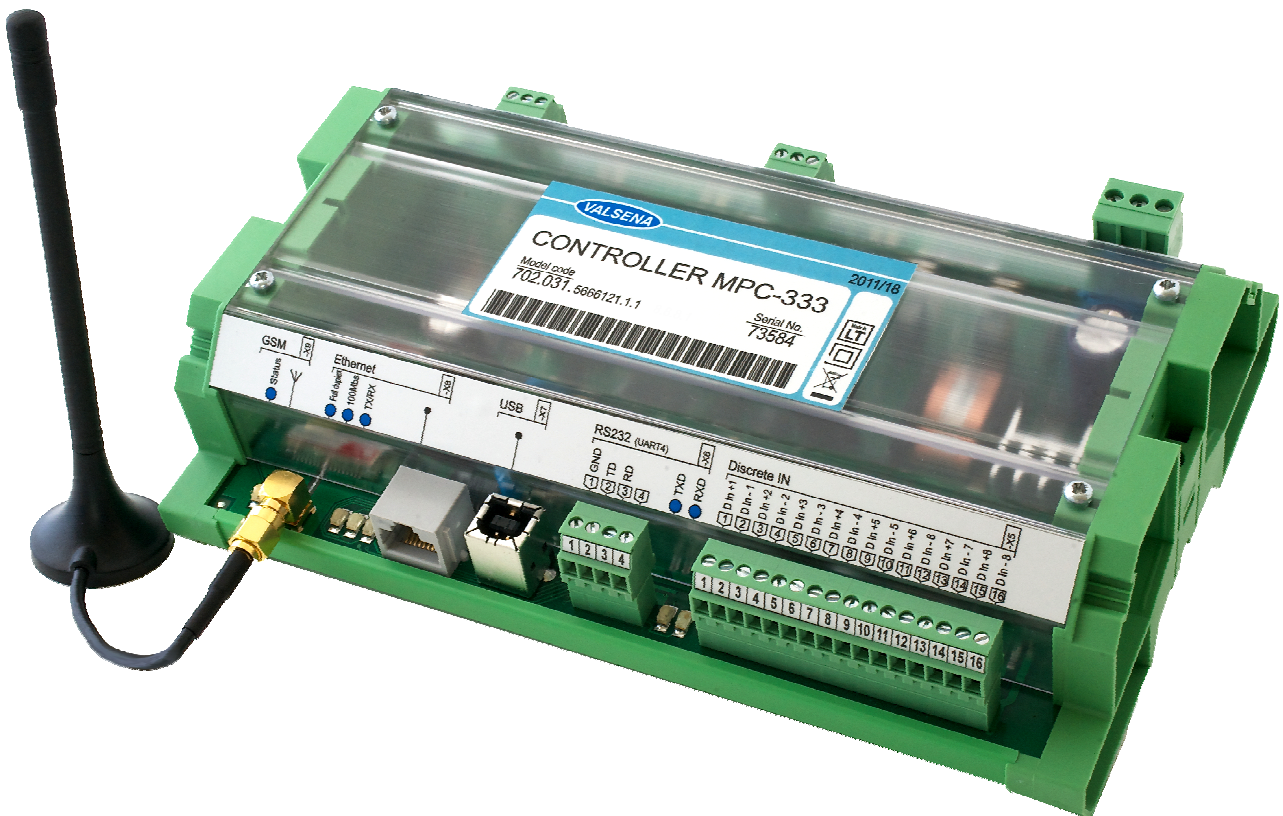


VALSENA

CONTROLLER MPC-333

USER'S MANUAL



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1 ABBREVIATIONS AND EXPLANATIONS

Xn – is a number of socket. This information are provided for manufacturer’s purpose and used in data schemas and connection diagrams.

GSM – Global Standart for Mobile Communications. This interfaces is prepared for remote connections and data bidirectional data transfer over Global Standart Mobile network.

GPRS - a packet oriented mobile data service on the 2G and 3G cellular communication system's global system for mobile communications (GSM).

Ethernet - a family of computer networking technologies for local area networks (LANs) commercially introduced in 1980. Standardized in IEEE 802.3, Ethernet has largely replaced competing wired LAN technologies. This interfaces is prepared for connection LAN (Local Area Network).

IP address - An **Internet Protocol (IP) address** is a numerical label that is assigned to devices participating in a network that uses the Internet Protocol for communication between its nodes.

TCP/IP – Transmission Control Protocol is for communication between computers, used as a standard for transmitting data over networks and as the basis for standard Internet protocols.

MAC address –**Media Access Control** address is a unique identifier assigned to most network adapters.

UART – An **Universal Asynchronous Receiver/Transmitter** is a type of “asynchronous receiver/transmitter, a part of computer hardware that translates data between parallel an serial forms. UART are commonly used in conjunction with communication standards such as EIA RS-232, RS-422 or RS-485. Record (UARTx) on top of enclosure also are used as serial interface number.

GND – ground wire contact

RS232 - the traditional name for a series of standards for serial binary single-ended data and control signals connecting between a DTE (Data Terminal Equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports. The standard defines the electrical characteristics and timing of signals, the meaning of signals, and the physical size and pin out of connectors. RS232 interfaces are prepared for connection of ppheripheral devices (example energy meters, controllers, machines and etc.).

TD – contact for transfer data wire of RS232 socket

RD – contact for read data wire of RS232 socket

DTR – contact for Data Transmit Ready wire of RS232 socket

RS485 - standard defining the electrical characteristics of drivers and receivers for use in balanced digital multipoint systems. The standard is published by the ANSI Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA). Digital communications networks implementing the EIA-485 standard can be used effectively over long distances and in electrically noisy environments. Multiple receivers may be connected to such a network in a linear, multi-drop configuration. RS485 interfaces are prepared for connection of peripheral devices (example energy meters, controllers, machines and etc.).

A+ – contact for positive wire of RS485 socket

B- –contact for negative wire of RS485 socket

USB – Universal Serial Bus is an industry standard, that defines the cables, connectors and protocols used for connection, communication and power supply between computer and electronic devices. USB type B socket is prepared for connection to PC(Personal Computer). USB type A socket is prepared for connection to peripheral devices (example memory stick's and etc.).

M-Bus - a European standard (EN 13757-2 physical and link layer, EN 13757-3 application layer) for the remote reading of gas or electricity meters. The M-Bus interface is made for communication on two wire, making it very cost effective.

MBUS+ – contact for M-Bus positive wire

MBUS- – contact for M-Bus negative wire

Socket – is an endpoint of a bidirectional inter-process communication flow across an Internet Protocol-based computer network, such as the Internet.

Data – contact for data wire

Req – contact for request wire

CL+ – contact for current loop positive wire

CL- – contact for current loop negative wire

Status – device status indicating LED

Uoutput – status of power for external device indicating LED

TX/RX – data transfer/receive indicating LED

TXD – data transferring LED indicator

RXD – data receiving LED indicator

100Mbs – Ethernet High speed connection indicating LED








“Alarm mode” – in state of alarm status Controller initiates an event notification for user selected discrete input mode (Alarm mode: unconnected, connected, both events)

Central computer – server or a computer, where data can be sent.

2 PREFACE

2.1 Symbols

International electrical symbol list. Some or all symbols can be used on controller marking or in this user manual.

Symbol	Explanation
	With the CE marking on a product the manufacturer ensures that the product conforms with the essential requirements of the applicable EC directives.
	DC (Direct Current)
	Caution
	Grounding
	LED indicator
	Contact number on plug
RoHS	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2002/95/EC. Commonly referred to as the Restriction of Hazardous Substances Directive or RoHS)
	Waste Electrical and Electronic Equipment Directive

2.2 Safety instructions

To install and setup device, social technical knowledges are needed. Call to seller or certified professionals to connect and setup device !

Before connecting to power supply, be sure that:

1. Controller is not damaged (no cracks, melted, broken or exposed areas)
2. Controller is used with right and correct thickness cables.
3. Controller and antenna are installed indoor.
4. The controller is intended for supply from a Limited Power Source (LPS) with current rating of overcurrent protective device not greater than 2A

5. The highest transients on the DC secondary circuite of LPS, derived from AC main supply, shall be less then 71V peak.
6. The associated equipments (AE): PC and PSU (LPS) shall comply with the requirements of Standard EN 69050-1.
7. Controller is dry;
8. Ambient temperature and humidity is in normal range;
9. Other types of devices (counters, etc.) are connected correctly by using manufacturer's regulations.
10. The end of stranded conductor shall not be consolidated by soft soldering and must to be terminated
11. Device, PC and other pheripheral devices are strictly connected through one double pole breaker (current break less than 5A and space between breaker contacts more than 3mm.) Pole breaker has to be in building's wiring and in reachable place with markings

Don't use:

1. Device under open water (in rain and if water are spalshing on controller or connected devices;
2. Device if enclosure, connected cables, or other connected devices are damaged;
3. External Back-Up batterys for powering of controller.



Use device by manufacturer's regulations otherwise you can damage controller or other devices. In that cace **munufacturer's warranty could not be obtained.**



If you suspect that device doesn't operate correctly or has visible violations, please contact manufacturer or your distributor to check or run maintanance.

2.3 Manufacturer's warranty

Manufacturer guarantees to remove failure or to change in a new one (if the failure is irreparable) in two years period if user didn't brake technical requirements and operating conditions named at chapter 2 and 3.

MANUFACTURER'S CONTACTS

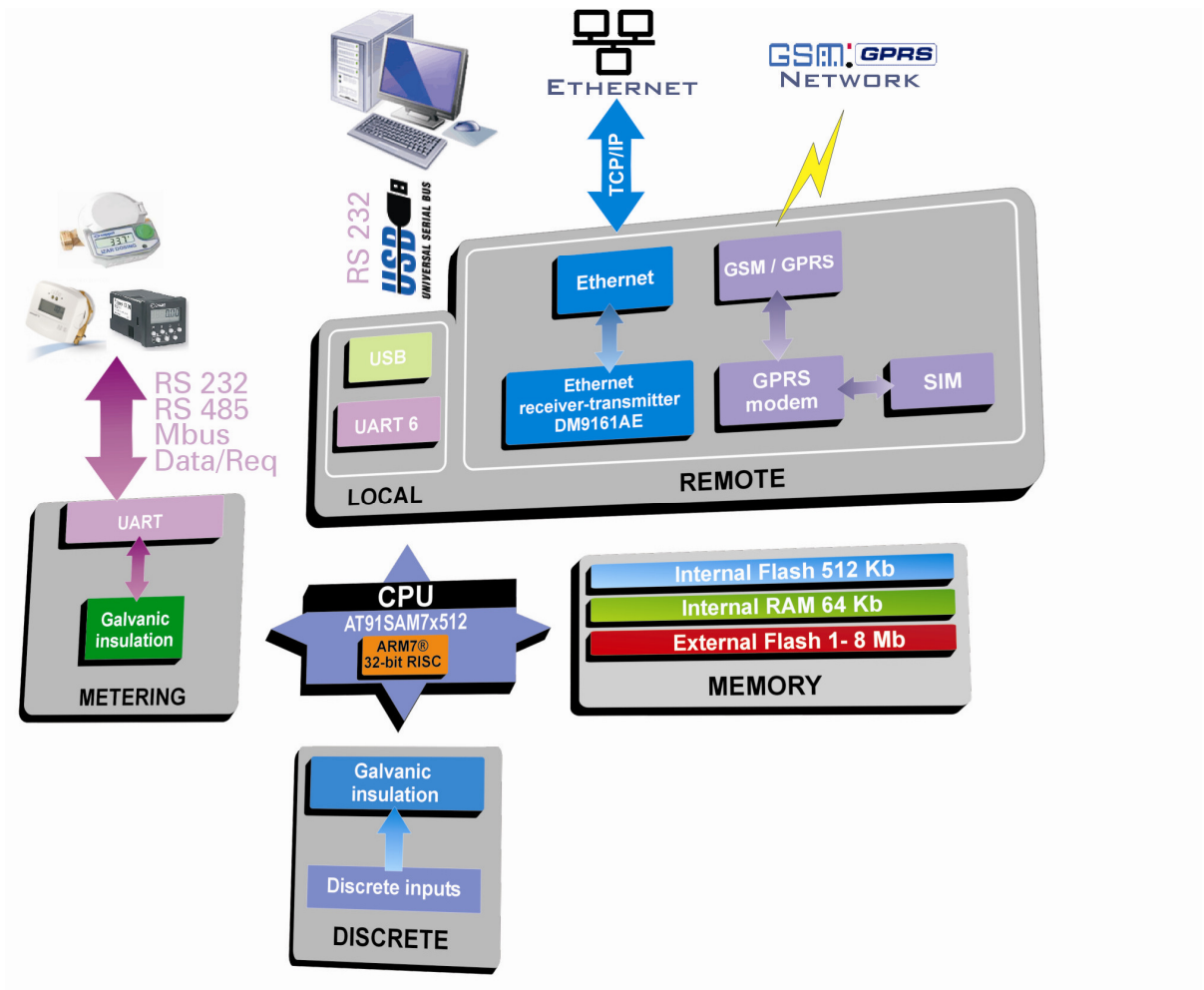
V. BARTKEVICIAUS ENTERPRISE "VALSENA"
 SAVANORIŲ AVE. 271- 412,
 LT50131 KAUNAS, LITHUANIA
 PHONE : (+370) 37 310603,
 FAX. (+370) 37 310648
 E-MAIL: VALSENA@VALSENA.LT

3 TECHNICAL DATA

3.1 Purpose of device

Controller designed to:

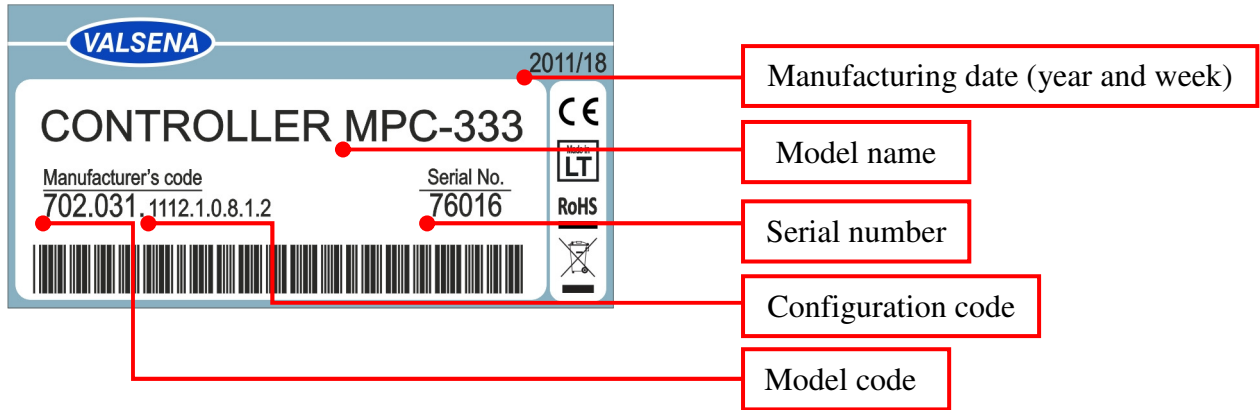
- Read out from meters of energy resources (electricity, heat, water, gas);
- Follow status of objects;
- Store accounting and measurement data;
- Carry out initial processing of data;
- Generate reports to service personnel at the limit of deviation from the preset parameters and status (discrete signals) change;
- Send all data through GSM/GPRS and Ethernet.



