

ICT International Telemetry



Overview

The ICT International Telemetry Hub is a powerful and flexible electronic platform that operates remotely in any climate, forming the foundation for specialised scientific and industrial equipment systems. Typically used as a telemetry gateway to transmit data from ICT International instruments to the 'Cloud', it is supported by an extensive software suite that can be customised to suit a wide range of IoT applications.

The Telemetry Hub can be optioned to communicate via Satellite (using the Iridium Short Burst Data service), Penta-band GSM, Wi-Fi, 2.4GHz proprietary wireless networking, LoRa, Bluetooth, RS485, RS232, Ethernet, USB and SDI-12. It can also be optioned to provide analogue and digital outputs and inputs.

It discovers, connects, concentrates and logs data collected from Smart Sensors and ICT International Instruments in CSV format on its SD memory card, and sends it to the Cloud.

The ICT International Telemetry Hub manages power supplied to externally connected devices. The ICT International Telemetry Hub is powered by a Lithium-Ion battery, with an inbuilt solar charging controller. It can also be connected to an external 24V DC power supply.

The ICT International Telemetry Hub is IP67 rated for extended operation in a wide range of environments. It can also be directly mounted on a mast or a flat surface. The Hub has the capacity to be factory customised to do almost anything, based on a combination of up to 4 mini-modules that can be plugged in.

Applications

Typical applications* for the Telemetry Hub include:

- Complete remote, standalone, experimental station for measuring, logging, controlling and sending data directly to the 'Cloud'. (eg: Scientific/Environmental/Agricultural/Mine monitoring)
- Plant Monitoring - Interfacing between sensors, climate control systems and remote management servers (eg: Greenhouses, Weigh stations, Building EMS)
- Managing / controlling remote equipment (eg: irrigation systems, solar and wind farms, security, etc).
- Store and forward repeater in a telemetry network. (eg: Environmental/agricultural monitoring)
- Automatic recording, communicating and playback of sound and images – (eg: Monitoring fauna and stock, Digital voice recording, Noise monitoring, Voice communication, Mine communication)

** Some applications may require factory or engineering customisation.*



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Mini - Modules

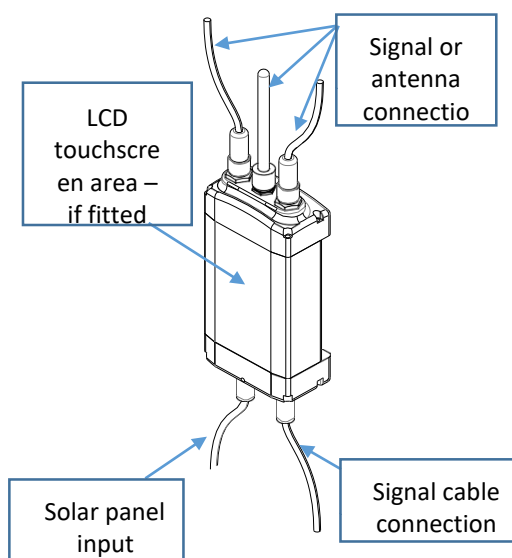
Mini-Modules are either Communications, Control, Sensing, Media or User Interface type. They are quite small in size and are targeted at providing specific functions. Development of new application specific mini-modules is quick, low risk and cost effective. Four slots are available on the ICT International Telemetry Hub for mini-modules. Bluetooth is a standard feature that does not occupy a slot. The Iridium module can be fitted without occupying one of the 4 mini-module slots. An Iridium module can be fitted with a GSM module, then the satellite would be available if the GSM is not. See table below with list of current modules.

Mini-Module	Type	Application
3G GSM module	Communications	Data to the 'Cloud' and remote system management
Iridium module	Communications	Data to the 'Cloud' in remote areas via satellite.
Wi-Fi / Bluetooth module	Communications	Communication with local wireless networks (intra or internet) or with individual mobile devices such as laptop PCs or mobile phones.
2.4GHz wireless module	Communications	Proprietary networked communications between all ICT International devices and loggers – range up to about 5km depending on terrain and antenna selection.
LoRa module	Communications	Network communications between ICT International devices and other LoRa devices – range up to 15km.
RS485 and RS232 ports modules	Communications, Control and Sensing	Interface to weather sensors, PLCs, industrial controllers / computers, etc. (eg via MODBUS)
SDI-12 module	Sensing	Interface to a wide range of environmental sensors.
Ethernet module	Communications	Interface to wired computer networks and the 'Cloud'
Analogue input module (24 bit)	Sensing	Auto-ranging Interface to standard voltage type analogue sensors down to μV level.
Analogue output module (16 bit)	Control	Interface to Programmable Logic Controllers and climate control systems
Audio Module	Media and Communications	Analogue to I ² S digital audio recording, signal processing, playback and sub-audio signaling control
LCD interface module	User Interface	Interface to LCD touchscreen for display of data and user control of Hub applications.

