## sensorProbeX+ (SPX+)

# Customizable Modular Design



Select from a standard configuration, or build your own customized monitoring solution. Choose a mounting options to suit your installation, whether it be 1U, 0U rack mounting, or DIN rail. Optional modules, internal DC power supply, PoE and Cellular modem can be selected depending on your requirements.



SPX+ is compatible with all AKCP sensors, including the latest "smart sensors" such as swing handle locks, cabinet thermal maps, LCD display and battery monitoring sensors.

Every SPX+ features an EXP port, which functions as an RS485 Modbus port as well as connecting with AKCP Expansion modules.

A Basic Expansion Bus (BEB) port expands to additional SPX+ modules. A maximum of 4x BEB units can b connected to a single SPX+

Monitor multiple SPX+ units from AKCPro Server for centralized monitoring and management of all devices.

# SPX+ - Modules

## MCU

The MCU Module is the core of the SPX+. A mandatory module it forms the base configuration of every unit. 4x intelligent sensor ports, Ethernet and a dual purpose Expansion (EXP) port for Modbus RS485 communications, or connection to AKCP Expansion. Basic Expansion Bus (BEB) port connects the SPX+ to SPX+ basic expansion units comprised of additional SPX+ modules.
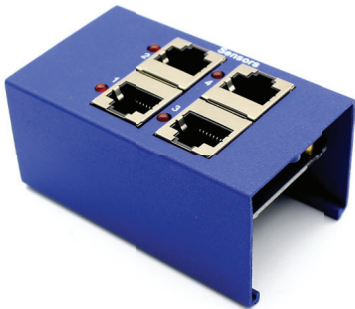
## sensor4

sensor4 modules give additional intelligent sensor ports, allowing you to build your SPX+ to your requirements. Connect a wide range of intelligent sensors and smartRack sensors such as Cabinet Thermal Maps, Programmable LCD Display and RFID Swing Handle Locks.
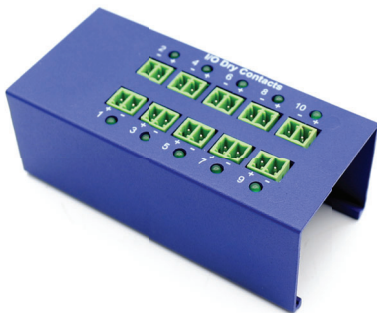
## Dry Contacts

Dry contact modules can be added in x10 and x20 blocks. The dry contacts can be ordered as I/O, isolated input only (internal 5V) and isolated input only (external 5-20V). Dry contacts can be used to monitor a variety of third party devices and alarm panels
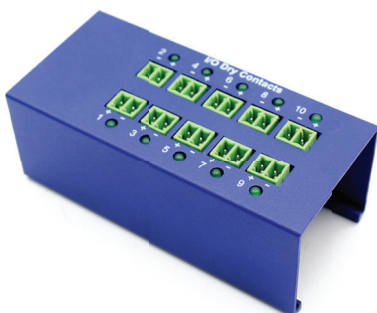
## AC Voltage Detection

Monitor 10x or 20x AC Voltage inputs, detect if circuits are energized or not. This module does not give a votlage reading, only the presence or absence of AC Voltage. Voltage range is 5-30ACV @ 44mA.

# SPX+ - Modules
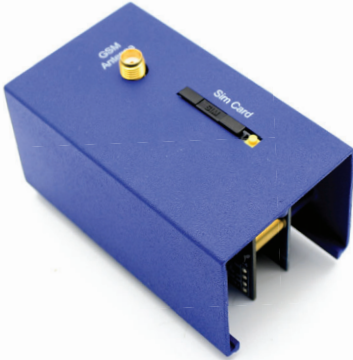
## Cellular Data Modem / GPS

4G Cellular Data Modem module gives a primary or backup method of communication. Send SMS and e-mail alerts directly from the device through the cell network. Ideal for remote site locations and those with unreliable DSL connection.
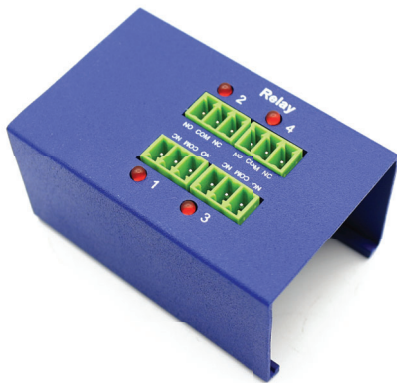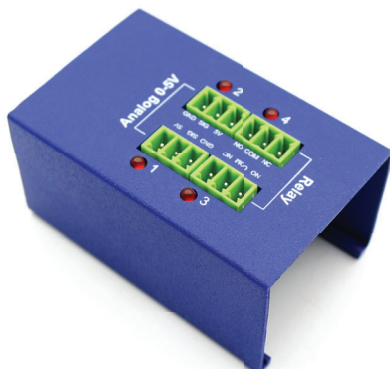
## 4x Mini Relays

This module includes 4x mini DC relays. Use them to switch on/off low current devices directly, or use them to drive larger relays. Ideal for systems and control, building and industrial automation.
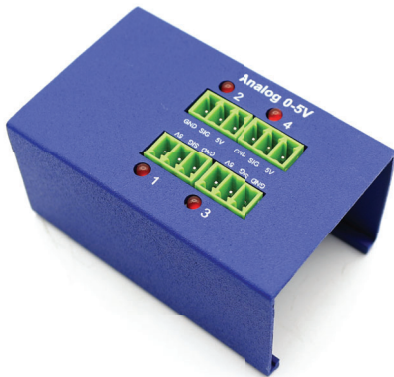
## 4x Analog to Digital Inputs

This module is ideal for connecting third party analog sensors with a 0-5VDC or 4-20mAmp scale output. Many industrial sensors are available with this scale output, opening up the possibilities of monitoring many different sensors not provided by AKCP.

