Data Acquisition & Communication Module
with 4 analog and 3 digital inputs, data logging and serial RS232/RS485 communication

8 - 30V DC or battery powered

Solar Powered

2G 3G 4G LTE-M

Advantages

- **Entirely autonomous monitoring and datalogging solution** independent from local infrastructure suitable for off-grid or hard to reach locations using 2G (GPRS), 3G (HSPA/UMTS) or 4G (Global LTE-M or LTE-Cat 1) communications with DC power, battery or solar panel power options.
- **Easy and time saving configuration** through **local** USB 2.0 port and bright and clear terminal interface (no code input!) or remotely, over the air (OTA), even when the M853 has a public, dynamic IP address.
- **Flexible freedom in data communication** by HTTP, TCP, FTP and/or e-mail. Alerts and alarms by SMS directly from the M853. Extensive alarm capabilities with E-mail and SMS through ProcessMonitor Cloud-Portal.
- **Universal and versatile applicable** for different kind of sensors and instruments through 4 analog, 3 digital status-/pulse inputs and **optional ASCII, Modbus RTU and SDI-12** communication.
- **Data logging** by 4GB micro-SD card, for over 20 million data entries with date and time stamp.
- **Reduce maintenance costs and service time** as even the optional internal battery will last for 3 - 8 years, depending on log and send interval.
- **Better cause-effect retrieval** with increased log interval and alarming when setpoint is triggered.
- **Resistant to harsh environments** not a DIN-rail mounted module but an "all-on-board" module in an UV stabilized polycarbonate field mount enclosure IP68 (30 min.@2 meters).

Features

- The M853 is in full compliance with the ProcessMonitor Cloud-Portal, powered by AWS with 99.9% up-time, for data collection, presentation and visualisation by user configurable dashboards, data validation, aggregates and derived values including forecasting, historical trend graphs, data exports and extensive alarm capabilities by Email and SMS text.
- 2G, 3G, 4G/LTE-M modem communication.
- 12 Volt @200mA sensor excitation to power external instruments.
- Onboard diagnostic features for battery (voltage and rest capacity) to determine remaining lifetime., CPU temperature sensor and GSM signal strength.
- Integrated antenna; no "eye-catchers" to prevent vandalism or abuse.
- Wide operating temperature range -30°C to +75°C.
- Flexible mounting possibilities (wall/panel/pipe).

Applications

- Specially designed for industrial applications using (field) devices and instrumentation to measure level, flow, weight/ mass, pressure, temperature, dissolved oxygen, pH, conductivity, vibration, energy/fuel consumption etc.
- Extremely suitable for replenishment purposes or logistic and Supply Chain (SCM) optimization for raw bulk materials including: Remote Silo/Tank Monitoring, Remote Inventory Management, Customer and Vendor Managed Inventory (VMI).

Introduction

M853 is an ultra-low power "all-in-one" Data Acquisition & Communication Module including datalogging, designed for a wide-range industrial applications. The M853 can be fully configured according to your process requirements. No additional signal converters / amplifiers, encapsulating cabinet or other electrical installation material necessary.

Signal inputs

The M853 consists of 3 digital inputs and 4 analog inputs. The 3 digital inputs are pulse, counter and/or status inputs. The 4 analog inputs consist of 2 current loop (0/4 - 20mA) inputs and 2 voltage (0-10V) inputs. A 1 potentiometer (max. 10M Ohm) input is also available e.g. for wind direction- and angle meters or a PT1000. An optional communication port can be configured for RS-232, RS-485 or SDI-12 mode and supports ASCII, MODBUS RTU/ASCII (read registers from up to 15 slaves) and SDI-12 protocols. The sensor inputs can be easily expanded by an optional Plug-in board with e.g. 4 additional analog inputs or a 2nd serial RS232 or RS485 communication port.

