Ruggedized and Weather-resistant SDR Platforms

RX410

KEY FEATURES

- Ruggedized version of the NI (Ettus Research brand) X410 Series Software Defined Radio
- Conduction-cooled construction optionally designed to meet MIL 810 for shock/ vibration and MIL 461 for EMI
- IP67 weatherproof sealed unit (except air cooled version)
- Other similar National Instruments (NI) small form factor SDR versions are available upon request
- Dual channel transceiver speeds to 100GbE
- Customizable I/O options
- Pole-mount and other mounting options available
- Optional internal heater and fan for extreme temperatures
- Contact Pixus for the RX440 version or ruggedization options for other NI SDRs

The Pixus Technologies RX410 is a ruggedized version of National Instruments (NI's Ettus Research brand) X410 Software Defined Radio. Working with NI, Pixus redesigned the commercial version of the product to create a hardened, sealed, conduction-cooled unit to meet IP67 specifications. There are options to further ruggedize the unit to MIL 810 for shock/vibration and MIL 461 for EMI.

The NI Ettus USRP X410 is a high-performance, multi-channel, Xilinx Zynq Ultrascale+ ZU28DR RFSoC based software defined radio (SDR) for designing and deploying next generation wireless systems. The RX410 series can be used in various types of airborne, shipboard, ground vehicle, or outdoor designs. Example applications include SIG-INT, passive RADAR, Drone Deterrence/ Spoofing and prototyping systems for advanced wireless (WiFi/Cell/ MIMO).

Contact Pixus for ruggedization inquiries for other SDRs from NI. Visit www.ettusresearch.com for SDR specifications.

