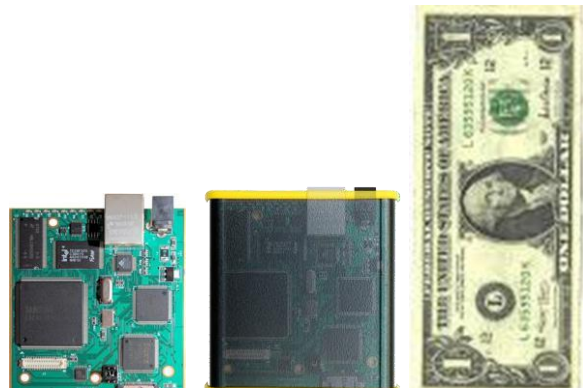




PXS_e

Protocol eXchange Server Ethernet

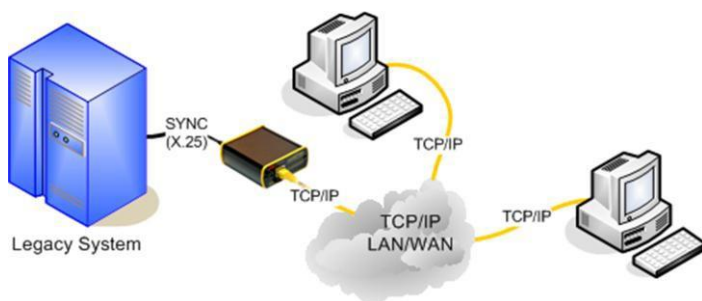
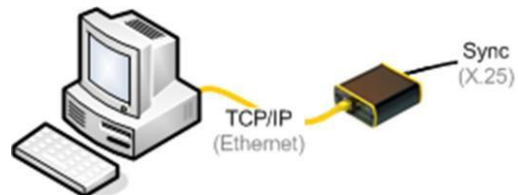


What is it?

The PXS_e is an Ethernet to synchronous adaptor or gateway. Connected directly to a computer's Ethernet port or indirectly through an Ethernet switch, the PXS_e can provide synchronous communication just as an internal synchronous adaptor does. Its true strength is to be able to operate as an autonomous gateway, tunnel, bridge, switch, RPC server or other type of communication server, including as a data line monitor. Synchronous protocols, such as LAPB, LAPD, X.25, Bisynchronous and Monosynchronous are supported through our LayGO multiprotocol host services that can operate either on the host computer or the PXS_e.

Ethernet an Alternative for PCMCIA and PCI

Nearly all PCs today come with built in Ethernet ports, and the operating systems support the full TCP/IP protocol suite. Because of the wide use of Ethernet, the PXS_e is a true alternative for disappearing PCMCIA and PCI synchronous adaptors. Each Ethernet port can be converted by the PXS_e to one or two synchronous ports, and exchange TCP/IP to synchronous protocol services, such as X.25, LAPB or others. These services can also be shared among multiple workstations.



The PXS_e connected to a *Legacy Host's* synchronous port(s) exchanges the physical connection to Ethernet, and the synchronous protocol to TCP/IP or UDP. Protocol exchange can be done on any layer, *physical, link, network* or higher. This exchange does not affect the legacy host system's synchronous hardware or the software.

SYNC Ports

The PXSe comes with one or two built-in high-density Hirose connectors, configurable for RS-232, RS-422, RS-485 and V.35. RS-232 supports 128 kbps; RS-422/485 and V.35 support 8.192 Mbps (E2). Standard straight (male) and X-Over (female) cables are available for all common interfaces. On request, we can deliver customized cables.

The PXSe supports bit synchronous and byte synchronous mode. Bit synchronous can be bit transparent or HDLC/SDLC; byte synchronous can be Bisynchronous or Monosynchronous. Data encoding can be NRZ, NRZI, FM0, FM1 or Manchester. Each PXSe port can be independently configured as DTE or DCE, RS-232, RS-422 or V.35, HDLC or Bi-Synchronous, X.25/LAPB or X.25/LAPD, etc.

