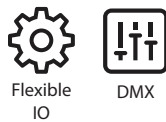
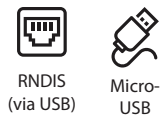
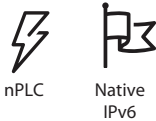


DATASHEET

Intelligent OFDM nPLC modem for industrial control and networking

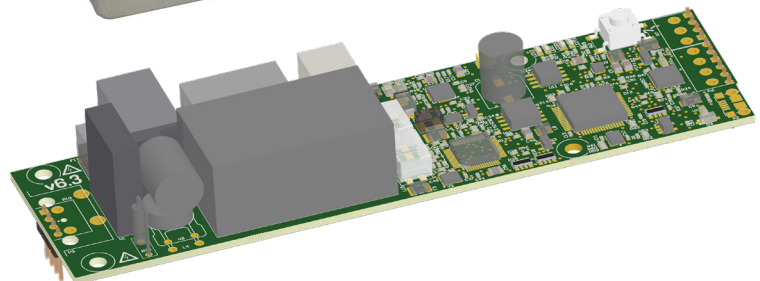
featuring the Semitech Semiconductor SM2400 nPLC controller



Standalone



Board-mount



Robust IPv6 networking built on a proven platform

The **Platypus-M** module provides robust narrowband powerline communications (nPLC) for industrial control applications.

It is built on our proven device platform that enables narrowband powerline communication applications in various form factors. Every device built on the Platypus platform integrates both a next-generation, multi-protocol capable and programmable OFDM transceiver, and a general-purpose ARM Cortex-M3 microcontroller that provides remote configuration and flexible digital and analog interfaces.

The on-board ARM Cortex-M3 runs a proprietary and modular firmware targeted at communications and authentication applications. Built upon the industry-standard RIOT multi-tasking kernel, In addition to integration with the PLC transceiver, Theobroma Systems has added USB-connectivity as a RNDIS device, integration to smart-card-based authentication tokens, a COAP-based management interface and sensor/actuator endpoints.

The **Platypus-M** module combines interfaces with industrial-grade nPLC networking and easy customisation for user-defined applications.

Supports evolving nPLC standards

The **Platypus-M** module features a future-proof architecture that ensures easy adaptability to evolving nPLC standards:

- nPLC transceiver is fully managed by the on-board ARM Cortex-M3 to allow local (via USB) and remote (via nPLC) firmware-upgrade
- DSP-based programmable nPLC transceiver with multi-protocol support via firmware swap (G3-PLC, PRIME, IEEE 1901.2)

Devices are preconfigured to communicate according to the G3-PLC standard:

- IPv6 packet format on the wire
- Integrated forward error correction (FEC)
- Adaptive modulation automatically lowers the data rate under harsh channel conditions
- Hardware-accelerated acknowledgement and retransmission
- Listen-before-talk for multi-peer access

Flexible IO ports to match diverse applications

The **Platypus-M** module features multiple digital and analog IOs. In addition to the integrated RS485 transceiver, analog and digital inputs and outputs are available.

Easy to integrate — it's just another device on an IPv6 network

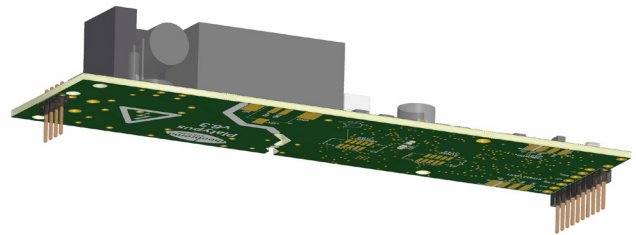
The **Platypus-M** module can be used in multiple communication configurations to adapt to different application requirements:

- configured as a **transparent serial bridge**, it operates stand-alone as a RS485 line-extender with configurable baud-rate
- connected to a PC via USB, it shows up as a standard **RNDIS** network card for limitless IPv6 connectivity

While the transparent serial bridge provides a low learning curve for the implementation of nPLC in customer applications, the full benefits of the device architecture become apparent in IPv6 mode: all devices in an nPLC network deployment are easily addressable through IPv6 and can be accessed from USB-connected host computers.

Board-Mount Option Available

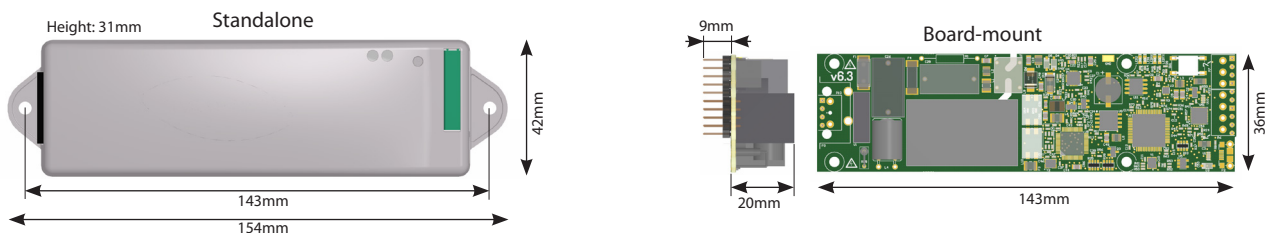
The **Platypus-M** module is available in a board-mount option. Instead of the C8 power connector, standard 2.54mm wire terminals are mounted. All low-voltage interfaces that are available on the standard option are routed to a standard 2.54mm board-to-board connector on the bottom. Robust mechanical mounting occurs through four M3 screws.

