be re-entered every time there is a change in the type of scale (whether an absolute value or a percentage value is used).



CHAPTER 3: PRODUCT USE

3.5 USING THE ISOLATED DIGITAL VOLTMETER TO INTEGRATE CUSTOM SENSORS

The unit has the ability to integrate with custom sensors via our Isolated Digital Voltmeter or 4-20mA Converter. For integration with custom sensors, the unit text can be customized to meet your needs; this text is reflected on the summary page of the web interface. All numbers are displayed in decimal format. The external sensor used should have an output as a linearized DC voltage (integrate with Isolated Digital Voltmeter) or 4-20mA signal (use 4-20mA Converter).

Display Units:

This field should be entered with an appropriate unit of the measured entity when the Isolated Digital Voltmeter is used with the custom sensor. For example, this field might be entered with Pounds or Lbs, and then the Isolated Digital Voltmeter is used with the custom pressure sensor or Volts for an absolute value of measured DC voltage.

Type of scale:

This field is used to select whether to display the current reading as an absolute value or a percentage.

Max scale of sensor in volts:

This field should be entered with the maximum value of the voltage that is input to the Isolated Digital Voltmeter. For example, if the Isolated Digital Voltmeter is used to measure the voltage in a range of 0 to 50 volts, this field should be filled in with 50. Or, if the Isolated Digital Voltmeter is used to integrate with the custom sensor, this field should be set to the maximum output voltage of the custom sensor.

How many percent or how many unit (max scale):

The field name is changed accordingly to the selected type of scale (absolute value or percentage). When the type of scale is set to Absolute, this field should be set to the maximum absolute value that can be measured by the DC Voltage or the custom sensor. In the Isolated Digital Voltmeter case, the value in this field should be the same as that in the "Max scale of sensor in volts" field.

Base scale of sensor in volts:

This field should be entered with the minimum value of the voltage that is input to the Isolated Digital Voltmeter. For example, if the Isolated Digital Voltmeter is used to measure the voltage in a range of 0 to 50 volts, this field should be filled in with 0. Or, if the Isolated Digital Voltmeter is used to integrate with the custom sensor, this field should be set to the minimum output voltage of the custom sensor.

How many percent or how many unit (base scale):

The field name is changed accordingly to the selected type of scale (absolute value or percentage). When the type of scale is set to Absolute, this field should be set to the minimum absolute value that can be measured by the DC Voltage or the custom sensor. In the Isolated Digital Voltmeter case, the value in this field should be the same as that in the "Base scale of sensor in volts" field.

CHAPTER 3: PRODUCT USE

3.6 CALIBRATING THE ISOLATED DIGITAL VOLTMETER

The calibration of the EME1D1-005-R2 sensor can only be performed in a Gateway GUI. Normally the sensor will not need calibration. It is good practice, however, to calibrate it at least once a year depending on the level of usage.

To calibrate the sensor:

1. Disconnect the CATx extension cable and connect the calibration cable following the labels indicating which end is connected to either the base unit's RJ-45 port or the sensor connection.
2. Connect the green connector to the DC Input Voltage connector.
3. Log in to the Gateway as an administrator.
4. Navigate to the Sensor's page and then to the Digital Voltmeter Settings.
5. Click on the Calibration button.
6. After the Calibration page is displayed, click on the Calibrate button. When the sensor has completed the calibration procedure, it will display "calibration completed."



APPENDIX A: REGULATORY INFORMATION

A.1 FCC STATEMENT

This equipment has been tested and found to comply with the regulations for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this Quick Installation Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case, the user will be required to correct the interference at his/her own expense.

A.2 CE STATEMENT

This is a Class B product in a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

A.3 ROHS

This product is RoHS compliant.

APPENDIX A: REGULATORY INFORMATION

A.4 NOM STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.



APPENDIX B: DISCLAIMER/TRADEMARKS

B.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

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