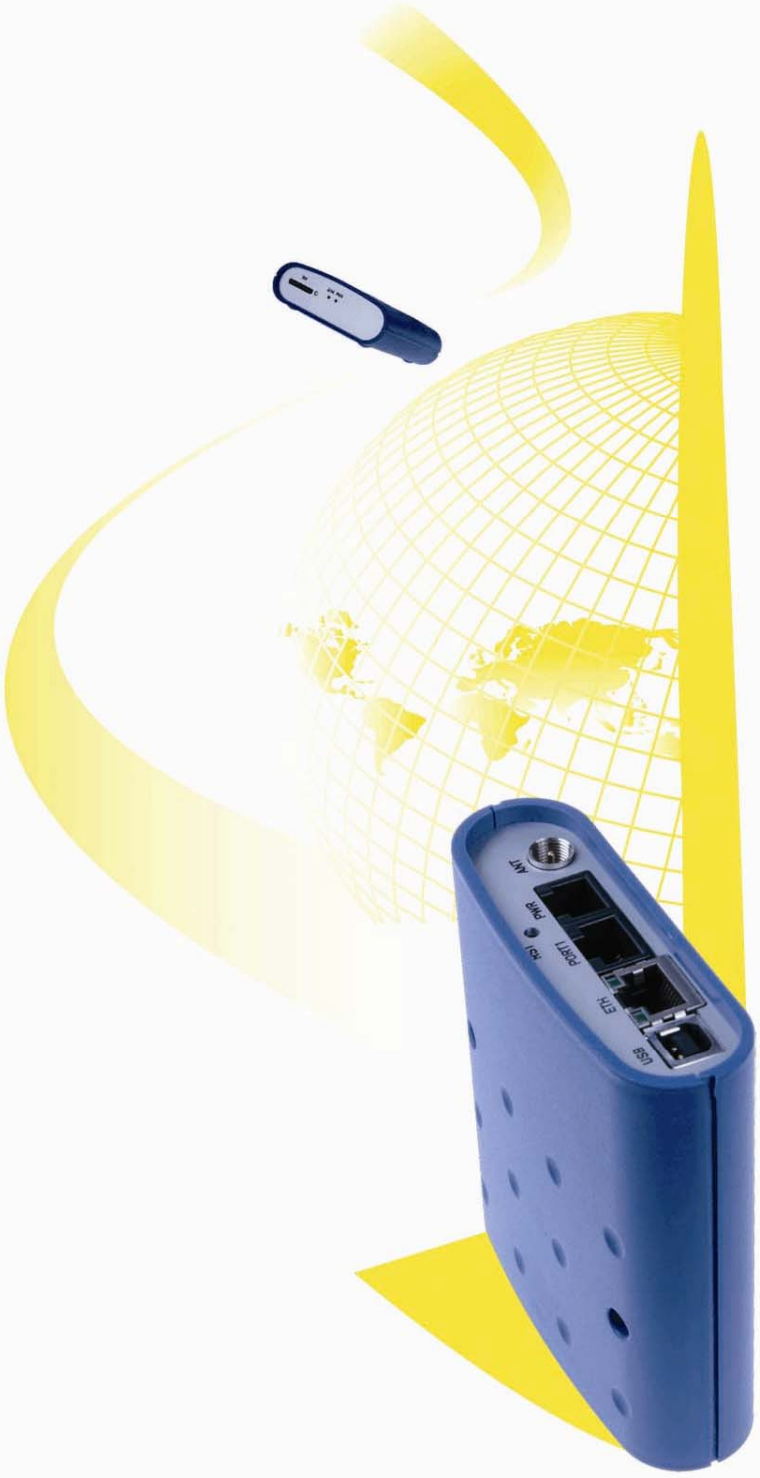
EDGE router ER75i

User´s guide



ISO 9001:2001

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Symbols used

Danger – important notice, which may have an influence on the user's safety or the function of the device.

Attention – notice on possible problems, which can arise to in specific cases.

Information, notice – information, which contains useful advices or special interest.

GPL licence

Source codes under GPL licence are available free of charge by sending email on info@conel.cz.

Conel s.r.o., Sokolska 71, 562 04 Usti nad Orlici, Czech Republic
Issue in CZ, 7/16/2008

1. Safety instructions

Please, observe the following instructions:

- The communication module ER75i must be used in compliance with any and all applicable international and national laws and in compliance with any special restrictions regulating the utilization of the communication module in prescribed applications and environments.
- To prevent possible injury to health and damage to appliances and to ensure that all the relevant provisions have been complied with, use only the original accessories. Unauthorised modifications or utilization of accessories that have not been approved may result in damage to the communication module and in a breach of applicable regulations. Unauthorized modifications or utilization of accessories that have not been approved may result in the termination of the validity of the guarantee.
- The communication module ER75i must not be opened. Only the replacement of the SIM card is permitted.
- **Caution!** The SIM card could be swallowed by small children.
- Voltage at the feed connector of the communication module must not be exceeded.
- Do not expose the communication module to extreme ambient conditions. Protect the communication module against dust, moisture and high temperature.
- It is recommended that the communication module should not be used at petrol stations. We remind the users of the duty to observe the restrictions concerning the utilization of radio devices at petrol stations, in chemical plants, or in the course of blasting works in which explosives are used.
- Switch off the communication module when travelling by plane. Utilization of the communication module in a plane may endanger the operation of the plane or interfere with the mobile telephone network, and may be unlawful. Failure to observe these instructions may result in the suspension or cancellation of telephone services for the respective client, or, it may result in legal sanctions; it may also result in both eventualities.
- When using the communication module in close proximity of personal medical devices, such as cardiac pacemakers or hearing aids, you must proceed with heightened caution.
- If it is in the proximity of TV sets, radio receivers and personal computers, the telephone may cause interference.

2. Description of ER75i router

2.1. Introduction

EDGE router ER75i is a compact electronic device based on the MC75 module which enables data transfers using GSM, GPRS and EDGE technologies.

Primarily, the ER75i router expands the capabilities of the MC75 module by the option of connecting more PCs by means of the built-in Ethernet interface. In addition, the firmware of the ER75i router provides automatic establishment and maintenance of GPRS connection. By means of integration of DHCP server it provides the users simple installation and Internet access.

In addition, the ER75i router is equipped with the USB 2.0 Full Speed interface which is designed only for connection to PC with Windows 2000 or Windows XP operating system. For its putting into operation it is sufficient to install drivers from the supplied CD to the PC.

By consumer request router ER75i is possible equip with modulus port PORT1 and extend functionality of EDGE router ER75i.

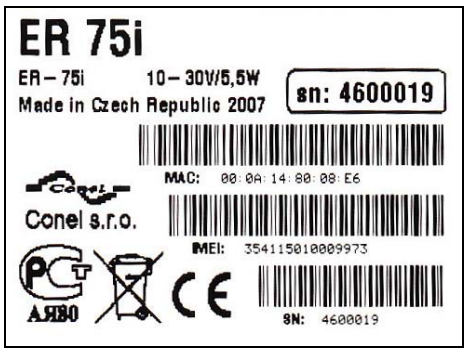
Examples of Possible Application

- mobile office
- image transmission
- security system
- telematics
- telemetry
- remote monitoring
- monitoring of traffic information
- vending and dispatcher machines

2.2. Delivery Identification

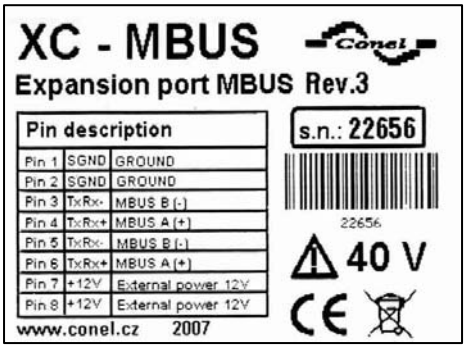
Specimen Label:

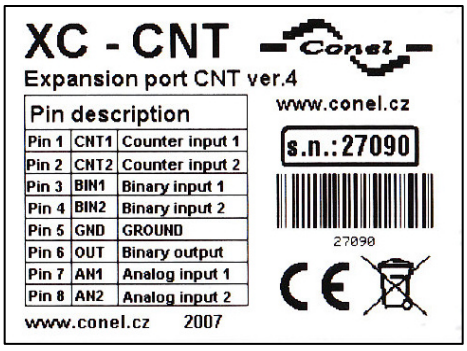
Trade name	Type name
ER75i	ER-75i



Specimen label of optional PORT1:

Trade name of PORT1	Type name of PORT1	Power supply
Expansion port RS232	XC-232	Internal power supply
Expansion port RS485	XC-485G	Internal/external power supply
Expansion port MBUS	XC-MBUS	External power supply
Expansion port CNT	XC-CNT	Internal power supply





Basic delivered set of ER75i includes:

- EDGE router ER75i,
- power supply,
- crossover UTP cable,
- external magnetic antenna,
- installation CD containing instructions and drives,
- plastic clips for the DIN bar with fixing screws.

In addition to the basic it is possible to deliver:

- expansion port RS232, RS485 or MBUS (distant columns are in distribution),
- USB A-B cable.

Router ER75i is standardly designed for:

- mounting to a panel using through holes,
- or possibly to be put on a worktop,
- for mounting onto the DIN rail by the plastic clips, which they are added.

2.3. Antenna Connection

The whip antenna is connected to ER75i using an FME on the back panel.

External whip antenna:

2.4. SIM Card Reader

The SIM card reader for 3 V and 1.8 V SIM cards is located on the front panel of the modem. For putting the modem into operation it is necessary to insert an activated SIM card with unblocked PIN in the reader.

1. Make sure that the modem is not being power-supplied.
2. Press the small yellow button next to the reader to eject the reader holder.
3. Insert the SIM card in the reader holder and slide it in the reader.

2.5. Power Supply

ER75i requires +10 V DC to +30 V DC supply. The protection against reversal of polarity without signaling is built in the modem.

The power consumption during receiving is 1W. The peak power consumption during data sending is 3.5W. For correct operation it is necessary that the power source is able to supply a peak current of 500mA.

2.6. Technical parameters

GSM module		MC75
Complies with standards		3GPP TS 51.010.-1,v5.10.0 EN 301 511, v9.0.2 EN 55022:1998, A1:2000, A2,Cor:2003 EN ISO/IEC 17025 EN 60 950:2001
Frequency bands		EGSM850, EGSM900, GSM1800 a GSM1900
Transmit power		Class 4 (2W) for EGSM850 Class 4 (2W) for EGSM900 Class 1 (1W) for GSM1800 Class 1 (1W) for GSM1900
Temperature range	Operation Storage	-20 °C to +55 °C -40 °C to +85 °C
Supply voltage		10 až 30 V DC
Consumption	Reception Transmission	1 W 3,5 W
Dimensions		30x90x102 mm (attachment to DIN bar 35mm)
Weight		140 g
Antenna connector		FME – 50 Ohm
User interface	ETH USB PORT1	Ethernet – connector RJ45 (10/100 Mbit/s) USB 2.0 – connector USB-B Optional – connector RJ45 (150 b/s – 230400 b/s), RS232, RS485, M-BUS, CNT

2.7. Description of individual components of ER75i

2.7.1. GSM/GPRS/EDGE module

The MC75 OEM module is used for GSM network wireless communication. It is integrated in the printed circuit board. The slide-out SIM card reader is accessible from the front panel. The FME antenna connector is accessible from the back panel.

The MC75 module is equipped with the USB 2.0 Full Speed interface which is brought to the USB-B connector marked USB. The MC75 module is connected to the control computer via the RS-232 high-speed serial interface.

Modul MC75

- Communicates in four GSM bands (850MHz, 900MHz, 1800MHz, and 1900MHz).
- In the GPRS mode it is able to transmit in three „Time Slot“ and receive in two (GPRS multi-slot class 10 – the maximum bit rate of reception is 42.8 kb/s) or transmit in one „Time Slot“ and receive in four (GPRS multi-slot class 12 – the maximum bit rate of reception is 85.6 kb/s).
- In the EDGE mode it is able to transmit in three „Time Slot“ and receive in two (EDGE multi-slot class 10 – the maximum bit rate of reception is 118.4 kb/s) or transmit in one „Time Slot“ and receive in four (GPRS multi-slot class 12 – the maximum bit rate of reception is 236.8 kb/s).
- Supports coding schemes CS1 to CS4 and MCS1 to MCS9.

Beware! The transmitting and receiving in timeslots is depends on the operator networks possibilities.

2.7.2. Control microcomputer

The core of the ER75i router is a 32-bit microprocessor with 16 MB RAM, 4 MB FLASH EEPROM, serial interface RS-232 and an Ethernet interface 10/100 Mbit/s. The microcomputer is connected to the MC75 OEM module through the serial interface and controls the communication via GSM/GPRS. Towards to the user it is connected on the Ethernet interface.

The software is built on the uClinux operating system.

The router ER75i support services as like DHCP, NAT, GRE, IPSec tunnels, etc.

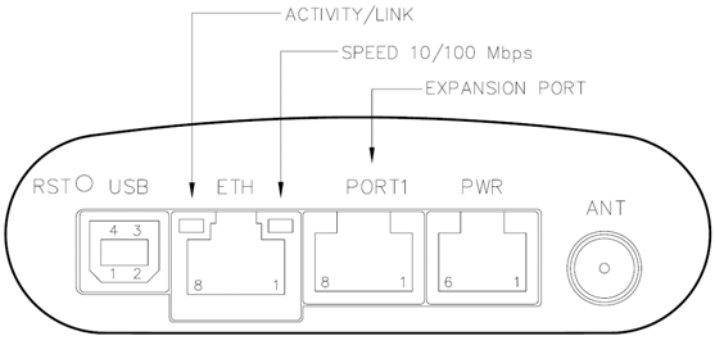
The router settings are saved in the FLASH EEPROM memory. All configuring of the modem can be done through a web interface (HTTP) which is security passwords.

2.8. User interfaces (Connectors)

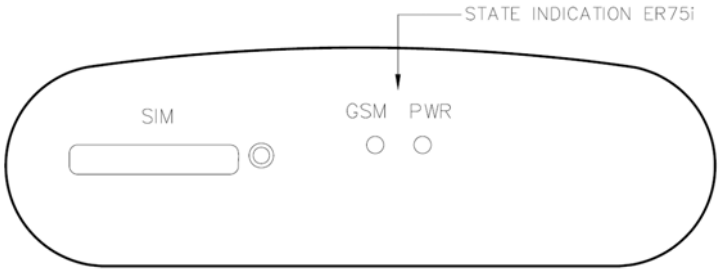
On the back panel of ER75i the following connectors are located:

- one RJ12 connector (PWR) – for connection of the power supply adapter
- one RJ45 connector (ETH) – for connection into the local computer network
- one RJ45 connector (optional PORT1) – for connection of the local any arrangement over RS232, RS485 or MBUS
- one FME connector (ANT) – for connection of the antenna
- one USB-B connector (USB) – for connection of the router to the PC.

Rear panel



Front panel

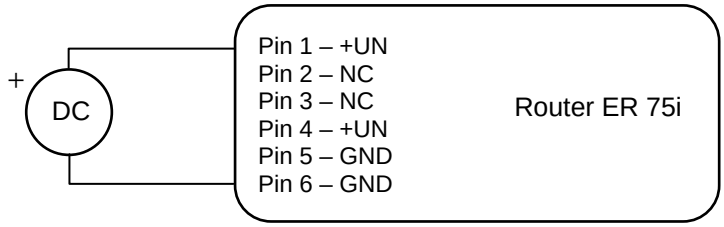


2.8.1. Connection of the PWR Supply Connector

Panel socket RJ12.

Pin number	Signal mark	Description
1	+UN	Positive pole of DC supply voltage (10 to 30 V)
2	NC	Signal not connected
3	NC	Signal not connected
4	+UN	Positive pole of DC supply voltage (10 to 30 V)
5	GND	Negative pole of DC supply voltage
6	GND	Negative pole of DC supply voltage

Circuit example:



2.8.2. Connection of the ETH Connector

Panel socket RJ45.

Pin number	Signal mark	Description	Data flow direction
1	TXD+	Transmit Data – positive pole	Input/Output
2	TXD-	Transmit Data – negative pole	Input/Output
3	RXD+	Receive Data – positive pole	Input/Output
4	EPWR+	DC supply voltage from the switch – positive pole	
5	EPWR+	DC supply voltage from the switch – positive pole	
6	RXD-	Receive Data – negative pole	Input/Output
7	EPWR-	DC supply voltage from the switch – negative pole	
8	EPWR-	DC supply voltage from the switch – negative pole	

ATTENTION! Port ETH is not POE (Power Over Ethernet) compatible!

2.8.3. Connection of the Connector USB

Panel socket USB-B.

Pin number	Signal mark	Description	Data flow direction
1	VCC	Positive pole of 5V DC supply voltage	
2	USB data -	USB data signal – negative pole	Input/Output
3	USB data +	USB data signal – positive pole	Input/Output
4	GND	Negative pole of DC supply voltage	

2.8.4. Connection of the optional connector PORT1

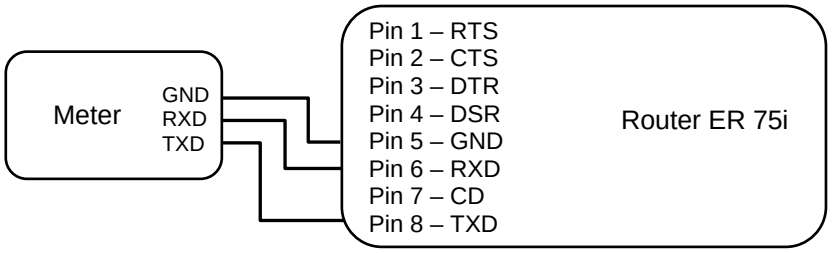
Panel socket RJ45.

2.8.4.1. Expansion port RS232

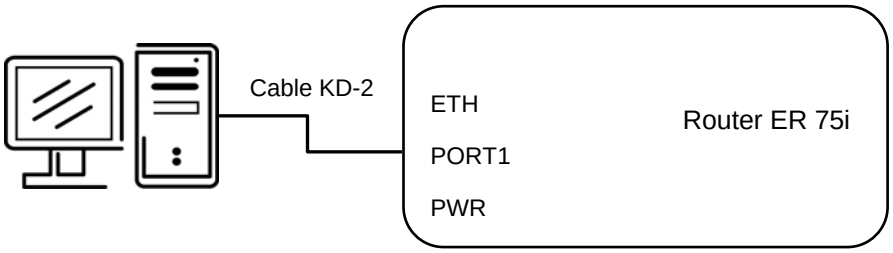
(RS232 – DCE – Data Communication Equipment)

Pin No.	Signal name	Description	Data flow direction
1	RTS	Request To Send	Input
2	CTS	Clear To Send	Output
3	DTR	Data Terminal Ready	Input
4	DSR	Data Set Ready – connected to +3,3 V over 330 Ohm resistor	Output
5	GND	GROUND – signal ground	
6	RXD	Receive Data	Output
7	CD	Carrier Detect	Output
8	TXD	Transmit Data	Input

Circuit example:

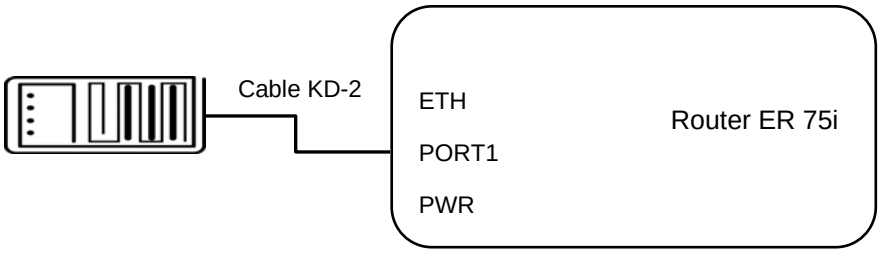


The ER 75i connection to the PC:



- cable KD2 is connected to serial port PC (example COM1)

The ER 75i connection to equipment with full-value RS232 interface:

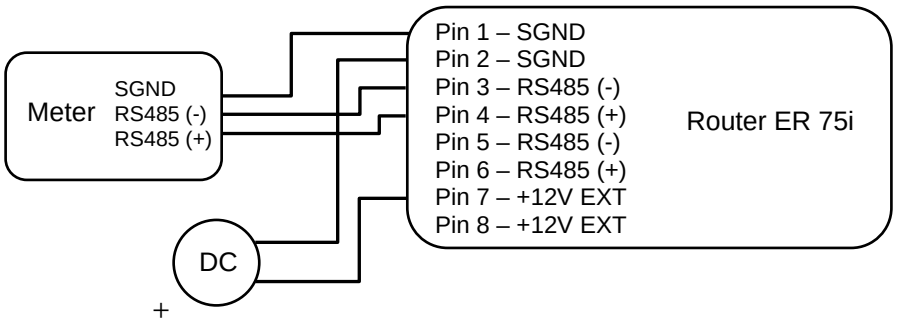


2.8.4.2. Expansion port RS485G

Pin No.	Signal name	Description	Data flow direction
1	SGND	Signal and power supply ground	
2	SGND	Signal and power supply ground	
3	TxRx-	RS485 B (-)	Input/Output
4	TxRx+	RS485 A (+)	Input/Output
5	TxRx-	RS485 B (-)	Input/Output
6	TxRx+	RS485 A (+)	Input/Output
7	+12V EXT	External power supply +10,8 ÷ +15,6V	
8	+12V EXT	External power supply +10,8 ÷ +15,6V	

ATTENTION! Power supply is selected on expansion port RS485 by help jumper, 2.9.
In case of need galvanic separated the converter must have external power supply.

