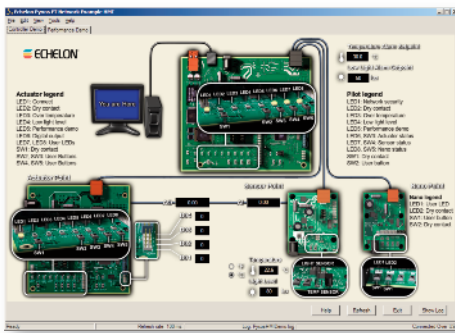**ECHELON®**

Pyxos Network Example HMI Application

Features

- Introduces developers to the Pyxos FT embedded control networking platform

- Includes an example application to demonstrate major features of the Pyxos FT platform

- Includes source code for the example application and APIs that you can port to different host microcontrollers

- Demonstrates easy integration with other control networks such as LonWorks networks

- Includes four evaluation boards, power supply, and cables for quick plug-and-play setup

- Includes all the tools you need to use in conjunction with your existing development tools to create new Pyxos FT applications

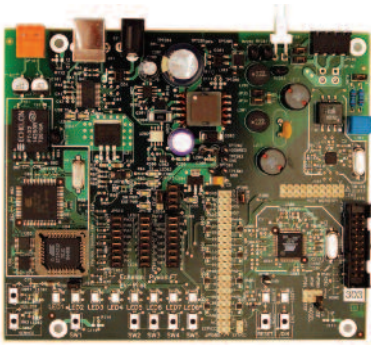- RoHS-compliant

Description

Echelon's Pyxos™ FT EVK Evaluation Kit is a set of hardware and software tools that you can use to demonstrate the functions and capabilities of Pyxos FT technology and to develop your own devices that incorporate Pyxos FT technology. You can also use the Pyxos FT EVK to develop devices that integrate a Pyxos network with a control network based on the LonWorks® platform.

Designed for hardware, software, and firmware engineers, the Pyxos FT EVK Evaluation Kit includes all the tools you need to use in conjunction with your existing development tools to create new Pyxos FT applications.

Hardware

The Pyxos FT EVK includes four evaluation boards that you can use with the included example application to quickly build a working Pyxos FT network. You can also use the evaluation boards to create your own Pyxos applications. The evaluation boards incorporate a Pyxos FT Network Chip and come with schematics so you can see their designs. The following evaluation boards are included:

- The Pyxos FT EV-Pilot Evaluation Board is the controller for the Pyxos EVK network. It contains an Atmel® ARM® AT91SAM7S64 host microcontroller that is connected to, and communicates with, a Pyxos FT Chip. A Pyxos Pilot is responsible for configuring, main-
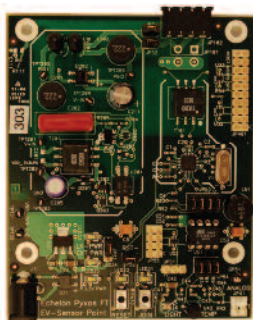

taining, and communicating with the Pyxos Points in a Pyxos network. The EV-Pilot can also optionally communicate with LonWorks devices using the included FT 3150® Smart Transceiver.

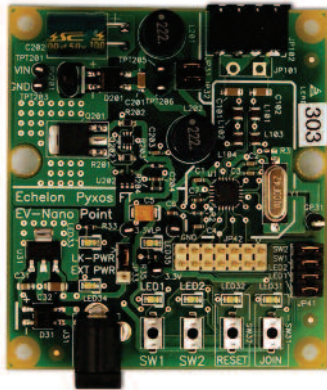- The Pyxos FT EV-Actuator Point Evaluation Board is a Pyxos Point
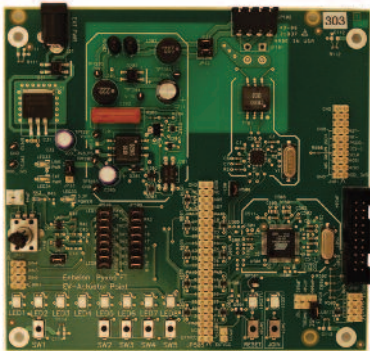
that serves as a hosted analog and digital actuator for the Pyxos EVK network. It also includes an Atmel ARM AT91SAM7S64 host microcontroller.

- The Pyxos FT EV-Sensor Point Eval-

uation Board is a Pyxos Point that serves as a hosted multi-sensor for the Pyxos EVK network. It includes an Atmel AVR® ATtiny13 host microcontroller. The sensors measure temperature, light level, and DC voltage.

