VMU-MC

Pulse concentrator

Information property

General warnings

WARNING! Live parts. Electrocution. Only specialized personnel working in safety conditions should perform installation. Do not use for purposes other than those indicated in the following manual.

This manual is an integral part of the product and accompanies it for its entire working life. It should be consulted for all situations tied to installation and use. For this reason, it should always be accessible to operators.

NOTICE: no one is authorized to open the device. This operation is reserved exclusively for CARLO GAVAZZI technical service personnel.

Service and warranty

In the event of malfunction, fault, requests for information or to purchase other GAVAZZI products, contact the CARLO GAVAZZI branch or distributor in your country.
The serial number to be communicated for service calls is indicated on the product label and in UCS.
Installation and use of VMU-MC other than those indicated in the provided instructions void the warranty.

Download

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UCS desktop (Windows 7 or later)	www.productselection.net/Download/UK/ucs.zip
VMU-C EM datasheet	www.productselection.net/PDF/UK/vmucemds.pdf

Description

VMU-MC is a pulse concentrator that makes totalizers available to master systems (i.e.: VMU-C EM) via Modbus RTU protocol. It controls up to three VMU-OC accessory modules via local bus to integrate from 2 to a maximum of 11 digital inputs.
It is configured with UCS software, available for free download, that is able to generate a driver to automatically integrate data in the VMU-C EM master.

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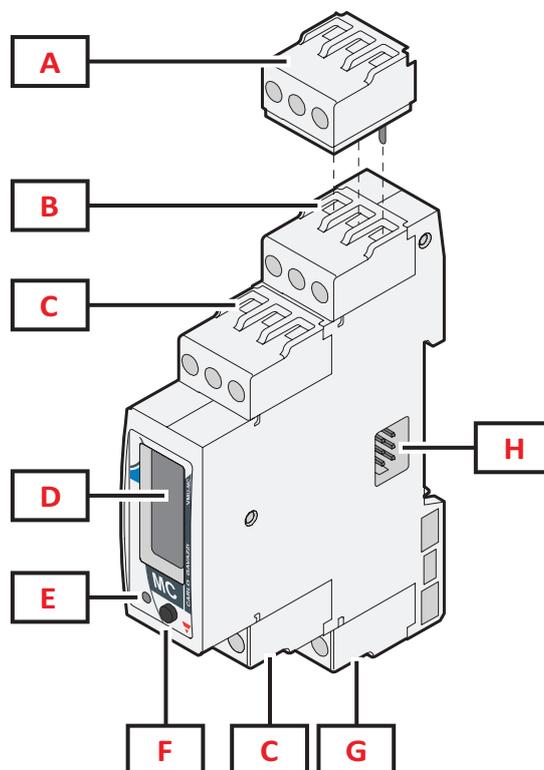
Area	Description
A	Termination block for serial output of the last device in the line (supplied in the box)
B	Terminal block for RS485 port for communication with the master
C	Digital input terminal block
D	LCD display
E	LED to indicate device status
F	Button to scroll the menus and set communication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