Circuit example:

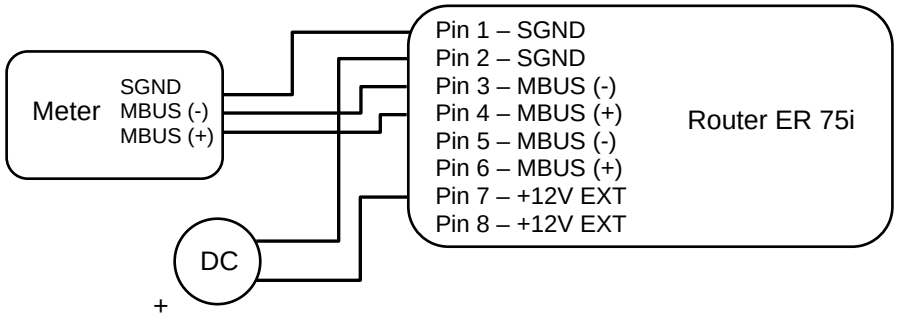


2.8.4.3. Expansion port MBUS

Pin No.	Signal name	Description	Data flow direction
1	SGND	Signal and power supply ground	
2	SGND	Signal and power supply ground	
3	TxRx-	MBUS B (-)	Input/Output
4	TxRx+	MBUS A (+)	Input/Output
5	TxRx-	MBUS B (-)	Input/Output
6	TxRx+	MBUS A (+)	Input/Output
7	+12V EXT	External power supply +10,8 ÷ +15,6V	
8	+12V EXT	External power supply +10,8 ÷ +15,6V	

ATTENTION! External supply is for converter MBUS!
In case of need galvanic separated the converter must have external power supply.

Circuit example:

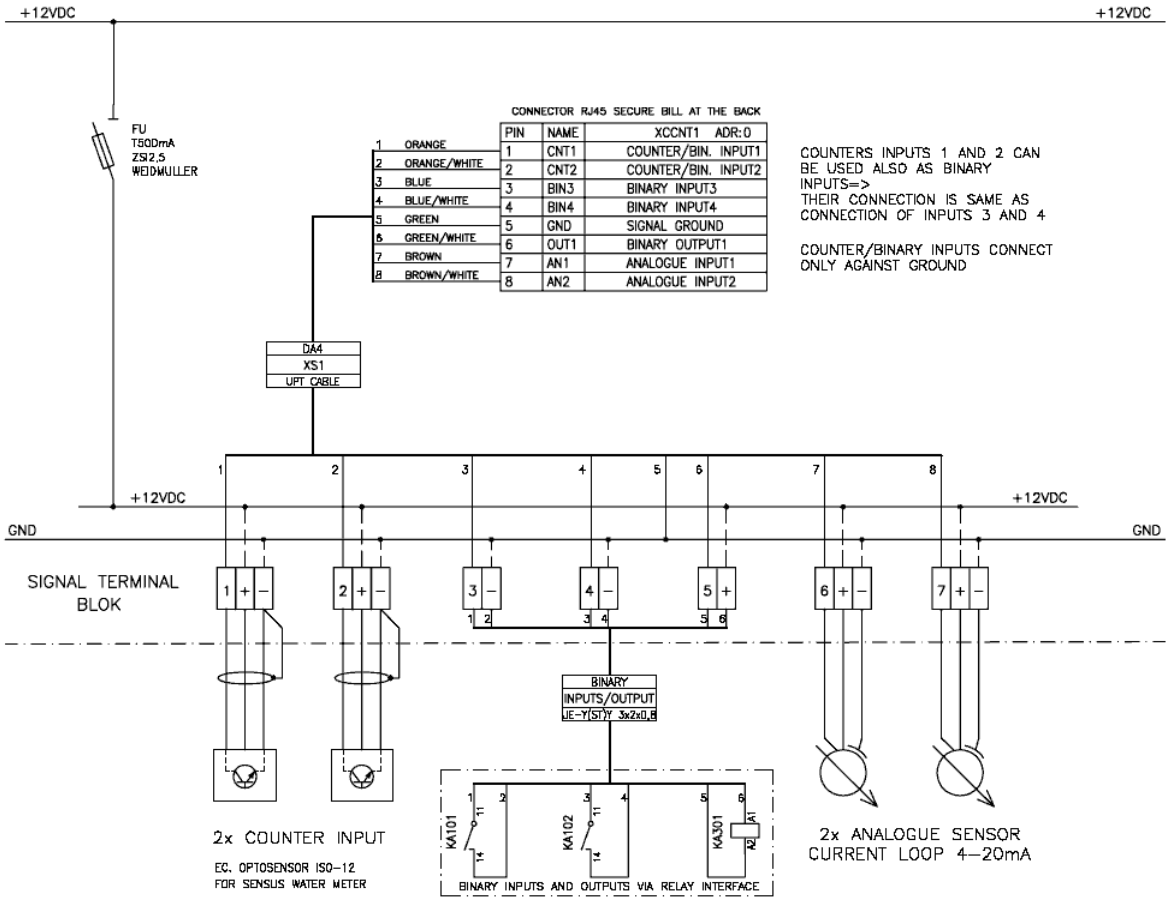


2.8.4.4. Expansion port CNT

Pin number	Signal mark	Description	Data flow direction
1	BIN1/CNT1	Binary input/counter input	Input
2	BIN2/CNT2	Binary input/counter input	Input
3	BIN3	Binary input	Input
4	BIN4	Binary input	Input
5	GND	Signal ground	
6	OUT1	Binary output (open collector)	Output
7	AN1	Analogy input	Input
8	AN2	Analogy input	Input

The user interface CNT is for monitoring and processing of analogy and binary signals and to control (settings) of binary signal. To disposition are 2 counter and 2 binary inputs or 4 binary inputs, 2 analogy inputs a 1 binary output. The settings of binaries and counters inputs by the help of firmware in which it is defined the singles inputs and output.

Typical connection of ER 75i measuring circuits:



2.9. Technical specification of optional PORT1

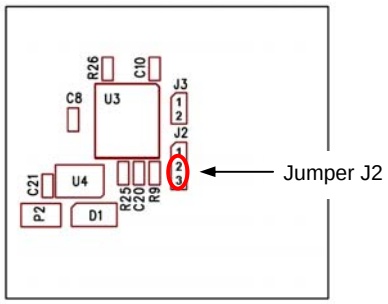
- Expansion port RS232

Name of product	Expansion port RS232	
Power supply	Internal	....
Environment	Operating temperature	-20 .. +55 C
	Storage temperature	-20 .. +85 C
Standards	Emission	EN 55022/B
	Immunity	ETS 300 342
	Safety	EN 60950
RS232 specifications (EN 1434)	Max. operating bus current	15 mA
	Max. bit rate	230400 bps
	Max. overvoltage	±30 V
	Max. total cable length (300Bd, 200nF/km)	20 m

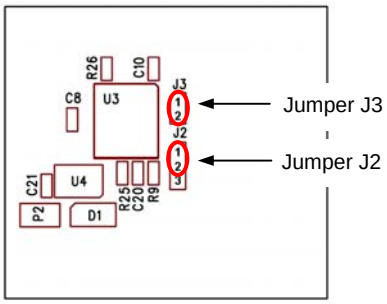
- Expansion port RS485

Name of product	Expansion port RS485	
Power supply	External	10,8 .. 15,6 V
	Internal	....
	Supply power	Max. 30 W
	Supply current	Max. 250 mA
Environment	Operating temperature	-20 .. +55 C
	Storage temperature	-20 .. +85 C
Standards	Emission	EN 55022/B
	Immunity	ETS 300 342
	Safety	EN 60950
RS485 specifications (EN 1434)	Max. devices (each 1,5 mA)	256
	Max. bit rate	38400 bps
	Overload detection	250 mA
	Short circuit strength	Permanent
	Max. total cable length (300Bd, 200nF/km)	1200 m

External or internal power supply of expansion port RS485 it is can evoke by wiring of the jumper J2 and J3 on this module. If it is necessitated external power supply of module, it must be by jumper J2 connection pin 2 - 3 and jumper J3 must be disconnection. Internal power supply is evoking of connection pin 1 - 2 on jumper J2 and connection jumper J3. Jumpers is placement them to a picture below (expansion port RS485 from TOP layer). We recommended internal power supply only in the event of, that it is not possible ensure external power supply. If it is choose internal power supply, converter RS485G is not galvanic separated.



The jumper circuitry for external supply



The jumper circuitry for internal supply

- Expansion port MBUS

Name of product	Expansion port MBUS	
Power supply	Voltage	10,8 .. 15,6 V
	Supply power	Max. 30 W
Environment	Operating temperature	-20 .. +55 C
	Storage temperature	-20 .. +85 C
Standards	Emission	EN 55022/B
	Immunity	ETS 300 342
	Safety	EN 60950
M-Bus specifications (EN 1434)	Max. devices (each 1,5 mA)	30
	Max. operating bus current	60 mA
	Overload detection	100 mA
	Short circuit strength	Permanent
	Bus voltage mark	36 .. 43 V
	Bus voltage space	24 .. 31 V
	Max. total cable length (300Bd, 200nF/km)	1000 m

- Expansion port CNT

Name of product	Expansion port CNT	
Power supply	Voltage	Internal 10 .. 30V
	Sleep	100 µA (counter is functional)
	Operation	2 mA
Environment	Operating temperature	-20 .. +55 C
	Storage temperature	-20 .. +85 C
Standards	Emission	EN 55022/B
	Immunity	ETS 300 342
	Safety	EN 60950
	Isolation	EN 60747
Inputs/Outputs	2x counter	Max. 100 Hz, ratio max. 1:10
	2x analogy inputs	0 .. 20 mA, R_{in} 100 Ohms
	2x binary inputs	reed contact
	1x output (open collector)	100 mA
Others	Voltage resistance	Permanent
	Sleeping mode	Controlled

2.10. Modem status indication

On the front and back panel of the modem there are altogether four LED indicators, which inform on the modem status.

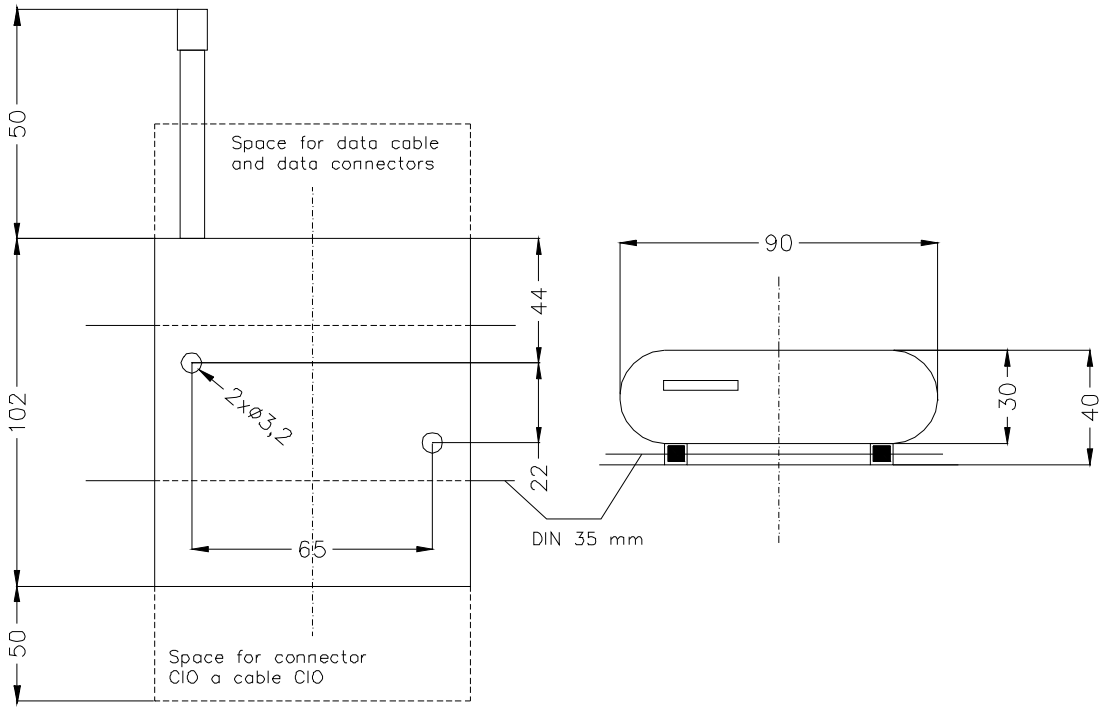
Panel	Color	Description	Description
Front	Green	PWR	Blinking 1:9 ..... join GPRS connection Blinking 9:1 ..... establishing of GPRS connection Permanently on ……. starting of the ER75i
Front	Red	GSM	Blinking ……..GSM/GPRS communication in progress
Back	Green	–	On ..... selected 100 Mbit/s Off ..... selected 10 Mbit/s
Back	Green	–	On..... the network cable is connected Blinking ……. data transmission Off ..... the network cable is not connected

2.11. Putting into operation

Before putting the ER75i router into operation it is necessary to connect all components needed for the operation of your applications and the SIM card must be inserted (the modem is off). The SIM card must support the GPRS.

The modem is put into operation by connection of the power supply to the modem. In the default setting the modem starts to login automatically to the preset APN. The behavior of the modem can be modified by means of the web interface which is described in the following chapter.

2.12. Mechanical external dimensions and mounting recommendations



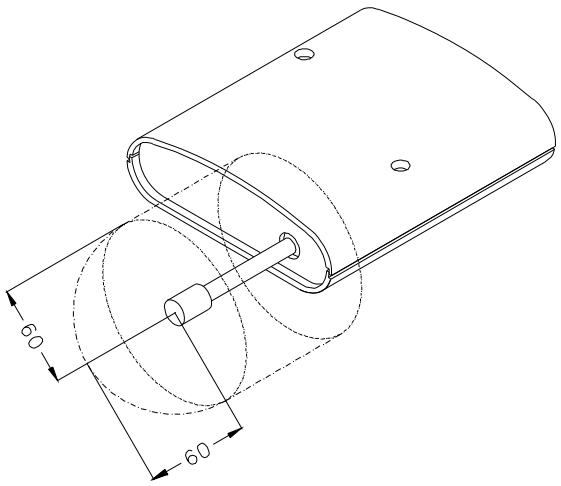
For majority applications with built-in modem in switch board it is possible recognize two sort of environment:

- no public and industry environment of low voltage with high interference,
- public environment of low voltage without high interference.

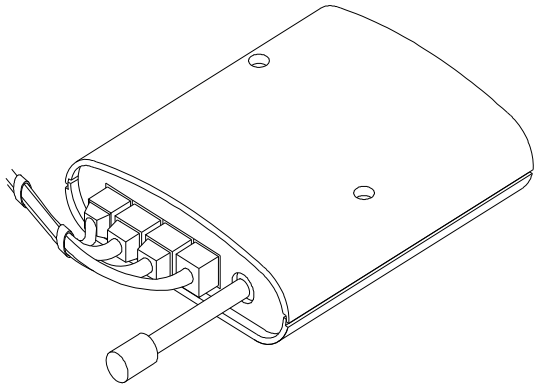
For both of these environments it is possible to mount modems to switch board, the following it is not need have no examination immunity or issues in connection with EMC according to EN 60439-1+A1.

For compliance of EN 60439 - 1 + A1 specification it is necessary observe next assembly of the modem to the switch - board:

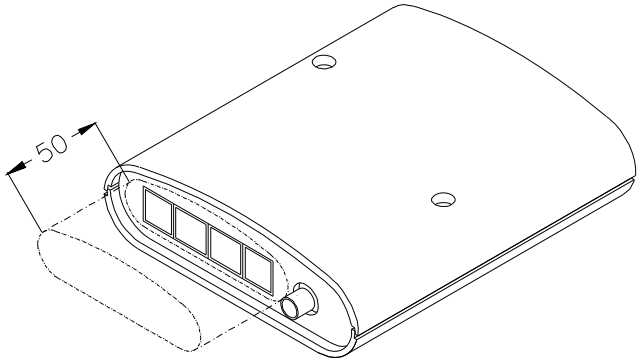
- round antenna we recommend to observe a distance of 6 cm from cables and metal surfaces on every side according to the next picture due to the elimination of interference, while using an external antenna except for the switch-board it is necessary to fit a lightening conductor,
- before mounting a modem on sheet-steel we recommend using an external antenna,



- for single cables we recommend to bind the bunch according to the following picture, for this use we recommend:
  - length of the bunch (combination of power supply and data cables) can be maximum 1,5 m, if length of data cables exceeds 1,5 m or in the event of, the cable leads towards the switch - board, we recommend to use fit over - voltage protectors (surge suppressors),
  - with data cables they mustn't carry cables with reticular tension ~ 230 V/50 Hz,
  - all signals to sensors must be twisted pairs.