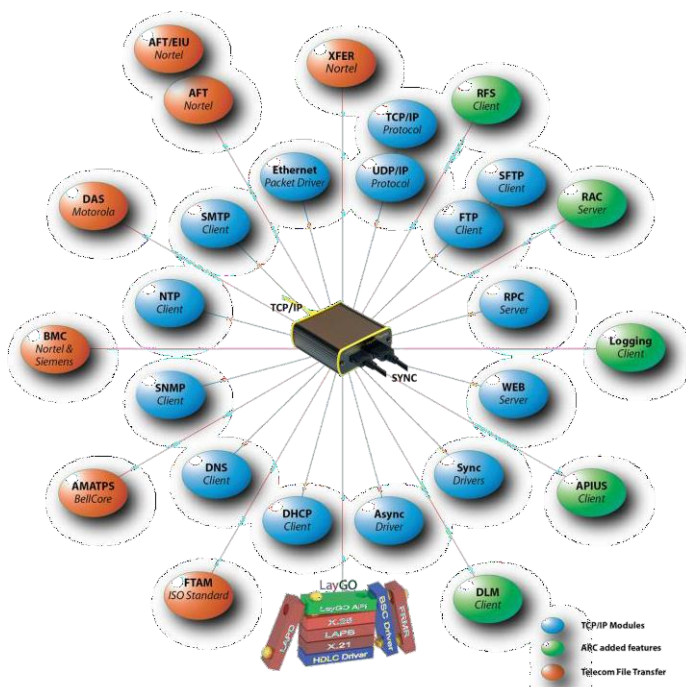
What about current LayGO users?

The PXSe can operate exactly as a PC with an internal synchronous adaptor by using an RPC-like interface between the LayGO API (RPC client) and the LayGO stack running inside the PXSe (RPC server). Current users of PCI, PCMCIA, PC/104, PMC and even ISA cards need only replace the existing LayGO API DLL. No other changes to existing applications are necessary.

Since communication between RPC client and server normally uses TCP/IP/Ethernet, LayGO applications from any LAN workstation can access the PXSe either locally (TCP/IP LAN) or remotely (TCP/IP WAN). In the latter situation, protocol delays through the network may occur.

What does it include?

In addition to the eCOS Real Time Operating System (RTOS) and built in TCP/IP support, the PXSe uses LayGO®, our highly modular multiprotocol stack (X.25, LAPB, LAPD, NRM, Frame Relay and proprietary). Besides HDLC, we support drivers for SDLC, bit transparent, Bisynchronous and Monosynchronous modes. The combined use of LayGO and TCP/IP services provides a great variety of communication solutions.



The PXSe provides a full range of remote server and client services:

- [WEB-Server](#) to update or reconfigure the PXSe.
- [RAC-Server](#) (Remote Application Control) to take control of the PXSe application.
- [LOG client](#) to automatically retrieve logging information.
- [APIUS](#) (Automatic PXSe Installation & Update Service) client to automatically install and update the PXSe software and CPLD hardware.
- DLM client to [monitor data](#) lines between the PXSe and the target system at the physical, link, network and application layers.
- SMTP or [SNMP](#) client to receive e-mail (SMS) or trap messages about potential communication problems.