UCS Desktop

VMU-C

Modbus RTU

VMU-MC

local bus

VMU-OC

local bus

VMU-OC

local bus

VMU-OC

Pulses

H_2O

Gas

Pulses

Heat

H_2O

Gas

Pulses

Heat

H_2O

Gas

Pulses

Heat

H_2O

Gas
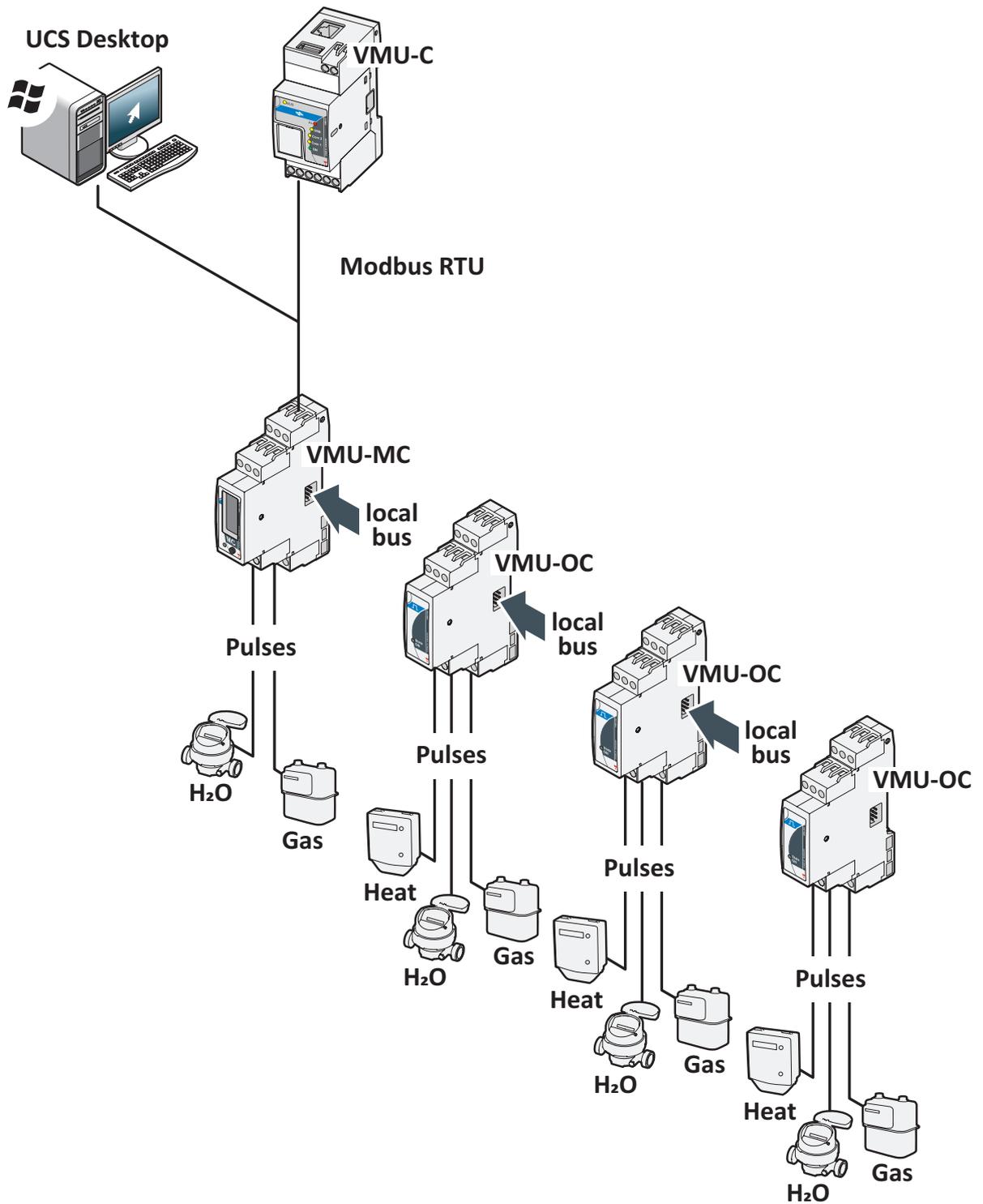
To learn more

Tariff management

Tariffs can be managed by one or two VMU-MC inputs or via Modbus with a master other than VMU-C EM.

With one input

IN1	Current tariff
0	1
1	2

With two inputs

IN1	IN2	Current tariff
0	0	1
1	0	2
0	1	3
1	1	4

Pulse weight and scale factor from UCS

The pulse weight must be set for each input as an integer. Any decimal points should be indicated as scale factor.

Totalizer

The displayed totalizer appears without decimal point and includes only the last six figures (roll-over 4 000 000 000).

Input status

For each input, the status (ON/OFF) is displayed according to the following table:

Normal status	Physical status	Status
Normally open	Open	OFF
Normally open	Closed	ON
Normally closed	Open	ON
Normally closed	Closed	OFF

Use procedures with UCS

Download UCS

Download UCS from www.productselection.net/Download/UK/ucs.zip.

Configure VMU-MC

Note: the configuration can be prepared and saved in UCS to be applied to VMU-MC later.

1. Connect VMU-MC to the PC via serial port using a USB/RS485 converter.
2. Power VMU-MC: the firmware version and set baud rate are displayed.
3. Start UCS and connect VMU-MC (default parameters: baud rate 9600, address 1, Parity None, STOP BIT 1).
4. Configure VMU-MC setting:
   - the tariff management mode
   - the minimum pulse duration for each module (from 5ms to 300ms)
   - pulse weight, scale factor, unit of measure, normal status (normally open or normally closed) for each input
5. For retrofit meters, set manually the totalizer values (offset) from the **Set** menu.

Export the driver for VMU-C EM

1. Configure VMU-MC (refer to the paragraph **Configure VMU-MC**)

2. From the **VMUC driver** menu, define:

   - the driver name
   - the driver brand
   - the variables to export.

