

# Data Acquisition & Communication Module

with 4 analog and 3 digital inputs, data logging and serial RS232/RS485 communication



## Advantages

- ☑ **Entirely autonomous monitoring and datalogging solution** independent from local infrastructure suitable for off-grid or hard to reach locations using 2G (GPRS), 3G (UMTS) or 4G 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**, 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 web-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 protocol.
- ☑ **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.
- ☑ **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 a polycarbonate field mount enclosure IP67 / NEMA4X.

## Features

- ☑ The M853 is in full compliance with the web-based ProcessMonitor server or ProcessView stand-alone software package for visualization, data history, trend graphics and/or extensive alarming.
- ☑ 2G, 3G or 4G modem communication.
- ☑ 8 - 30V DC power supply, battery or solar powered.
- ☑ Energy management sensor onboard, accurately calculates the remaining battery lifetime.
- ☑ 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).

## General information

### 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 winddirection- and angle meters or a PT1000. The sensor inputs can be easily expanded with approx. 15 Modbus slaves through a RS485 communication port or the SDI-12 protocol. The optional serial port can also be configured for RS232 mode.

### Data outputs

The generated data by the M853 is send through HTTP, FTP, email (SMTP) or TCP (CHAP). Total control can be gained through the fully integrated ProcessMonitor web-portal or the ProcessView stand-alone software package. 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.

### Configuration

Setup can be done through the local USB 2.0 port via a clear terminal menu (no code input!).

When using the ProcessMonitor web-portal or the ProcessView stand-alone software package, remote configuration is possible by smart reversed communication. Even with 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.

### 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).

### 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.

### Enclosure

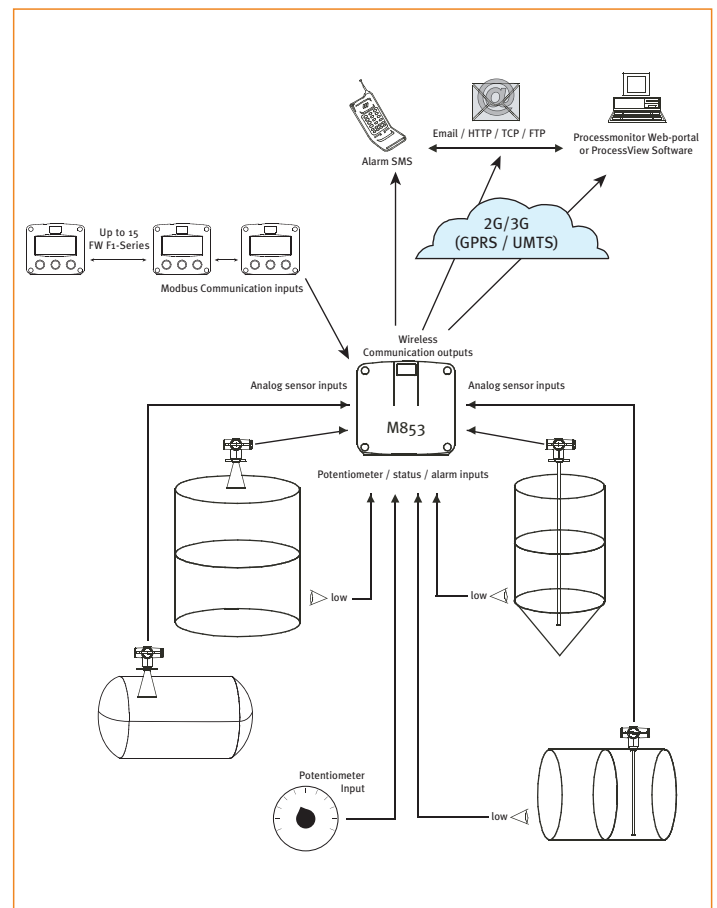
The M853 is supplied in a rugged field mount enclosure, classified as IP67/Type 4X.

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

### Options

An external antenna is optional available. The M853 blind cover can be exchanged by additional displays / monitors from the Fluidwell F-Series.

## Overview application M853



# Technical specification

## Power requirements

Power supply	
Type PB	D-Size Long-life 3.6V Lithium battery with smart energy management sensor which tracks the real remaining battery lifetime.
<i>Lifetime</i>	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: 100mA @ 12V DC.

## Casing

General	
Enclosure	UV stabilized Polycarbonate.
Sealing	EPDM.
Classification	IP67 / NEMA 4X.
<i>Dimensions</i>	130 x 120 x 85mm (5.12" x 4.72" x 3.35") - W x H x D.
<i>Weight</i>	approximately 530 gr.
Cable entry	No holes.

Terminal connections	
Type	Removable plug-in terminal strip. Wire max. 1.5mm <sup>2</sup> and 2.5mm <sup>2</sup> .

