

VMU-MC and VMU-OC



Pulse concentrator



Description

VMU-MC is a pulse concentrator that makes totalizers available to master systems (i.e.: VMU-C EM) via Modbus RTU protocol. Furthermore, it controls up to three VMU-OC accessory modules via local bus to integrate from 2 to a maximum of 11 digital inputs. Each VMU-OC module controls up to three digital inputs, connected via local bus and powered by VMU-MC.

Applications

Designed for commercial, residential and industrial applications, guarantee rapid installation with few easy connections.

They are particularly indicated for:

- retrofit applications in existing distribution panels where data is to be collected from pre-existing pulse output meters
- utility type meters with pulse outputs

All consumption data (i.e. electricity, gas, water, heat) of a commercial or industrial building or a residential home can be integrated in the same VMU-C EM master, enabling the following:

- precise cost allocation
- implementation of energy efficiency improvement policies
- check on correct operation and use of systems and machinery

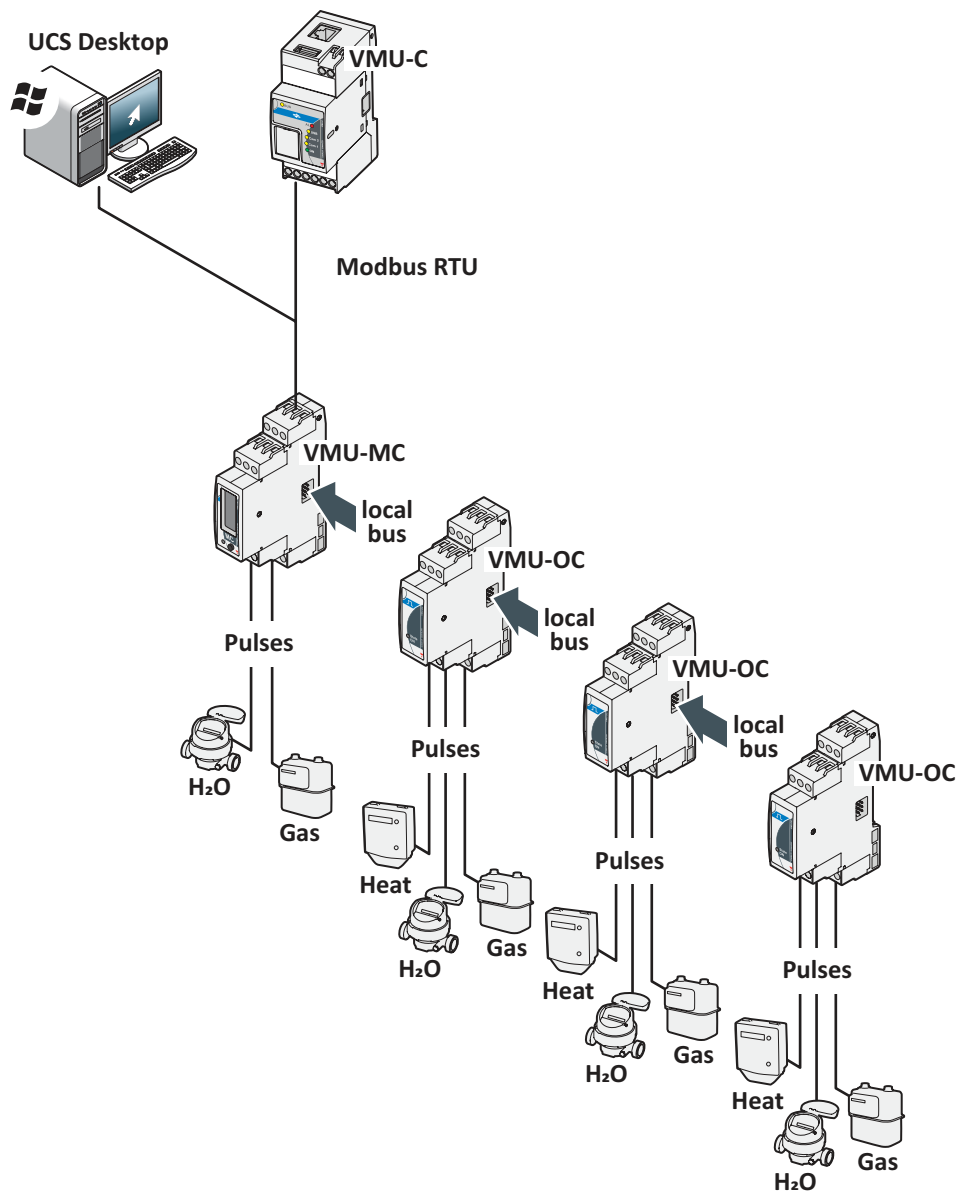
Main functions

- Read and concentrate pulse output meter data
- Transmit data read via serial communication to VMU-C EM or another master

