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# Battery Temperature Sensor Manual



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## Introduction

This Battery Temperature Sensor is the first in a new range of sensor products designed for battery health monitoring, suitable for monitoring solar panel, UPS and generator batteries.

The BTTS is embedded into a terminal lug and is designed to connect directly to the Negative Battery Terminal and provide readings to aid in monitoring the battery health, and internal temperature. As the battery terminal provides the closest thermal connection to the batteries internal plates it will give you the closest accuracy to the actual battery temperature. The sensor chip is insulated to help protect it from interference from ambient temperature fluctuations.

It is based on our AKCP Temperature sensor design, with a fixed 12ft length of cable. As with all our intelligent sensors its presence will be automatically detected by the base unit. Each sensor has its own SNMP OID so that data can be collected over the network and graphed.

We do not recommend you trying to connect any of our AKCP sensors including the Battery Temperature sensors though patch panels or using the RJ-45 couplers to extend them. You may find that this works, however it will be very inconsistent and this is due to the signal strength from the sensor to the base unit. The resistance of the extra connectors in a patch panel, or couplers is often enough to prevent the sensor from working.

**Important Note:** New style of temperature, and temperature humidity sensors were introduced in the later part of 2017. These sensors WILL NOT function correctly if you have not upgraded the firmware on your AKCP base unit to the latest on our website.

These new style of sensors are NOT compatible with the old obsolete AT-Mega128 AKCP sensorProbe or the old obsolete PXA type securityProbe base units. You can check these details regarding your unit type on our support site.

All of the previous style temperature, temperature and humidity sensors are fully supported on the AKCP sensorProbe, SP+ and SEC+ base units.

## Sensor Information



**Product Code: BTTS** – The sensor cable should not be extended as it is designed to connect to the AKCP base unit’s sensor port and monitor the temperature at the location where the base unit has been installed. You can purchase the sensor with a fixed 12 feet of cable length. Please note the sensor is susceptible to EMI (Electromagnetic interference). It is recommended to not run the cable near any type of power supply or other equipment that will emit EMI. This sensor should also not ever be connected through patch panels.

## Sensor Calibration

All Battery Temperature sensors are calibrated at the factory, so there is no need to calibrate them. We do have the calibration certificates, so please contact AKCP support if these are required.

The sensors are very accurate, however if you find the temperature reading varies slightly you can use the “Offset” feature which is explained in detail later in this manual.

## Battery Safety Essentials & Disclaimer

# ESSENTIAL BATTERY SAFETY



**Battery Acid**

Acid may leak, or be given off as droplets and/or spray/mist during recharge.

Sulphuric Acid is a corrosive and poisonous liquid which will cause burns and irritation to the skin and eyes and could severely damage clothing.

- > Always handle batteries with care
- > Never overfill with acid
- > Always store upright
- > Never allow children access to a battery
- > Always charge in a well ventilated area
- > Never allow battery vents to become blocked
- > Always wear eye protection and protective clothing



**Electrical Energy**

Short circuit of battery terminals by a conductive object (eg. metal tool or jewellery) can cause severe burns.

Severe electrical shocks may be received from faulty mains electrical charging equipment and during the recharge of high voltage battery systems.



- > Never smoke, allow naked flames, or create sparks near a battery
- > Always charge in a well ventilated area
- > Ensure the charging leads are correctly fitted before switching on the mains
- > Always ensure the mains is switched off before disconnecting the charging leads
- > Always use eye protection and protective clothing



**Emission of Gases**

Hydrogen gas emitted during charging is explosive at concentration levels above 4%.

These gases may also be emitted at other times, for example, if the battery is moved or shaken.

- > Always remove metal jewellery
- > Never place tools or metal objects near to or on top of a battery
- > Before disconnecting the battery switch off all electrical loads
- > Make the first disconnection and the last reconnection the earth point as far from the battery as possible
- > Always take great care to avoid shorting the live terminal to earth