Pic 1: Controller's flowchart

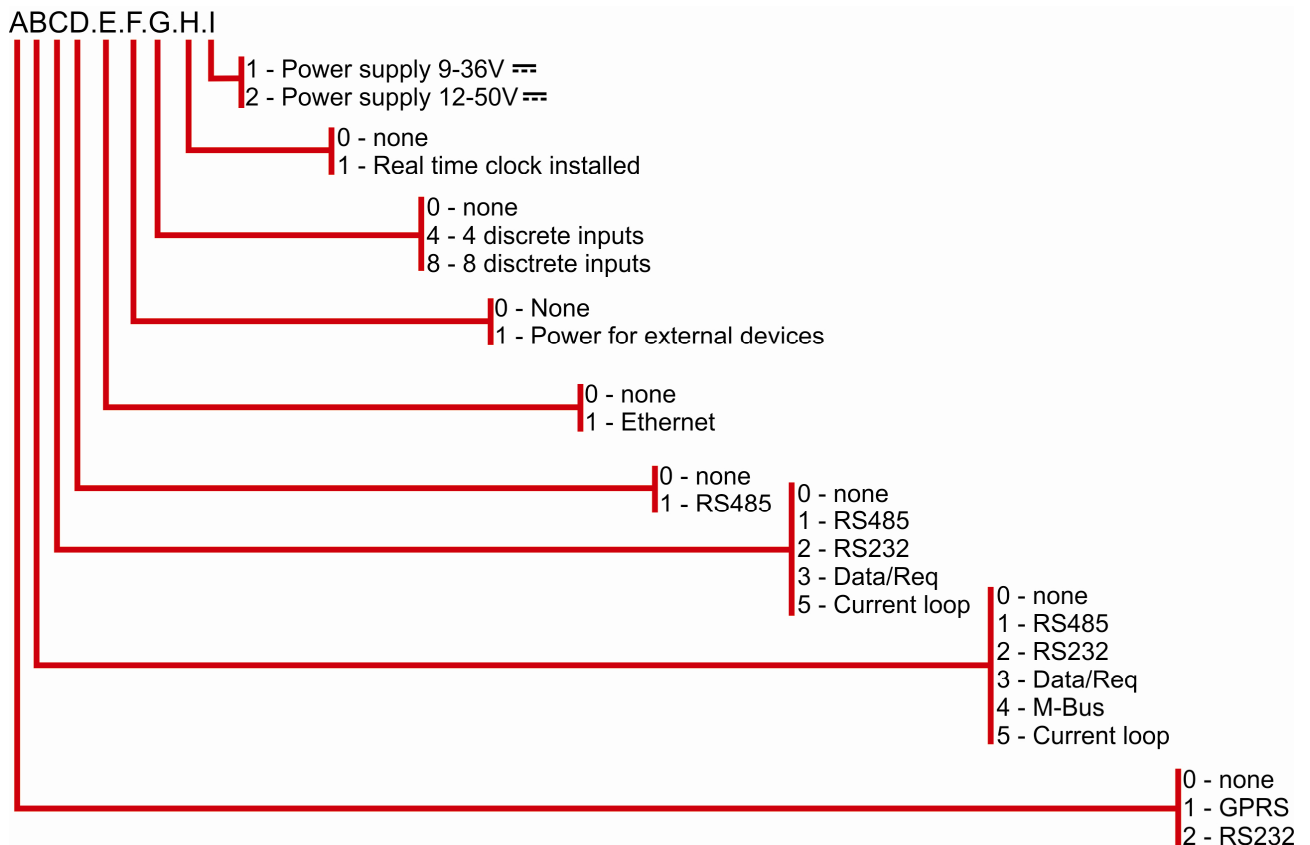
3.2 Information on top label

This label provides common information about controller's and if you will need any consultations from technical center or manufacturer, please let them know full Manufacturer's code and Serial No.



Pic 2 Controller's label information

Configuration code provides full information about installed interfaces, supported power and other technical information:



Pic 3 Controller's configuration code

3.3 Communication interfaces

Interfaces	Technical data
RS485	up to 1.2 km, max 32 transivers, speed up to 19.2 Kbits/s
RS232	up to 15m, speed up to 19,2 Kbits/s
Data/Req	(KAMSTRUP) data transfer interface
Current loop	<30V, 14-20mA, up to 6 km, speed up to 19,2 Kbit/s
M-Bus	Up to 8 devices
GPRS	3 band 900/1800/1900 MHz
Ethernet	10/100 Mb twisted pair, up to 100m
USB	Type B, version 2.0
Discrete INPUTS	“Dry contact”, Open >6 k Ω ; Closed <500 Ω .


3.4 Galvanic insulation

Insulation voltage between powe supplier and second circuits	1500 V
Insulated interfaces	A, B, C, D, E
Discrete INPUTS	Yes. Non-insulated from discrete inputs

3.5 Indication

Indication type	LED's
Indicated parameters	<ul style="list-style-type: none"> • Each discrete input and output status • Status of each Serial interfaces • GSM/GPRS modem status • GSM/GPRS modem transfer and receive • Ethernet Duplex mode status • Ethernet High speed connection status • Ethernet Transfer/Receive status

3.6 Power supply

Power supply	9 ÷ 36 V or 12 ÷ 50 V  200mA max
Power consumption	Up to 10VA

3.7 Construction

Mounting	DIN35 rail
Dimensions	197 mm x 128 mm x 50 mm
Tightness	IP20

3.8 Climate conditions

Operating temperature	From - 25 °C to + 60°C
Storage temperature	From - 40 °C to + 60°C
Relative humidity	From 5 % to 95 % non-condensing

3.9 Safety parameters

Safety requirements	Meets requirements: LST EN 60950-1:2006 LST EN 60950-1:2006/A11:2009
Electromagnetic compatibility	Meets requirements: EN 55022:2010 EN 61000 – 4-2:2009 EN 61000 – 4-3:2006 EN 61000 – 4-3:2006/A1:2008 EN 61000 – 4-3:2006/A2:2010 EN 61000 – 4-4:2004 EN 61000 – 4-4:2004/A1:2010 EN 61000 – 4-4:2009

3.10 Other parameters

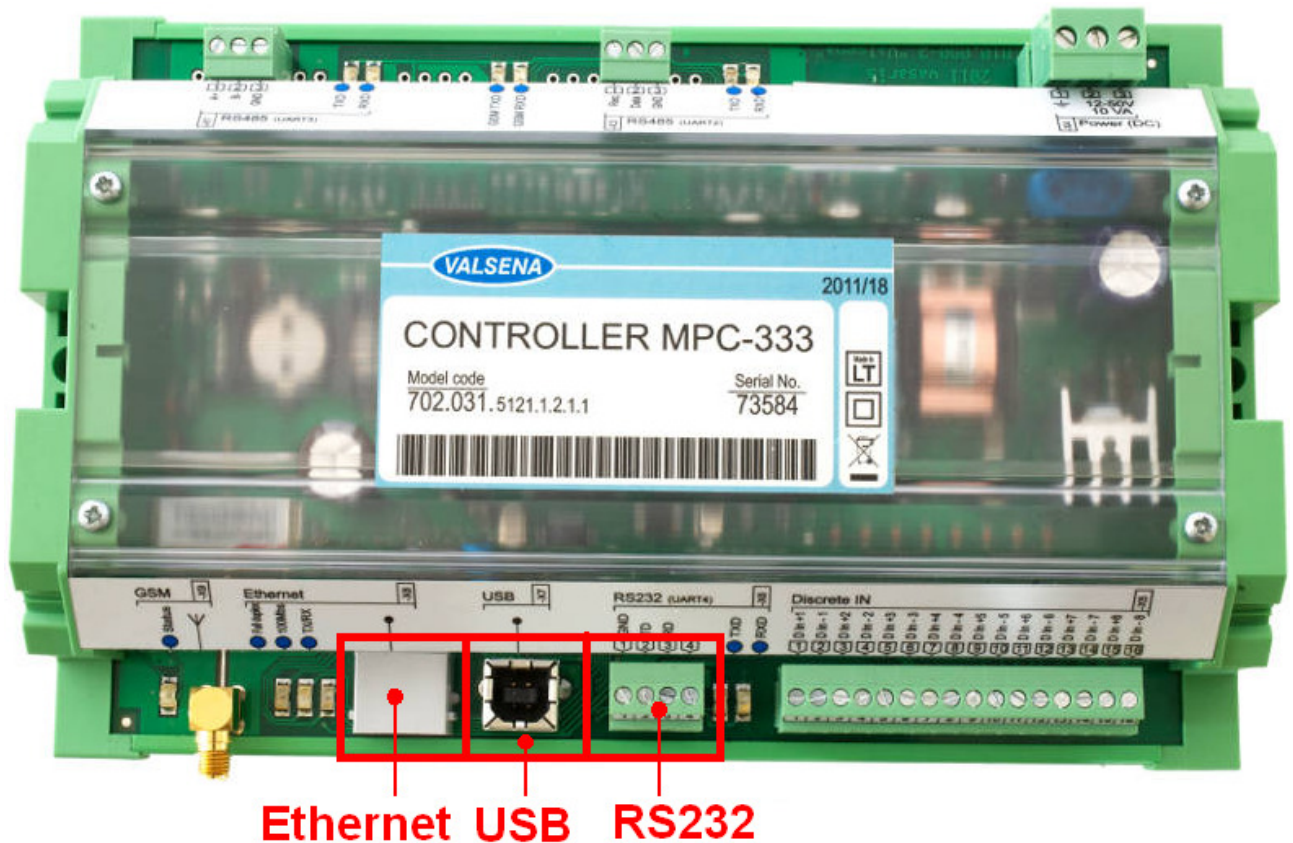
Storage memory	1 ÷ 8 MB
Configuration settings storage without power supply	More than 5 years
Remote firmware loading	Yes. Through RS232 or/and Ethernet and GSM/GPRS. Through USB (under separate order).

4 CONNECTING TO DEVICE

To communicate with controller, you need to prepare cables and correctly setup your computer. Be sure your computer stands at least [minimal requirements](#).

Depending on type of controller you can connect through [RS232](#), [Ethernet](#), [GPRS](#) or [USB](#).

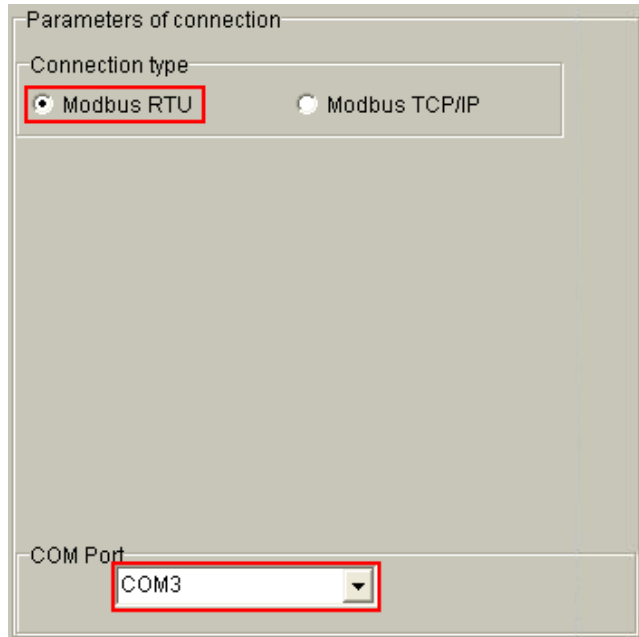
Every controller has it's own [connection default values](#) and can be connected only using them.



Pic 4 Connecting to controller

4.1 Connecting to controller over serial COM port

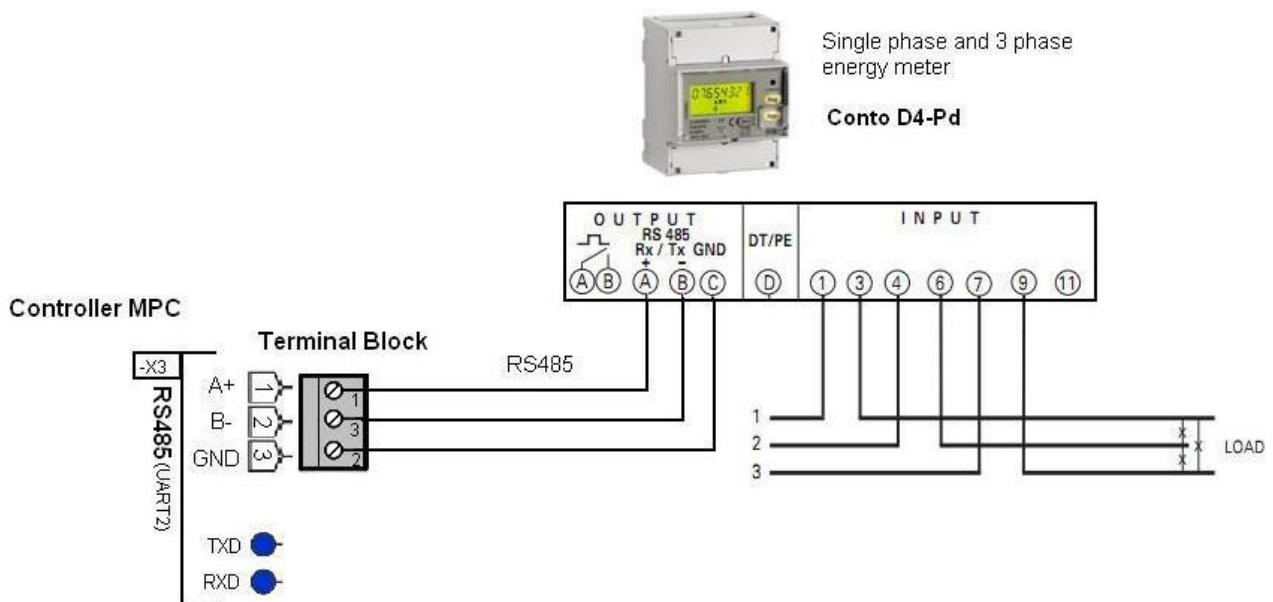
Before connecting to controller over RS232 you need to choose correct [RS232 cable](#), [configure serial port](#) and select right port in program (port that is connected to your computer's serial com port). You need to choose Modbus RTU connection type. Select Com port, that you will use for connection with PC. If connection fails, recheck cabling, check if using right Com port.



Pic 5 Connecting to controller through serial COM port

4.2 Connecting devices to Controller through RS485

Before connecting any device (counters, meters, etc.) make sure that this device has RS485 interface, controller is configured to read data from device. How to configure controller's serial interface see **Pic 15**.



Pic 6 Connecting other devices to controller

4.3 Connecting over USB

Connect to controller over USB port (if USB interface is installed) you need to choose correct [USB cable](#). If you are using controller for the first time, before connecting device with PC through USB you need to download driver from our product support page: www.valsenal.it/support/MPC-374.it. Valsena controller inside has USB/COM converter. You just need to install driver on your PC. See [Valsena USB driver installation](#) guide, how to install driver.

Connecting to controller through USB is the same as connecting through [serial COM port](#). You just need select connection type Modbus RTU and right Com port.

4.4 Connecting over Ethernet

To connect with controller over Ethernet (if Ethernet interface is installed) you need to choose correct [setup your computer's IP](#) address to access controller (see [default values](#)). No matter if you use controller over network (switch, hub, etc.) or connecting directly to PC, controller automatically detects cable wiring.

You need to choose Modbus TCP/IP Communication type. Every controller has unique IP address which will be used to connect to device. By default controller is set to 502 Port (this is system standard Modbus TCP/IP port), change it if you need other. By pressing “Connect” you will be connected to controller. If connection fails, recheck cables, communication type, IP address and connect again.

The screenshot shows a software interface titled "Parameters of connection". It has three main sections:

- Connection type:** Two radio buttons are present: "Modbus RTU" (unselected) and "Modbus TCP/IP" (selected).
- Modbus TCP_IP connection:**
 - IP number:** Four input fields contain the values "192", "168", "1", and "125". A red line points to these fields with the label "Controller's IP address".
 - Port:** A dropdown menu shows "502". A red line points to this field with the label "TCP/IP port".
- Connection through:** Two radio buttons are present: "Ethernet" (selected) and "GPRS" (unselected).

At the bottom of the dialog is a "Connect" button.

Pic 7 Connecting to controller over Ethernet

4.5 Connection over GPRS/GSM

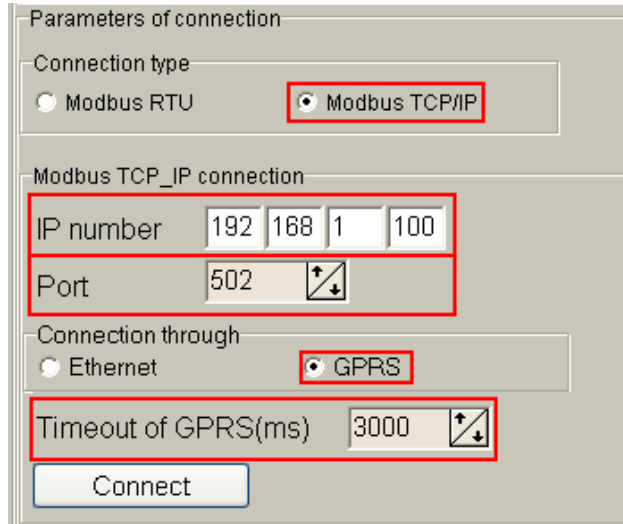
To connect to device over GPRS you need to have GPRS/GPS modem configured to connect to your APN network.



Don't forget to enter APN name when configuring GPRS/GSM modem.

Disable other Ethernet devices and/or modems that can dial by IP query.

You need to choose Modbus TCP/IP Communication type. Every controller must have unique IP address which will be used to connect to device. By default controller is set to 502 Port (this is system standard Modbus TCP/IP port), change it if you need other. Select GPRS on the Connect through section. By default controller's Timeout is set to 3000ms (this is system standard timeout time), change it if you need other. By pressing “Connect” you will be connected to controller. If connection fails, check GPRS modem, Communication type, IP address, Port values.



Parameters of connection

Connection type

Modbus RTU Modbus TCP/IP

Modbus TCP_IP connection

IP number 192 168 1 100

Port 502

Connection through

Ethernet GPRS

Timeout of GPRS(ms) 3000

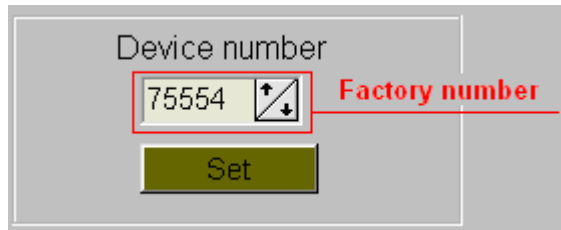
Connect

Pic 8 Connecting to controller over GPRS

5 OPERATING PRINCIPLES AND SETTINGS

5.1 General settings [Custom parameters]

Each controller has it's own factory number.

