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iDCV Isolated Digital Voltmeter User Manual

Help Version updated till firmware SP446

1) Introduction

What is the iDCV Isolated DC Volt Meter?

The AKCP iDCV Sensor is an isolated digital DC volt meter which can be used to not only monitor and log DC voltage readings from batteries and other equipment, but also can be used to integrate third party sensors that output a DC voltage.

The Isolated Digital Voltmeter can be used by OEM's and engineers to create their own custom data collection systems. The user can input a DC voltage range from -60 to 0 volts or from 0 to +60 volts DC. Any company or building with a large battery bank or solar power storage or involvement in the manufacture or storage of batteries needs this sensor.

The sensor now incorporates an isolated ground for better safety and protection against over voltages 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. The web interface for our Isolated DC Voltage Sensor is very 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 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 (i.e. 0 -1000V).

One popular OID for the Digital Voltmeter is the current reading. For the Isolated Digital Voltmeter plugged into RJ45#1 that OID is **.1.3.6.1.4.1.3854.1.2.2.1.17.1.3.0**

AKCP has prided itself on the only company in the world to bring low cost, easy to use complete access control, CCTV security, environmental and power monitoring solutions to market.

How to use this manual

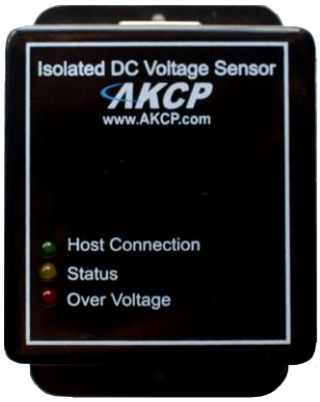
This manual is meant to provide the user with a step by step guide on how to configure and set up their sensor. It utilizes screen shots in an effort to make things simpler for the user to follow. It is split up into sections that form "mini tutorials". These cover the basic set up and common configurations of the unit, and give an introduction to its most useful features.

If you need any further information or help with using your unit then please contact us on support@akcp.com and one of our technical support staff will be only to pleased to help you with any information you require.

2) Specifications & Features:

- Measurement range - 0 to +60V or -60 to 0VDC.
- Isolated ground for protection against a differential ground between the target device and the iDCV sensor.
- Full auto ranging from -60VDC to +60VDC and from -5VDC to +5VDC.
- Status range - High Warning, Low Warning, High Critical, 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.
- Two 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%.
- 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: powered by the unit. No additional power needed.
- The unit auto detects the presence of the Isolated Digital Voltmeter.
- Measurement rate - multiple readings every second.
- Full Autosense including disconnect alarm.

3) Sensor LED's:



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 over voltage is connected to the sensor.

4) Configuring the Isolated Digital Voltmeter

a) Plug the sensor into one of the RJ45 ports on the rear panel of the unit.

b) Now point your browser to the IP address of the unit (default, 192.168.0.100). Next you need to login as the administrator using your administrator password (default is "public"). You will then be taken to the summary page.

c) From the summary page you need to select the sensors tab. The layout of the next page will vary depending on your unit so please refer to your units manual.

d) You should now be able to setup the thresholds for your sensor. The low critical, low warnings, normal, high warnings, high critical values can be set from this page.

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

5V 60V Switch Setting

The Isolated Digital Voltmeter has a two way switch located next to the voltage input connection. This switch is 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 then the sensor will be in the **High Resolution Mode** which would be selected when applying -5 to +5 VDC. .

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, 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)

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 whatever you would like; 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).

EXAMPLE: consider a pressure sensor, measuring range 0-500MPa, sensor output 0-12VDC signal.

Connect to the securityProbe with our Isolated Digital Voltmeter.

On the DC Voltage Sensor Settings page, in the **Custom Digital Voltmeter Settings** section, enter MPa as the Display Units.

Enter the following settings:

Max Scale of Sensor in Volts:	**12**
Base Scale of Sensor in Volts:	**0**
How Many MPa at 12V (Max Scale):	**500**
How Many MPa at 0V (Base Scale):	**0**

Now, sensor readings will be displayed in MPa, with the configured scaling – i.e. an input signal of 6V will be displayed as 250MPa.

These units will be displayed on graphs, sensor notifications, summary page etc.

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 filed might be entered with Pounds or Lbs 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 filed should be filled in with 50. Or, if the Isolated Digital Voltmeter is used to integrate with the custom sensor, this filed should be set to the maximum output voltage of the custom sensor.