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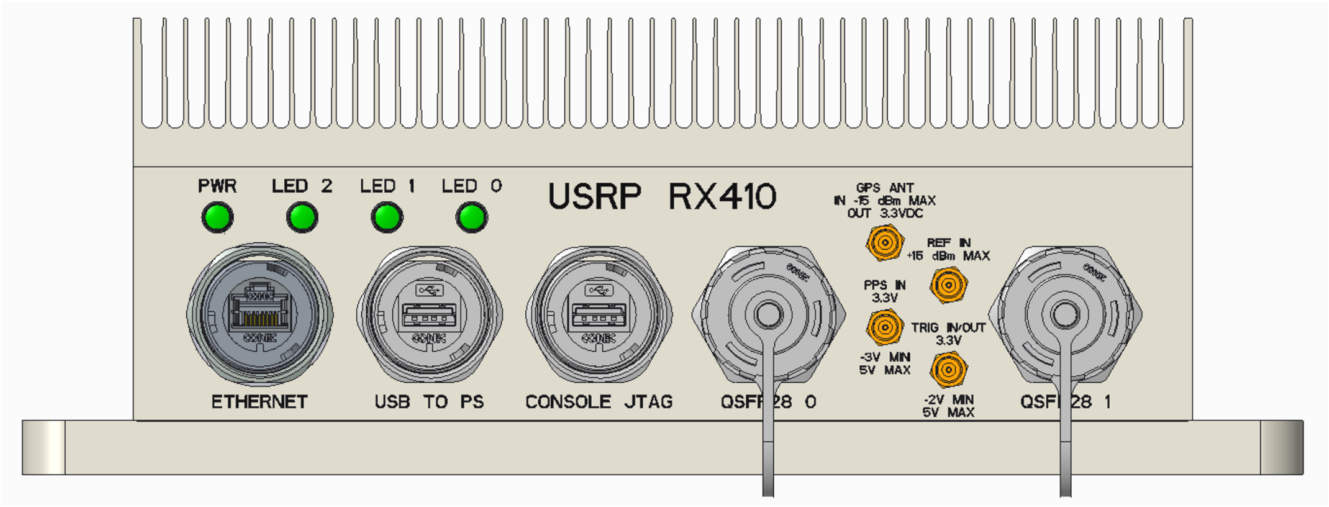
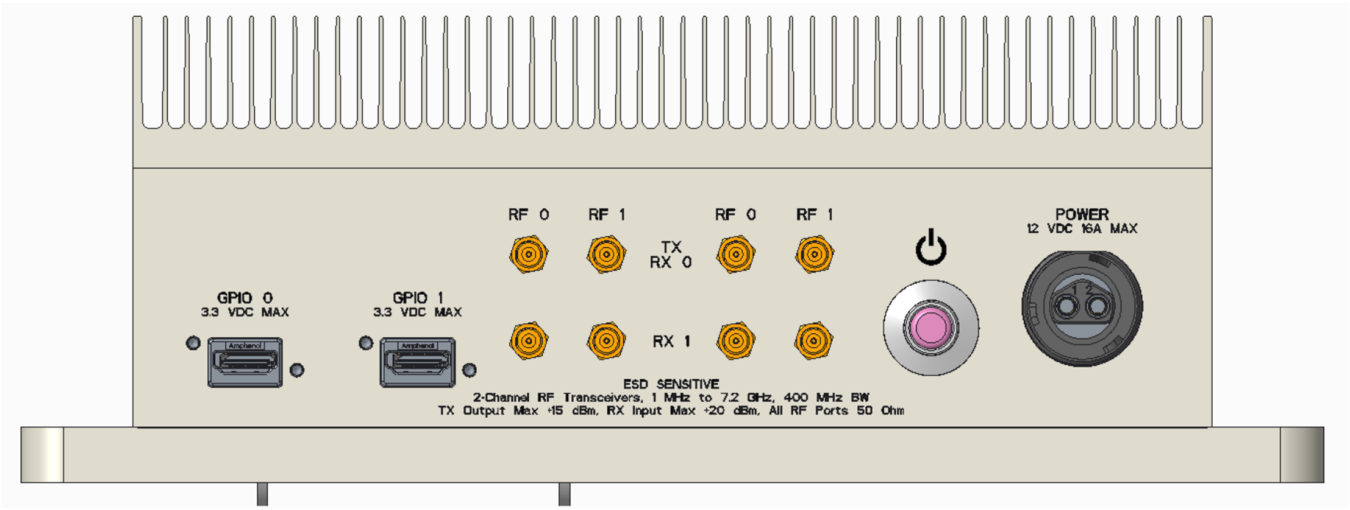
Ruggedized and Weather-resistant SDR Platforms

I/O Configurations & Power

Pixus offers a standard I/O configuration for the IP67 RX410 (see below) and other SDRs. (Consult factory for RX4410 version I/O details) The modular front and rear faceplates are also customizable. Consult Pixus to discuss your specific requirement. The RX410 comes with a loose connector that can be terminated by the user to the application's power source (via crimp or solder). Please note that the MIL rugged version requires modification to the I/O details below. The unit standardly runs on 12V power. For versions that require an internal heater for low-temp applications, the power will utilize a 20-36VDC converter. A 36-72V converter option is also available (with recommended max 60V limit). A MIL 704A compliant version for power is also available.