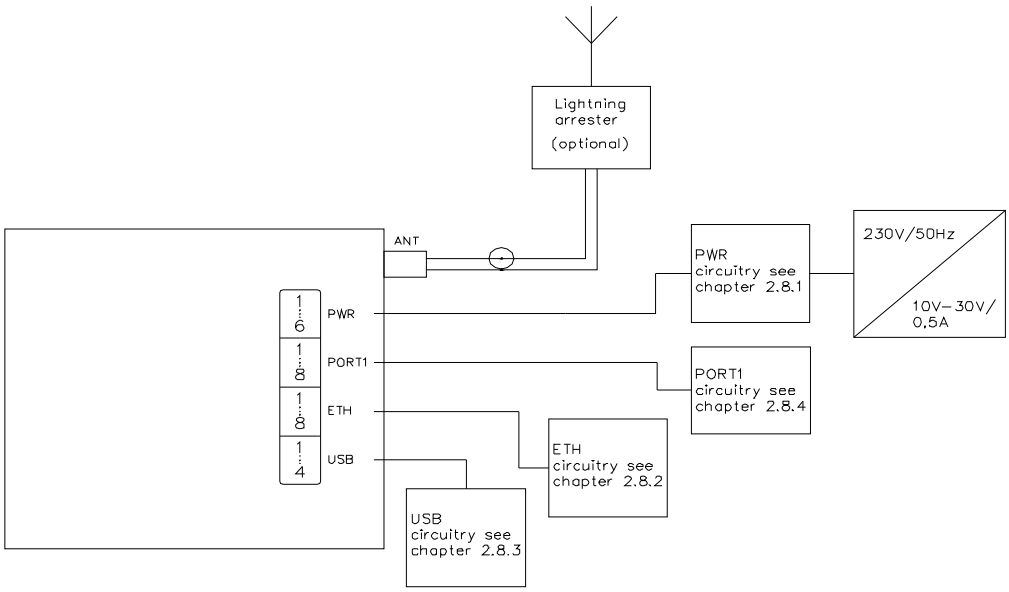


- sufficient space must be left before individual connectors for handling of cables,



- for correct function of the modem we recommend to use in switch - board earth-bonding distribution frame for grounding of power supply of modem, data cables and antenna,

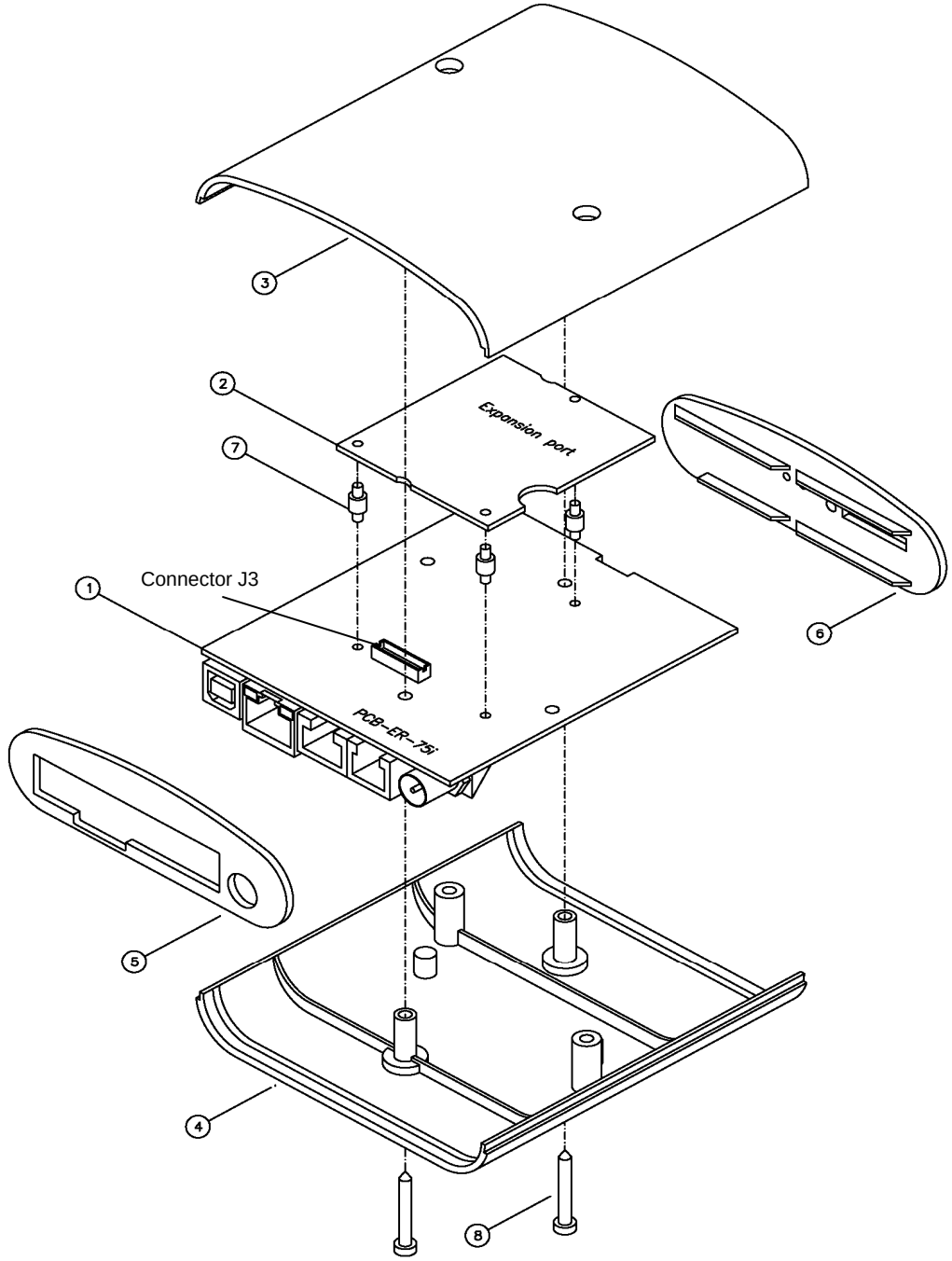
- the circuit diagram of the modem is on the following pictures.



3. Expansion port mounting

Attention! Expansion port include when the router ER75i is switch off.

After unscrewed two screws (position 8) on box bottom part (position 4) and carried out box top part (position 3) the expansion port PORT1 (position 2) connect to connector J3 (see below) of the router B-ER-75i motherboard (position 1) from TOP side. Expansion port is mounted to motherboard by the help of three distant columns (position 7). After expansion port mounting the box is screwed by the help three screws.



Parts list and description

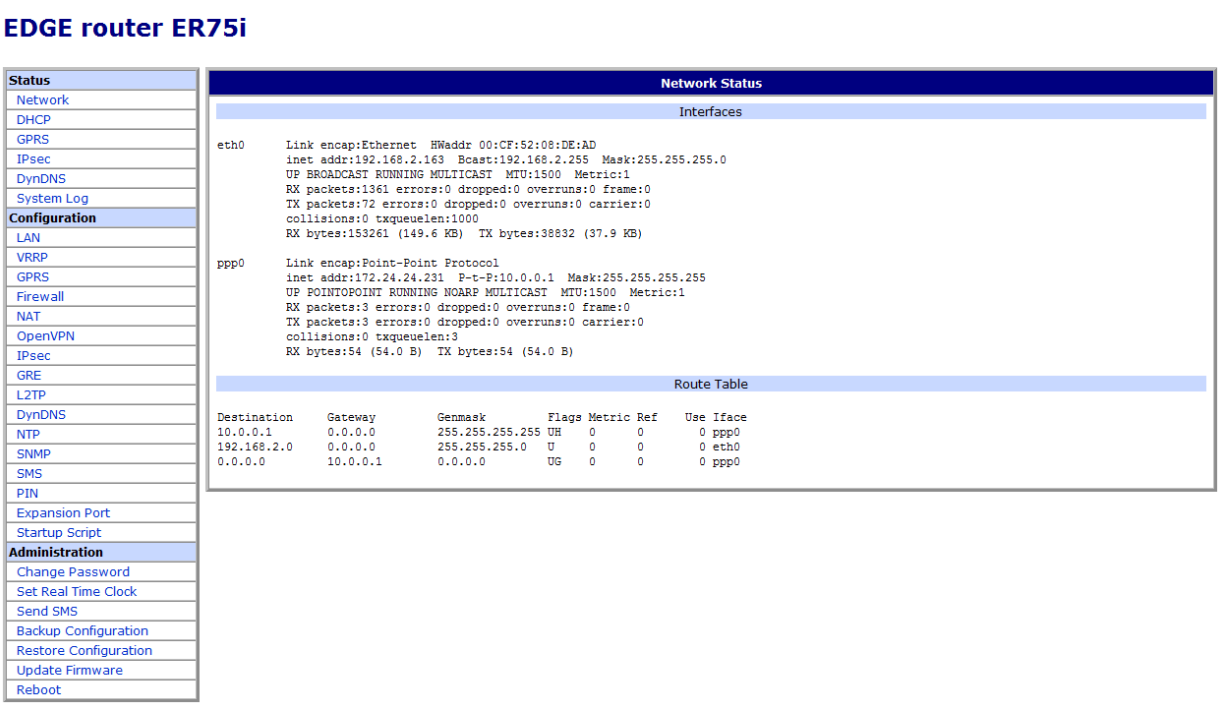
Part	Description	Number
1	EDGE router ER75i motherboard	1
2	Expansion port PORT1	1
3	ER-75i box top part	1
4	ER-75i box bottom part	1
5	ER-75i rear head	1
6	ER-75i front head	1
7	Distant columns for expansion port PORT1 mounting to motherboard	3
8	Screw for box completion	2

4. Configuration setting over web browser

Attention! If the SIM card isn't included in router ER75i, it is impossible router ER75i operate. Included SIM card must to have activated GPRS. The SIM card include when the router ER75i is switch off.

Monitoring of status, configuration and administration of the ER75i router can be performed by means of the web interface which is available after entering the IP address of the modem in the web browser. The default IP address of the modem is 192.168.1.1. Configuration may be performed only by the user "root" with initial password "root".

The left part of the web interface contains the menu with pages for monitoring of the Status, Configuration and Administration of the ER75i router.



After green LED diode start blinking it is possible restore initial setting of the router by pressing buttons RST, whereby it is fulfilment restoration configuration and reset (green LED will be on).

4.1. Network Status

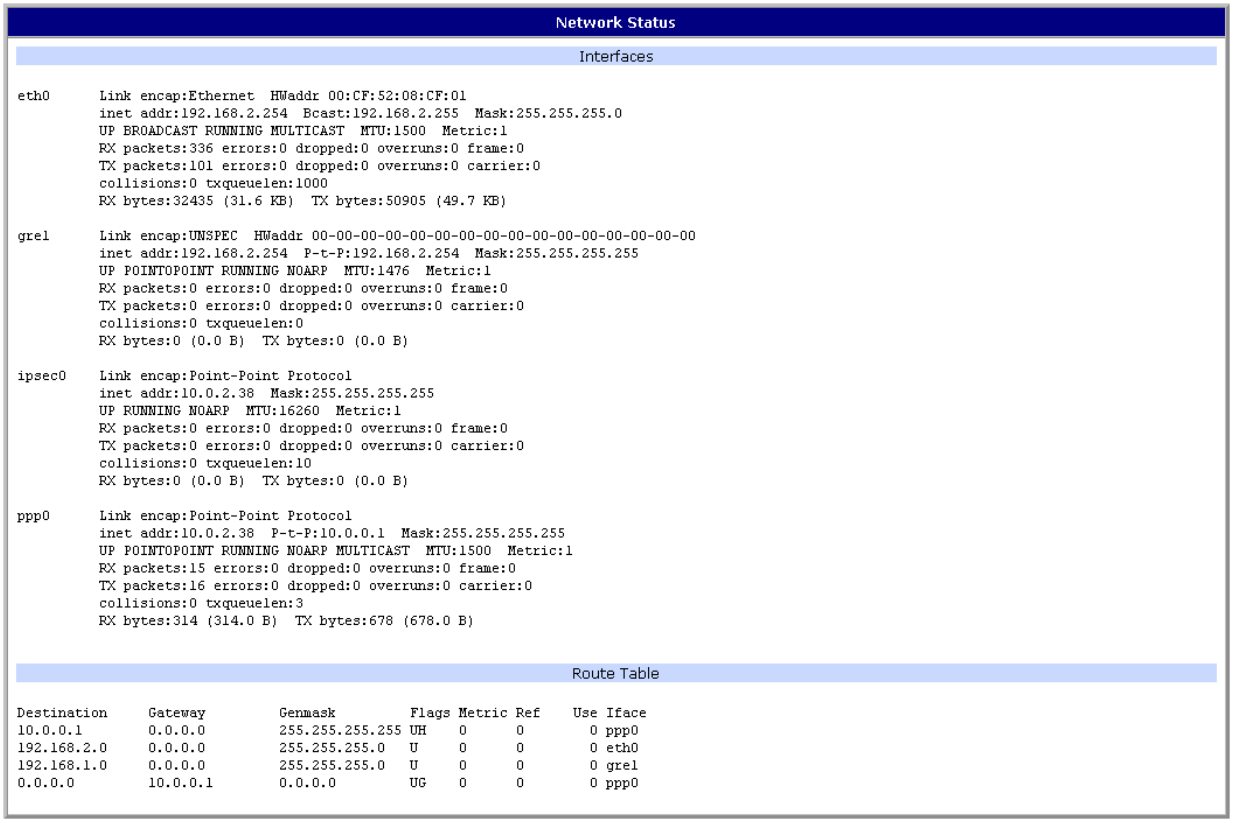
To view the system information about the modem operation, select the *System Informations* menu item. The bottom part of the window contains information about the system memory usage. The upper part of the window displays detailed information about active interfaces:

- eth0 – parameters of networks interface
- ppp0 – PPP interface (active connection to GPRS/EDGE)
- tun0 – OpenVPN tunnel interface
- gre1 – GRE tunnel interface
- ipsec0 – IPSec tunnel interface

By the each of interface are then painted next information

- HWaddr – hardware (unique) address of networks interface
- inet – own IP address
- P-t-P – IP address second ends connection
- Bcast – broadcast address
- Mask – mask of network
- MTU – maximal size of packet, which is equipment able transmit
- Metric – number of routers, over which packet must pass
- RX packets – received packets, errors – number of errors, dropped – dropped packets
- TX packets – transmit packets, errors – number of errors, dropped – dropped packets
- collisions – number of collisions
- RX bytes – total number of received bytes
- TX bytes – total number of transmit bytes

From network information it is possible reproach GPRS connection state. When the GPRS connection is active, it is in system information painted ppp0 connection.



Network Status

Interfaces

```
eth0      Link encap:Ethernet  HWaddr 00:CF:52:08:CF:01
          inet addr:192.168.2.254  Bcast:192.168.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:336 errors:0 dropped:0 overruns:0 frame:0
          TX packets:101 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:32435 (31.6 KB)  TX bytes:50905 (49.7 KB)

grel      Link encap:UNSPEC  HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00
          inet addr:192.168.2.254  P-t-P:192.168.2.254  Mask:255.255.255.255
          UP POINTOPOINT RUNNING NOARP  MTU:1476  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

ipsec0    Link encap:Point-Point Protocol
          inet addr:10.0.2.38  Mask:255.255.255.255
          UP RUNNING NOARP  MTU:16260  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:10
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

ppp0      Link encap:Point-Point Protocol
          inet addr:10.0.2.38  P-t-P:10.0.0.1  Mask:255.255.255.255
          UP POINTOPOINT RUNNING NOARP MULTICAST  MTU:1500  Metric:1
          RX packets:15 errors:0 dropped:0 overruns:0 frame:0
          TX packets:16 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:3
          RX bytes:314 (314.0 B)  TX bytes:678 (678.0 B)
```

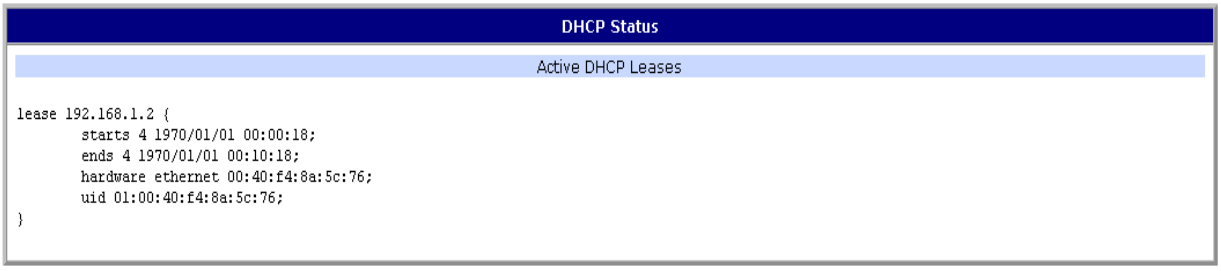
Route Table

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
10.0.0.1	0.0.0.0	255.255.255.255	UH	0	0	0	ppp0
192.168.2.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0
192.168.1.0	0.0.0.0	255.255.255.0	U	0	0	0	grel
0.0.0.0	10.0.0.1	0.0.0.0	UG	0	0	0	ppp0

4.2. DHCP Status

Information about IP addresses which was allotted of DHCP server to ER75i; it is possible find in menu in sum *DHCP:*

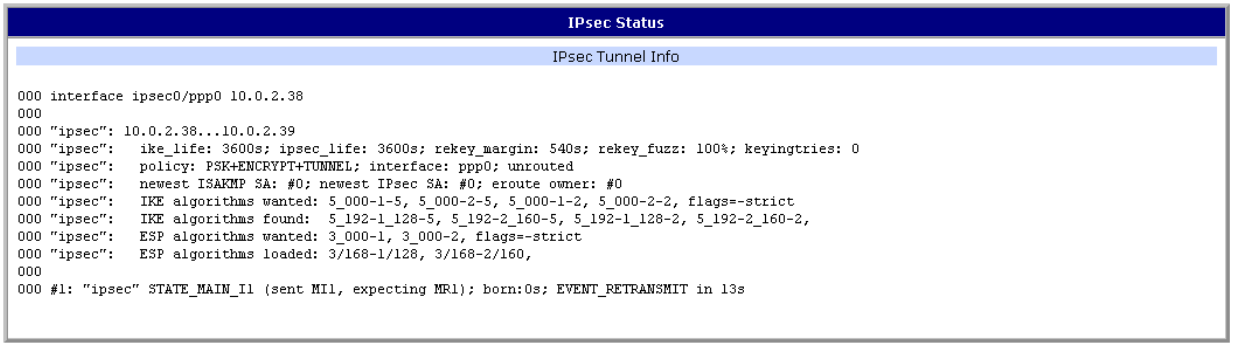
- lease 192.168.1.2 (generally IP address) – assigned IP address
- starts – information about time of assigned IP address
- ends – information about time of termination IP address
- hardware ethernet – hardware MAC (unique) address
- uid – unique ID



In the extreme the DHCP status can display to one's IP address two DHCP status, causes of that it can be reset of network cards.

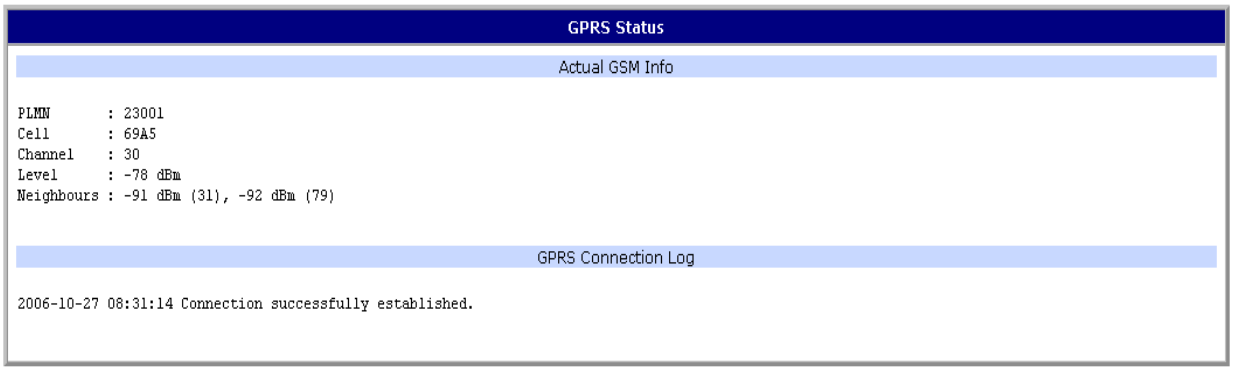
4.3. IPsec status

Information on actual IPsec tunnel state it can be call up option entries NTP in menu. Detailed information description here painted it can be find on the following link http://www.freeswan.org/doc.html.



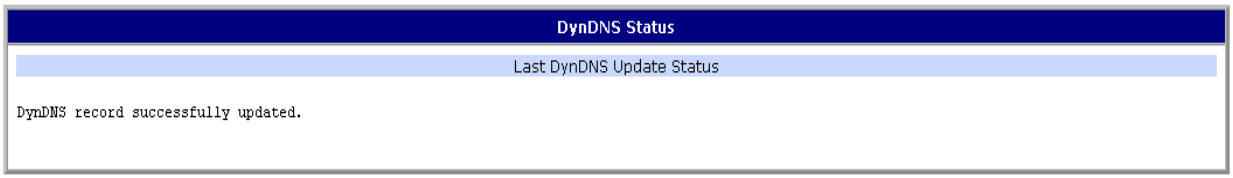
4.4. GPRS Status

The item *GPRS* in menu contains information about PLMN (code of operator), cell, channel and signal (information are by a single application find out on power up MC75). In bottom of window hereof windows it is GPRS Connection Log, where there are information about make up GPRS connection and pertinent problems on this formation.



