

DCM1

DC Energy Meter

Launch Presentation

October 2024

Contents

INTRODUCTION

- Why this launch ?
- Expectations
- Typical applications

THE PRODUCT

- Part numbers
- Relevant technical data

THE MARKET

- Relevant applications
- Marketing tools
- Certifications



Why this launch?

- To provide a reliable and accurate metering system for fast, ultra-fast, hyper-fast chargers, in order to avoid the anachronistic charge-by-time method, or inaccurate results using upstream AC metering system
- DCM1 is the complete solution for this application by Carlo Gavazzi. A very flexible, simple, compact, and easy-to-integrate solution for energy metering in fast chargers
- Featuring RS485 Modbus RTU and Ethernet Modbus TCP in the same unit, it guarantees seamless integration
- With DCM1 we can provide a metering system that can be certified within the US and German calibration law requirements and that can be applied for the legal use in different European Countries, being MID certified
- Furthermore, DCM1 can be used for accurate measurements (according to the most recent IEC standard for DC energy) in other emergent applications of DC current:
 - DC industry
 - PV Energy Storage for big industries/commercial building
 - DC Microgrids

Expectations

- Consolidate our presence in the e-mobility market by being able to offer a comprehensive range of AC and DC meters
- Enrich our existing DC meter offering by covering all the application where a display is needed for visualization along with MID approval, or where Modbus TCP is required as alternative to Modbus RTU
- Strengthen our presence in the market thanks to the new features (display, Modbus TCP and MID/LNE*/Eichrecht certification)
- Acquire commercial and technical know-how as the base for future product development and business opportunities (e.g higher power chargers, standard evolution, etc.)
- To satisfy customer needs, both current and emerging, thanks to the experience made in AC products for EV chargers and with the cooperation of key partners in the e-mobility working group

* LNE (France) certification pending

Introduction

Typical applications



EV Charging Stations



PV Energy Storage



DC Industry

Relevant technical data

- Class 1 (kWh) according to EN62053-41 or class B according to EN50470-4.
- Accuracy: $\pm 0.5\%$ RDG (current/voltage)
- Voltage inputs: 150 to 1000 V dc
- Auxiliary power supply 12 or 24 V dc
- Current inputs: direct connection up to 600 A (DCT1A60) or up to 300 A (DCT1A30)
- Real time variables: V, A, W
- Energy measurements (total imported and exported, partial imported and exported): kWh
- Energy resolution: 0.0001 kWh (0.1 Wh), CTEP compliant
- Ampere-hour meters (total imported and exported, partial imported and exported): Ah
- Run hour meters (relevant to both imported/exported energy, total and partial)
- Total operating time (total/partial)
- RS485 Modbus RTU and Ethernet Modbus TCP (S1 without signature, S2 with 256 bit signature, S3 with 384 bit signature)
- Communication data refresh time: 200 ms
- cURus approval
- MID certified, LNE (pending), Eichrecht certified
- DIN-rail or back panel (via screw terminals) mounting
- Horizontal or vertical mounting

The product

Part numbers

Part number	Voltage input	Current input	Bidirectional	Approvals
DCM1A60V10L20S1ULB	150 to 1000 V	6-120 (600) A	x	CE, cURus
DCM1A60V10L20S1PFA	150 to 1000 V	6-120 (600) A	-	CE, cURus, MID
DCM1A60V10L20S1PFB	150 to 1000 V	6-120 (600) A	x	CE, cURus, MID
DCM1A60V10L20S2DEB	150 to 1000 V	6-120 (600) A	x	CE, cURus, MID, Eichrecht 256 bit signature
DCM1A60V10L20S3DEB	150 to 1000 V	6-120 (600) A	x	CE, cURus, MID, Eichrecht 384 bit signature
DCM1A30V10L20S1ULB	150 to 1000 V	2,5-50 (300) A	x	CE, cURus
DCM1A30V10L20S1PFA	150 to 1000 V	2,5-50 (300) A	-	CE, cURus, MID
DCM1A30V10L20S1PFB	150 to 1000 V	2,5-50 (300) A	x	CE, cURus, MID
DCM1A30V10L20S2DEB	150 to 1000 V	2,5-50 (300) A	x	CE, cURus, MID, Eichrecht 256 bit signature
DCM1A30V10L20S3DEB	150 to 1000 V	2,5-50 (300) A	x	CE, cURus, MID, Eichrecht 384 bit signature

Relevant applications – DC metering in electric vehicle fast chargers



Customer need

Fast charger manufacturers for electric vehicle need a DC meter able to measure correctly the amount of energy provided to the battery and transmit data to the controller in a secure way, in order to correctly bill the customer. AC meters upstream the AC/DC converter provide inaccurate measurement because they consider also losses given by the AC/DC conversion and the losses in the cable.