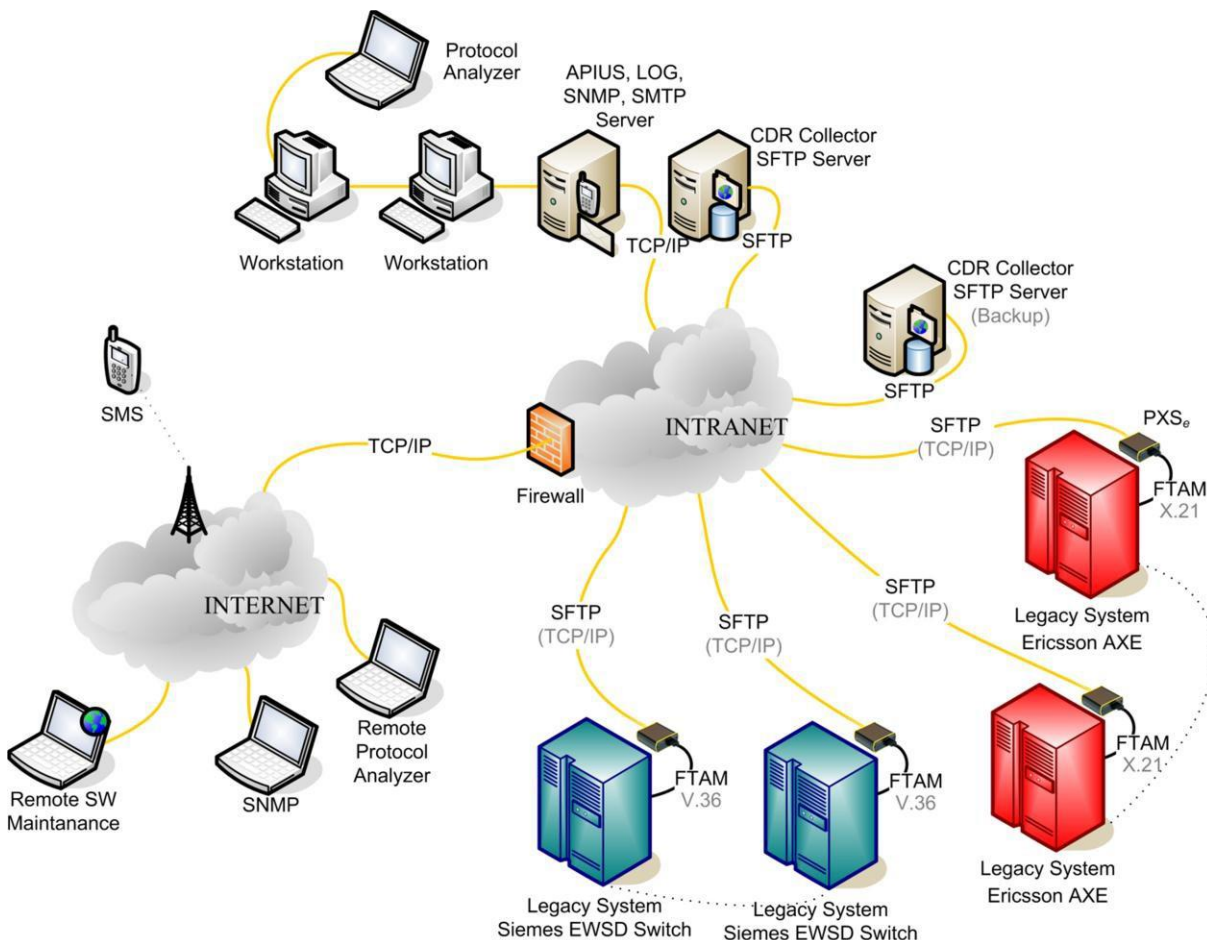
Advantages

- The PXS_e is a small external device that is easy to install using an Ethernet connection.
- It combines the host computer with Ethernet, synchronous communication adaptor, operating system, TCP/IP protocol suite, and LayGO multiprotocol software.
- LayGO communications services can be accessed by any workstation to access, control, monitor and configure the PXS_e, even if it is connected through a TCP/IP WAN.
- The PXS_e can be remotely updated, maintained and monitored through the APIUS, the Web server and the DLM Tap.

Example

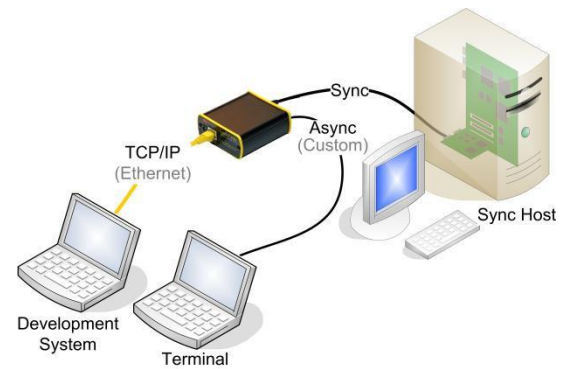
Since April 2008 Swisscom has used our PXS_e as an FTAM/X.25-to-SFTP/TCP/IP gateway on nearly 140 Siemens EWSD and Ericsson AXE phone switches, to replace all their FTAM/X.25 ISDN BRI connections and remote gateways. Besides transferring all CDR files to two collectors (SFTP Servers), the APIUS is used to automatically install and upgrade PXS_e software and configuration profiles. The LOG and DLM clients are used to log events to remotely monitor the FTAM/X25 traffic.

The Swisscom installation was a complete success, and has not failed once!