3. Click on **Export** and save the file.

Use procedures with VMU-C EM

Import the driver into VMU-C EM

1. Access the VMU-C EM Web Interface
2. Go to **Settings** > **Plant** > **Driver** > **Editor**
3. Click on ● ● ● > **Import**
4. Select the .xml file created with UCS
5. Select the imported driver from the **Driver list**
6. Click on ● ● ● > **Build***
7. Select again the imported driver
8. Click on ● ● ● > **Activate****
9. The driver is now available in the Wizard.

Note: Once the driver is built, the **Status** in the Driver list will be **Built: Ok.***
*Note**: Once the driver is activate, the **Status** in the Driver list will be **Activated.***

Analyze data

1. Disconnect the power supply.
2. Connect VMU-MC to VMU-C EM* via serial port.
3. Power VMU-MC.
4. Access the VMU-C EM Web Interface
5. Go to **Settings** > **Plant** > **Setting**> **Wizard**
6. Use the imported driver
7. Use the VMU-C EM analysis tools.

Note*: If you want to use another master than VMU-C EM, follow the procedure described above until the step 3 and configure the Modbus map manually.

# Use procedures with VMU-MC (via display and push button)

Main menu

* SYSTEM
↓
M-Po. 0
↓
o-Po. 1
↓
o-Po. 2
↓
o-Po. 3
↓
SEtUP
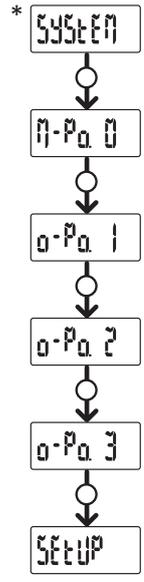
Key

Button press	Symbol
Short	○
Long (about 3 seconds)	●

Note *: item only displayed if the configuration is incorrect (inconsistency found).

SYSTEM: Inconsistency found

Procedure to automatically adjust the number of VMU-OC configured to the number of connected VMU-OC from the display.

SYSTEM ⇄ rESEt → PASS → 0 ○——● system error reset
0-9999
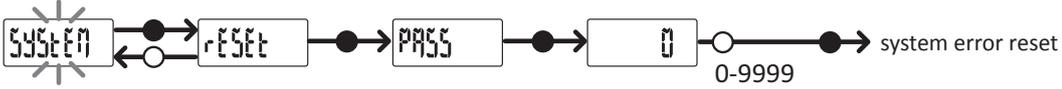
Note *: item only displayed if the configuration is incorrect (inconsistency found).

M-Po. 0: VMU-MC menu

For each input, the status and the associated counter value (without decimals) are displayed.

M-Po. 0 ⇄ i1 oFF → 123456 → i2 on → 123456 → t.1
       status   *meter   status   *meter   **active tariff

[IN1] [IN2]
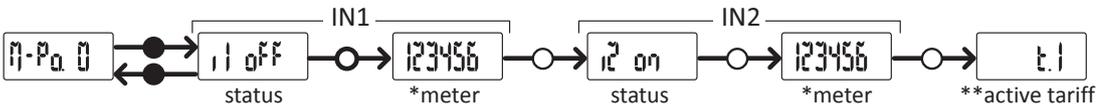
Note *: not displayed if VMU-MC is used to manage tariffs.

Note **: only with tariff management enabled (managed via inputs or Modbus).

O-Po. 1: VMU-OC 1 menu

o-Po. 1 ⇄ i1 OFF → 123456 → i2 on → 123456 → i3 oFF → 123456
    status   counter   status   counter   status   counter

[IN1] [IN2] [IN3]
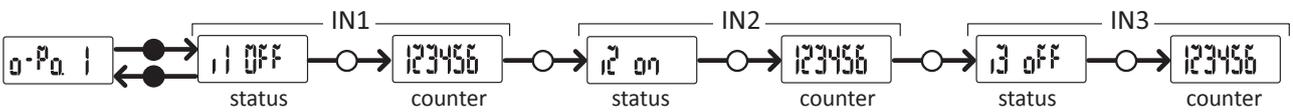
Note: standard view, also applies without VMU-OC or its inputs connected.

O-Po. 2: VMU-OC 2 menu

o-Po. 1 ⇄ i1 OFF → 123456 → i2 on → 123456 → i3 oFF → 123456
    status   counter   status   counter   status   counter

[IN1] [IN2] [IN3]
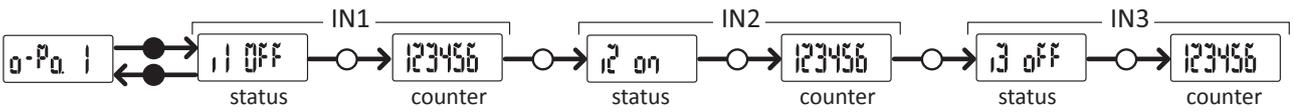
Note: standard view, also applies without VMU-OC or its inputs connected.