Benefits

- **Modularity.** The VMU-MC module can be used singularly or with the addition of VMU-OC modules (from 1 to 3) based on the number of meters to be monitored.
- **Compact and retrofit products.** VMU-MC and VMU-OC are suited for small spaces and existing systems with pulse output meters.
- **Ease of installation.** The modules can be mounted on DIN rail.
- **Termination block.** Supplied in the VMU-MC package, it easily and quickly terminates the RS485 port on the last device in the line.
- **Free specific software.** The system is compatible with UCS software that has a simple and intuitive interface. The software and subsequent updates are free.
- **Configuration ease and flexibility.** The units of measure and pulse weight of each input can be configured from UCS. Configurations can also be set off-line, saved and retrieved from UCS at any time.
- **Elementary diagnostics.** Correct system operations can be checked from UCS and the display.
- **Easy integration with VMU-C EM.** The UCS software is able to generate the driver to easily import input configurations in the VMU-C EM master.

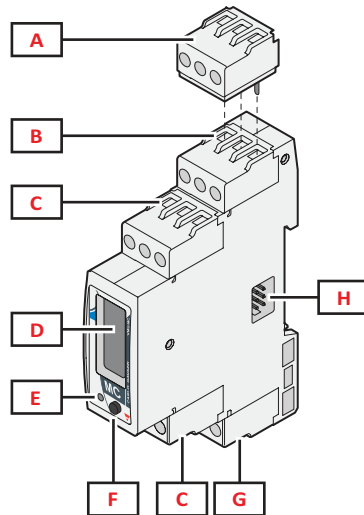
Architecture



Main features

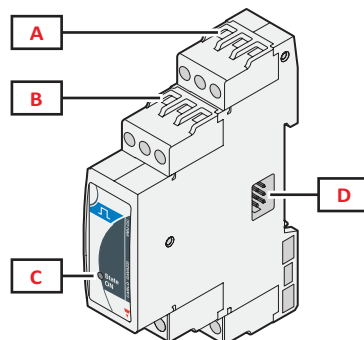
- Up to 11 S0 digital inputs (2 integrated and up to other 9 via VMU-OC modules)
- Up to 3 VMU-OC modules connected via local bus and powered by VMU-MC
- Input function: remote input status reading / tariff management / pulse counting
- Communication ports: RS485 Modbus RTU and local bus
- 6 digits LCD display (for VMU-MC only)
- Dimensions: from 1 to 4 DIN modules according to the number of VMU-OCs
- Configurable from UCS

Layout (VMU-MC)



Area	Description
A	Termination block for serial output of the last device in the line
B	Terminal block for RS485 port for communication with the master
C	Digital input terminal block
D	LCD display
E	LED to indicate device status
F	Button to scroll the display and set communication parameters
G	Power supply terminal block
H	Local bus port for VMU-OC module connection

Layout (VMU-OC)





Area	Description
A	Digital input terminal block (+)
B	Digital input terminal block (-)
C	Multipurpose LED: device status identification of the module selected by VMU-MC
D	Local bus ports right side: connection to any VMU-OC module left side: connection to VMU-MC or another VMU-OC module

Features

General

Material	Noryl
Protection degree	Front: IP40 Terminals: IP20
Terminals	Cable section: 1.5 mm ² Torque: From 0.4 to 0.8 Nm
Pollution degree	2
VMU-MC Insulation	Not insulated among power supply, inputs and RS485 port
VMU-OC Insulation	Inputs not insulated Towards power supply, VMU-MC inputs, RS485 port and other VMU-OC modules: 4 kV rms, 50 Hz/1' Reinforced insulation, overvoltage cat. III, systems with voltage up to 300 V grounding
Mounting	On DIN rail
Dimensions (mm)	1-DIN See figures
Display	6 digits LCD
Weight	About 100 g (packaging included)