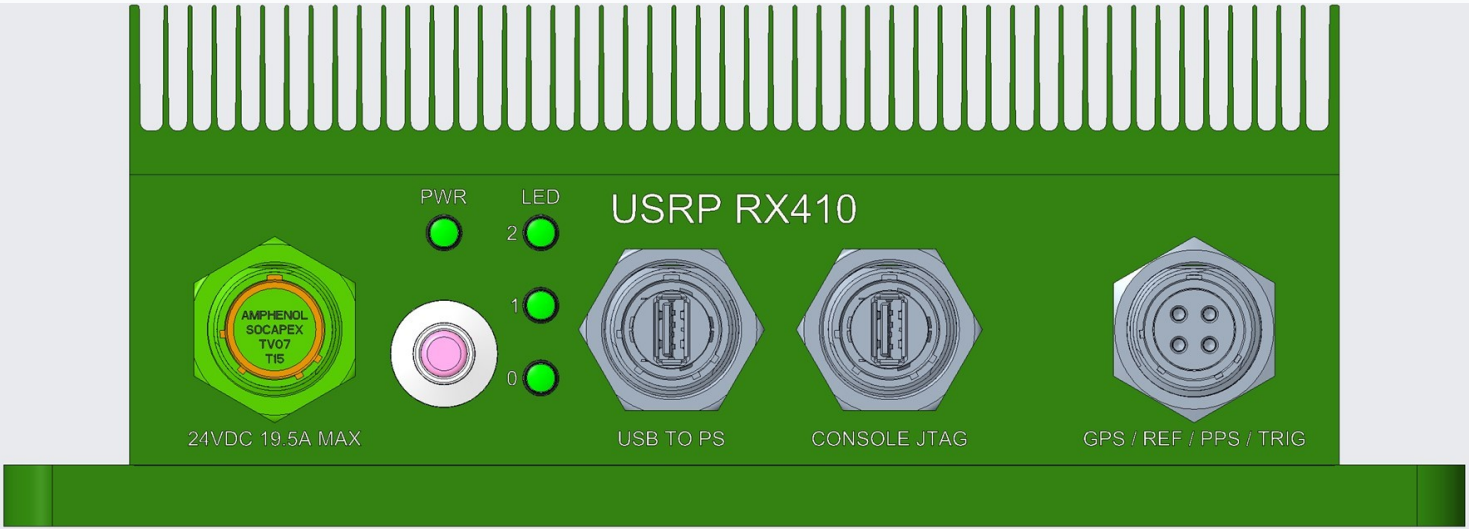


Front I/O

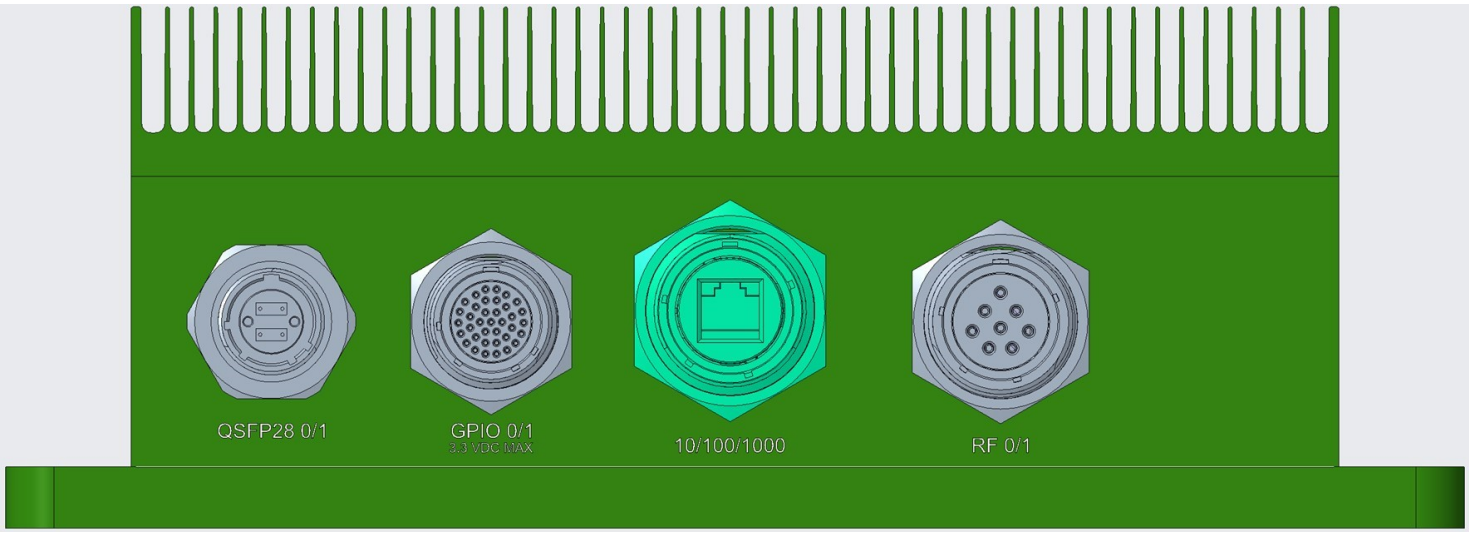


Rear I/O

Ruggedized and Weather-resistant SDR Platforms



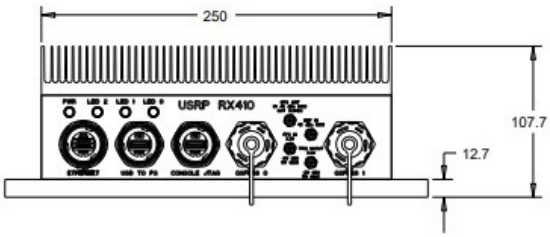