**Common battery symbols and their meanings:**

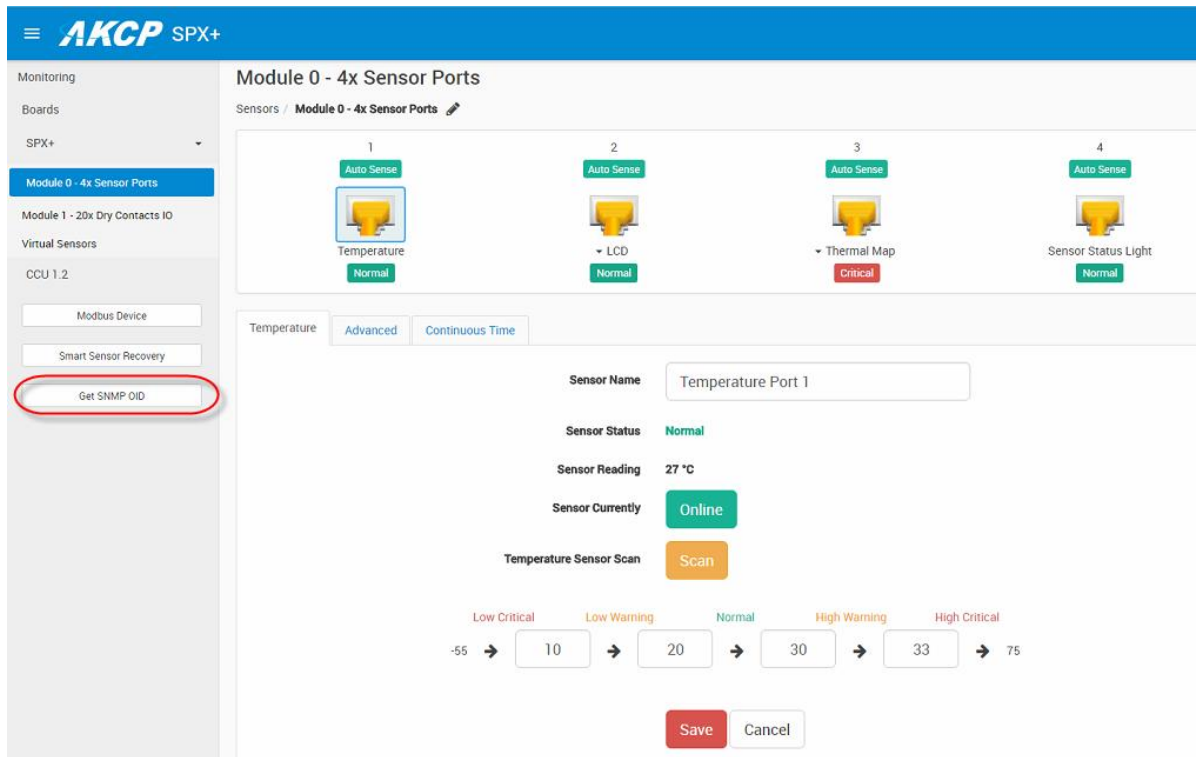
				
Note operating instructions	Shield eyes - eye protection must be worn	Keep away from children	Battery acid - corrosive and poisonous	No smoking - no naked flames - no sparks
	<b>Pb</b>			
Explosive gases	Contains lead	Never dispose of as domestic waste - take to a designated waste reclamation site		Battery is recyclable - follow local recycling & reclaiming procedures

AKCP is not responsible for any problems or injury caused by the misuse, abuse, incorrect installation of any battery, or failure to comply with the above warnings and guidelines.