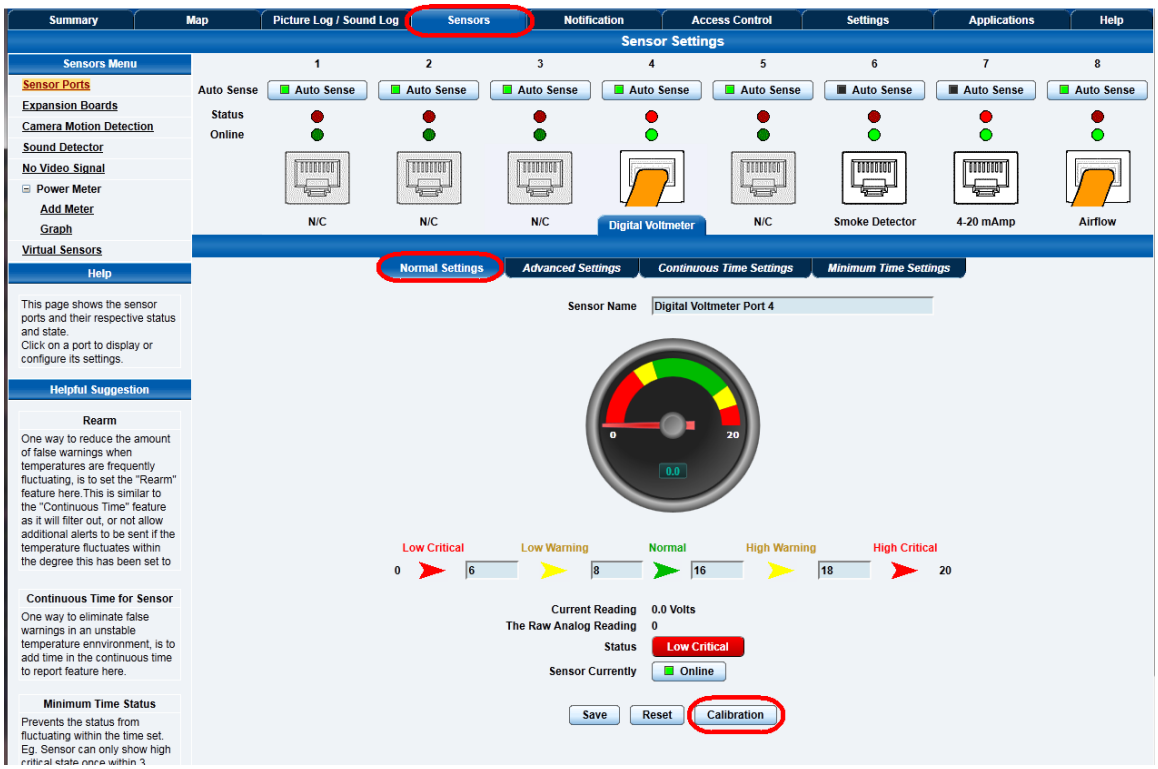
How many percent or How many unit (max scale): The field name is changed accordingly to the selected type of scale (absolute value or percentage). When the type of scale is set to Absolute, this field should be set to the maximum absolute value that can be measured by the DC Voltage or the custom sensor. 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 filed should be filled in with 0. Or, if the Isolated Digital Voltmeter is used to integrate with the custom sensor, this filed should be set to the minimum output voltage of the custom sensor.

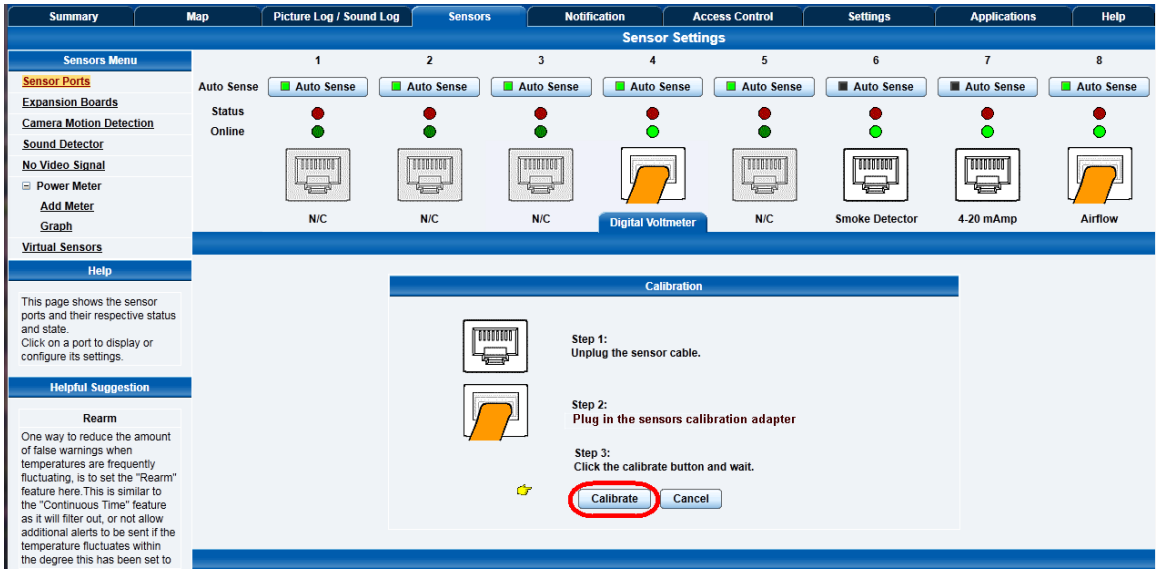
How many percent or How many unit (base scale): The field name is changed accordingly to the selected type of scale (absolute value or percentage). When the type of scale is set to Absolute, this field should be set to the minimum absolute value that can be measured by the DC Voltage or the custom sensor. 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.

5) Calibrating the Isolated Digital Voltmeter

The calibration of the iDCV sensor can only be performed on the securityProbe base units. Normally the senor will not need calibration, however it is good practice to calibrate it once a year depending on the level of usage.



To calibrate the sensor, you would first disconnect the extension cable and connect the yellow calibration cable following the labels indicating which end is connected to either the base units RJ-45 port or the sensor connection. Now connect the green connector to the DC Input Voltage connector. Now as shown in the screen shot above you would log in to the base unit as an administrator, then navigate to the Sensors page >> Normal Settings, then click on the Calibration button.



This will bring you to the Calibration page where you can click on the Calibrate button as shown in the screen shot above.

When the sensor has completed the calibration procedure it will display calibration completed.

If you have any problems or technical questions, please contact our technical support department at support@akcp.com