Front I/O– MIL

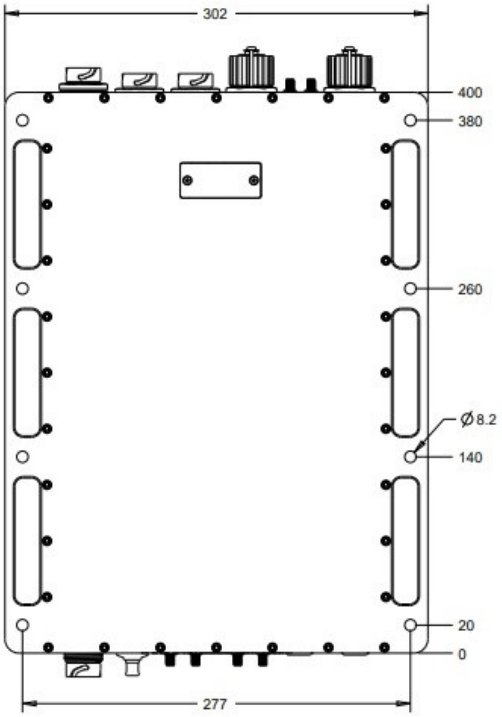


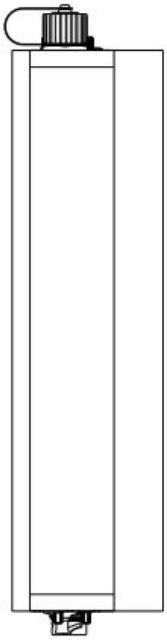
Rear I/O—MIL

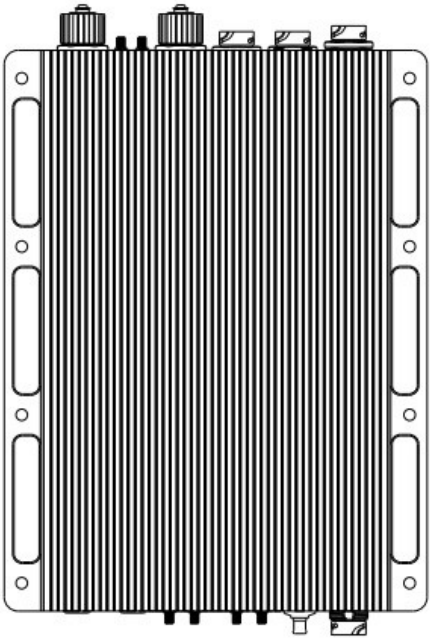
Ruggedized and Weather-resistant SDR Platforms