Data outputs

The logged data by the M853 is send through HTTP, FTP, Email (SMTP), TCP (CHAP) or MQTT in native TXT, JSON or CSV-format. Alerts and alarms can increase data logging interval as well as transmission interval. Internal diagnostics may send alarm messages including battery capacity, temperature and GSM signal strength. Total control can be gained when the M853 is integrated at the optional ProcessMonitor Cloud-Portal. Ask your distributor for more details.

Data logging

Data logging by standard 4GB micro-SD card, for over 20 million data entries with date and time stamp. Log frequency is max. 1Hz. The log file is readable on every ordinary PC.

Configuration

Setup can be done through the local USB 2.0 port via a clear terminal menu (no code input!). When using the ProcessMonitor Cloud-Portal, remote configuration over the air (OTA) is possible by smart reversed communication, even in case of a public, dynamic IP address from a telecom provider. Configuration includes communication settings, event report by exception (alarms), datalogging interval, TAG no, specific sensor information, including scaling, units etc. All settings are stored in non-volatile memory and will not be lost in the event of power failure.

Enclosure

The M853 is supplied in a rugged field mount enclosure, classified as IP68 (30 min.@2 meters). Operational temperature is -30°C to +75°C (-22°F to +167°F).
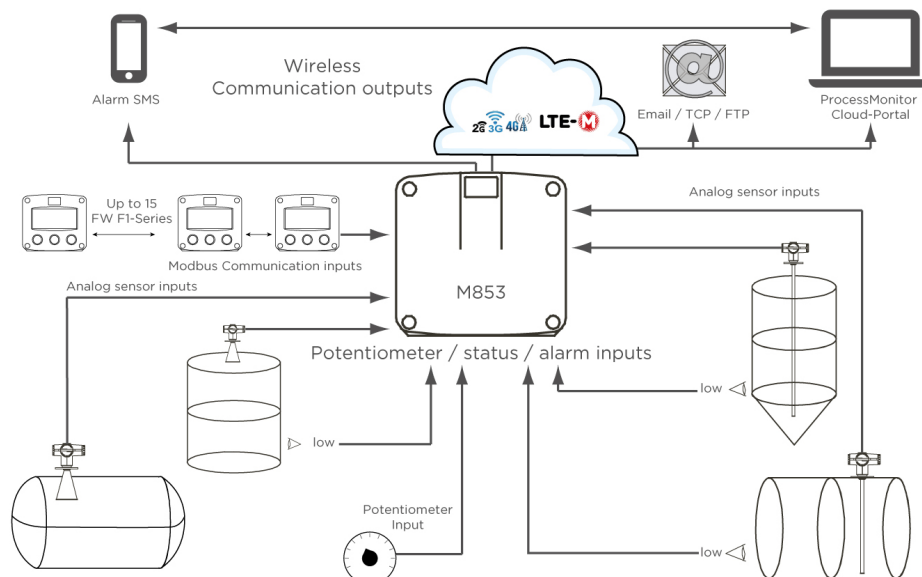
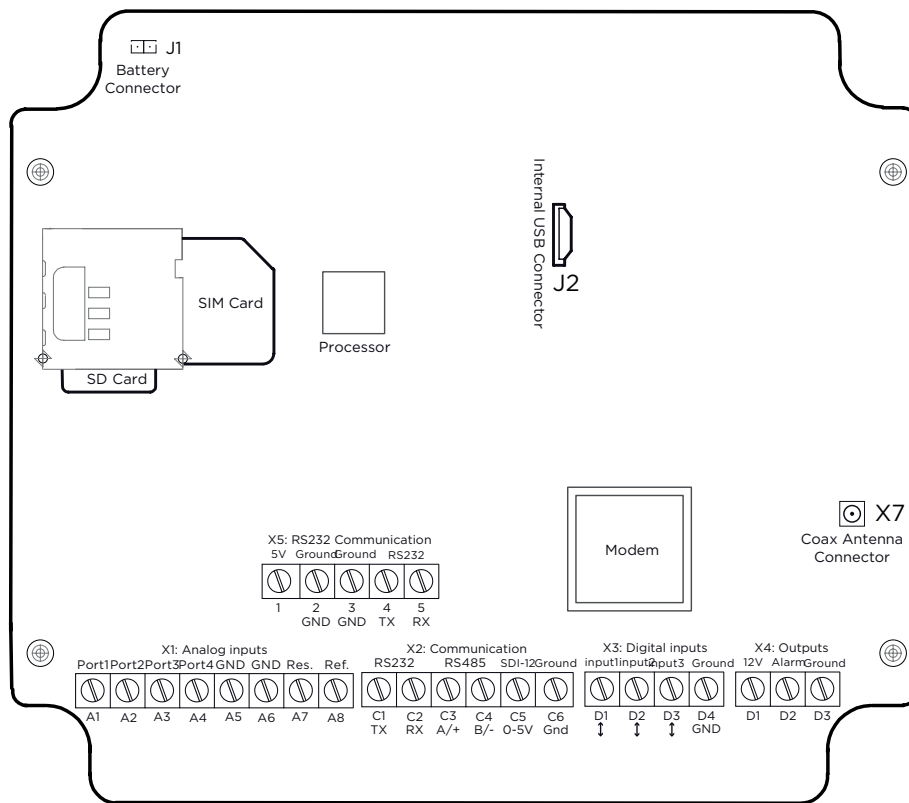## Options