Our Solution

DCM1 is installed on the DC side and is compatible with most of the DC charger on the market thanks to the wide voltage and current measuring range. Thanks to the cable loss compensation function, only energy provided to the vehicle battery is considered, removing the losses due to the cable resistance. Data transmitted to the controller are signed to guarantee data authenticity. The display is automatically updated to show charging session relevant information.

Benefits

- Wide measuring range up to 1,000 V, 300 or 600 A
- Cable loss compensation, charging session management
- Signed data transmission (256 bit or 384 bit)
- CE, cURus, MID, LNE (pending), Eichrecht and CTEP compliant

The market


Marketing tools

Data Sheets

DCM1_DS

Available in:

Chinese, Danish, English, French, German, Italian, Spanish



DCM1
Energy meter for DC systems

Benefits

- **Fiscal metrology.** State of the art technology, high accuracy and modern architecture allow DCM1 to be the perfect solution for billing purposes, in fact, the product conforms with the most important international standards for fiscal metrology in EV chargers: MID, Eichrecht, LNE, CTEP.
- **Secure and signed data transmission.** DCM1 is conceived to be secure and safe: sealable terminal caps prevent external intervention and tampering, while data authenticity is ensured by the digital signature and the OCMF file.
- **User-friendly interface.** The 128x96 matrix LCD with backlight display presents clearly readable information to the user. In addition, the interface can be easily programmed and customized, with a straightforward setting procedure using UCS software or the 3 mechanical keys.
- **Maximum connection flexibility.** The intelligent design of the DCM1 makes it easy to integrate inside the EV charger architecture: the display is detached from the measuring component and both Modbus RTU and Modbus TCP are in the same unit, allowing different connection layouts.
- **Temperature calibrated.** Able to work in an extremely wide temperature range thanks to the temperature drift compensation exploiting a calibration method based on two temperature sensors.
- **Clear and effective diagnostics.** Correct operation is immediately visible through the LEDs and the warning status icons on the display. Diagnostic alerts and real-time temperature values are also available via Modbus to permit constant monitoring.

Description

DCM1 is a direct connection energy Meter for DC systems up to 1000 V dc and current up to 600 A dc. Specifically designed for installation in EV fast chargers, it has two components: a transducer for voltage and current connection and a display unit featuring both Modbus RTU and Modbus TCP communication port. The cable that links the two parts is included and connected to the transducer, making installation easy and fast.

Applications

DCM1 can be installed in any DC switchboard with a rated current up to 600 A to monitor energy consumption or production and the main electrical variables. The main application is within a DC fast charger for electric vehicles, thanks to the 70 °C / 158 °F maximum ambient temperature and allowed maximum current and voltage.

DCM1 is compliant with the German calibration law (Eichrecht), the French requirements for DC EV chargers (LNE) and the European MID directive for fiscal metrology. Furthermore, thanks to its high accuracy and resolution, DCM1 is also suited for EV chargers addressed to the US market, where CTEP and oURus approvals are needed. Both imported and exported energy are certified, making DCM1 the perfect solution also for vehicle to grid applications.

11/04/2024 DCM1_DS_ENG

CARLO GAVAZZI Controls SpA 1

The market

Certifications



According to Low Voltage Directive 2014/35/EU
According to EMC Directive 2014/30/EU
According to RoHS Directive 2011/65/EU & Delegated Directive 2015/863

Europe: MID certificate

Germany: Eichrecht certificate

France: LNE certificate (pending)



North America: UL61010-1

Environmental Management System: ISO 14001:2015

Quality Management System: ISO 9001:2015

