InetSupervisor™

SO3 I/O Programmable Controller
Multi-Protocol: BACnet/IP and LonWorks

APPLICATIONS

SO3 typical application: Lighting automation

Other applications of the SO and SI line of controllers:

HVAC automation

Industrial automation

OVERVIEW

The S Series are microprocessor based I/O controllers designed to control, optimize and improve energy efficiency of variety of equipment. When used with Rhea programmable BACnetIP router, all controller I/O are freely programmable with the InetSupervisor app. The app is free to use by our customers. The SO3 uses Q-Bus a fully isolated transceiver for best in its class networking over twisted pair of wires. Q-Bus networks are polarity and topology free. The network utilizes open standard BACnet/IP protocol and is encrypted using FIPS grade algorithms.

SO3 features fast response time suitable for lighting, building and lite industrial automation . Large number of up to 30 SO3 controllers can be connected on the Q-BUS sub network, recognized by the programmable host and made available automatically for graphical programming. There are no limits to program length or complexity other than the underlying physical hardware memory.

PRODUCT PART NUMBERS

HW Part Number: **SO3-0.0.6**
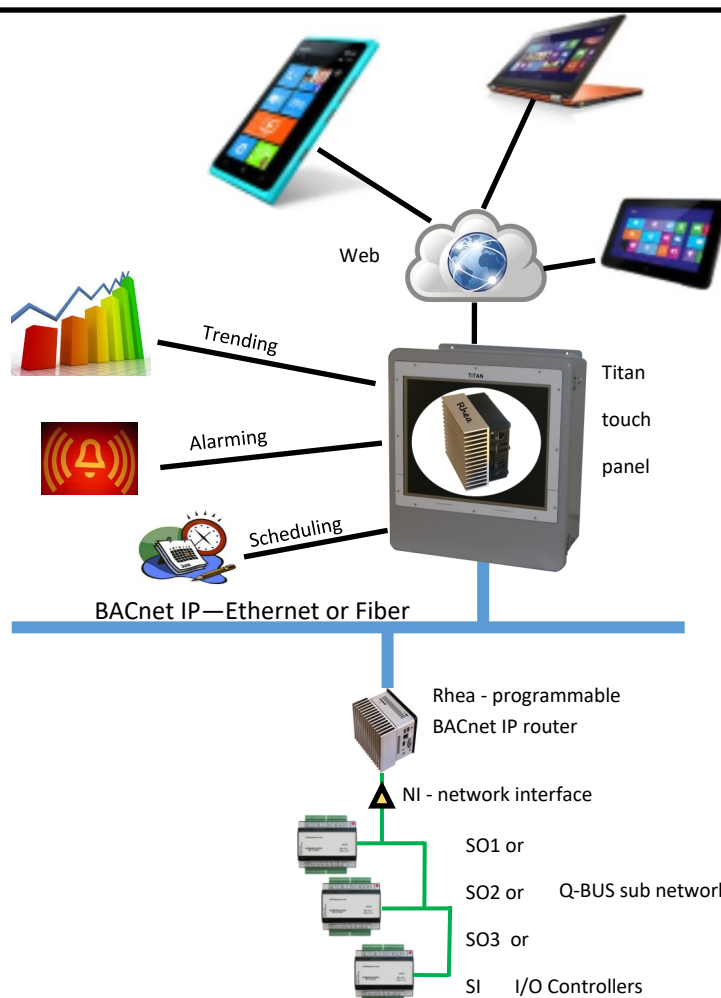
IOT Platform

SO3 is a generic platform of 48V DC devices designed for operation directly on resilient micro-grid. The micro-grid is typically created by combining Photovoltaic Arrays (solar panels) with battery bank and inverters. Inverters may connect the micro-grid with house AC grid. Some of the micro-grid benefits include:

- Resiliency by independence from utility grid and easy battery bank and PV integration.

- Superior efficiency by avoiding multiple voltage translations.

- Future proofing by investing in DC.

- Enlarged profits.

