Eagle GPS (4G LTE Cat-M1/NB1)

GPS data-Logger with SDI-12, I²C, Digital and Analog Inputs, 4-20mA, RS485/Modbus, Bluetooth, Ultra-long Battery Life, in a Waterproof Housing

APPLICATIONS

Soil moisture probes | Temperature / cold-chain | Asset location | Tank levels | Door open / close | Meter pulse counting

The Eagle is a battery-powered data logger that provides GPS asset tracking while catering for an impressive array of inputs and outputs and different sensor interfaces for connectivity to 4G LTE Cat-M1 / NB-IoT networks.

FEATURES

- 4G LTE Cat-M1 / NB-IoT Modem
- Ultra-long battery life, wide input voltage range caters for LTC batteries with external power option
- High Performance GPS tracking with LNA and 3D Accelerometer
- Inputs: 3 x Digital, 2 x Analog, 2 x 4-20mA, 1-wire (iButton)
- Outputs: 2 x switched GND, Vout, 3.3V
- SDI-12, RS-485, I²C sensor interface
- Bluetooth 5 Low Energy (BLE)

MECHANICAL SPECIFICATIONS	
Low-profile IP67 rugged housing	The IP67 rated housing is made of sturdy ABS/Polycarbonate plastic to survive bumps and knocks and to survive many years in the sun and weather. It is low-profile and caters for a number of cable glands to allow for waterproof cable entry to the housing. The housing screws together for easy assembly, and has convenient mounting tabs.
Dimensions	L 183 x W 145 x H 40 mm
Operating Temperature	-20°C to +65°C For operation in extreme temperatures, the device must be fitted with Lithium Batteries

POWER	
Input Voltage	4V - 16V Flexible options – from “off the shelf” Alkaline batteries to $LiSO_2$ and 12V options
Long-life	The Eagle is ultra-low power and can run off a set of batteries for many years, including powering sensors. External power can be used if available.
External Power Input	4.5V – 16V The internal battery can be used as a backup to operate when external power fails or is not present
Battery Meter	The innovative battery meter gives an accurate reading of the energy being used from the battery, allowing for superior battery life prediction and monitoring

CONNECTIVITY	
Cellular Networks	4G LTE Cat-M1 and NB-IoT
SIM Card	Hinged Micro-SIM holder (3FF)
Antenna	The Eagle has a U.FL connector on the PCB that connects to an internal cellular antenna by default. This offers the option of installing an external antenna if maximum range is required.
Configuration	Firmware and parameters can be changed Over-The-Air (OTA) using Digital Matter’s device management platform “OEM Server Administration Interface”.

GPS TRACKING	
GPS/GLONASS tracking	- UBLOX EVA-M8Q GPS Module - Low-noise amplifier (LNA) The GPS design allows the Eagle to operate as a high performance tracking device or to obtain occasional position and time updates.
GPS Antenna	High performance internal patch antenna
Offline Assist	Offline Assist GPS satellite data is downloaded via the cellular network and stored in flash memory – used to dramatically improve the TTFF (time to first fix) and performance of the GPS.

INTERFACES	
SDI-12	This interface is commonly used in agricultural sensors and measurement devices for soil moisture probes, temperature, electrical conductivity (EC) of soils, water levels / pressures, other SDI-12 probes and sensors.
Switched Sensor Power (Vout)	Used to control the battery power to external sensors and peripherals. Load limited and short circuit protected. Output voltage is the same as input voltage.
I²C Interface	I²C (inter-IC communications) is an interface commonly used in sensor modules. This allows the Eagle to talk to a wide range of sensors including: temperature, humidity, vibration, CO_2 gas and many others. (requires firmware support - contact Digital Matter about sensor support)
3.3V Switched Power	Used to control the 3.3V power to external sensors and peripherals. Load limited and short circuit protected.
3 x Digital Inputs	Configurable for Pull-up/Pull-Down Wake-up from deep sleep Can be used for low power pulse counting Max input voltage 48V Thresholds: 'Low' below 1.0V, 'High' above 2.6V (approx.)
2 x Analog Inputs	Input range 0-30V with Auto Ranging 12-bit ADC 0-5V range: 1.22mV precision 0-30V range: 7.32mV precision

INTERFACES	
2 x Digital Outputs	The switched ground outputs can be used to control external devices and circuits, for example to turn a lighting tower on / off
2 x 4-20mA Inputs	The 4-20mA inputs can be used to interface to current loop sensors. 0.025mA precision
RS-485	The RS-485 interface can be used to interface to devices that support this interface, including Modbus (may require specific firmware integration)
1-wire	1-wire or "iButton' can be used to read Dallas tags, or interface to sensors using the 1-wire interface
Bluetooth 5	The Bluetooth Low Energy v5 module can be used to interface to BLE sensors and peripherals, or can be used to scan for BLE tags. This is an exciting new option and adds massive flexibility to the device. (may require specific firmware integration)
OTHER	
Accelerometer	3D accelerometer to detect movement
Flash Memory	The flash memory is used to store non-volatile information like parameters and data records. The Flash memory is large enough to store approx. 30,000 records
Test Button & LED	Easy to do in-field testing

Housing example - System integrators can drill additional holes for cabling