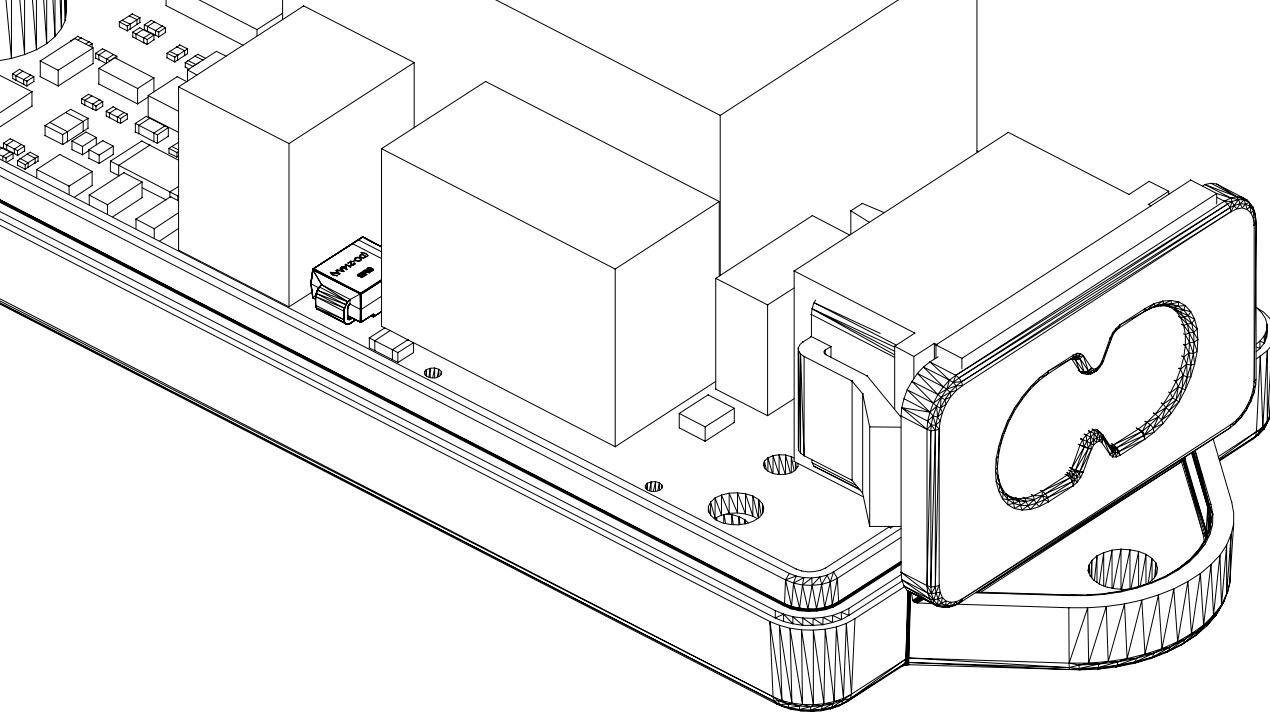


Technical Summary

Main processor	STMicroelectronics STM32: 72MHz ARM Cortex-M3 with integrated peripherals
Transceiver	Semitech Semiconductor SM2400 DSP-based, programmable transceiver for OFDM-based nPLC communications Ready for G3-PLC, PRIME, IEEE1901.2 and legacy FSK-protocols
Modulations	ROBO, BPSK, QPSK, 8PSK, 16QAM
Used standard	G3-PLC
Frequency range	95 – 140kHz (CENELEC B and C) 155 – 487 kHz (FCC)
Data rate	Up to 77 kbit/s (CENELEC B and C) Up to 621 kbit/s (FCC)
Powerline connector	IEC C8 power jack (standalone option) 2.54mm headers (board-mount option)
Supply	Integrated AC/DC switching power supply 100-240VAC, 50-60Hz
Consumption	< 2W (at 25°C ambient operating temperature)
USB	Full-Speed USB network card (RNDIS device), supports Windows and Linux Micro-USB connector (standalone option) Routed to 2.54mm header (board-mount option)
Configuration interface	Integrated CoAP server, RFC 7252 compliant - accessible with any CoAP client
Wire Terminals (all terminals routed to 2.54mm header on board-mount variant)	2x GPIO (ADC and digital I/O) 1x 0-10V output 1x RS485 (differential) 1x 3.3V 100mA supply output
RS485	Integrated transceiver for direct connection DMX mode supported, controls DMX lighting
Serial bridge	Configurable as a stand-alone RS485 serial bridge Baud rates and line termination are configurable through CoAP
DMX	DMX-512 controller, configurable through CoAP, programmable for automatic fades
Operating environment	-40°C to 85°C (industrial)

Dimensions





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