

# VMUC-EM

**the WebServer Solution  
for any energy management  
applications**

## VMUC-EM WebSERVER solution

# Applications that we can use the VMUC-EM

- Conventional energy
- Building, shopping centers, hospitals, public services etc
- And many other applications of markets that requiring an energy monitoring system

## VMUC-EM WebSERVER solution

# Why the VMUC-EM ?

- To supply a complete solution including metering, logging, analysis and communication features for any energy management applications (which is also an extraordinary driver to sell our energy management instrumentation and accessories)
- To replace existing software solutions with a more robust and reliable proposal
- No need of a dedicated PC for monitoring
- No HD crash problems which lead to data losses
- No compatibility problems due to different operating systems, different languages, libraries, etc.
- Polling device, datalogger, Ethernet gateway in a single, very compact, unit
- Modular concept for additional input/output whenever needed
- Optional modular modem for wireless Ethernet connections

## VMUC-EM WebSERVER solution

# Features and Benefits

### CUSTOMER ISSUE :

Remote electric plant information access

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Remote electric plant information access when wired Internet is not available

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Remotely collect and analyse all the plant data (or group of plants data) by customer's own software, SCADA or BMS system

### OUR SOLUTION:

Web-based module allowing the access to all key information of any plant when an Internet connection is available

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Additional mobile modem unit allowing the wireless access to all key information of any plant

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FTP data push function can be enabled on VMU-C, in order to have a scheduled updating of the remote server database

### BENEFITS:

Flexible and compact integrated solution, specifically developed to complete CG offer of energy meters, power analysers and optional VMU modules

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Modular mobile solution designed to be part of the VMU-C architecture being easy to install and to use

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VMU-C EM is able to periodically update the remote server and log all the info locally in case the Internet connection is temporarily not available



## VMUC-EM WebSERVER solution

- ▼ Integrated modular local monitoring system for Energy Management based on **WEB access**
- ▼ VMUC-EM can collect data from:
  - ▼ **Energy Meters** (EM21, EM23, EM24, EM33, EM26, WM30, WM40, ...)
  - ▼ **Array groups** (temperatures, Analogue signals, Pulse rate signals, digital input status)
- ▼ VMUC-EM can manage **on its local bus** up to 5 VMU modules:
  - ▼ Up to n.1 VMUW (universal mobile **modem**)
  - ▼ Up to n.1 VMUP-EM (environmental variables module)
  - ▼ UP to n.3 VMUO-EM (input/output module)
- ▼ VMUC-EM can manage on its local RS485 busses up to 10 Array groups (COM1) and up to 32 Energy Meters (COM2) .

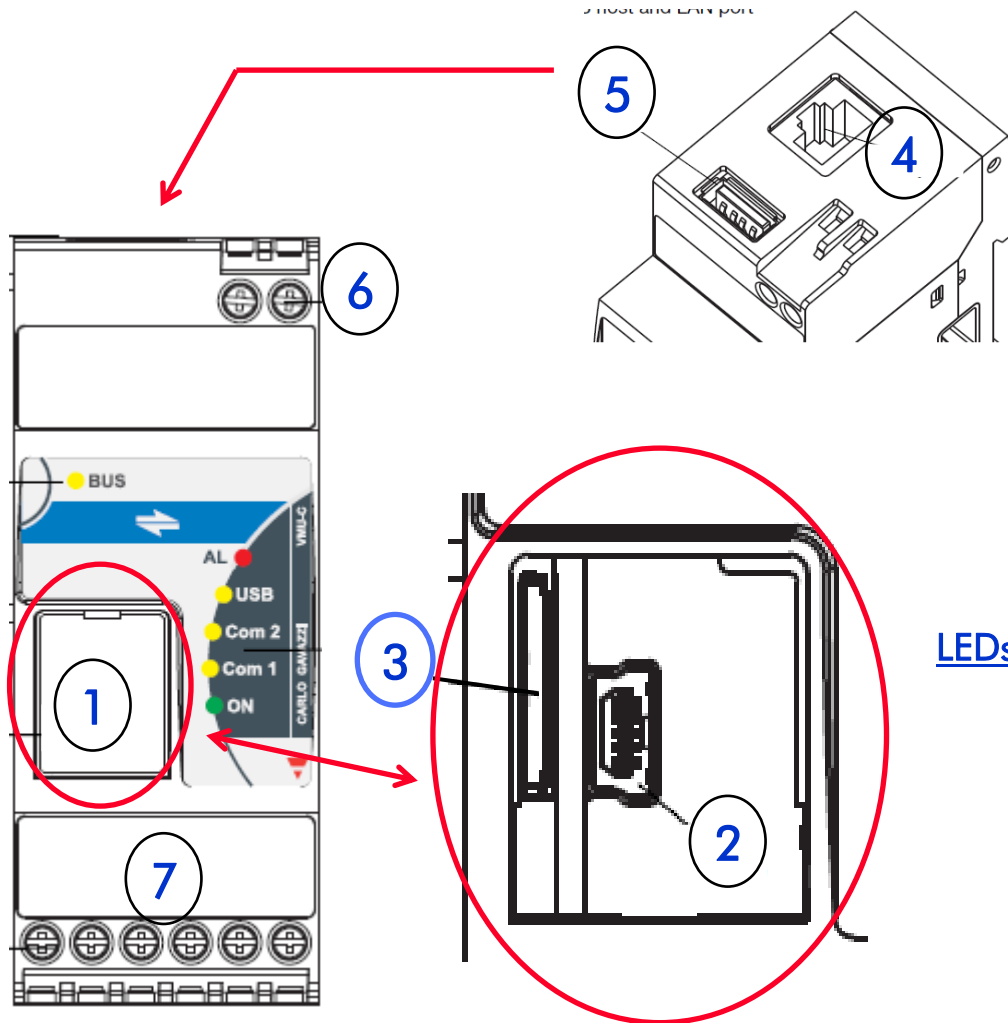


## VMUC-EM WebSERVER solution

- ▼ Micro PC with Web-server and Web service capability
- ▼ Environment variables: temperature, analogue signals (0-120.0mV and 0 – 20.00mA), tachometer signal.
- ▼ Energy Meters: AC information: Voltage, Current, Active/Reactive power, Active/Reactive energy, Power Factor, ...
- ▼ Energy Meters: Counters from digital inputs (e.g. Hot Water, Cold water, GAS, ...).
- ▼ Storage Interval time: selectable among 5 – 10 – 15 – 30 – 60 min.
- ▼ **The stored sample within the selected time interval results from the continuous average calculation of the measured values.**
- ▼ Variables shown as graphs and in real time reading format.
- ▼ Alarms control with automatic e-mailing and SMS management
- ▼ All data exports on XLS format
- ▼ Data storage up to 30 years (into its 4Gb memory)
- ▼ Two RS485 communication ports (Modbus)
- ▼ One Ethernet port
- ▼ Two multi purpose USB 2.0 ports
- ▼ 12 to 28 VDC power supply
- ▼ Dimensions: 2-DIN modules
- ▼ Protection degree (front): IP40



## VMUC-EM WebSERVER solution



1. Front plastic door
2. Mini USB connector (it can be used for a first configuration)
3. Plug-in slot per micro SD or micro SDHC (it is used to have a copy of the data-base and in case of d disaster-recovery should be needed)
4. RJ45connector for Ethernet connection
5. USB "A" type connector (as per the point 3)
6. Power supply terminals
7. COM1 and COM2 terminals

LEDs: ON : power supply indication and SD card writing operation in progress (if flashing)  
 COM1: communication activity indicator  
 COM2: communication activity indicator  
 USB : writing operation in progress  
 AL : at least one active alarm  
 BUS : communication activity over RJ45 connector

## VMUC-EM WebSERVER solution

- Each **VMUM-EM** module can manage up to:
  - 1 VMUP-EM unit  
(environmental variables module);
  - 3 VMUO-EM units (the input/output module);



## VMUC-EM WebSERVER solution

### Data logger and local bus manager

- ▼ Local display: 6-DGT readout
- ▼ Communication bus: RS485 (Modbus), baud rate up to 115.200 bits/s
- ▼ Local bus: up to 4 mixed VMUP-EM and VMUO-EM units
- ▼ “Two temperature inputs: Pt100 or Pt1000, 2 or 3-wire (-50.0 to +200.0°C)”
- ▼ “Or One digital input: Detection ON/OFF status”
- ▼ Clock: European or American format selection (internal battery)
- ▼ Real and virtual alarm management
- ▼ **Data stamping format: date, time, temperatures, analogue inputs and digital pulse ratio**
- ▼ **Data stamping interval: selectable 5-10-15-30-60 minutes**
- ▼ **Events stamping: date and time of: alarms, digital inputs status changing and other events**
- ▼ Power supply: 12 to 28VDC
- ▼ Mounting: DIN-rail
- ▼ MTBF / MTTF: 24.2 years (gf, 50°C, MIL standard “MIL-HDBK-217F”)
- ▼ Operating temperature: -25°C to 55°C
- ▼ Storage temperature: -30°C to 70°C



# VMUM-EM

## VMUC-EM WebSERVER solution

### Environment measurement unit

- ▼ Local multicolour LED: colour code for diagnostic purpose
- ▼ Local bus: **one** VMU-P unit per bus
- ▼ **Two channels for temperature measurement (Pt100 or Pt1000, 2 or 3 wires)**
- ▼ **One analogue input (120mV or 20mA)**
- ▼ **One digital pulse rate input (0 to 1000Hz max.)**
- ▼ Accuracy  $\pm 0.5\%$  RDG
- ▼ Data format: 4-DGT
- ▼ Power supply: self-power supply from VMUM-EM unit
- ▼ Mounting: DIN-rail
- ▼ MTBF / MTTF: 31.7 years (gf, 50°C, MIL std "MIL-HDBK-217F")
- ▼ Operating temperature: -25°C to 55°C
- ▼ Storage temperature: -30°C to 70°C



# VMUP-EM



## VMUC-EM WebSERVER solution

### I/O unit

- ▼ Local multicolour LED: colour code for diagnostic purpose
- ▼ Local bus: up to 3 VMUO-EM units
- ▼ **Two digital inputs for “Detection ON/OFF status”**
- ▼ **Two digital outputs for Alarm notification or automatic activation/deactivation of an external load (by means of the internal clock or as a remote control).**
- ▼ Output type: relay, SPST type (AC 1-5A @ 250VAC, AC 15-1.5A @ 250VAC)
- ▼ Power supply: self-power supply from VMUM-EM unit
- ▼ Mounting: DIN-rail
- ▼ MTBF / MTTF: 65.4 years (gf, 50°C, MIL std “MIL-HDBK-217F”)
- ▼ Operating temperature: -25°C to 55°C
- ▼ Storage temperature: -30°C to 70°C



# VMUO-EM

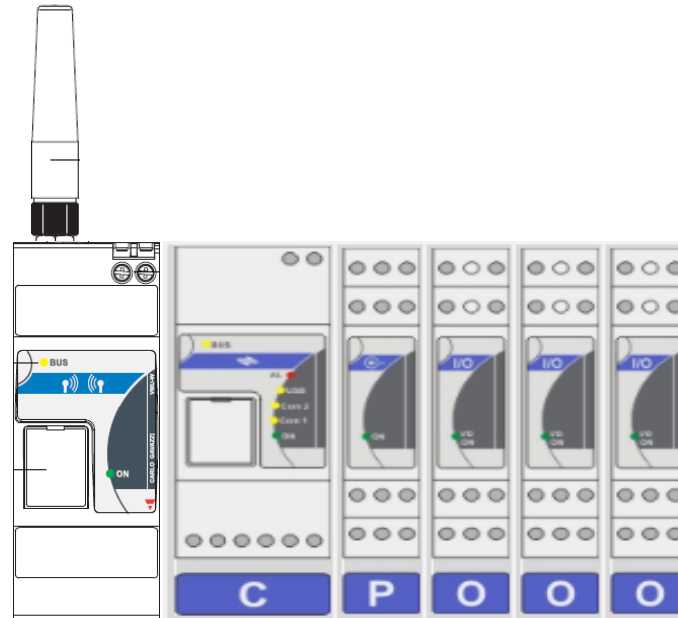


## VMUC-EM WebSERVER solution

In case of a **wired Internet communication not available**, in the VMUC-EM system it is possible to add the modem **VMUWAUMMX**

The VMU-W modem is based on “UMM” (Universal Mobile Modem) communication technology (GPRS / UMTS).

With the VMU-W, in addition to the scheduled email service, it is possible to manage the remote plant surveillance by a SMS alert received by maintenance personnel on mobile phone.



## VMUC-EM WebSERVER solution

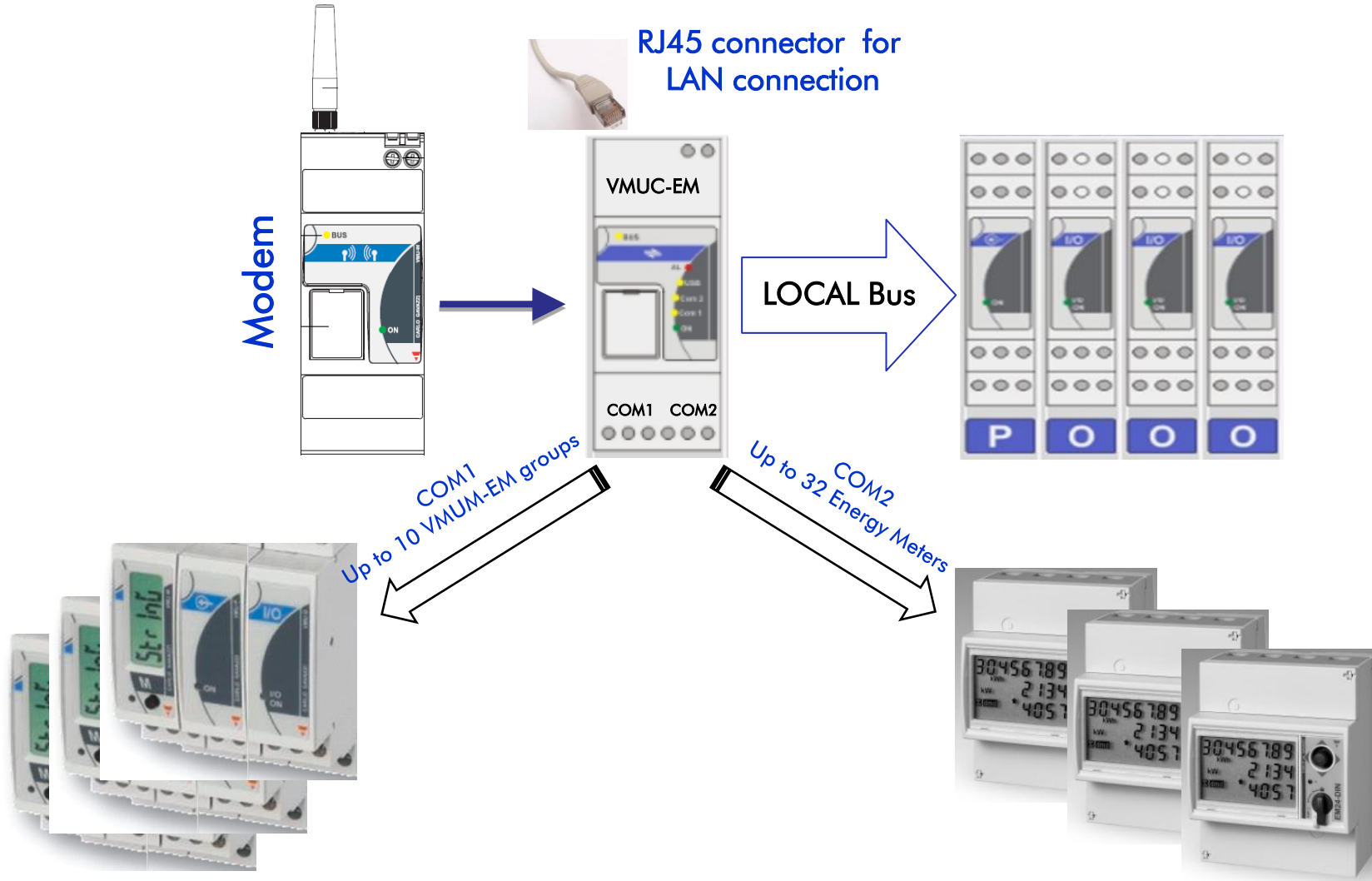
### MODEM

- ▼ Quad band modem: 850MHz, 900MHz, 1800MHz, 1900MHz
- ▼ GSM, GPRS, EDGE standard, UMTS, HSPA standard
- ▼ Class4 (2W, 33dBm) @ GSM 850 / 900 MHz
- ▼ Class1 (1W, 30dBm) @ GSM 1800 / 1900 MHz
- ▼ ClassE2 (0.5W, 27dBm) @ EDGE 850 / 900 MHz
- ▼ ClassE2 (0.4W, 26dBm) @ EDGE 1800 / 1900 MHz
- ▼ Class3 (0.25W, 24dBm) @ UMTS
- ▼ Power supply: 12 to 28 VDC
- ▼ Mounting: DIN-rail
- ▼ Main purpose: Access to the Web-Server (VMUC-EM) and all its functionalities if the wired network is not available
- ▼ Additional purpose: To send SMS
- ▼ SIM (25 x 15mm) for data communication (M2M SIM only)
- ▼ Operating temperature: -25°C to 55°C
- ▼ Storage temperature: -30°C to 70°C