SO3 device can be powered directly from mains by a 48V power supply (recommended Meanwell HLG-600H-54) or be a part of micro-grid as depicted below:
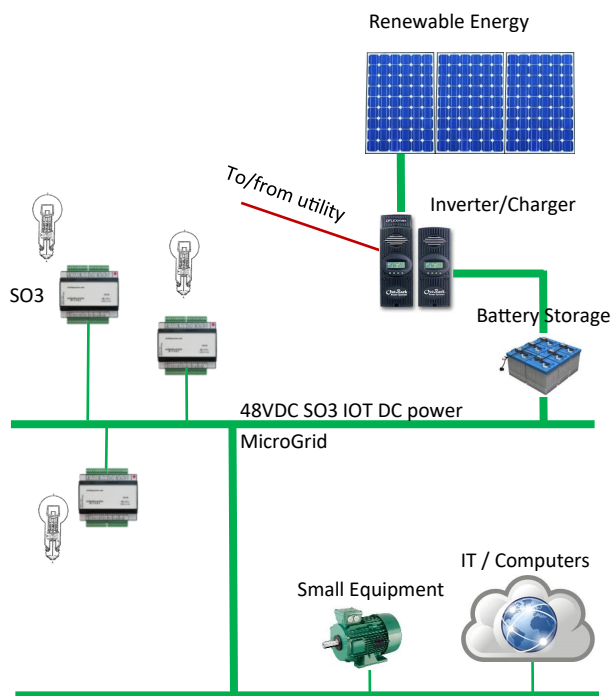
Mobile App

Mobile app provides graphical programming interface for free programming of the inputs , outputs, and the logic in between the two. The app stores configuration for multiple SO3 IOT controllers and arranges it into projects. Programs can be backed up and sent for use in another project. The app currently runs on full version of windows desktops and tablets.
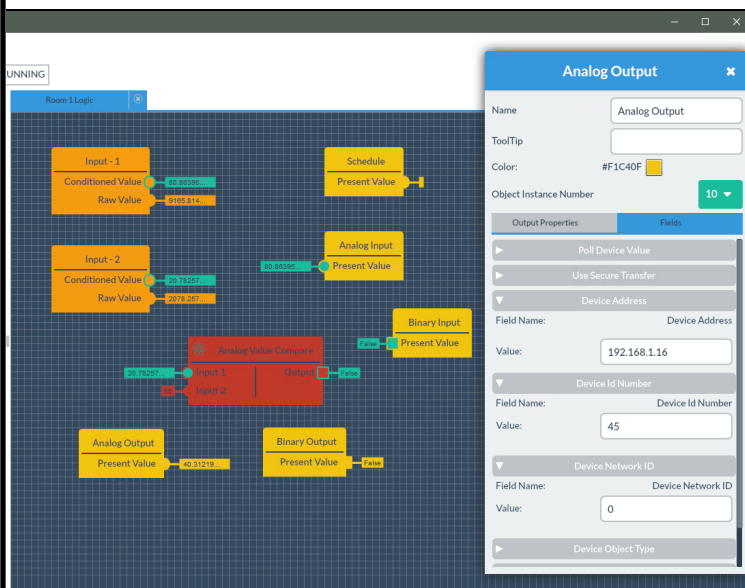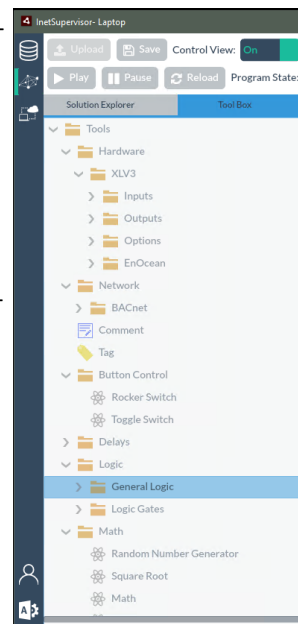
EnOcean wireless

EnOcean is a wireless sensor technology for the "last 50 feet". By the use of energy harvesting the need for power wiring or batteries is removed practically eliminating sensor maintenance.

Supported and tested EnOcean profiles

- Light Sensors
    - A5-06-01
    - A5-06-02
- Occupancy Sensor
    - A5-07-01
    - A5-07-02
    - A5-07-03
    - A5-08-01
    - A5-08-02
- RPS Switches and Key Card

Software features include:

- EnOcean packet monitoring with filtering and teach packet recognition.
- Easy single click device registration.
- Offline device registration for engineered solutions.
- 902MHz frequency support in US markets.
- EnOcean Device heartbeat support with alarming.
- Standard ON/OFF or timed based switches (great for dimming).

The use of EnOcean sensors requires separate purchase of 902MHz antenna. Antenna connects to the SO3 IOT by standard CAT-5 cable (straight-through). Max cable length is 250 feet.