Drawings—IP67 Version







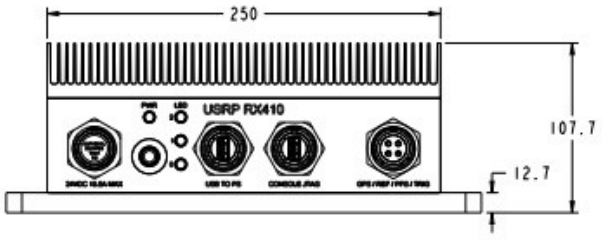


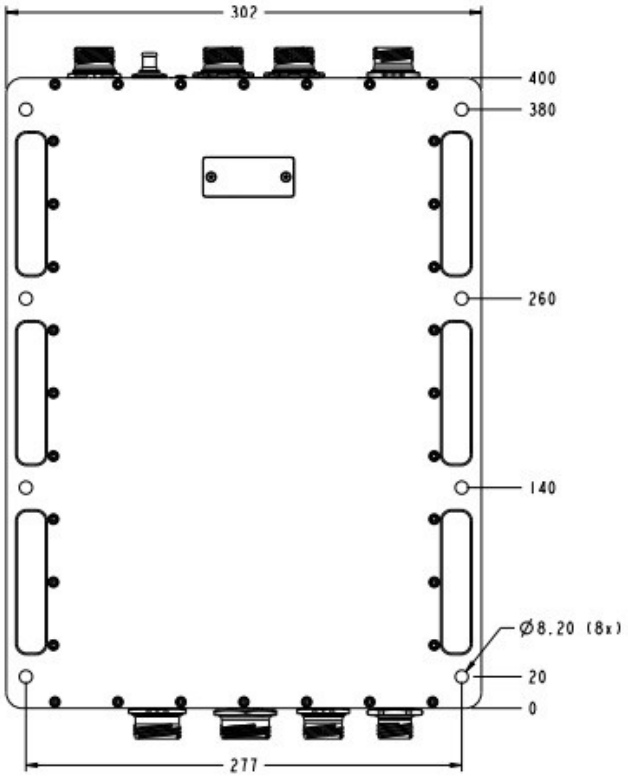
IP67 version—Front

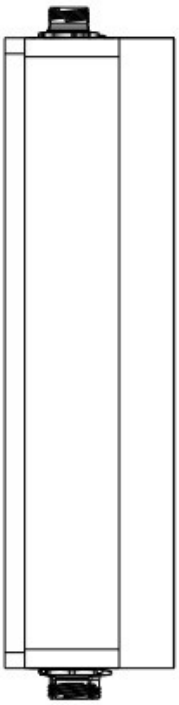
IP67 version—Rear

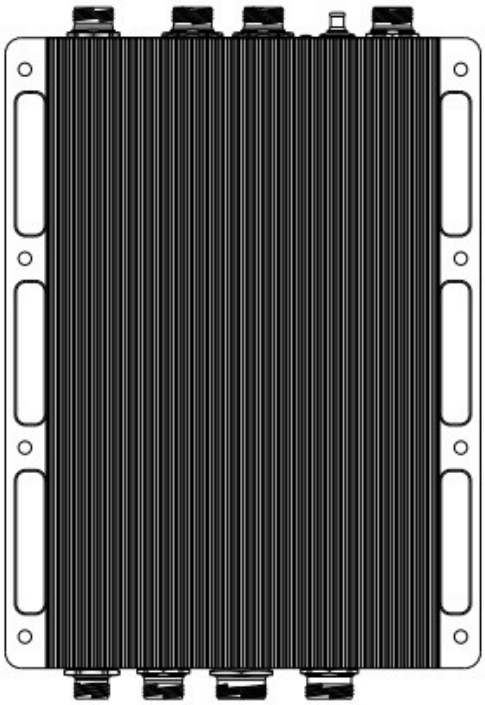
Ruggedized and Weather-resistant SDR Platforms

Drawings—MIL Version









Ruggedized and Weatherproof SDR Platforms

Ruggedization Levels

The RX410 was initially designed to meet IP67 waterproof specifications in a rugged, conduction-cooled design. The unit standardly meets –10C to 45C temperature ranges (can meet 50C for short periods without a fan). There are options to extend the temp range to +71C with an external fan or with customization.