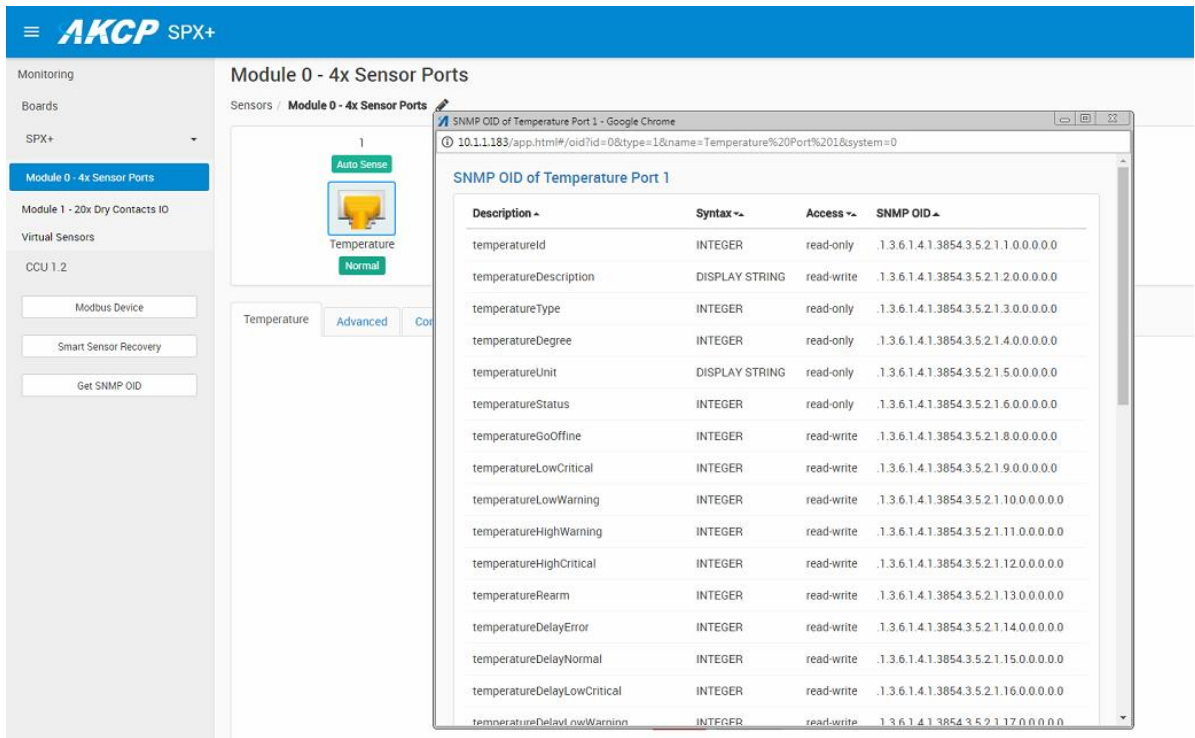
## Battery Temperature Sensor OID

A commonly used SNMP OID for the temperature sensor is the number of degrees. This information can be used for graphing the sensor.

The SNMP OID for the temperature sensor degrees on RJ45#1:  
**.1.3.6.1.4.1.3854.1.2.2.1.16.1.3.0**



By using the GET SNMP OID button shown in the above screen shot allows you to view all of the Temperature sensors OID's as shown in the screen shot below. This feature is only available on the SP+, SEC+ and securityProbe base units.



The screen shot above shows the results of the GET SNMP OID feature for the Temperature Sensor connected to port #1 of the SPX+ unit.

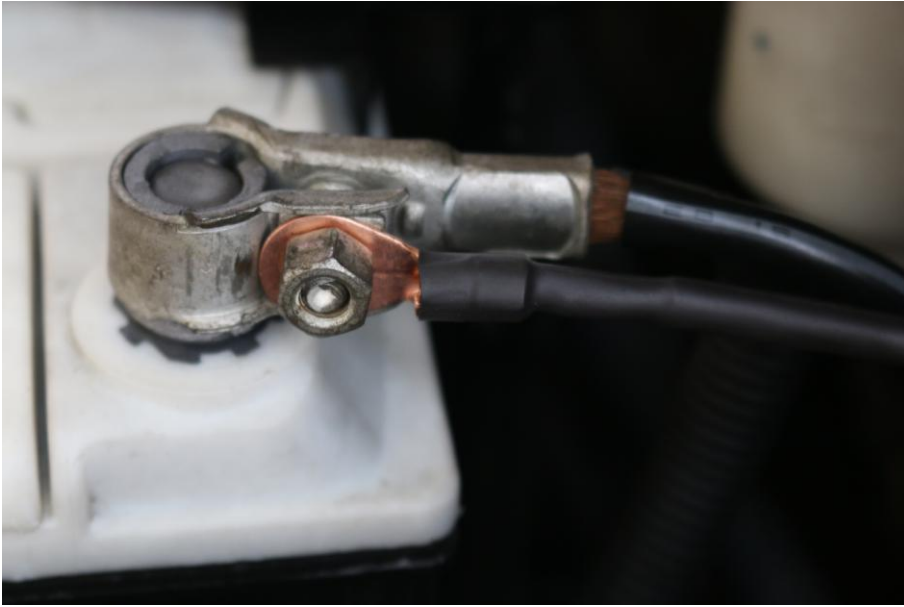


## Installation and Connection of the sensor

Below you'll see an example about how this sensor could be installed on a car's battery.







The sensor is connected to the battery's negative terminal, where the temperature can be most accurately measured.