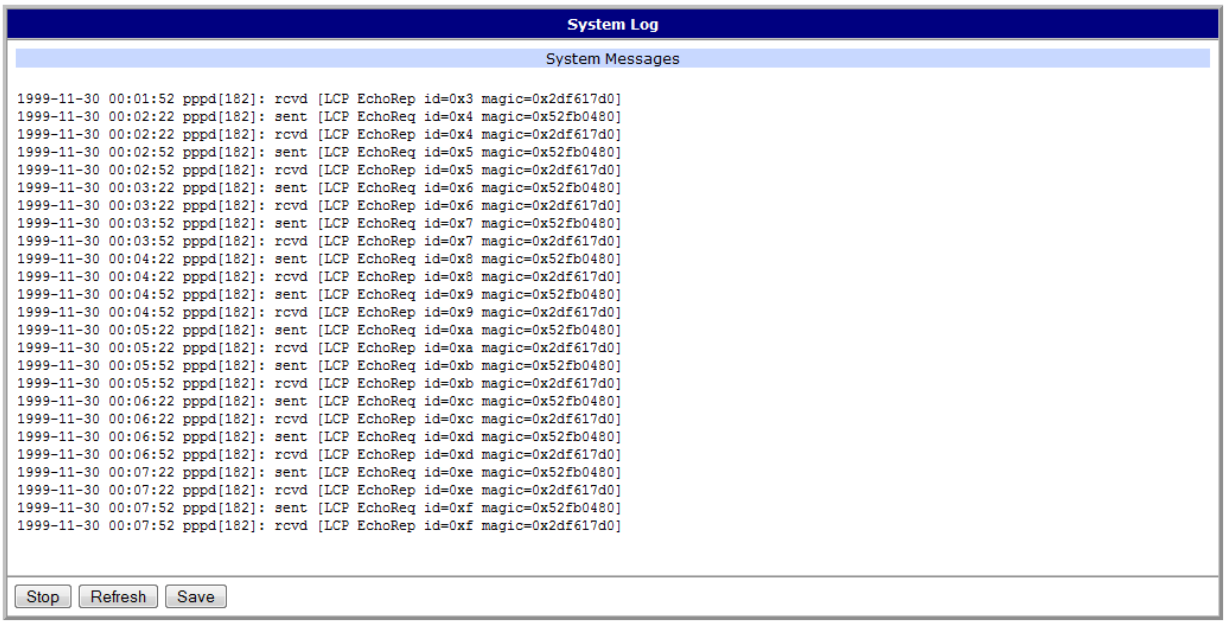
4.5. DynDNS status

DynDNS up - dating entry result on server www.dyndns.org it can be call - up option DynDNS item in menu.



4.6. System Log

In case of any problems with connection to GPRS it is possible to view the system log by pressing the *System Log* menu item. The System log observes only connection to GPRS and formation of IPsec tunnel. The upper part of the window displays possible errors at GPRS connection establishment. After switching on the log daemon by pressing the *Start* button, the bottom part of the window displays detailed reports from individual applications running in the modem. To update the contents of the window press the *Refresh* button. By the help of button *Save* is possible save the system log to computer.



4.7. LAN Configuration

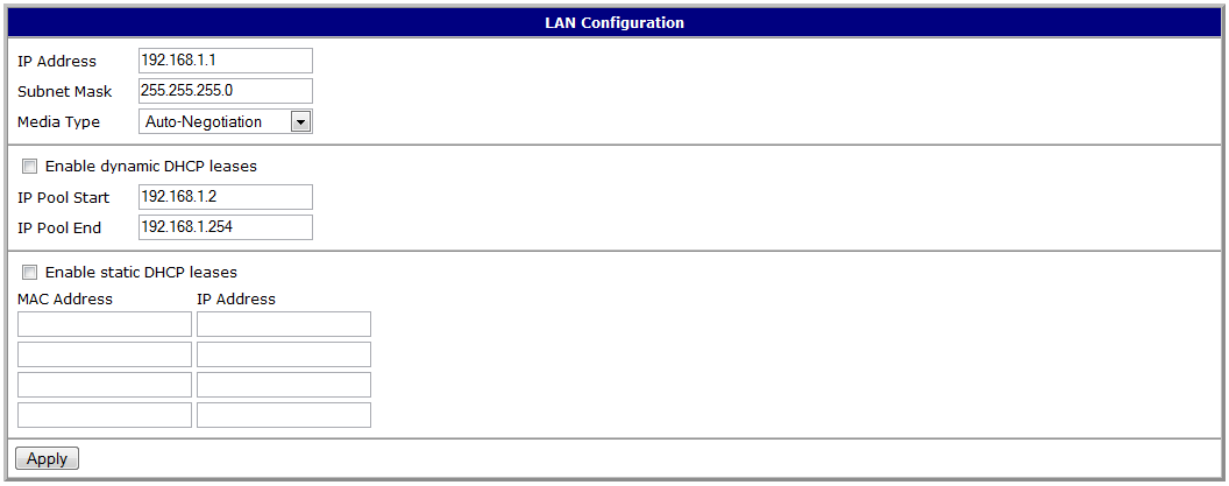
To enter the network configuration, select the *LAN* menu item. In the first part of window it is possible to define the network interface IP address (*IP address*) and the network mask (*Subnet Mask*).

In the second part of window, it is possible to define DHCP server by checking the *Enable dynamic DHCP server* option. In the window it is possible to define the beginning (*IP Pool Start*) and end (*IP Pool End*) of the pool of IP addresses which will be assigned to DHCP clients.

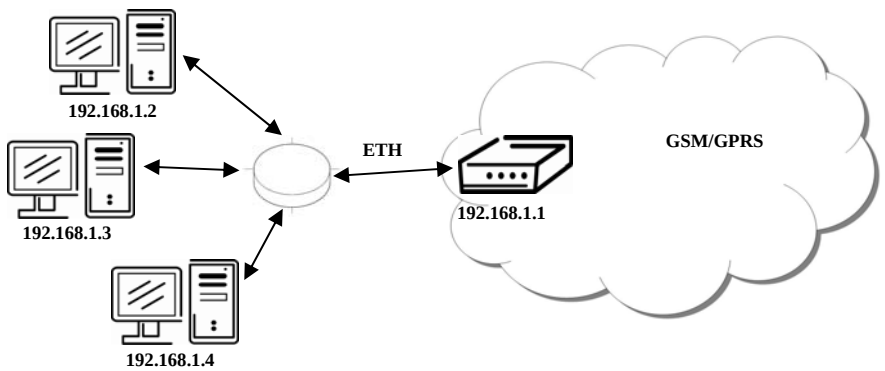
In the third part of Windows, it is possible by checking the *Enable static DHCP server* option define leases up to four static *IP Addresses*, which conform to *MAC Address* of the connected equipments etc.

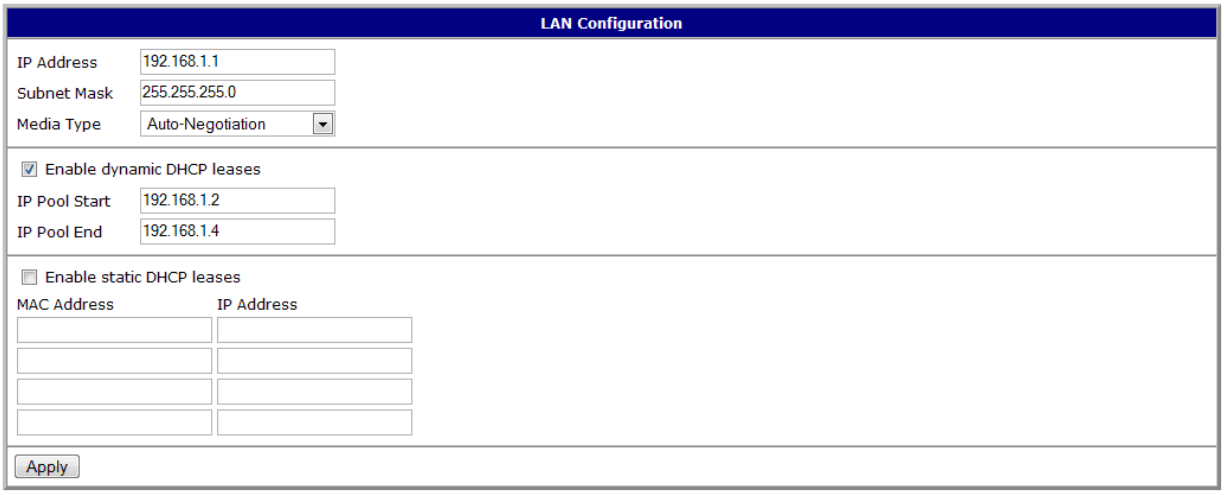
The changes in settings will apply after pressing the *Apply* button.

The DHCP server assigns to the connected clients IP addresses from the defined address pool, IP address of the gate and IP address of the primary DNS server. It is important to don't overlap ranges of static engaged IP address with address allotted by the help of DHCP, else is able to get to collision of addresses and thereby to false function of network.

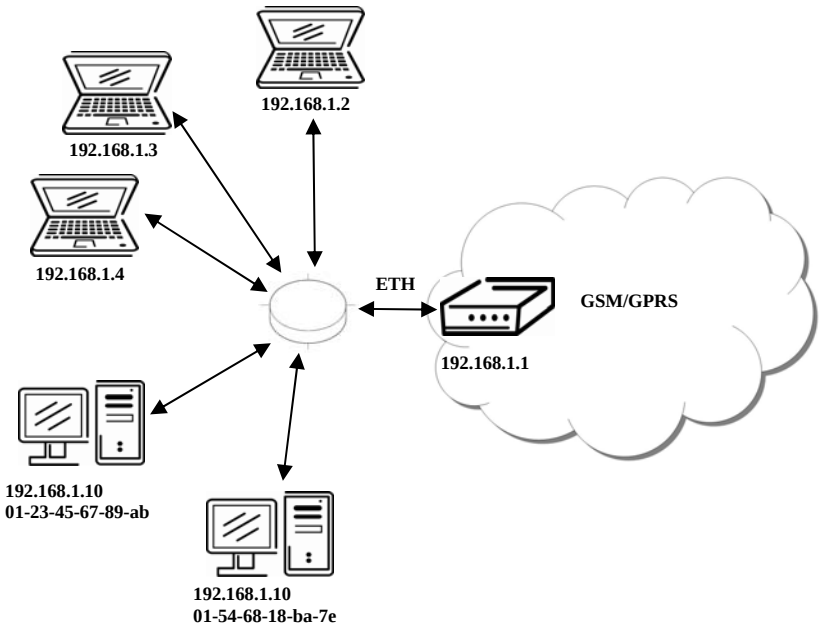


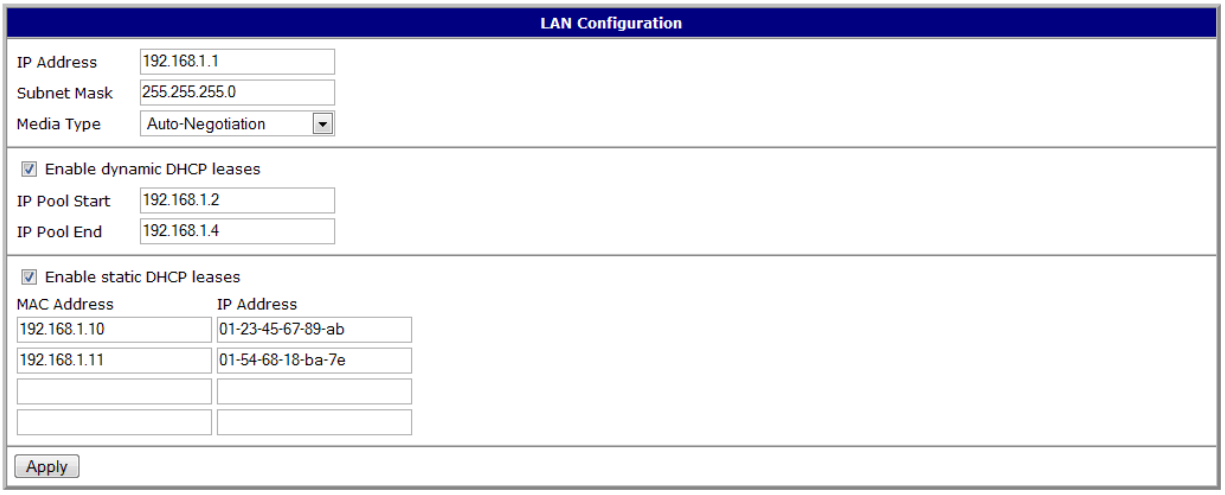
Example of the network interface with dynamic DHCP server:





Example of the network interface with dynamic and static DHCP server:

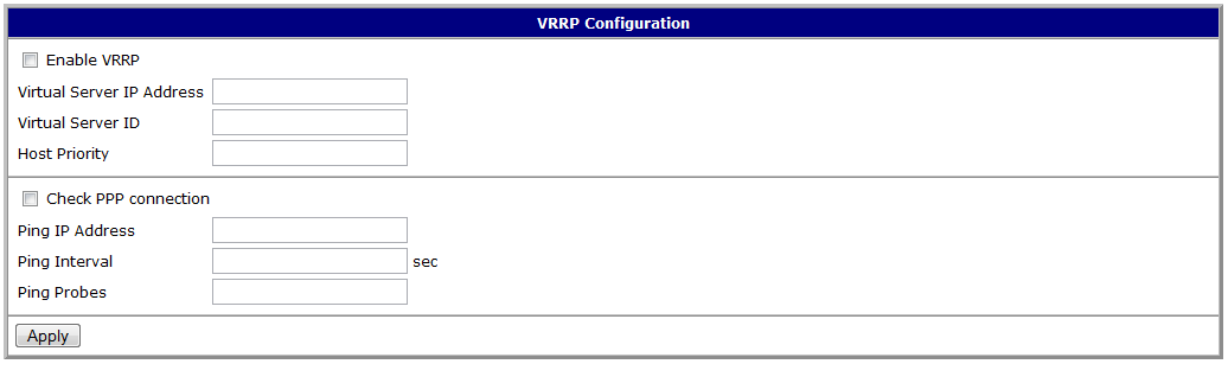




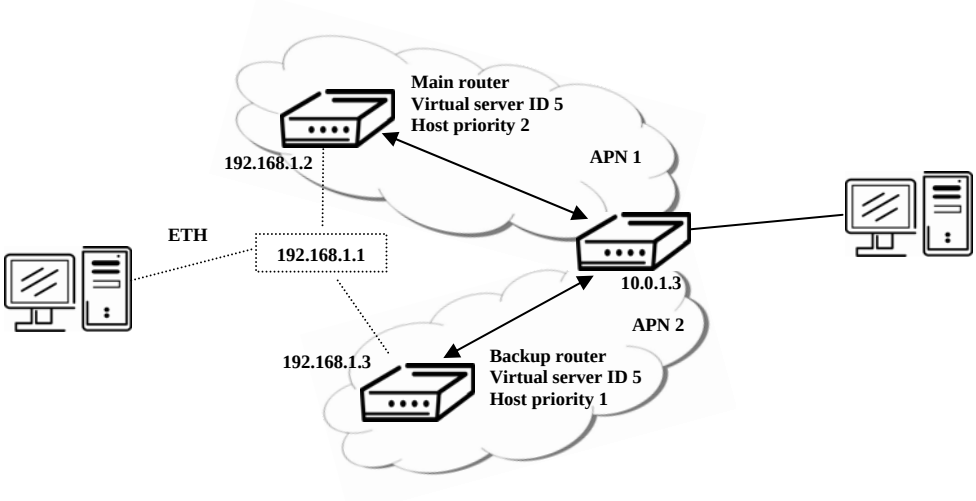
4.8. VRRP configuration

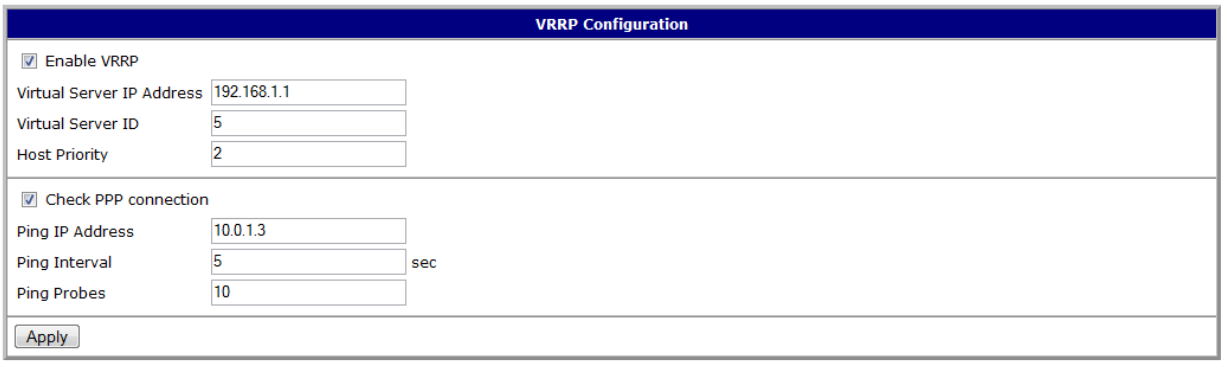
To enter the VRRP configuration select the *VRRP* menu item. VRRP protocol (Virtual Router Redundancy Protocol) is technique, by which it is possible forwards routing from main router to backup router in case of the main router failure. If the *Enable VRRP* is checked it is possible to set the following parameters. Parameter *Virtual Server IP Address* set virtual server IP address, this address is the same for both routers. Parameter *Virtual Server ID* makes out more virtual routers in the network. The main and backup router have to had the same this parameter. The main router is this which has set parameter *Host Priority* higher.

In the second part of the windows it is possible *Check PPP connection*. The main router will send ping questions on defined *Ping IP Address* in the *Ping Interval*. The function check PPP connection is intended for trace continuity verifies. If don't answers on set number of *Ping Probes* from ping IP address the trace is functionless. It is possible to use as ping IP address for example DNS server of mobile operator.



Example of the VRRP protocol:





4.9. GPRS Configuration

To enter the GPRS connection configuration select the *GPRS* menu item. If the *Create GPRS connection* option is checked, the modem automatically tries to establish GPRS connection after switched on. In the window it is possible to define *Username*, *Password* and *IP address* for two different *APN*. If the *IP address* field is not filled in, the operator when establishing the connection will automatically assign the IP address.

If the *APN* field is not filled in, the APN will be automatically assigned by the IMSI code of the SIM card. If the PLMN (operator number format) is not in the book of APN, then default APN is “internet“. The mobile operator defines APN. The PLMN parameter is possible to define in *Operator* item.

The choice *Get DNS address from operator* is given for easier configuration on client side; by this choice it is possible to use the web browser. If this field is not filled, the client’s station has no access to the Internet and it is possible to send data to a known IP address.

If the Check PPP connection option is checked, it has active control of connection over PPP. The modem will automatically send the ping question to the selected IP address (*Ping IP Address*) in periodic time intervals (*Ping Interval*). After three unsuccessfully pings on appropriate IP address the ER75i terminates connection and tries establish new connection. It is possible to use as ping IP address for example DNS server of mobile operator.

Parameter *Data limit* set limit for sending via GPRS. By the parameter *Accounting Start* is possible set start of the accounting which is defined in *Data limit*. If the parameter *Switch to secondary SIM card when data limit is exceeded* (see next) or *Send SMS when datalimit is exceeded* (see SMS configuration) are not checked the data limit wont accounting.