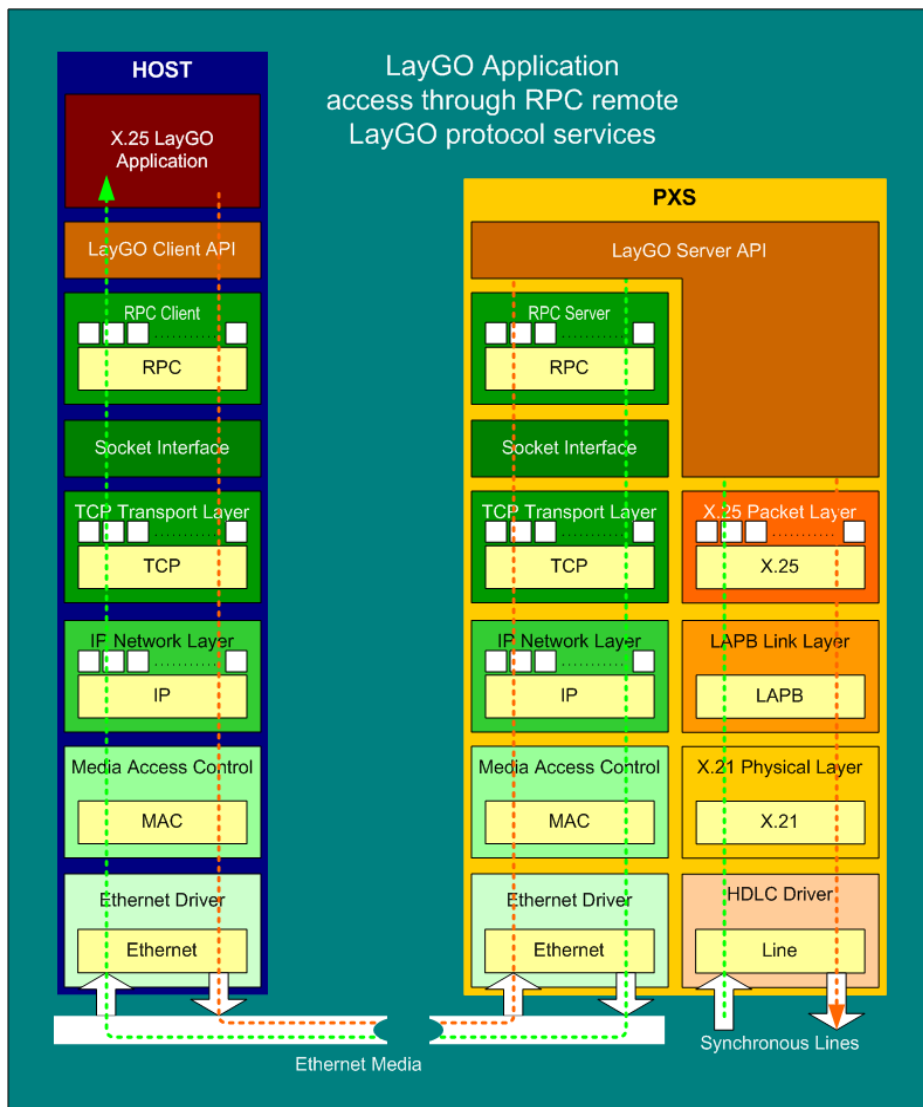


PXS_e Target Platform for Developers

The most powerful use of the PXS_e is as a target platform for proprietary applications or customized protocol implementations. Most LayGO solutions in use by our customers function as gateways and are using TCP/IP, UDP, FTP or SFTP (Secure FTP) as part of their application. The PXS_e is the ideal platform for these applications. We offer developers a LayGO toolkit to build PXS_e-targeted applications. A Linux-based, cross platform development environment for the ARM processor is available through Advanced Relay. Software development for embedded Real Time Operating Systems (RTOS) requires special experience, particularly for eCOS, a single tasking multithreaded RTOS. If requested, we offer our experience and support during this development.