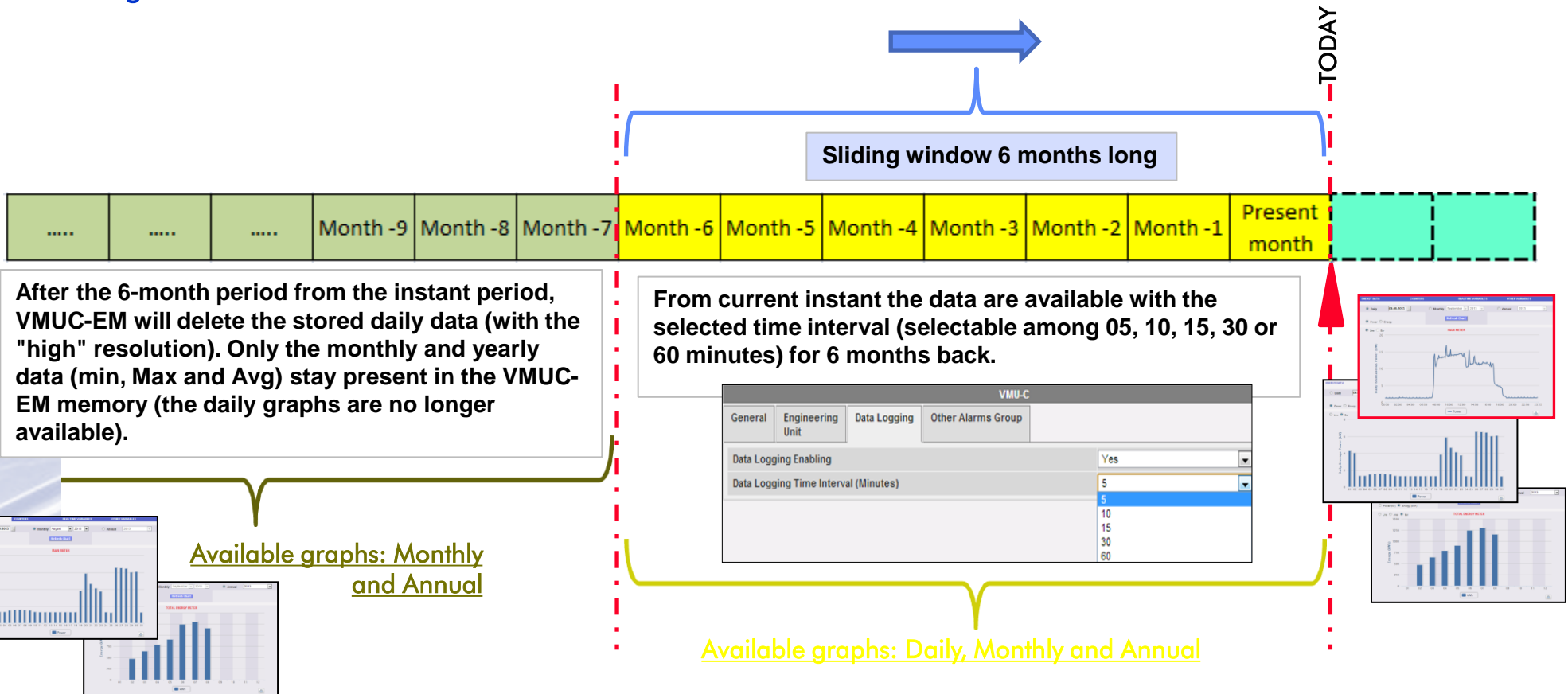
# VMUW

# VMUC-EM WebSERVER solution

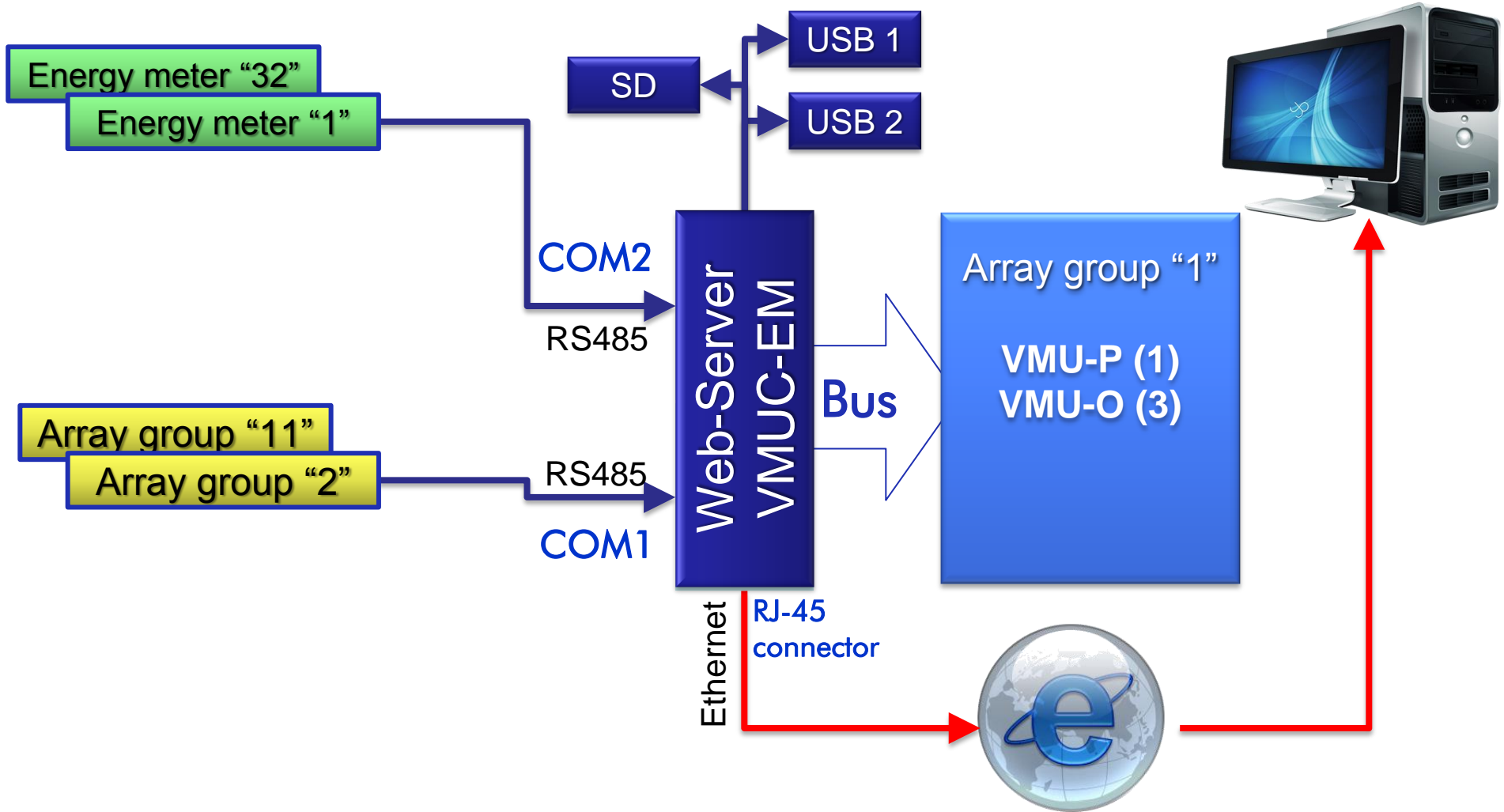


# Storing data in the VMUC-EM

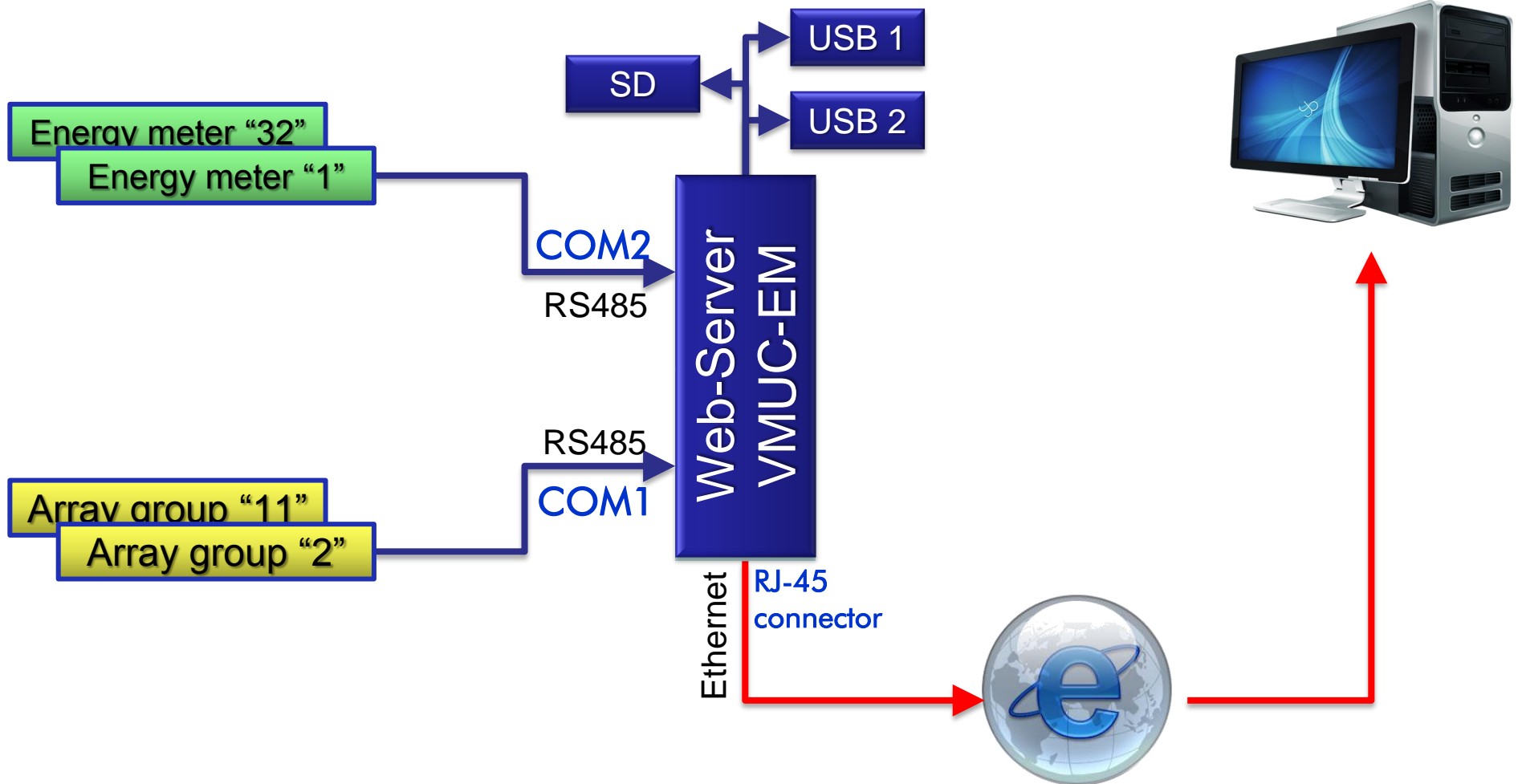
VMUC-EM is able to grant the declared 30 years of data storing capability by using its internal 4 Gb memory considering the below rule:



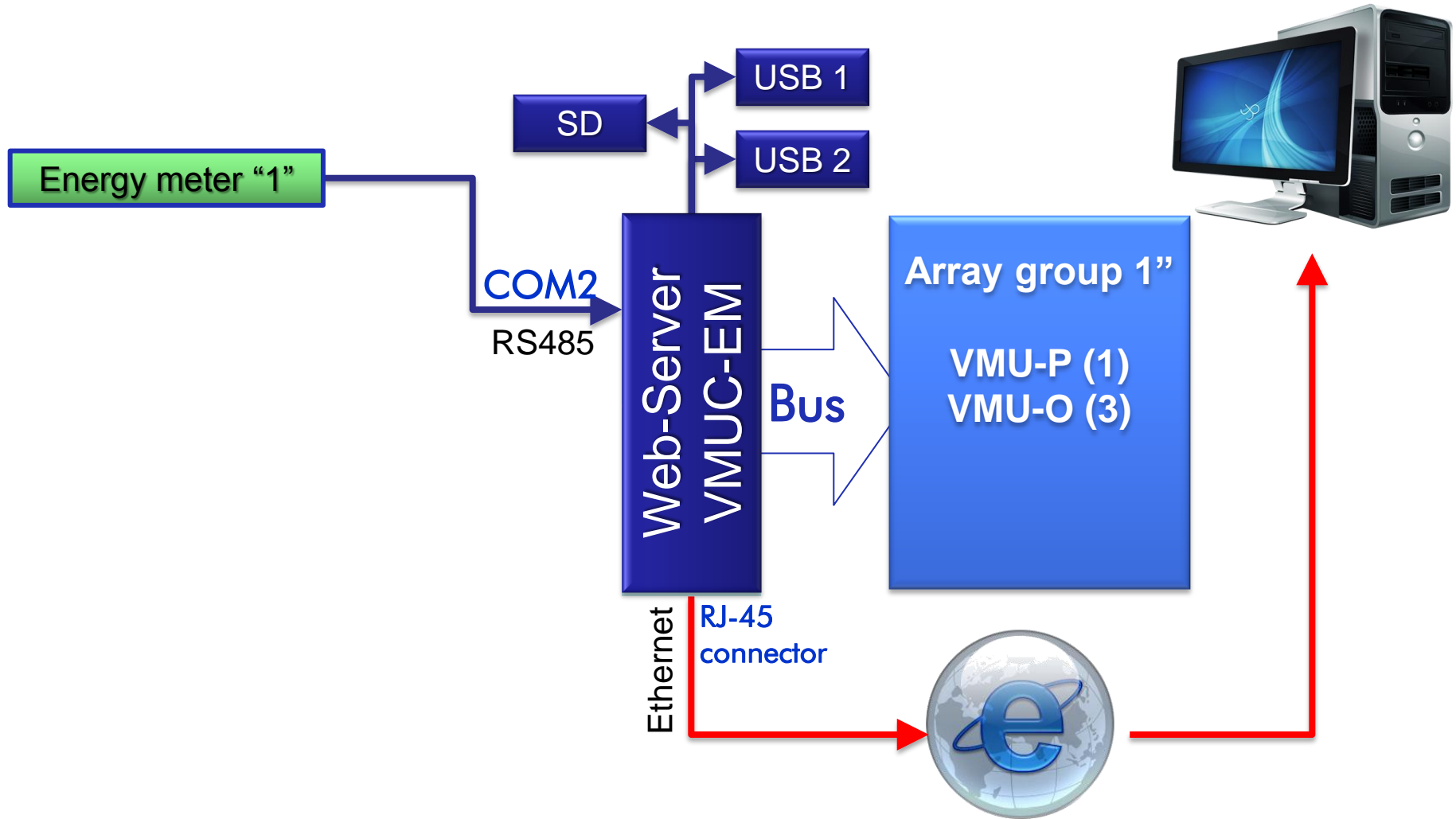
## Example of communication architecture with wired Internet access



# Example of communication architecture with wired Internet access

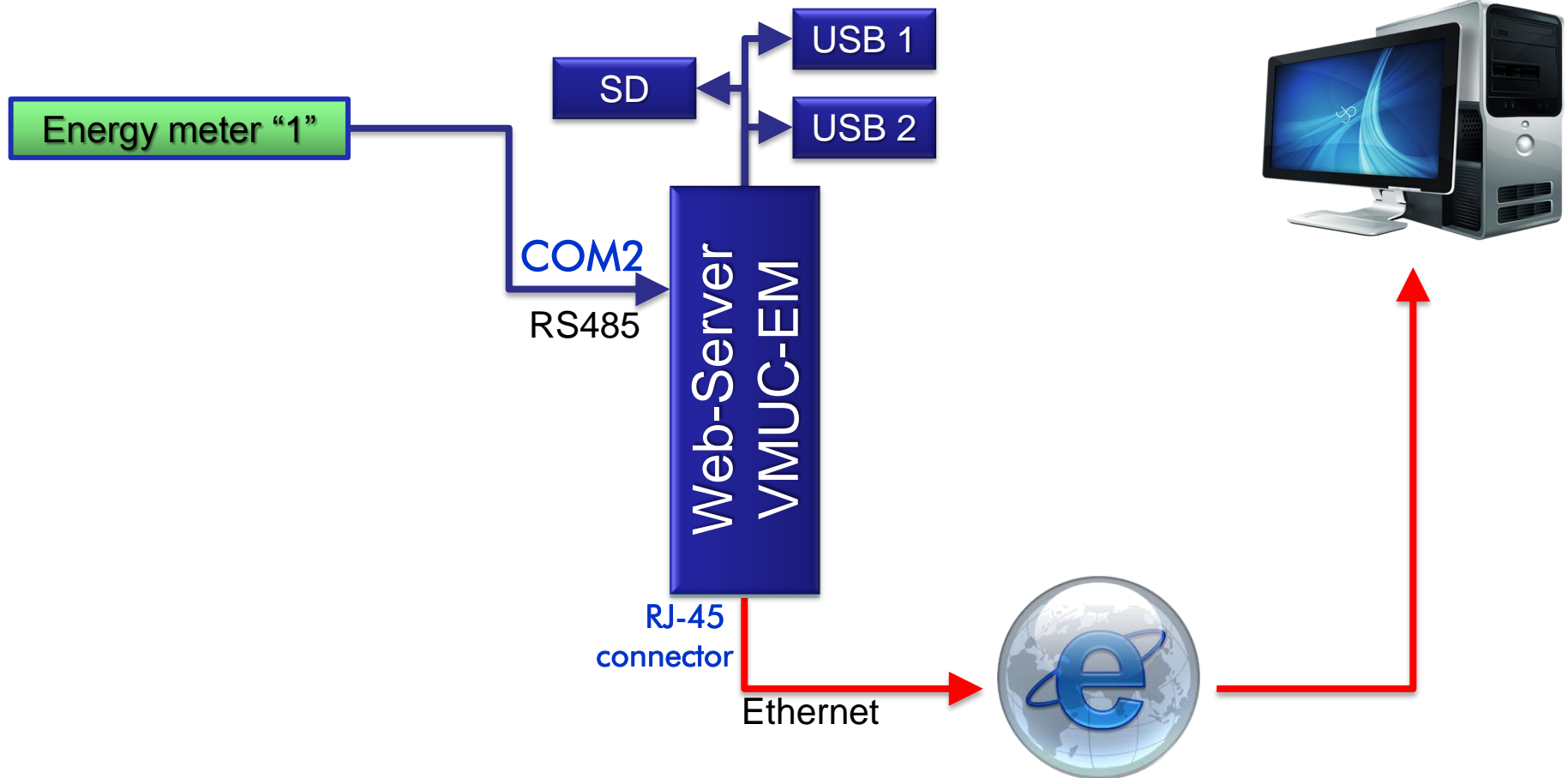


## Example of communication architecture with wired Internet access

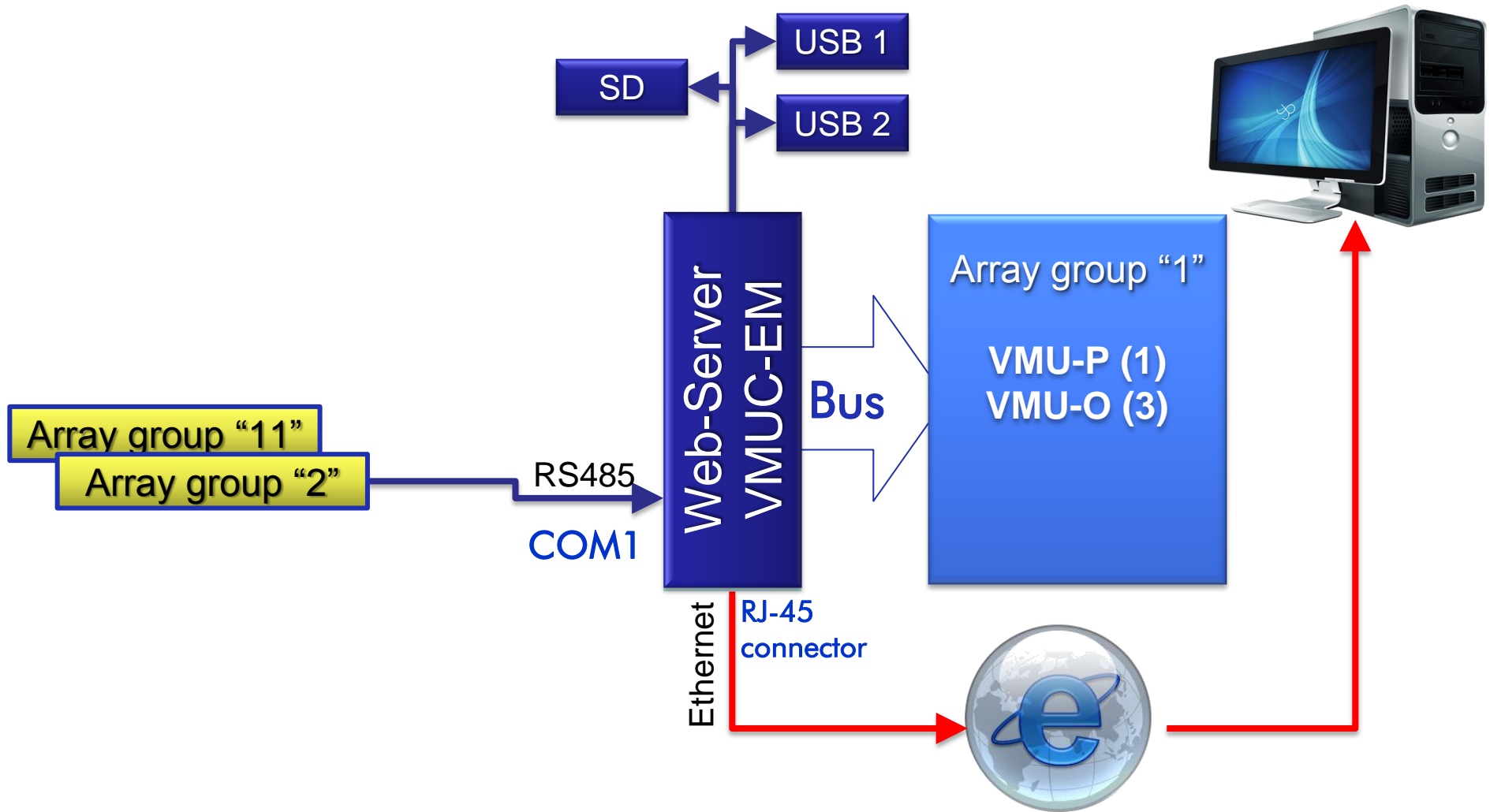




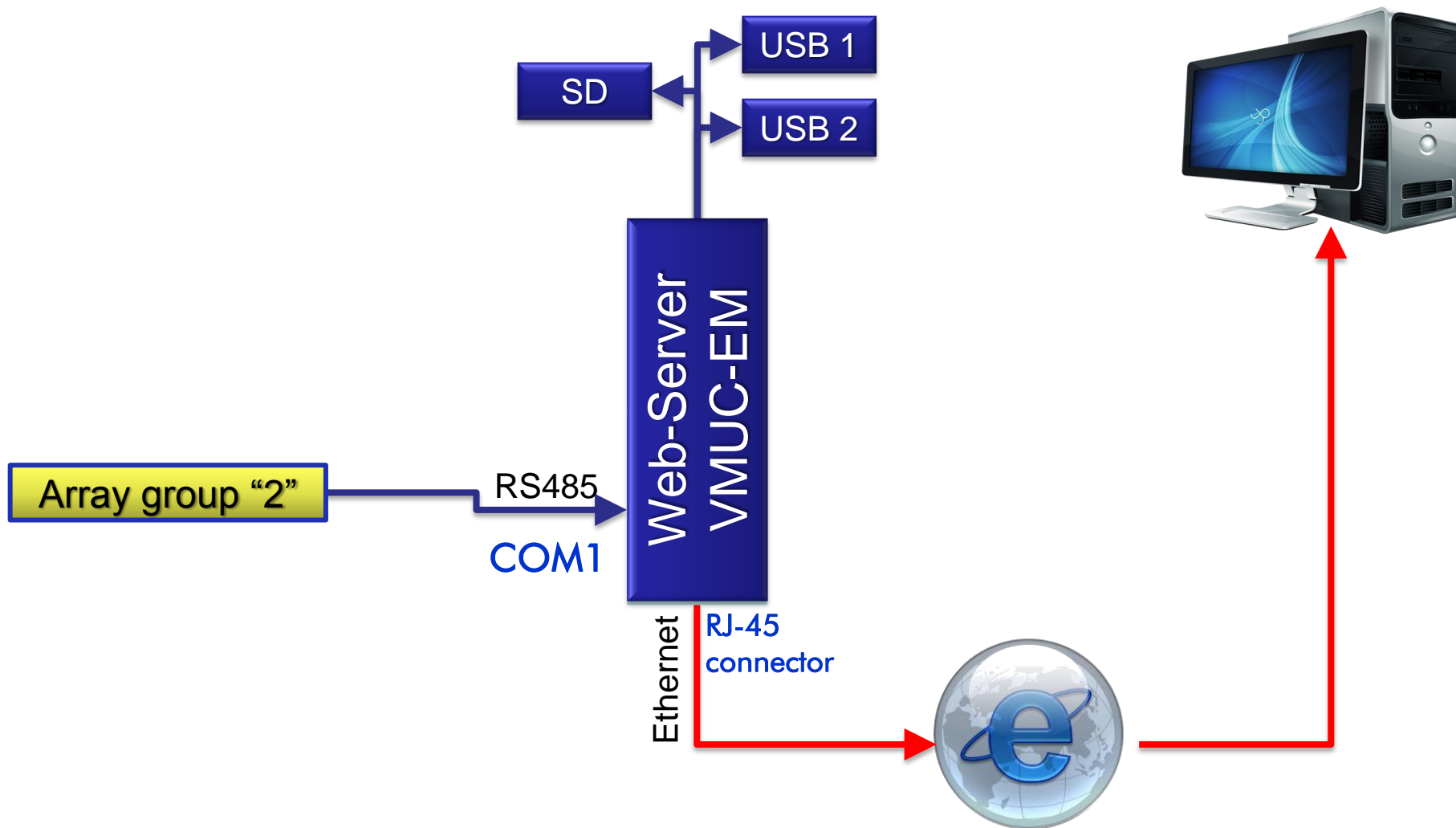
## Example of communication architecture with wired Internet access and energy meter management only