## 2x Mini Relays & 2x Analog Inputs

This module is a combination of the above modules, with 2x relays and 2x 0-5VDC or 4-20mA analog sensor inputs.

# SPX+ - Modules

## Valve Control Module

If you have DC motors or electronically controlled ball valves which require polarity reversal to turn in the opposite direction, this module is applicable. Ideal for water irrigation or industrial applications which require valve and motor controls.

## Internal Mini UPS

This module is useful in situations where the SPX+ may face power outages. An internal battery backup using 4x AA batteries can power the SPX+ for several hours (depending on sensors connected, alerts generated etc). This is ample time to be able to continue to send alerts, and most importantly notify you of the power situation so the main power can be restored.

Ideally combined with the internal cellular data modem, SMS alerts can be sent even if the rest of your network is down.

| Mounting | Internal |
|---|---|
| Power | Input Voltage 5.5V<br><br>4x AA NimH batteries |
| Charger | Slow Charge circuit for long lasting batteries |
| Status Indication | Red LED indication for On Battery Status<br>Green LED indication for charging status |
| Components | Manufactured using highly integrated, low power surface mount technology to ensure long term reliability. |
| Operating Environment | Temperature : Min. -35° C – Max.80° C<br>Humidity: Min. 20% – Max. 80% (Non-Condensing) |
| MTBF | 1,400,000 Hours based on field experience with sensorProbe units. |
| Other | For SPX+ series only |

## Online Configuration

Customize your SPX+ with our online configuration tool, graphically build up your device with the modules you need and submit for quotation.

## SPX+ - Expansion

# Basic Expansion Bus (BEB)

Using an SPX+ Master with BEB, together with SPX+ Basic Expansion Bus devices, you can increase the number of sensor ports, and dry contacts available. Recommended for use over a short distance , within the same cabinet only, it provides a cost effective way to expand your system. The maximum distance from the SPX+ Master to the last unit in the chain is 10 meters.

4x BEB - Max total cable length 10 meters
3x BEB - Max total cable length 18 meters (3x 6m)
2x BEB - Max total length 20 meters (2x 10m)
1x BEB - Max total length 20 meters (1x 20m)



**Max 20 meters**

# RS485 Expansion (EXP)

Using an SPX+ Master with EXP, together with EXP units you can add dry contacts and sensor ports to your system, with the ability to place the units up to 300 meters (1,000ft) away from each other. Supported EXP devices are the E-Sensor8 and E-Opto16 Expansion units.



Max 300 Meters — EXP Unit — Max 300 Meters — EXP Unit

## SPX+ - Dual Power Inputs

### Dual Power Inputs

The SPX+ is available with an internal 12-24 VDC or 48-60 VDC power supply. This power supply features dual inputs with redundant fail-over. Ideal for telecoms where DC power is available directly in the cabinets.

It can also be utilized in a data center with a dual PDU setup. Connect the 220VAC-12VDC power adapters to the separate AC power sources, and the output of the 12VDC adapters to the SPX+.