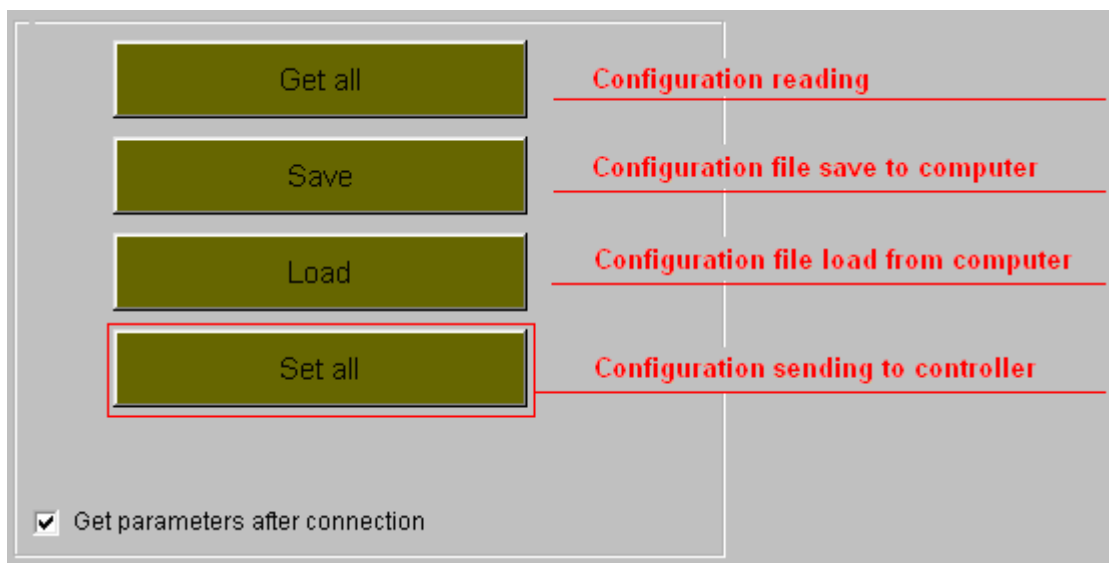


Pic 9: Setting factory number of controller

In each controller is loaded factory setting. If you want to work in different mode you have to change configuration. Pressing button “Save” can save changed configuration. After that you have to press “Send” for configuration to take effect. If you want to load other saved configuration you have to press “Load” and choose file you want, and then press “Set all”. After sending configuration to controller it's necessary to restart it.

Notification reports about it:  Necessary restart

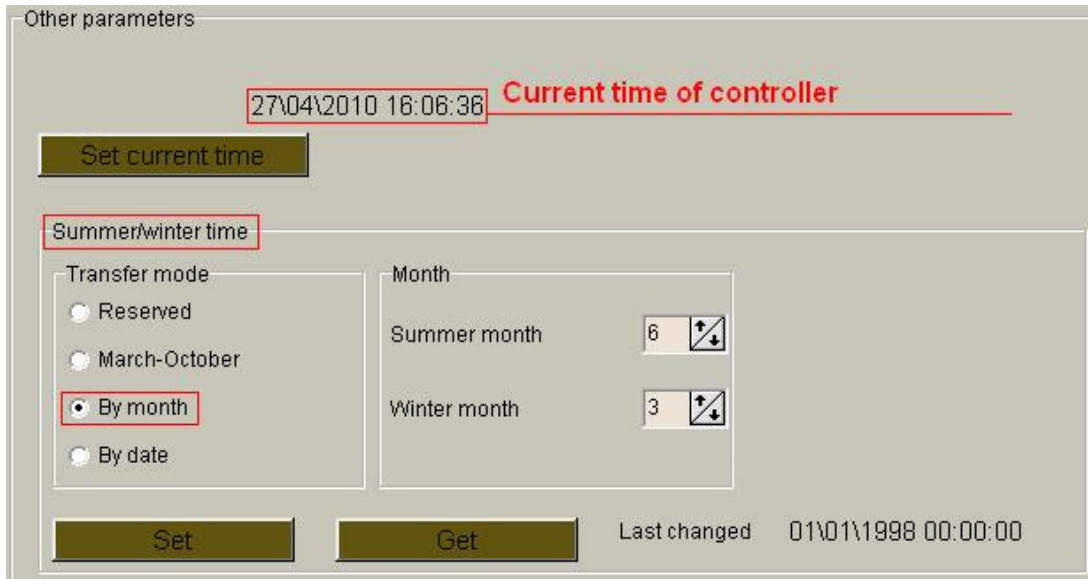
Controller can be restarted by turning off/on power supply or pressing button:



Pic 10: Controller configuration settings [Custom parameters]

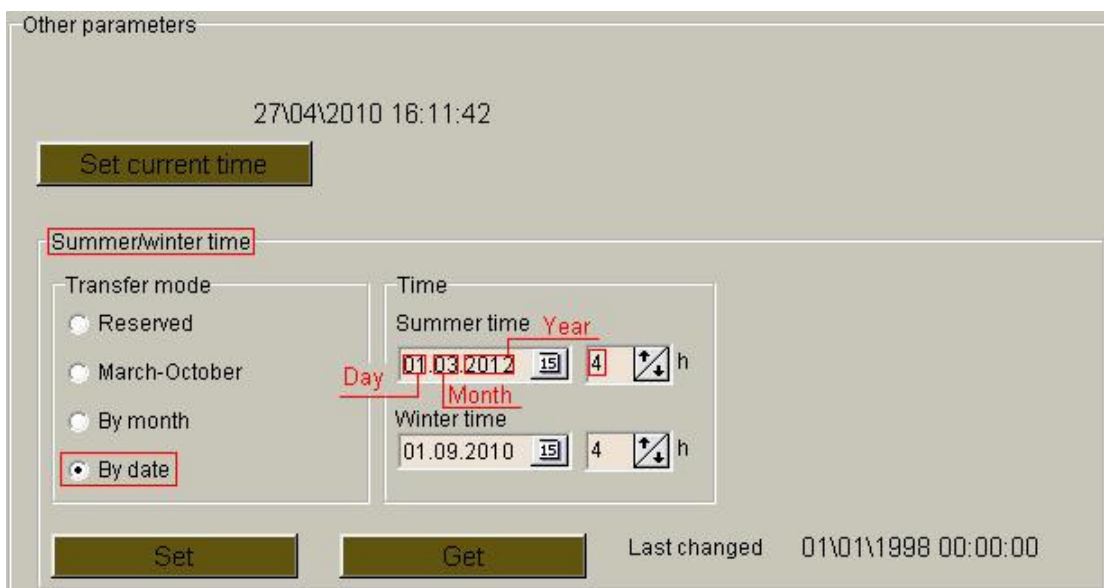
5.2 Controller's clock setup [Custom parameters]

In section Other parameters you can see controller's time. If it doesn't coincide with real time, press "Set current time" and controller gets computer's time. There is possibility for controller to set his time automatically then time goes from summer to winter. Transfer mode is not in use by defaults.



Pic 11: Controller DKEG-48 clock settings [Custom parameters]

If it's not enough, transfer mode can be chosen in particular date, by choosing years and desired month and day, and even hour. After setting time transfer mode, press "Set".



Pic 12: Controller summer/winter time transfer mode [Custom parameters]

5.3 Discrete measurements [Discrete inputs]









Controller performed functions:

- Tracking of discrete signal status;
- Filtering from discrete signal fluctuations;
- Discrete signal's change storage;
- "Alarm" status (events) fixation;
- Impulse aggregation.

Controller configurable parameters:

- Channel usage;
- Can be used as discrete inputs or pulse counters;
- Debounce filtering time;
- State to archive (signal is, no signal, both cases);
- "Alarm" state (signal is, no signal).

Controller periodically tracks all discrete channels' status and during change on each channel it stores that change with real time value. Also (if user defined) can be initiated report. Discrete channel's state displayed by corresponding picture in configuration program. Each discrete channel can be used as impulse counter. Taken into account only the first four discrete input channels. All summed impulses are stored in controller's memory. Physical value is converted from impulse quantity number multiplied by user-defined multiplier. Multiplier can be from 1 to 1000. Discrete measurement state is fixated considering to given archive type (**Pic 13** Archive type: Open, Close, Both Cases.).

	Chan. 1	Chan. 2	Chan. 3	Chan. 4	Chan. 5	Chan. 6	Chan. 7	Chan. 8
Current state								
Impulse quantity	4	0	2	0				
Value	4.000	0.000	2.000	0.000				
Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Purpose	<input type="radio"/> Discret. inp. <input type="radio"/> Impulse count <input checked="" type="radio"/> Alarm signal	<input type="radio"/> Discret. inp. <input type="radio"/> Impulse count <input checked="" type="radio"/> Alarm signal	<input type="radio"/> Discret. inp. <input checked="" type="radio"/> Impulse count <input type="radio"/> Alarm signal	<input checked="" type="radio"/> Discret. inp. <input type="radio"/> Impulse count <input type="radio"/> Alarm signal	<input checked="" type="radio"/> Discret. inp. <input type="radio"/> Impulse count <input type="radio"/> Alarm signal	<input checked="" type="radio"/> Discret. inp. <input type="radio"/> Impulse count <input type="radio"/> Alarm signal	<input checked="" type="radio"/> Discret. inp. <input type="radio"/> Impulse count <input type="radio"/> Alarm signal	<input checked="" type="radio"/> Discret. inp. <input type="radio"/> Impulse count <input type="radio"/> Alarm signal

Pic 13: Discrete measurements configuration [Discrete inputs]

Choosing discrete signal purpose as alarm signal, controller sends report when event occurs (**Pic 13** Alarm state: Open, Close, Both cases). Event reports are taken into account in archived values. Discrete signal meaning is filtrated by user-defined debounce time (**Pic 14** Debounce time (ms)).

Debounce time can be from 1 to 1000 msec. If signal does not persist for fixed time it is rejected. If signal persists fixed debounce time, it is accepted, summed and if necessary report is initiated.

Alarm state	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input checked="" type="radio"/> Open <input type="radio"/> Close <input type="radio"/> Both case	<input checked="" type="radio"/> Open <input type="radio"/> Close <input type="radio"/> Both case	<input checked="" type="radio"/> Open <input type="radio"/> Close <input type="radio"/> Both case	<input type="radio"/> Open <input checked="" type="radio"/> Close <input type="radio"/> Both case	<input type="radio"/> Open <input checked="" type="radio"/> Close <input type="radio"/> Both case	<input type="radio"/> Open <input checked="" type="radio"/> Close <input type="radio"/> Both case	<input type="radio"/> Open <input checked="" type="radio"/> Close <input type="radio"/> Both case
Archive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
State to archive	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case	<input type="radio"/> Open <input type="radio"/> Close <input checked="" type="radio"/> Both case
Debounce time (ms)	50	50	50	50	0	0	0	0
Impulse multiplier	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<div style="display: flex; justify-content: space-around;"> Set Get </div>								

Pic 14: Discrete measurements configuration [Discrete inputs]

5.4 Serial interfaces

5.4.1 First serial interface:

Performed functions:

- Data transfer from counters goes transparently. It means that user from server through controller transparently applies to counter and counter sends data directly to server. Controller only performs router functions for sending data packets between Ethernet/GPRS and counter;
- Buffering data received from Ethernet/GPRS, while last packet is sent to serial interface and received response or “Time out” occurred. When buffering depth exceeds, other packets will be rejected (ignored);
- Packetting data, (after getting all data from serial interface) is done by time after last byte, by received byte or received bytes quantity;
- TCP or UDP ports filtering and data transfer to serial interface only from named ports.

Configurable parameters:

- Serial interface parameters:
 - Transfer rate (from 300 to 19200 bod)
 - Parity (None, Odd, Even, Mark, Space)
 - Bits (7 or 8)
 - Stop bits (1 or 2)
 - Response waiting time (“time-out”)
- Data packetization (time, byte meaning or byte quantity);
- Data packetization (time, byte meaning or byte quantity);
- Data packetization time, if packetization executed by time after last byte;
- Packetization byte value, if packetizing under-byte value;

- Packetization byte count, if packetization executed by byte count;
- TCP or UDP port numbers, which can send data to serial interface;
- Packet buferization depth (how many packets received from Ethernet or GPRS has to be buffered).

5.4.2 Second serial interface

Performed functions - Periodical data readings from gas counters,

Data scanned:

- Adjusted total gas consumption;
- Adjusted instantaneous gas flow;
- Gas pressure;
- Gas temperature;
- Corrector's data storage frequency.

Configurable parameters:

- Gas corrector type;
- Connection settings (transfer rate and parity) in case if corrector has connection settings;
- Corrector's addresses, if corrector is addressed;
- Received data conversion coefficients and multipliers;
- Data from corrector reading frequency;
- Corrector's data storage frequency.

5.4.3 Third serial interface

Performed functions - Periodical data readings from heat controllers.

Data scanned:

- Total Energy;
- Total water amount;
- Power;
- Flow;
- Incoming temperature;
- Outgoing temperature;
- Temperature difference;
- Work time;
- Corrector's data storage frequency.

Configurable parameters:

- Heat counter type;
- Connection settings (transfer rate and parity) in case if corrector has connection settings;
- Counters quantity, connecting more than one sensor to the interface;
- Counters' addresses, if counters are addressed;
- Received data conversion coefficients and multipliers;
- Data from corrector reading frequency;
- Data storage frequency.

5.4.4 Fourth serial interface

Options and parameters are similar to the first interface.

	UART 1	UART 2	UART 3	UART 4
Bode	<input type="radio"/> 300 <input type="radio"/> 600 <input type="radio"/> 1200 <input type="radio"/> 2400 <input type="radio"/> 4800 <input checked="" type="radio"/> 9600 <input type="radio"/> 19200 <input type="radio"/> 38400	<input type="radio"/> 300 <input type="radio"/> 600 <input checked="" type="radio"/> 1200 <input type="radio"/> 2400 <input type="radio"/> 4800 <input type="radio"/> 9600 <input type="radio"/> 19200 <input type="radio"/> 38400	<input type="radio"/> 300 <input type="radio"/> 600 <input type="radio"/> 1200 <input checked="" type="radio"/> 2400 <input type="radio"/> 4800 <input type="radio"/> 9600 <input type="radio"/> 19200 <input type="radio"/> 38400	<input type="radio"/> 300 <input type="radio"/> 600 <input type="radio"/> 1200 <input checked="" type="radio"/> 2400 <input type="radio"/> 4800 <input type="radio"/> 9600 <input type="radio"/> 19200 <input type="radio"/> 38400
Parity	<input type="radio"/> Even <input type="radio"/> Odd <input type="radio"/> Mark <input type="radio"/> Space <input checked="" type="radio"/> None	<input type="radio"/> Even <input type="radio"/> Odd <input type="radio"/> Mark <input type="radio"/> Space <input checked="" type="radio"/> None	<input type="radio"/> Even <input type="radio"/> Odd <input type="radio"/> Mark <input type="radio"/> Space <input checked="" type="radio"/> None	<input type="radio"/> Even <input type="radio"/> Odd <input type="radio"/> Mark <input type="radio"/> Space <input checked="" type="radio"/> None
Bits	<input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input checked="" type="radio"/> 8	<input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input checked="" type="radio"/> 8	<input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input checked="" type="radio"/> 8	<input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input checked="" type="radio"/> 8
Stop bits	<input checked="" type="radio"/> 1 <input type="radio"/> 1.5 <input type="radio"/> 2	<input checked="" type="radio"/> 1 <input type="radio"/> 1.5 <input type="radio"/> 2	<input checked="" type="radio"/> 1 <input type="radio"/> 1.5 <input type="radio"/> 2	<input checked="" type="radio"/> 1 <input type="radio"/> 1.5 <input type="radio"/> 2
Packetization	<input checked="" type="radio"/> Time <input type="radio"/> Symbol <input type="radio"/> Length	<input checked="" type="radio"/> Time <input type="radio"/> Symbol <input type="radio"/> Length	<input checked="" type="radio"/> Time <input type="radio"/> Symbol <input type="radio"/> Length	<input checked="" type="radio"/> Time <input type="radio"/> Symbol <input type="radio"/> Length
Packet time (msec.)	50	50	20	50
Packet symbol(Hex)	0D	00	00	00
Packet byte count	0	0	1	100
Mode	<input type="radio"/> Full duplex <input checked="" type="radio"/> Half duplex	<input type="radio"/> Full duplex <input checked="" type="radio"/> Half duplex	<input type="radio"/> Full duplex <input checked="" type="radio"/> Half duplex	<input type="radio"/> Full duplex <input checked="" type="radio"/> Half duplex
Destination of DTR	<input type="radio"/> Always OFF <input type="radio"/> Always ON <input checked="" type="radio"/> OFF when send <input type="radio"/> ON when send	<input type="radio"/> Always OFF <input type="radio"/> Always ON <input checked="" type="radio"/> OFF when send <input type="radio"/> ON when send	<input type="radio"/> Always OFF <input type="radio"/> Always ON <input checked="" type="radio"/> OFF when send <input type="radio"/> ON when send	<input type="radio"/> Always OFF <input type="radio"/> Always ON <input checked="" type="radio"/> OFF when send <input type="radio"/> ON when send
	Set	Get		

Pic 15: Serial interface settings [Interfaces>UARTs]

5.5 Ethernet

Ethernet interface is used for:

- data transferring to central computer;

- controller setup;
- Firmware version upgrade and update.

