

NEW
& MID DIRECTIVE
L2 A/B EXPLAINED INSIDE

CARLO GAVAZZI

Providing MID certified meters
to standard energy metering
applications....



Can you afford not to comply
to the latest regulations?



Overview of Building Regulations

Overview of current Building Regulations part L2A/B

Sub-metering energy end-uses such as lighting, fans or pumps provides the means to identify where and when energy is being wasted. To reduce energy consumption and carbon emissions, building designers should incorporate sub-metering in new designs so that systems can be managed properly.

As a result of installing and using meters you can often save 5-10% of the energy being metered. Sometimes you can save more. For example, a meter that identifies pumps being left on for 24 hours per day, seven days a week, may save 60% of the energy passing through it.

Benefits of sub-metering

- Allows property managers to understand and manage their buildings better, resulting in greater energy savings.
- Establish the breakdown of energy use within a building, ie: 'Where does it all go?'
- Identify where energy use is greatest.
- Promote a detailed assessment of demand patterns and benchmarking to identify end-uses that are untypically high.
- Reveal useful trends between, say, day/night, summer/winter, weekday/weekend.
- Demonstrate compliance with building regulations

Part L of the Building Regulations for England and Wales cover energy efficiency requirements and since 2002 have recognised the valuable role of metering by including requirements for sub-metering in non-domestic buildings. In new buildings, installing sub-meters that enable at least 90% of the estimated annual energy consumption of each fuel to be accounted for is considered reasonable provision. Allocation of energy consumption to the various end uses can be achieved using the following techniques:

- Direct metering
- Measuring the run-hours of a piece of equipment that operates at a constant known load
- Estimating non-constant small power loads

It is also considered that reasonable provision to install incoming meters in every building with more than 500m² gross floor area, Reasonable provision of sub-metering would be to provide additional meters such that the following consumptions can be directly measured or reliably estimated.

- electricity, natural gas, oil and LPG provided to each separately tenanted area that is greater than 500m²
- energy consumed by plant items with input powers great or equal to that shown in Table 13 of Approved Document L2^(3,4) (ADL2) *(reproduced here as table 1)*
- any heating or cooling supplied to separately tenanted spaces for larger tenancies, i.e those with floor area greater

than 2500m², direct metering of the heating and cooling may be appropriate.

Table 1 Size of plant for which separate metering would be reasonable (ADL2⁽³⁾ Table 13)

Plant Item	Rated power input / kW
Boiler installations comprising one or more boilers or CHP plant feeding a common distribution circuit	50
Chiller installations comprising of one or more chiller units feeding a common distribution circuit	20
Electric Humidifiers	10
Motor control centres providing power to fans and pumps	10
Final electrical distribution boards	50



Carlo Gavazzi can provide a wide selection of metering solutions to help you comply with the latest building regulations. We can provide meters with additional inputs for water/gas or hot/cold water and offer a selection of outputs including pulse, relay, Modbus, profibus and Ethernet to allow you to interface with data loggers, BMS/BEMS or stand alone energy management software such as PowerSoft, developed to interface directly with the CG meters (more info in this brochure). These unique meters offer both you and your client products that meet both the Part L2A/B building regulations and the MID certification, allowing you to use the same meter in billing applications.

Useful Links:

www.carlogavazzi.co.uk

Carlo Gavazzi Datasheets

www.cibse.org

Part L2A/B building regulations (TM-39)

www.planningportal.gov.uk

Complete Part L2 A/B regulations

www.nwml.gov.uk

General information on MID

www.est.org.uk

Energy Savings Trust

www.carbontrust.co.uk

The Carbon Trust

www.opsi.gov.uk/stat.htm

Electricity act 1989 schedule 7

& Measuring Instruments Directive

What is MID?

The MID (Measuring Instruments Directive) is a new European Union (EU) directive aimed at creating a single market for measuring instruments across the EU. MID took effect on October 30, 2006.

The scope of this Directive is to guarantee to the users a high level of safety and reliability of the measuring instruments, protected against data corruption, ensuring in the meantime the free circulation of certified measuring instruments within the EU.



