Point Blue

ATEX/ IECEx certified, IP68 rated, low powered Remote Telemetry Unit with software configurable I/O

Point Blue is an intrinsically safe, ATEX and IECEx certified compact Logger/RTU with a 3G modem with GPRS fallback, internal and/or external antenna, flexible I/O options, Modbus and SDI-12 master capability and a submersion sensor.

Key Functionality:

- Real-time remote monitoring of up to 5 programmable I/O channels, allowing over 100 possible combinations of digital, counter, analogue and serial inputs.
- IP68 enclosure suitable for submersion to 4m for 4 days with a range of mounting options for in-field deployment
- Patented integrated submersion sensor able to detect when the unit is submerged
- Communicates with Medina, DNP3 or WITS DNP3 Masters or a FTP server
- Tri-band 3G modem with quad band GSM/GPRS fallback
- Internal antenna and optional external antenna with automatic switching
- Internal or external lithium battery options with an expected life of 5+ years
- Flexible integrated installation bracket
- Local diagnostic points such as cellular signal strength, temperature, battery voltage
- Capable of communicating with Modbus and SDI-12 slaves

EXTERNAL I/O

Point Blue provides real time remote monitoring of up to 5 programmable sensors. It has software programmable I/O functionality for hundreds of configurable combinations and includes support for analogue, digital, counter and serial inputs.

The following table lists the available I/O:

Type	Max No.	Range	Notes
Digital input	5	0-1	Volt-free, includes a debounce filter
Counter input	4	32-bit	Volt-free, up to 100 Hz, includes a debounce filter
Active loop	2	4-22mA	Independent settle time, 12V 42mA supply
Passive loop	2	4-22mA	
Active voltage	2	0-2V	Independent settle time, 12V 42mA supply
Passive voltage	4	0-2V	
Serial	1	N/A	Supports connection to various serial slave devices via interfaces such as SDI-12, RS232 and RS485

The active loop and active voltage I/O options supply power to the external sensor whereas the passive loop and passive voltage I/O options do not power the external sensor, and require a secondary power supply for the sensor, or the sensor is self-powered.

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COMMS

The Point Blue is a 3G device and supports 3G network technology, falling back to GSM/GPRS when 3G isn't available. The modem on the Point Blue is paired with a software switchable antenna offering internal and external options to facilitate communication with the Master. The Point Blue provides the following functionality with regards to communication:

- Tri-band 3G modem with quad band GSM/GPRS fallback
- High gain hexa-band customised internal cellular antenna
- Support for a third party external antenna
- Automatic selection between the internal and external antenna
- Configurable periodic scheduled dialback (useful to minimise battery usage)
- Global RF band selection (software configurable)
- Support for TCP/IP over 3G/GPRS or v110 over GSM CSD
- Trigger dial in using magnetic reed switch

INTERNAL MONITORING

In addition to external sensor reading the Point Blue can monitor and report information about itself. Some of the parameters monitored include:

- Internal battery voltage
- External supply voltage
- Temperature
- Loop voltage
- Cellular signal strength (for the external and internal antenna)
- Modem error code
- No. of successful calls to the Master
- No. of unsuccessful calls to the Master
- Cell information using Cellid, LAC, MMC and MNC
- Modem usage
- Submersion sensor

All of these internal values can be accessed remotely as points on the Master and can be configured with trends and events in the normal way.

DNP3 PROTOCOL

The Point Blue can be configured as a DNP3 slave capable of the following:

- DNP Level 2 + parts of level 3 and level 4
- Class 1, 2 and 3 Events
- Two event models for Analogue inputs (value change and level change)
- Contactable events (Alarms)
- Periodic events (Trends)
- Object Group 0 device attributes
- File transfer and activation
- Time synchronisation with Master
- Object 20 (Counter) writes
- Object 110 (string) points
- Supports unsolicited reporting
- Frozen counters

MEDINA PROTOCOL

The Point Blue can be configured as a Medina slave capable of the following:

- Monitoring of inputs
- Eventing and Alarming
- Trending
- File transfer
- Time synchronisation with Master

WITS DNP3 PROTOCOL

The Point Blue can be configured as a WITS DNP3 slave capable of the following:

- WITS enhancements to Object Group 0
- Binary State Actions
- Analogue Limits and Scaling
- Object Flag Actions
- On/Off scan
- Incremental, Bulk and Template Configuration
- Periodic Data Logging for AI and CI
- Scheduled Communications
- Health Check Data Set

FTP

The Point Blue can be configured to upload Comma Separated Value (CSV) files to an FTP server. This mode makes the Point Blue an ideal first step into remote telemetry. The following are supported:

- Trending
- Events and Alarming
- Time synchronisation with mobile network

MEMORY

Volatile Memory

The Point Blue has low power static RAM that is used for storing trend and event data. With a common trend configuration (see example below), the Point Blue can store Medina trend data for up to 45 days (DG configuration dependent). For DNP3 or WITS DNP3 event data, approx. 15,000 events, which equates to ~120 days.