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

## Signal inputs

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.
<i>Intern. pull U/D</i>	Selectable, up to 10 kHz.
<i>Function</i>	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).
<i>Accuracy</i>	Resolution: 12 bit.

Communication (optional)	
Function	Input expansion and flexibility.
Serial ports	RS232 / RS485 / SDI12
Protocols	Guidance TDR200, ASCII / Modbus RTU and / or SDI-12 (others can be implemented on request).
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 outputs

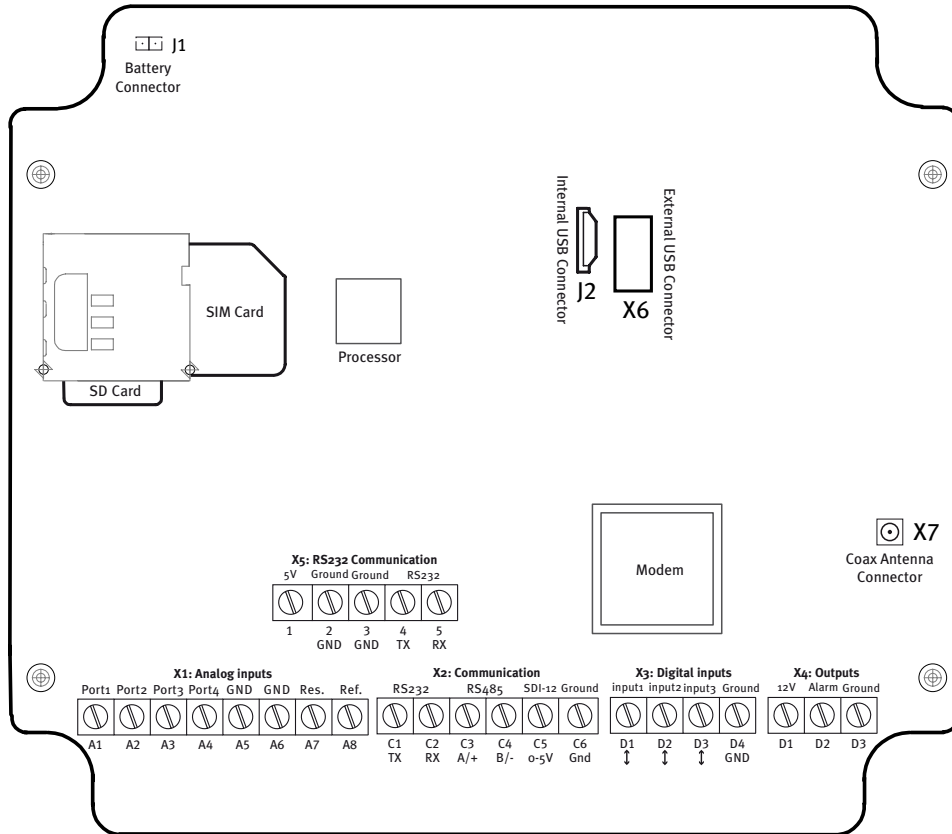
Data logging	
Storage	Standard 4GB micro-SD card.
Frequency	Independent regular and alarm intervals; 1 second to 1 day intervals
Data entries	Over 20.000.000 with date and time stamp.
Log file	FAT32 file system, readable at any ordinary PC.

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 Webportal.
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: Quad band GPRS EGSM 850/900/1800/1900MHz 3G: Global (UMTS/HSPA) modem (Penta-band & Quad-band GPRS fallback) E4G: 4G LTE-Cat 1 modem Europe (B1/B3/B7/B8/B20) and GPRS fallback (1800/900Mhz) N4G: 4G LTE-Cat 1 modem North America (B2/B4/B5/B12) and 3G fallback (1900/850Mhz) 4GM: 4G LTE-M global modem & Quad band GPRS fallback
SIM-card	2FF (class B) SIM-card slot.
Antenna	Integrated. External antenna optional available.