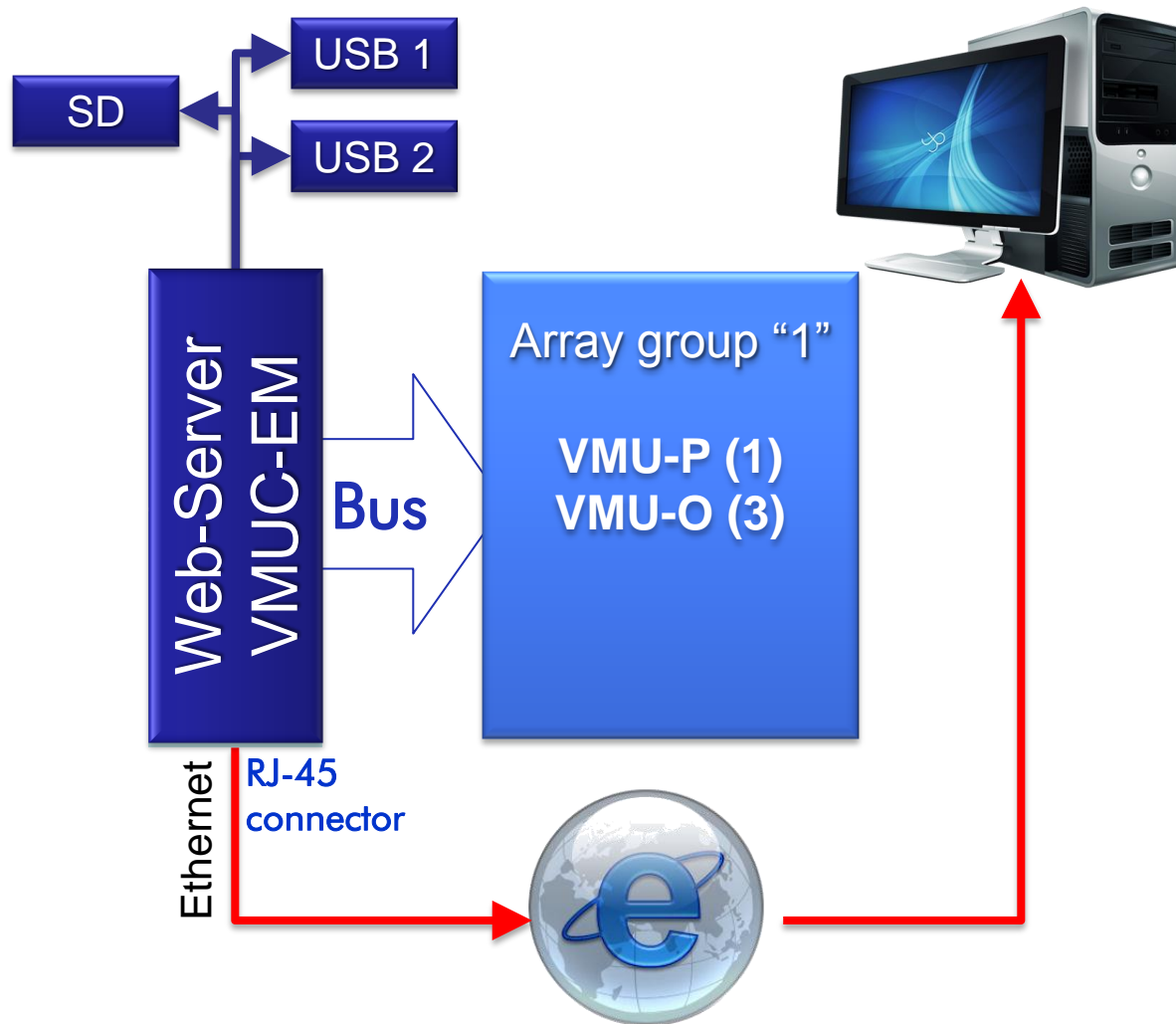
## Example of communication architecture with wired Internet access



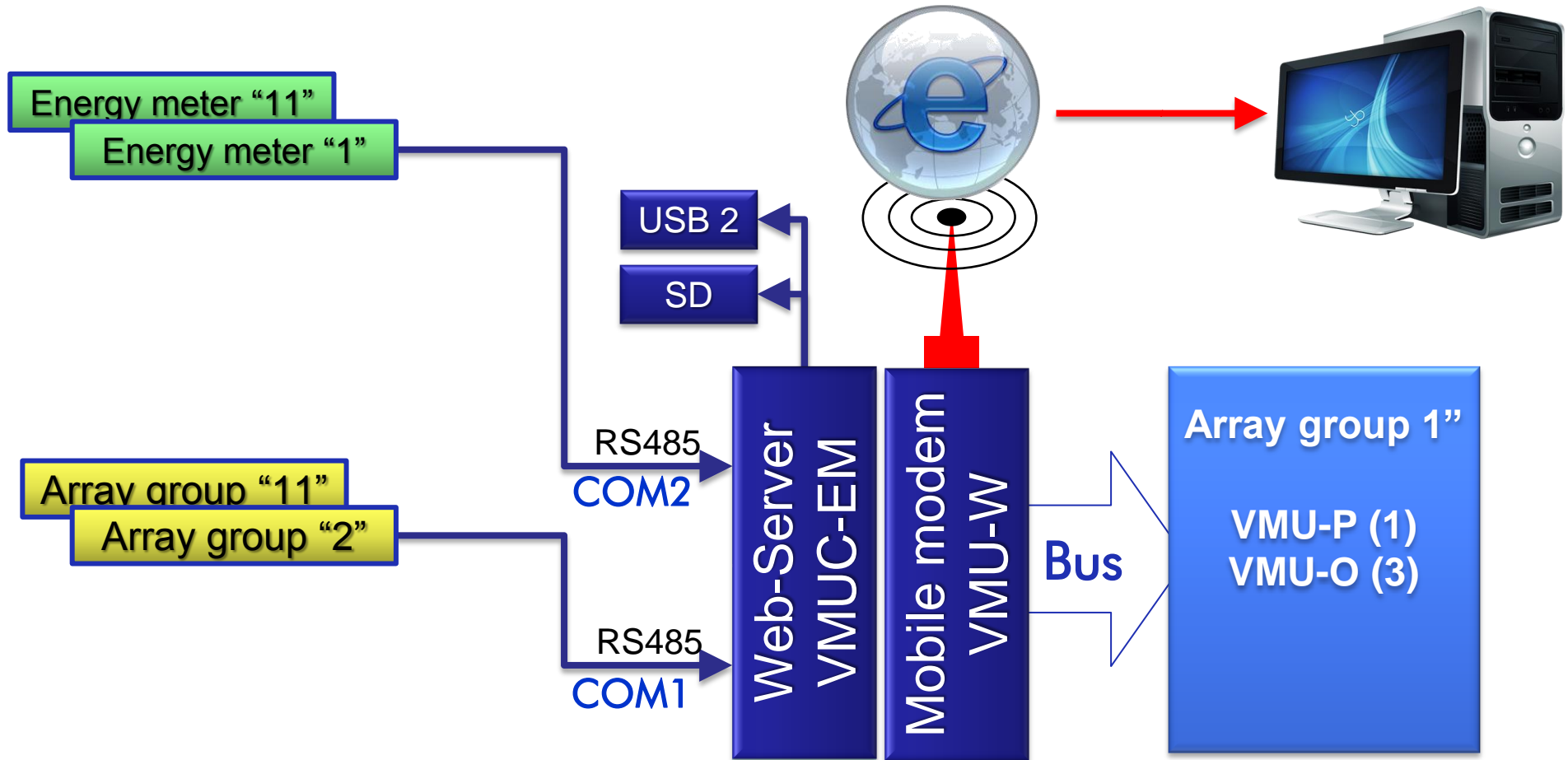
## Example of communication architecture with wired Internet access



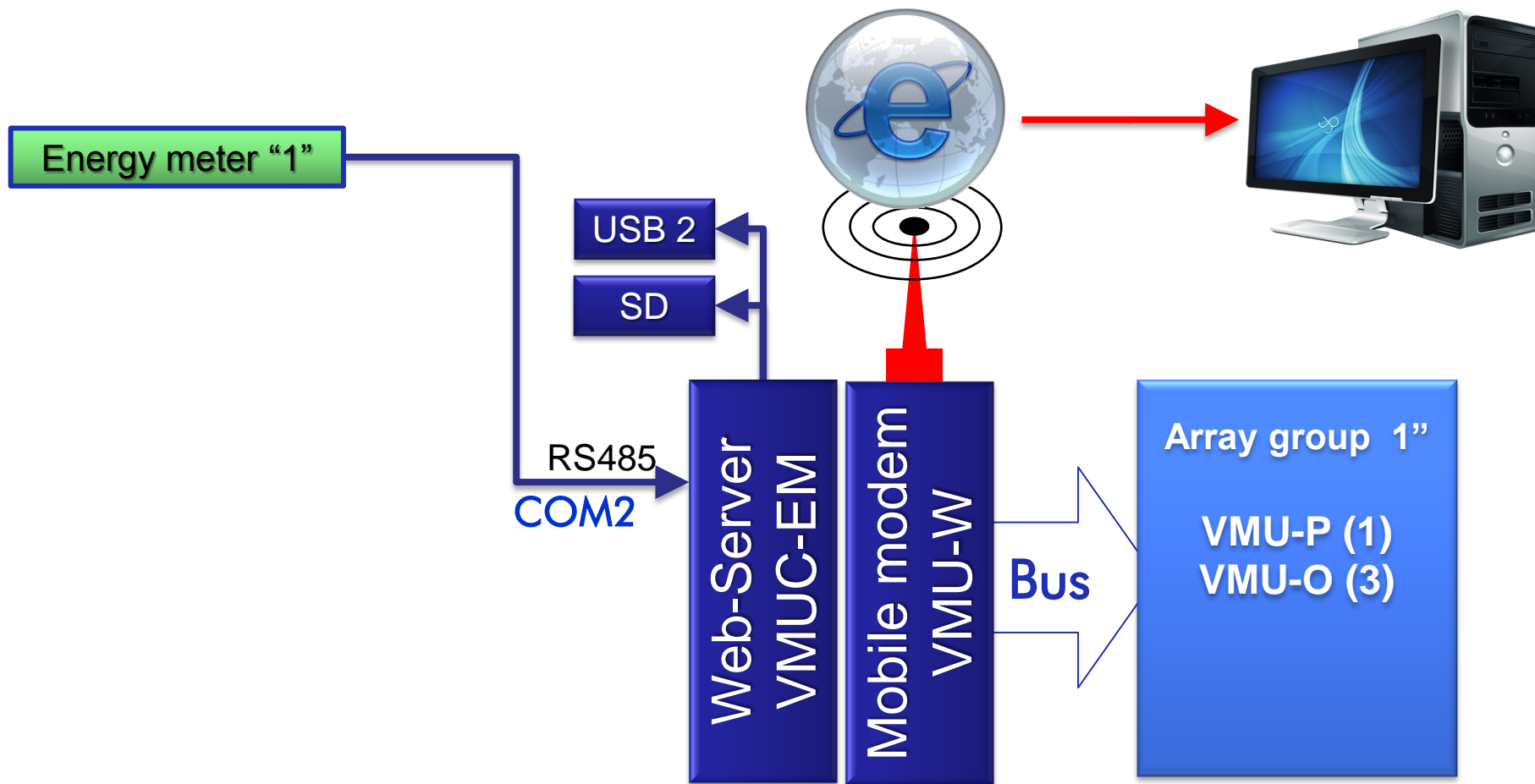
## Example of communication architecture with wired Internet access



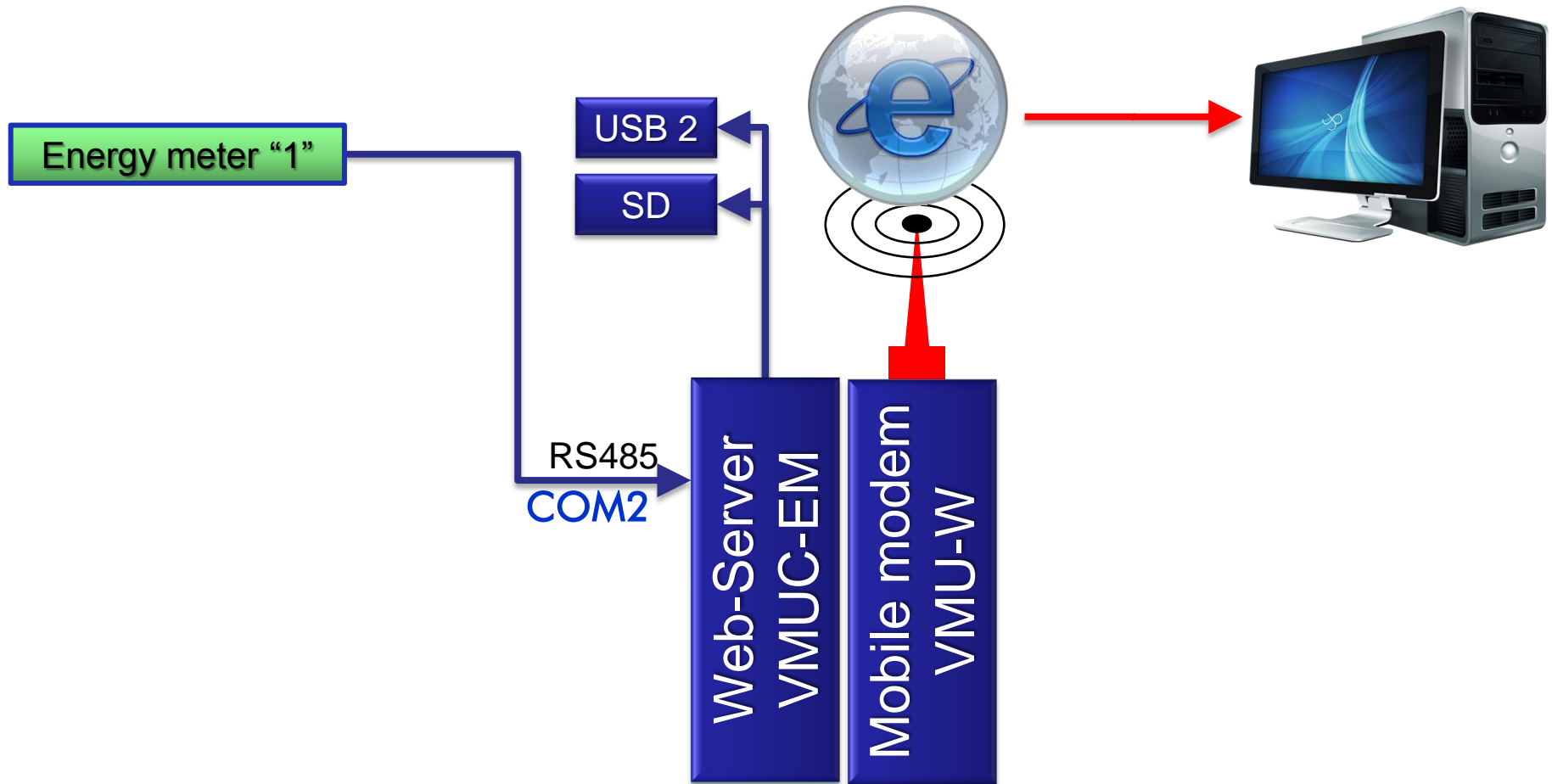
## Example of communication architecture with wireless Internet access