- The Pyxos FT EV-Nano Point Evaluation Board is a Pyxos Point that serves as a simple unhosted digital sensor and actuator for the Pyxos EVK network. It demonstrates how a Point can participate in a Pyxos FT network without a host microcontroller.

The system is powered from a single included power supply that you connect to the EV-Pilot, which then distributes 24VAC link power over the included network cable to the EV Points.

The Pyxos FT EVK includes all the cables you need—network cables to connect all the evaluation boards, a USB cable to connect the EV-Pilot to a Windows computer, and an I/O cable to connect the analog output of the EV-Actuator Point to the analog input of the EV-Sensor Point.

You can optionally connect the EV-Pilot to a Windows computer using a LonWorks network. A LonWorks connection requires a LonWorks network interface that is not included with the Pyxos FT EVK—the details of this hardware are listed in the System Specifications section.

Example Network Application

The Pyxos FT EVK comes with example software that demonstrates a complete control system using the included evaluation boards, and shows how you can use a Windows computer to monitor and control a Pyxos network through a Pyxos Pilot. The software is preloaded in the evaluation boards, and is also included as source code that you can use to learn how to develop
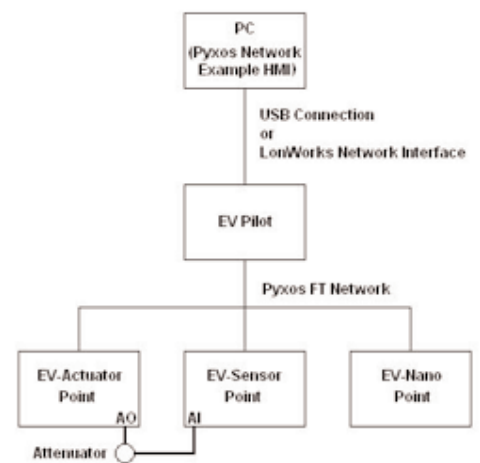
Pyxos Pilots and Pyxos Points.

The example application simulates a room controller network with analog and digital sensors, analog and digital actuators, and a controller running on a Pyxos Pilot. The example also includes a Performance Demo that you can use to demonstrate Pyxos FT network determinism. The example demonstrates several of the major features of the Pyxos platform, including:

- Automatic registration of Points
- Manual registration of Points
- Seamless replacement of Points within the Pyxos FT network
- Determinism within the Pyxos FT network
- Network security monitoring for the Pyxos FT network
- Free-topology wiring with 24VAC link power
- Optional connectivity to LonWorks networks

Development Tools

The Pyxos FT EVK includes software that you can use in conjunction with your host microcontroller development tools to develop applications for Pyxos Pilot and Pyxos Points. The software includes C source code for a Pyxos FT application programming interface (API) that you can

Pyxos Example Network Application Block Diagram

use with your applications to access a Pyxos network from a Pyxos Pilot, or to interact with a Pyxos Pilot from a Pyxos Point. You can also port this software to

other microcontrollers if you are using a microcontroller that is not included with the Pyxos EVK. The software also includes the Pyxos FT Interface Developer utility that simplifies development of Pyxos applications that use the Pyxos API.

The EV-Pilot and the EV-Actuator Point Evaluation Boards include a header connector that provides external access to the host microcontroller memory. You can use the JTAG header connector to load a new Pyxos application firmware into the host processor for the EV-Pilot or the EV-Actuator Point. The EV-Sensor Point Evaluation Board includes a connector that provides access to the AVR programmed I/O (PIO) line that you can use to download applications to the Tiny13 processor on the EV-Sensor Point.

You can also use the evaluation boards to test or debug applications for the Pyxos FT platform that use host microcontrollers different from the ones used on the evaluation boards. You can replace the AVR host microcontroller on the EV-Sensor Point Evaluation Board with your own host microcontroller using the Serial Peripheral Interface (SPI) header on the evaluation board.