Supported protocols:

- Modbus TCP/IP Server – for data transfer;
- Modbus TCP/IP Client – for event alert;
- TCP – for data transfer;
- UDP – for data transfer;
- ICMP – for connection quality testing.

5.5.1 Modbus TCP/IP protocol

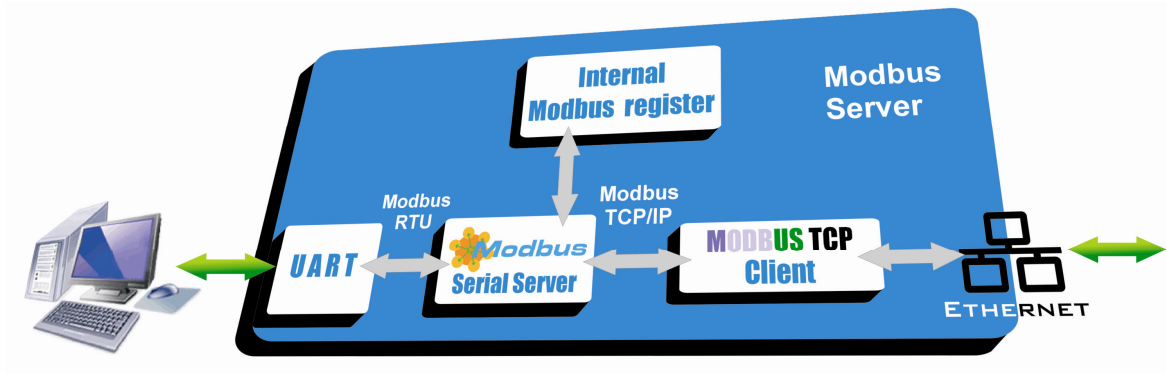
Modbus TCP/IP it is a Modbus RTU adapted for TCP. Modbus TCP/IP use TCP/IP protocol to transfer Modbus data packets over Ethernet network. Modbus RTU packet and all his functions (except Modbus control sum) is inserted into TCP frame and sent over 502 port, with is reserved for use with Modbus. All Modbus TCP/IP clients and servers query and accept Modbus data over 502 port. Data security is guaranteed by TCP (Transport Control Protocol). IP (Internet Protocol) takes care of addressing and data transferring.

Controller is using Modbus protocol for direct data exchange with PC, by using Ethernet. Controller can work as Modbus Server and as Modbus Client at the same time. Modbus Client sends query to Modbus Server, the Server makes decision, to answer in to query (read/write data), or to send it to other Server.

5.5.2 Modbus Server

Controller use Modbus RTU protocol to communicate with client's PC.

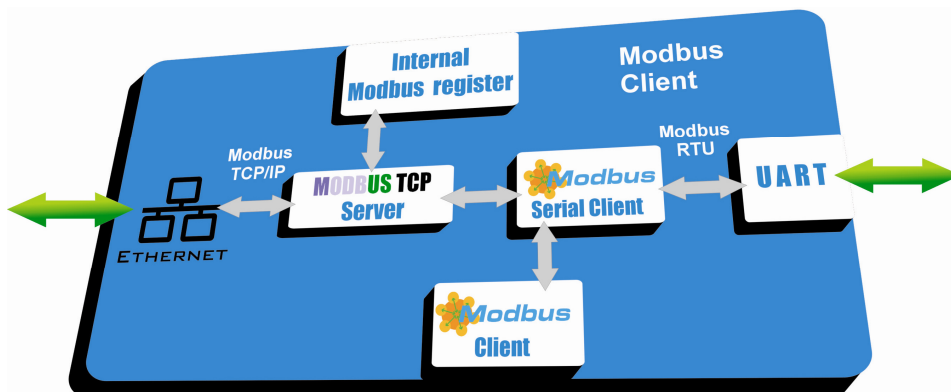
PC, over UART interface query Controller, with Modbus Server. The Modbus Server make decision what to do with query, and query internal Modbus Server register or send query to next Server and so on.... Query contains TCP port, MAC address (every controller has unique MAC), controllers IP address. Then query is sent over Ethernet. Remote Server over Ethernet returns answer to Controllers Modbus Server.



Pic 16: Scheme, how controller sends data in Modbus Server mode

5.5.3 Modbus Client

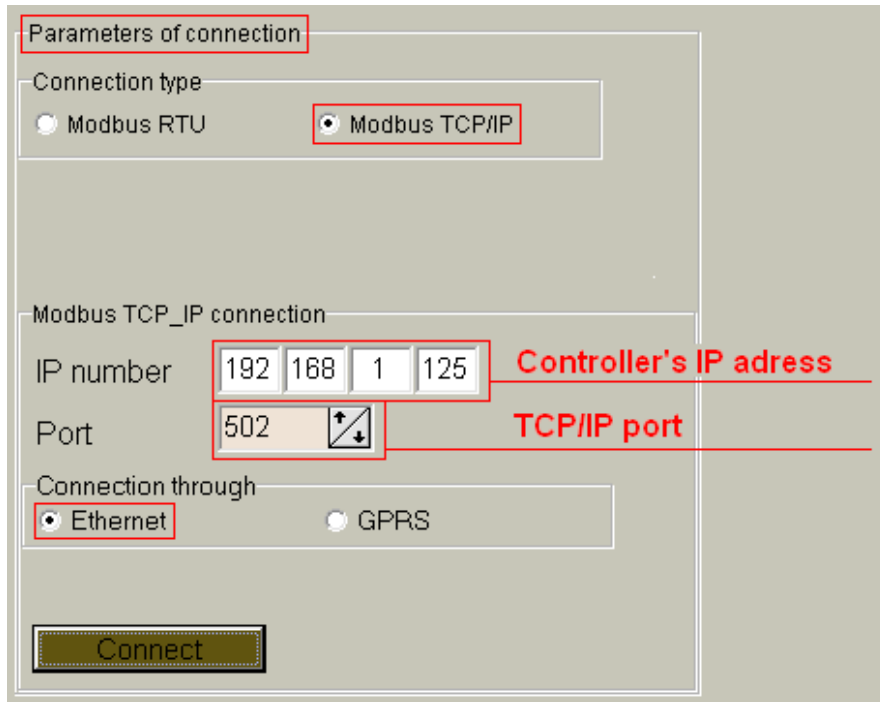
The query received over Ethernet in to Controllers Modbus TCP Server, which contains TCP port, Clients IP and MAC address, are redirected to internal register of Modbus Server or to Modbus Serial Client. Modbus Serial Client answers to query, sends it to some UART interface, or redirect to Modbus client (temperature, pressure or other sensor, Mbus counter or other device).



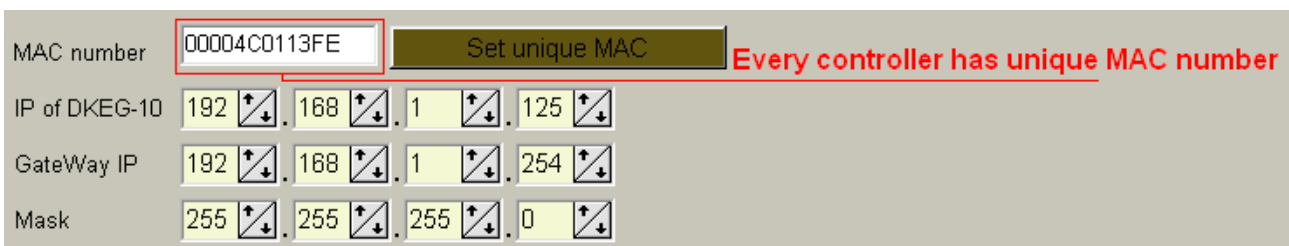
Pic 17: Scheme of controller in Modbus Client mode

5.5.4 Connecting to controller over Ethernet

You need to choose Modbus TCP/IP Communication type. Every controller must have unique IP address which will be used to connect to device. By default controller is set to 502 Port (this is system standard Modbus TCP/IP port), change it if you need other. By pressing “Connect” you will be connected to controller. If connection fails, recheck cables, Communication type, IP and Port values.

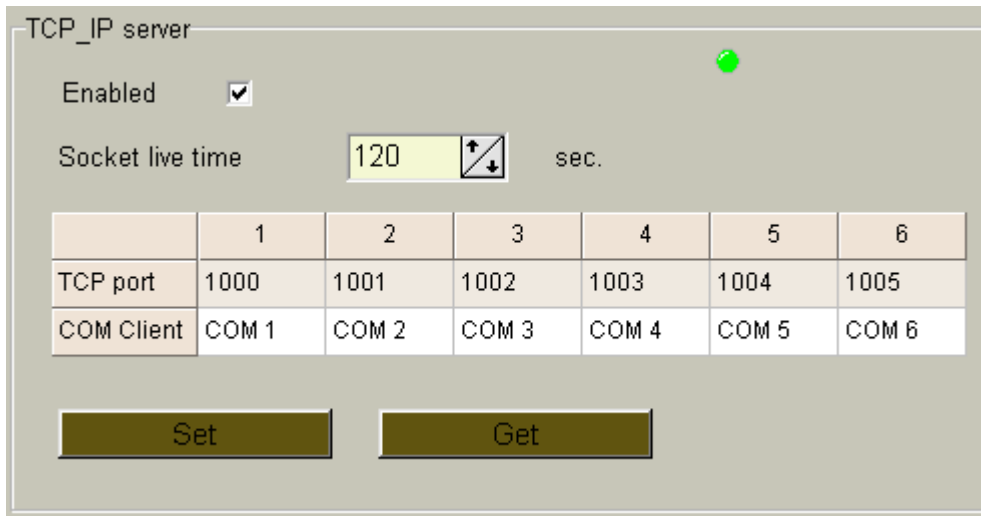


Pic 18: Controller connection screen [Interfaces>Ethernet]



Pic 19: Modbus TCP/IP Server screen [Interfaces>TCP parameters]

5.5.5 Setting up Modbus TCP/IP Server [Interfaces>TCP parameters]:

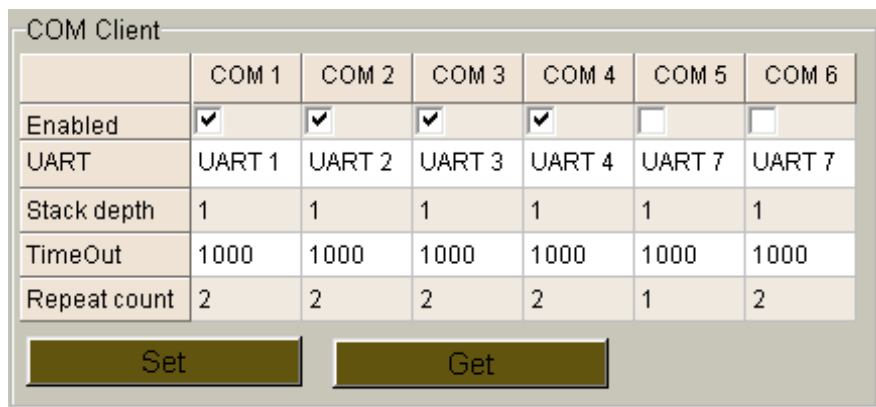


Pic 20: Ethernet interface settings [Interfaces>Ethernet]

Use check box to Enable or Disable TCP/IP Server. By default TCP/IP socket life time is set to 120 seconds, you can change if you need other time. Every COM client must have his one TCP port number.

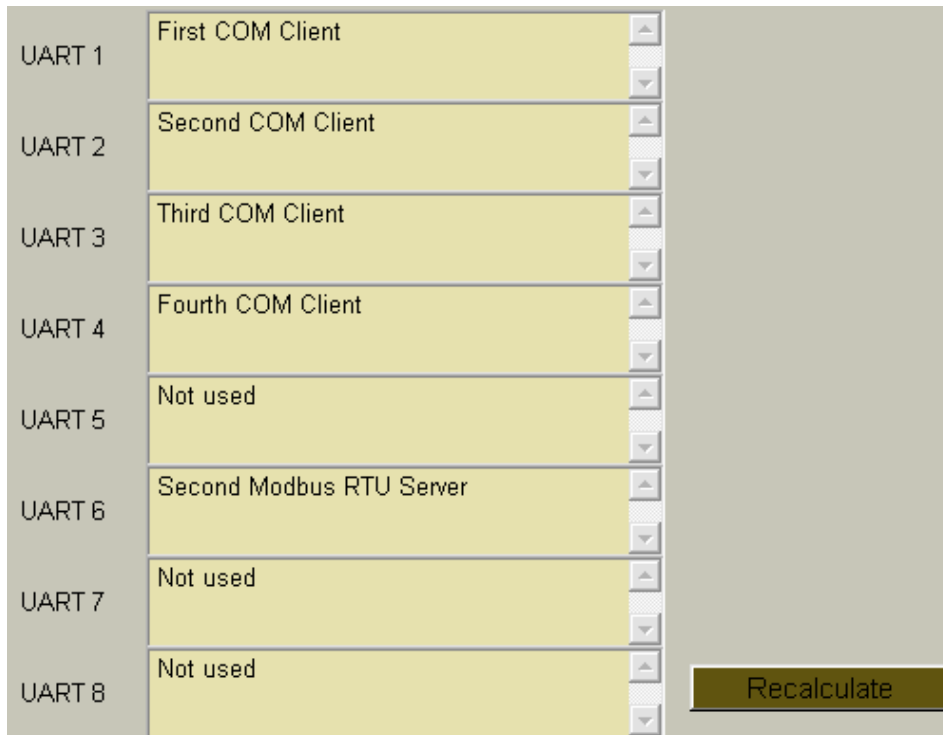
5.5.6 Setting up COM clients:

Use check box to Enable or Disable COM Clients (from COM1 to COM6). In the line „UART“, choose which UART (Universal Asynchronous Receiver Transmitter) port will be accessed by COM (values are from UART1 to UART5, and UART7). By default, UART6 is used by Modbus RTU Server and is used to configure controller. COM client is used, to read data from counter, and we need to set up COM client (not UART) (see **Pic 21**).



Pic 21: COM Client setup screen [Interfaces>Virtual interfaces]

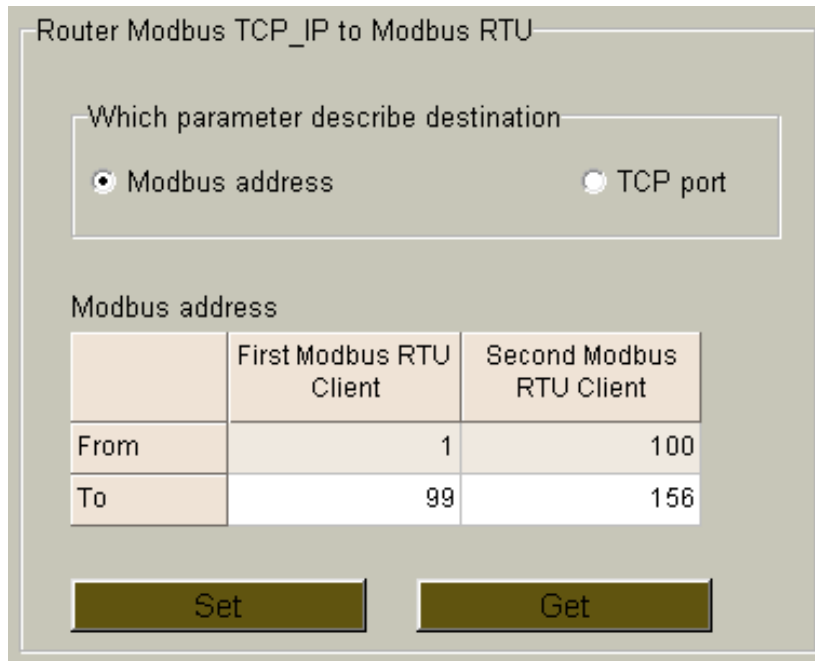
After you setup COM, the UART will show his configuration (see **Pic 22**). In this case UART1–UART4 correspond to COM1 – COM4 client. UART5 to first Modbus RTU client, UART6 to second Modbus Server (configuration port), UART7 – reserved, UART8 – GPRS modem.



Pic 22: UART interface settings [Interfaces>Virtual interfaces]

Modbus TCP/IP to Modbus RTU converter setting:

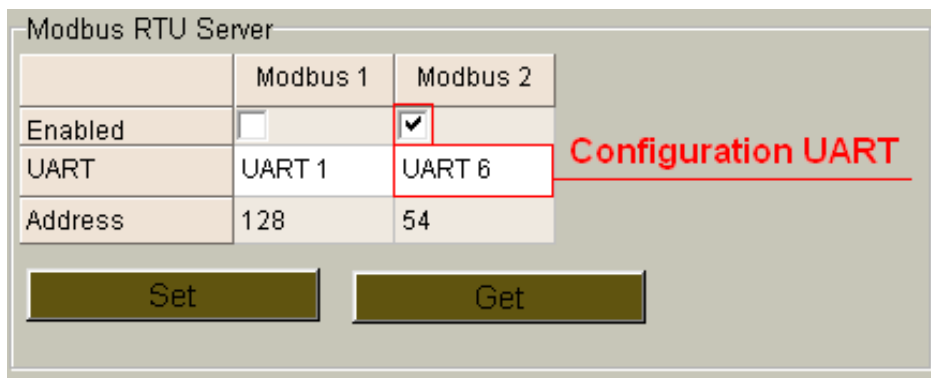
You need to choose Modbus RTU client redirection type (Modbus address or TCP port). In the Modbus address fields you can chose range of addressee to query.