Annexes define how the instruments can be declared as compliant to MID. Notified bodies are authorised to carry out testing, and the certification issued by one of the bodies shall be accepted within the EU within any limitations. This MID is a replacement for the old OFGEM approval in the UK.

Are you billing legally?

A Spokesperson at the National Weights and Measures Laboratory has provided the following response from OFGEM Legal Team:

We have been advised that all electricity meters must be approved if used in a billing situation. This is a requirement of Schedule 7 of the Electricity Act 1989 and this is equally applicable to landlord/tenant supplies. Prior to 30 October 2006 approval would be granted by Ofgem/NWML although approvals for meters where the supply is below 100KWh are now granted by a notified body under the Measuring Instruments Directive.

Meters approved under previous UK provisions need not be certified in exempt supply situations - such as landlord/tenant - if a written agreement exists between the relevant parties to dispense with the certification requirements. However the meter is still required to be of an approved design and the meter owner is obliged to keep the meter in good working order.

Which utility meters are covered by MID?

The new Directive is related to ten categories of measuring instruments, which are indicated in ten annexes, of which 4 relate to utility meters. For these, the MID defines categories of climatic conditions, mechanical environments and electromagnetic environments, these are shown below:

- MI-001: WATER METERS
- MI-002: GAS METERS AND VOLUME CONVERSION DEVICES
- **MI-003: ACTIVE ELECTRICAL ENERGY METERS**
- MI-004: HEAT METERS

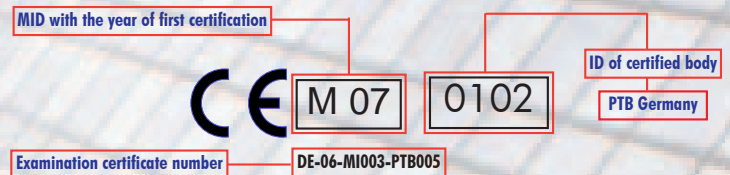
A complete list is available on the NWML website

The MID applied to the Carlo Gavazzi Energy Meters

The annex is **MI-003: ACTIVE ELECTRICAL ENERGY METERS** where the accuracy requirements for active energy meters are defined in three classes:

A (old class 2), B (old class 1), C (old class 0.5). **EM10-DIN and EM24-DIN are designed according "class B"**. The individual certification is obtained according to the following method: Annex B + Annex F: **the type approval is carried out by a Notified Body and the verification of each meter (or part of a batch, depending on agreements with the Notified Body) is carried out by authorised laboratories.** In our case the PTB laboratory in Germany.

The EM24 DIN MID mark



In the case of Carlo Gavazzi both EM10-DIN and EM24-DIN have been fully tested in accordance with the stated MID accuracy, climatic conditions, mechanical and electromagnetic environments. A copy of the MID certificate is available on request as a PDF file.

The EM10-DIN and EM24-DIN have tamper proof terminal covers to protect all inputs/outputs and are MID Certified for revenue billing purposes. The EM24-DIN also has a lockable front selector switch and password protection for enhanced security. Although these are DIN rail mounting meters we have a 4 DIN to 96x96 adapter so that the EM24-DIN can be retrofitted to existing switch boards where existing 96x96 standard sub meters need to be removed where they are no longer able to be used legally for sub billing/revenue applications.

Accuracy Standards

The latest accuracy standard for meters is now EN62053-21 (class 1) or EN50470-2 (for MID Class B). EN61036 is no longer the latest standard, any meters that state class 1 accuracy to this standard are in fact only a class 2 accuracy meter in accordance with the latest standards. If a specification states class 1 meters, they should be against EN62053-21 or EN50470-2. The above class 1 standards give an accuracy of 0.5% for kWh.

Power Soft Energy Manager - Software Solution

PowerSoft is an analysis platform suitable for Win98, 98SE, 2000 and XP, which has been specifically developed to interface, by means of the Modbus protocol (RTU and TCP/IP), the Carlo Gavazzi products for Energy Management. Consisting of a main core and of a series of optional plug-in modules, it allows to correctly and efficiently manage an electrical distribution system, mainly considering the cost reduction point of view. This aim is achieved monitoring the consumptions, checking the demanded power peaks and adopting accurate analysis and data processing tools.