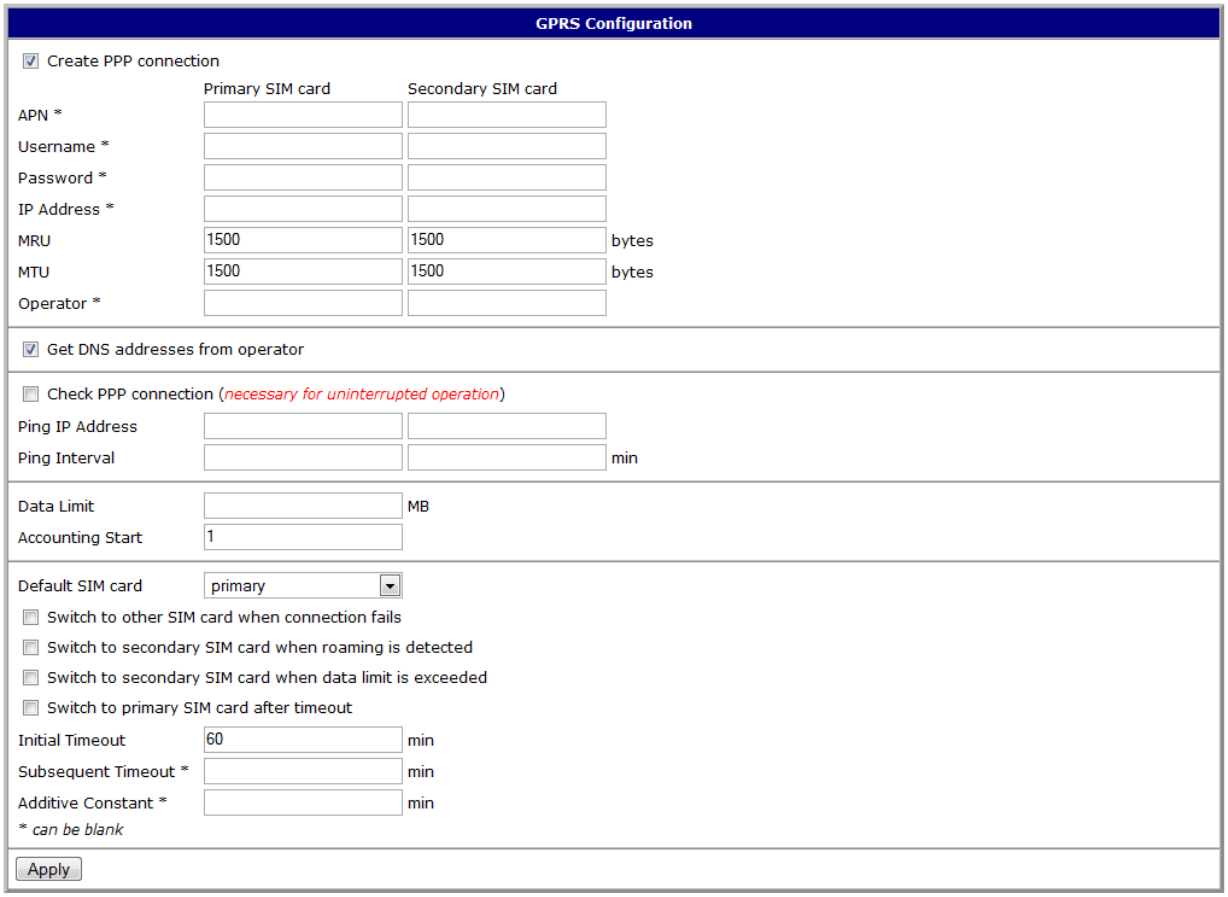
At the bottom of configuration it is possible set rules for switching between two APN’s on the SIM card. Parameter *Default SIM card* sets default SIM card from which will try the PPP connection. If this parameter is set to *none* the ER75i is launch in offline mode and it is need establish PPP connection by SMS message. If PPP connection fail the parameter *Switch to other SIM card when connection fails* ensure switch to secondary APN of the SIM card. In case that the roaming is detect the parameter *Switch to secondary SIM card when roaming is detected* enable switching to secondary APN of the SIM card. In case that the data limit exceeded the parameter *Switch to secondary SIM card when data limit is exceeded* enable switching to secondary APN of the SIM card. Parameter *Switch to primary SIM card after timeout* defines conditions, how to switch back to the default APN.

Parameter *Switch to primary SIM card after timeout* defines how the ER75i will try switch back to default APN.

Parameter *Initial Timeout* set time after which ER75i try to make connection with default APN, range of this parameter is 1 up to 10000 minutes. Parameter *Subsequent Timeout* set time period for every other next attempt to make connection with default APN, range is 1 up to 10000 minutes. Parameter *Additive Constant* set amount of time which is added to every attempt at main connection establishment after unsuccessful defined attempt (for example: after second unsuccessful attempt at main connection establishment time of next attempt is extended about 30 minutes etc.). Range is 1 up to 1000 minutes.

Attention! Check GPRS connection we recommended in case of uninterrupted running.

The changes in settings will apply after pressing the *Apply* button.



Annotation:

- MRU (Maximum Transmission Unit) – it is identifier of maximal size of packet, which it is possible transfer in given environment.
- MTU (Maximum Receiving Unit) – it is identifier of maximal size of packet, which it is possible, received in given environment.

Default value is 1500 bytes. Other settings may cause incorrect transmission of data.

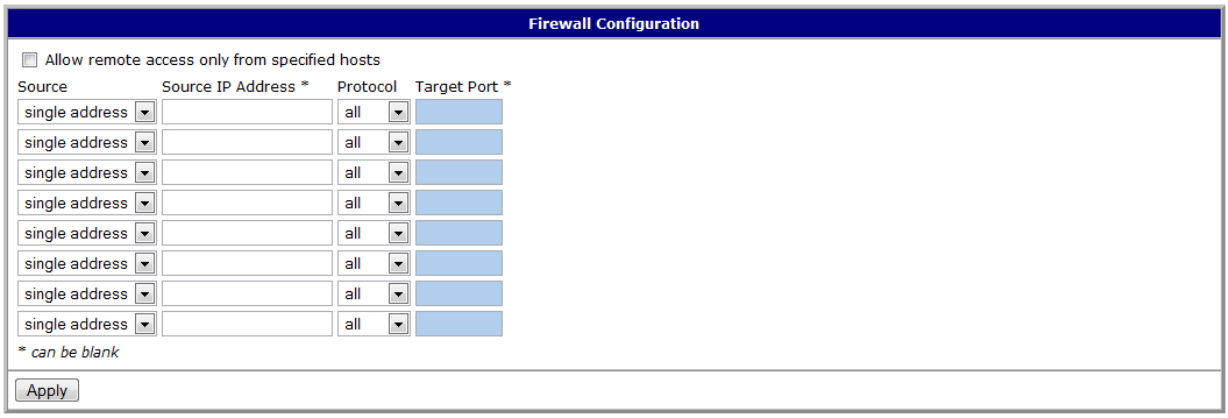
4.10. Firewall Configuration

By the help of a firewall are possible set IP addresses from which is possible remote access on ER75i. The choice *Allow remote access only from specified hosts* is given for easier configuration of hosts. In this firewall configuration is possible set up to four remote accesses by the help of *Source*, *Source IP Address*, *Protocol* and *Target Port*.

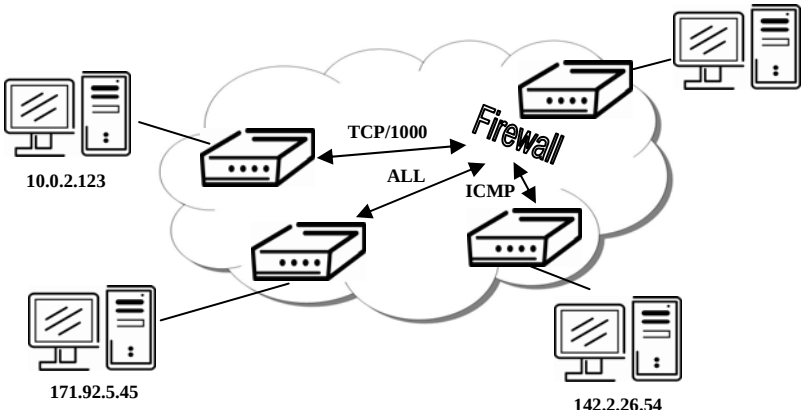
Parameter *Source* defines if access is allowed to one IP address which is defined by *Source IP Address*, or every IP addresses. In menu *Protocol* it is possible specifies protocol for remote access, it is possible allow all protocols (*all*), or only one protocol *UDP*, *TCP* or *ICMP*. By parameter *Target Port* is possible specifies port number.

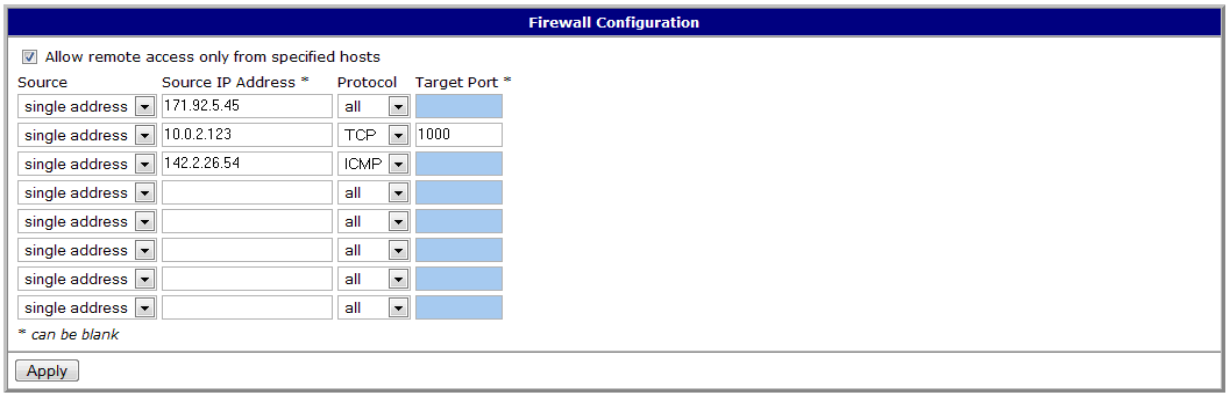
The changes in settings will apply after pressing the *Apply* button.

Caution! Firewall doesn't filter via Ethernet.



Example of the firewall configuration:





4.11. NAT Configuration

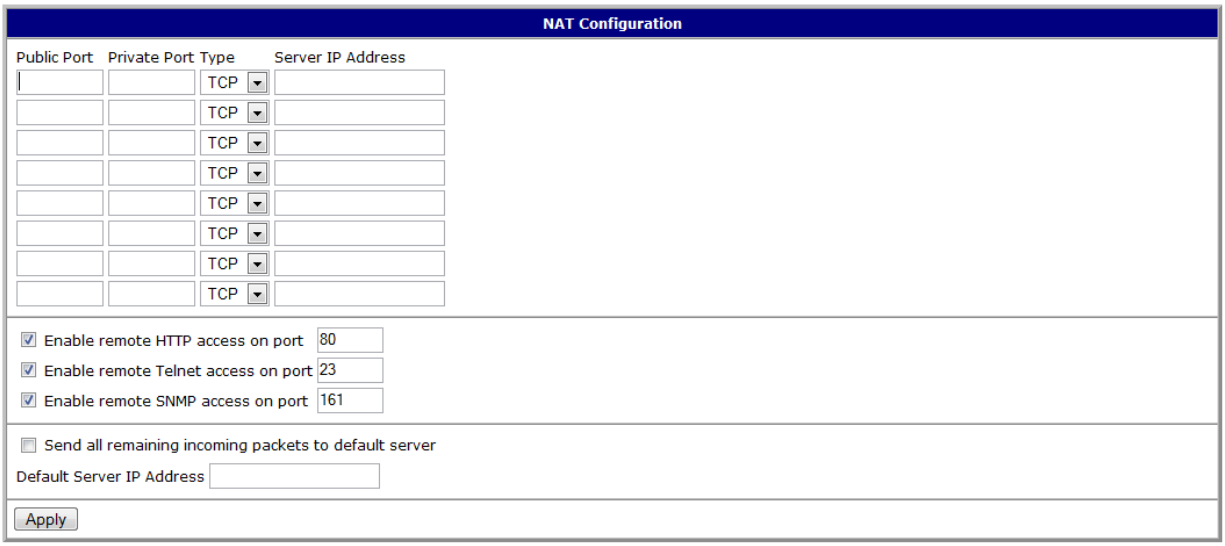
To enter the Network Address Translation configuration, select the *NAT* menu item. By checking off the *Send all incoming packets to default server* item and setting the *Default Server* item it is possible to put the ER75i router into the mode in which all incoming data from GPRS will be routed to the computer with the defined IP address.

If the *Enable remote HTTP access* field and port number is filled in, it is maybe configuration of router over web interface.

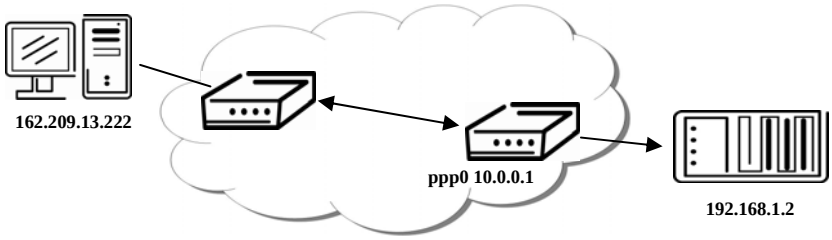
Choice *Enable remote Telnet access* and port number makes it possible access over Telnet.

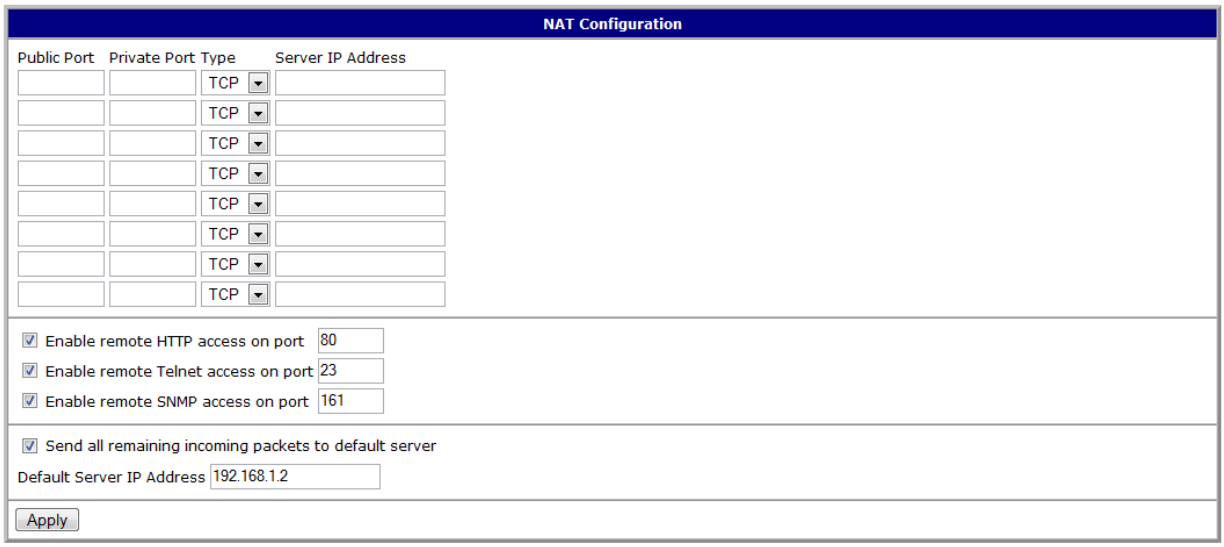
Choice *Enable remote SNMP access* and port number makes it possible access to SNMP agent.

The changes in settings will apply after pressing the *Apply* button.



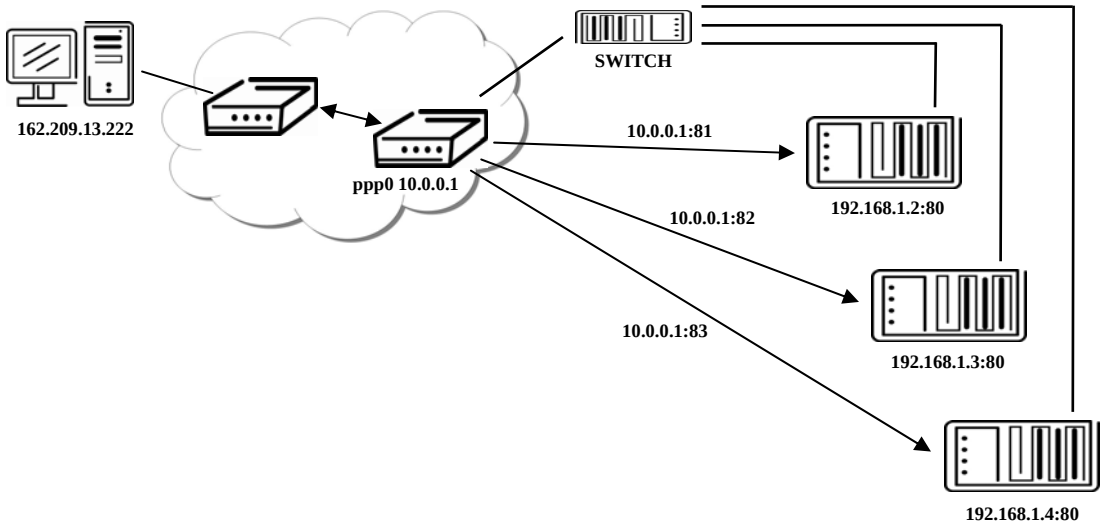
Example of the configuration with one connection equipment on the ER75i:

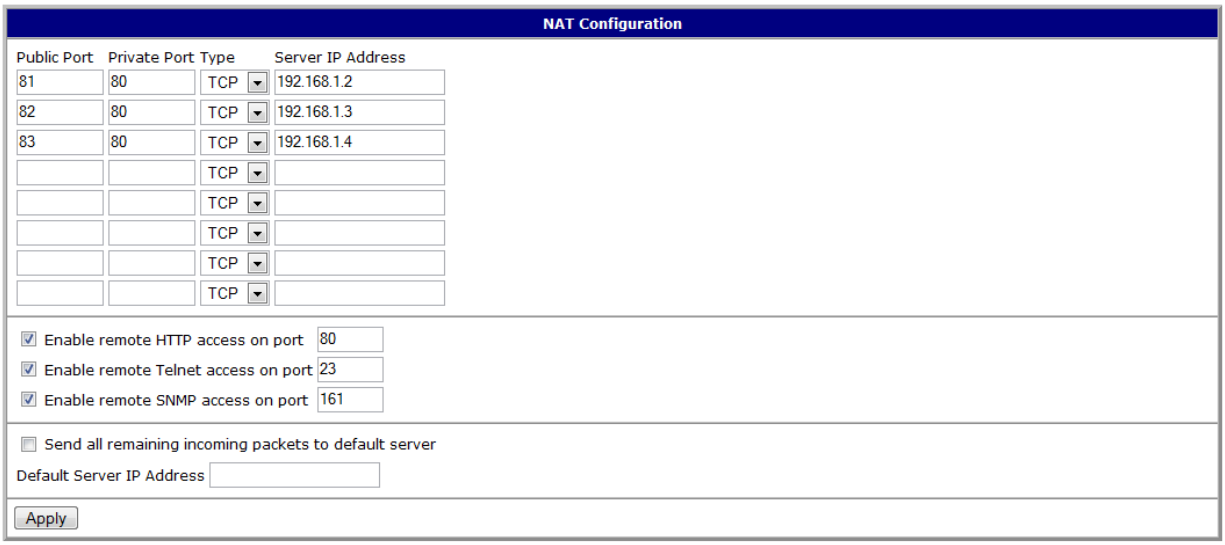




At these configuration it is important to have mark election *Send all remaining incoming packets it default server*, IP address in this case is device address behind ER75i. Connected equipment behind ER75i must have setting Default Gateway on the ER75i. At distant PING on IP address of the SIM card matches connected equipment.