Max distance between sensors and the antenna is 35ft indoors. Longer distances can be achieved by careful planning of sensor and antenna locations.

Please refer to EnOcean installation notes for more info:

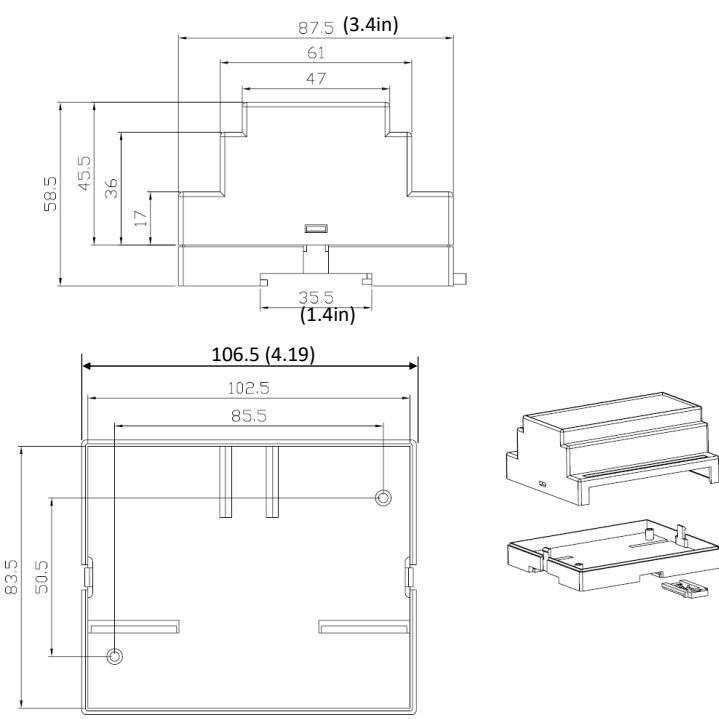https://www.enocean.com/fileadmin/redaktion/pdf/tec_docs/AN001_INSTALLATION_NOTES_Nov08_en.pdf

Wired BACnet IP—Ethernet

BACnet IP over Ethernet allows SO3 IOT controller to be used in networks of hundreds or thousands of IoT devices. Wired backbone assures system stability and resiliency. Standard twisted pair wire can be run from one controller to the next and so on.

SO3 IOT pioneers device-level system security with FIPS grade AES 256 encryption. Encryption can be turned off in case of a requirement to integrate with other BACnet IP system vendors that don't support device-to-device encryption.

BACnet IP protocol standardizes communications and makes it possible to integrate the SO3 IOT platform with other compliant networks. AllJoyn BACnet interface can be used to link SO3 IOT devices to IoT cloud. RHEA appliance can be used for management of BACnet network, trend storage, data analytics, sensor data binding to other BACnet controllers, scheduling, alarming, etc.

I/O CONFIGURATION

NOTE: No Hardware Jumpers required to configure I/O

Analog Outputs	6 x Analog
	Constant current analog outputs 1.5A DC max. Each output is protected by a 4A blow fuse. Fuses are soldered to the board.

INSTALLATION

Must be installed into a NEMA rated enclosure.

STATUS LIGHTS

LED	
Device status GREEN	Pulsing green = Normal Off = No power or other fault
Service pin GREEN	OFF = Normal, running ON = No application

AGENCY APPROVALS

Safety Certifications	UL916 Energy Management Equipment

WARRANTY

Standard 2-year warranty.

LonMark   **UL916** RoHS   ETL us Intertek

MECHANICAL

| Hardware	
Processor	ARM Cortex M4
Transceiver	Q-BUS; 78kbps
Indicators	LED, power, status
Power	
Supply Voltage	40V AC or 60V DC max
Supply Current	10A max
Enclosure	
Material	ABS
Color	Black
Installation	35mm DIN
Connectors	Removable (Green)
Environment	
Temperature	0°-50°C (32°-122°F)
Humidity	0-90% non-condensing
Storage	-20°- 70°C (-4° - 158°F)

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INSTALATION

SO3 IOT controller must be installed into NEMA-rated enclosure using DIN rail. Standard 35mm DIN rail (top hat rail EN 50022 – 35 × 7.5mm) is used to speed up the installation. Mount DIN rail onto enclosure's backplate, then snap-in the SO3 IOT controller onto the DIN rail. The red clips on
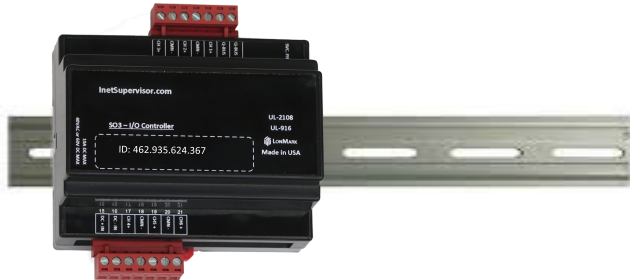
the   back of the enclosure will latch onto the DIN rail. To remove the controller, use thin screwdriver to gently pull out the clips while removing the enclosure from DIN rail.

