

ADVANCE PRODUCT BRIEF

The SM2400A-MOD1-FCC is a complete solution for the rapid deployment of Narrowband Power-Line Communications (N-PLC) into various systems. Utilizing the highly versatile SM2400A modem, the module offers a OFDM-based communication scheme interoperable with industry standards (G3-PLC FCC) and proprietary mode (XXR) that balance high data rates with most robust communications in noisy conditions. The module provides a direct bridge from the host micro-controller to the power-line network without the need of additional components and allows systems to communicate over extended ranges up to several kilometers.

Features

- Low-cost, small form-factor design
- Power-line Communications over AC/DC lines of up to 240V
- Operates over FCC band: 155 kHz - 490 kHz
- Built-in power-line coupling circuit
- Supports multiple N-PLC schemes:
 - High robust/noise immunity (XXR)
 - Industry compatible, high speed low latency (G3-PLC FCC)
- Turnkey networking solution - Physical Layer (PHY), Media Access Controller (MAC) and mesh networking
- Simple control interface and pass-through modes
- SPI/UART micro-controller interface
- Integrated zero-crossing circuit
- Low power consumption

Specifications

- 12V DC input voltage
- 3.3V (5V) tolerant I/O
- Communication Line Voltage: up to 240VAC
- High Robust/Noise Immunity mode (XXR)
 - Max data rate: 5 kbps (PHY)
 - Max payload size: 100 bytes
 - Max number of nodes: 250
 - Sensitivity: -90dB
 - Peak power (12V)
 - Standby: 984 mW
 - Tx: 1116 mW
 - Rx: 984 mW
- Industry Compatible OFDM mode (G3-PLC FCC)
 - Max data rate: 400 kbps (PHY)
 - Max payload size: 1,280 bytes
 - Max number of nodes: 1000
 - Sensitivity: -85dB
 - Peak power (12V)
 - Standby: 456 mW
 - Tx: 780 mW
 - Rx: 600 mW

Applications

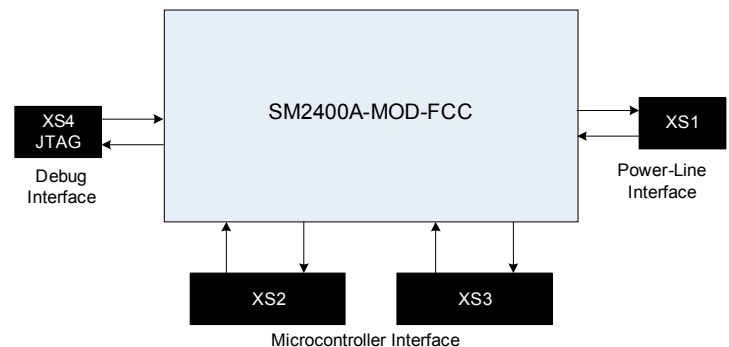
The SM2400A-MOD1-FCC is ideally suited for adding extended communications capability with power-line networking with the SM2400A PLC modem. Typical applications include:

- Street lighting control
- Industrial control and automation
- Smart grid communication
- Advanced Metering Infrastructure (AMI)
- Solar and alternative energy management
- Smart home automation
- Serial to PLC adapter

Board Photo



Block Diagram

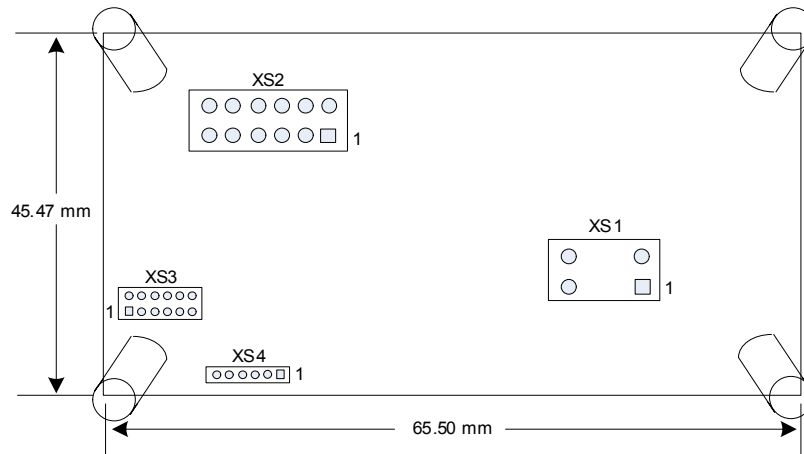


Firmware Options

- G3-PLC FCC (PHY, MAC and command interface)
- XXR and Mesh Networking Stack
- UART Pass-through over XXR

SM2400A PLC Module Dimensions and Connector Pinouts

The overall dimensions of the SM2400A-MOD1-FCC are 65 mm x 45 mm.



The four connector pinouts (XS1 - XS4) shown in the Dimensions Diagram above are defined as follows: .

4-Pin Connector XS1		
Pin Number	Name	Description
1	AC240V-N	Mains neutral
2	AC240V-N	Mains neutral
3	AC240V-L	Mains active
4	AC240V-L	Mains active

6-Pin JTAG Connector XS4		
Pin Number	Name	Description
1	JTRSTb	JTAG test reset
2	JTCK	JTAG test clock
3	JTDI	JTAG test data in
4	JTDO	JTAG test data out
5	JTMS	JTAG test mode select
6	GND	Ground

12-Pin Connector XS2		
Pin Number	Name	Description
1	Reserved	Reserved
2	EVENTOUT	Event Out pin (Reserved)
3	STA	STA pin (Reserved)
4	\overline{RST}	Reset pin
5	RXD	UART receive data in
6	\overline{SET}	SET pin (Reserved)
7	5V0	5V Input (Reserved)
8	TDO	UART transmit data out
9	GND	GND
10	GND	GND
11	AFE_VCC	12V Input
12	AFE_VCC	12V Input

12-Pin Connector XS3		
Pin Number	Name	Description
1	SPIS_SSb	Host SPI Slave I/F select
2	SPIS_IN	Host SPI Slave I/F data in
3	SPIS_SCK	Host SPI Slave I/F clock
4	SPIS_OUT	Host SPI Slave I/F data out.
5	UART_HSI	UART I/F handshake in
6	UART_HSO	UART I/F handshake out
7	COREIO12	Used for zero crossing detection
8	COREIO15	Host interrupt request signal
9	MODE0	Boot mode pin latched on reset.
10	MODE1	
11	GND	GND
12	GND	GND