If the SPX+ features the Power over Ethernet (PoE) option, this can also be used as a redundant power input. If the power source to the DC jack is interrupted the SPX+ will switch to the PoE source.
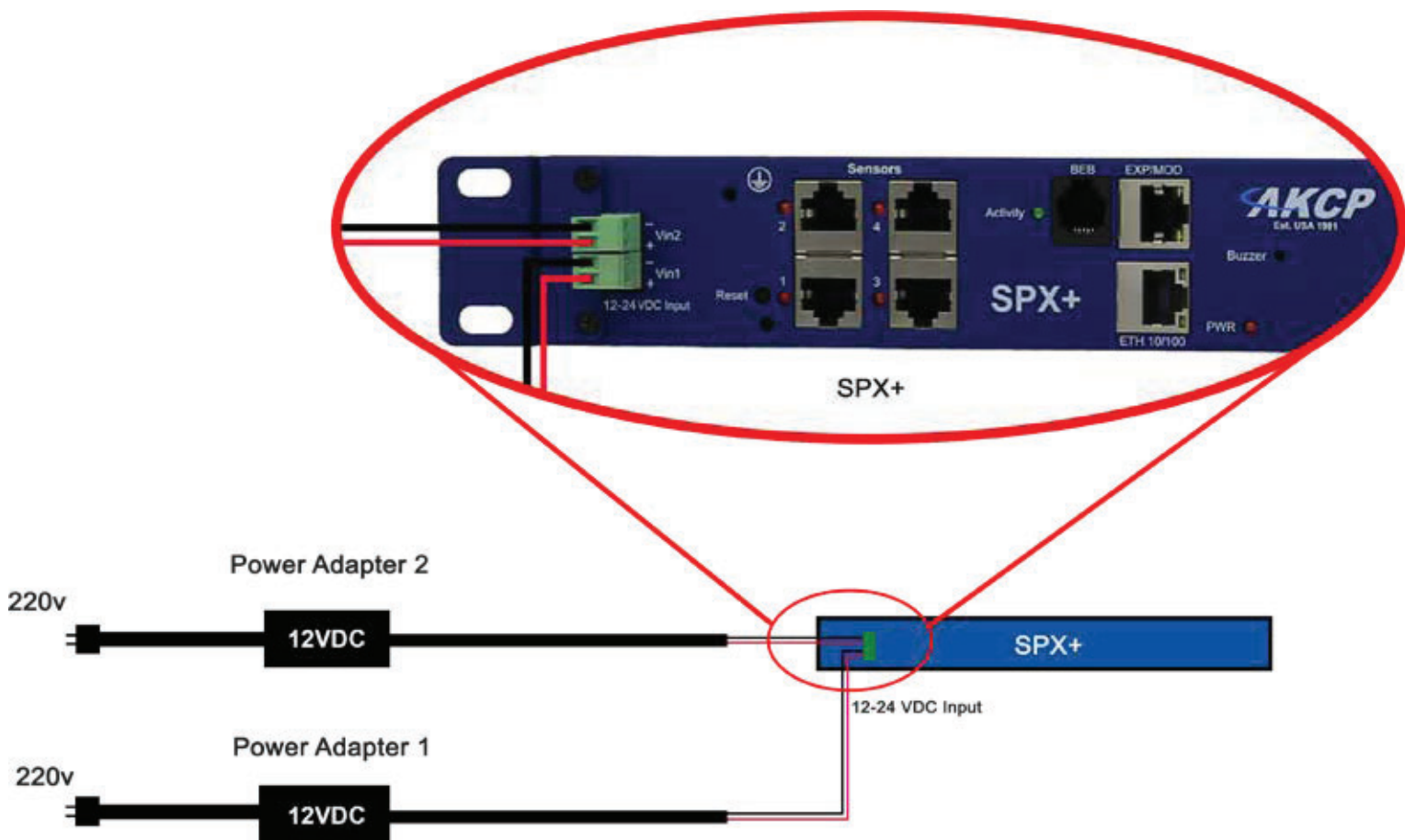


The dual DC inputs are also available as an external converter under product codes DCW024-5 and DCW048-5

# SPX+ Technical Specification

| | |
|---|---|
| **Dimension** | 44 (W) x 44 (H) low profile design |
| **Expansion Port *** | EXP port connecting EXP Remote Units<br>BEB port for connecting SPX+ BEB Remote Units |
| **Mounting** | 0U Toolless rack mount, optional wall mount brackets, horizontal 1U mounting or DIN rail brackets. |
| **Power** | External 5.5V 3A Power Adapter<br>Input Voltage and Current ratings : 100V~240V - 0.22A<br>Options:<br>Power over Ethernet (PoE)<br>Dual 12-24VDC internal power supply<br>Dual 40-60 VDC internal power supply |
| **Status Indication** | LED indication for power<br>LED for network connectivity<br>LED for sensor online and threshold status<br>Internal Buzzer for audible alerts |
| **Components** | Manufactured using highly integrated, low power surface mount technology to ensure long term reliability. |
| **Operating Environment** | Temperature : Min. -35° C – Max.80° C<br>Humidity: Min. 20% – Max. 80% (Non-Condensing) |
| **MTBF** | 1,400,000 Hours based on field experience with sensorProbe units. |
| **Base Unit** | 4x Sensor Ports for connecting AKCP sensors<br>1x Expansion Out or Modbus RS-485 Port  (supports up to 4 CCU, E-Sensor8 or E-Opto16)<br>1x Basic Expansion Bus Port (BEB)<br>1x 10/100 Mbps Ethernet Port |
| **Max Sensors** | Maximum of 150 onlined sensors, including Expansion Units and virtual sensors. |
| **SPX+ Modules** | – 4x Sensor Ports module for connecting AKCP sensors or swing handle cabinet locks<br>– 10x or 20x Dry Contacts module, 3 configurations :<br>  + Configurable Input / Output dry Contact (0VDC/5VDC)<br>  + Input only 5V Dry Contact, opto-coupled input<br>  + Isolated input Dry Contact, from 5V to 20V voltage input signal<br>  + Isolated AC Detection input 5-30ACV @44mA<br>- 4x Mini relays for driving larger relays<br>- 4x 0-5VDC / 4-20mA input for third party sensors<br>- 2x 0-5VDC / 4-20mA input for third party sensors with 2x Mini relays<br>- Valve controller module |
| **Optional** | Internal mini UPS, 4x AA rechargeable batteries<br>Internal 40-60V DC power supply<br>4G Cellular data modem with external antenna<br>Power over Ethernet (PoE)<br>Internal DC Power Supply |
| **Maximum Number of Access Control Users** | 500 Users<br>100 Users default |
| **Supported Protocols** | Rsyslog<br>MQTT / MQTTS<br>SNMP V1/2<br>IPV6<br>RADIUS<br>TACACS<br>HTTPS<br>Encrypted E-mail |
| **Licensing** | |
| **Virtual Private Network (VPN) : VP** | VPN - Connect to AKCPro Server from your base unit through VPN over Ethernet or cellular network. |
| **Virtual Sensor pack : VS** | Virtual sensor (pack of 5 sensors). Maximum of 80 virtual sensors. * **<br>Every SP2+ comes with 5 free virtual sensors |
| **3rd Party PMS & Modbus : PM** | 3rd Party Modbus / PMS device.<br>Up to 4 modbus devices with 15 sensors.* ** |
| **500 Access Control user database : UA** | 500 users for access control (SP+ series has 100 users as standard) |
| **IPV6 : SP-IPV6** | Support for IPV6 network addresses |
| **Radius : RAD** | Radius user authentication server connection. TACACS authentication to Radius. |
| **Important Notes** | * the sensorProbe+ units can only have 60 Modbus RS485 sensors (virtual sensor + modbus devices)<br>** the sensorProbe+ units can only have 60 Modbus TCP/IP sensors (virtual sensor + modbus devices) |