To meet MIL specifications for shock/vibration, there are modifications required to utilize 38999 connectors and internal bracing. Pixus also offers a light-rugged solution providing –20C to +71C temperature range and transport grade shock/ vibration levels in an air-cooled configuration.

The RX410 is a chassis platform for the end customer/integrator to incorporate their software, interface, and mounting options. As such, it is up to the integrator to provide end application testing to the applications' requirements. Pixus will guarantee that we will meet agreed upon ruggedization levels. The numbers below are what the units are designed to meet. Contact Pixus for more details or to discuss co-testing options.

	Air cooled	Conduction cooled	Shock/vibration	IP67	Environmental/EMI
Light-rugged	Temp: - 20C to 71C	N/A	Transport grade	N/A	Not sealed. Various EMI level options.
Rugged IP67, not MIL-grade	Custom only	-10C to 45C, With heater/fan: - 40C to 71C	~ 15G shock, above Transport grade	Yes	Fully sealed, MIL461 EMI
MIL Spec Rug-ged	Custom only	-10C to 45C, With heater/fan: -40C to 71C	~ 20-25G shock, meet various MIL810 specs	Yes	Fully sealed, MIL461 EMI

Specification Notes

The weight of the IP67 version is ~ 27.5 lbs. The optional fan assembly (fan/cover/etc) adds ~ 3.5 lbs and the MIL 38999 connectors add ~ 0.5 lbs.

Interface Connectors

Pixus provides the mating connectors to the external I/O interfaces except for the fiber connector. Contact Pixus to discuss what mating fiber connector options are available by 3rd parties.

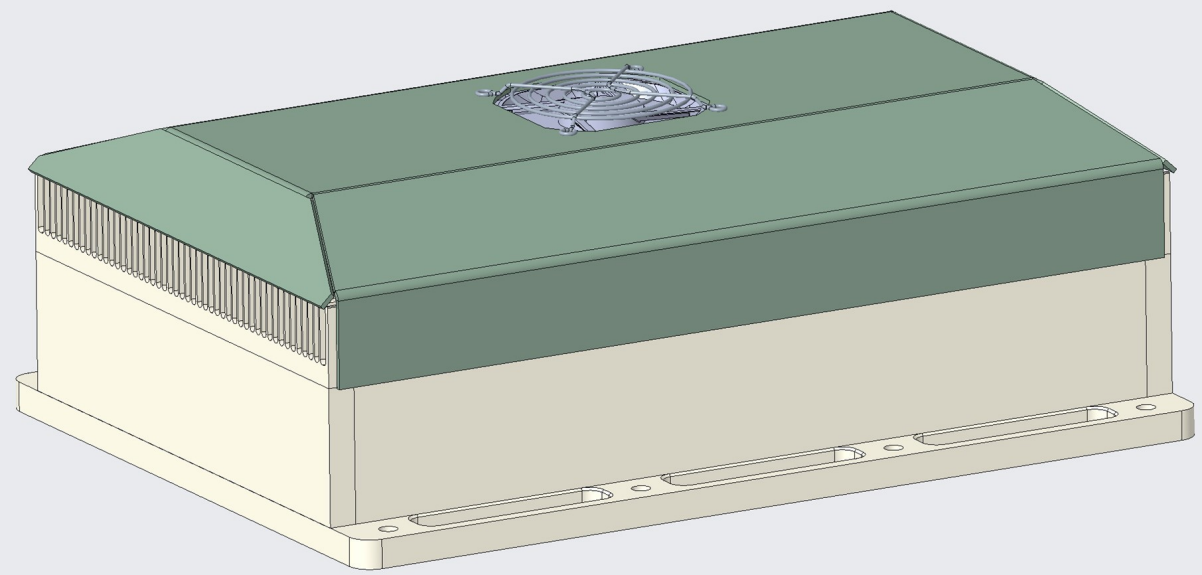
In all versions except the Semi-rugged air cooled configuration, Pixus uses interface cables/connectors from NI's unit to the front and rear I/O panels. Pixus uses components that are expected to match the end performance of the NI SDR, however, some degree of loss may arise as a result of these interfaces. Contact Pixus for cable rating details.