Example of the configuration with more connected equipment:



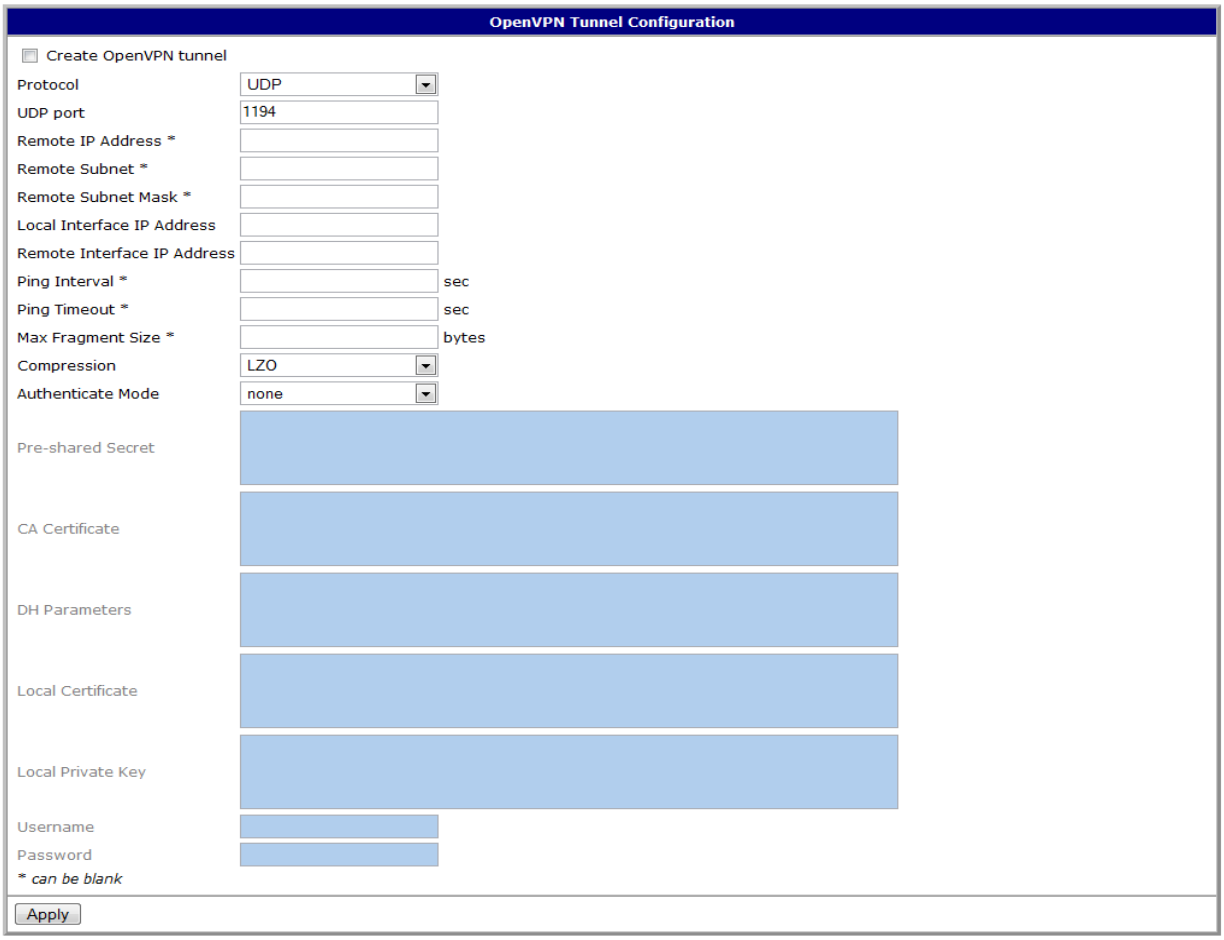


At this configuration the address define Server IP Address equipments wiring behind ER75i. At distant PING matches ER75i. Access on web interface of equipment behind ER75i it is possible by the help of Port Forwarding, when behind IP address of SIM is indicating public port of equipment on which we want come up. At demand on port 80 it is surveyed singles outer ports (Public port), there this port isn't defined, therefore at check selection Enable repote http access it is automatically opens web interface ER75i. If this choice isn't check and is check volition Send all remaining incoming packets to default server fulfill oneself connection on induction IP address. At it is not check election web interface and Default server IP address it is request failure.

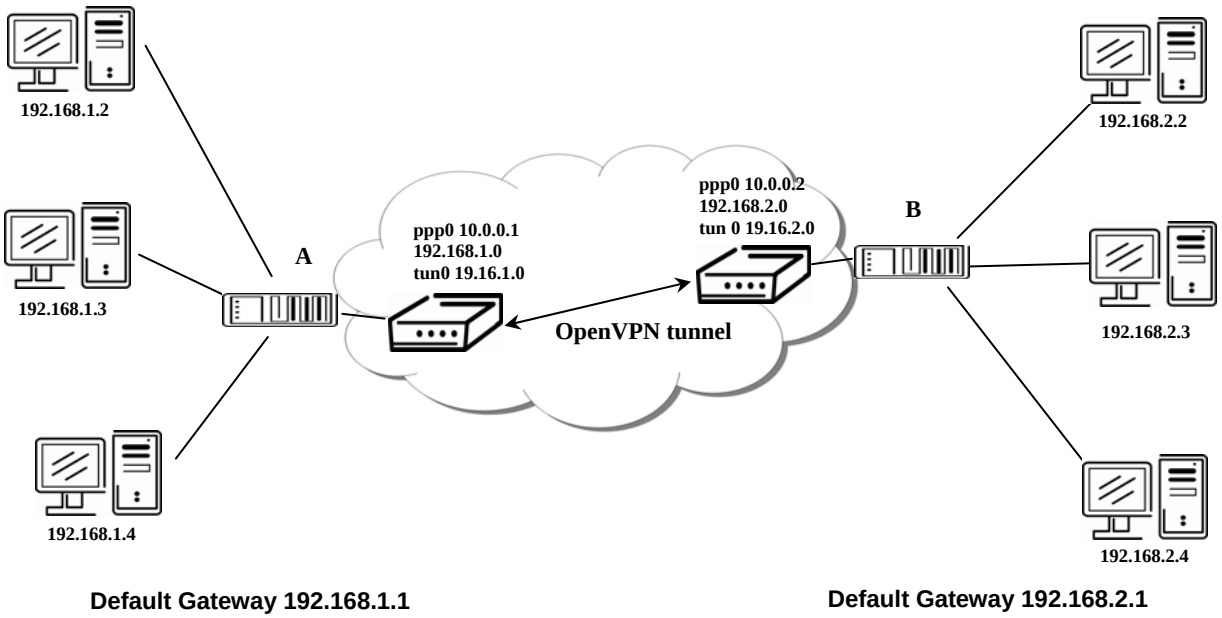
4.12. OpenVPN Tunnel Configuration

OpenVPN tunnel configuration it can be call - up option *OpenVPN* item in menu. The OpenVPN tunnel enables secured connection of two LAN networks to one homogenous. Choice *Create OpenVPN tunnel* makes it possible creates tunnel.

In window it can be define *Protocol*, by which the tunnel will communicate. At choice is *UDP*, *TCP server* or *TCP client* protocol which have to have defined *port* protocol. On off - side tunnel IP address (*Remote External IP Address*), address nets behind off - side tunnel (*Remote Subnet*), mask nets behind off - side tunnel (*Remote Subnet Mask*). Parameter *Local Interface IP Address* defines local interface IP address, parameter *Remote Interface IP Address* defines interface IP address of the off-side tunnel. Parameter *Ping Interval* defines time period after which it send message to off-side and by parameter *Ping Timeout* wait on message from off-side tunnel. Parameter *Ping Timeout* have to be bigger than *Ping Interval* because of OpenVPN tunnel true verify. By parameter *Max Fragment Size* is possible defines maximal sending packet size. Sending data is possible compress by lossless LZO compression, compression have to be on both off-side tunnel. By *Authenticate Mode* it is possible choice authentication. At choice are *none* authentication, or by *Pre-shared secret* which set shared key for both off-side tunnel; or by *Username/Password* which enable authentication by *CA Certificate*, *Username* and *Password*; next can be *X.509 Certificate (client)*, this enables authentication by *CA Certificate*, *Local Certificate* and *Local Private Key*; last possibility is *X.509 Certificate (server)* which enables authentication by *CA Certificate*, *DH Parameters*, *Local Certificate* and *Local Private Key*.



Example of the OpenVPN tunnel configuration:



OpenVPN tunnel configuration:

	A	B
Protocol	UDP	UDP
UDP Port	1194	1194
Remote IP Address:	10.0.0.2	10.0.0.1
Remote Subnet:	192.168.2.0	192.168.1.0
Remote Subnet Mask:	255.255.255.0	255.255.255.0
Local Interface IP Address:	19.16.1.0	19.16.2.0
Remote Interface IP Address:	19.16.2.0	19.18.1.0
Compression	LZO	LZO
Authenticate mode:	none	none

4.13. IPsec Tunnel Configuration

IPsec tunnel configuration it can be call - up option *IPsec* item in menu. IPsec tunnel allows protected connection of two networks LAN to the one which it is cheek as one homogenous. Choice *Create IPsec tunnel* makes it possible creates tunnel.

In window it can be define off - side tunnel IP address (*Remote IP Address*), identification of off-side tunnel (*Remote ID*), address nets behind off - side tunnel (*Remote Subnet*), mask nets behind off - side tunnel (*Remote Subnet Mask*), identification of local side (*Local ID*), local subnet address (*Local Subnet*), local network mask (*Local Subnet Mask*), sharable key for both parties tunnel (*Pre shared Key*), service life keys (*Key Lifetime*) and service life IKA SA (*IKE Lifetime*). *Rekey Margin* specifies how long before connection expiry should attempts to negotiate a replacement begin. *Rekey Fuzz* specifies the maximum percentage by which *Rekey Margin* should be randomly increased to randomize re-keying intervals. If it is used address translation between two end points of the IPsec tunnel it is need permit NAT Traversal (*Enabled*). Authentication is possible set by parameter *Authenticate by*, at choice are following possibilities: *Pre-shared key* or *X.509 Certificate*. Parameter *Pre-shared Key* set shared key for both off-side tunnel. At authentication by X.509 certificate it is necessary put in certificates *CA Certificate*, *Remote Certificate* and *Local Certificate* and private key *Local Private Key*. The certificates and private keys have to be in PEM format. As certificate it is possible to use only certificate which has start and stop tag certificate. Parameters ID contain two parts: *hostname* and *domain-name*. Items which can be blank, are used for to exact IPsec tunnel identification.

The changes in settings will apply after pressing the *Apply* button.

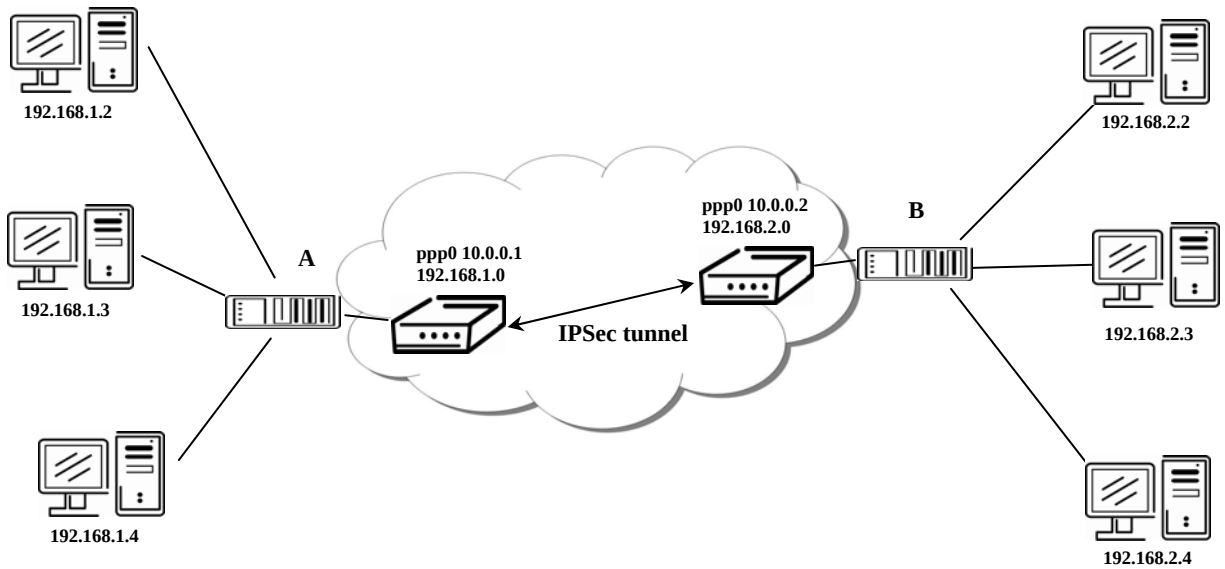
IPsec Tunnel Configuration

Create IPsec tunnel		
Remote IP Address *		
Remote ID *		
Remote Subnet *		
Remote Subnet Mask *		
Local ID *		
Local Subnet *		
Local Subnet Mask *		
Key Lifetime	3600	sec
IKE Lifetime	3600	sec
Rekey Margin	540	sec
Rekey Fuzz	100	%
NAT Traversal	disabled	
Authenticate By	pre-shared key	
Pre-shared Key		
CA Certificate		
Remote Certificate		
Local Certificate		
Local Private Key		
Local Passphrase *		

** can be blank*

Apply

Example of the IPSec Tunnel configuration:



Default Gateway 192.168.1.1

Default Gateway 192.168.2.1

IPsec tunnel configuration:

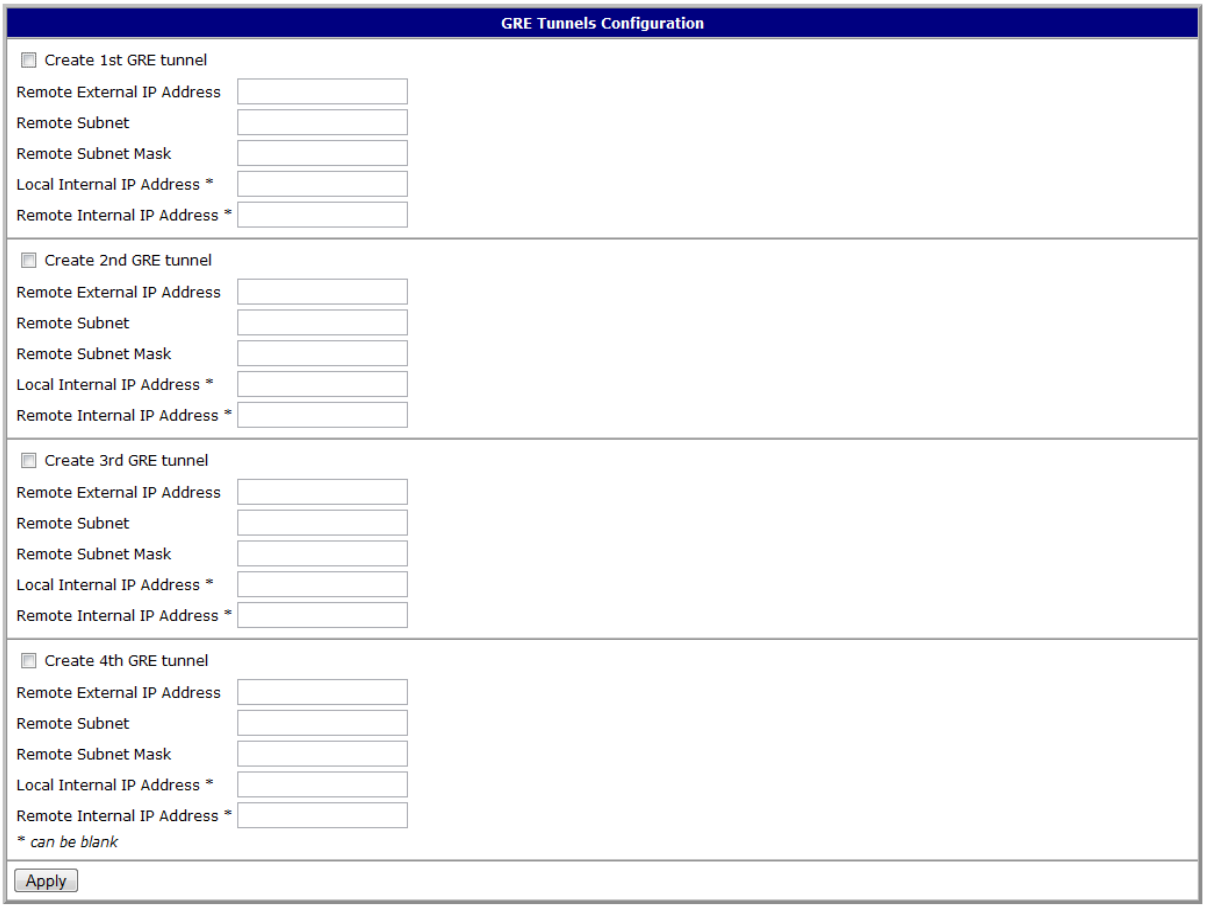
	A	B
Remote IP Address:	10.0.0.2	10.0.0.1
Remote Subnet:	192.168.2.0	192.168.1.0
Remote Subnet Mask:	255.255.255.0	255.255.255.0
Local Subnet:	192.168.1.0	192.168.2.0
Local Subnet Mask:	255.255.255.0	255.255.255.0
Authenticate mode:	pre-shared key	pre-shared key
Pre-shared key	test	test

4.14. GRE Tunnel Configuration

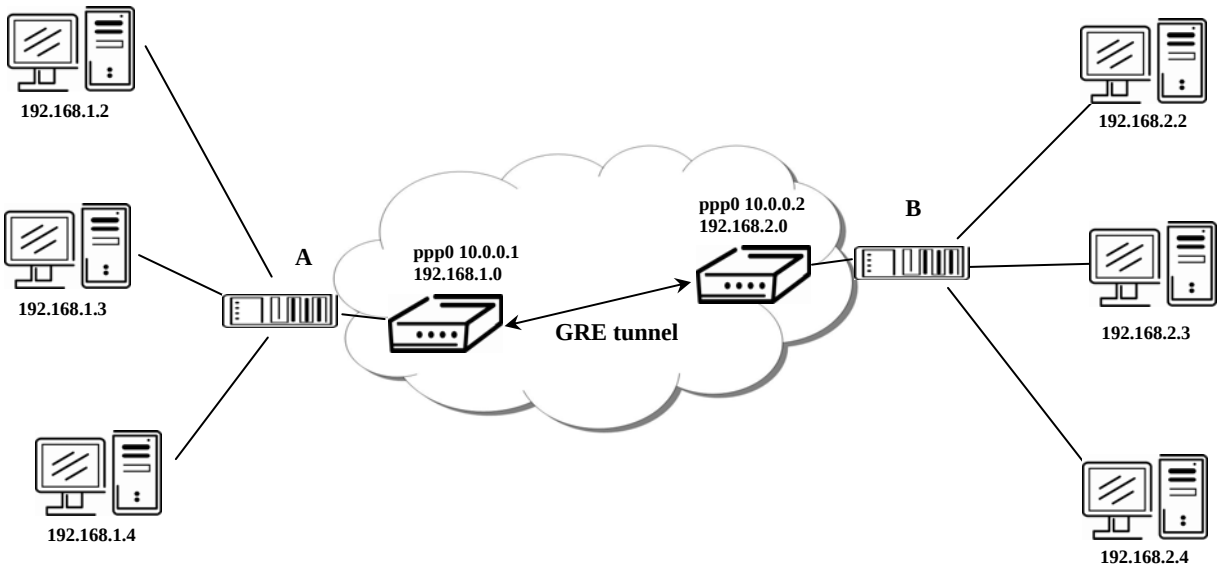
To enter the GRE tunnels configuration, select the *GRE* menu item. It is possible configure up to four GRE tunnels. The tunnels are active after enter of choice *Create x GRE tunnel*.

In the singles window it is possible to define the IP address of the remote side of the tunnel (*Remote External IP Address*), internal IP address of the local side of the tunnel (*Local Internal IP Address*), internal IP address of the remote side of the tunnel (*Remote Internal IP Address*), address of the network behind the remote side of the tunnel (*Remote Subnet*) and the mask of the network behind the remote side of the tunnel (*Remote Subnet Mask*). The GRE tunnel is used for connection of two networks to one that appears as one homogenous.

The changes in settings will apply after pressing the *Apply* button.



