

# Energy Meter Datasheet

## Electrical Characteristics

LV Supply Voltage	9-60VDC
LV Power Consumption	Typ: 600mW Max: 2W
LV Internal Fusing	None
Sample Rate Logging	250 Hz
Sample Rate CAN	20Hz
Data Download	USB and Bluetooth
Max HV Voltage	800V
Max Voltage Error Logging	±0,6%
Max Voltage Error CAN	±2,5V
Continues HV current	±500A
Max HV current (10s)	±1000A
Shunt Resistance	36μΩ
Max Current Error Logging	±0.4%
USB Interface	USB 2.0
Bluetooth	V2.0

## Mechanical Characteristics

Housing Dimensions	87x94x39 mm
Weight	260g

## Connector Specifications

HV-, Energy Meter side	M8 screws with self-locking nuts
HV-, Vehicle side	M8 ring-lugs or similar
HV+, Energy Meter side	B02B-JWPF-RK-R (LF)(SN)
HV+, Vehicle side	O2R-JWPF-VRLE-S (RS Part Number 820-1302)
LV, Energy Meter side	Phoenix Contact 1551820 / M12-A 4-Pin Male PIN 1: LV+ PIN 2: GND PIN 3: CAN H PIN 4: CAN L <i>Note: This connector is compatible to the FSG 2017 Energy Meter</i>
LV, Vehicle side	M12-A 4-pin Female (Pictured: Phoenix 1681127 / Conrad 748710)
USB, Energy Meter side	Binder 710 4-Pin Male (09-0981-00-04) PIN 1: USB VCC PIN 2: D- PIN 3: D+ PIN 4: USB GND
USB, Vehicle side	Binder 710 4-Pin Female (Pictured: Binder 99-0980-100-04 / Farnell 1122366)

USB, external (measurement) port	USB-Steckverbinder Typ B 2.0 (e.g. RS Part Number: 818-0280) PIN 1: USB VCC PIN 2: D- PIN 3: D+ PIN 4: USB GND PIN 5: Shield
----------------------------------	---

### CAN Specification

CAN Standard	ISO 11898-2 (High Speed CAN) with 11-Bit-Identifier, 1MBaud Internal Termination: none
ID 430h	DLC =8 Byte 1: Message Counter Byte 2: Status (Bitfield) Byte 3+4: Power, signed 16 Bit, 3W/Bit Byte 5+6: Voltage, signed 16 Bit, 0,04V/Bit Byte 7+8: Current, signed 16 Bit, 0,05A/Bit  Downsampling: The Power, Voltage and Current signals will be provided at a lower sample rate than internally available. The downsampling method is to provide the max() of all the original samples between two CAN messages.  <i>Note: this is compatible to the FSG 2017 specification</i> <i>Note2: the FSG DBC file is provided for reference</i>
ID 431h	Reserved
ID 432h	Reserved
ID 635h	Reserved for 2018 use
ID 636h	Reserved for 2018 use

### Mounting Instructions

- The Energy Meter must be protected from shock and vibration, i.e. not directly fastened to rigid parts of the car. Use e.g. foam rubber on the mounting surface to achieve this.
- The Energy Meter must be protected from moisture
- An USB type B socket connector, which must be directly wired to the USB port of the Energy Meter and mounted near the GLVMS/TSMS/TSMP must be provided by the team so that one can connect to the EM without removing bodywork.

### Main Dimensions