- Counter -15 mins
- Internal battery voltage - 60 mins
- Cellular signal strength - 24 hours
- Modem error code – 24 hours
- Dial back success -24 hours
- Dial back failure - 24 hours

Non-Volatile Memory

The Point Blue also has 4GB of non-volatile memory which is used to store diagnostic, firmware and configuration files.

CONFIGURATION

The Point Blue configuration is stored in non-volatile memory meaning that it is retained after a power reset.

The Point Blue can be configured locally by connecting over USB to a Microsoft Windows PC running the Metasphere application, Poco+. The RTU can also be configured remotely via Medina, DNP3 or WITS DNP3.

FIRMWARE UPGRADE

Point Blue supports firmware upgrades, either over-the-air via the Medina protocol, DNP3 file transfer (DNP3 and WITS DNP3), or locally via the USB cable from Poco+.

ACCESSORIES

A number of standard Point Blue accessories are available:

- USB configuration cable
- Test box
- Connector cap (to be used when no external connections are required to maintain the IP68 rating of the RTU)
- Antenna cap (cap should always be used unless an external antenna is fitted)
- Off-the-shelf I/O cables (these cables are pre-wired for some common applications)

An example of an off-the-self cable system. This particular setup gives two analogue inputs, and two pulsed inputs

POWER

There are two versions of the Point Blue, Point Blue 3Gi and Point Blue 3Ge. The Point Blue 3Gi has an internal battery only, whereas the Point Blue 3Ge is only powered by an external battery with no internal battery.

- Internal Lithium Thionyl Chloride (LTC) battery pack (tested to UN38.3 safe transportation standards)
- Internal battery has a life of 5+ years for many applications
- External LTC battery pack (tested to UN38.3 safe transportation standards)
- External DC source (5V DC to 8V DC, minimum 7.5W)

ATEX/IECEX PARAMETERS

Sensor input parameters

- U_o = 13.65V
- I_o = 42mA
- P_o = 143mW

- C_i = 306pF
- L_i = 0

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SPECIFICATIONS

Analogue Inputs	Up to 4 channels Type: Active current, passive current, active voltage, passive voltage Current range: 0-20mA, Voltage range: 0-2V Active AI power supply (12V DC, 21mA per channel) Input impedance: 10.2kΩ Accuracy typically: ±0.5% (Max ±2%) Absolute maximum ratings: ±5VDC Resolution: 16-bits
Counter inputs	Up to 4 channels Volt free, Impedance: 50kΩ 32-bit counter support up to 100Hz
Digital inputs	Up to 5 channels Volt free, Impedance: 50kΩ
Power	Internal or external LTC battery pack
Protocols	Medina DNP3 (Level 2+ elements of level 3 and 4) WITS DNP3 v1.1 Modbus master (RS232, RS485 full and half duplex) SDI-12 master (up to 10 sensors)
Memory	4GB flash memory and 512kB static RAM
Comms	Internal Tri-band 3G modem (850, 900, 2100 MHz) with quad band GPRS fallback (850, 900, 1800, 1900 MHz) Auto switching internal and external antenna
Local monitoring	Ambient temperature sensor (± 1˚C) Integrated submersion sensor Battery, loop, and external supply voltages (± 2%) Antenna selection and performance
Remote management	Remote firmware upgrade and configuration
Dimensions	156mm × 110mm × 112mm (excluding mating cables) 0.6 Kg (fully assembled)
Environmental	Operating temperature -20˚C to +50˚C Relative Humidity up to 95% non-condensing Protection classification: IP68 4m for 4 days
Certification	⟨Ex⟩ II 1G Ex ia IIB T4 Ga (-20˚C ≤ Ta ≤ +50˚C) Atex: Baseefa15ATEX0045X IECEx: BAS 15.0027X

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Metasphere provides robust asset monitoring of time critical remote operations for operators to gain competitive advantage and meet regulatory compliance.