

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

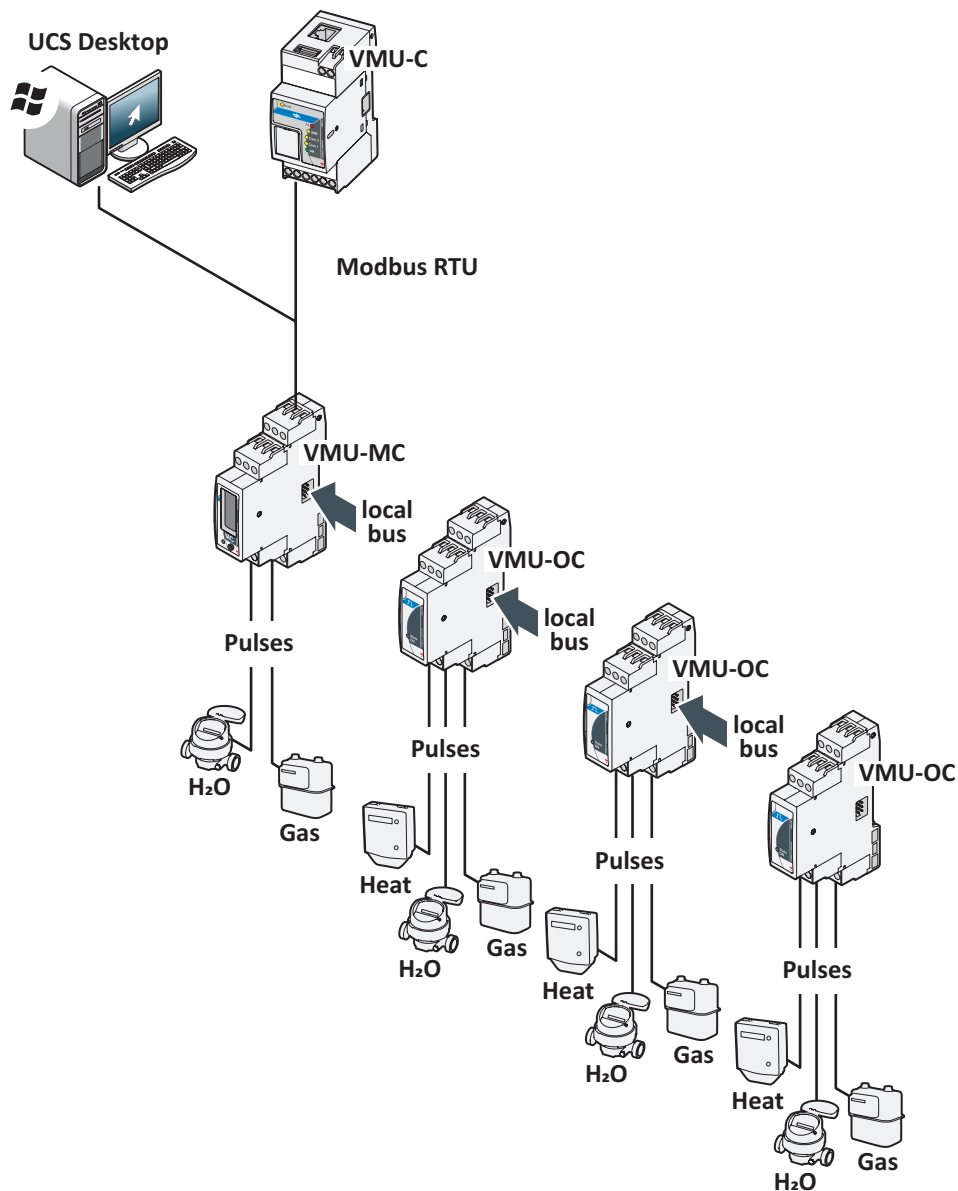
Main functions

- 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.

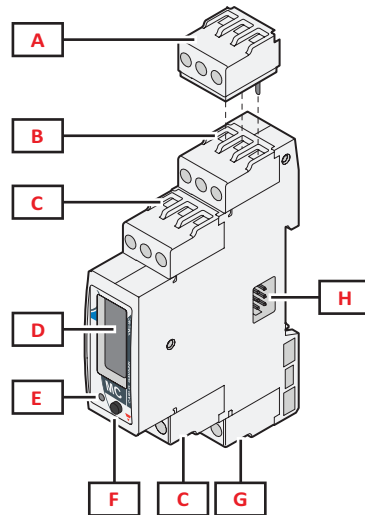
Architecture



Main features

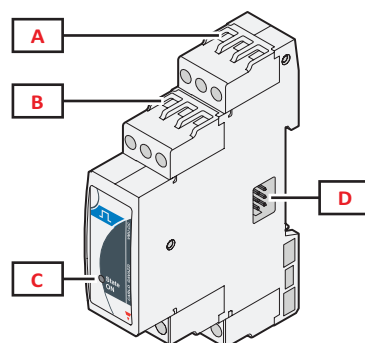
- Up to 11 S0 digital inputs (2 integrated and up to other 9 via VMU-OC modules)
- Up to 3 VMU-OC modules connected via local bus and powered by VMU-MC
- Input function: remote input status reading / tariff management / pulse counting
- Communication ports: RS485 Modbus RTU and local bus
- 6 digits LCD 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)