Ruggedized and Weatherproof SDR Platforms

Heater and/or Fan Options for IP67 or MIL Rugged Versions

The Rugged series of Ettus/NI enclosures from Pixus are designed to run in environments from –10C to 45C (can meet 50C for short periods) without a fan or a heater. The optional MIL grade fan pulls airflow over the external fins of the conduction-cooled chassis. No airflow goes through the inside of the unit. The heater is an internal device running on either 28VDC power (18-36VDC converter) or 48VDC (36-72VDC converter) options. For the latter option, the recommended max input power is 60VDC. Whether an application requires a heater depends on the end application. Factors include whether the device will run from a cold start, the time intervals in the cold environment, altitudes, etc. The approximate time for the heater to bring the chassis from –40C to +10C is 30 minutes.

To ensure safe operation, the 28VDC and 48VDC versions have different power connector interfaces. Below is a model showing the fan interface. It is recommended to leave at least 40mm gap between the top of the unit and the fan (27mm minimum clearance required).



Terms of Use*

The Customer agrees that the Products will not be re-exported, resold, or transferred to:

- (a) any country subject to export restrictions under the Export Administration Act of 1979 (EAR).
- (b) any end-user who has been denied participation in export transactions by any federal agency of the United States government.
- (c) an end-user who the Customer knows or has reason to believe will utilize the Products directly or indirectly in nuclear activities listed in the EAR 778.3(b)(1), (2) & (3), whether the items are specifically designed or modified for such activities.
- (d) an end-use destined for the design, development, production, or use of missiles or missile projects, or activities related to nuclear, chemical, or biological weapons.
  The Customer acknowledges that “Products” include technical data subject to the export and re-export restrictions of the EAR.

* Pixus’ other standard terms and conditions apply.

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Ruggedized and Weatherproof SDR Platforms

ORDERING OPTIONS

RX410-ABC-DEF-XX

A = Type

0 = Standard x410 motherboard 1 = Other
2 = Standard x440 motherboard (available upon request)

B = I/O Configuration

0 = Standard x410 I/O as shown page 2 1 = Other
1 = x440 I/O

C = Ruggedization Level

0 = IP67, Rugged (standard)
1 = Semi-Rugged, air cooled
2 = Reserved
3 = MIL 810/461 Rugged, IP67
4 = Other
5 = MIL 810/461 Rugged, IP67, MIL 704A for power

D = Light Indicator Setting

0 (or blank) = 4x light indicators connected, lit
1 = Light indicators not connected, dark

E = Ethernet Type

F = Fiber (MPO, Multi-mode, 100m) (standard option)
X = Custom, Other

F = Heater Installation

0 (or blank) = no heater installed, 12V power
1 = Heater installed for low-temp apps, 18-36VDC power
2 = Heater and MIL grade fan over fins for extreme temp apps, 18-36VDC power
3 = Other
4 = Heater and MIL grade fan over fins for faster heating for extreme temp apps, 36-72VDC power

2 digit customization code

Blank = standard, no customization

ACCESSORIES

Power Supply Kit P/N: TBD

The connector for terminating the cable is supplied with the unit (Conec 17-400143 or equivalent). The power that needs to be supplied to the unit without a heater or fan is 12VDC, max 16A. For a heater or fan, the voltage would be 28VDC or 48VDC as discussed on page 5. As each application is different, the customer will need to convert the power from their source to this interface.

Pole Mount Kit P/N: SPS0007