

ML-x15 Low Power Data Logger



The ML-x15 data logger is a small, ultra low power, cost effective data logger with built-in cellular modem available for the EMEA, APAC and NA regions. This small data logger, is further provided with an internal temperature sensor, 4GB micro SD card and an 2FF SIM card slot. The data logger can be powered by an internal 3.6 Volt Lithium battery that will last for years when the data logger is configured in a lowpower mode. It is also possible to power the data logger using an optional 8.30V DC-adaptor or integrated solar panel with 3 x AA NiMH charger.

The data logger can acquire physical signals by 2 current loop inputs, 2 voltage inputs, 1 potentiometer input and 3 digital inputs. The data logger is provided with one serial port to capture measurements from ASCII, MODBUS/RTU, NMEA or SDI-12 compatible sensors. External sensors can be powered by the data logger itself, to prevent them to consume power while the data logger is a sleep. Up to 8 mathematical channels are available to calculate meaningful engineering values derived from sensor input values (e.g. a polynomial to calculate a flow from a stream level).

Logged data can be pushed to a central host by HTTP, FTP, e-mail or TCP at configurable intervals. Optionally logged data can be transmitted by satellite as well (Iridium SBD).

The ML-x15 is available with 3 different cellular modems:

- ML-215: GPRS.
- ML-315: 3G Europe, M-East, Africa & Asia-Pacific.
- ML-N315: 3G North America.

When equipped with the integrated solar panel a complete self providing remote monitoring station can be arranged, all you need is a data logger and applicable sensor(s). This self providing cellular data logger is costs saving, because you don't need: a) solar panels, b) big batteries, c) cellular modem and d) encapsulating cabinet.



Features

- 2G/3G Cellular Data Logger
- Solar, Battery or DC Powered
- 12V@100mA DC Excitation
- 4GB Data Storage
- Analog & Digital Inputs
- Counter Inputs
- Derived Inputs
- RS232, R485 & SDI-12
- ASCII, MODBUS & NMEA
- TCP, FTP, HTTP, e-Mail & SMS
- CSV, TXT, JSON & JPG Files
- IP68/IP67/IP54 Enclosure

Accessoires

- Camera (JPG)
- Iridium Satellite Modem
- GPS Receiver
- Pole Mounting Bracket

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Specifications

Data Logging

- 1 second to 1 day intervals.
- Regular, alarm and independent intervals.
- Daily operation time bracket (e.g. 07:00AM to 20:00PM or 21:00PM - 06:00AM)
- 4GB micro SD-Card for data and picture storage.

Data push

- 1 minute to 1 day intervals.
- Regular and alarm intervals.
- Direct push on alarm raise and fall.
- Daily operation time bracket (e.g. 07:00AM to 20:00PM)
- Native TXT, JSON or CSV log files by HTTP, FTP, e-Mail(SMTP) or secure TCP (CHAP)
- JPG pictures by HTTP, FTP, e-Mail or TCP
- SBD messages by Iridium satellite modems (960x)

Alarming

- Alerts by SMS
- Open collector output (max. 100mA sink current)

Internal Sensors

- Battery (voltage and rest capacity)
- Processor temperature
- GSM signal strength

Analog Inputs (12bit resolution & <0.1% FS accuracy)

- 2x current loop inputs (0/4..20mA, 150 Ohm impedance)
- 2x voltage inputs (0..10V)
- 1x potentiometer input (max. 10M Ohm)

Digital Inputs (0..5V)

- 3x state, pulse or counter (max. 10kHz)

Serial Input (1x RS-232, RS-485 or SDI-12)

- **SDI-12** (up to 15 devices, max 20 channels per device)
- **MODBUS/RTU** (read registers from up to 15 slaves)
- **NMEA-0183** (GGA, DBT, HDG and MWV)
- **ASCII** (sensors autonomously outputting readable lines of numeric values)

Derived Inputs (8x calculation channels, to derive engineering values from sensed values using mathematical operators and functions (a/o cos, sin, atan2, ln, sqrt).

Accessory Port (1x RS-232 & 5V excitation, to connect and power a GPS receiver, Iridium SBD modem, JPG camera or TFT-display)

Built-in cellular modem (3 different models)

- **ML-215**: 2G (QUAD-band GPRS)
- **ML-315**: 3G (900/2100Mhz UMTS/HSPA & GPRS fallback)
- **ML-N315**: 3G (850/1900Mhz UMTS/HSPA & GPRS fallback)
- 2FF (Class B) SIM-CARD slot.
- Integrated GSM antenna, external GSM antenna optional.

Configuration by:

- USB (local)
- TCP (remote, in cooperation with the central data collector)
- Web-browser (remote, in combination with the yDocInsights webserver)

Power consumption

- 100mA@3.6V average operating¹⁾ current during a duty cycle of less than 1 sec²⁾ per log interval.
- 250mA@3.6V average operating current during 20..60 seconds cellular communication.
- 100uA@3.6V sleep current.
- 12V@100mA excitation to power external sensors.

Power supply (4 different covers)

- **LI** : 3.6V D-Size SAFT-LSH20 Lithium battery³⁾
- **PV** : 1Wp Integrated solar panel and 3x AA NiMH charger
- **DC/TFT**: 8..30V DC adapter and 3x AA NiMH charger

Enclosure (4 different covers)

- **LI /DC**: IP68 (30min@2m), 130x120x85mm, 460g.
- **PV**: IP67, 130x120x125mm, 530g.
- **TFT**: IP54, 130x120x85mm, 600g.
- Base of UV stabilized polycarbonate.
- Cover of UV stabilized glass fiber enforced polyamide66
- Wide temperature operating range -30°C +75°C

1) 100mA if no external sensors need to be powered.

2) <1 sec. if external sensors are responsive and don't require time to "warm up".

3) SAFT LSH20 Lithium or NiMH batteries not included.

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Editions



Stock Keeping Unit Table

SKU format: ML-x15y-z (x=Modem, y=Edition, z=Power Supply)

Modem (x) Description

ML-215y-z Data logger with built in 2G modem (Quad band GPRS)

ML-315y-z Data logger with built in 3G modem (900/2100MHz UMTS/HSPA, EMEA/APAC & GPRS fallback)

ML-N315y-z Data logger with built in 3G modem (850/1900Mhz UMTS/HSPA, North America & GPRS fallback)

Edition (y) Description

ML-x15TFT-z With 4 analog & 3 digital inputs, serial port & TFT-display cover on accessory port.

ML-x15ADS-z With 4 analog & 3 digital inputs, serial & accessory port.

ML-x15AD-z With 4 analog & 3 digital inputs (no serial port, no accessory port).

ML-x15DS-z With 3 digital inputs & serial port (no analog inputs, no accessory port).

Power Supply (z) Description

ML-x15y-LI Powered from a 3.6V DC SAFT LSH20 or equivalent D-size lithium battery.

ML-x15y-DC With integrated 3 x AA NiMH charger powered from external 8..30V DC source.

ML-x15y-PV With integrated 3 x AA NiMH charger powered from 1Wp integrated solar panel.

Example:

ML-315ADS-PV is a data logger with a built in 900/2100MHz 3G modem, PV-cover, digital & analog inputs, a serial and accessory port.

Remark:

The data logger will be supplied with 4 unmounted PG7 cable glands, giving the user the freedom to choose the number and size of the glands them self to avoid unnecessary points of risk for moisture penetration. We recommend removing the PCB before drilling.