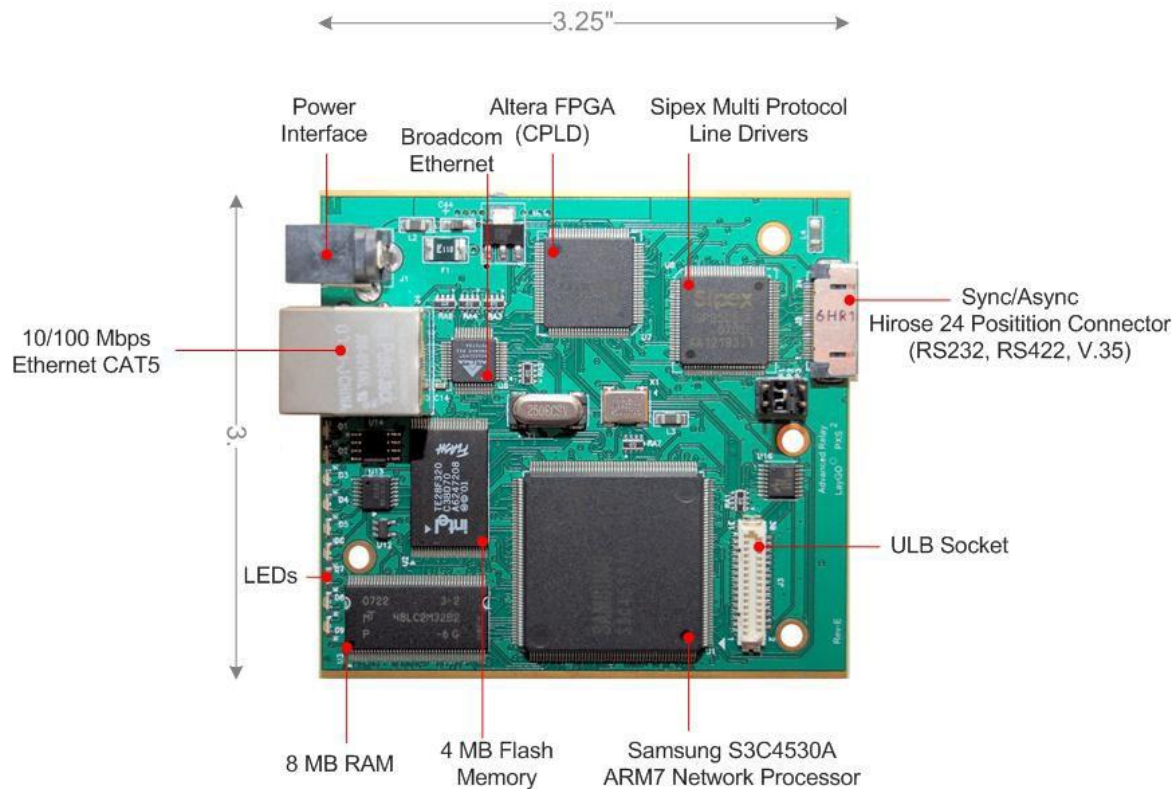


PXS_e Functional Block Diagram



PXS_e Hardware

The PXS_e uses an integrated Samsung ARM7 network processor with memory, flash disk, one Ethernet port, and one or two sharable synchronous serial ports.



Two additional features provide needed flexibility. A CPLD (Complex Programmable Logical Device) allows hardware customization and a Universal LayGO Bus (ULB) socket interface allows the design and use of a wide range of ULB daughter cards. Through a daughter card, a 2nd serial synchronous port is supported.

The synchronous port(s) support RS-232, RS-422 and V.35 signaling. The RS-232 supports 128 kbps, the RS-422/V.35, 8.192 Mbps or E2 (4x E1). The Ethernet port auto-detects 10 or 100 Mbps and direct or crossover connection (MDI/X). The PXS_e uses a 100/240 VAC 60/50 Hz switching power supply.



Front View: Power, Ethernet and LEDs



Back View: Sync 24 position Hirose Port
RS-232, RS-422 (EIA-530, X.21, RS-449), V.35

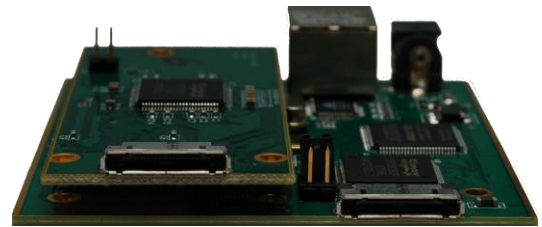
CPLD

Currently, only 10% of the CPLD's 570 logical elements are used, mainly for registers to configure board ID, synchronous port selection, DTE/DCE clock routing and RS-232, RS-422, V.35 signaling mode. The remaining capacity can be used to design custom features in VHDL, such as a 13-bit bound radar protocols. One of the strongest features is that, just as with software, the PXSe allows the selection of different CPLD codes (NetMap) to be loaded from flash memory, and to remotely update the flash.