In the image above you can see how the sensor is installed on the negative terminal of the car battery by first removing the nut from the battery terminal inserting the sensor connector onto the bolt of the battery terminal connector, then installing the nut back onto the terminal bolt.

The nut needs to be tightened down to insure the connection is tight and cannot become loose during any vibration which could cause the sensor to not function properly.

The RJ-45 end of the Battery Temp Sensor then will connect to the sensor port on the AKCP base unit

## Configuring the Battery Temperature Sensor

- 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 unit's 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.*

**Current Reading:** The number of Degrees is displayed in this read-only field. This is an integer SNMP OID field which has a precision of 1 degree. The value can be polled via SNMP, and the data can be used to graph the temperature variations. The value displayed can be in Fahrenheit or Celsius. If communication to the temperature sensor is lost, the sensor value -512 will be returned by a *snmpget*.



*Hint: The actual precision for the temperature sensor is 0.9°F (0.5°C). Nevertheless, the Current Reading field only displays the temperature with an increment/decrement of 1 degree. To retrieve the actual reading from the temperature sensor, another SNMP OID must be used; it is:*

***.1.3.6.1.4.1.3854.1.2.2.1.16.1.14.0*** for the sensor on RJ45#1.

*However, since this is an integer SNMP OID, the temperature must be multiplied by 10 before polled via SNMP. Therefore, the returned value has to be divided by 10 to become the actual temperature.*

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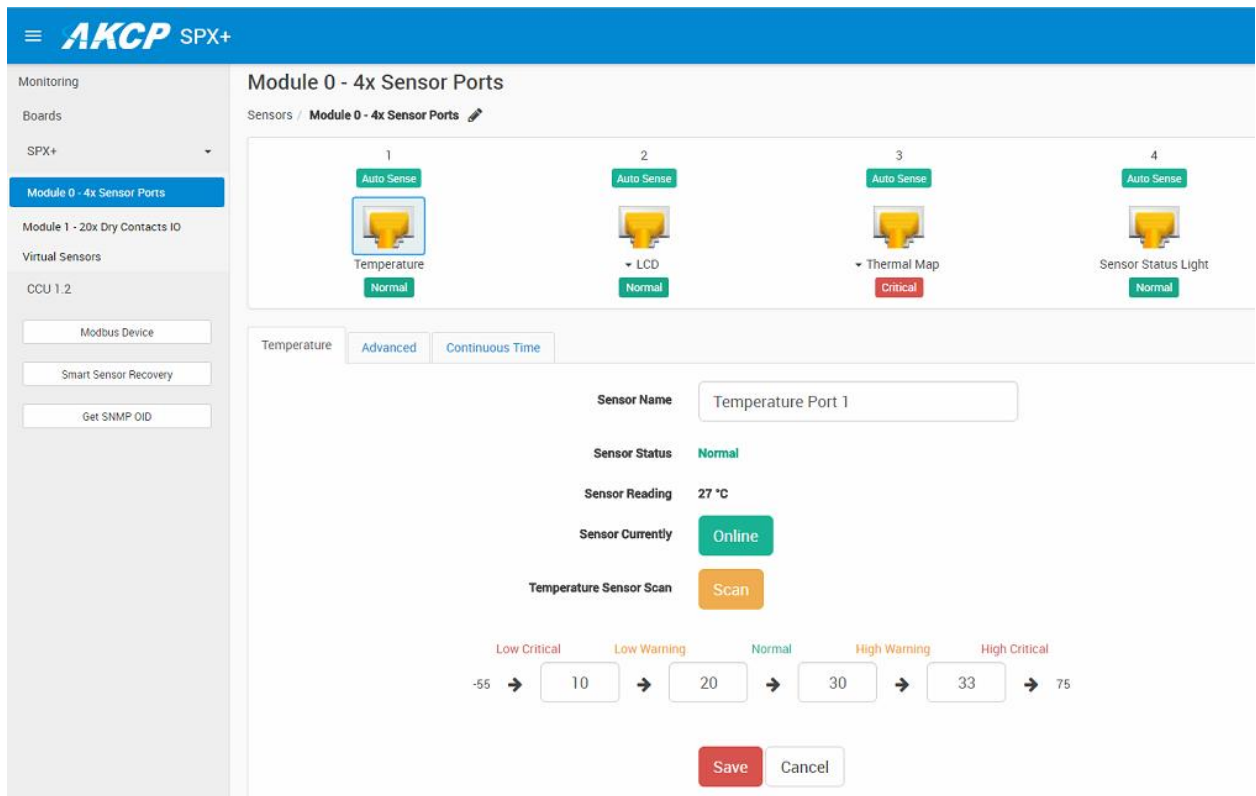
**Status:** If at any time communications with the temperature sensor are lost, the status of the temperature sensor is changed to sensorError. If communications with the temperature sensor are re-established the status will be formed by comparing the Degree to the high and low thresholds.