O-Po. 3: VMU-OC 3 menu
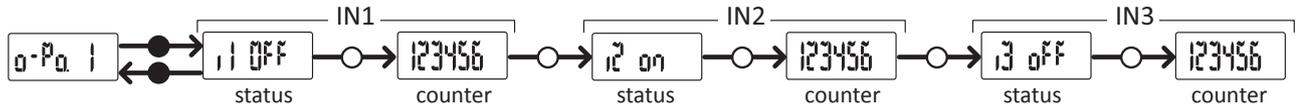
Note: standard view, also applies without VMU-OC or its inputs connected.

SETUP: Modbus communication menu
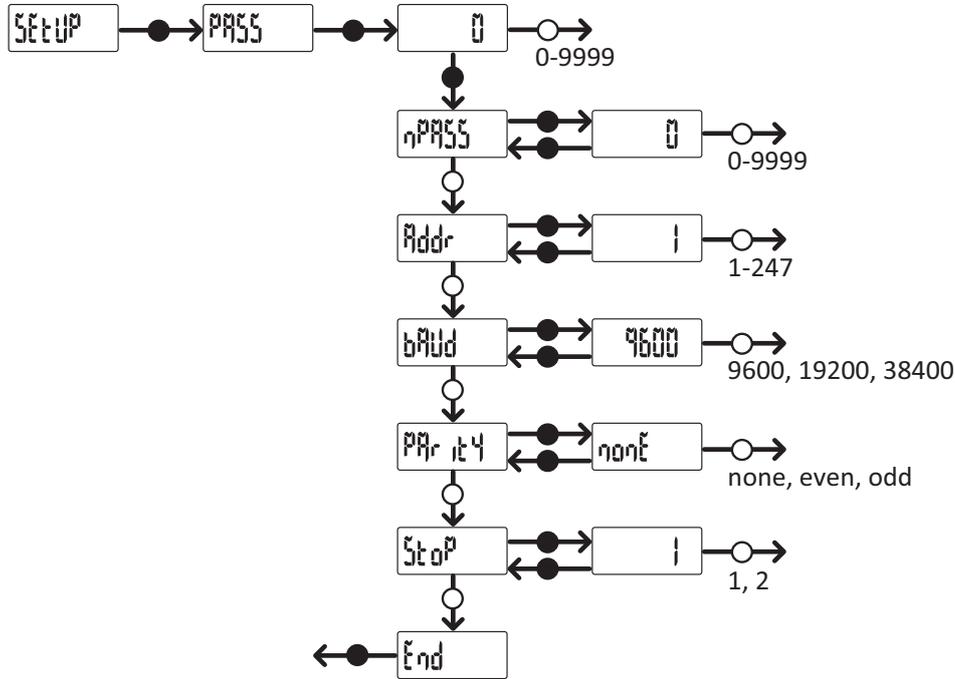
Note: to save the set value, press and hold down the button for about three seconds. To clear changes, wait 20 seconds.

Diagnostics and troubleshooting

LED status

Status	Description
Steady green	On and powered
Blinking green	Modbus RTU communication in progress
Steady red	Inconsistency found*
Alternating blinking red/green	Inconsistency found* and Modbus RTU communication in progress

Note*: inconsistency between the number of VMU-OC physically connected and UCS configuration parameter (3 by default).

Diagnostics

Meter increases and input status can be checked on both the display and UCS. In UCS, the input set ON is illustrated by a green dot and the totalizers are available in the **Variables** section.

Troubleshooting

Problem	Cause	Solution
From VMU-MC: Red LED, System on display From UCS: gray VMU-OC	Number of connected/ read VMU-OC different than that set in UCS (default = 3)	• From VMU-MC, follow the procedure in "Inconsistency found" • From UCS, edit the number of connected modules. • Check VMU-OC modules connection.
	Technical fault	• Remove any moisture from the connector or call for service. • In the event of broken pin, replace the module.

Maintenance and disposal

Responsibility for disposal

The product must be disposed of at the relative recycling centers specified by the government or local public authorities. Correct disposal and recycling will contribute to the prevention of potentially harmful consequences to the environment and persons.

CARLO GAVAZZI Controls SpA

www.productselection.net