Pic 23: Modbus TCP/IP to Modbus RTU configuration screen [Interfaces>TCP parameters]

Modbus RTU server:

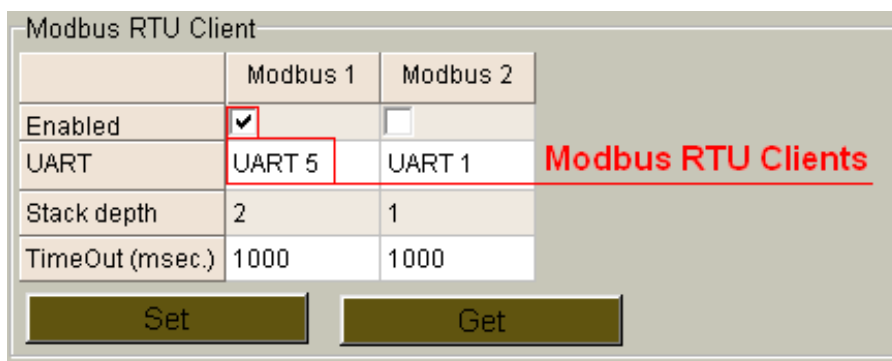
In this section, you can choose UART for controller configuration purpose. After you make your choice, you need to Transfer data to controller, by pressing “set”.



Pic 24: Modbus RTU server section [Interfaces>Virtual interfaces]

Modbus RTU client:

In this section, you can choose UART for Modbus client purpose. After you make you choice, you need to Transfer data to controller,by pressing “set”.



Pic 25: Modbus RTU Client section [Interfaces>Virtual interfaces]

5.5.7 Alert over Ethernet settings [Alerts>Configuration].

Select check box to Enable alert over Ethernet function. Enter destination Modbus TCP/IP servers IP address and Port, change time values if you need and set data.

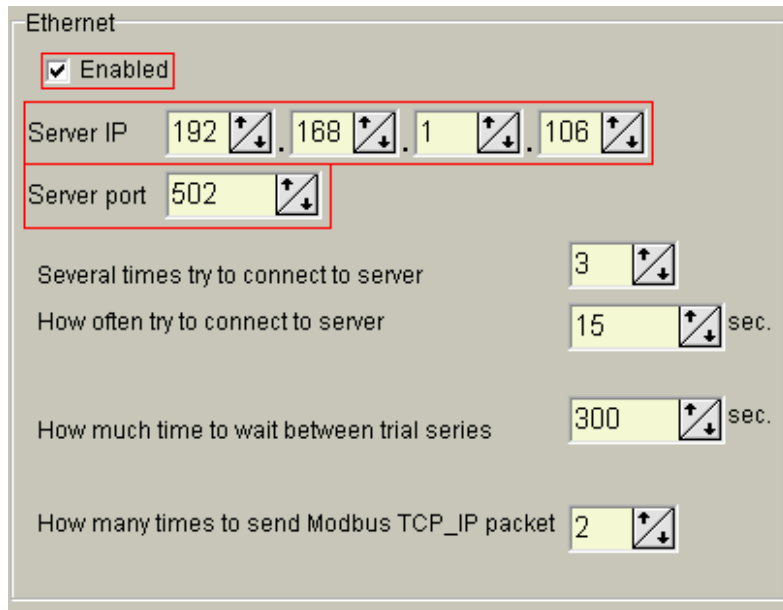
If you did everything correct, on every deviation, the alert message will be sent.

Information transfer algorithm:

- 1) Controller makes connection to server, over Ethernet TCP socket.
- 2) By Modbus TCP/IP protocol, using function nr. 16, deviation report will be sent to server.

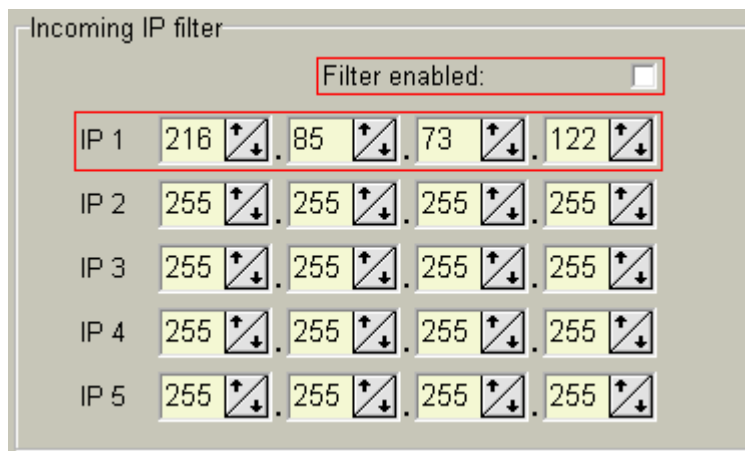
Report contains:

- Unique controller number;
 - Controller IP address;
 - Deviation identifier (see chapter 5.7.6)
- 3) When answer into function nr. 16 is received, controller disconnects from TCP socket.
 - 4) When server get's deviation information, it initializes connection with controller and over Modbus TCP/IP read all details about deviation
 - 5) If connection with server was not established over the set (connection to server time) number of tries, controller will try to connect after some time (see **Pic 26**).
 - 6) If opening of socket is succeeded, but server do not answer into Modbus function 16, controller repeat once and on failure, closes TCP socket. After set time (wait between trial times) amount of time controller will try to send alert again. (see **Pic 26**).



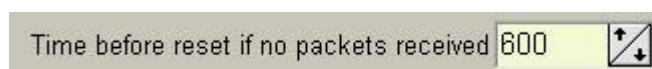
Pic 26: Alert over Ethernet configuration section [Alerts>Configuration]

By checking FILTER ENABLE you enable Firewall. You can enter 5 IP (IP1 – IP5) exception addresses. After enabling filtering, connection to controller can be established only from addresses listed in the table (see **Pic 27**).



Pic 27: IP filtering section [Interfaces>Ethernet]

To prevent system hangingup, you can set Ethernet packet time before reset (in seconds), if no packets received values range from 600 to 36000 seconds (see **Pic 28**).

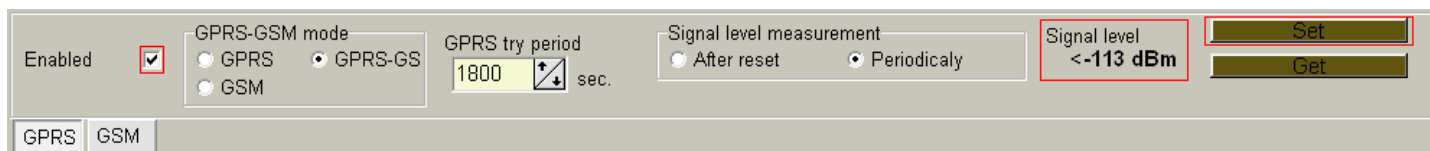


Pic 28: Time before reset if no packet received [Interfaces>Ethernet]

5.6 GPRS/GSM [Interfaces>GPRS]

GPRS (General Packet Radio Service) – it is a packet transferring over GSM protocol. By using GPRS sent/receive data is splitted into TCP/IP packets, and then in TCP/IP packets they will be transferred over GSM network. All network devices, has unique static IP addresses. By using APN (Access Point Name) identification your device will access an IP packet data network (PDN), that a mobile data user wants to communicate with. In addition, to identifying a PDN, an APN may also be used to define the type of service, (e.g. connection to wireless application protocol (WAP) server, multimedia messaging service (MMS)), that is provided by the PDN, and access private company network. GPRS devices cannot use dynamic addresses. On turning controller on, if SIM card is inserted, controller is making connection. Connecting takes about 30s.

To use GPRS/GSM modem, you must enable device (by checking “Enable” box) in INTERFACES>GPRS screen. Also you can choose data transfer protocol: GPRS; GSM; GPRS/GSM (see **Pic 30**). Please don’t forget to SET data to controller.



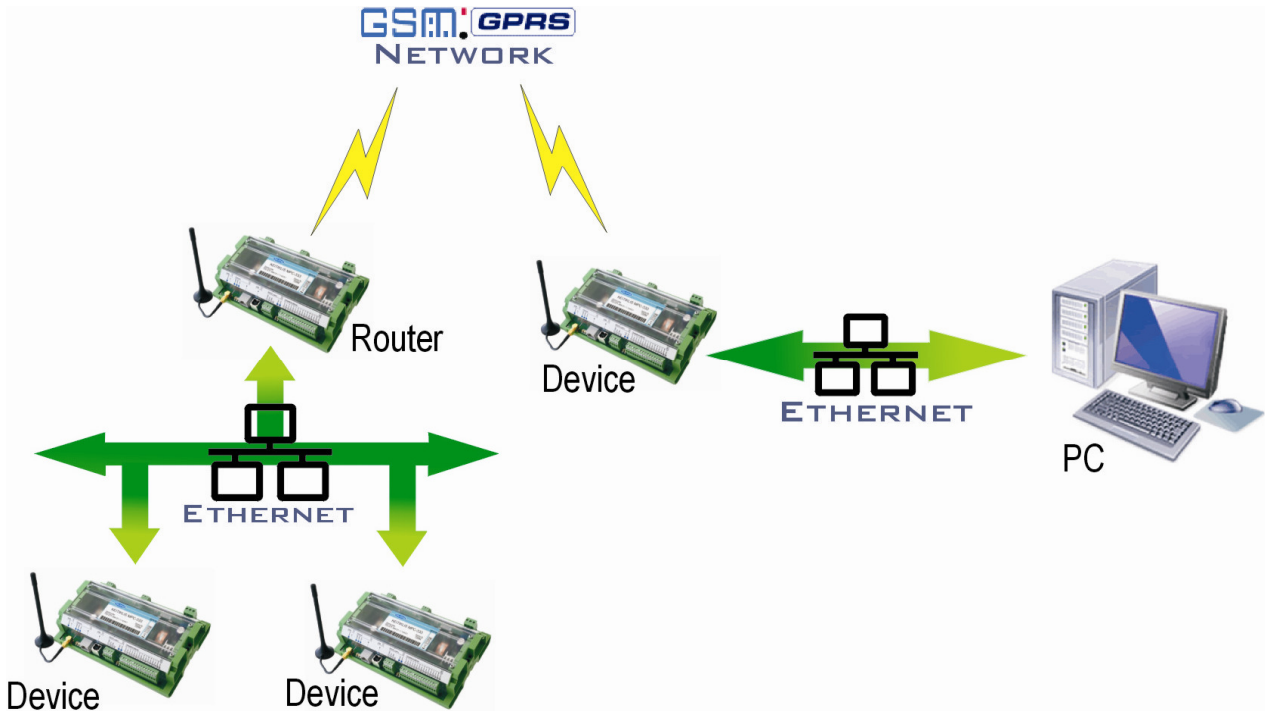
Pic 29: GPRS/GSM setup section [Interfaces>GPRS>GPRS]

On GPRS status section You can seen GPRS/GSM connection data (status, IP address, last connection date and time, last disconnection date and time, total connection value) (see **Pic 29:**). After restart, controller will establish GPRS/GSM connection automatically. Connection status will show every connection step (disconnected, in progress, connected). After connection was established, controller receive GPRS IP address, you can see it in field Assigned IP (see **Pic 29:**).

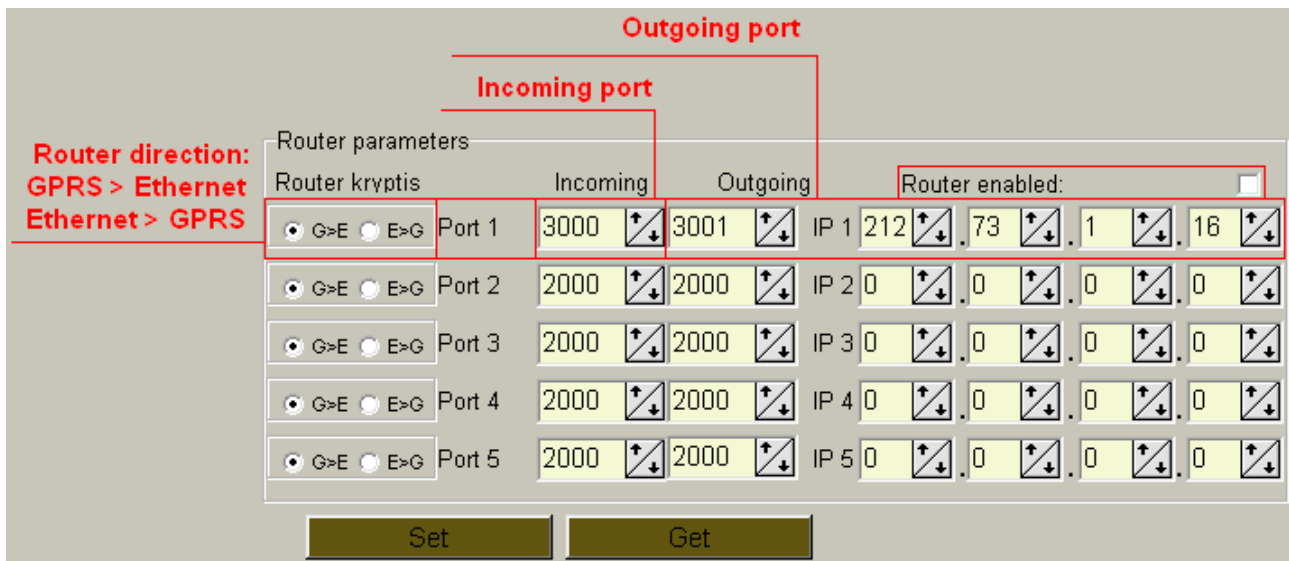


Pic 30: GPRS status section [Interfaces>GPRS>GSM]

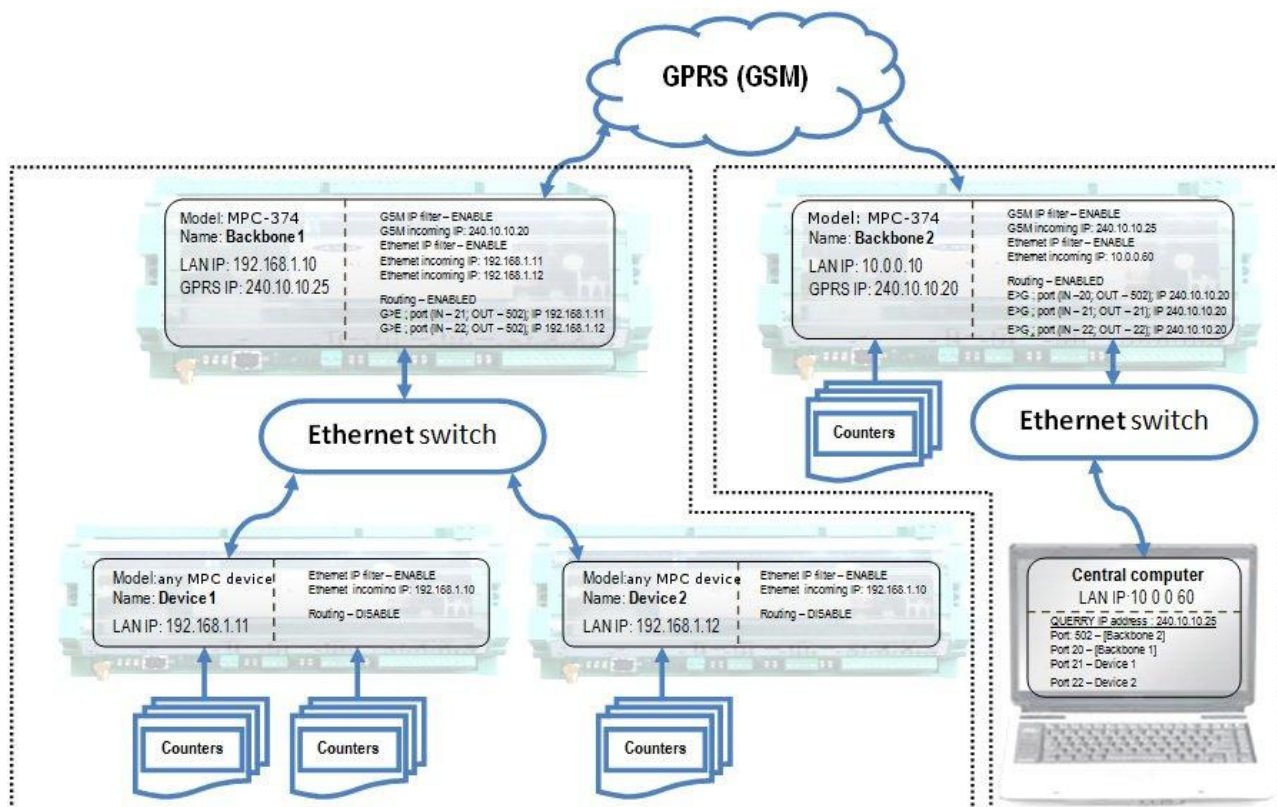
Controller can be used, as router, when you trying to access other our controllers, or sending packets to Ethernet network. If controller, in router mode, is establishing connection to GPRS network, incoming port (Port1 –Port5) will be changed to outgoing port (Port1 – Port 2). The internal GPRS IP address will be changed in to configurable IP addresses (IP1 – IP5), will be checked Checksum and data will be sent over Ethernet port 502.