**Degree Type:** The Degree Type can be set to Fahrenheit or Celsius. When the Degree Type is changed all the threshold fields will change their values automatically. The securityProbe stores the thresholds for both Celsius and Fahrenheit independently allowing you to switch between the two.

**Reading Offset:** The Reading Offset parameter can be used to calibrate temperature and humidity sensors. If for example the actual reading of a sensor is 28 degrees Celsius and the Reading Offset is set to 2 the temperature will be displayed as 30 degrees Celsius.

Usually these settings can be configured on the Advanced tab of the sensor's settings.

## Examples of the Battery Temperature sensor in the Web UI



The screen shot above shows the sensor settings in the SPX+ web UI as an example. Please refer to the SP+ base units product manuals for more details.

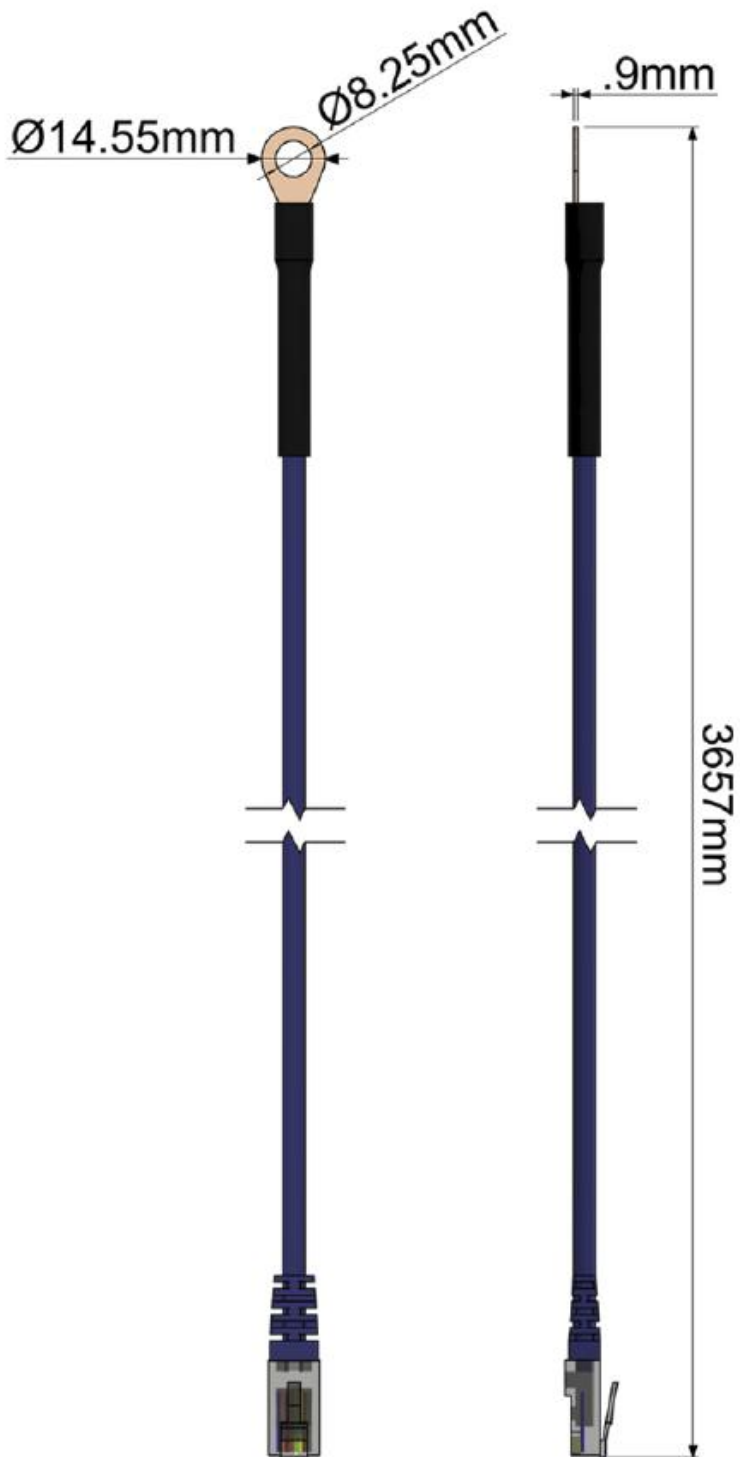


The screenshot shows the 'Online Status of Sensors' page. At the top, it displays 'AKCP sensorProbe2 v 2.0' and 'Admin Log Off'. Below the header, there are navigation tabs for Summary, Sensors, Traps, Mail, Network, System, and Help. The 'Sensors' tab is active, showing a table with columns: Port, Type, Description, Reading, Status, Action, and Graph. The table contains two rows: Port 1 with Humidity (74 %) and Temperature (25 °C) sensors, and Port 2 with a Relay sensor. The Humidity status is 'Warning' and the Temperature status is 'Normal'. Below the table is a 'Sys Log (0 messages)' section with a list of log entries (1-10) and navigation buttons: '< Prev', 'Oldest', 'Newest', 'Next >'.

The screenshot shows the 'Sensor Settings' page for 'Temperature (Temperature1 Description) on Port 1'. The left sidebar contains a tree view of sensor categories: Environmental (Temperature, Humidity, Liquid Detector, Airflow Sensor), Contacts & Drivers (Dry Contacts & Drivers, 4-20 mAmp, Dry Contacts (3--12)), Power (AC Voltage Detector, DC Voltage Sensor), Security Sensor (Security, Motion Detector), Alarm Security (Siren & Strobe Light), and Autosense. The main content area shows settings for Port 1: Description (Temperature1 Description), Current