## Example of communication architecture with wireless Internet access

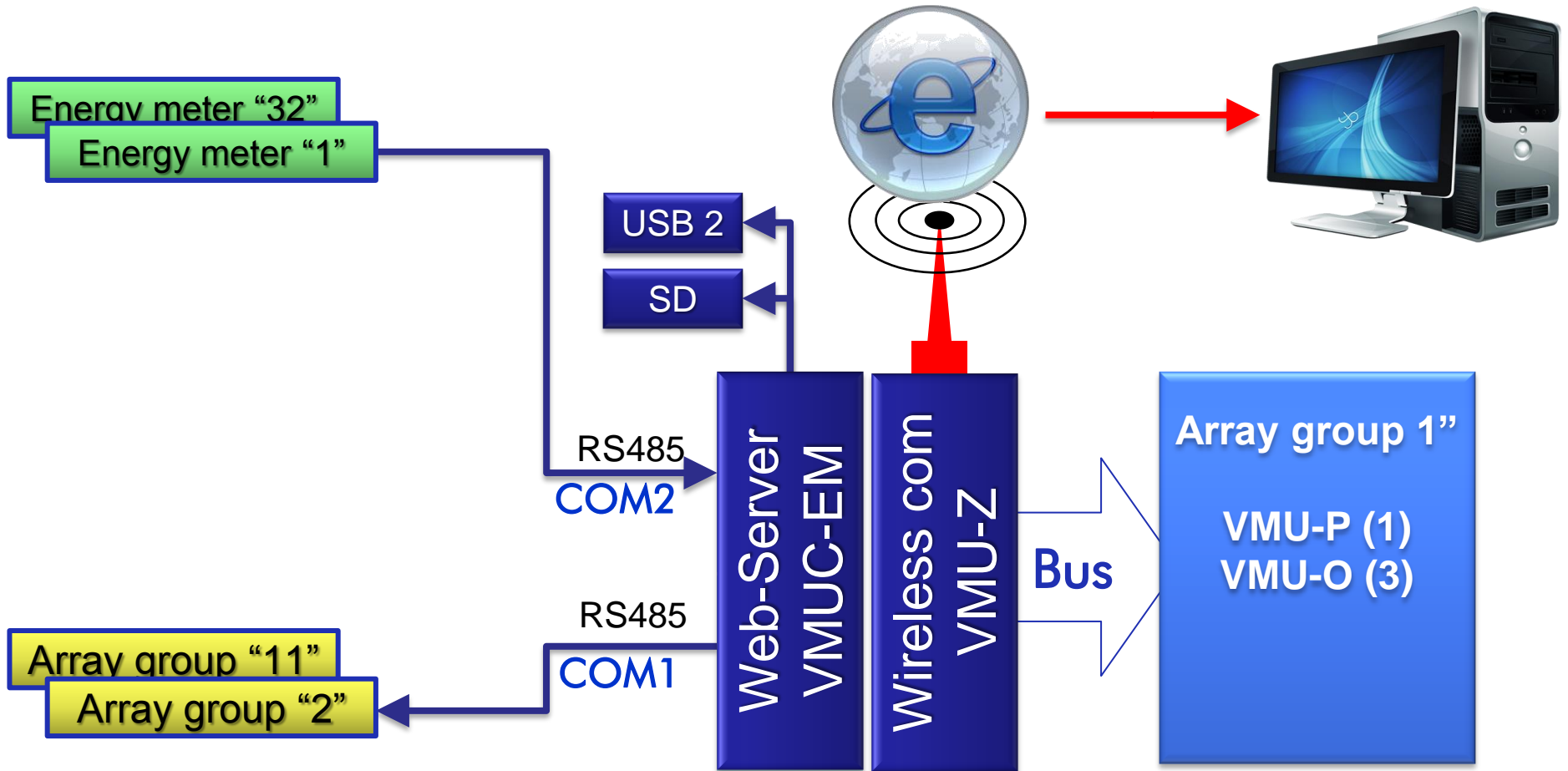


# Example of communication architecture with wireless Internet access and energy meter management only



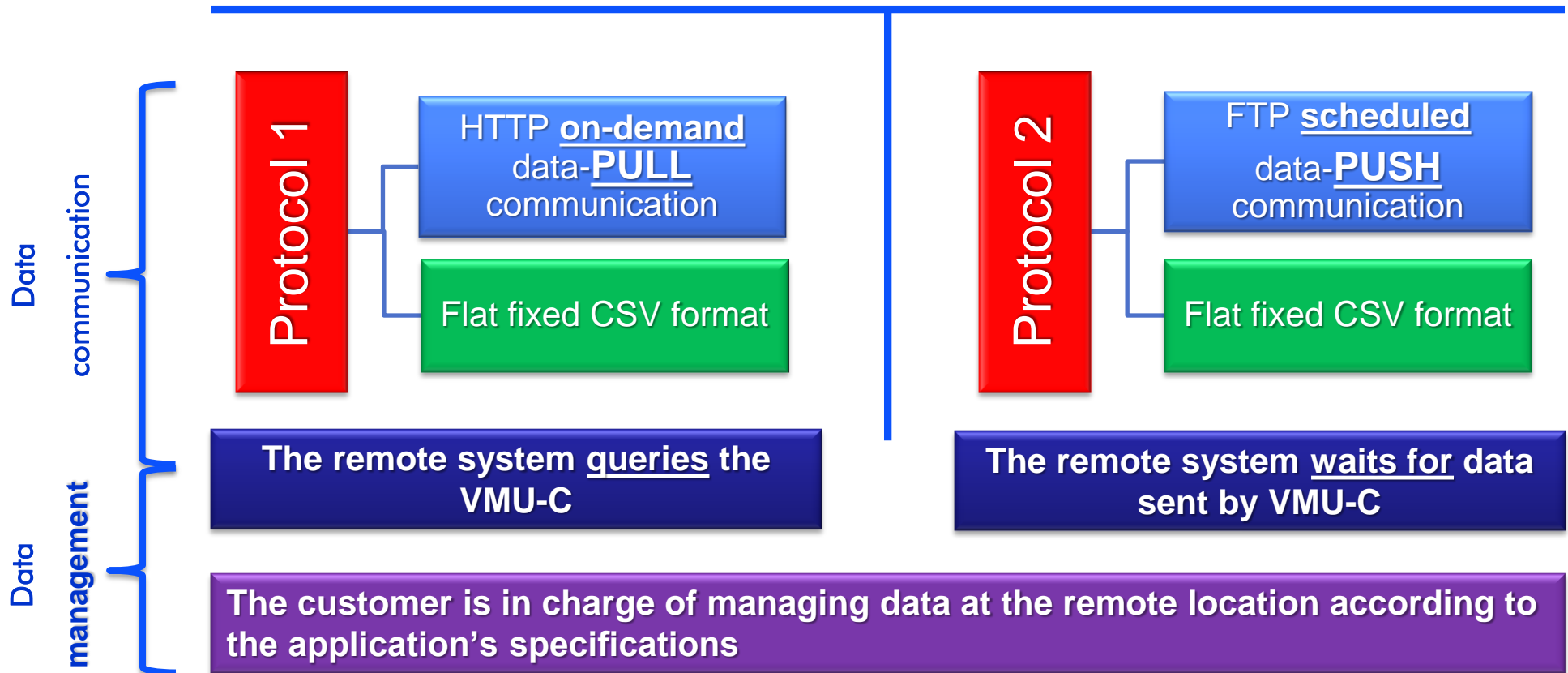


## Example of communication architecture with wireless internal LAN access



## VMUC-EM FTP: 2 M2M open protocols available

“Communication Protocol = communication rules + data format”



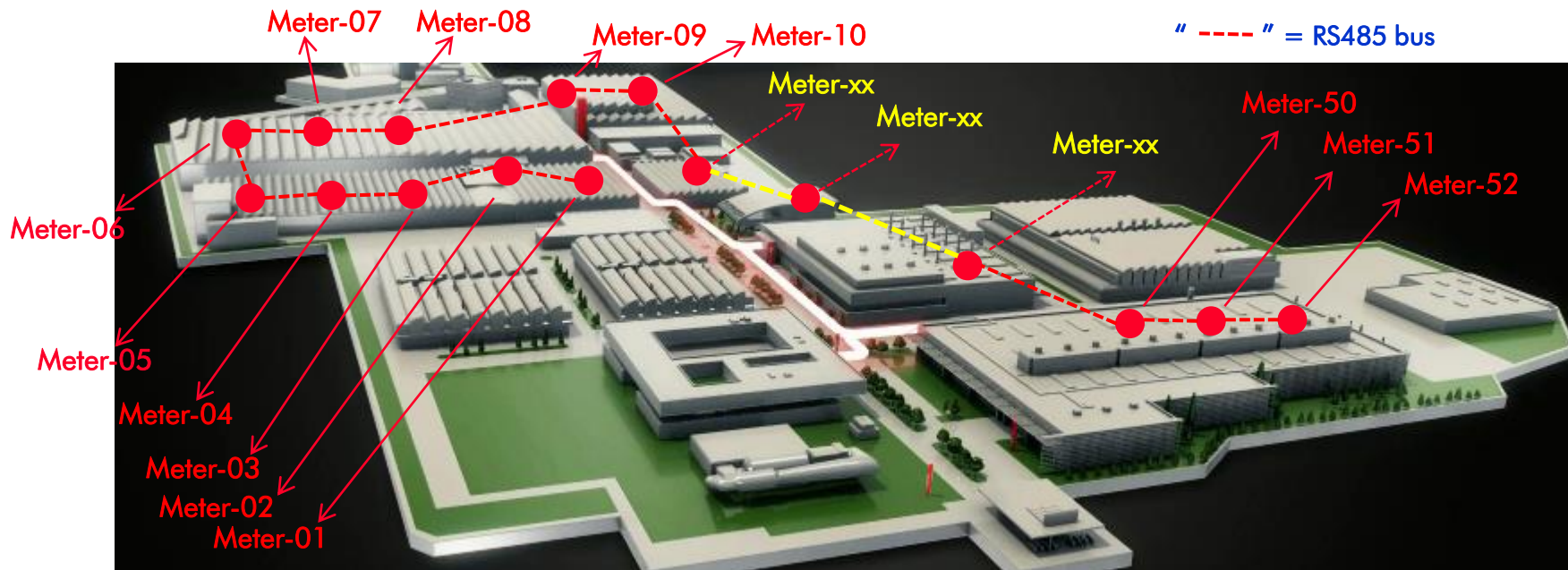
## VMUC-EM FTP: 2 M2M open protocols available

### When and why this type of protocol should be used?

- 1) When the amount of instruments to be monitored is greater than 32 units, two or more VMUC-EM must be used to allow for the proper monitoring of the data.
- 2) When the instruments to be monitored belong to different installations but “below” the same owner.
- 3) When the instruments to be monitored belong to different installations, same owner, but installed in different geographic area

## When and why this type of protocol should be used?

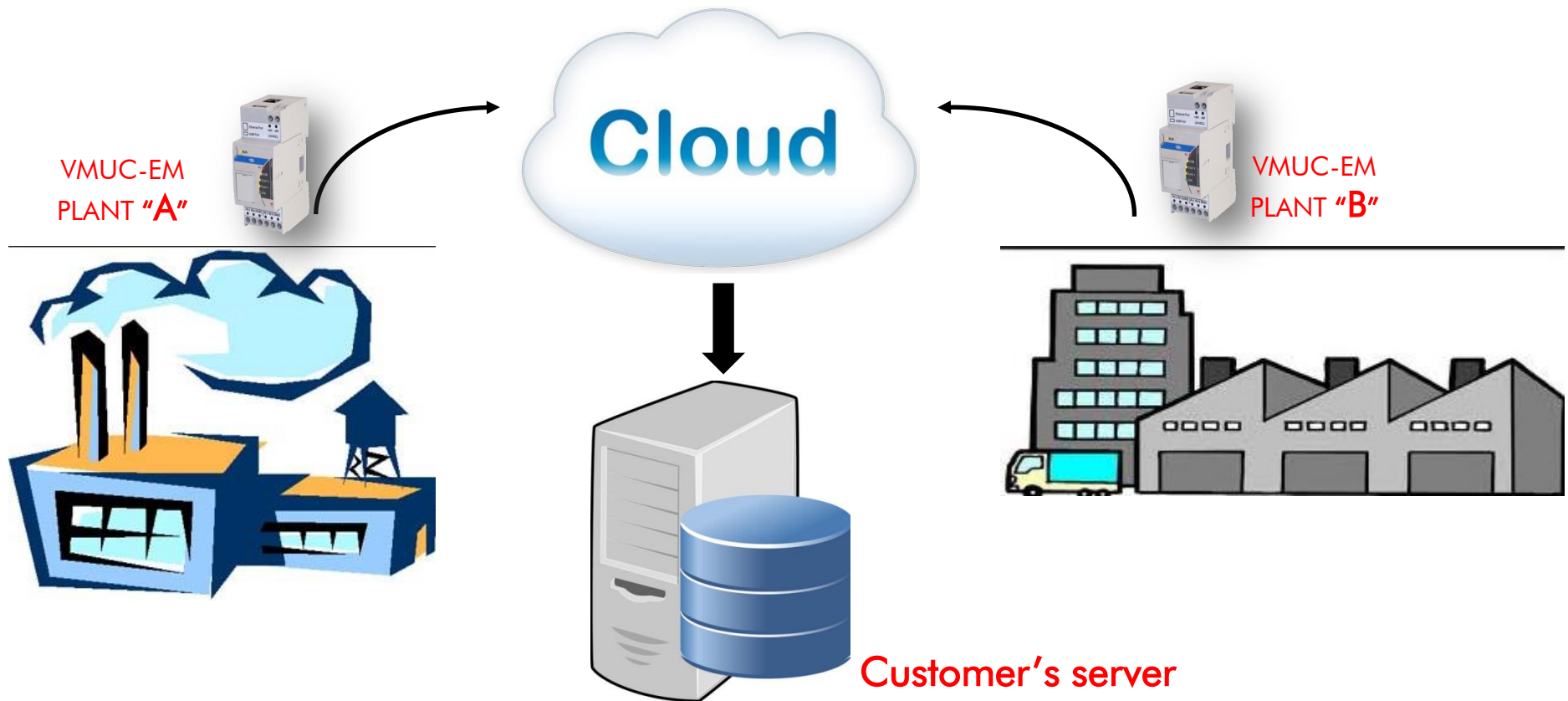
- 1) When the amount of instruments to be monitored is greater than 32 units, one or more VMUC-EM must be added to allow for the proper monitoring of the data.



- In a similar application, even if all the Energy Meters are connected through a RS485 bus, at least n.2 VMUC-EM have to be used.

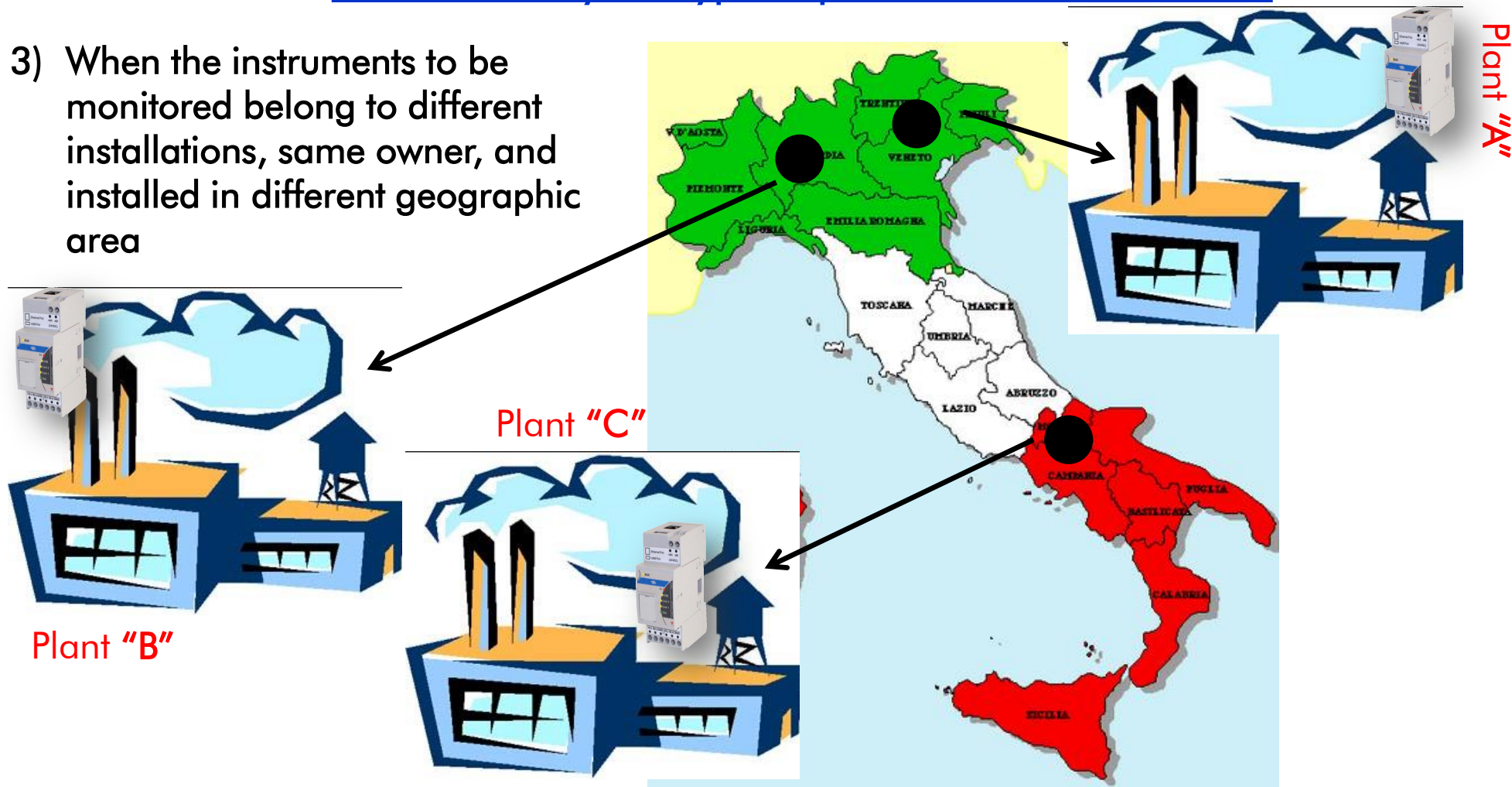
## When and why this type of protocol should be used?

- 2) When the instruments to be monitored belong to different installations but “below” the same owner.



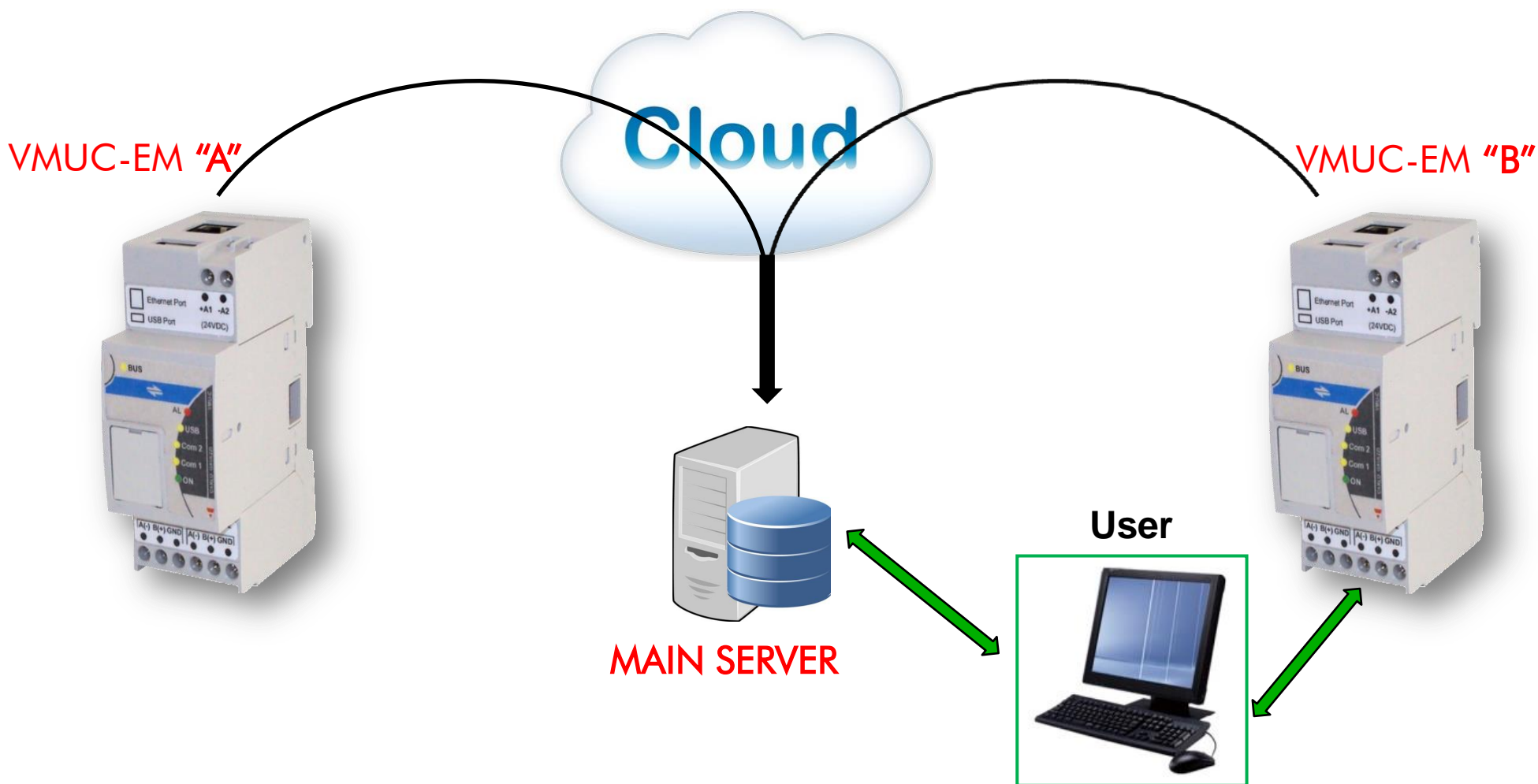
## When and why this type of protocol should be used?