Pic 31: Routing scheme

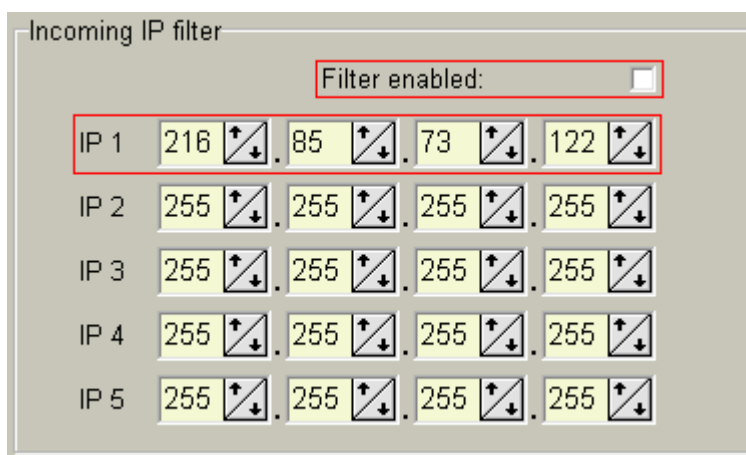


Pic 32: Controller, router configuration section [Interfaces>GPRS>GPRS]



Pic 33: Controller, router configuration section [Interfaces>GPRS>GPRS]

By checking FILTER ENABLE you enable Firewall. You can enter 5 IP (IP1 – IP5) exception addresses. After enabling filtering, connection to controller can be established only from addresses listed in the table (see **Pic 34**).



Pic 34: IP filtering section [Interfaces>GPRS>GPRS]

5.6.1 Alert over GPRS [Alerts>Configuration].

Event, on input port change, controller generates event. Through GPRS controller can send

information to remote server (we call this Alert). To use Alerts over GPRS:

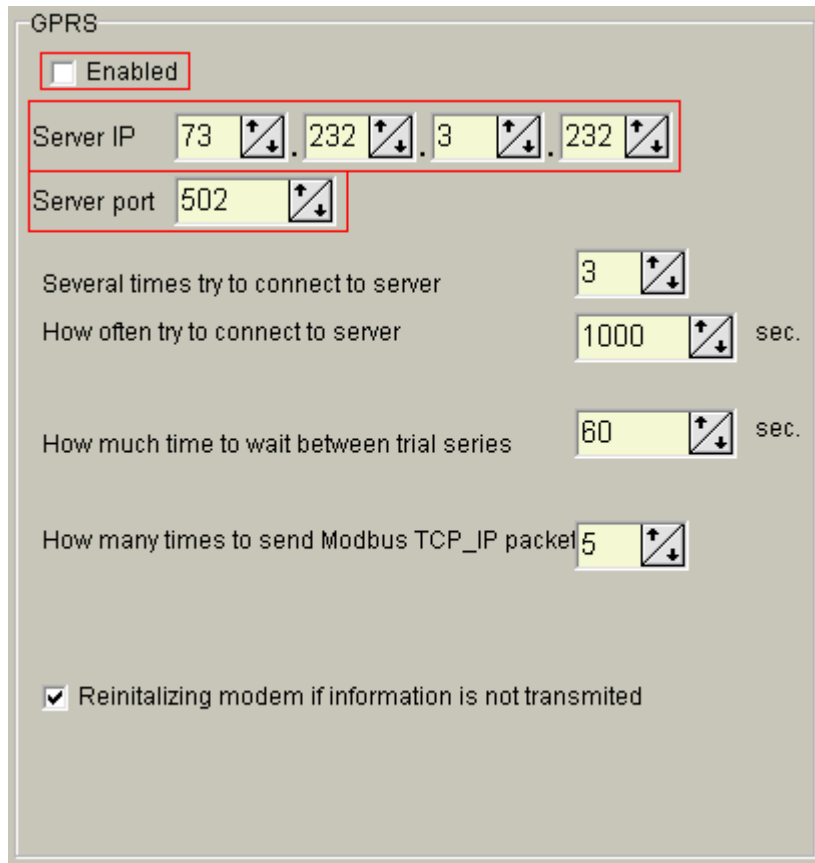
- 7) Check box Enable
- 8) Enter remote server IP address (PC that you use to receive alerts IP address).
- 9) Use default, or change Modbus TCP/IP port address.

Information transfer algorithm:

- 10) Controller makes connection to server, over Ethernet TCP socket.
- 11) By Modbus TCP/IP protocol, using function nr. 16, deviation report will be sent to server.

Report contains:

- Unique controller number;
 - Controller IP address;
 - Deviation identifier (see chapter **5.7.6**)
- 12) When answer into function nr. 16 is received, controller disconnect TCP socket.
 - 13) When server get's deviation information, he initialize connection with controller and over Modbus TCP/IP read all details about deviation
 - 14) If connection with server was not established over the set (connection to server time) number of tries, controller will try to connect after some time (see **Pic 35**).
 - 15) If opening of socket is succeeded, but server do not answer into Modbus function 16, controller repeat once and on failed, close TCP socket. After set time (wait between trail times) amount of time controller will try to send alert again. (see **Pic 35**).



Pic 35: Alert over GPRS configuration section [Alerts>Configuration]

5.7 Data storing to archive [Archives]

All collecting data in controller are grouped into 9 groups:

- 16) Analog inputs
- 17) Discrete inputs
- 18) Heat
- 19) GAS
- 20) Water
- 21) Electricity
- 22) Discrete impulses
- 23) Events
- 24) Diagnostic

Controller, some data, writes to archive by default, but you can edit data storing time intervals. Other data, like Analog inputs you need to enable.

To write analog inputs data to archive - enable it by selecting check box. If you need, you can change data storing period (default value is 900s). This table is in [Archives/Configuration]

window.

Period of storing other data also can be changed in [Archives/Configuration] (see **Pic 36**).

Storage parameters		
	Enabled	Period
Analog inputs (sec.)	<input checked="" type="checkbox"/>	60
Heat account (min.)	<input type="checkbox"/>	60
Gas account (min.)	<input type="checkbox"/>	60
Impulse (min.)	<input type="checkbox"/>	1
Water account (min.)	<input type="checkbox"/>	60
Electricity account (min.)	<input type="checkbox"/>	60

Pic 36: Archive storage parameters section [Archives>Configuration]

In section RECORDS IN ARCHIVES, you can see total number of stored values in each group. By pressing clean, you can manually clean group data from archive (see **Pic 37**).

Records in archives		
	Records	
Analog inputs	1599	<input type="button" value="Clear"/>
Heat account	162	<input type="button" value="Clear"/>
Gas account	162	<input type="button" value="Clear"/>
Water account	162	<input type="button" value="Clear"/>
Electricity account	162	<input type="button" value="Clear"/>
Impulse	3997	<input type="button" value="Clear"/>
Discret. in-out	237	<input type="button" value="Clear"/>
Alerts	571	<input type="button" value="Clear"/>

Pic 37: Records in archives section [Archives>Configuration]

In Analog input group are also stored data from thermometers that can be connected to serial interface (up to 5 devices). More details on thermometers, you can read in chapter (5.7.1).

5.7.1 Log of analog input channels [Archives>Analog inputs].

In Analog inputs archive you can find values of all 8 analog inputs and up to 5 temperature sensors, connected through serial interface. Every record contains time (long integer – 32 bits), and values (float 32 bits) of all analog and temperature inputs (see **Pic 37**).

By default analog inputs are stored every 900 seconds. In the [Archives/Configuration] window you can change this value to yours (see **Pic 36**).

Time	Analog inputs 1	Analog inputs 2	Analog inputs 3	Analog inputs 4	Analog inputs 5	Analog inputs 6	Analog inputs 7	Analog inputs 8	Temperature 1
23/04/2010 09:05	0.00	0.00	9.88	0.00	0.00	0.00	0.00	0.00	0.00
23/04/2010 09:04	0.00	19.76	9.88	0.00	0.00	0.00	0.00	0.00	0.00
23/04/2010 09:03	19.76	19.76	9.88	0.00	0.00	9.88	0.00	0.00	0.00
23/04/2010 09:02	19.76	0.00	9.88	0.00	0.00	9.88	0.00	0.00	0.00
23/04/2010 09:01	19.76	0.00	9.88	8.70	0.00	9.88	0.00	0.00	0.00
23/04/2010 09:00	0.00	0.00	9.88	19.76	0.00	9.88	0.00	0.00	0.00
23/04/2010 08:59	0.00	0.00	9.88	19.77	0.00	9.88	0.00	0.00	0.00
23/04/2010 08:58	0.00	0.00	9.88	19.76	0.00	9.88	0.00	0.00	0.00
23/04/2010 08:57	0.00	0.00	9.88	19.76	0.00	9.88	0.00	0.00	0.00
23/04/2010 08:56	0.00	0.00	9.88	0.00	0.00	9.88	0.00	0.00	0.00
23/04/2010 08:55	0.00	0.00	8.24	0.00	0.00	9.88	8.70	0.00	0.00
23/04/2010 08:54	0.00	0.00	0.00	0.00	0.00	9.88	19.76	0.00	0.00
23/04/2010 08:53	0.00	0.00	0.00	0.00	0.00	9.88	19.77	0.00	0.00
23/04/2010 08:52	0.00	0.00	0.00	0.00	0.00	9.88	19.76	0.00	0.00
23/04/2010 08:51	0.00	0.00	0.00	0.00	0.00	8.24	19.76	0.00	0.00

Pic 38: Structure of Analog input table [Archives>Archived values>Analog inputs]

Temperature sensors:

To controller can be connected up to 5 “Valsena” made temperature sensors. Temperature sensors use RS485, to connect to controller. Every sensor has it’s one number, two last symbols in sensor’s code is Modbus address. In thermometer configuration section Temperature sensors (on [Interfaces/Virtual interfaces]), you can enable temperature sensors (see **Pic 39**).

Temperature sensors

Enabled

Modbus RTU Client
 Client 1 Client 2

Count of sensors Read period sec.

	Sens. 1	Sens. 2	Jut. 3	
Address	26	6	33	Temperature sensors addresses
Value	20.0	10.2	15.6	Measured temperature value

Pic 39: Temperature sensors section [Interfaces>Virtual interfaces]

Also you need to set:

- number of temperature sensors,
- read period (by default – 2s),
- sensor’s Modbus address (two last digits of sensor number)

5.7.2 GAS counter data logging [Archives>GAS]

Controller can log data from up to 5 counters. Data are grouped by counter, in first group you can see all data form 1 counter, then 2 and up to 5 (see **Pic 40**). Data field type is float (32 bits) digit.

Logged parameters:

- 25) Pressure
- 26) Temperature
- 27) Corrected factor
- 28) Uncorrected factor
- 29) Corrected volume
- 30) Uncorrected volume

Analog inputs					Heat					Gas					Water					Electricity					Discrete inputs					Events					Diagnostic				
Time	Counter 1				...	Counter 5																																	
	Totalizer	Flow	Temperatur	Pressure		Flow	Temperatur	Pressure	Totalizer																														
2009-07-10 12:00	-1000.0	-1000.00	-1000.0	-1000.000		-1000.0	-1000.00	-1000.0	-1000.000																														
2009-07-10 11:30	-1001.0	-1001.00	-1001.0	-1001.000		-1001.0	-1001.00	-1001.0	-1001.000																														
2009-07-10 11:00	-1001.0	-1001.00	-1001.0	-1001.000		-1001.0	-1001.00	-1001.0	-1001.000																														
2009-07-10 10:30	-1001.0	-1001.00	-1001.0	-1001.000		-1001.0	-1001.00	-1001.0	-1001.000																														
2009-07-10 10:00	-1001.0	-1001.00	-1001.0	-1001.000		-1001.0	-1001.00	-1001.0	-1001.000																														

◀ [Get] ▶

Pic 40: GAS counter archive screen [Archives>GAS]

5.7.3 Logging water data [Archives>Water]

In water data log, can be stored up to 50 counters. All data are grouped by counters and each counter contains 2 value fields and time stamp.

Analog inputs Heat Gas Water Electricity Discrete inputs Events Diagnostic									
Time	Counter 1		Counter 2		Counter 3		Counter 50		
	Main . 1	Main . 2	Main . 1	Main . 2	Main . 1	Main . 2	Main . 1	Main . 2	Main . 2
2009-07-10 13:30	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000
2009-07-10 13:15	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000
2009-07-10 13:00	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000
2009-07-10 12:45	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	...	-1000.000	-1000.000
2009-07-10 12:30	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000
2009-07-10 12:15	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000
2009-07-10 12:00	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000	-1000.000
2009-07-10 11:45	-1001.000	-1001.000	-1001.000	-1001.000	-1001.000	-1001.000	-1001.000	-1001.000	-1001.000

Get

Pic 41: water data log screen [Archives>Water]

5.7.4 Electricity counter data logging [Archives>Electricity].

To controller can be connected up to 40 electricity counters. All data are grouped by counters. Each record of counter's has 4 value fields and data stamp (see Pic 42).

Analog inputs Heat Gas Water Electricity Discrete inputs Events Diagnostic									
Time	Counter 1				Counter 40				
	Energy 1	Energy 2	Energy 3	Energy 4	Energija 1	Energija 2	Energija 3	Energija 4	
2009-07-10 12:51	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	
2009-07-10 10:16	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	
2009-07-10 05:59	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	
2009-07-10 01:42	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	
2009-07-09 21:25	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	-1001.0	
2009-07-09 17:08	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	-1000.0	

Get

Pic 42: electric counters log screen [Archives>Electricity]

5.7.5 Discrete inputs log [Archives>Discrete inputs]

Discrete input table contains records about discrete channel changes. Totally controller has 8 discrete channels.

Every record has time stamp, channel number (from 0 to 7, totally -8), state after changes (0 – open, 1 – closed contact) and state of all channels, in binary format you can see state of every channel (0 –open, 1 – closed contact), if value is two symbols, this means it is in HEX (you need to

convert to binary manually) (see **Pic 43**).

Analog inputs Heat Gas Water Electricity Discrete inputs Events Diagnostic						
Time	Chan.	State	State of all ch			
20\04\2010 15:31:12	1	0	00			
20\04\2010 15:29:45	1	1	02			
20\04\2010 15:29:44	0	0	00			
20\04\2010 15:29:40	0	1	01			
20\04\2010 15:29:28	0	0	00			
20\04\2010 15:29:14	0	1	01			

Pic 43: screen of discrete inputs log [Archives>Discrete inputs]

5.7.6 Event logging [Archives>Events]

Event conditions:

- Analog inputs value go out from set range,
- Discrete input channel change.

Every deviation can be set/changed by configuring controller. On deviation appears, it will be saved in event log. Event log records fields:

- Time
- Identifier
- Parameters
- Chanel
- Event
- Value

By parameters column, you can understand which device group send's this event :

- 0 – Analog inputs;
- 1 – Discrete inputs;
- 2 – Heat counter;
- 3 – Gas counter.