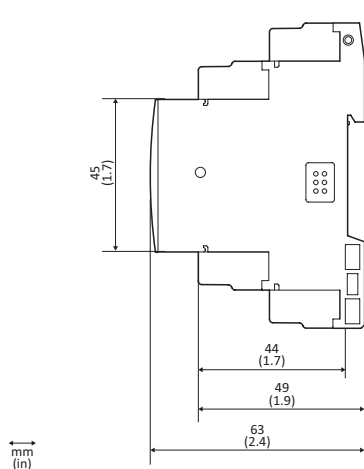


Fig. 1 VMU-MC dimensions

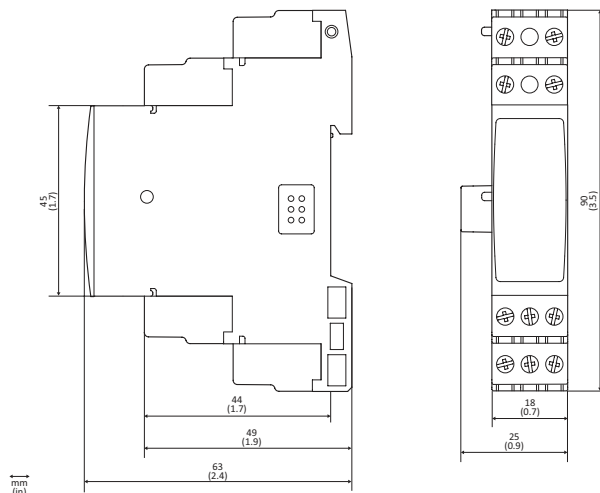


Fig. 2 VMU-OC dimensions



Environmental specifications

Operating temperature	From -25 to +55 °C/from -13 to +131 °F
Storage temperature	From -30 to +70 °C/from -22 to +158 °F

NOTE: R.H. < 95% non-condensing @ 40 °C .



Conformity

Directives	2011/65/EU (Electric-electronic equipment hazardous substances) 2014/30/EU (EMC - Electro Magnetic Compatibility) 2014/35/EU (LVT - Low Voltage)
Standards	Safety requirements for electrical equipment for measurement, control and laboratory use: IEC61010-1/UL61010-1 Devices with pulse outputs: IEC62053-31, S0 class B Electromagnetic compatibility (EMC) - emissions and immunity: EN61326-1.
Approvals	 

Power supply


Power supply	From 15 to 24 V dc, Cl. 2
Consumption	Maximum 100 mA
Connector	Screw terminals

Digital inputs

Number of inputs	VMU-MC: 2 VMU-OC: 3
Type	S0, class B according to EN62053-31 ($I_{max} < 15 \text{ mA}$, $U_{max} \leq 15 \text{ V}$)
Configuration parameters	Pulse weight Units of measure: kWh, kvarh, kVAh, kJ, kcal, m3, Nm3, h, pcs, kg Normal input status (normally open or normally closed) Minimum pulse duration filter (configurable from 5 ms to 300 ms)
Frequency	Maximum 100 Hz
Functions	Pulse counting Input status reading* Tariff management* (VMU-MC only) Note *: not managed by VMU-C EM