3) When the instruments to be monitored belong to different installations, same owner, and installed in different geographic area



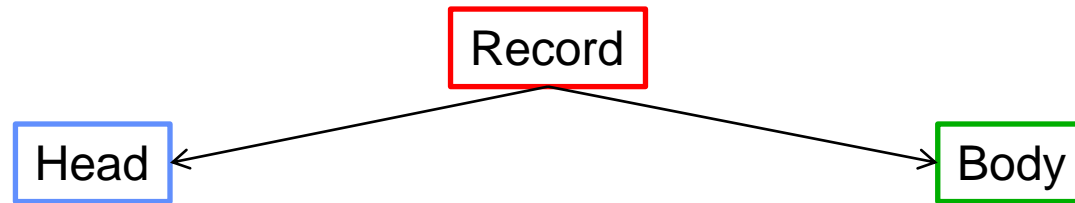


# VMUC-EM FTP: FTP scheduled data-PUSH communication





# VMUC-EM FTP: FTP scheduled data-PUSH communication



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	OK																			
2	AC	EM_VIRTUAL	EM_VIRTUAL				1378127400	2013-09-02T15:10:00+02:00	72421.1	0.0	0.0	224.7	227.1	224.5	389.7	389.4	390.6	390.1	29.3	18.8
3	AC	CPT-DIN_B_AV5_AVIMeter_4_Commerc		4	1378127400	2013-09-02T15:10:00+02:00	116661.0					224.7	227.2	224.5	389.7	389.4	390.7	390.0	5.9	3.8
4	AC	CPT-DIN_B_AV5_AVIMeter_6_Shipment		6	1378127400	2013-09-02T15:10:00+02:00	184009.7					224.8	227.4	224.4	389.9	389.7	390.7	390.3	10.2	4.7
5	AC	CPT-DIN_B_AV5_AVIMeter_8_Production		8	1378127400	2013-09-02T15:10:00+02:00	153775.9					224.7	227.1	224.5	389.7	389.4	390.7	390.1	9.3	7.8
6	AC	CPT-DIN_B_AV5_AVIMeter_10_Office		10	1378127400	2013-09-02T15:10:00+02:00	18574.5					224.5	226.9	224.6	389.5	389.2	390.4	390.0	4.0	2.5
7	AC	EM_VIRTUAL	EM_VIRTUAL				1378127700	2013-09-02T15:15:00+02:00	472422.2	0.0	0.0	224.5	227.1	224.6	389.7	389.7	390.4	389.8	29.7	18.9
8	AC	CPT-DIN_B_AV5_AVIMeter_4_Commerc		4	1378127700	2013-09-02T15:15:00+02:00	116061.2					224.5	227.2	224.6	389.7	389.7	390.5	389.7	5.9	3.8
9	AC	CPT-DIN_B_AV5_AVIMeter_6_Shipment		6	1378127700	2013-09-02T15:15:00+02:00	184010.0					224.6	227.4	224.5	389.9	390.0	390.5	389.9	10.2	4.7
10	AC	CPT-DIN_B_AV5_AVIMeter_8_Production		8	1378127700	2013-09-02T15:15:00+02:00	153776.4					224.5	227.1	224.6	389.7	389.6	390.4	389.7	9.4	7.7

390.3	389.9	4.2	2.7		
390.4	389.8	30.3	19.0		
390.4	389.7	5.9	3.8		
390.4	389.8	10.9	4.7		
VMU-C_BN0250021001H_ALARM_2013-09-02-15-40-02_S.csv	3	File con valori...	02/09/2013 18:31:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_VAR_2013-09-02-15-35-22_S.csv	7.705	File con valori...	02/09/2013 18:26:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_ALARM_2013-09-02-15-10-03_S.csv	3	File con valori...	02/09/2013 18:01:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_VAR_2013-09-02-15-05-23_S.csv	7.707	File con valori...	02/09/2013 17:56:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_ALARM_2013-09-02-14-40-03_S.csv	3	File con valori...	02/09/2013 17:31:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_VAR_2013-09-02-14-35-23_S.csv	7.707	File con valori...	02/09/2013 17:26:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_ALARM_2013-09-02-14-10-03_S.csv	3	File con valori...	02/09/2013 17:01:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_VAR_2013-09-02-14-05-22_S.csv	7.707	File con valori...	02/09/2013 16:56:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_ALARM_2013-09-02-13-40-03_S.csv	3	File con valori...	02/09/2013 16:31:00	-rw-r--r--	ftp ftp
VMU-C_BN0250021001H_VAR_2013-09-02-13-35-23_S.csv	7.705	File con valori...	02/09/2013 16:26:00	-rw-r--r--	ftp ftp

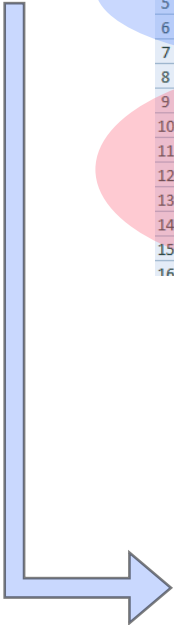
# VMUC-EM FTP: FTP scheduled data-**PUSH** communication

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
1		Model		Name		Serial address	timestamp	Date and time	+ kWh tot	- kWh tot	VLN sys	VLN1	VLN2	VLN3	VLL sys	VL12	VL23	VL31	VL32	
2	OK																			
3	AC	EM_VIRTUAL		EM_VIRTUAL			1371729900	2013-06-20T14:05:00+02:00	465554.2	0.0	0.0	222.5	226.1	223.8	387.6	386.8	389.0	387.7	27.8	
4	AC	CPT-DIN_B_AV5_AV6		CPT_4_CommercialOffice		4	1371729900	2013-06-20T14:05:00+02:00	115420.3			222.5	226.2	223.8	387.5	386.9	389.1	387.6	1.4	
5	AC	CPT-DIN_B_AV5_AV6		CPT_6_Shipment		6	1371729900	2013-06-20T14:05:00+02:00	180343.7			222.6	226.4	223.8	387.7	387.0	389.2	387.8	12.2	
6	AC	CPT-DIN_B_AV5_AV6		CPT_8_Production		8	1371729900	2013-06-20T14:05:00+02:00	151772.3			222.6	226.1	223.8	387.6	386.9	389.2	387.7	9.5	
7	AC	CPT-DIN_B_AV5_AV6		CPT_10_Office		10	1371729900	2013-06-20T14:05:00+02:00	18017.9			222.3	225.9	223.8	387.4	386.5	388.7	387.6	4.7	
8	AC	EM_VIRTUAL		EM_VIRTUAL			1371730200	2013-06-20T14:10:00+02:00	465554.9	0.0	0.0	222.3	225.4	223.2	386.8	386.2	387.9	386.8	26.0	
9	AC	CPT-DIN_B_AV5_AV6		CPT_4_CommercialOffice		4	1371730200	2013-06-20T14:10:00+02:00	115420.3			222.4	225.5	223.1	386.7	386.2	388.0	386.7	1.5	
10	AC	CPT-DIN_B_AV5_AV6		CPT_6_Shipment		6	1371730200	2013-06-20T14:10:00+02:00	180344.0			222.5	225.6	223.1	386.9	386.4	388.0	387.0	10.7	
11	AC	CPT-DIN_B_AV5_AV6		CPT_8_Production		8	1371730200	2013-06-20T14:10:00+02:00	151772.6			222.4	225.4	223.2	386.8	386.2	388.0	386.8	9.4	
12	AC	CPT-DIN_B_AV5_AV6		CPT_10_Office		10	1371730200	2013-06-20T14:10:00+02:00	18018.0			222.1	225.2	223.3	386.6	386.0	387.7	386.9	4.4	
13	AC	EM_VIRTUAL		EM_VIRTUAL			1371730500	2013-06-20T14:15:00+02:00	465555.7	0.0	0.0	222.7	226.1	223.7	387.6	386.7	389.1	387.9	25.4	
14	AC	CPT-DIN_B_AV5_AV6		CPT_4_CommercialOffice		4	1371730500	2013-06-20T14:15:00+02:00	115420.3			222.8	226.2	223.7	387.6	386.7	389.1	387.9	1.4	
15	AC	CPT-DIN_B_AV5_AV6		CPT_6_Shipment		6	1371730500	2013-06-20T14:15:00+02:00	180344.2			222.8	226.3	223.7	387.8	386.9	389.1	388.0	10.4	
16	AC	CPT-DIN B AV5 AV6		CPT 8 Production		8	1371730500	2013-06-20T14:15:00+02:00	151773.0			222.8	226.1	223.8	387.7	386.7	389.1	387.9	9.2	

# VMUC-EM FTP: FTP scheduled data-PUSH communication

VMU-C\_BN1090002001H\_VAR\_2013-09-16-11-25-22\_S.csv 16/09/2013 11:26 File con valori sep... 3 KB

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	OK																		
2	AC	EM24_AV5		EM24_DEMO	2	2	1379329200	2013-09-16T11:00:00+00:00	472558.9	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	4000.0	400.0
3	AC	EM24_AV5		EM24_DEMO	2	2	1379329500	2013-09-16T11:05:00+00:00	472789.0	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	4000.0	400.0
4	AC	EM24_AV5		EM24_DEMO	2	2	1379329800	2013-09-16T11:10:00+00:00	473019.3	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	4000.0	400.0
5	AC	EM24_AV5		EM24_DEMO	2	2	1379330100	2013-09-16T11:15:00+00:00	473249.4	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	4000.0	400.0
6	AC	EM24_AV5		EM24_DEMO	2	2	1379330400	2013-09-16T11:20:00+00:00	473479.1	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	4000.0	400.0
7	AC	EM24_AV5		EM24_DEMO	2	2	1379330700	2013-09-16T11:25:00+00:00	473709.0	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	4000.0	400.0
8	EN	VMU-P		VMU-M_001[.1]	1	1	1379329200	2013-09-16T11:00:00+00:00	27.2	32765.0	32.4	0.0							
9	EN	VMU-P		VMU-C_EM[.1]			1379329200	2013-09-16T11:00:00+00:00	111.1	32766.0	30.26	0.0							
10	EN	VMU-P		VMU-M_001[.1]	1	1	1379329500	2013-09-16T11:05:00+00:00	27.2	32765.0	32.4	0.0							
11	EN	VMU-P		VMU-C_EM[.1]			1379329500	2013-09-16T11:05:00+00:00	111.1	32766.0	44.74	0.0							
12	EN	VMU-P		VMU-M_001[.1]	1	1	1379329800	2013-09-16T11:10:00+00:00	27.2	32765.0	32.4	0.0							
13	EN	VMU-P		VMU-C_EM[.1]			1379329800	2013-09-16T11:10:00+00:00	111.1	32766.0	29.3	0.0							
14	EN	VMU-P		VMU-M_001[.1]	1	1	1379330100	2013-09-16T11:15:00+00:00	27.1	32765.0	32.4	0.0							
15	EN	VMU-P		VMU-C_EM[.1]			1379330100	2013-09-16T11:15:00+00:00	111.1	32766.0	9.28	0.0							
16	EN	VMU-P		VMU-M_001[.1]	1	1	1379330400	2013-09-16T11:20:00+00:00	27.1	32765.0	32.4	0.0							



Data from environmental units (VMUP-EM)

Data from Energy Meters (Emxx or WMxx)

# VMUC-EM FTP: FTP scheduled data-PUSH communication

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	OK																
2																	
3		<b>Model</b>	<b>Name</b>	<b>Serial address</b>	<b>timestamp</b>	<b>Date and time</b>	<b>+ kWh tot</b>	<b>- kWh tot</b>	<b>VLN sys</b>	<b>VLN1</b>	<b>VLN2</b>	<b>VLN3</b>	<b>VLL sys</b>	<b>VL12</b>	<b>VL23</b>		
4																	
5	AC	EM24_AV5	EM24_DEMO	2	2	1379323800	2013-09-16T09:30:00+00:00	468419.6	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	
6	AC	EM24_AV5	EM24_DEMO	2	2	1379324100	2013-09-16T09:35:00+00:00	468648.7	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	
7	AC	EM24_AV5	EM24_DEMO	2	2	1379324400	2013-09-16T09:40:00+00:00	468879.0	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	
8	AC	EM24_AV5	EM24_DEMO	2	2	1379324700	2013-09-16T09:45:00+00:00	469109.5	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	
9	AC	EM24_AV5	EM24_DEMO	2	2	1379325000	2013-09-16T09:50:00+00:00	469339.2	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	
10	AC	EM24_AV5	EM24_DEMO	2	2	1379325300	2013-09-16T09:55:00+00:00	469568.9	0.0	2300.0	2300.0	2300.0	2300.0	4000.0	4000.0	4000.0	
11																	
12																	
13		<b>Model</b>	<b>Name</b>	<b>Serial address</b>	<b>timestamp</b>	<b>Date and time</b>	<b>Temp. Ch1</b>	<b>Temp. Ch2</b>	<b>Analogue input</b>	<b>Pulse rate input</b>							
14																	
15	EN	VMU-P	VMU-M_001[.1]	1	1	1379323800	2013-09-16T09:30:00+00:00	25.9	32765.0	32.2	0.0						
16	EN	VMU-P	VMU-C_EM[.1]			1379323800	2013-09-16T09:30:00+00:00	111.1	32766.0	31.09	0.0						
17	EN	VMU-P	VMU-M_001[.1]	1	1	1379324100	2013-09-16T09:35:00+00:00	26.1	32765.0	32.2	0.0						
18	EN	VMU-P	VMU-C_EM[.1]			1379324100	2013-09-16T09:35:00+00:00	111.1	32766.0	11.13	0.0						
19	EN	VMU-P	VMU-M_001[.1]	1	1	1379324400	2013-09-16T09:40:00+00:00	26.2	32765.0	32.2	0.0						
20	EN	VMU-P	VMU-C_EM[.1]			1379324400	2013-09-16T09:40:00+00:00	111.1	32766.0	8.92	0.0						
21	EN	VMU-P	VMU-M_001[.1]	1	1	1379324700	2013-09-16T09:45:00+00:00	26.2	32765.0	32.2	0.0						
22	EN	VMU-P	VMU-C_EM[.1]			1379324700	2013-09-16T09:45:00+00:00	111.1	32766.0	28.88	0.0						
23	EN	VMU-P	VMU-M_001[.1]	1	1	1379325000	2013-09-16T09:50:00+00:00	26.3	32765.0	32.2	0.0						

Data from environmental units (VMUP-EM)

Data from Energy Meters (Emxx or WMxx)

# VMUC-EM FTP: FTP scheduled data-PUSH communication

<http://www.epochconverter.com/>



## Epoch & Unix Timestamp Conversion Tools

The current Unix epoch time is **1379326750**

Convert epoch to human readable date and vice versa

Timestamp to Human date



[batch convert timestamps to human dates]

Mon

Day

Yr 

Hr

Min

Sec

/

/

:

:

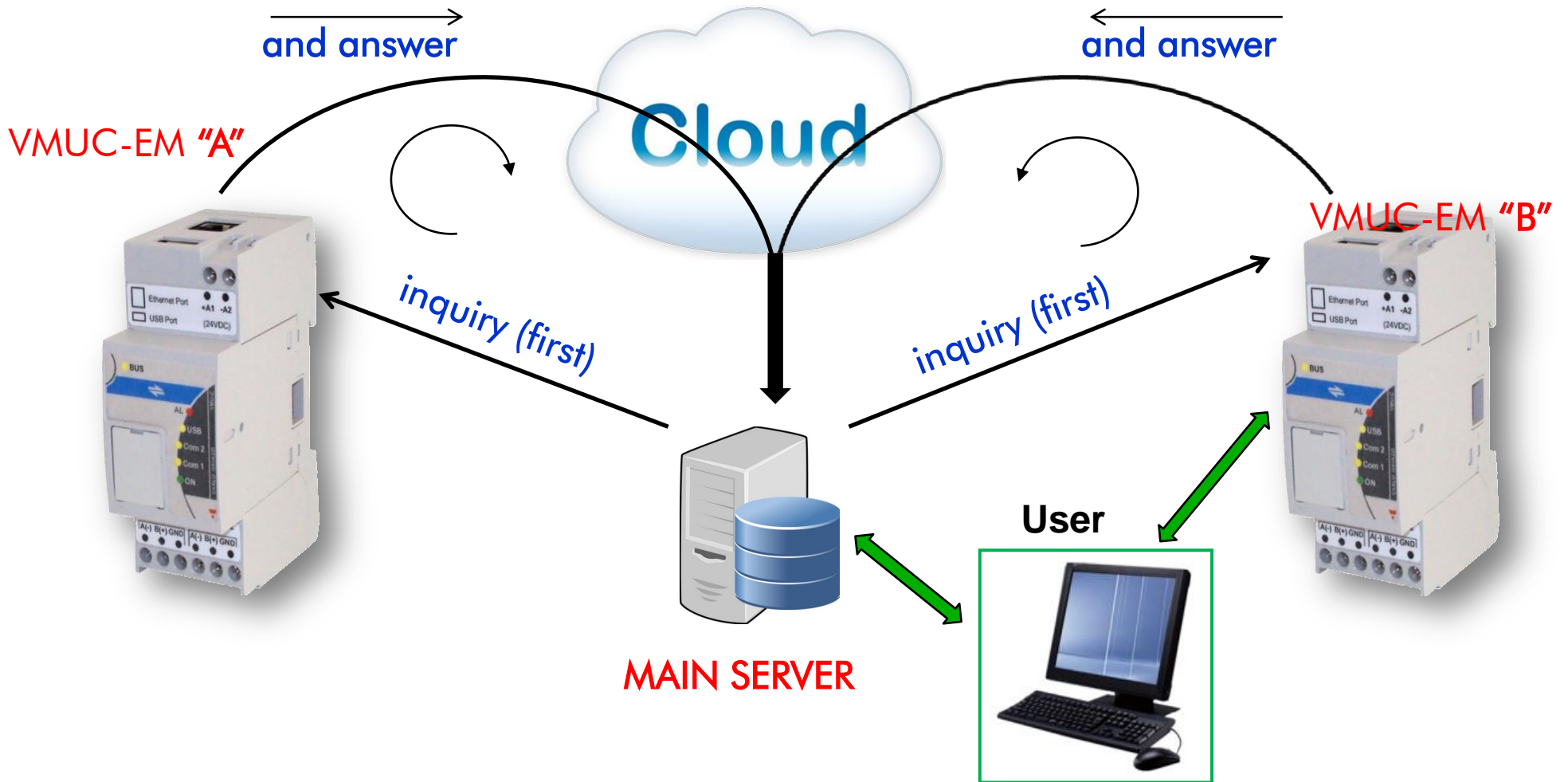
GMT



Human date to Timestamp



# VMUC-EM FTP: HTTP on-demand data-PULL communication

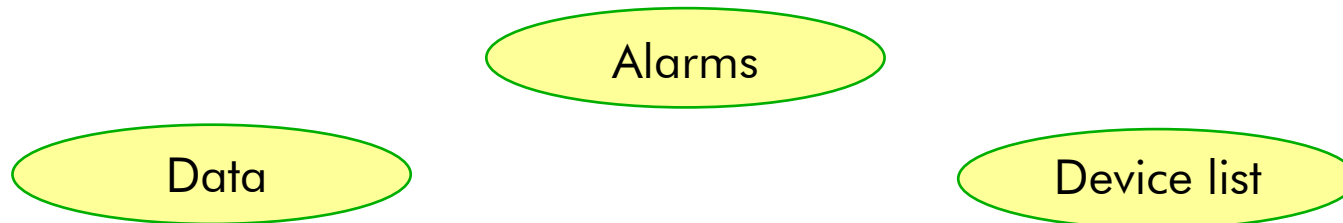


## VMUC-EM FTP: HTTP on-demand data-PULL communication

All the information can be obtained by means of HTTP requests, structured as follows:

[http://myVMUC.mydomain.com/special\\_page?command&user@password&parameter1&...parameterN](http://myVMUC.mydomain.com/special_page?command&user@password&parameter1&...parameterN)

Also in this case, three different types of information are available:





## VMUC-EM FTP: FTP on-demand data-PULL communication

Example: structure of query to obtain the device list:

```
← → ↻ www.carlogavazzi-vmuc.com/receiverftp.php?HTML_DEV_QRY&client@client
OK
DEVICE_LIST;1378211585;2013-09-03T14:33:05+02:00;;;VMU-M;;;VMUC-EM;.....
DEVICE_LIST;1378211585;2013-09-03T14:33:05+02:00;AC;;;EM;;2;4;Meter_4_CommercialOffice;CARLO GAVAZZI;CPT-DIN_B_AV5_AV6;.....
DEVICE_LIST;1378211585;2013-09-03T14:33:05+02:00;AC;;;EM;;2;6;Meter_6_Shipment;CARLO GAVAZZI;CPT-DIN_B_AV5_AV6;.....
DEVICE_LIST;1378211585;2013-09-03T14:33:05+02:00;AC;;;EM;;2;8;Meter_8_Production;CARLO GAVAZZI;CPT-DIN_B_AV5_AV6;.....
DEVICE_LIST;1378211585;2013-09-03T14:33:05+02:00;AC;;;EM;;2;10;Meter_10_Office;CARLO GAVAZZI;CPT-DIN_B_AV5_AV6;.....
DEVICE_LIST;1378211585;2013-09-03T14:33:05+02:00;AC;;;EM;;2;0;New_Instrument;.....
DEVICE_LIST;1378211585;2013-09-03T14:33:05+02:00;AC;;;EM;;;EM_VIRTUAL;.....
```

Note: any software capable of managing HTTP request/response processes could be used to remotely pull VMU-C data (example of freely available software packages are WGET and CURL).

Data are then processed according to the application needs by means of the user's software.