# SP+ 4G Modem (M4E / M4U) - Technical Specification

| | |
|---|---|
| **Frequencies** | EU model :<br>• LTE-TDD B38/B40/B41<br>• LTE-FDD B1/B3/B5/B7/B8/B20<br>• UMTS/HSPA+ B1/B5/B8<br>• GSM/GPRS/EDGE B3/B8<br>US model :<br>• LTE-FDD B2/B4/B12<br>• UMTS/HSPA+ B2/B5 |
| **Category** | CAT1 |
| **Data Transmission** | HSPA+: up to 5.76 Mbps(UL), 42 Mbps(DL)<br>LTE Category 1: up to 5 Mbps (UL), 10 Mbps (DL) |
| **Transmitting Power** | WCDMA: Class 3 (0.25W)<br>LTE: Class 3 (0.25W) |
| | |
| **Features** | SMS<br>Telephone Call with Text to Speech<br>Internet (PPP) : email, VPN, cloud<br>Optional GPS *<br>+ GNSS: GPS/GLONASS/Beidou/Galileo<br>+ GPS active antenna provided |
| | |
| **SIM card** | Standard SIM card size<br>Support SAT class 3, GSM 11.14 Release 98 |
| **Antenna** | 3m External Antenna |
| | |
| **Components** | Manufactured using highly integrated, low power surface mount technology to ensure long term reliability. |
| **Operating Environment** | Temperature : Min. -20° C – Max.70° C<br>Humidity: Min. 20% – Max. 80% (Non-Condensing) |
| **Certification** | EU Version :<br>• CE-RED<br>• IMDA<br>• GCF<br>• RoHS<br>• REACH<br>US Version :<br>• FCC<br>• PTCRB<br>• IC<br>• RoHS<br>• REACH |
| **Carrier certification** | EU version :<br>• Deutsche Telekom / Vodafone<br>US version :<br>• AT&T / Rogers |
| **Important Note** | This modem will support telephone call text to speech and GPS in future releases<br>* GPS support on SP2+ and WTG only |

