

# Cello

A Universal Solution for Remote Monitoring of Networks



## Pressure and Flow Cello

**Inputs** Channel 1 - absolute pressure; Channels 2 & 3 - flow

**Pressure Inputs** Input range 0 - 100m or 0 - 200m  
Operating temperature range: +1°C to +20°C (water)  
Accuracy/resolution: +/-0.5% of range  
Pressure port: Standard quick-fit male probe

**Flow Inputs** Pulses counted over, and recorded at, preset intervals

## Universal Cello

**Inputs** Number of channels: 8  
Channel types: Voltage, event, state, count, frequency (independently selected on each channel)  
Input impedance: >300k  
Input protection: Protected against reverse connection and over voltage  
Voltage input: Range 0 to 2.5 volts, 0.01 volt accuracy and resolution  
Event input: Switch closure or logic pulse, date and time of event stored, resolution 1 second or 10 seconds  
State input: Switch closure or logic state. On state change, date, time and new state are stored, resolution 1 second or 10 seconds.  
Count input: Switch closures or logic pulses, maximum rate Channel 1, 4, 5, 6, 7, 8 = 10 per second, Channel 2 and 3 = 45 per second (Counted over and recorded at preset intervals). 16,000 maximum per logging interval  
Frequency input: Switch closures or logic pulses, maximum frequency 16 kHz, programmable sampling period of 1 to 250 seconds, independent of recording rate. Resolution 0.01% maximum

**Outputs** 2 independent digital outputs for transducer power control and alarm signalling (0 and 3 volt levels, active low, 100k output impedance)  
1 fixed output for "open collector" signal bias (3 volts, 33k output impedance)

## Cello 4 - 20mA

**Inputs** Number of channels: 8  
Channel types: 2 channels dedicated to 4-20mA (High or Low resolution) loops, remaining 6 channels specifications as per Universal Cello

**4 - 20mA** Channels: One or two 4 - 20mA loops, 12 Volt self 'flash' powered, or 12 Volt loop powered.  
Measurement accuracy: Dependent on the accuracy of external sensor equipment connected to the loop.  
Logger accuracy: Better than +/- 0.1% full scale.  
Logger resolution: Better than 0.02% (High resolution version); Better than 0.7% (Low resolution version).

**Outputs** 2 individually switched 12 Volt 'flash' power supplies for powering 4 - 20mA loops.

## General Specifications

**GSM Modem** Frequency: 900 MHz (Vodafone UK, O<sub>2</sub> UK), 1800 MHz (Orange UK, T-Mobile UK) & 1900 MHz - Integral antenna.

**Serial Port** Type: Full duplex, asynchronous  
Data rate: 1200, 2400, 4800, 9600 bps

**Memory** Type: Solid state, non-volatile  
Size: 128K, allocatable between channels as required (max 64K/channel)

**Clock** Type: Crystal controlled calendar clock with leap year adjustment  
Accuracy: 100 seconds per month maximum error over operating temperature range  
Synchronisation: Option to synchronise clock to GSM network

**Supply** Type: Internally powered by a replaceable lithium cell (Internal back up cell maintains logging and local communications when main battery pack is discharged)  
Life: Typical battery life 5 years depending on mode of use

**Recording** Recording interval: Programmable between 1 second and 1 hour  
Data storage: Rotating store, or store until full

**Alarm Dial-Out** High/low alarms independently programmable on each channel. Continuous, time window and profile modes of operation. Option to update data more frequently after an alarm

**Environmental** Operating temperature: -20°C to +50°C  
Protection classification: IP68, submersible to 1 metre

**Connectors** Military specification, conforming to MIL-C-26482

**Mechanical** Dimensions: 191mm x 140mm x 150mm  
Weight: 1 kg  
Suitable for use in water meter boundary boxes: Ebco, Atplas, Fusion Meters, Talbot. (For others, please contact Technolog.)

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DS589003 Iss. B  
DMR: 4045

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Cello is a new family of fully integrated wireless data loggers.