Example of the GRE Tunnel configuration:



GRE tunnel Configuration:

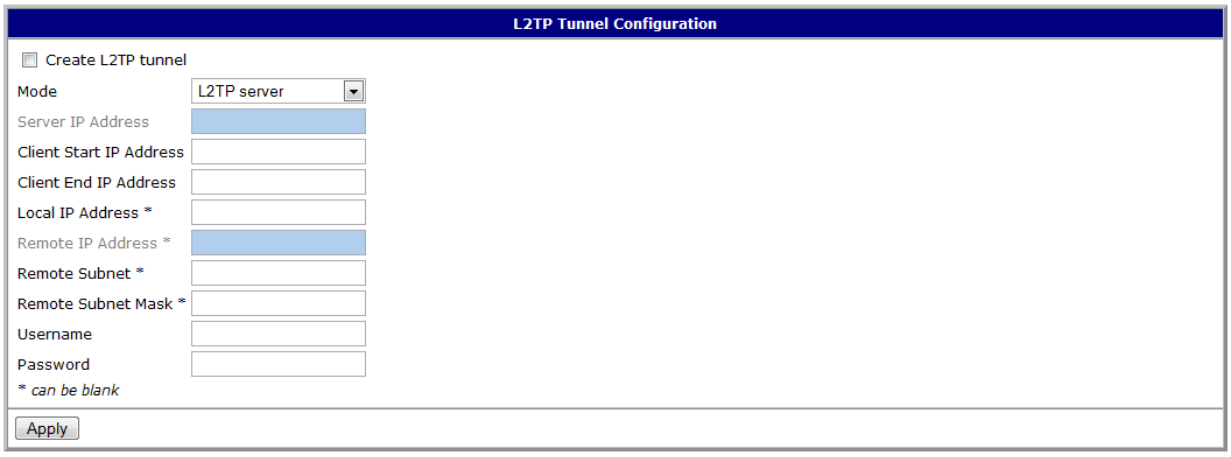
	A	B
Remote External IP Address:	10.0.0.2	10.0.0.1
Remote Subnet:	192.168.2.0	192.168.1.0
Remote Subnet Mask:	255.255.255.0	255.255.255.0

4.15. L2TP tunnel Configuration

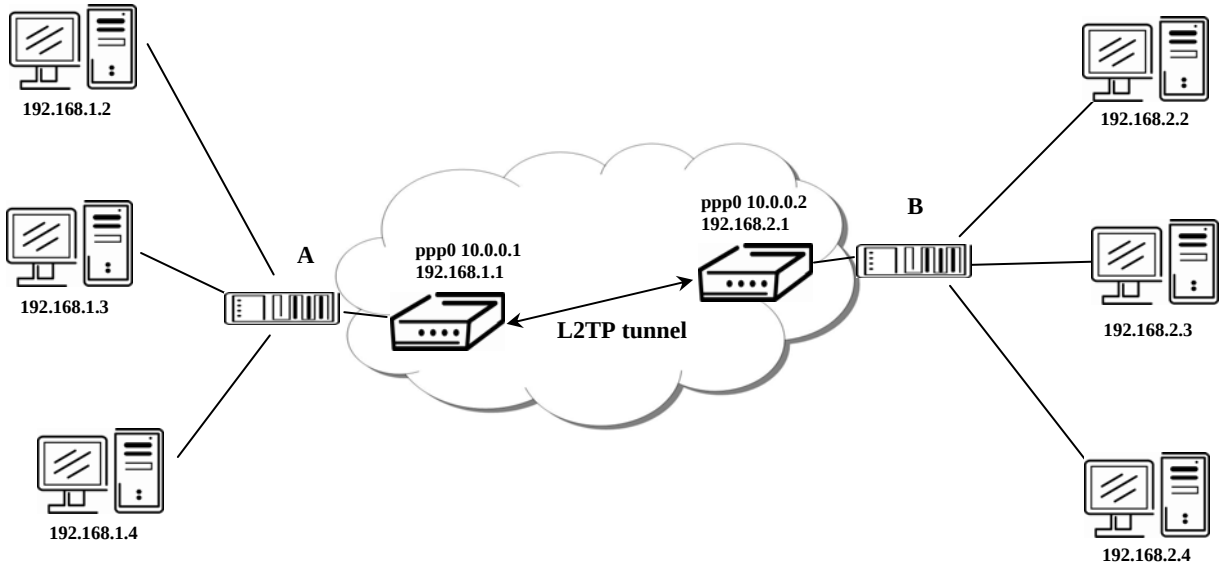
To enter the L2TP tunnels configuration, select the *L2TP* menu item. L2TP tunnel allows protected connection by password of two networks LAN to the one which it is cheek as one homogenous. The tunnels are active after enter of choice *Create L2TP tunnel*.

In the window it is possible to define L2TP tunnel mode (Mode) on ER75i side, in case of client IP address of server (Server IP Address), start IP address in range, which is offered by server to clients (Client Start IP Address), end IP address in range, which is offered by server to clients (Client End IP Address), IP address of the local side of the tunnel (Local IP Address), IP address of the remote side of the tunnel (Remote IP Address), address of the network behind the remote side of the tunnel (Remote Subnet), the mask of the network behind the remote side of the tunnel (Remote Subnet Mask), username for login to L2TP tunnel (Username) and password (Password).

The changes in settings will apply after pressing the *Apply* button.



Example of the L2TP Tunnel configuration:



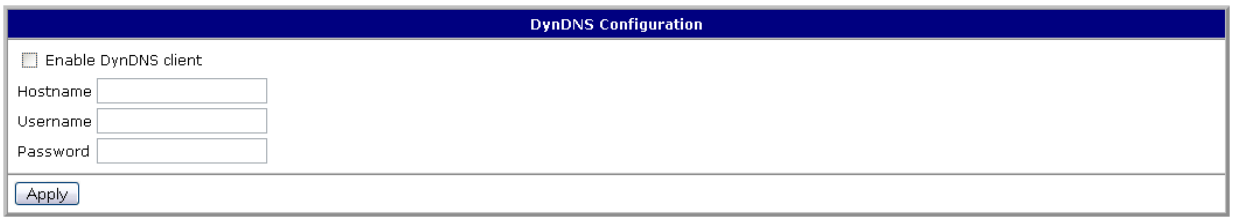
L2TP tunnel Configuration:

	A	B
Mode	L2TP Server	L2TP Client
Server IP Address	---	10.0.0.1
Client Start IP Address:	192.168.1.2	---
Client End IP Address:	192.168.1.254	---
Local IP Address:	192.168.1.1	---
Remote IP Address	---	---
Remote Subnet	192.168.2.0	192.168.1.0
Remote Subnet Mask	255.255.255.0	255.255.255.0
Username	user	user
Password	password	password

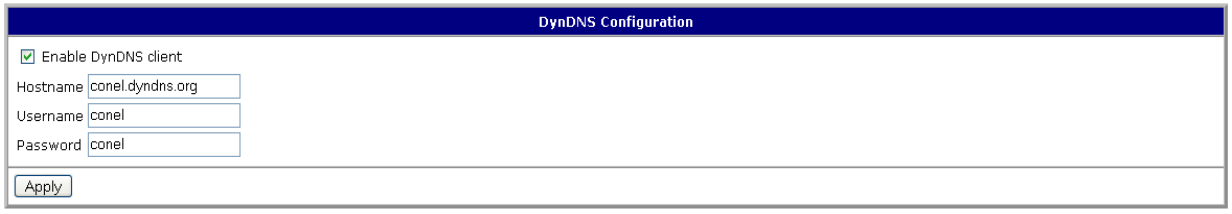
4.16. DynDNS Client Configuration

DynDNS client Configuration it can be call - up option DynDNS item in menu. In window it can be define domain of third order registered on server www.dyndns.org (*Hostname*), user name (*Username*) and password (*Password*).

The changes in settings will apply after pressing the *Apply* button.



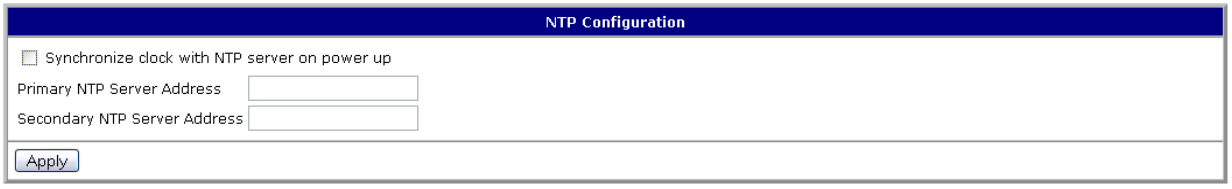
Example of the DynDNS client configuration with domain conel.dyndns.org, username conel and password conel:



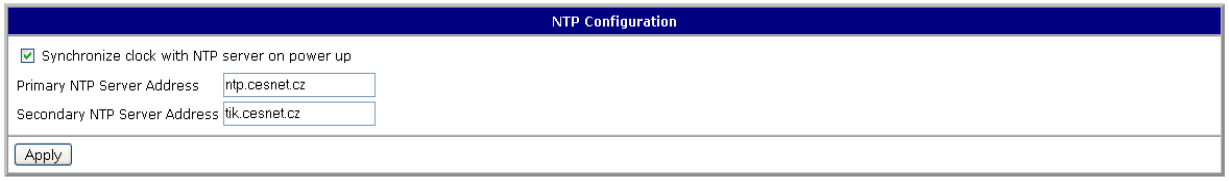
4.17. NTP Client Configuration

NTP client Configuration it can be call - up option NTP item in menu. In window it can be define address prime (Primary NTP server Address) and secondary NTP server (Secondary NTP server Address), by the help of which router after first interface to the GPRS from make power supply will adjust inner o'clock. Example of NTP server address can be on ntp.isc.org/bin/view/Servers/StratumOneTimeServers.

The changes in settings will apply after pressing the *Apply* button.



Example of the NTP configuration with set primary and secondary NTP server:

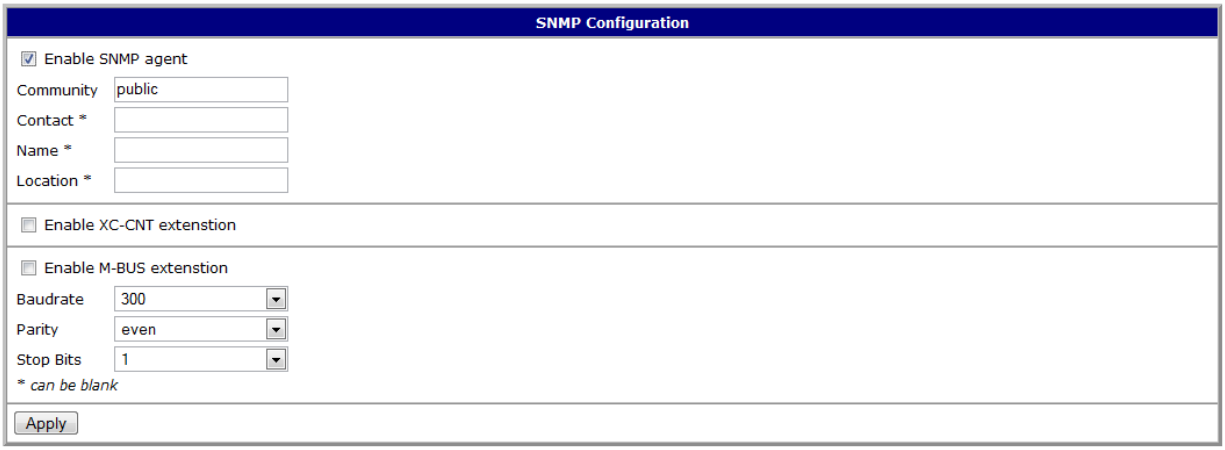


4.18. SNMP Configuration

To enter the SNMP Configuration it is possible SNMP agent ver.1 configuration which sends information about the ER75i, eventually about status of the expansion port CNT or MBUS.

The *Community* item defines password for access to the SNMP agent. Item *Contact* identify a person which manage the ER75i together with informations how contact this person, item *Name* is designation of the ER75i and item *Location* describe physical placing of the ER75i.

By the choice *Enable XC-CNT extension* is possible monitor the expansion port CNT inputs status or by the choice *Enable M-BUS extension* and enter the *Baudrate*, *Parity* and *Stop Bits* is possible monitor meter status connected to the expansion port MBUS status.



Every monitor value is uniquely identified by the help of number identifier **OID** - *Object Identifier*.

For the expansion port CNT is used following range of OID:

OID	Description
.1.3.6.1.4.1.30140.2.1.1.0	Analogy input AN1 (range 0-4095)
.1.3.6.1.4.1.30140.2.1.2.0	Analogy input AN2 (range 0-4095)
.1.3.6.1.4.1.30140.2.1.3.0	Counter input CNT1 (range 0-4294967295)
.1.3.6.1.4.1.30140.2.1.4.0	Counter input CNT2 (range 0-4294967295)
.1.3.6.1.4.1.30140.2.1.5.0	Binary input BIN1 (values 0,1)
.1.3.6.1.4.1.30140.2.1.6.0	Binary input BIN2 (values 0,1)
.1.3.6.1.4.1.30140.2.1.7.0	Binary input BIN3 (values 0,1)
.1.3.6.1.4.1.30140.2.1.8.0	Binary input BIN4 (values 0,1)

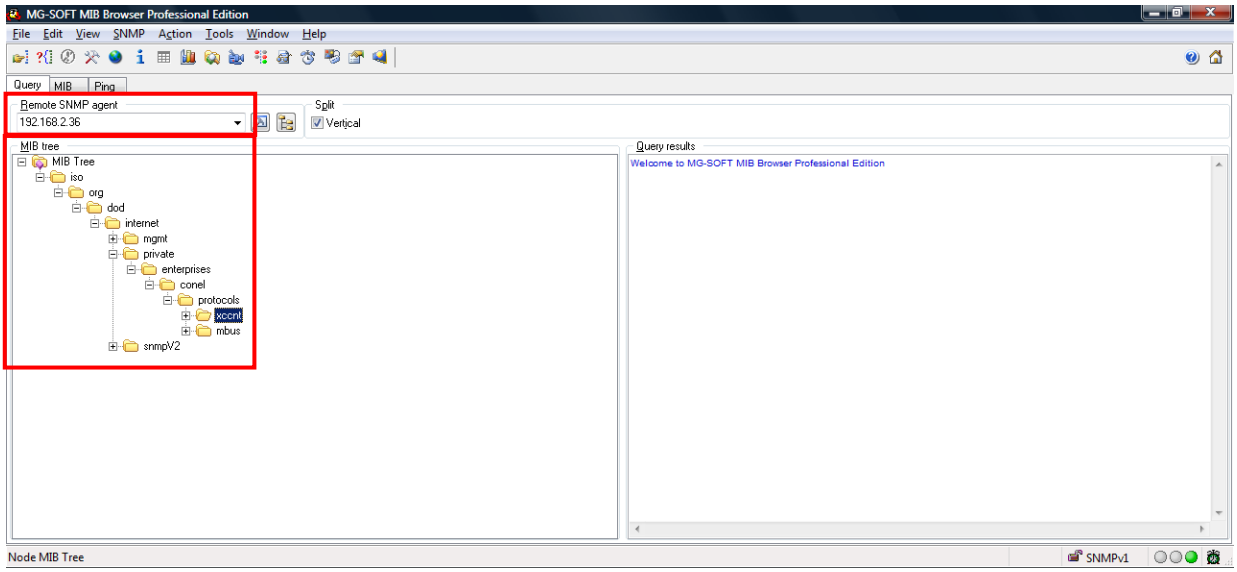
For the expansion port MBUS is used following range of OID:

OID	Description
.1.3.6.1.4.1.30140.2.2.<address>.1.0	IdNumber – meter number
.1.3.6.1.4.1.30140.2.2.<address>.2.0	Manufacturer
.1.3.6.1.4.1.30140.2.2.<address>.3.0	Version – specified meter version
.1.3.6.1.4.1.30140.2.2.<address>.4.0	Medium – type of metered medium
.1.3.6.1.4.1.30140.2.2.<address>.5.0	Status – errors report
.1.3.6.1.4.1.30140.2.2.<address>.6.0	0. VIF – value information field
.1.3.6.1.4.1.30140.2.2.<address>.7.0	0. measured value
.1.3.6.1.4.1.30140.2.2.<address>.8.0	1. VIF – value information field
.1.3.6.1.4.1.30140.2.2.<address>.9.0	1. measured value

…	
.1.3.6.1.4.1.30140.2.2.<address>.100.0	47. VIF – value information field
.1.3.6.1.4.1.30140.2.2.<address>.101.0	47. measured value

The meter address can be from range 0..254 when 254 is broadcast.

Example of the MIB browser:



It is important to set the IP address of the SNMP agent (ER75i) in field *Remote SNMP agent*. After enter the IP address is in a *MIB tree* part is possible show object identifier. The path to objects is:

iso->org->dod->internet->private->enterprises->conel->protocols

4.19. SMS Configuration

To enter the *SMS* in menu it is possible configuration. It is possible to select automatic sending of SMS messages following power up (*Send SMS on power up*) and at the start (*Send SMS on PPP connect*) or the loss (*Send SMS on PPP disconnect*) of the PPP connection and at data limit exceeded (*Send SMS when datalimit exceeded*). Info is possible to send to three telephone numbers. *Unit ID* is the name of the ER75i that it will send a SMS message to. Unit ID may have a random form.

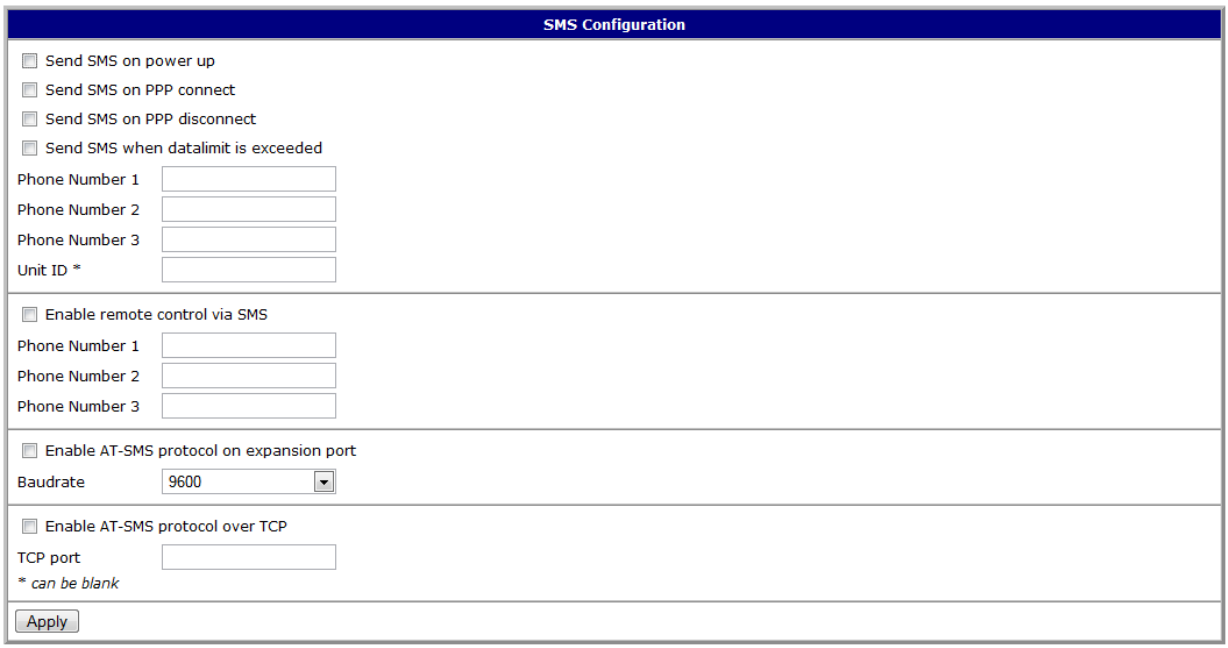
In the second part of window it is possible set function *Enable remote control via SMS*. After this is possible establish and close PPP connection by SMS message.

SMS	Description
go online sim 1	PPP connection establishment from first SIM card (APN1)
go online sim 2	PPP connection establishment from second SIM card (APN2)
go offline	PPP connection termination

By the choice *Enable AT-SMS protocol on external port* and *Baudrate* is possible send/receive a SMS on serial port.

By the choice *Enable AT-SMS protocol on TCP port* and enter the *TCP port* is possible send/receive a SMS on TCP port. SMS messages send by the help of a standard AT commands. More about the AT commands in reference **[1]**.

Choices *Enable AT-SMS protocol on external port* and *Enable AT-SMS protocol on TCP port* mustn't be checked at the same time.



Behind power up ER 75i, at introduction telephone number it come SMS in the form of:

ER75i (Unit ID) has been powered up. PLMN:xxxxx,Cell:xxxx,Channel:xx,Level:-xxdBm.

