



TECHNOLOG

## Cello EM

The Intelligent GSM Modem for Remote Reading and Control of Electricity Meters



### MAJOR ADVANTAGES

- Designed for the electricity meter environment making it very dependable
- GSM advantages over PSTN and X25 include lower cost operation and installation
- No phone or power cables, means no need for PTT line engineers and qualified electrical fitters
- Easy, low-skill, fast 'plug-and-play' installation
- 'Instant' availability of network connection
- Permits a 'two-box' solution so the utility can use the same modem on many meter models
- Long reliable operating life
- Designed to save costs in data collection and modem/meter maintenance
- Superb network connection management capabilities for dependable operation
- Technolog an independent manufacturer of GSM devices specialised for metering
- GSM enables selective installation at one or many sites with no comms infrastructure cost

### OPERATING MODES

#### Data Call (CSD) Mode

*Operationally compatible with traditional outbound 'dial-up' meter reading systems*

- Auto-answer
- Compatible with many leading meters

#### GPRS & SMS Modes

*Proven proprietary Technolog GPRS and SMS modem and meter management techniques and central systems technology change the cost equation of automatic remote reading and meter control using GSM networks and enable individual meter data to be graphically displayed on web pages*

- Cost effective for small C&I consumers and particularly difficult-to-read and frequent-read sites
- Options on read frequency and reading of complex profiles or simple index information
- GPRS and SMS provide low network tariffs and improved GSM communications coverage compared to dial-up operation
- Supporting central systems technology easily scalable from a hundred to many thousands of meters
- Minimal host hardware required for readings from even very large meter populations means easy, rapid and low cost AMR deployment



*Cello EM will connect directly to the RS232 serial port of meters. A special internal power supply system enables the modem to operate with a supply of just 40mA while providing the high output power required to support GSM communication*

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# Cello EM

## Features and Benefits

### General

- Dual band (900/1800 MHz)
- Small size, fits under meter cover of many meters
- 10 year life for typical applications
- Supports data calls of up to 1 hour per day
- Settings can be programmed in at manufacture saving time in set up at point of installation.
- Range of Technolog antenna options



Above is shown an Actaris ACE6000 meter fitted with a Cello EM via an interface adapter cable. See last page for examples of meters to which Cello EM can connect.

### Installation

- Immediate operation without recharge time
- 5 minute installation and no installation equipment
- SIM card security sealed
- 'Hot-swappable' meaning it can be fitted to or removed without the need to switch-off mains
- Automatic contact with the meter and GSM network
- Signal strength is displayed on an LED. 'Heart-beat' signal on LED shows satisfactory working



**Cello EM is available customised for certain meters.**

*Illustrated (left) is the Horstmann S-Series single phase meter with designed-in GSM modem board and antenna.*

*Illustrated (right) is Elster Metering's A1140 polyphase meter for C&I consumers and is shown fitted with a customised Cello EM at its base. The unit is powered directly from the meter and an external antenna cable is provided.*



*The GSM and power-supply technology in Cello EM have a long pedigree having been proved over many years in Technolog data loggers for gas and water applications. Illustrated is the Cello Data Logger designed to work in and transmit messages from below-ground meter chambers*

### Operational

- 'Over-air' remote change of settings and firmware upgrades means less site visits
- 'Over-air' upgrade from CSD to SMS or GPRS provides deployment flexibility with no need for costly visits by meter
- Signal strength monitoring
- Orderly call disconnections by proper termination of network connections due to various call failure conditions such as disconnection during meter power-loss, timeouts or carrier losses or if modem disconnected from the meter
- Automatic periodic detach/reattach to GSM network for continuous reliable operation obviates the need for site visits to reset GSM modems
- Stable, reliable operation
- Optional remote notification of mains outage or disconnection from meter
- Optional alarms and status messages can be sent by Cello EM using SMS
- Alarm messages are reliably delivered using Technolog's data-centre technology
- Low temperature operation provides reliable year-round access to metered data