An external antenna is optional available. As optional Plug-in boards are available: 4 additional analog (0/4... 20mA or 0...1,25/ 2,5/ 5/ 10V) inputs, 2 differential (±250/ 500/ 1000/ 2000 mV) inputs, internal barometric pressure (0,3...1,2 Bar) and temperature (-30 ... +70°C) or a sine wave converter board (a: 50mV...24 V, f: 0 ... 50kHz) to digital pulse (0/ 3,6V).

Power requirements

Three power options are available to power the M853. The M853 can be supplied by a long-life (3 - 8 years) lithium battery. A solar powered version is available with a 3 x AA NiMH rechargeable battery pack and charging circuit. The energy management sensor tracks the real remaining battery life for both versions. Finally, an 8 - 30V DC power supply is available including a battery back-up with charger for 3 x AA NiMH rechargeable batteries (excluded).
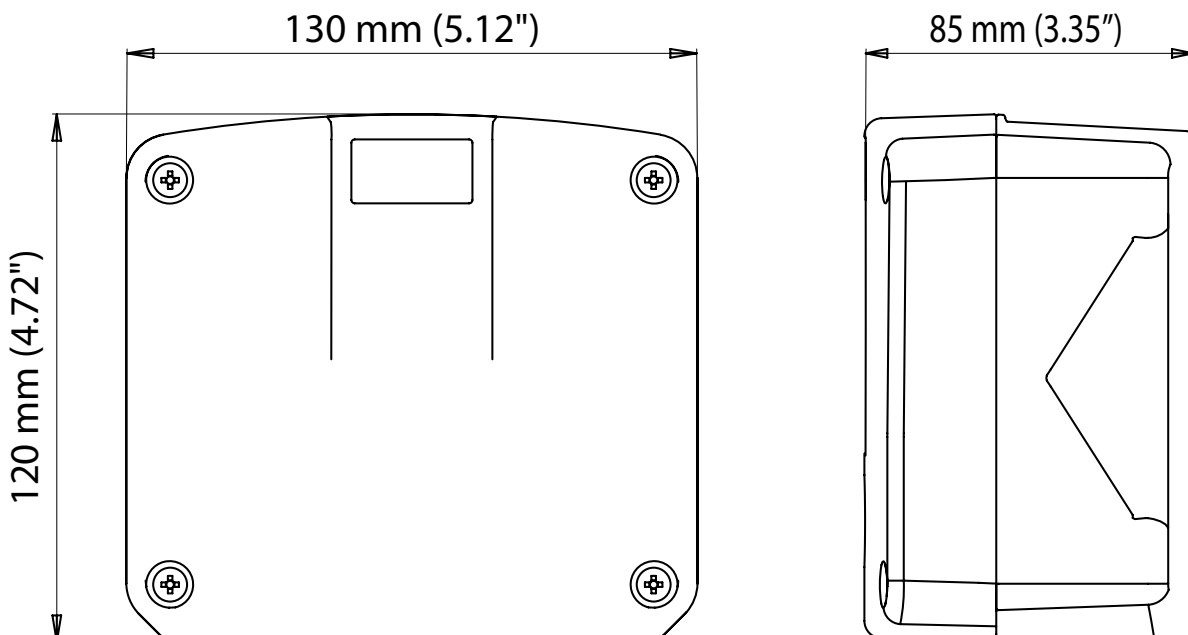
Terminal connections M853