# VMUC-EM FTP: HTTP on-demand data-PULL communication

Example: structure of query to obtain the DATA list:

```
← → ↻ www.carlogavazzi-vmuc.com/receiverftp.php?HTML_VAR_QRY&client@client&1377660000&1377675472&AC&ALL  
OK  
AC;EM;;EM_VIRTUAL;;;1377660000;2013-08-28T05:20:00+02:00;471805.7;0.0;229.7;230.5;230.3;398.0;397.8;399.0;398.3;5.9;0.0;1.2;1.5;1.3;0.0;0.2;  
AC;CPT-DIN_B_AV5_AV6;;Meter_4_CommercialOffice;;4;1377660000;2013-08-28T05:20:00+02:00;115959.6;;229.8;230.5;230.3;398.0;397.9;399.0;398.2;0.0;0.0;0.0;0.0;0.0;0.0;  
AC;CPT-DIN_B_AV5_AV6;;Meter_6_Shipment;;6;1377660000;2013-08-28T05:20:00+02:00;183730.1;;229.9;230.9;230.2;398.1;398.1;399.0;398.5;5.9;0.0;1.2;1.5;1.3;0.0;0.2;  
AC;CPT-DIN_B_AV5_AV6;;Meter_8_Production;;8;1377660000;2013-08-28T05:20:00+02:00;153585.8;;229.8;230.4;230.3;398.0;397.8;399.0;398.3;0.0;0.0;0.0;0.0;0.0;0.0;  
AC;CPT-DIN_B_AV5_AV6;;Meter_10_Office;;10;1377660000;2013-08-28T05:20:00+02:00;18530.2;;229.5;230.2;230.4;397.8;397.6;398.8;398.3;0.0;0.0;0.0;0.0;0.0;0.0;  
AC;CPT-DIN_B_AV5_AV6;;EM_VIRTUAL;;;1377660300;2013-08-28T05:25:00+02:00;471805.8;0.0;230.2;230.8;230.5;398.4;398.4;399.4;398.9;5.3;0.0;1.2;1.3;1.1;0.0;0.2;  
AC;CPT-DIN_B_AV5_AV6;;Meter_4_CommercialOffice;;4;1377660300;2013-08-28T05:25:00+02:00;115959.6;;230.3;230.8;230.5;398.5;398.4;399.4;398.7;0.0;0.0;0.0;0.0;0.0;0.0;  
AC;CPT-DIN_B_AV5_AV6;;Meter_6_Shipment;;6;1377660300;2013-08-28T05:25:00+02:00;183730.2;;230.3;231.2;230.5;398.6;398.6;399.5;399.1;5.3;0.0;1.2;1.3;1.1;0.0;0.2;  
AC;CPT-DIN_B_AV5_AV6;;Meter_8_Production;;8;1377660300;2013-08-28T05:25:00+02:00;153585.8;;230.3;230.7;230.5;398.4;398.4;399.4;398.9;0.0;0.0;0.0;0.0;0.0;0.0;  
AC;CPT-DIN_B_AV5_AV6;;Meter_10_Office;;10;1377660300;2013-08-28T05:25:00+02:00;18530.2;;230.0;230.5;230.6;398.3;398.2;399.2;399.0;0.0;0.0;0.0;0.0;0.0;0.0;
```

Example: structure of query to obtain the ALARM list:

```
← → ↻ www.carlogavazzi-vmuc.com/receiverftp.php?HTML_ALARM_QRY&client@client&1377590000&1377675472&A  
OK  
ALARM;EM;;Meter_8_Production;1377581139;2013-08-27T07:25:39+02:00;C;kWsys > 0.50 kW;1377619461;2013-08-27T18:04:21+02:00;  
ALARM;EM;;Meter_8_Production;1377667617;2013-08-28T07:26:57+02:00;C;kWsys > 0.50 kW;1377705928;2013-08-28T18:05:28+02:00;
```

## VMUC-EM WebSERVER solution

**Customer issue:** In a small industry, there is the need to allocate the cost of each single production machine. This is important both to keep consumptions under control and to split in the proper way the cost of the energy in each product.

**Our Solution:** A complete monitoring system can be easily carried out by installing energy meters or power analysers to each single machine cabinet and connecting them to VMU-C EM via RS485. A second serial line in VMU-C EM is connecting various VMU series I/O modules, which allows gathering temperature, flow, any scalable analogue variable information, plus digital input status.

**Benefits:** The architecture of the monitoring system is extremely simple and compact: in addition to the meters, just a 2-DIN module VMU-C EM and the I/O modules are to be installed. The VMU-C EM acts at the same time as a polling device, a datalogger, web-server for data analysis, a gateway for Internet data availability, and it can also send scheduled emails with, for example, monthly data from each measurement point, or specific alarm email in case any.

If this system is used to monitor a remote installation, e.g. an aqueduct pump station, where the wired Internet is not available, a VMU-W modem can be simply added to the system, granting wireless Internet connectivity for all the VMU-C EM functions.

## Relevant applications



## VMUC-EM WebSERVER solution

**Customer issue:** in all the sub-metering applications involving re-billing of energy costs (e.g. single apartments in a residential building or shops within a mall), it is required to have revenue approved meters (MID) in each single flat switch gear.

While the official value to be charged is the meter one, it is also necessary a device to centralize all the information both for statistic and control purposes.

**Our Solution:** The load to be monitored (apartment or shop consumption) are measured by a MID energy meters connected in a RS485 network to a VMU-C EM master.

The VMU-C EM is a web-server based solution that allows collecting, displaying and analysing all the consumptions information from the field, in any PC connected to the Internet, in the same location of the meters or remotely by a standard browser.

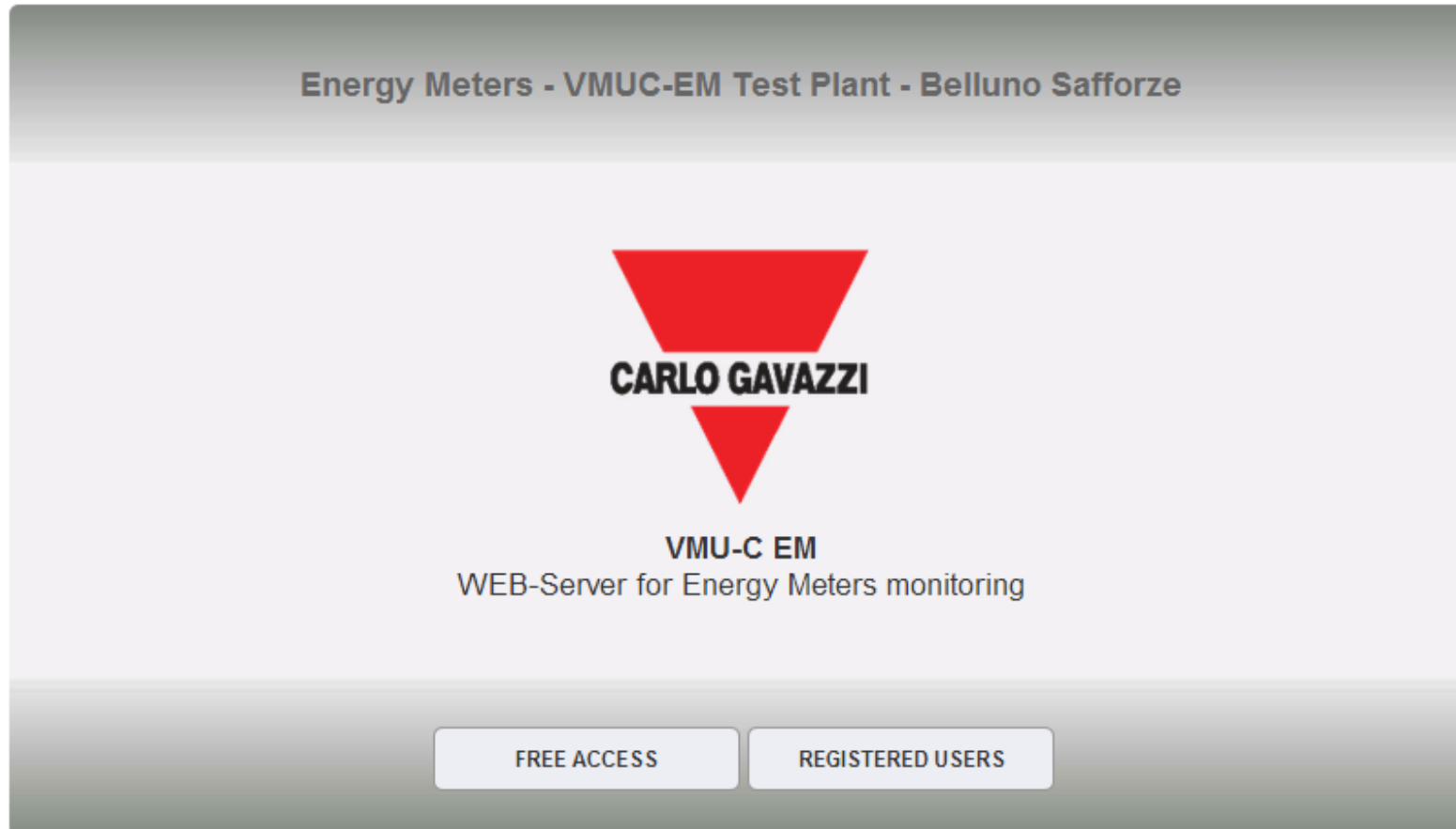
**Benefits:** The architecture of the monitoring system is extremely simple and compact: in addition to the meters, just a 2-DIN module VMU-C EM is to be installed.

In case the metering points are to be controlled by customer's own SCADA solution, VMU-C EM can easily push all the collected data directly into the database from which the SCADA is taking any info.

## Relevant applications



Online Web Server (VMUC-EM): [www.carlogavazzi-vmuc.com](http://www.carlogavazzi-vmuc.com)



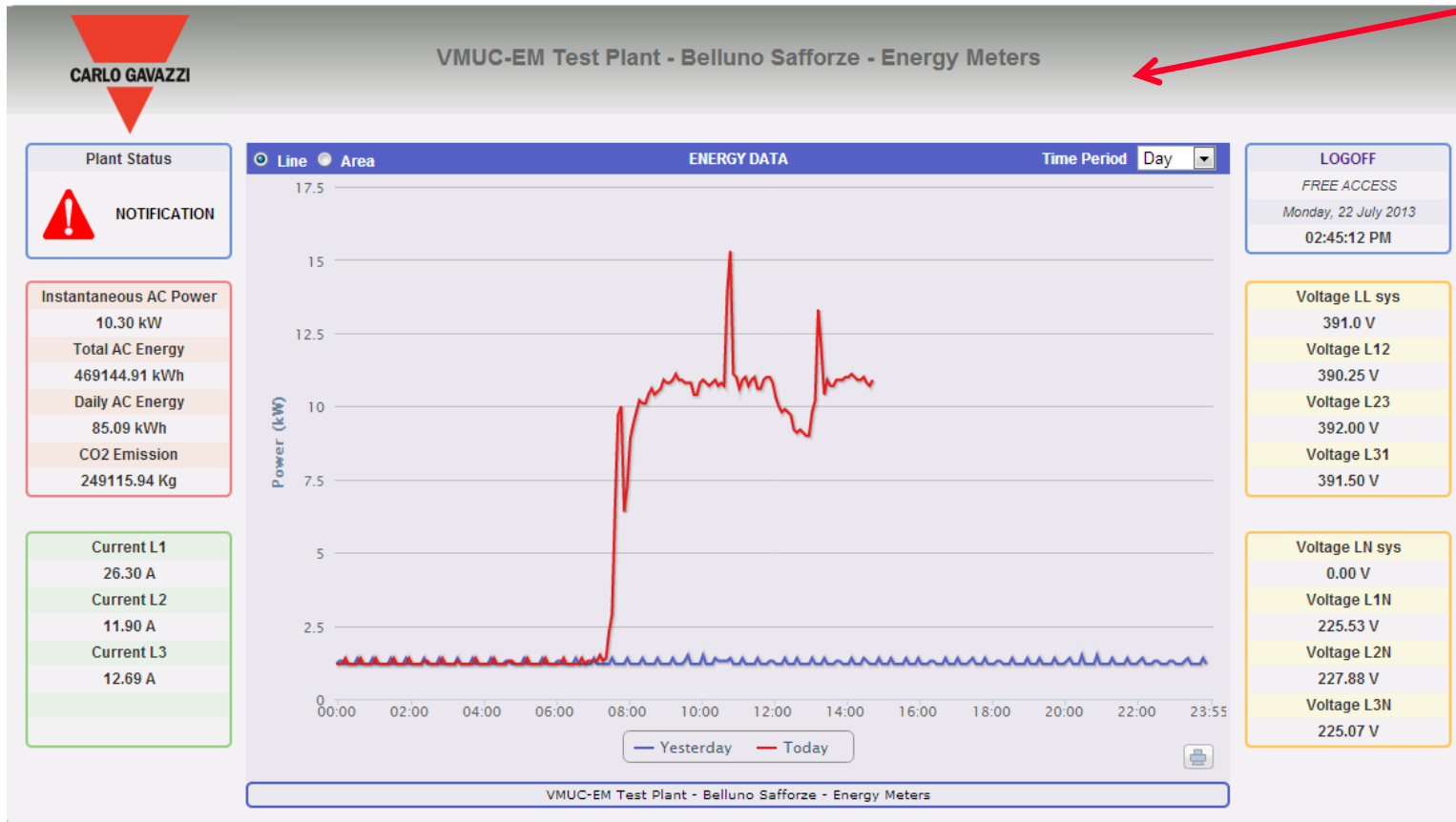
Username: user

Password: user

Online Web Server (VMUC-EM): [Free access](#) (

FREE ACCESS

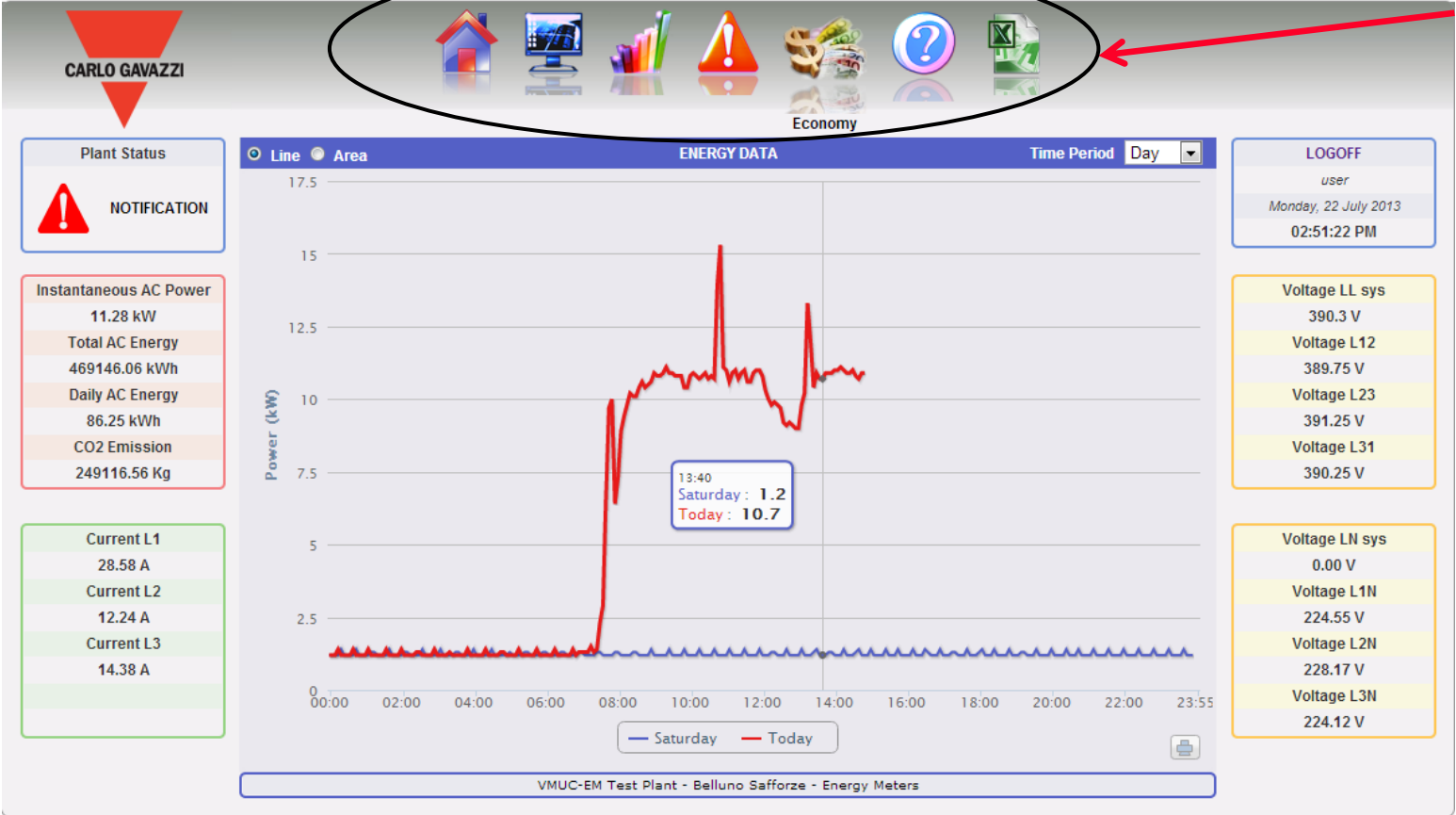
No surfing icons available



# Online Web Server (WMUC-EM): User access (

REGISTERED USERS

With surfing icons available but without "Setup" icon

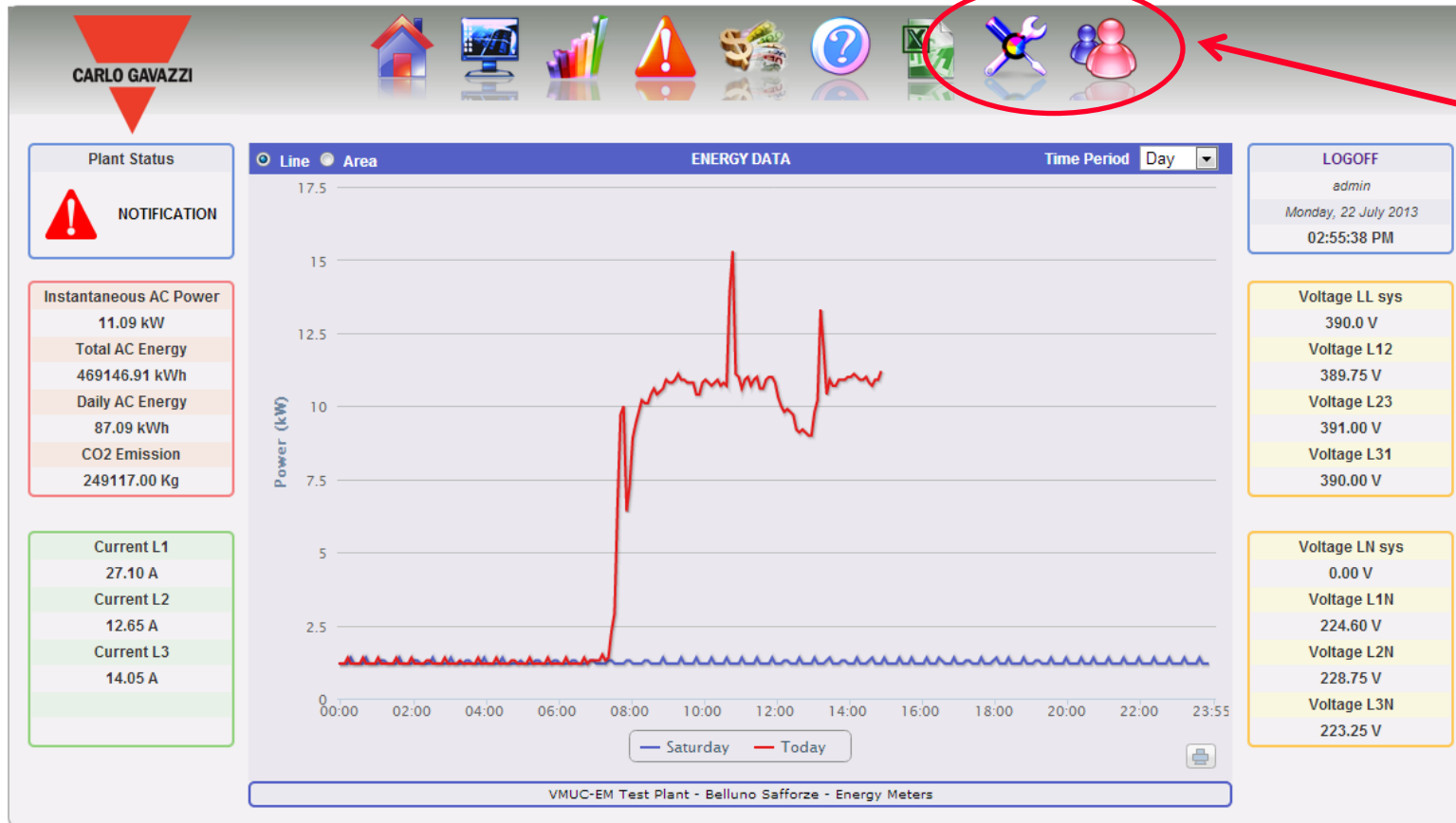




# Online Web Server (VMUC-EM): Administrator access (

REGISTERED USERS

With surfing icons available and with "Setup" and "Account" icons



Home page:



Present working day against the previous working day

(or present non-working day against the previous non-working day)

CARLO GAVAZZI

Plant Status

NOTIFICATION

Instantaneous AC Power  
11.09 kW  
Total AC Energy  
469146.91 kWh  
Daily AC Energy  
87.09 kWh  
CO2 Emission  
249117.00 Kg

Current L1  
27.10 A  
Current L2  
12.65 A  
Current L3  
14.05 A

ENERGY DATA

Time Period Day

LOGOFF  
admin  
Monday, 25 July 2013  
02:53:38 PM

Voltage LL sys  
390.0 V  
Voltage L12  
389.75 V

Power (kW)

17.5  
15  
12.5  
10  
7.5  
5  
2.5  
0

00:00 02:00 04:00 06:00 08:00 10:00 12:00 14:00 16:00 18:00 20:00 22:00

— Saturday — Today

VMUC-EM Test Plant - Belluno Safforze - Energy Meters

ENERGY DATA

Time Period Week

Power (kW)