Analog inputs Heat Gas Water Electricity Discrete inputs Events Diagnostic						
Time	Identifier	Main fields	Chan.	Event	Value	
23\04\2010 10:26:28	685	0	3	1	0.0	
23\04\2010 10:26:28	684	0	2	1	0.0	
23\04\2010 10:26:28	683	0	1	1	0.0	
23\04\2010 10:22:32	682	0	3	1	0.0	
23\04\2010 10:22:22	681	0	3	2	9.9	
23\04\2010 10:21:30	680	0	3	2	19.8	
23\04\2010 10:21:23	679	0	8	1	0.0	
23\04\2010 10:21:23	678	0	7	1	19.8	
23\04\2010 10:21:23	677	0	3	1	0.0	
23\04\2010 10:21:23	676	0	2	1	0.0	
23\04\2010 10:21:23	675	0	1	1	0.0	
23\04\2010 10:20:21	674	0	1	1	0.0	
23\04\2010 10:19:47	673	0	1	2	19.8	
23\04\2010 10:19:45	672	0	1	1	0.0	
23\04\2010 10:19:35	671	0	1	2	19.8	

Pic 44: Events log screen [Archives>Events]

5.8 Accounting of energy carrier counters [Interfaces>Accounting]

5.8.1 Heat counters [Interfaces>Accounting>Heat]

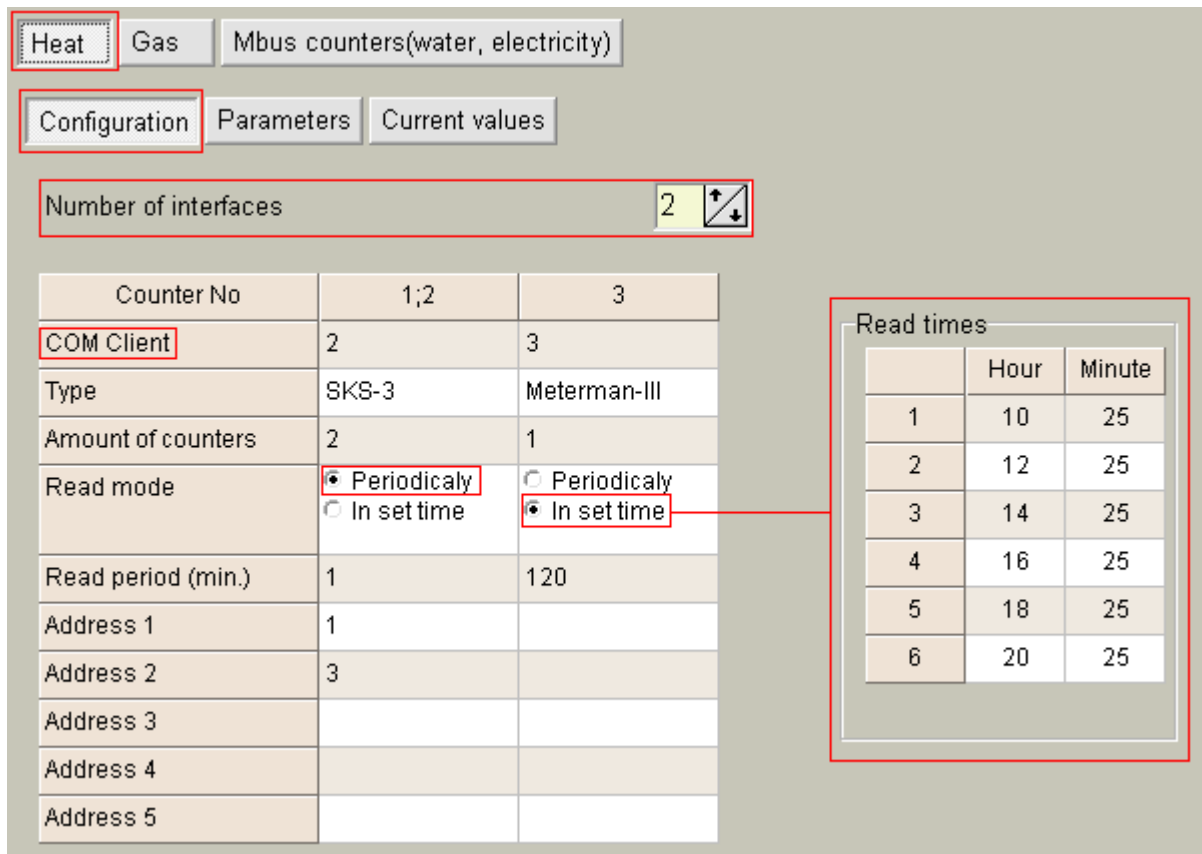
For the first, you need to understand 3 things:

1. Number of interfaces – it is number of physically used interfaces on controller.
2. Amount of counters – it is number of counters, connected to interface.
3. And mostly important is, that total number (sum) of interfaces and counters, per controller can be 5 devices. So, if to one interface you connect 4 counters, you can use 1 more interface, but to this interface you can connect only 1 counter, because 4+1 is 5 (MAX number) – you can't connect one more counter to any interface!

To **CONFIGURATE** HEAT counters, you need to setup (see **Pic 45**):

1. Number of interfaces;
2. Interface settings:
 - a) COM client (UART port must be configured and assigned to COM client, how to do this, see chapter **5.5.6**);
 - b) Type of counter (choose from the list of supported counters, or contact manufacturer);

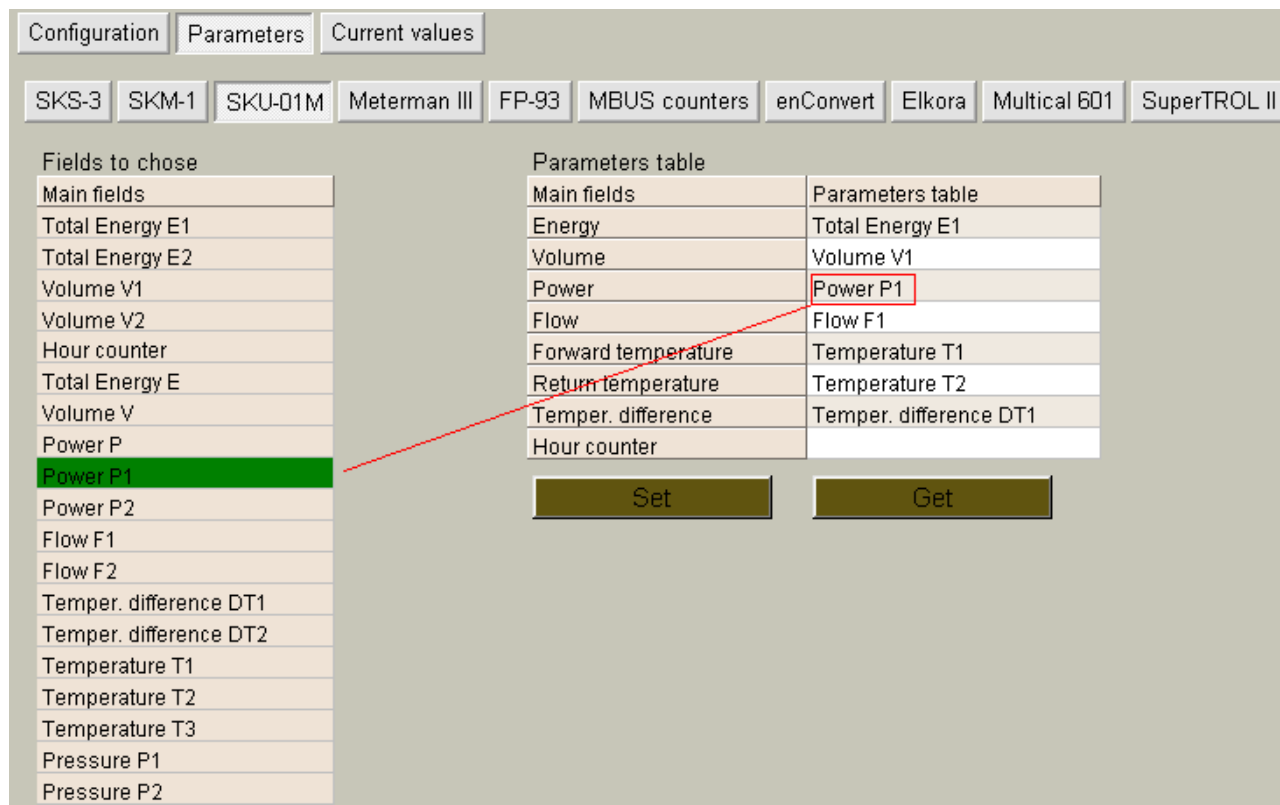
- c) Amount of counters, that you connect to this interface;
- d) Data read mode, “Periodically” or “In set time”;
- e) Read period (min), if in previous section you selected “Periodically”, now you need to set reading period in minutes, the value can be from 1 to 720 minutes (be default it is 120 min). If “Reading mode” is set to “In set time”, this value is not important, because it is not used;
- f) In Address1 .. Address5 fields, you need to enter address of each connected counter (some address values is set by counter manufacturer, some models support custom addresses, read counter’s manual, to get more information);
- g) If in “Read mode” you choose “In set time, then in right part appears “Data read time” table, you must enter up to 6 data read from counter times.



Pic 45: Heat counter configuration screen [Interfaces>Accounting>Heat>Configuration]

To setup **PARAMETER**, you must choose type of counter, that you use. In All available fields table, you can see all Heat indicators for selected type of counter. In Data for logging tables left side you can see field name and by using Drag-and-Drop you can drag parameters form “All available fields” table to Data for logging table (you need to drag in to right side of table, and take care to drag into right row). By choosing data in Data for logging table, you will unify logged data values

and in this case you can compare data from different type of counters. Do not forget to write data to controller, by pressing SET (see Pic 46).



Pic 46: Heat counter parameters screen [Interfaces>Accounting>Heat>Parameters]

In [Interfaces>Accounting>Heat>Current values] you will find current values of all heat counters (see **Pic 47.**)

Main fields	Counter 1	Counter 2
Energy	0,191	0,154
Volume	10	15
Power	5,61	7,82
Flow	2,3	4,6
Forward temperature	222,11	200,35
Return temperature	60,92	73,94
Temper. difference	161,19	126,41
Hour counter		

Pic 47: Heat current values [Interfaces>Accounting>Heat>Current values]

5.8.2 GAS counters [Interfaces>Accounting>GAS]

Controler can log data form 5 independent GAS counters.

To configure new GAS counter, [Interfaces>Accounting>GAS>Configuration] (see **Pic 48**) you need to:

- 31) Enable counter;
- 32) Set COM port number (UART port must be configured and assigned to COM client, on how to do this, see chapter 5.5.6);
- 33) Chose type of connected counter;
- 34) Enter counter data read period in minuters (time value can be from 1 to 60);
- 35) In Address field, you need to enter address of counter (some address values is set by counter manufacturer, some models support custom addresses, read counters manual, to get more information);
- 36) Multiplier 1 and Multiplier 2 – some counters gave values without the decimal point, and using Multiplier, you can correct value. Multiplier 1 is used for *Totalizer* value, Multiplier 2 – *Flow* value. Only counters, that doesn't use decimal point let you change values in this fields. If you can't enter new value, this means multiplication is not needed.

	Counter 1	Counter 2	Counter 3	Counter 4	Counter 5
Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COM Client	1	2	3	4	1
Type	ROOTS PTZ	Unigas	Unigas	Unigas	Unigas
Read period (min.)	1	1	1	1	1
Address	255	255	255	255	255
Multiplier 1	1.00000	1.00000	1.00000	1.00000	1.00000
Multiplier 2	1.00000	1.00000	0.00000	0.00000	0.00000

Pic 48 : GAS counters configuration screen [Interfaces>Accounting>GAS>Configuration]

Currenty values of GAS's counters, you can find in [Interfaces>Accounting>GAS>Current values] (see **Pic 49**).

Main fields	Counter 1	Counter 2	Counter 3	Counter 4
Totalizer	16.097	23.000	20.319	25.970
Pressure	1.092	1.360	1.590	1.600
Temperature	60.070	63.198	65.020	70.917
Flow	2.400	4.650	3.500	6.000

Pic 49: GAS current values screen [Interfaces>Accounting>GAS>Current values]

5.8.3 MBus connected counters [Interfaces>Accounting>MBus]

Controller support up to 2 Mbus interfaces, to each interface can be connected up to 200 Mbus counters (by using RS232/RS485 to Mbus converter you can extend range of supported devices), so total number counters per controller is 400 (see **Pic 50**).

Setting up Mbus interfaces:

- 37) Enable or Disabel interface by using check box.
- 38) Assign COM client by entering number of COM port (UART port must be configured and assigned to COM client, on how to do this, see chapter **5.5.6**);
- 39) See and correct if you need Read period value in minutes. Field value can be form 1 to 720 minutes.
- 40) Send data to controller, to take action.

	Mbus interf.	Mbus interf.
Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
COM Client	2	1
Amount of counters	5	1
Read period (min.)	1	1

First group		Second group			Address
Pos No	Water ind.	Electr. ind.	Heat ind.	Gas ind.	
1					06110091A34A46907
2					0118D091A74A4607
3					4560D8915D5379A3
4					08A891D1802A6470
5					0711007A54618D79

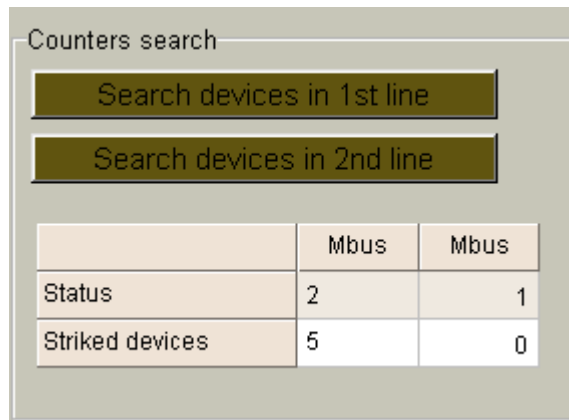
Pic 50: Mbus counter configuration screen [Interfaces>Accounting>MBus]

When you setup Mbus interface, you can use automatic Mbus device Search buttons for each

interface (see **Pic 51**). Then controller will search and setup all to controller connected Mbus devices.

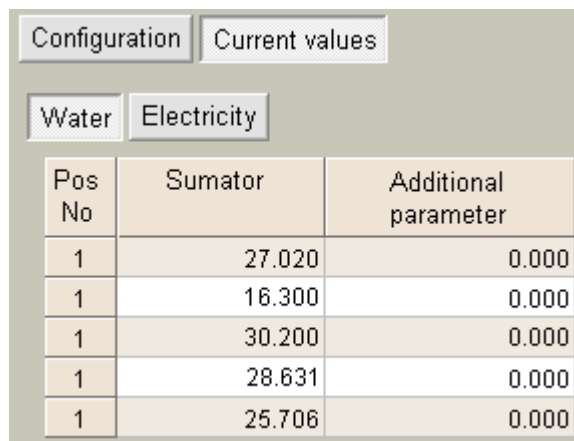
Counter will be grouped by type, depending on “Measured medium” values (1 - Oil, 2 - Electricity, 3 - GAS, 4 - Heat and so on)

Attention !: Do not use search function (or at least be careful), if system already has data, and some devices are already listed in Mbus device list, because Search will reindex all records and you will lose all saved data.



Pic 51: Mbus automatic Search section [Interfaces>Accounting>Mbus]

Logged data you can read in [Interfaces>Accounting>Mbus>Current values] window (see **Pic 52**).



Pic 52: Mbus Current values screen [Interfaces>Accounting>Mbus>Current values>Water]

6 SUPPLEMENT

6.1 System requirements

Minimal system requirements

PC with 300 megahertz or high processor
128 megabytes (MB) of RAM
100 megabytes (MB) free hard disk space
Super VGA (800 x 600) or higher-resolution video adapter and monitor
Keyboard and Mouse or compatible pointing device
Free COM port, USB or Ethernet adapter (depending on your connection type)
Microsoft Windows 95 or high Operating system

Recommended system requirements

PC with 2 gigahertz processor
512 megabytes (MB) of RAM
200 megabytes (MB) free hard disk space
Super VGA (800 x 600) or higher-resolution video adapter and monitor
Keyboard and Mouse or compatible pointing device
Free COM port, USB or Ethernet adapter (depending on your connection type)
Microsoft Windows XP or high Operating system

6.2 Default connection values

Configuration UART 6 default values is:

Bits per second **19200**
Data bite **8**
Parity **Even**
Stop bits **1**

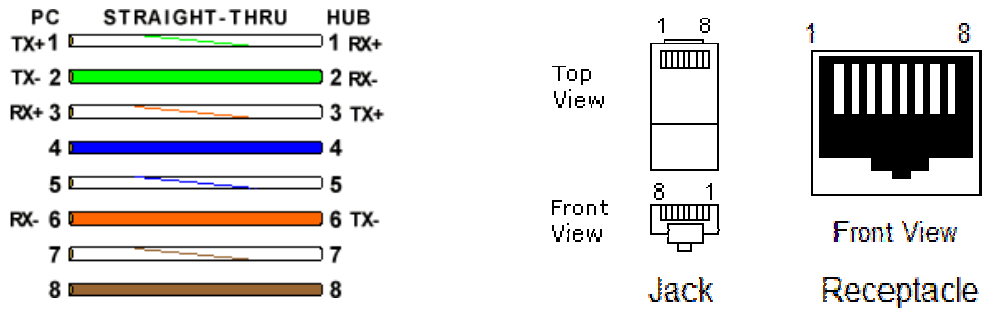
Default Ethernet settings are:

IP address **192.168.1.125**
number of bits **24** (this means MASK: 255.255.255.0)

6.3 Preparing UTP cable

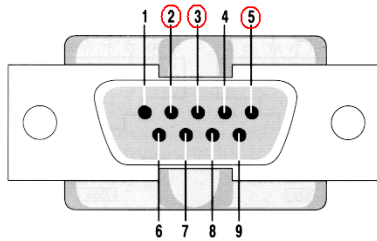
You can connect computer to controller over network (switch, hub, etc.) or directly (controller is auto sensing) - using standart UTP or FTP cable. Cable must to be connected straightly – wiring of Jack must to be the same in bouth ends of cable.

Ethernet uses 1, 2, 3 and 6 pins, see carefully cable colors of this pins.