ULB

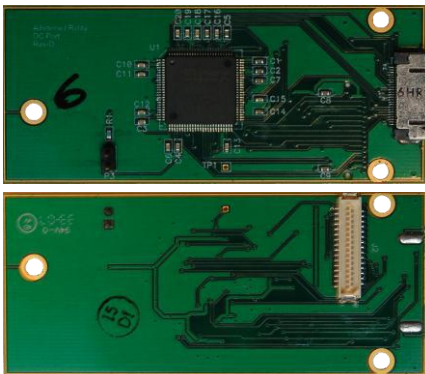
The Universal LayGO Bus opens the PXSe architecture for future device extensions. Plug-in daughter cards can be developed to support a wide range of interfaces such as channelized T1/E1, with or without CSU/DSU, ISDN, DSL, wireless GPRS/GMS/UMTS, GPS or analog/digital converters, etc. The ULB interfaces directly or indirectly through the FPGA to the microprocessor bus.

A second synchronous port is supported via a ULB card (see picture to the right).



ULB card with 2nd Synchronous Port

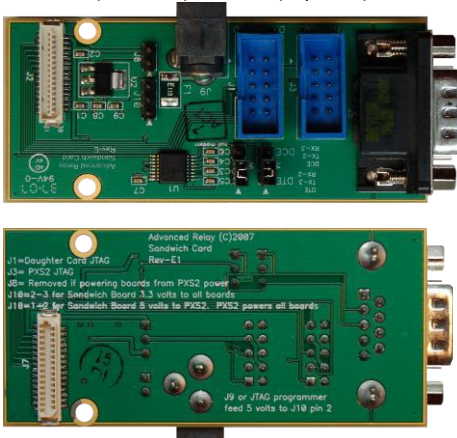
For developers who need to debug the PXSe or new ULB cards, a sandwich card with JTAG headers and an asynchronous DB9 (male) terminal connection is provided.



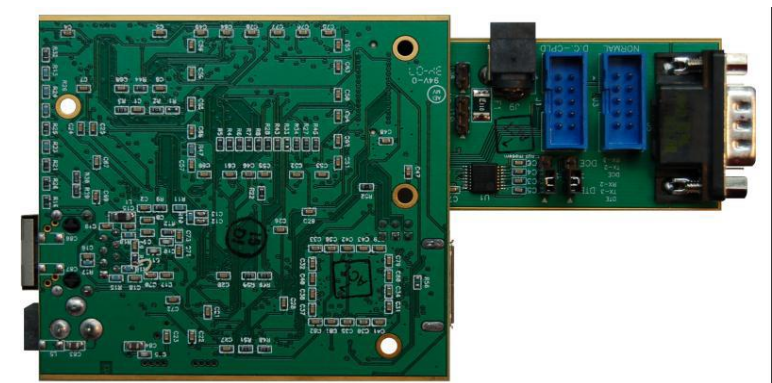
2nd port Synchronous ULB Card and Debugging (Sandwich) ULB card (Top View)



2nd port mounted Synchronous ULB Card and inserted Debugging (Sandwich) ULB card (Top View)



Debugging (Sandwich) ULB Card JTAG Header and DB9 Async Terminal connection (Bottom View)



2nd port mounted Synchronous ULB Card (hidden) and inserted Debugging (Sandwich) ULB Card with JTAG Headers and DB9 Async Terminal connection (Bottom View)

PXS_e Specifications

Environmental

- Temperature, system on:
0° to 45°C / 32° to 113° F
- Temperature, system off:
-20° to 85°C / -4° to 185° F
- Humidity, system on:

8% to 80%
- Humidity, system off:
20% to 80%
- Altitude:
0 to 10,000 feet / 0 to 3100 meters
- Heat Output:

10.23 BTU/hour
- MTBF:
40.0 years

Regulatory Approvals

FCC, Class A, CE, UL, CUL, C-tick.

Physical

- Dimensions (LxWxH):
3.4" x 3.3" x 1.3" / 86mm x 83mm x 33mm
- Weight:
5 ounces / 142 grams

Power

- Current Consumption:
600 mA @ 5VDC
- Power Consumption:
3 W

Line Supply

- Line Frequency:
50-60 Hz
- Line Voltage:
100-240V AC

Warranty

The PXS_e hardware has a one year warranty.

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