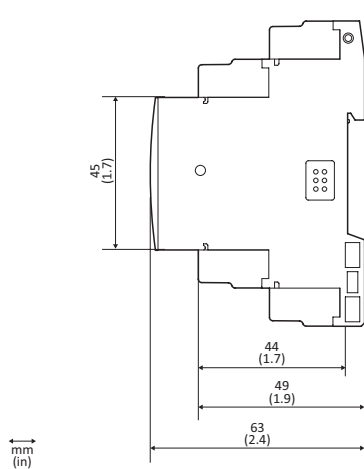


Fig. 1 VMU-MC dimensions

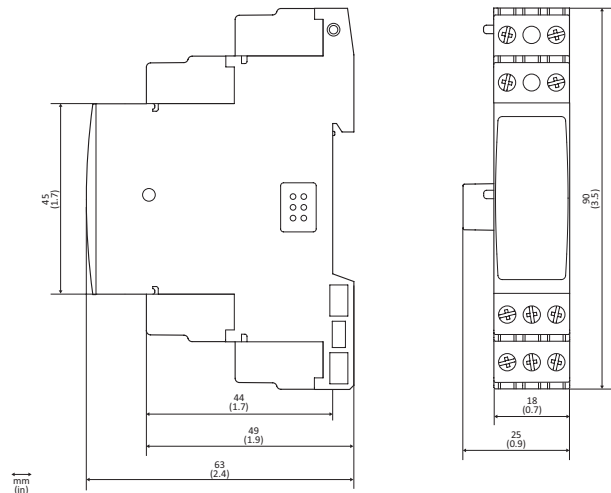


Fig. 2 VMU-OC dimensions



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

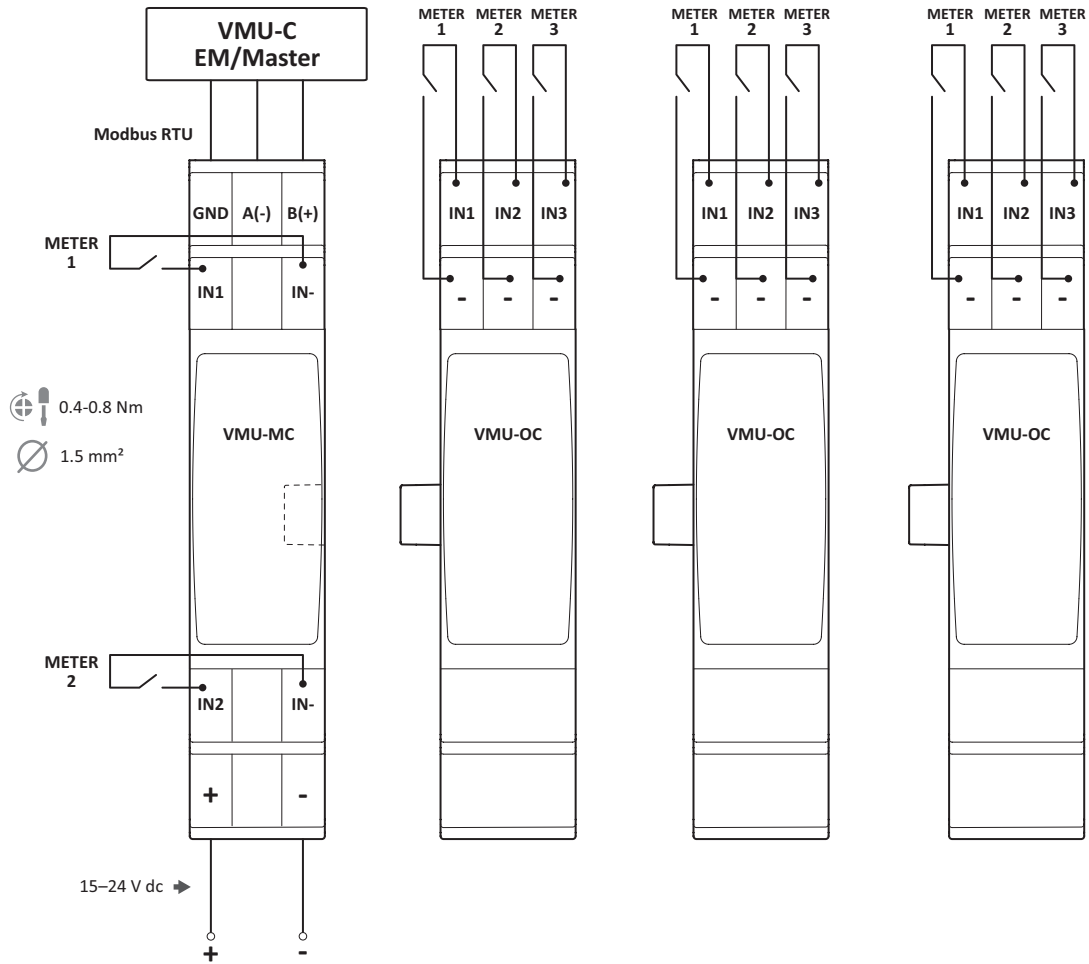
RS485 port

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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