## Terminal connections M853



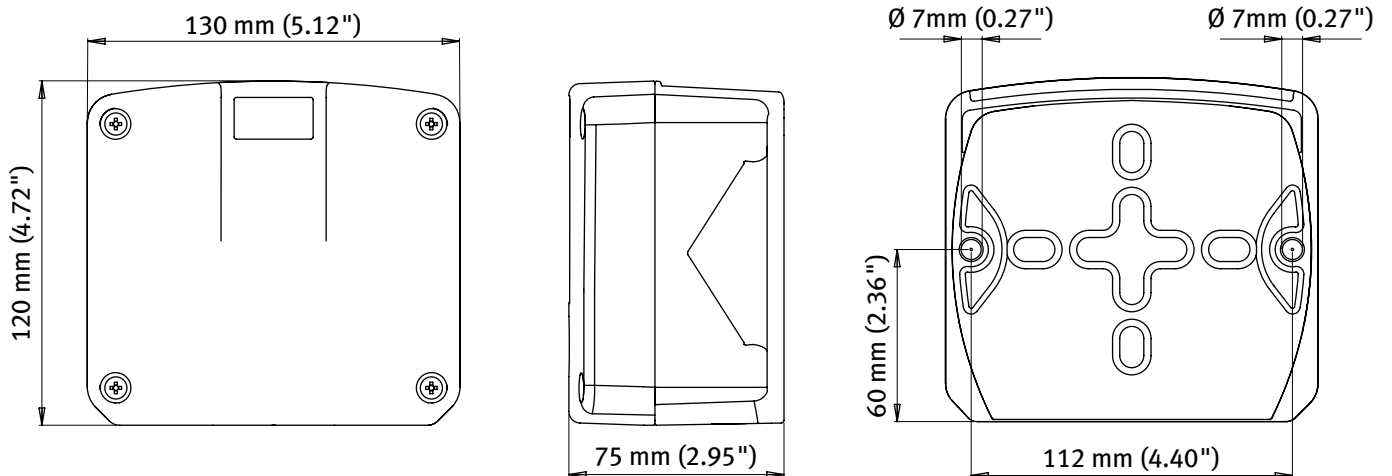
### Terminal Connections M853

X1	Analog inputs.
X2	RS232 / RS485 / SDI-12 Communication.
X3	Digital inputs.
X4	Power and alarm output

### Terminal Connections M853

X5	RS232 Communication
X6	External USB connector for local configuration
X7	External Antenna
J1	Battery pack connector
J2	Internal USB connector for local configuration

## Dimensions polycarbonate enclosure



# Datasheet M853

Data Acquisition &  
Communication Module

**PROCESSMONITOR**  
Remote Location Surveillance  
a Fluidwell company

Outgoing

Count on us.

## Ordering information

Standard configuration: **M853-2G-CX-HD-NI-PB-ZX-APM00**.

Ordering information: **M853**      -2G   -C   -HD   -N   -P   -Z   -APM

### Integrated Cellular Modem

- 2G**    Quad band GPRS / EGSM 850/900/1800/1900MHz.
- 3G**    3G Global (UMTS/HSPA) modem (Penta-band & Quad-band GPRS fallback).
- E4G**   4G LTE-Cat 1 modem Europe (B1/B3/B7/B8/B20) and GPRS fallback (1800/900Mhz).
- N4G**   4G LTE-Cat 1 modem North America (B2/B4/B5/B12) and 3G fallback (1900/850Mhz).
- 4GM**   4G LTE-M global modem & Quad band GPRS fallback.

### Serial Communication

- CX**    No communication.
- CS**    RS232, RS485 or SDI12, selectable during configuration.

### Polycarbonate field / wall mount enclosures - IP67 / NEMA4X

- HD**    No cable entry holes.

### Antenna

- NI**    Internal antenna.
- NE**    External antenna.

### Power requirements

- PB**    Battery powered, 1 x D-Size long-life 3.6V Lithium battery.
- 3PD**   Battery powered, 3 x D-Size long-life 3.6V Lithium batteries.
- PD**    8 - 30V DC adapter, with charger and back-up for 3xAA NiMH rechargeable batteries (batteries not included).
- PS**    Solar powered, with charger and holder for 3xAA NiMH rechargeable batteries (batteries not included).

### Optional Plug-in board

- ZX**    No options.
- ZA**    4 additional analog (0/4... 20mA) inputs (16-bit) including 12V@80mA excitation.
- ZD**    2 additional differential ( $\pm 250 / 500 / 1000 / 2000$  mV) inputs including 5V@80mA excitation.
- ZP**    Internal barometric pressure (0,3...1,2 Bar) and temperature (-30 / +70°C).
- ZV**    4 additional analog (0...1,25 / 2,5 / 5 / 10V) inputs (16-bit) including 12V@80mA excitation.
- ZW**    Converter board sine wave (a: 50mV...24 V, f: 0 ... 50kHz) to digital pulse (0 / 3,6V).

### Mounting accessories

- APM00** No mounting accessories.
- APM01** Universal wall- or pipe mounting bracket UV-resistant polycarbonate.
- APM02** pipe mounting kit: APM01 + two stainless steel worm gear clamps  $D = 40 - 60\text{mm}$  (1 5/8" - 2 3/8"), including 4x M4 bolts (16mm), nuts and washers, all stainless steel A2 / AISI304.

The bold marked text contains the standard configuration.