System Specifications

PC Requirements

Software	Windows XP (plus Service Pack 2 or later) or Windows 2000 (plus Service Pack 4 or later)
Hardware	*Minimum:* Intel® Pentium® III 500MHz or AMD™ Athlon® 750MHz processor, 128MB RAM, 65MB hard disk space, CD-ROM drive, 1 available USB port
	Recommended: Intel Pentium 4 1.0GHz or AMD Athlon 1.5GHz processor, 256MB RAM, 100MB hard disk space, CD-ROM or DVD-ROM drive, 3 available USB ports
Monitor Display	Minimum screen resolution of 1024 x 768 pixels
LONWORKS Network Interface Hardware Requirements	LONWORKS OpenLDV™ compatible TP/FT-10 network interface such as an Echelon U10, PCC-10, PCLTA-20, PCLTA-21, or SLTA-10 interface, or an *i*.LON® 10, *i*.LON 100, or *i*.LON 600 server

Evaluation Board Specifications

All Pyxos FT Evaluation Boards incorporate a Pyxos FT Network Chip.

Pyxos FT EV-Pilot	Hosted Pyxos Pilot with a 47.9 MHz Atmel ARM AT91SAM7S64 as the host microcontroller. Includes five push buttons, eight LEDs, and a pre-loaded demo application. Also includes an Echelon FT 3150 Smart Transceiver with a ShortStack 2 Micro Server that provides an optional interface to a LONWORKS network.
Pyxos FT EV-Actuator Point	Hosted Pyxos Point with a 47.9 MHz Atmel ARM AT91SAM7S64 as the host microcontroller. Includes 0 to +3.0VDC analog output, five push buttons, eight LEDs, and a pre-loaded demo application.
Pyxos FT EV-Sensor Point	Hosted Pyxos Point with a 2.4 MHz Atmel AVR ATtiny13 as the host microcontroller. Includes a temperature sensor, light-level sensor, 0 to +3.0VDC analog input, and a pre-loaded demo application.
Pyxos FT EV-Nano Point	Unhosted Pyxos Point with four general-purpose digital I/Os, in parallel with two push buttons and two LEDs.
Link Power Supply (included):	
Input Voltage	100 to 120VAC or 200 to 240VAC; 50 or 60Hz (depending on power option).
Output Voltage	24V AC nominal unregulated
Local Power Supply (not included):	
Input Voltage	100 to 120VAC or 200 to 240VAC; 50 or 60Hz (depending on power option).
Output Voltage	9V DC nominal unregulated (see below for individual current requirements of each Evaluation Board)
Evaluation Board Input Current*	
EV-Pilot	100mA
EV-Actuator Point	50mA
EV-Sensor Point	15mA
EV-Nano Point	15mA

* Does not include the application current for user I/O.

Temperature	
Operating	0 to +40°C
Non-operating	-20 to +65°C
Dimensions (excluding connectors)	
EV-Pilot	144mm x 122mm x 22mm
EV-Actuator Point	127mm x 120mm x 35mm
EV-Sensor Point	79mm x 97mm x 20mm
EV-Nano Point	62mm x 70mm x 16mm
EMI Compliance	FCC Level A; En55022 Level A

Documentation

The following documentation is included with the Pyxos FT EVK. The brief Quick Start Guide provides a quick introduction on how to install and use the Pyxos FT EVK. It is included in printed and on-line PDF format. All other documents are included only in on-line PDF format. In addition, the evaluation board schematics are also included with the Pyxos FT EVK.

Document	Echelon Part Number
Pyxos FT EVK Quick Start Guide	078-0340-01A
Pyxos FT EVK User's Guide	078-0342-01A
Pyxos FT Programmer's Guide	078-0339-01A
Pyxos FT Chip Datasheet	003-0406-01A
Pyxos FT Chip Databook	005-0188-01A
Introduction to the LONWORKS System	078-0183-01A
Introduction to Pyxos FT Platform	078-0341-01A

Ordering Information

Product	Echelon Model Number
Pyxos FT EVK Evaluation Kit	
Pyxos FT Evaluation Kit (US power supply)	11000R-10-11
Pyxos FT Evaluation Kit (Continental Europe power supply)	11000R-10-12
Pyxos FT Evaluation Kit (UK power supply)	11000R-10-13
Pyxos FT Evaluation Kit (Japan power supply)	11000R-10-14
Pyxos FT Evaluation Boards	
Pyxos FT EV-Pilot Evaluation Board (US power supply)	11200R-11
Pyxos FT EV-Pilot Evaluation Board (Cont'l Europe power supply)	11200R-12
Pyxos FT EV-Pilot Evaluation Board (UK power supply)	11200R-13
Pyxos FT EV-Pilot Evaluation Board (Japan power supply)	11200R-14
Pyxos FT EV-Sensor Point Evaluation Board	11210R
Pyxos FT EV-Actuator Point Evaluation Board	11220R
Pyxos FT EV-Nano Point Evaluation Board	11230R