# SPX+ Technical Drawing

## SPX+ Standard Configurations

### SPX4
SPX with 4 sensor ports
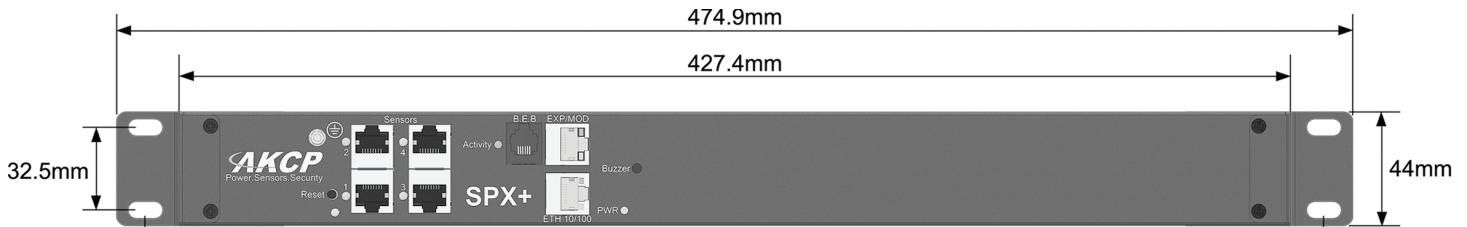


### SPX8
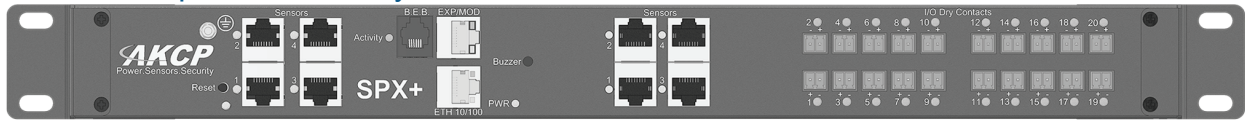SPX with 8 sensor ports
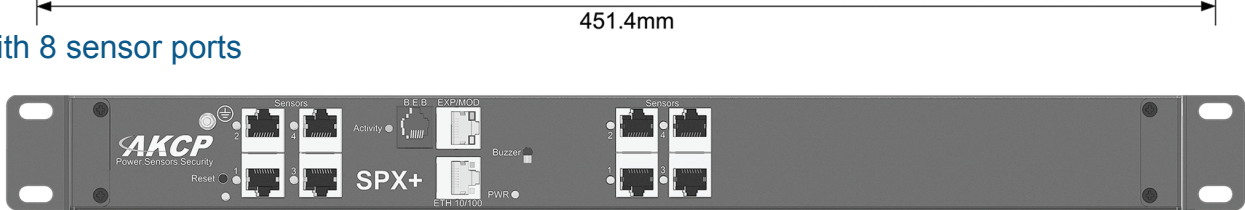


### SPX4-X10
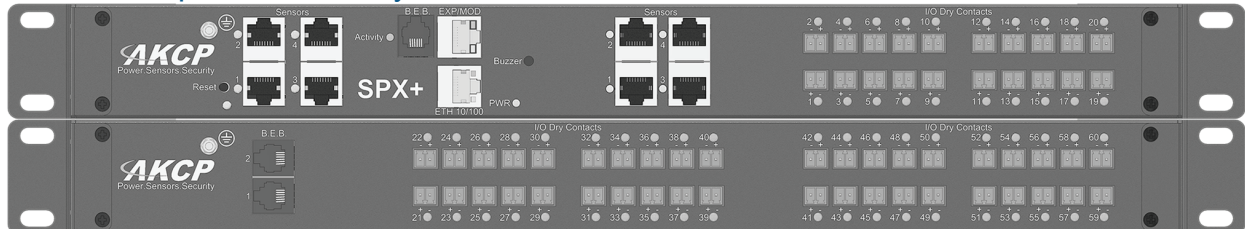SPX with 4 sensor ports and 10 dry contacts



### SPX8-X20
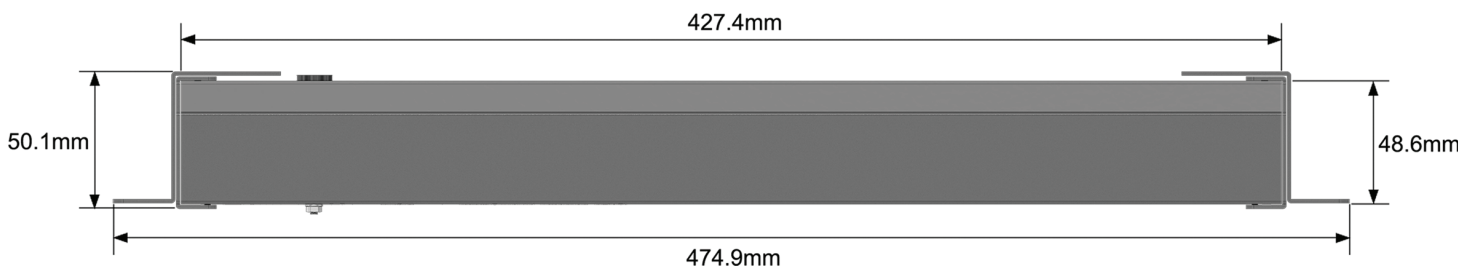SPX with 8 sensor ports and 20 dry contacts



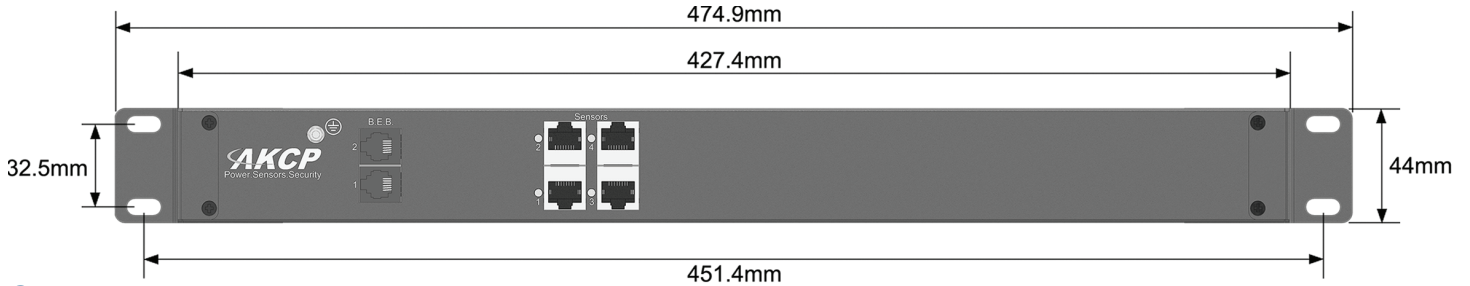### SPX8-X60
SPX with 8 sensor ports and 60 dry contacts