Terminal Connections M853

X1	Analog inputs.
X2	40°C to +70°C (-40°F to +158°F).
X3	Digital inputs.
X4	Power and alarm output

Terminal Connections M853

X5	RS232 Communication
X7	External Antenna
J1	Battery pack connector
J2	Internal USB connector for local configuration

Dimensions polycarbonate enclosure

130 mm (5.12")

85 mm (3.35″)

120 mm (4.72")

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a Fluidwell company

Power supply

Type PB	D-Size Long-life 3.6V Lithium battery with smart energy management sensor which tracks the real remaining battery lifetime. Lifetime: 3 - 8 years, depending on update rate.
Type 3PB	3 x D-size Long-life 3.6V Lithium battery with smart energy management sensor which tracks the real remaining battery lifetime.
Type PD	8 - 30V DC adapter, with integrated battery backup and charger in cover (3 x AA NiMH not included).
Type PS	Solar powered and 3xAA NiMH rechargeable batteries (not included).
Consumption	< 110 µA @ 3.6V in sleep mode. 100mA @ 3.6V average per log interval of < 1 s. 250mA @ 3.6V average during data transfer max 60 s.

Sensor excitation

Power switch	For low power applications: 200mA @ 12V DC.

Enclosure

General	UV stabilized Polycarbonate.
Sealing	EPDM.
Classification	IP68 (30 min.@2 meters).
Dimensions	130 x 120 x 85mm (5.12" x 4.72" x 3.35") - W x H x D.
Weight	approximately 530 gr.
Cable entry	No holes.

Terminal connections

Type	Removable plug-in terminal strip. Wire max. 1.5mm2.

Operating temperature

Operational	-30°C to +75°C (-22°F to +167°F).

Digital inputs

Status / pulse inputs	3 status or counter/pulse inputs 0 ~ 3.6 Volts, TTL. tolerant (0-5V), NPN/PNP, open collector, reed-switch.
Intern. pull U/D	Selectable, up to 10 kHz.
Function	Alarm or flow/counter.
Values storage	Saved in non-volatile memory, even after battery replacement.

Analog inputs

Inputs	2 x current loop inputs (0/4 - 20mA, 150Ohm impedance) 2 x voltage inputs (0 - 10V). 1 x potentiometer input (max. 10MOhm).
Accuracy	Resolution: 12 bit.

Communication (optional)

Function	Input expansion and flexibility.
Serial ports	RS232 / RS485 / SDI12
Protocols	ASCII / Modbus RTU and / or SDI-12.
Speed	Application dependable up to 115200 bps.
Addressing	Read registers from up to 15 slaves.

Local configuration

Function	Configuring all settings before operation.
Port	USB 2.0

Data logging

Storage	Standard 4GB micro-SD card.
Frequency	Independent regular and alarm intervals; 1 second to 1 day intervals.
Data entries	Over 20.000.000 with date and time stamp.
Log file	FAT32 file system, readable with any text editor.