Q-BUS NETWORK WIRING

Use only low capacitance LEVEL IV, 22AWG, twisted pair for network wiring. This wire type is sometimes called the "Echelon wire". Wire is available from many distributors i.e. Windy City Wire and Cable. Part number 105500. Total network wire length is not to exceed 1000ft. Network must be terminated with one 50-OHM, 1/4-watt resistor, typically located at the network interface (NI-FT) of the programmable host. To avoid interference, the network wiring should be installed at least 1/2 inch from other network and AC power wiring.
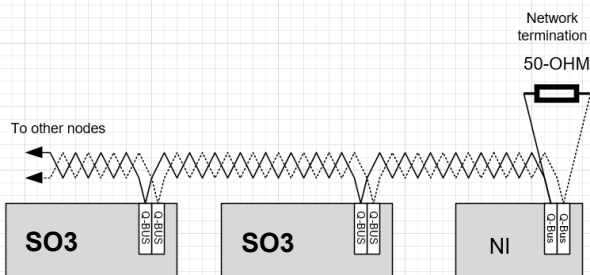
LED OUTPUT WIRING

SO3 IOT is to be used as an LED low voltage lighting system and powered by a power supply listed by a Nationally Recognized Testing Laboratory and for permanent installation and use in location in accordance with NEC, NFAP, Article 411.

LED Fixtures suitable for installation with the SO3 IOT controller consist of an LED string (light engine) and a connector that allows for direct wire connection from the LED string to one of the output channels on the SO3 IOT controller. Note that there is no LED DRIVER in the lighting fixture as the SO3 IOT controller is the LED Driver with 12 output channels. Some LED fixtures are tunable and feature cool and warm light LEDs. In such case two output channels are used, one to drive the cool LEDs and the other to drive the warm LEDs.
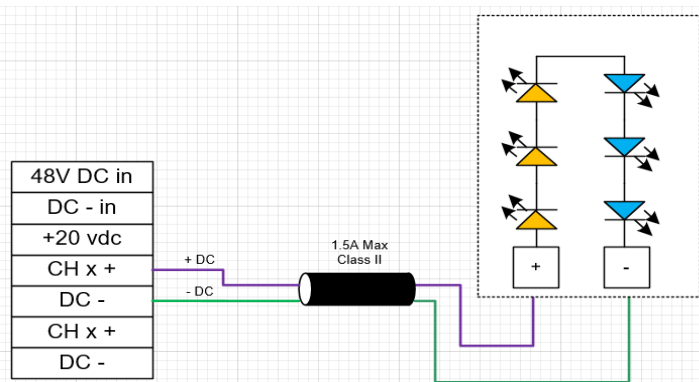
Typical LED Fixture Connection — DETAIL "OA"
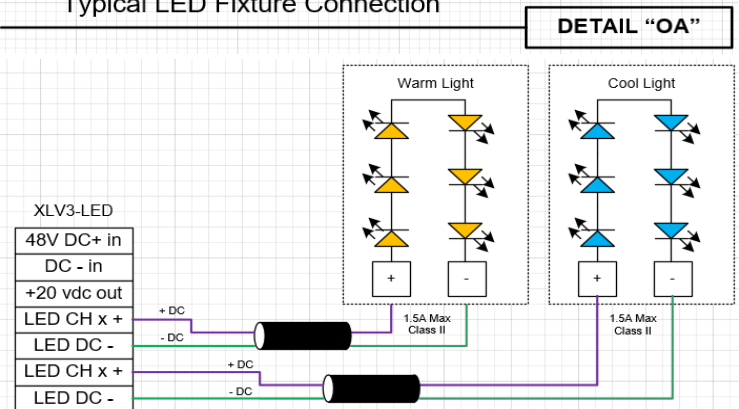
Tunable LED Fixture Connection — DETAIL "OB"