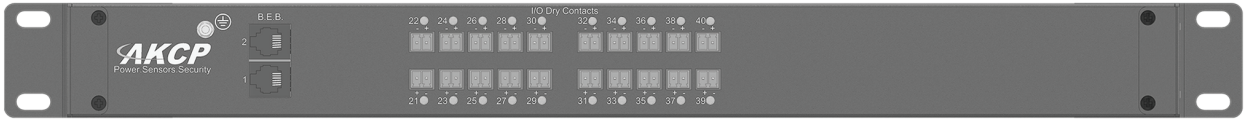*Top View*

# SPX+ Technical Drawing

## Standard BEB Configurations
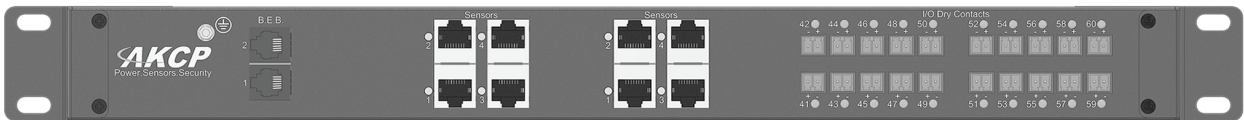
### SPXB4
SPX BEB with 4 sensor ports



### SPXB-X20
SPX BEB with 20 dry contacts



### SPXB8-X20
SPX BEB with 8 sensor ports and 20 dry contacts



### SPXB16
SPX BEB with 16 sensor ports
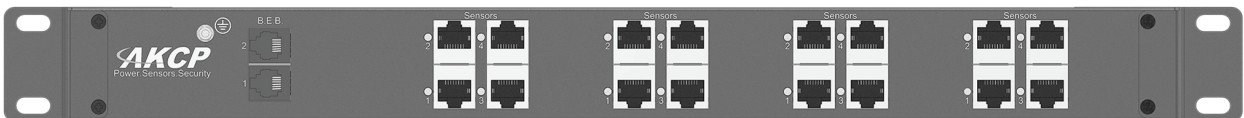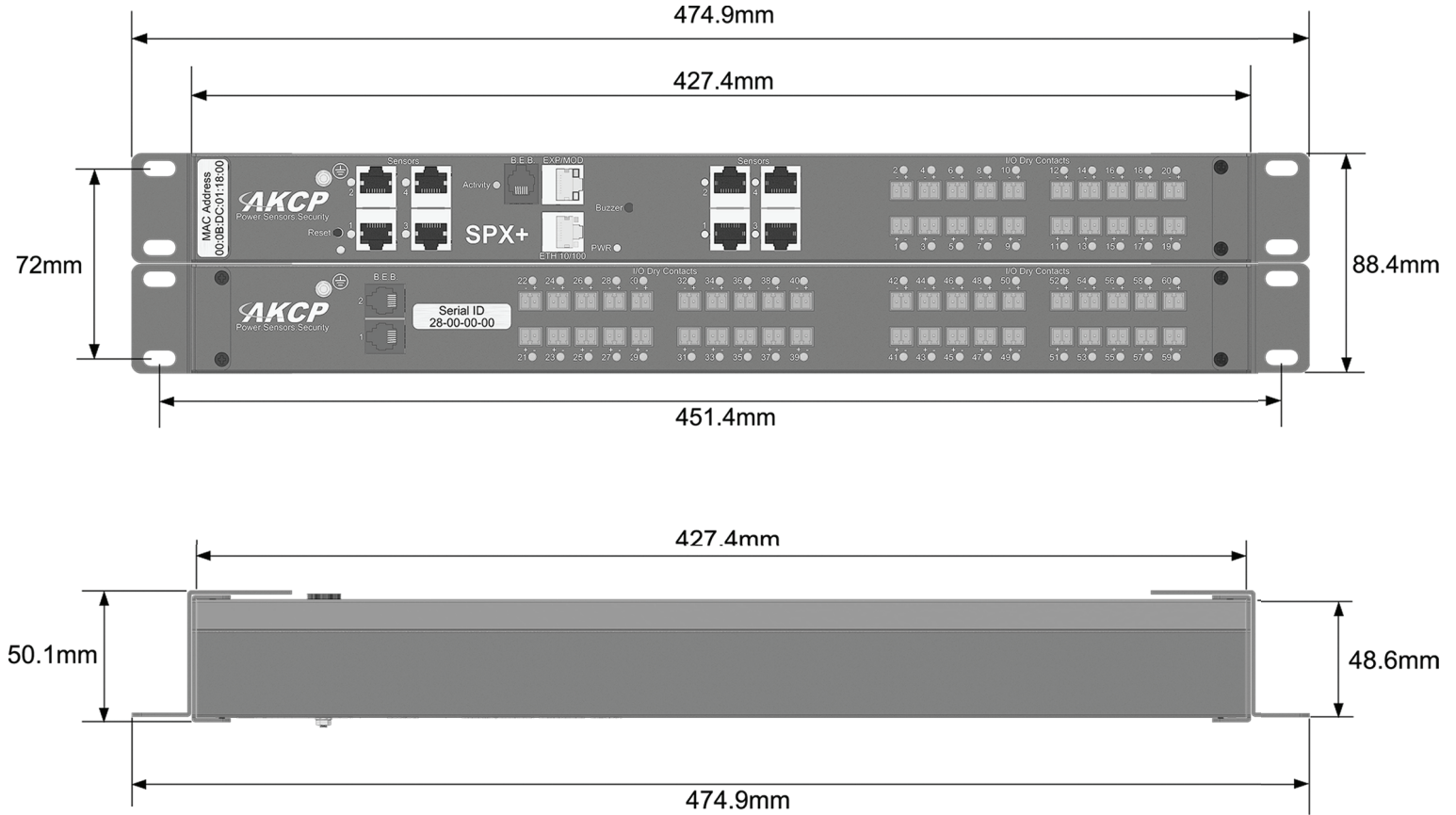