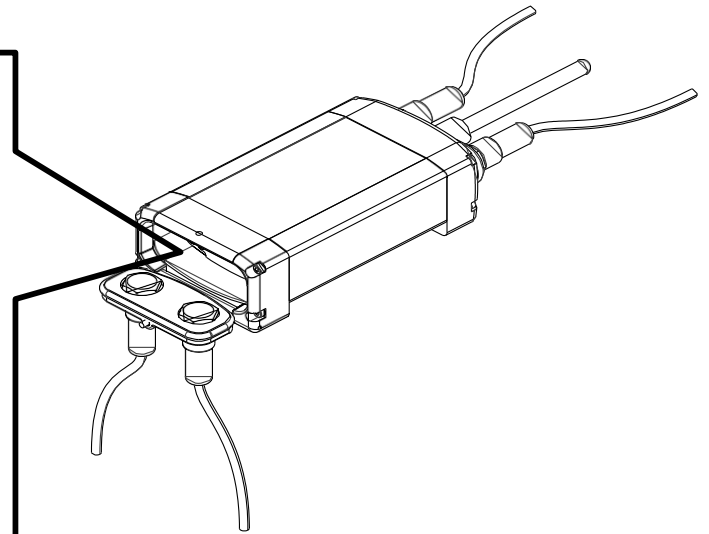
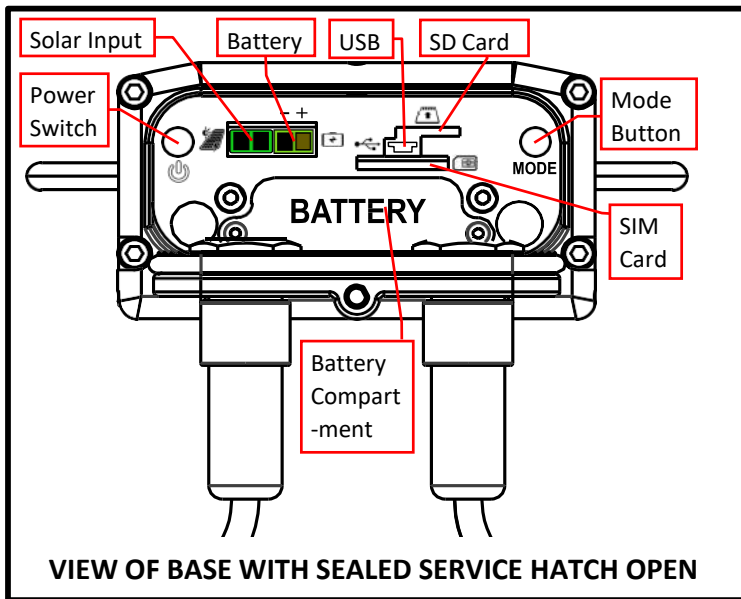
Hardware specifications:

The Telemetry Hub is housed in a rugged IP67 enclosure designed for direct field deployment. Complete communications, control and instrumentation or media solutions are packaged in a single unit. Powered by an internal Lithium Ion battery, with a built in solar charge regulator. The Telemetry Hub has a multiprocessor architecture, where the main CPU is a 32 bit, three stage, pipelined ARM Cortex M3 processor with a nested vectored interrupt controller and a high-performance DMA controller.

The Telemetry Hub is designed to conserve power when not active and manage activity based on battery charge level. The Telemetry Hub can be fitted with a smart phone sized graphical LCD touchscreen to provide custom user interfaces. It is designed to be easy to open up and service at a basic level, (eg: changing a battery, SD or SIM card or replacing a circuit board.) External connections are made to the Telemetry Hub via IP67 waterproof connectors.



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Enclosure:	IP67 rated, Extruded aluminium – hard anodised body. Moulded UV, moisture, & impact resistant endcaps. All external fasteners 316 stainless steel.
Service Hatch:	Sealed service hatch provides access to switches, SD and SIM cards and non-waterproof connections.
Solar Panel:	10W or 20W depending on application. Charge rate automatically adjusts depending on available sunlight.
Data storage:	FAT32, CSV files saved on SDHC cards up to 32GB capacity.
USB:	USB 2.0 Full Speed (12Mbps)
Auxiliary Serial Ports:	1 x RS485 port, 1 x I ² C / SPI port.
Battery:	4.9Ah Wide temperature range, lithium-ion.
Power outputs:	Dual switched, 4.2V battery voltage at up to 4Amps OR up to 15V at up to 1Amp.
External connections:	5 flexible external IP67 connectors (N-type for wireless or multi-way gold plated for signalling and power) Can be used for communications, sensing, control and/or power output.



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Software

ICT has an extensive software and firmware suite, developed, tested and refined over many years that can be customised to suit any application.