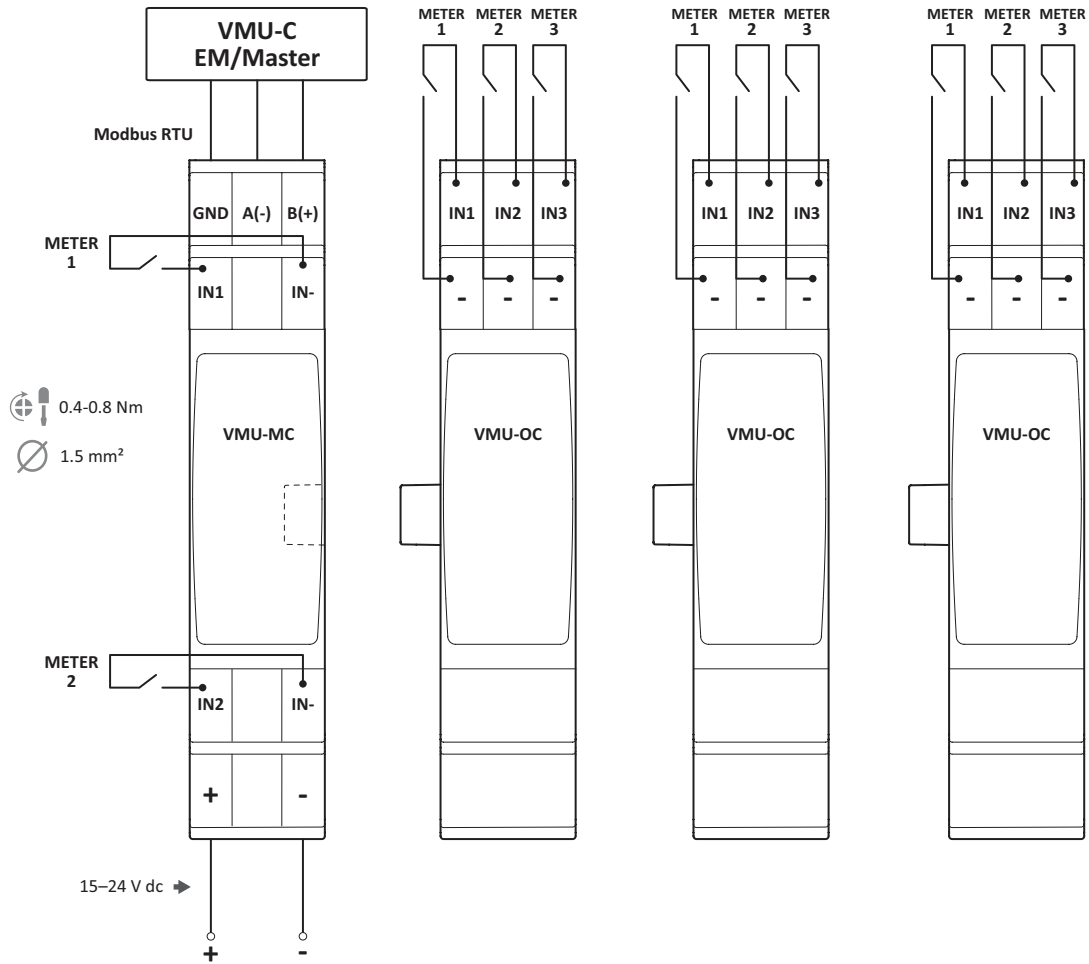
RS485 port

Communication type	Multidrop, bidirectional (static and dynamic variables)
Connection type	Screw terminals 3 wires
Protocol	Modbus RTU
Data	All
Data format	1 start bit, 8 data bits, no parity/even/odd, 1 or 2 stop bit
Configuration parameters	Modbus address (from 1 to 247) Baud rate (9.6 / 19.2 / 38.4 kbps) Parity (None/ Odd/ Even) Stop bit (1 or 2)

 **Display**

Type	LCD
Refresh time	<1 s
Information displayed	Status Totalizer (without decimals) Any active tariff
Utilities	View/edit communication parameters Check connected meter status operation and the state of each input

Connection Diagrams





References

▶ Further reading

Information	Document	Where to find it
Installation, operating and maintenance instruction	Instruction manual - VMU-MC	www.productselection.net
Installation, operating and maintenance instruction	Instruction manual - VMU-OC	www.productselection.net
Datasheet	VMU-C EM Datasheet	www.productselection.net
Modbus register map decryption	Modbus protocol	www.productselection.net

▶ CARLO GAVAZZI compatible components

Purpose	Component name/part number	Notes
Configure VMU-MC and generate the driver for VMU-C EM	UCS configuration software	Available for free download at: www.productselection.net
Monitor data from several devices	VMU-C EM	See relevant datasheet
Power VMU-MC	SPM1241	See relevant datasheet
Connect to VMU-MC from PC via USB/RS485 converter	SIU-PC3	See relevant datasheet

▶ How to order VMU-MC

Code	Description
VMU-MC AS1I2EM	Pulse concentrator with two integrated digital inputs

▶ How to order VMU-OC

Code	Description
VMU-OC AI3XXEM	Module with three digital inputs to integrate VMU-MC



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