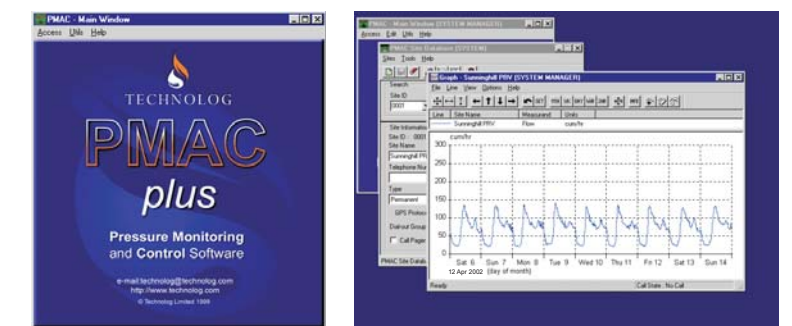
The nationwide GSM network is used to transfer recorded data and alarm messages to a host computer.

Housed in a rugged, waterproof enclosure, Cello is suitable for installation in underground chambers avoiding the inconvenience and expense of above ground kiosks.

- Flow, pressure, pressure & flow, universal eight channel and 4-20mA versions.
- Self powered for five years.
- Nationwide wireless coverage.
- Includes all GSM service charges for typical applications. (only available in certain countries)
- On-demand data retrieval option.
- Compatible with Technolog's PMAC software.
- Sophisticated profile alarm dial out regimes.
- Signal strength survey mode.
- Totally portable: no mains power or telephone line connections.



Comprehensive data analysis is provided by Technolog's Windows™ - based PMAC software



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Technolog can also provide a complete installation and maintenance service

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# Cello

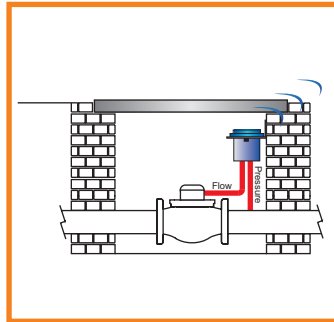
## A Universal Solution for Remote Monitoring of Networks



### Network Monitoring

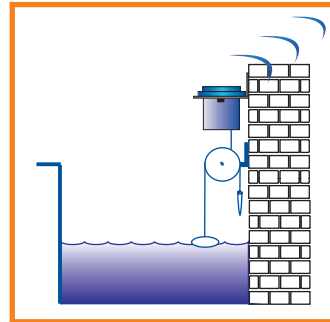
Cello can be mounted directly in the meter chamber.

In areas of poor GSM coverage or for domestic consumption monitoring, Cello is designed to fit inside a domestic water meter boundary box.



### Environmental Monitoring

Cello is suitable for many environmental applications including river level, bore hole depth, water quality and rainfall recording.



### Alarms

A PMAC Alarm Wizard enables HIGH/LOW threshold alarms to be set. Additionally, profile alarms can be configured to follow daily data profiles.

In the event of an alarm, Cello can be programmed to automatically send data more frequently.



### Pocket PMAC

PDA's are compact, Windows CE compatible computers that feature high resolution 'touch screen' displays and long battery life.

The latest PDA's have optional integrated GSM/GPRS communications. This provides high speed internet connections and mobile access to Web PMAC data.

### PMAC Plus

Cello is fully compatible with Technolog's PMAC software.

PMAC incorporates a communications driver, site database and simple point and click system to access information.

Data can be viewed graphically or as tables of values and can be exported to other software packages including spreadsheets.



### Web PMAC

Technolog have installed a web server that will receive Cello data and publish the results on a secure web site, [www.webpmac.com](http://www.webpmac.com).

A simple log in procedure allows customers to view, analyse and, if required, download their data onto a local computer.

There are many advantages to the Web PMAC system. No special software is required on customers' computers (Web PMAC supports standard Internet browsers). Data is available at all times from any PC with Internet access and no additional modems or communication links are required to receive Cello data.



### PMAC SMS

PMAC data can now be accessed remotely using a standard GSM mobile telephone.

A simple SMS text message sent to the host computer instructs PMAC to reply with a text message containing the required information.

The PMAC SMS system is invaluable for field staff!

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