Data communication outputs

Frequency	Independent regular and alarm intervals; 1 second to 1 day intervals Direct push on alarm raise and fall.
Operation	Free configurable daily operation time bracket (e.g. 07.00AM to 08.00PM).
Alarming	SMS to 1 number direct from M853 or extensive alarm capabilities by SMS and Email in combination with the ProcessMonitor Cloud-Portal.
Format	Native TXT, JSON or CSV log files.
Transmit	HTTP, FTP, Email (SMTP) or TCP (CHAP).

Alarm output

Function	Transmitting alarm status.
Specification	Open collector (max. 100mA sink current).

Modem communication

Modem	• 2G Global Quad band (GPRS) EGSM 850/900/1800/1900MHz • 3G Global Penta band (UMTS/HSPA) and GPRS fallback • 4G LTE-Cat 1 for Europe and GPRS fallback (1800/900Mhz) •4G LTE-Cat 1 for North America and 3G fallback (1900/850Mhz) •4G LTE-M global and Quad band GPRS fallback
SIM-card	2FF (class B) SIM-card slot.
Antenna	Integrated. External antenna optional available.

		Description							
Model	**M853**	**Data Acquisition & Communication Module**							
Integrated Cellular Modem	**2G**	**Quad band GPRS / EGSM 850/900/1800/1900MHz.**	**-2G**						
	3G	3G Global (UMTS/HSPA) modem (Penta-band & Quad-band GPRS fallback).	-3G						
	E4G	4G LTE-Cat 1 modem Europe (B1/B3/B7/B8/B20) and GPRS fallback (1800/900Mhz)	-E4G						
	N4G	4G LTE-Cat 1 modem North America (B2/B4/B5/B12) and 3G fallback (1900/850Mhz)	-N4G						
	4GM	4G LTE-M global modem & Quad band GPRS fallback	-4GM						
Power	PB	Battery powered, 1 x D-Size long-life 3.6V Lithium battery. (SAFT LSH20)	-PB						
	3PB	Battery powered, 3 x D-Size long-life 3.6V Lithium batteries incl. safety electronics.	-3PB						
	PD	**8 - 30V DC adapter, with integrated battery backup and charger in cover lid.**	**-PD**						
	PS	Solar powred; 1Wp solar panel with charging ciruit and battery holder for 3x AA NimH	-PS						
Enclosure	**HD**	**Field/wall mount UV stabilized polycarbonate enclosures - IP68 Cable entry: No holes.**		**-HD**					
Antenna	**NI**	**Internal antenna.**			**-NI**				
	NE	External antenna.			-NE				
Comm.	**CX**	**No communication port.**				**-CX**			
	CS	RS232, RS485 or SDI12, selectable during configuration..				-CS			
Optional Plug-in board	**ZX**	**No options.**					**-ZX**		
	ZA	4 additional analog (0/4... 20mA) inputs (16-bit) including 12V@80mA excitation.					-ZA		
	ZD	2 additional differential (±250/ 500/ 1000/ 2000 mV) inputs including 5V@80mA excitation.					-ZD		
	ZP	Internal barometric pressure (0,3...1,2 Bar) and temperature (-30 / +70°C).					-ZP		
	ZV	4 additional analog (0...1,25/ 2,5/ 5/ 10V) inputs (16-bit) including 12V@80mA excitation.					-ZV		
	ZW	Converter board sine wave (a: 50mV...24 V, f: 0 ... 50kHz) to digital pulse (0 / 3,6V)					-ZW		
Mounting accessoiries	**APM00**	**No mounting accessoiries.**							**-APM00**
	APM01	Universal wall- or pipe mounting bracket UV-resistant polycarbonate							-APM01
	APM02	Complete pipe mounting kit: UV-Resistant polycarbonate bracket APM01, with two 12mm width stainless steel worm gear clambs D = 40 - 60mm (1 5/8" - 2 3/8"), including 4x M4 bolts (16mm), nuts and washers, all stainless steel A2 / AISI304.							-APM02
		M853	-P_	-HD	-N_	-C_	-Z_		-APM__

The **bold** marked text contains the standard configuration: M853-2G-PD-HD-NI-CX-ZX-APM00.