PowerSoft PWS - £793.00 includes the below features

Interactive Synoptics

The animated interactive synoptics allow users to:

- display the plant configuration with planimetric and functional diagrams and page links to other synoptic pages.
- display the real time values acquired from the instruments; monitor the digital inputs status acquired by the system;
- monitor any setpoint and communication alarm of the instruments;

Real Time Display

Consisting of 4 pages including all the real time information of the selected instrument.

- Indicators: it displays, through analogue indicators, the power and current values and the energy meters showing any alarm condition.
- Variables: it displays all the measurements of the selected instrument, with the indication of any alarm and of the minimum, average and maximum values took by the variables.
- Inputs/outputs: it displays the digital input and output status.
- Fresnell: it displays the Fresnell diagram of the line monitored by the instrument.

Multi Instrument Display

It displays the real time measurements of all the instruments connected to PowerSoft, grouped in three parts:

- voltages and currents;
- powers and power factors;
- temperatures, total harmonic distortions, imported and exported energies, gas and water consumptions.

Trending

The access to the measurements historical archive is allowed in:

- graphical format, exportable in ".wmf" format;
- analytical format, exportable in ".csv" and ".xls" format.

The different tariffs, if set in the relevant module, can be connected with the stored and displayed values. Up to 4 variables (from the same or from different instruments) can be contemporary displayed. With simple and intuitive procedures is also possible to zoom the graph, analyse it in detail with a cursor and modify the displayed time period.

Setpoint Configuration

It allows to set up and down setpoints on all the variable measured by all the instruments of the network, exceeding which an alarm is activated. The alarm can be:

- software, and it is displayed in the Active alarms windows and stored in the Alarms and events log;
- hardware, which is stored as above and switches the digital output of the instrument that are pointing out the anomaly.

Alarms and events - PWS-Alarm £423.00

Two manners are provided to display alarms and events.

- Active alarms window: it advises the user if a setpoint has been exceeded or if a communication error is present; it allows to acknowledge the selected alarms by the qualified users.
- Alarms and events log window: it allows to access the archive of the events (login, logout, startup, alarm acknowledgment, etc.) and of the alarms (setpoint alarm, communication errors, missing data storing, etc.) and to carry out filter based searches.

Analysis Support - PWS-Analysis - £687.00

It allows to carry out statistical analysis on the power trends and energy consumption by extrapolating:

- simple mean, median and standard deviation of the energy consumption, removing from the computation, if needed, the week-ends, holidays and days with anomalous consumption due to external reasons;
- week-based consumption trends;
- consumption trend of each day of the week;
- estimation of the ideal installed power for each tariff, calculated with a selectable confidence level.

Tariff Management - PWS-Tariff £212.00

The different tariffs during the day and the distribution of the typical-days among the year can be set according to the supplier tariff regulations in a very easy and extremely flexible way. It can manage:

- up to 12 tariffs;
- up to 24 tariff change per day;
- up to 365 different typical-days per year.

Bill Calculator - PWS-Bill £528.00

According to the utility contract parameters, it allows to:

- estimate the costs, relevant to a selected month, due to the energy, water and gas consumption;
- perform the cost allocation among the monitored lines;
- display the daily trend of the consumption;
- identify the reason of any penalty.

E-Mail Manager - PWS-Mail £265.00

It manages the automatic e-mailing, able to notify the electrical system status to one or more e-mail addresses. The e-mailing can be carried out on regular basis and/or as a consequence of a defined alarm or event.

WebServer - PWS-Web £528.00

It allows to remotely access PowerSoft, using a standard browser. It allows to display:

- the synoptics;
- the single and multi-instrument real time data;
- the active alarms;
- the logged data in graphical & analytical format;

Remote Internet - PWS-Internet £515.00

Allows downloading via Ethernet the WM4-96 and PQT-90 memories and let the data be analysed with PowerSoft. The download is scheduled on regular basis (e.g. once a day), Up to 200 meters and/or IP addresses can be connected, therefore collecting information from remote locations all over the world. Up to 30 meters (RS485) can be read from the same IP address. With this solution any cabling problem or Internet/LAN connection failure won't lead to any loss of data, since the WM4-96/PQT-90 memory can store all the information until the link is established again.