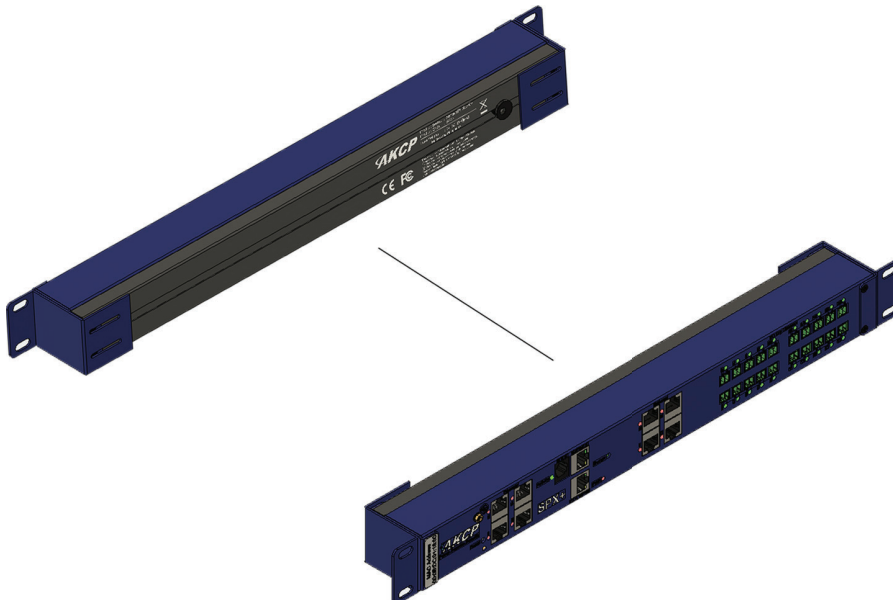### SPXB-X40
SPX BEB with 40 dry contacts
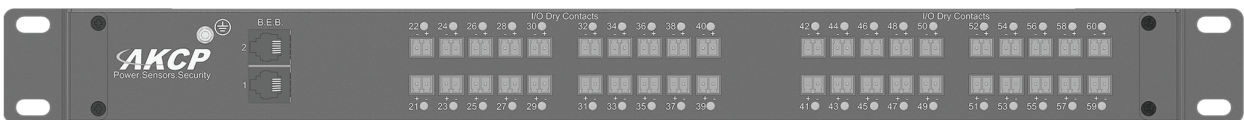


*Top View*
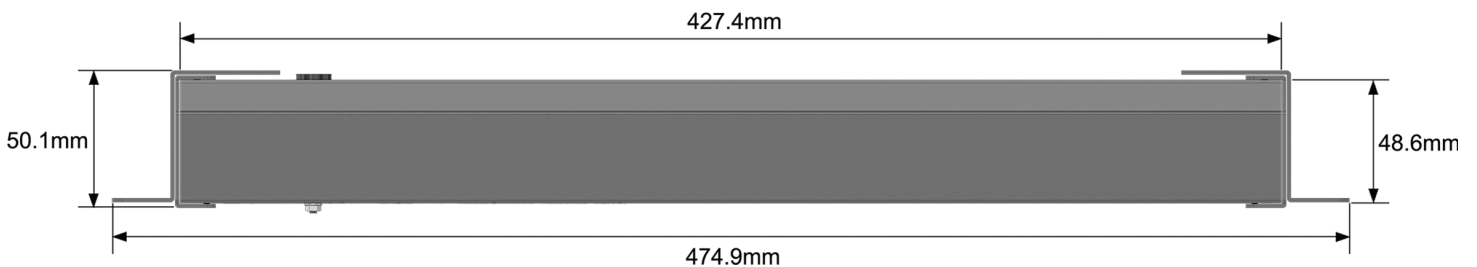
# SPX+ Technical Drawing

## SPX8-X60

SPX8-X60 is a 2U device, comprised of an SPX+ with BEB unit. This can be mounted in 2 seperate U's, or back to back in the same U as illustrated below.
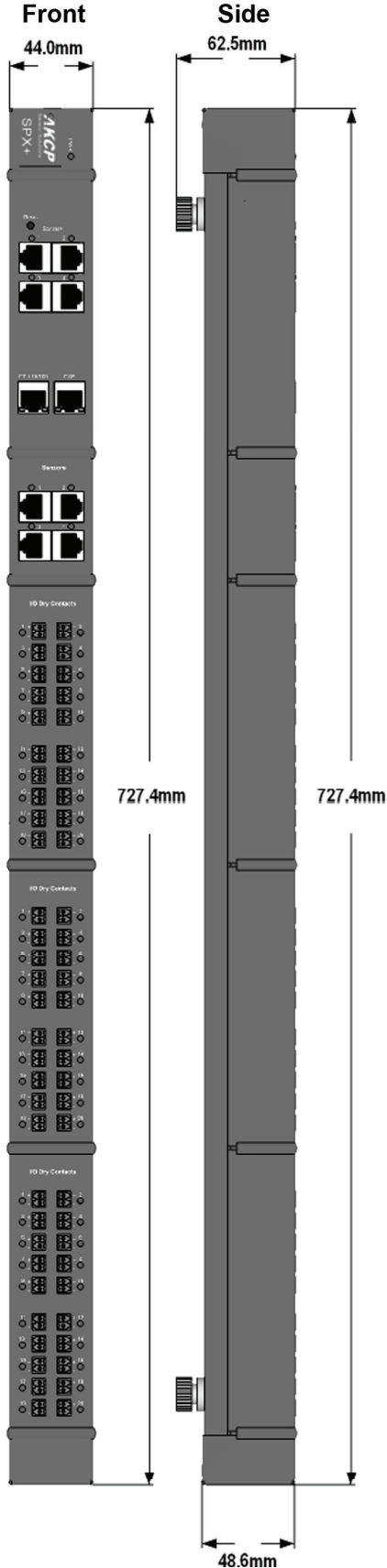