8  
7  
6  
5  
4  
3  
2  
1  
0

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

Monday  
Last Week: 5.82  
Current Week: 5.18

— Last Week — Current Week

Holidays

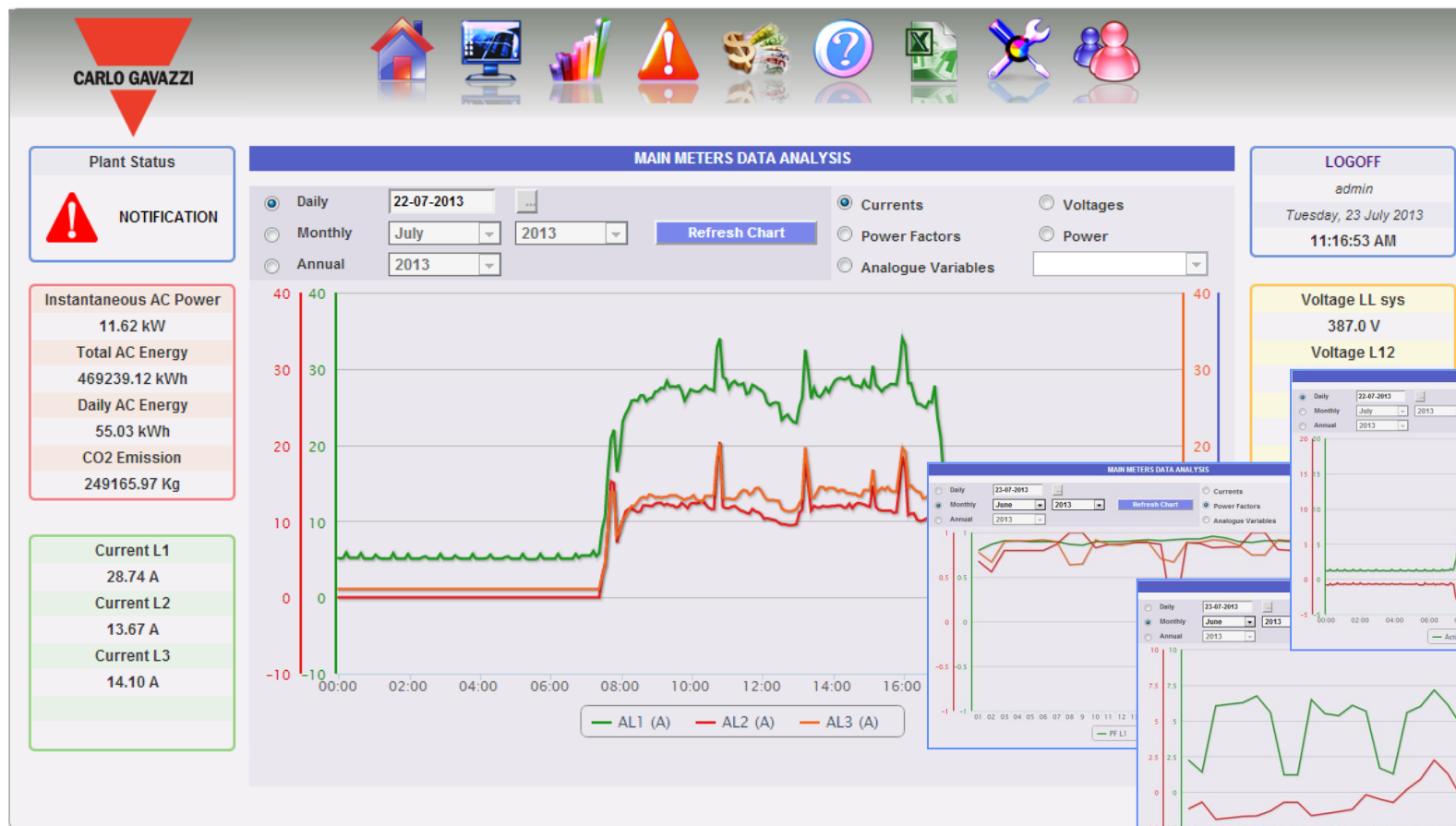
Mon  Tue  Wen  Thu  Fri  Sat  Sun



Monitor page:



Daily / Monthly / Annual trends of the main variables of the main meter:



- Current
- PowerFactor
- Voltage
- Power
- +
- Analogue variables

# Plant pages:



- Available pages:
  - Energy data (1)
  - Counters (2)
  - Real-time variables (3)
  - Other variables (4)

Plant Status

NOTIFICATION

Instantaneous AC Power  
11.45 kW

Total AC Energy  
469247.62 kWh

Daily AC Energy  
63.53 kWh

CO2 Emission  
249170.48 Kg

Current L1  
27.56 A

Current L2  
13.59 A

Current L3  
13.05 A

ENERGY DATA
COUNTERS
REALTIME VARIABLES
OTHER VARIABLES

Daily  Monthly  Annual  
 22-07-2013 July 2013 2013

Power  Energy

Refresh Chart

Energy Meter Name: All

ENERGY METERS

LOGOFF

Energy Meter Name	Refresh Time	System	L1 (A)	L2 (B)	L3 (C)
EM_VIRTUAL	10 s	11.00	5.56	2.74	2.00
Realtime Readings					
Active Power (kW)		-1.27	-1.19	-0.59	0.92
Reactive Power (kvar)		12.08	6.20	3.10	2.81
Power Factor		0.91	0.90	0.89	0.92
Frequency (Hz)		49.9			
Current (A)		27.45	13.40	12.00	
Phase-phase Voltage (V)		391.75	390.00	393.75	392.00
Phase-to-neutral Voltage (V)		0.00	224.02	229.80	229.08
Imported (Exported) Active Energy		495243.6			
Imported (Exported) Reactive Energy		280412.6			
THD Current (%)		0.00	0.00	0.00	
THD Voltage (%)		0.00	0.00	0.00	

Energy Meter Name	Refresh Time	System	L1 (A)	L2 (B)	L3 (C)
EM_VIRTUAL	10 s	11.00	5.56	2.74	2.00
Realtime Readings					
Active Power (kW)		-1.27	-1.19	-0.59	0.92
Reactive Power (kvar)		12.08	6.20	3.10	2.81
Power Factor		0.91	0.90	0.89	0.92
Frequency (Hz)		49.9			
Current (A)		27.45	13.40	12.00	
Phase-phase Voltage (V)		391.75	390.00	393.75	392.00
Phase-to-neutral Voltage (V)		0.00	224.02	229.80	229.08
Imported (Exported) Active Energy		495243.6			
Imported (Exported) Reactive Energy		280412.6			
THD Current (%)		0.00	0.00	0.00	
THD Voltage (%)		0.00	0.00	0.00	

IN TEMPO REALE

23-07-2013

ALTRE VARIABILI

2013

# Alarm and Command pages:



## Alarms

**Plant**

**Plant Status**

**NOTIFICATION**

---

**Instantaneous AC Power**

3.51 kW

**Total AC Energy**

9600.20 kWh

**Daily AC Energy**

10.90 kWh

---

**Saved CO2 Emissions**

5097.71 kg

**Saved Trees**

662.70

**Saved Oil**

2092.30 L

**PLANT ALARMS**

Alarms
 Anomalies
 Events
 Commands
Delete
Commands
View only open Alarms 
Show All 
Hide All

ID	Message	Description	Module	Start Date	Start Time	End Date	End Time	Zone	Hide
1016	VMU-P Temperature channel 2	VMU-C	VMU-P mV	23-01-2013	12:25:47 PM			Amorphous	<input type="checkbox"/>
1015	VMU-S or VMU-S30 Current	VMU-C	VMU-S	23-01-2013	10:35:35 AM	23-01-2013	10:40:13 AM	Amorphous	<input type="checkbox"/>
1014	VMU-S or VMU-S30 Current	VMU-C	VMU-S	22-01-2013	02:37:29 PM	23-01-2013	10:01:11 AM	Amorphous	<input type="checkbox"/>
989	Power On	VMU-C	VMU-C	16-01-2013	03:48:52 PM			Amorphous	<input type="checkbox"/>
988	Power Off	VMU-C	VMU-C	16-01-2013	03:48:13 PM			Amorphous	<input type="checkbox"/>
985	Power On	VMU-M_3	VMU-M	16-01-2013	03:48:19 PM			Monocrystalline	<input type="checkbox"/>
984	Power On	VMU-M_2	VMU-M	16-01-2013	03:48:20 PM			Polycrystalline	<input type="checkbox"/>
982	Power Off	VMU-M_3	VMU-M	16-01-2013	03:48:15 PM			Monocrystalline	<input type="checkbox"/>
981	Power Off	VMU-M_2	VMU-M	16-01-2013	03:48:15 PM			Polycrystalline	<input type="checkbox"/>
709	Power On	VMU-C	VMU-C	28-11-2012	07:19:08 PM			Amorphous	<input type="checkbox"/>

⏪ ⏩ 1 OF 3 ⏪ ⏩

**LOGOFF**

admin

Wednesday, 23 January 2013

01:45:08 PM

---

**Policrystallin (W/m<sup>2</sup>)**

421.0

**Air Amorfo (°C)**

11.40

**Wind (m/s)**

1.10

---

**Feed-in Tariff**

2188.85 €

**Total savings on bill**

1440.03 €

**Daily FIT**

2.49 €

## Commands

**Plant Status**

**NOTIFICATION**

---

**Instantaneous AC Power**

0.00 kW

**Total AC Energy**

0.00 kWh

**Daily AC Energy**

0.00 kWh

---

**Saved CO2 Emissions**

0.00 kg

**Saved Trees**

0.00

**Saved Oil**

0.00 L

**PLANT SE**

All Outputs Test

External light	ON	OFF
Main gate opening	ON	OFF
Washing system	ON	OFF
Manual alarm activation	ON	OFF
	ON	OFF
	ON	OFF
	ON	OFF
	ON	OFF
	ON	OFF

**Total Solid Energy**

0.00 €

**Daily FIT**

0.00 €

# Economy page:



- Available information:
  - Total (€)
  - Consumed kWh / kvarh (€)
  - Fee due to the overload (€)

Plant Status

! NOTIFICATION

Instantaneous AC Power  
10.59 kW

Total AC Energy  
469250.62 kWh

Daily AC Energy  
66.53 kWh

CO2 Emission  
249172.08 Kg

Current L1  
25.94 A

Current L2  
13.02 A

Current L3  
12.15 A

### ECONOMIC ANALYSIS

Monthly
 June
2013

 Annual
 2013
Refresh Chart

Select Costs Calculation:

Total Tariff Costs
T1 1680.46 €
T2 723.67 €

Select Costs Calculation:

Total Costs
2404.13 €

Total     kWh     kvarh     kWmax

■ Tariff 1    ■ Tariff 2

LOGOFF

admin

Tuesday, 23 July 2013

12:16:41 AM

Voltage LL sys  
393.0 V

Voltage L12  
392.0 V

Voltage L23  
395.0 V

Voltage L31  
394.0 V

ECONOMIC ANALYSIS

Monthly
 June
2013

 Annual
 2013
Refresh Chart

Select Costs Calculation:

kilomax Tariff Costs
T1 48.36 €
T2 24.48 €

Select Costs Calculation:

Total Costs
36.84 €

■ Tariff 1    ■ Tariff 2

ECONOMIC ANALYSIS

Monthly
 June

Select Costs Calculation:

Total Tariff Costs
T1 624.42 €
T2 244.71 €

Select Costs Calculation:

Total Costs
769.13 €

■ Tariff 1    ■ Tariff 2

# Information page:



## ➤ Available information:

- Main description
- Contract Data
- Tariff setting
- Tariff calendar

Plant Status

! NOTIFICATION

Instantaneous AC Power

0.00 kW

Total AC Energy

0.00 kWh

Daily AC Energy

0.00 kWh

CO2 Emission

0.00 Kg

Current L1

0.00 A

Current L2

0.00 A

Current L3

0.00 A

PLANT CHARACTERISTICS

Description

Plant Name	VMUC-EM Test Plant
Plant Location	Belluno Safforze
Plant Property	Carlo Gavazzi Controls SPA
Installer	Carlo Gavazzi
VMU-C Installation Date	2013-01-01

Contract Highlights

	Fixed Monthly Costs	kWh Unit Cost	kvarh Unit Cost	Wmax Monthly Cost	Max Contractual Peak
Tariff 1	100.0 €	0.25 €	1.0 €	3.5 €	100.0 kW
Tariff 2	90.0 €	0.16 €	1.2 €	2.5 €	75.0 kW

Tariff Calendar Configuration

Tariff T1 Interval	Working Day	T1 Start 1	T1 End 1		T1 Start 2	T1 End 2
		08	12	--	13	18
Holidays	<input type="checkbox"/> Mon <input type="checkbox"/> Tue <input type="checkbox"/> Wen <input type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input checked="" type="checkbox"/> Sun					

All period outside tariff T1 range, are automatically included in the tariff T2. All holidays are included into tariff T2.

LOGOFF

admin

Thursday, 29 August 2013

11:28:05 AM

Voltage LL sys

0.0 V

Voltage L12

0.00 V

Voltage L23

0.00 V

Voltage L31

0.00 V

Voltage LN sys

0.00 V

Voltage L1N

0.00 V

Voltage L2N

0.00 V

Voltage L3N

0.00 V

## Excel export page:



### ➤ Exportable information:

- Alarms
- Energy Meter Data (Max, min, Avg)
- Temperature
- Analogue input
- Pulse Rate Input

**Plant Status**

**NOTIFICATION**

**Instantaneous AC Power**  
11.52 kW

**Total AC Energy**  
469265.22 kWh

**Daily AC Energy**  
81.12 kWh

**CO2 Emission**  
249179.83 Kg

**Current L1**  
27.86 A

**Current L2**  
15.34 A

**Current L3**  
13.61 A

**EXPORT DATA**

Time Period

Interval 23-07-2013 ... 23-07-2013 ...

Monthly July 2013

Yearly 2013

ALARMS

ENERGY METER EM\_VIRTUAL Average

TEMPERATURE

ANALOGUE INPUT

PULSE RATE INPUT

**Export Data**

**LOGOFF**  
admin  
Tuesday, 23 July 2013  
01:37:22 PM

**Voltage LL sys**  
387.5 V  
Voltage L12  
386.50 V  
Voltage L23  
389.00 V  
Voltage L31  
388.25 V

**Voltage LN sys**  
0.00 V  
Voltage L1N  
223.38 V  
Voltage L2N  
225.60 V  
Voltage L3N  
224.10 V

# Account page:



- ▼ Account management:
  - ▼ List of the registered users
  - ▼ Addresses and location of the connected users.

Information

**Plant Status**

NOTIFICATION

Instantaneous AC Power  
11.43 kW

Total AC Energy  
469267.00 kWh

Daily AC Energy  
82.91 kWh

CO2 Emission  
249180.78 Kg

**ACCOUNT MANAGEMENT**

Name	User	Online	<a href="#">Log Users</a>
admin	admin	Connected	
Andrea	andrea	Not Connected	
user	user	Not Connected	
oscar_test interni	admin2	Not Connected	
francesco	francesco	Not Connected	

Add Account
Update Account

**LOGOFF**

admin

Tuesday, 23 July 2013

01:46:28 PM

Current L1  
27.08 A

Current L2  
14.69 A

Current L3  
15.02 A

User	Logged	IP	Last Login
admin	Connected	192.168.3.104	24-01-2013
admin	Connected	88.32.230.180	24-01-2013
admin	Connected	192.168.3.168	24-01-2013
admin	Not Connected	192.168.3.104	24-01-2013
admin	Connected	88.32.230.180	24-01-2013
admin	Not Connected	95.249.19.129	23-01-2013
admin	Not Connected	95.249.19.129	23-01-2013
admin	Not Connected	192.168.2.216	23-01-2013
admin	Not Connected	95.249.19.129	23-01-2013
admin	Not Connected	37.176.246.127	23-01-2013

Voltage LL sys  
387.5 V

Voltage L12  
386.75 V

Voltage L23  
226.83 V

Voltage L3N  
222.65 V



# Setting page:



## Full configuration of the system:

- ▼ Energy Meters
- ▼ VMUO-EM
- ▼ VMUP-EM
- ▼ Commands
- ▼ VMUM-EM
- ▼ VMU-C

LOGOFF  
admin  
Tuesday, 23 July 2013  
01:39:49 PM

Plant Status

! NOTIFICATION

Instantaneous AC Power  
11.14 kW

Total AC Energy  
469265.75 kWh

Daily AC Energy  
81.66 kWh

CO2 Emission  
249180.11 Kg

Current L1  
26.66 A

Current L2  
14.86 A

Current L3  
13.37 A

SYSTEM
PLANT
OTHER VARIABLES

Plant Description

Plant Name	VMUC-EM Test Plant				
Plant Location	Belluno Safforze				
Plant Property	Carlo Gavazzi Controls SPA				
Installer	Carlo Gavazzi				
VMU-C Installation Date	2013-01-01	yyyy-mm-dd	Currency	€	

Contract Highlights

	Fixed Monthly Costs	kWh Unit Cost	kvarh Unit Cost	Wmax Monthly Cost	Max Contractual Peak
Tariff 1	100.0 €	0.2 €	1.0 €	1.0 €	1.0 kW
Tariff 2	90.0 €	0.16 €	1.2 €	1.3 €	1.4 kW

Tariff Calendar Configuration

		T1 Start 1	T1 End 1		T1 Start 2	T1 End 2
Tariff T1 Interval	Working Day	08	12	--	13	18
Holidays	<input type="checkbox"/> Mon <input type="checkbox"/> Tue <input type="checkbox"/> Wen <input type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input checked="" type="checkbox"/> Sun					

All period outside tariff T1 range, are automatically included in the tariff T2. All holidays are included into tariff T2.

Voltage LL sys  
387.3 V

Voltage LN sys  
0.00 V

VMU-C

General
Engineering Unit
Data Logging
Other Alarms Group

Data Logging Enabling Yes

Data Logging Time Interval (Minutes) 5

COM Port Setup

COM1 (VMU-M EM)

Baud Rate 115200

Parity None

Data bits 8

Stop bits 1

Save Setting

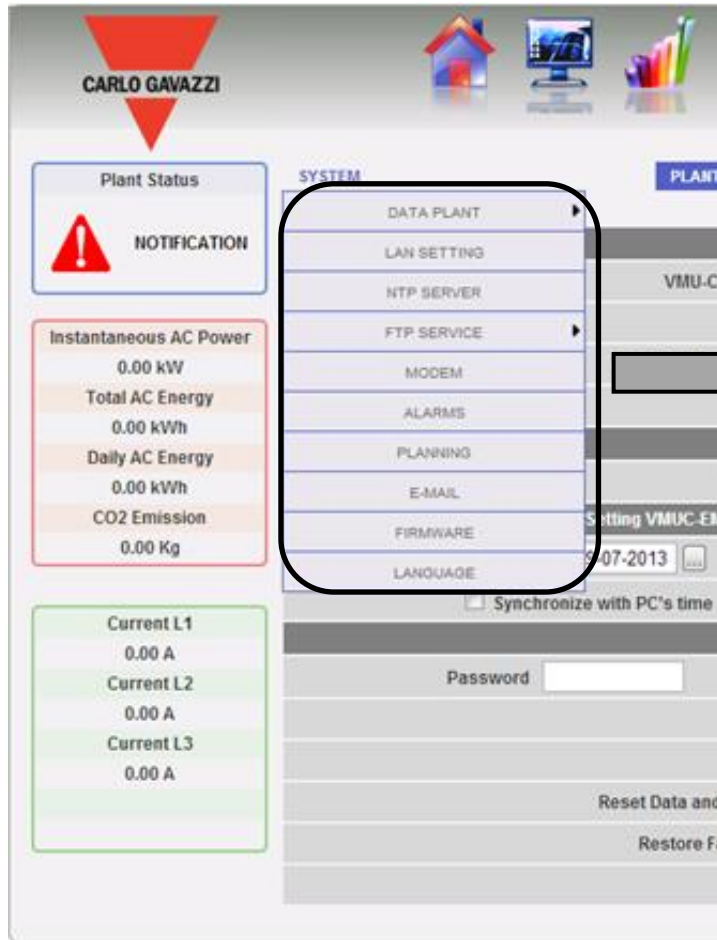
Find Connected Vmu-m

Manual Setup

Resume Configuration

Save Setting

## Setting SYSTEM page:

- Description of the plant
- IP address, subnet mask, ...
- NTP server setting for clock synchronization
- Setting for FTP service setting
- Setting of the VMU-W (modem)
- Alarm setting (groups and alarms)
- Scheduled e-mail planning (daily, weekly, ...)
- Configuration out-going e-mail server
- Firmware update, reset commands, ...
- Language setting and decimal symbol for exported excel files (". " or ",")

## Data Plant Description page:



Main description of the installation

### Plant Description

Plant Name	<input type="text" value="VMUC-EM Test Plant"/>
Plant Location	<input type="text" value="Belluno Safforze"/>
Plant Property	<input type="text" value="Carlo Gavazzi Controls SPA"/>
Installer	<input type="text" value="Carlo Gavazzi"/>
VMU-C Installation Date	<input type="text" value="2013-01-01"/> yyyy-mm-dd
Currency	<input type="text" value="€"/>

### Contract Highlights

	Fixed Monthly Costs	kWh Unit Cost	kvarh Unit Cost	Wmax Monthly Cost	Max Contractual Peak
Tariff 1	<input type="text" value="100.0"/> €	<input type="text" value="0.25"/> €	<input type="text" value="1.0"/> €	<input type="text" value="3.5"/> €	<input type="text" value="100.0"/> kW
Tariff 2	<input type="text" value="90.0"/> €	<input type="text" value="0.16"/> €	<input type="text" value="1.2"/> €	<input type="text" value="2.5"/> €	<input type="text" value="75.0"/> kW

[Save Setting](#)

### Tariff Calendar Configuration

Tariff T1 Interval	Working Day	T1 Start 1	T1 End 1		T1 Start 2	T1 End 2
		<input type="text" value="08"/> ▾	<input type="text" value="12"/> ▾	--	<input type="text" value="13"/> ▾	<input type="text" value="18"/> ▾
Holidays	<input type="checkbox"/> Mon <input type="checkbox"/> Tue <input type="checkbox"/> Wen <input type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input checked="" type="checkbox"/> Sun					

All period outside tariff T1 range, are automatically included in the tariff T2. All holidays are included into tariff T2.

