



SMT-C22 – Wireless Data Acquisition Unit

General Description

The SMT-C22 Cellular Data Acquisition unit is a multi-channel high precision measurement device designed to interface with a variety of different building sensors.

The sleek design of the SMT-C22 allows it to be installed in virtually any environment imaginable. The SMT-C22 seamlessly attaches to a double gang junction box or NEMA shell and supports up to four external sensors.

The 24-bit A/D and cellular network are ideal for building monitoring in both new construction and retrofit work, provided the unit is not encased in metal, glass, or concrete to any significant degree, the cellular signal will reach our cloud.

The C22 comes stock with integrated RH & Temperature.

Applications

- Remote sensor analysis and data collection
- High precision data acquisition
- Building science research
- Targeted repair monitoring
- Construction monitoring without electrical or wireless infrastructure

Features

- Integrated relative humidity and temperature sensors.
- Supports 2 external resistance channels capable of reading wide moisture content ranges
- Two universal channels configurable for either resistance or voltage-based external sensors. Supports up to 2 0-5V sensors such as RH, pressure differential, LVDT, displacement, light sensors and more.
- Sensors are installed using a two-part terminal block permitting sensor lengths to be cut to their appropriate lengths and terminated prior to installing electronics.
- The unit will connect to the cellular network once per day to transmit the data collected, which will come from samples taken every at the sample rate the project may require.
- There is no user interface, the device is preconfigured from the factory and only needs to be installed on site. All interactions, alarms, & reporting will come from the Analytics online portal.
- Communicates to SMT Building Analytics

Electrical Performance
Wireless U260

Specification	3GPP Release 7
Bands	GSM 850 MHz PCS 1900 MHz
Power	Class 4 (33 dBm) for 850 band Class 1 (30 dBm) for 1900 band

U260 compatible countries listed at end of document

Wireless U270

Specification	3GPP Release 7
Bands	E-GSM 900 MHz DCS 1800 MHz
Power	Class 4 (33 dBm) for 900 band Class 1 (30 dBm) for 1800 band

U270 compatible countries listed at end of document

Wi-Fi Photon

Specification	WLAN IEEE 802 11b/g/n
Bands	2.412GHz -- 2.462GHz (United States of America and Canada) 2.412GHz -- 2.472GHz (EU/Japan)
Sub Channels	1 -- 11 (United States of America and Canada) 1 -- 13 (EU/Japan)
Modulation	DSSS, CCK, OFDM, BPSK, QPSK, 16QAM, 64QAM

Battery Typical - (depending on sample rate and ambient temperatures)

Life 1 year (hourly sampling and one cloud sync per day)

Type 6 AA Batteries

Max Voltage 4.8V

Capacity Typical: 16000 mAh
Minimum 4000 mAh

Self Discharge 75% after 3 years

Memory and USB

Memory 1 year at hourly sampling

USB USB 2.0 Interface

Environmental

Operating Temperature	-20° to 60°C / -4° to 140°F
Storage Temperature	-30° to 75°C / -22° to 167°F
Humidity	5% to 95% RH non-condensing
Electrostatic Susceptibility HBM (Human Body Mode)	2kV

Safety/Regulatory

Safety Requirements SELV Separated Extra Low Voltage

Regulatory

Contains FCC ID: XPYSARAU260 (For 3G using the U260 module)

Contains FCC ID: XPYSARAU270 (For 3G using the U270 module)

WLAN
Contains FCC ID: 2AEMI-PHOTON



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Contains IC: 8595A-SARAU260 (For 3G Electron using the U260 module)

Contains IC: 8595A-SARAU270 (For 3G Electron using the U270 module)

WLAN
Contains IC: 20127-PHOTON

Measurement Specifications
Internal Temperature

Sensor	TE Connectivity HTU21D(F)
Range	-40°C to +125°C
Resolution	0.1°C
Accuracy	±1°C

Internal Relative Humidity

Sensor	TE Connectivity HTU21D(F)
Resolution	0.5% RH
Accuracy	±2% RH typ
Hysteresis	±1% RH
Repeatability	±0.5% RH

Resistance Channels 1-2

Range	100KΩ to 1GΩ
Resolution	1KΩ
Accuracy	±5%

Universal Channels 3-4

Range	100Ω to 100MΩ
Resolution	1KΩ
Accuracy	±5%
Range	0V to 5V
Resolution	100mV
Accuracy	±5%

Mechanical

Standard Enclosure

Dimensions	118mm (L) x 90mm (W) x 60mm (H)
Weight	200g
Ratings	IP66
Resistance Port	Two channels Resistance 100Ω to 1GΩ
Universal Port	Two channels Resistance 100Ω to 100M Ω or 5V, GND, Vin

Interface

LEDs	RGB Status
Buttons	Mode/Reset buttons

Specifications are subject to change without notice

Hardware

- The green terminal block connector is removable.
- Press the button with the yellow circle on the cellular engine to read and transmit data. Verify the data by logging into Analytics. You may have to wait 3 to 5 minutes for the data to synchronize and insert into the analytics database.
- **Do not** plug into the USB port with batteries connected. Only certified batteries can be recharged over the USB port. The USB port is also used for upgrades and service.
- Connect the battery to the battery port as indicated in blue.

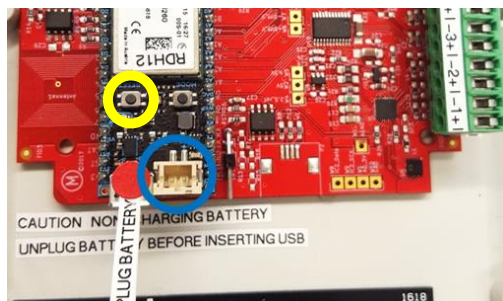


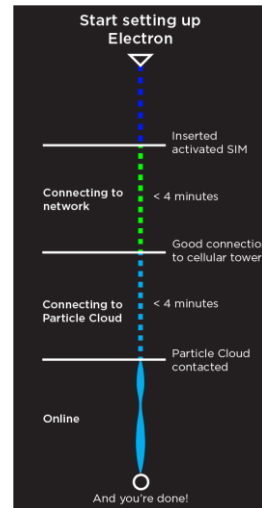
Figure 1. C22 Battery, USB and Button locations

LED Operation

LED operation has two phases:

1. System control: Connecting to Network/Cloud
2. Application control: Taking measurements and transmitting

LED System control:



Connecting (normal):

1. ● Connecting to network
The green LED will flash
2. ● Connecting to cloud
During: Led will flash cyan

Errors:

- ● Blinking Blue: Unable to connect to cell network.

Figure 2. C22 LED Status

LED Application control:

1. Breathing yellow: Taking measurement
2. Solid yellow: Transmitting data to analytics (single or logged reading)
3. Blink green after solid yellow (transmitting)
Transmit success
4. Blink red after solid yellow (transmitting):
Transmit failed

U260 Compatible Countries: United States, Australia, Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Venezuela

U270 Compatible Countries: Austria, Bahrain, Belarus, Belgium, Bulgaria, China, Congo, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Germany, Ghana, Gibraltar, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jersey, Kenya, Republic of Korea, Latvia, Lithuania, Luxembourg, Republic of Macedonia, Malaysia, Republic of Moldova, Republic of Montenegro, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Philippines, Poland, Portugal, Qatar, Reunion, Romania, Russian Federation, Rwanda, Saudi Arabia, Republic of Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Taiwan, United Republic of Tanzania, Thailand, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, Uruguay, Zambia