Reading (26 °C), Status (Normal), Sensor Online/Offline (Online), Go Online/Offline (Online), Critical High (35), Warning High (28), Warning Low (15), Critical Low (13), and Rearm (2). There are 'Save' and 'Reset' buttons. At the bottom, there are settings for Units (Celsius) and Reading Offset (0), also with 'Save' and 'Reset' buttons.

The above two screen shots shows the SP2 base unit with a dual Temperature / Humidity sensor connected, and the sensor settings. Please refer to the sensorProbe base units product manual for more details.

If you connect the Battery Temperature sensor, it will only be shown as a single Temperature sensor.

**Technical drawing**



## Technical specifications

<b>Measurements range Celsius</b>	-55°C to +75°C
<b>Measurement resolution Celsius</b>	1°C for the sensorProbes and 0.5°C for the securityProbe units.
<b>Measurement accuracy Celsius</b>	+/-0.5°C accuracy from -10°C to +75°C
<b>Measurement range Fahrenheit</b>	-67°F to +167°F
<b>Measurement resolution Fahrenheit</b>	1°F for the sensorProbes and 0.9°F for the securityProbe units.
<b>Measurement accuracy Fahrenheit</b>	+/-0.9°F accuracy from +14°F to +167°F
<b>Tube Material</b>	Stainless Steel
<b>Communications Cable</b>	RJ45 jack to temperature sensor using UTP Cat 5 wire
<b>Sensor Type</b>	Semiconductor microprocessor controlled
<b>Power Source</b>	Powered by the base unit. No additional power needed.
<b>Power Consumption</b>	Typical 10.70 mWatt, 2.14mA sensorProbe auto detects the presence of the temperature sensor.



<b>Measurement Rate</b>	One reading every second Up to 2 temperature sensors per sensorProbe2, 8 per sensorProbe8. You can connect up to 8 on the securityProbe main unit and 8 more on each E-sensor8 expansion module.
<b>Temperature Description OID</b>	.1.3.6.1.4.1.3854.1.2.2.1.16.1.1.<port>
<b>Temperature Status OID</b>	.1.3.6.1.4.1.3854.1.2.2.1.16.1.4.<port>
<b>Temperature Degrees OID</b>	.1.3.6.1.4.1.3854.1.2.2.1.16.1.3.<port>

**This concludes the Battery Temperature Sensor Manual.**

Please contact [support@akcp.com](mailto:support@akcp.com) if you have any further technical questions or problems.

**Thanks for Choosing AKCP!**