6.4 RS232 cabling

Devices to controller is connected through terminal blocks. Exact configuration of pins are shown on the top of the case. For communication with computer controller is using only RD, TD and GND signals:

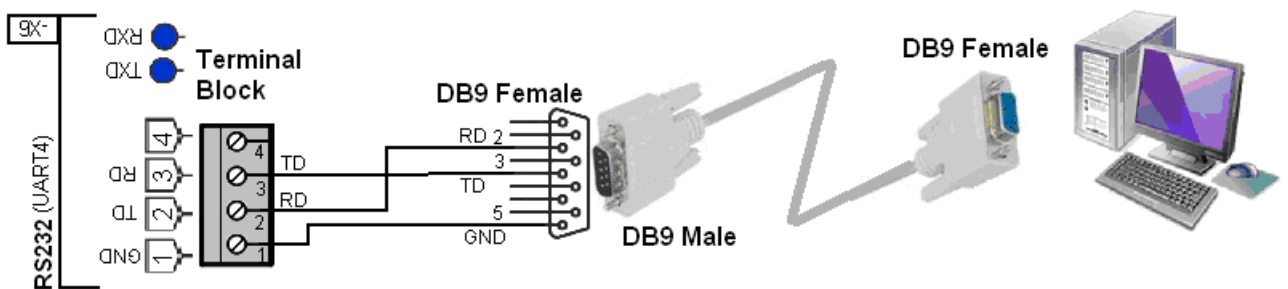


2 pin – RD (Received data)

3 pin – TD (Transmitted data)

5 pin – GND (Ground)

You can use existing Com port, or USB to Com port, PCMCIA to Com or etc. device.



6.5 Com port setup

If you are connecting for the very first time or after hardware reset, on top of device, you can find default manufacturers connection settings (in other case ask integrator or system administrator for current connection settings). You need to set correct your computers COM port settings - Speed (Bits per second), Data bits, Parity, Stop bits to connect to controller.

Depending on what USB port you plug in device or adapters, your COM port will change. Here is how to find out what the setting is and to change if necessary. Often such devices use common ports COM1 - COM8.

Depending on your computers operating system, COM port setting can be find:

Windows 98 COM port setting

1. Choose Start > Settings > Control Panle
2. In the Control Panel window, double-click the System icon and then click the Device Manager tab.
3. On the Device Manager card, determine the COM port settings for each COM port.
4. Double-click the Ports (COM&LPT) icon.

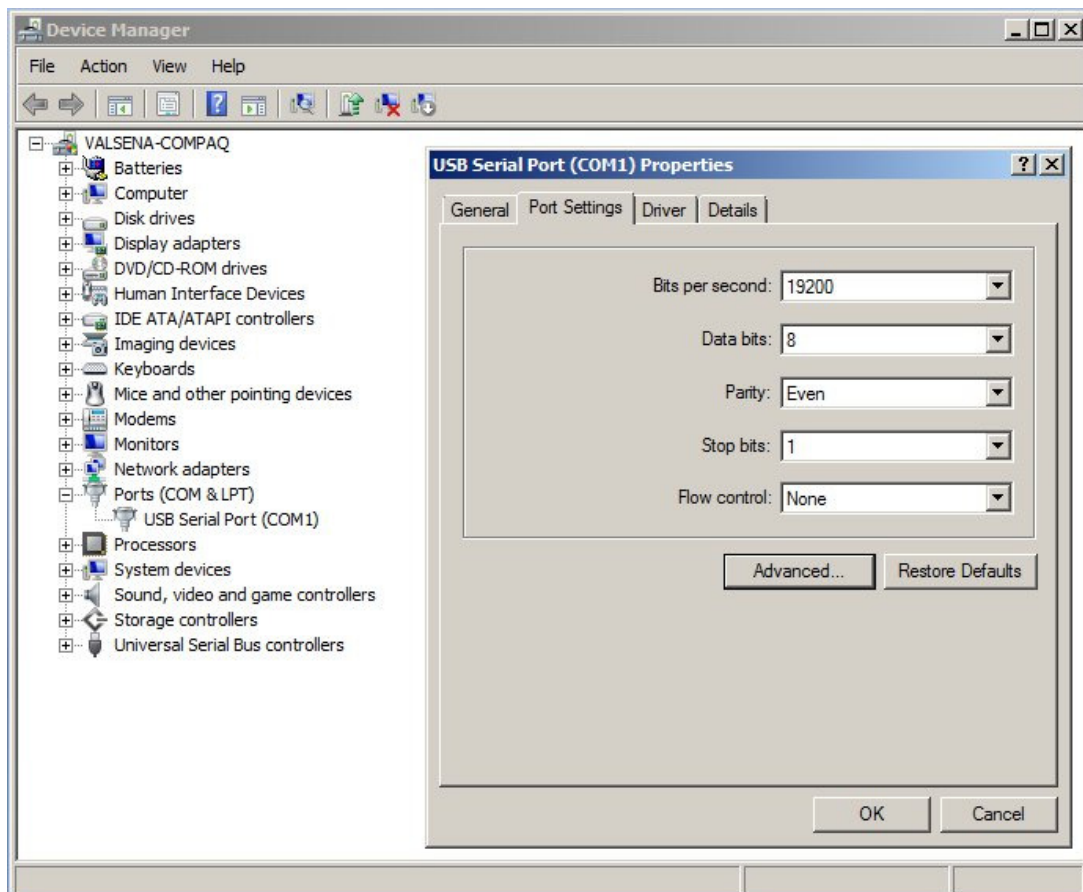
Windows XP COM port setting

1. Choose Start > Settings >Control Panel
2. Double-click Administrative Tools, double-click Computer Management, and then click Device Manager.
3. Double-click Ports (COM&LPT). Right-click the port for which you want to change settings, and then click Properties. On the Port Settings tab, make changes if necessary.

Windows Vista and Windows 7 COM port setting

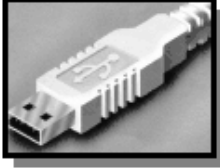
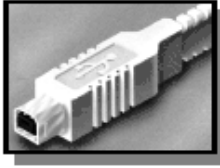

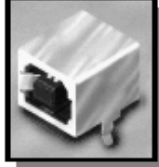
1. Chose Start > Control Panel > Device manager
2. Click continue if user permissions set up
3. Click plus sign next to Port

Look for your device and view COM port used



6.6 USB cable

Depending on controller's model, there can be used A or B type USB connector.

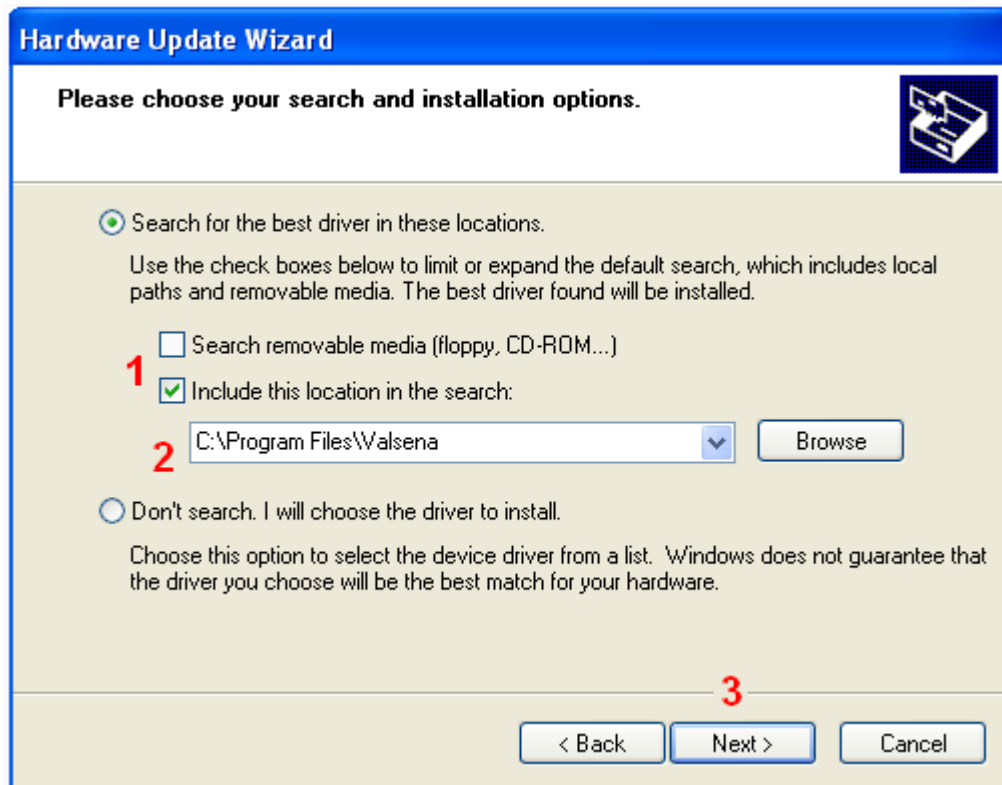
Series "A" Connectors	Series "B" Connectors
<ul style="list-style-type: none"> Series "A" plugs are always oriented upstream towards the <i>Host System</i> 	<ul style="list-style-type: none"> Series "B" plugs are always oriented downstream towards the <i>USB Device</i>
 <p>"A" Plugs (From the USB Device)</p>	 <p>"B" Plugs (From the Host System)</p>
<p>"A" Receptacles (Downstream Output from the USB Host or Hub)</p> 	<p>"B" Receptacles (Upstream Input to the USB Device or Hub)</p> 

6.7 Installing VALSENA USB driver

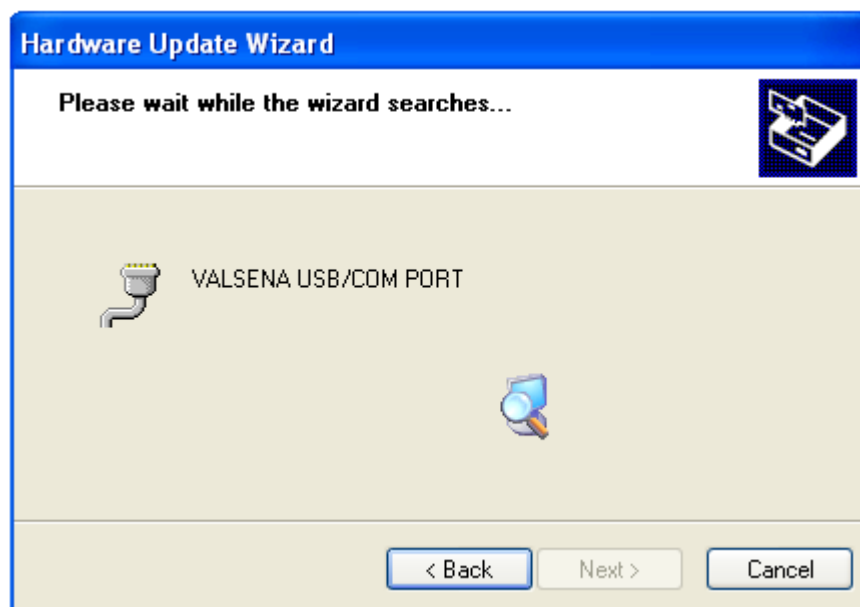
Power up device and connect USB cable. Message pops out that New Hardware found: Automatically Setup Wizard window appears. Choose that the setup wizard intalls driver from a list or specific location and press **Next**.



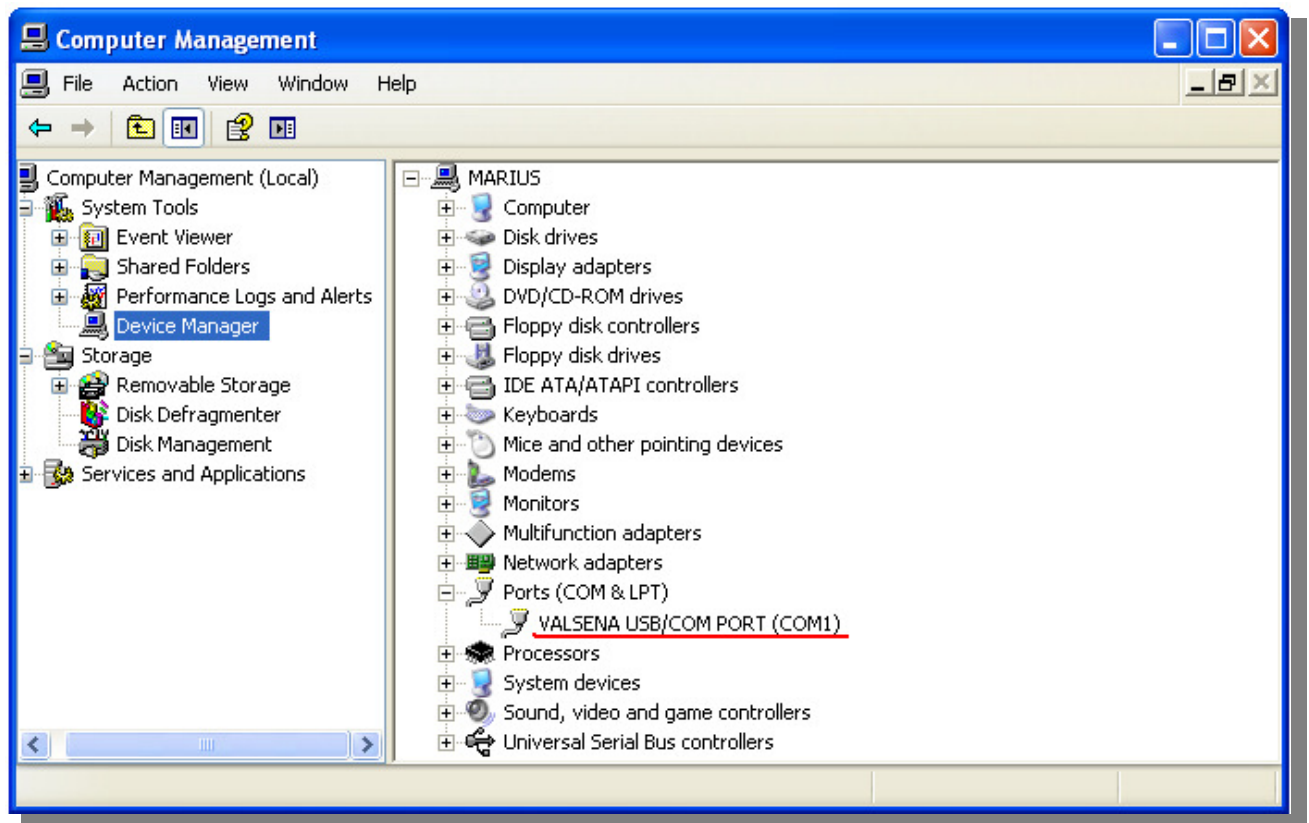
Secondly, you need to point correct path to your downloaded driver directory and press **Next**.



Wait a few minutes while install wizard searches for driver. After installer has finished installing driver press **Finish**.



If Valsena USB/COM port driver installed successfully in computer device manager Ports (COM & LPT) appears new device. How to change port number, see [Com port setup](#).



6.8 TCP/IP settings

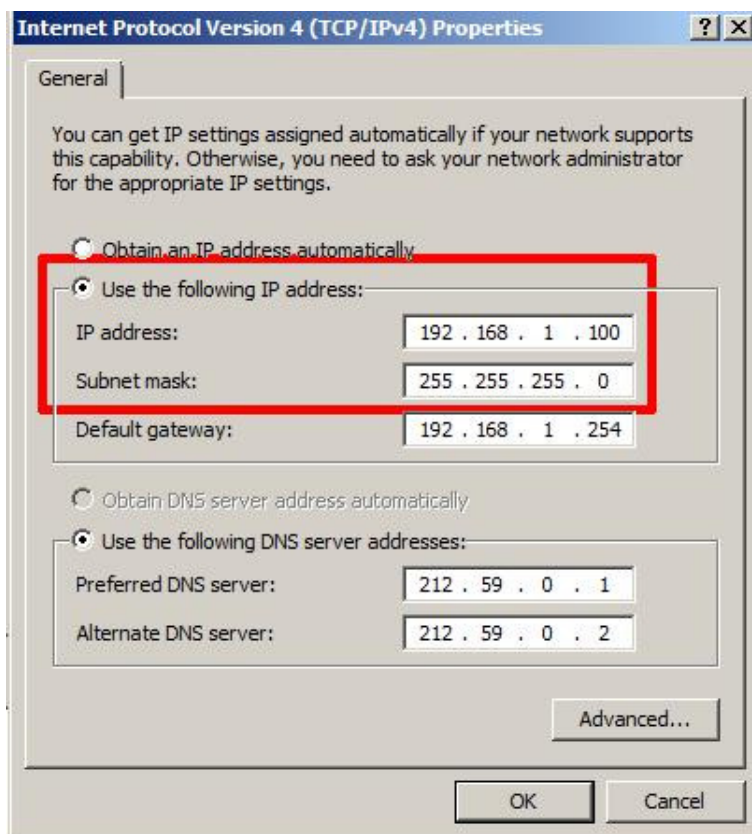
Windows XP, Vista, 7 TCP/IP settings

Choose **Start** > Settings > Control Panel > Network and Sharing connections

On the Network Connections window double click your network device, in mostly PC this is Local Area Connection, click Properties and Continue in new window.

On the Local Area Connections Properties window double click Internet Protocol Version 4 (TCP/IPv4).

On the Internet Protocol Version 4 (TCP/IP4) Properties window select Use the following IP addresses, Subnetmask (255.255.255.0) (and other addresses if you need). In that case I use: IP: 192.168.1.100, Subnet 255.255.255.0. IP addresses can't duplicate on the network



You can check your configuration:

Choose **Start > Run**

On the Run window type "cmd" and press OK

On the Command Prompt window type "ipconfig" and press Enter

Example: ipconfig screen