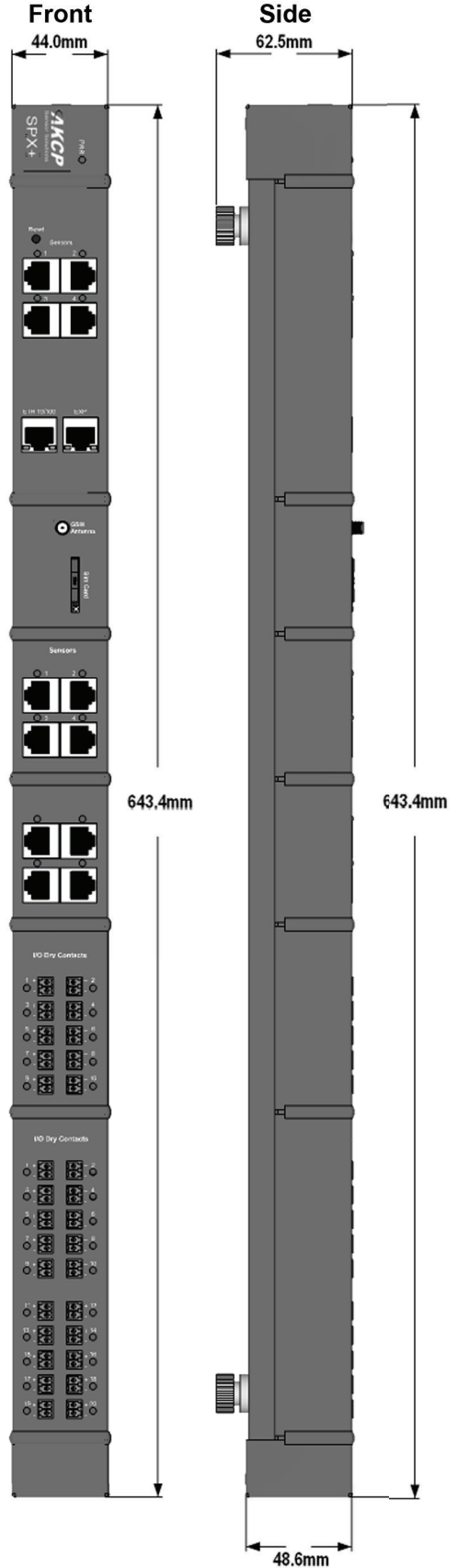*1U mounting of SPX8-X60 at front and rear of cabinet*

# SPX+ Technical Drawing

### 0U SPX+ with 60x dry contacts
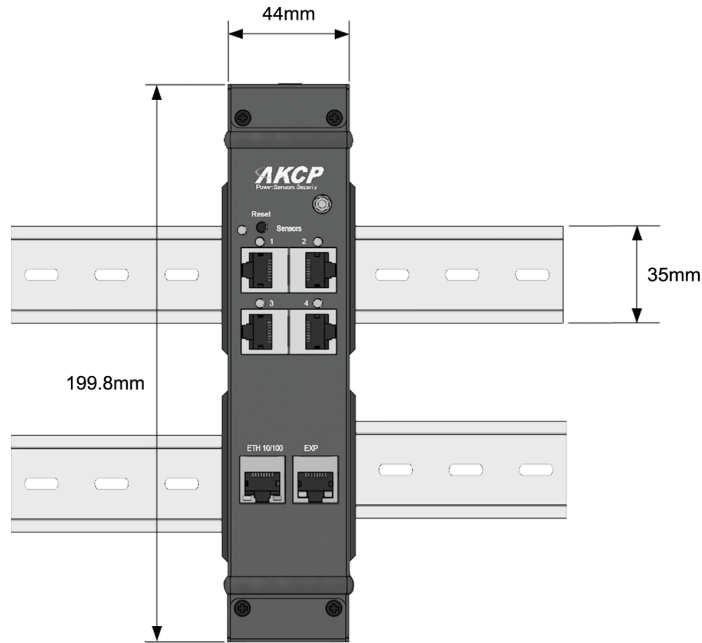(configured as input only, I/O or opto isolated).



### 0U SPX+ with 12x sensor ports and 30x dry
contacts (configured as input only, I/O or opto isolated).

# SPX+ Technical Drawing

## 0U SPX+ with DIN rail mounting

44mm

35mm

199.8mm

## 0U SPX+ with internal modem & DIN rail mounting

44mm

35mm

278mm