[Save Setting](#)

Details of the economical contract

Tariffs (up to 2) and holidays setting

# LAN setting:

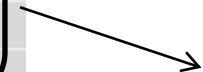
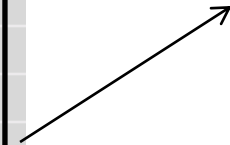


Network Setting	
VMU-C Name	VMU-C <input type="text" value="0"/> <input type="text" value="1"/> (Example: VMU-C01)
<input checked="" type="radio"/> Use the following IP Address:	<input type="radio"/> Get an IP address Automatically (DHCP)
IP Address:	<input type="text" value="192.168.2.xx"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="192.168.2.xx"/>
<input checked="" type="radio"/> Use the following DNS server addresses:	<input type="radio"/> Get DNS Server address automatically
Preferred DNS server:	<input type="text" value="192.168.1.x"/>
Alternative DNS server:	<input type="text"/>
<input type="button" value="Save Setting"/>	

Dynamic IP Address Management	
<input type="checkbox"/> Enable Dynamic DNS	Server Dynamic DNS <input type="text" value="DynDns.org"/>
	Hostname <input type="text"/>
	Username <input type="text"/>
	Password <input type="text"/>
<input type="button" value="Save Setting"/>	

LAN setting  
(fix address or  
DNS or DHCP service)



Setting in case of  
the dynamic DNS  
service is used

## NTP service setting:



Clock Synchronisation	
Enabling Network Clock Synchronisation	<input checked="" type="checkbox"/>
NTP Server 1 :	<input type="text" value="ntp1.inrim.it"/>
NTP Server 2 :	<input type="text" value="ntp2.inrim.it"/>
<input type="button" value="Save Setting"/>	

In order to have DATE and TIME always correctly synchronized, the NTP server can be used

## FTP service setting:



FTP SERVICE	
Enable FTP Service	<input checked="" type="checkbox"/>
Server Address	10.1.5.9
Remote Directory	testem
Server User	vmucem_test
Server Password	.....
Client User	client
Client Password	....
Upload Time Interval	00 - 30 (hh:mm)
Alarms Flag	<input checked="" type="checkbox"/>
Measurement Flag	<input checked="" type="checkbox"/>
First Delivery (Date / Time)	07 - 05 - 2013 09 : 20 : 01
<input type="button" value="Save Setting"/>	
<input type="button" value="Test Connection"/>	



Address and other info about the server where to save the data sent by all the connected VMUC-EM

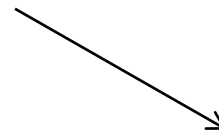
Defined interval time for PUSH data

Alarm info and/or Variables.  
Data and time of the first operation of PUSH.

## Modem "VMUW" setting:



Modem Connection Status			
	Signal		Model <i>VMU-W.A.UMM.1.X</i>
	Network Registration	<i>vodafone IT</i>	Data Connection <i>Connected</i>
	IP address		91.80.19. <b>XXX</b>
Modem Configuration			
<input checked="" type="checkbox"/> Modem Enabling	<input checked="" type="checkbox"/> Internet Connection Enabling		<input type="checkbox"/> SMS Enabling
Modem setting for Internet Connection			
Provider		VODAFONE IT M2M ▼	
<b>Save Setting</b>			



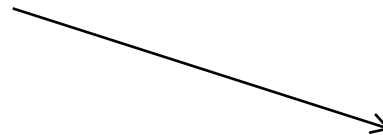
In case of a wired Internet connection is not available, the UMTS modem can be used.



## ALARMS setting:



Configuring Alarming - Group 1				
Recipients Addresses	<input type="text"/>			
Object	<input type="text"/>			
Action	<input type="checkbox"/> Send Mail			<b>Test Mail</b>
	<input type="checkbox"/> Send SMS	Phone Number	<input type="text"/>	<b>Test SMS</b>
Send for:	<input checked="" type="checkbox"/> Alarms	<input type="checkbox"/> Anomalies	<input type="checkbox"/> Events	
Configuring Alarming - Group 2				
Recipients Addresses	<input type="text"/>			
Object	<input type="text"/>			
Action	<input type="checkbox"/> Send Mail			<b>Test Mail</b>
	<input type="checkbox"/> Send SMS	Phone Number	<input type="text"/>	<b>Test SMS</b>
Send for:	<input checked="" type="checkbox"/> Alarms	<input type="checkbox"/> Anomalies	<input type="checkbox"/> Events	
<b>Save Setting</b>				



It is possible to create up to 2 groups of people where to address the email (or SMS messages when the Modem is present) in case of an alarm rises.

## PLANING (scheduled email) setting:



Scheduling Sending data via Mail		
Recipients Addresses	<input type="text"/>	
Action	<input type="checkbox"/> Send Mail	<input type="button" value="Test Mail"/>
Send Plant Data	<input type="checkbox"/> Daily	<input type="checkbox"/> Weekly
	<input type="checkbox"/> Monthly	<input type="checkbox"/> Yearly
<input type="button" value="Save Setting"/>		

If activated, an email with the main data from the plant (Power and Energy) can be sent with the set interval time (daily / weekly / monthly / yearly)

## Email setting:



Configuring Outgoing Mail Server	
Sender Address	<input type="text" value="vmucem.pss@gmail.com"/>
Sender Name	<input type="text" value="VMUCEM.pss"/>
Server SMTP	<input type="text" value="smtp.gmail.com"/>
Username Server SMTP	<input type="text" value="vmucem.pss"/>
Password Server SMTP	<input type="password" value="*****"/>
<input type="button" value="Save Setting"/>	

In order to be able to send emails, in the VMUC-EM setting, the above boxes have to be properly fulfilled with the server SMTP data.

## Date/Time setting, Reset commands and Firmware updating:



Here it is possible to verify the firmware release and just in case to update it

VMU-C Firmware Update	
VMU-C Serial Number	BN1090002001H
MAC Address	00-19-EE-10-06-B2
Installed Firmware Version	Ver. B16_A1
VMU-C Update	<input type="button" value="Browse..."/> <input type="button" value="Load"/>

Remote Reboot	
VMU-C Reboot	<input type="button" value="Reboot"/>

Setting VMUC-EM's Date and Time - VMU-M EM's Synchronization	
VMU-C's Date <input type="text" value="29-08-2013"/> <input type="button" value="..."/>	VMU-C's Time <input type="text" value="15"/> <input type="text" value="08"/> <input type="text" value="04"/> hh:mm:ss
<input type="checkbox"/> Synchronize with PC's time	<input type="button" value="Adjust"/>


Date and time setting

System Data Reset	
Password <input type="text"/>	Confirm Password <input type="text"/>
Data Reset	<input type="button" value="Reset"/>
Events Reset	<input type="button" value="Reset"/>
Reset Data and Plant Settings	<input type="button" value="Reset"/>
Restore Factory Settings	<input type="button" value="Reset"/>

RESET commands

## Language setting:



Language	
Language Seleccion	English UK 

Engineering Units	
Date Format	Day - Month - Year
Time Format	Hours : Minutes : Seconds AM/PM
Data Export: Decimal Separator	,

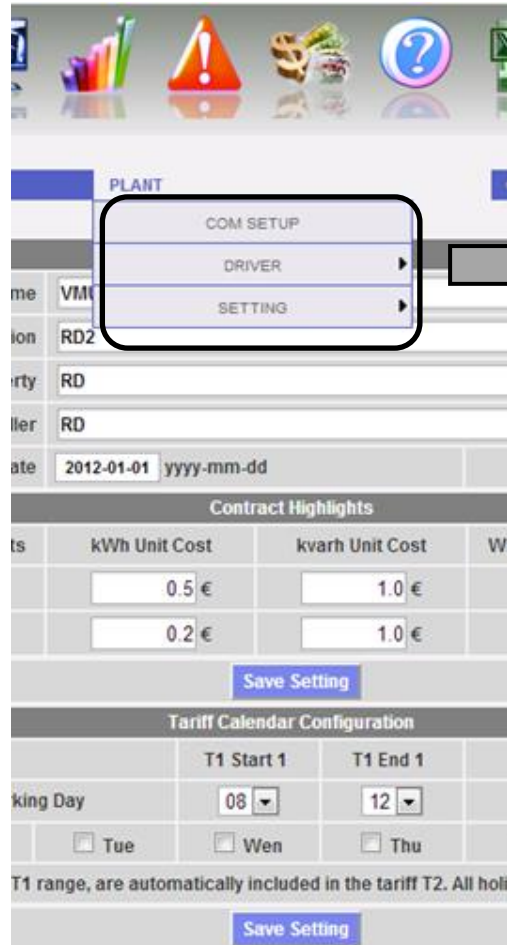
Time Zone	
Area	Location
Europe	Rome
<input type="button" value="Apply"/>	

Language setting

Setting of the decimal separator to be used in all the created Excel files

Setting of the geographic area where the VMUCEM has been installed

## Setting PLANT page:

PLANT

- COM SETUP
- DRIVER
- SETTING

Contract Highlights

ts	kWh Unit Cost	kvarh Unit Cost	Wh
	0.5 €	1.0 €	
	0.2 €	1.0 €	

Tariff Calendar Configuration

	T1 Start 1	T1 End 1
Working Day	08	12
	<input type="checkbox"/> Tue	<input type="checkbox"/> Wen
	<input type="checkbox"/> Thu	

T1 range, are automatically included in the tariff T2. All holi

- COM1 setting
- DRIVER pages (list of the available drivers, ...)
- VMUC-EM main setting

Setting PLANT page:



COM Port Setup	
COM1 (VMU-M EM)	
Baud Rate	115200 ▾
Parity	None ▾
Data bits	8 ▾
Stop bits	1 ▾
<input type="button" value="Save Setting"/>	



- COM1 setting
- 
-

## Setting PLANT page:



Available driver list			
Brand	Driver	Version	Instrument
CARLO GAVAZZI	EM21	2.2	Energy Meter
CARLO GAVAZZI	EM21_PF	2.2	Energy Meter
CARLO GAVAZZI	EM21_R	1.1	Energy Meter
CARLO GAVAZZI	EM23_AV2_AV9	1.0	Energy Meter
CARLO GAVAZZI	EM24_AV0	2.3	Energy Meter
CARLO GAVAZZI	EM24_AV5	2.3	Energy Meter
CARLO GAVAZZI	EM24_AV5_PF	2.3	Energy Meter
CARLO GAVAZZI	EM24_AV6	2.3	Energy Meter
CARLO GAVAZZI	EM24_AV9_AV2	2.3	Energy Meter
CARLO GAVAZZI	EM24_AV9_AV2_PF	2.3	Energy Meter
CARLO GAVAZZI	EM26_AV5	2.3	Energy Meter
CARLO GAVAZZI	EM26_AV5_PF	2.3	Energy Meter
CARLO GAVAZZI	EM26_AV6	2.3	Energy Meter
CARLO GAVAZZI	EM26_AV6_PF	2.3	Energy Meter
CARLO GAVAZZI	EM33	2.1	Energy Meter
CARLO GAVAZZI	WM30	2.2	Energy Meter
CARLO GAVAZZI	WM40	2.3	Energy Meter





# Setting PLANT page:



VMU-C Settings	
Autoscan Devices Connected to VMU-C	<a href="#">Find Connected Vmu-m</a>
Perform the manual configuration of the devices connected to the VMU-C	<a href="#">Manual Setup</a>
Resume Configuration	<a href="#">Resume Configuration</a>
Load Configuration from File	<a href="#">Import</a>

- 
- 
- **VMUC-EM main setting**

## Find Connected Vmu-m

Autoscan Devices Connected to VMU-C			
	VMU-C		COM 1
Modbus Address	1		7
Found Devices	1		1
Scan Status	Running...		Running...

[End Scan](#)

## Resume Configuration

Manual setup

START > VMU-O > EM > VMU-P > VMU-M > VMU-C > END

[Back](#)
[Next](#)

Base Module VMU-C VMU-C\_EM (Addr. 1) VMU-O Position 2

VMU-O "12R2"

Output 1	Output 2	Timer
Output Function 1		Norma
Output Initial Status		
Activation Hour 1		14
Deactivation Hour 1		15
Activation Hour 2		16
Deactivation Hour 2		17

## Import

Load Configuration from File

Select the file using the "Browse" button File Selected!

[Import](#)

---

Import Configuration from USB

Import Plant Configuration
  Disaster Recovery

[Import](#)

---

Import Configuration from microSD

VMUC\_VMU-C

Import Plant Configuration
  Disaster Recovery

[Import](#)

## Manual Setup

Manual setup

START > VMU-O > EM > VMU-P > VMU-M > VMU-C > END

[Back](#)
[Next](#)

[Add](#)

Address	Description [Devices Connected]		
	VMU-C_EM		<a href="#">Modify</a>
1	VMU-M_001 [02]	<a href="#">Remove</a>	<a href="#">Modify</a>

- Import plant configuration
- Disaster recovery function

Setting PLANT page:



## VMUC-EM main setting

Manual setup			
START	VMU-O	EM	VMU-P
	Back		Next
	VMU-M		Add
Address	Description [Devices Connected]		Modify
VMUC-EM			

Full configuration of all the Array modules (VMUM, VMUO and VMUP) plus a partial configuration of the connected Energy Meters.

**Energy Meters configuration**

Energy Meter Configuration	
Brand	CARLO GAVAZZI
Model	EM24_AV5
Address	2
Description	EM24_DEMO
Energy Meter COM 2 Communication Enabling	<input checked="" type="checkbox"/>
Define as Main Meter	<input type="checkbox"/>
Enable Contribution to the Virtual Main Meter	<input type="radio"/> Yes <input checked="" type="radio"/> No
	Configure Set Points
	Counters Configuration
Notes	
Baud Rate	9600
Data bits	8
Parity	None
Stop bits	1
	Back
	Save

Configure Set Points

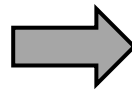
Counters configuration

Array modules configuration:

Manual setup			
START	VMU-O	EM	VMU-P
	Back		Next
Base Module	VMU-C	VMU-M_001 (Addr. 1)	VMU-P Module Position
			1
VMU-P (mV)			
Temperature Measure	Temperature ch.1 and ch.:	Probe Type	Pt1000 2-Wire
Analogue Input Measure	Enabled	Pulse Rate Input Measure	Enabled
Temperature ch.1	Temperature ch.2	Analogue Input	Pulse Rate Input
			Error Management
Alarm Type			Position 2, VMU-O: Chann
Alarm Set-point 1 (°C)	(S1 >= S2 Up Alarm; S1 < S2 Down Alarm)		30.0
Alarm Set-point 2 (°C)	(S1 >= S2 Up Alarm; S1 < S2 Down Alarm)		28.0
Alarm Activation Delay Filter (seconds)	(On-Time Delay)		5

- VMU-O
- VMU-P
- VMU-M
- VMU-C

## Setting OTHER VARIABLES page:

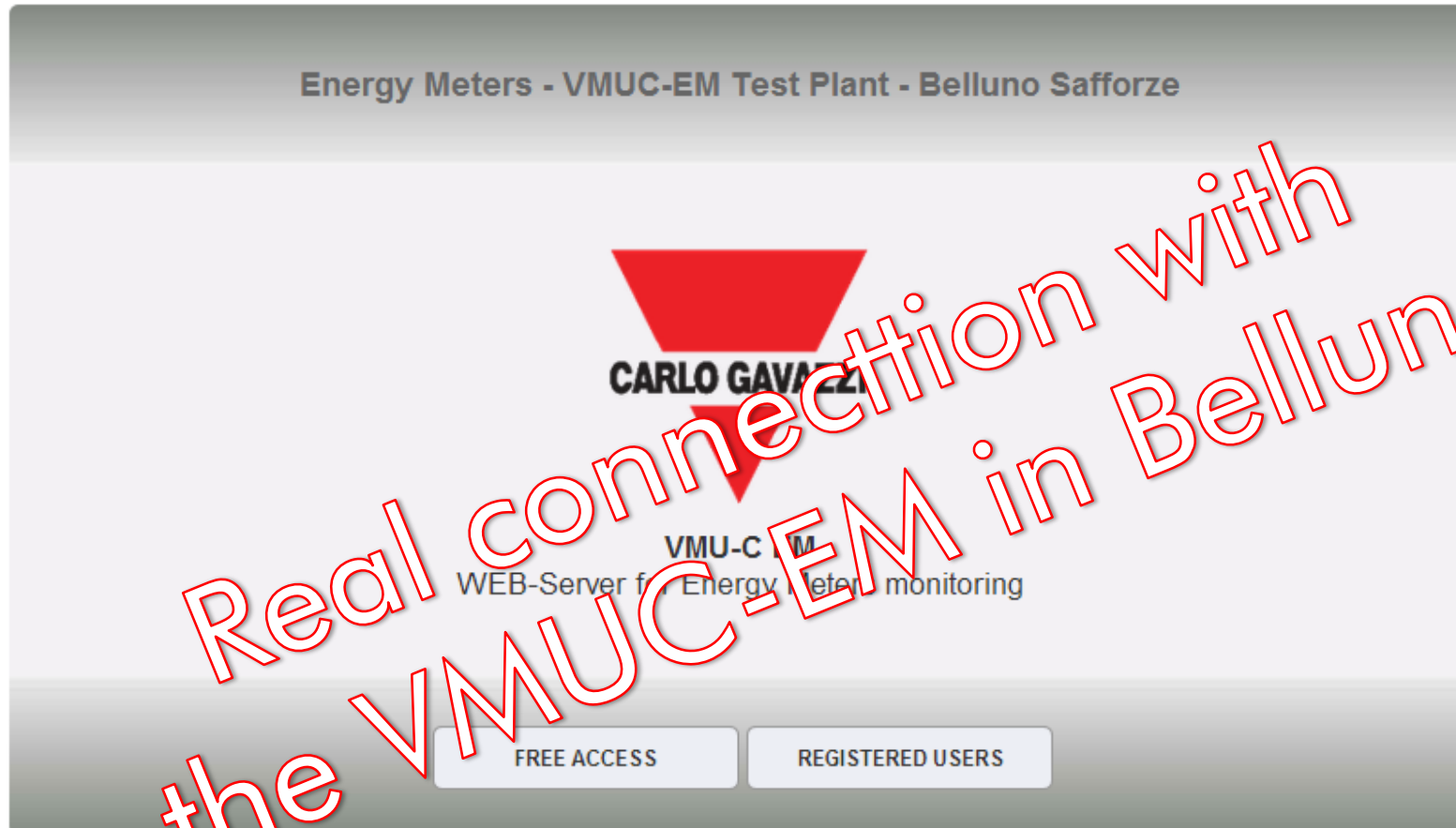
- Descriptions of the additional probes:
  - Temperature probes (Pt100 and Pt1000)
  - Analogue probes (mV and mA)
  - Pulse rate input (pulses)

ANALOGUE INPUT			
Description	VMU-M		
Analogue_In_mA	VMU-C_EM		<a href="#">Details</a>
Analogue_In_mV	VMU-M_001		<a href="#">Details</a>

Temperature ch.1			
Description	VMU-M		
VMUC_Temp_ch1	VMU-C_EM		<a href="#">Details</a>
VMUM_Temp_ch1	VMU-M_001		<a href="#">Details</a>

PULSE RATE INPUT			
Description	VMU-M		
Pulse_Rate_Input	VMU-C_EM		<a href="#">Details</a>
Pulse_Rate_Input	VMU-M_001		<a href="#">Details</a>

Online Web Server (VMUC-EM): [www.carlogavazzi-vmuc.com](http://www.carlogavazzi-vmuc.com)



Username: user

Password: user