# Cello EM

## Specification

### Modem

**Frequency (MHz)**

Dual Band 900/1800 MHz

**Modes of Operation**

CSD (data call) up to 9600 bps  
SMS MO and MT  
GPRS class 8

**Antenna Connector**

MCX socket to accept antenna with MCX 90° plug

**Transmit Power**

2W for GSM900, 1W FOR GSM1800

**Non-Volatile Memory**

For programmable settings

### Interfaces

**Interface to Host Meter**

Serial RS232 via DB 25 pin female connector  
Refer to Technolog for pin-out

**Remote**

Remote set-up & reprogramming 'over air' by SMS

**SIM Interface**

3V SIM Cards

**SIM Card Holder**

Integral with modem power switch  
Security label cover

### Power and Power Management

**Supply Input**

Via RS232 Port. 5.6V to 15V DC at 40mA minimum

**Transmit Power**

2W for GSM900, 1W FOR GSM1800

**Internal Power Supply**

Proprietary integrated programmed power supply for GSM operation on meters with low power output.

**Data Call Duration and Power Supply Recovery**

8 min call: 2 hour recovery to 95% charge

30 min call: 6 hour recovery to 95% charge

20 minute daily call is possible at minus 20°C

**Mains/Host Power Management**

Optional SMS notification of power outage and on modem disconnection from meter

**Charge 'Shelf' Life**

Accepts incoming calls during host power outage.

Delivered fully charged with charge shelf life of 1 year

(Applicable also to units not attached to a host power source but with SIM card removed)

**Optional External Power Operation**

Optional DC socket on modem for external supply

### General

**Design Life**

10 years assuming one 8-minute call per day

**Operation Indicator**

LED for set-up, network connection & 'heartbeat'

### Compliance and Standards

GSM standard international. Complies with EU Directives on electrical safety & EMI

### Physical

**Weight**

90 grams

**Operating Temperature**

-20° to +55° Celsius

**IP Rating**

IP 40

**Dimensions**



# Cello EM

## Meters Supported

### Interface & Power Supply Compatibility

The Cello EM modem generally fits directly into the following meters under the meter cover with no need for external power or interface adapters:

The Cello EM modem can be used with other meters with various styles of powered RS232 comms ports through simple cable adapters. Some of many such meters include

Safety approved external DC power supply with jack plug is required for meters fitted with RS232-type interfaces but without DC power on the interface. *Optional DC jack-socket on Cello EM must be specified.* Some of many meters that can be powered this way include:

Customised versions of the Cello EM modem operating in dial-up and Technolog's proprietary GPRS & SMS modes are available for the meters listed, right.

### Meters

- Elster/ABB A1700 'Vision'
- Actaris/Schlumberger standard Indigo+
- Actaris ACE6000
- PRI Premier
- Ampy-Email EM 500 (With special antenna connection)

- Actaris SL7000 with RS232
- Ampy/Email Metering Q4
- Cewe Prometer with RS232
- L&G ZxF
- PRI ICM 400
- GEC/ABB PPM meters with RS232

- Elster/ABB Alpha meters
- Elster A140 and similar meters
- Actaris DC3 and DC4 meters
- EDMI Mk 6 and similar meters
- Siemens/L&G ZmC, ZxD and similar

- Elster A1140 and A1120
- Horstmann Timers & Controls 'S' Series

*(Modules for other leading meters are being developed in co-operation with manufacturers)*

***Meter model configurations can vary and interface specifications, power supplied from the meter and meter set up should be checked for compatibility with the modem before connecting it to the meter. Consult Technolog for interface pin-out and power supply requirements and for information on compatibility with other meters.***



***Cello EM is included in the UK's Energy Technology Product List. This means that it meets the energy saving criteria of the Government's Enhanced Capital Allowance Scheme so that profitable UK companies can claim 30% of the product's cost including installation.***

The above specification refers to the standard *Cello EM* generally where employed in CSD (dial-up/data call) mode. Different information may apply where units are employed in SMS or GPRS operation. Modem set up and interfacing will be individual to the meter model, meter interface and power supply options and meter set-up values. Different values and operation may also apply to custom versions of the *Cello EM*. The above is for general information only and Technolog should be consulted for specific information in individual cases. The information and product specifications provided in this document are subject to change and products withdrawn without notice. All drawings, pictures and copy are the Copyright of Technolog Limited and may not be used or reproduced without permission.

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