Where is PLMN – number of mobile operator, Cell – number of cell, Channel – used channel, Level – level signal

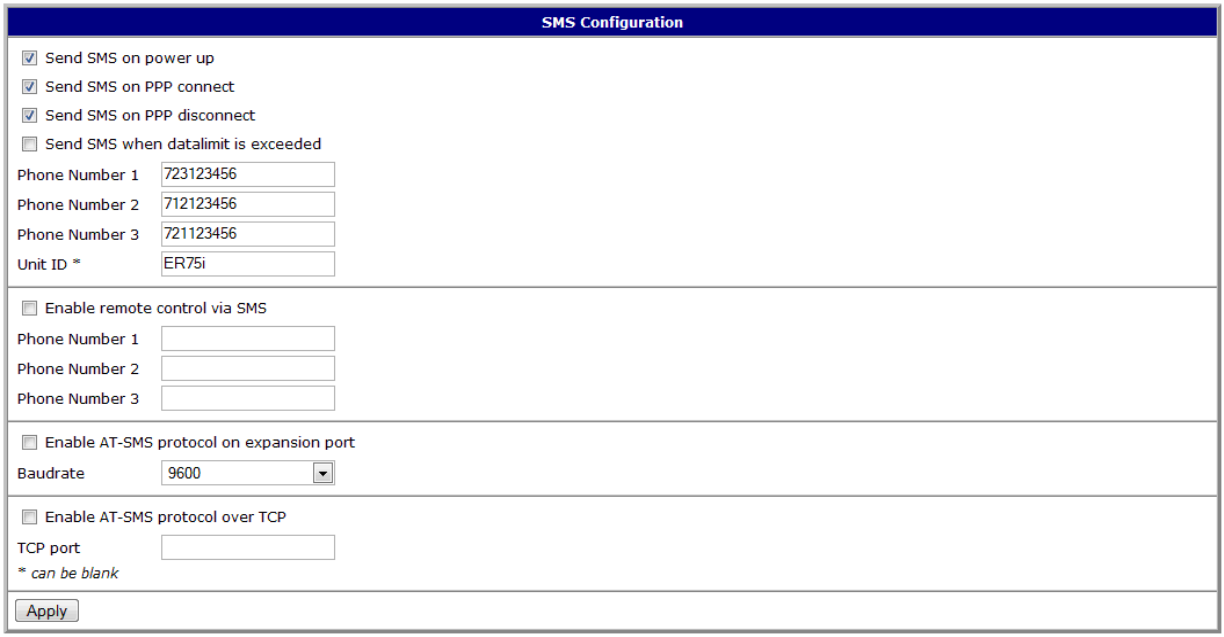
Behind PPP connect at introduction telephone number it come SMS in the form:

ER75i (Unit ID) has established PPP connection. IP address xxx.xxx.xxx.xxx

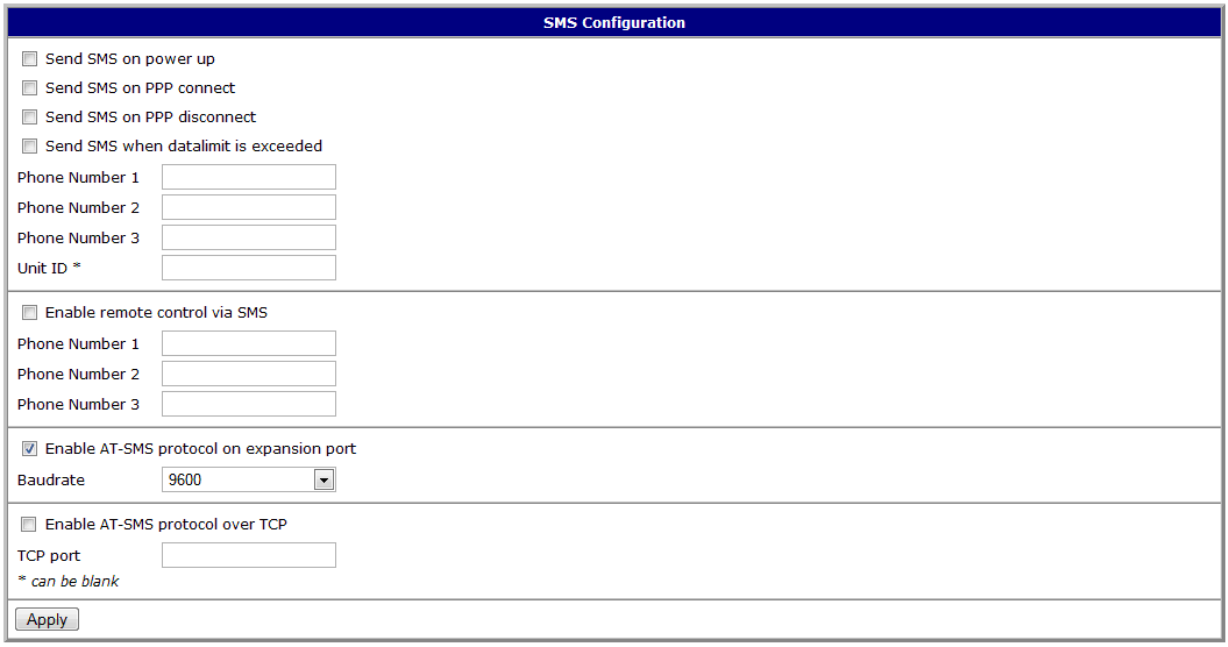
Behind PPP disconnect at introduction telephone number it come SMS in the form:

ER75i (Unit ID) has lost PPP connection. IP address xxx.xxx.xxx.xxx

Configuration of sending this SMS is following:



Example of the ER75i onfiguration for SMS sending via serial interface:



The SMS is possible to do for example in HyperTerminal program. After establish of the connection with the ER75i via serial interface or Ethernet, is possible do with SMS by the help of the next AT commands (more about AT commands see reference **[1]**):

AT commands	Description
AT+CMGF=1	Set the text mode for SMS writing
AT+CMGS=”tel. number”	Commands enables to send SMS on entered tel. number
AT+CMGL=ALL	List of all SMS messages
AT+CMGR=<index>	Read of the definite SMS (all SMS has our index)
AT+CMGD=<index>	SMS delete according to index

For the text mode for SMS writing is used command *AT+CMGF=1*.

AT+CMGF=1 Enter

OK

The SMS message is create by the help of command *AT+CMGS=<tel. number>*. After *Enter* button press is display mark >, behind this mark it is possible to write own SMS message. The SMS message is send by the help of *CTRL+Z* (SMS sending take about few minutes). The SMS writing is possible cancel by *Esc*.

AT+CMGS=”712123456” Enter

>***Hello World!*** CTRL+Z

OK

The new SMS is possible find out by the help of command *AT+CMGL=ALL*. This command reproaches all SMS messages.

AT+CMGL=ALL Enter

+CMGL: <index>, <status>,<sender number>, ,<date>,<time>
SMS text.

+CMGL: 1,"REC UNREAD","+420721123456", ,"08/02/02, 10:33:26+04"
Hello World!

where <index> is ordinal number of the SMS,

<status> is SMS status:

REC UNREAD – SMS unread
REC READ – SMS read
STO UNSENT – stored unsent SMS
STO SENT – stored sent SMS
ALL – all SMS messages

<sender number> is tel. number from which the SMS was receive,

<date> is date of SMS receive,

<time> is time of SMS receive.

The new SMS message is possible read by command AT+CMGR=<index>.

AT+CMGR=1 Enter

+CMGL: <index>, <status>,<sender number>, ,<date>,<time>
SMS text.

+CMGL: 1,"REC READ","+420721123456", ,"08/01/12, 9:48:04+04"
Hello World!

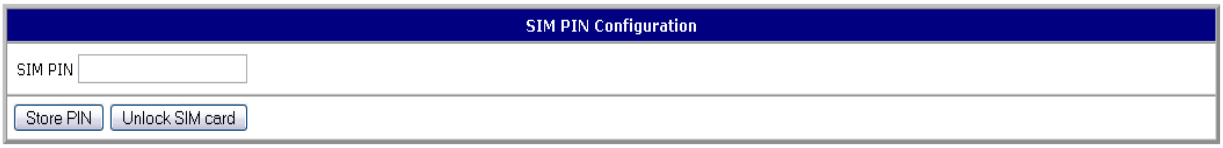
Received SMS is possible delete by command AT+CMGD=<index>.

AT+CMGD=1 Enter

OK

4.20. SIM PIN Configuration

Change of PIN or PIN forbids it is possible in the PIN item. If it is necessary to protect SIM card in the router ER75i by PIN number, to area SIM PIN it is written PIN number and it is confirmed by button Store PIN. The router ER75i then by help written PIN unlocked access to SIM card after stand by ER75i. The PIN number is possible forbid by button Unlock SIM card.



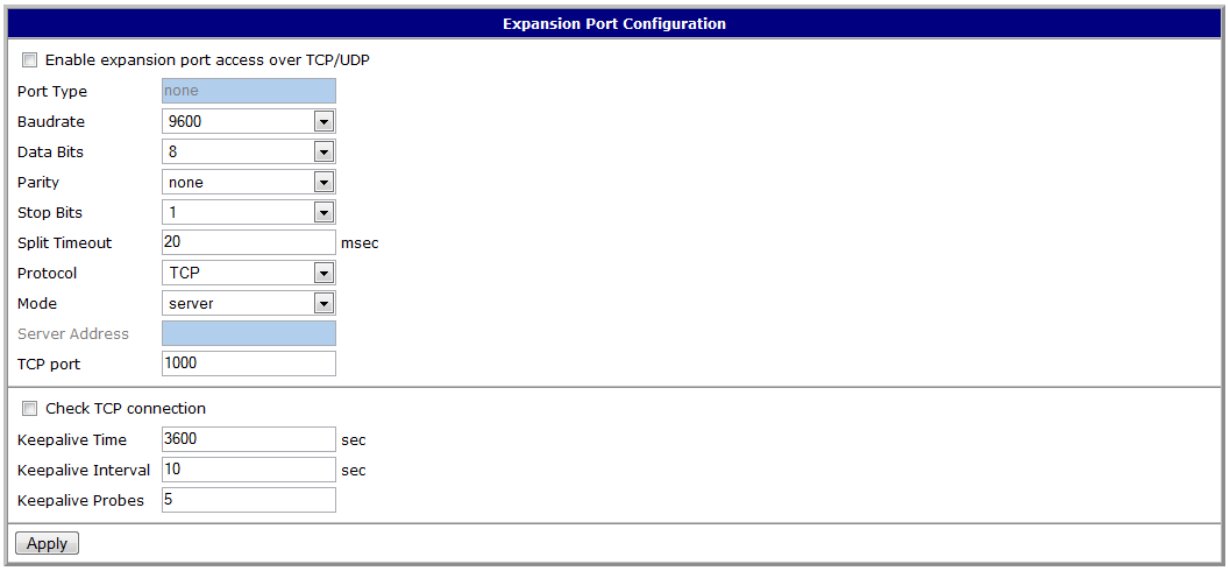
4.21. External port Configuration

The external port configuration can be call up by airbrush option External Port in menu. Inside of window it can define *Baudrate*, number of *Data bits*, *Parity*, number of *Stop bits*, *Protocol* and *Mode*. *Split timeout* is for messages.

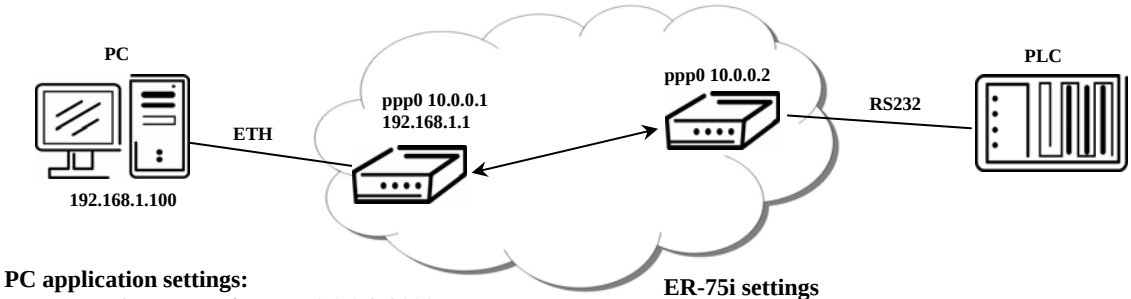
In mode *TCP server* it is necessary enter the *TCP port*, on which it will router listen to incoming requests about TCP connection. In mode *TCP client* it is necessary enter the *Server address* and final *TCP port*.

At *Check TCP connection* it activates verification of coupled TCP connection. Inside of window it can define time, after which it will carry out verification of the connection (*Keepalive Time*), waiting time on answer (*Keepalive Interval*) and number of tests (*Keepalive Probes*).

The changes in settings will apply after pressing the *Apply* button.



Example of external port configuration:

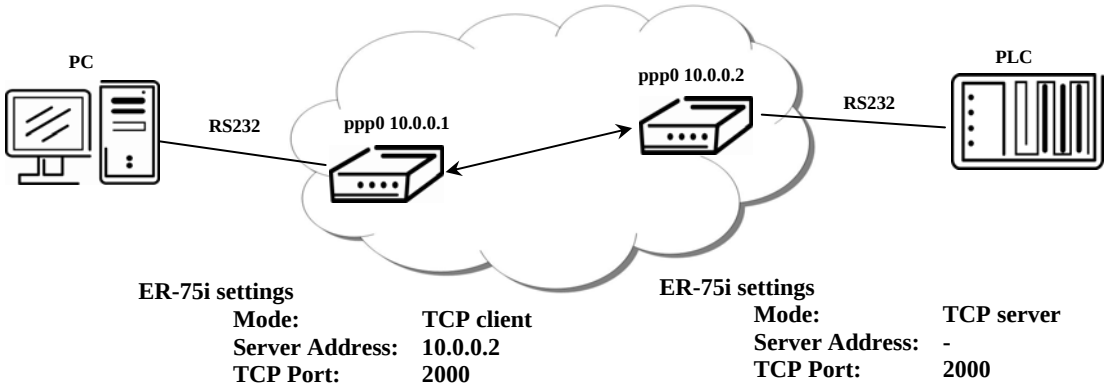


PC application settings:
TCP connection on 10.0.0.2:2000

Default Gateway 192.168.1.1

ER-75i settings

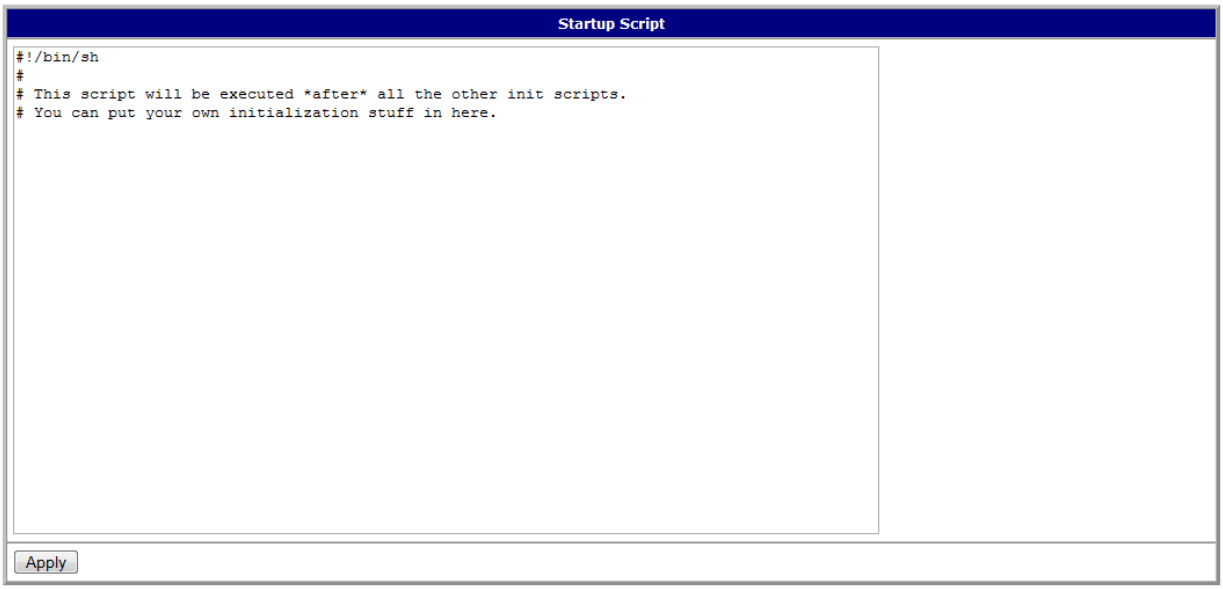
Mode:	**TCP server**
Server Address:	**-**
TCP Port:	**2000**



4.22. Start-up script

In the window *Startup Script* it is possible create own scripts which will be executed after all init scripts. This scrip is not stored or restored when using web interface backup or restore option.

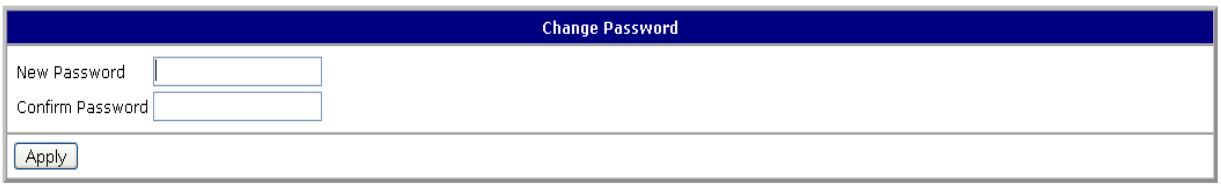
The changes in settings will apply after pressing the *Apply* button.



4.23. Change password

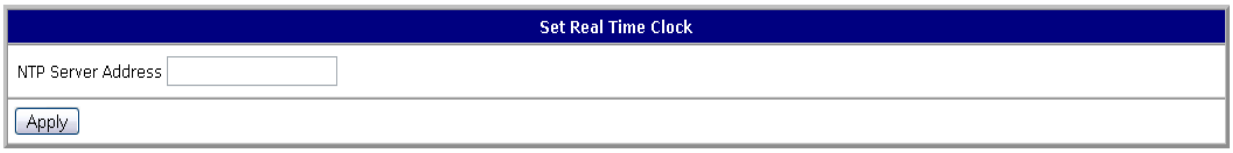
To open the dialog box for changing the access password select the *Change Password* menu item. The new password will be saved after pressing the *Apply* button.

In basic setting of router ER75i password is set on default form *root*. For higher secure of our network we recommended to change this password.



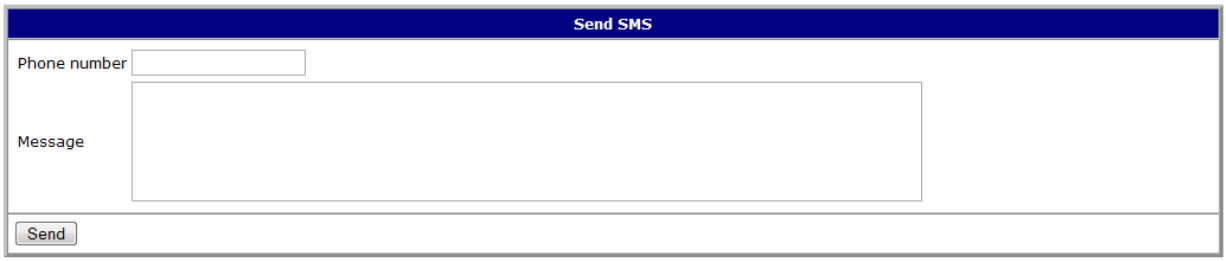
4.24. Setting inner o'clock

One - shot setting inner o'clock of the router it can be call - up option *Set Real Time Clock item* in menu. O'clock are setting according to engaged NTP server after push-button operation *Apply*.



4.25. Send SMS

SMS message sending is possible in menu *Send SMS*. The SMS message will send after put in *Phone number* and text SMS (*Message*) by button *Send.*



SMS message sending via HTTP request is in form:

GET /send_exec.cgi?phone=%2B**420712345678**&message=**Test** HTTP/1.1
Authorization: Basic cm9vdDpyb290

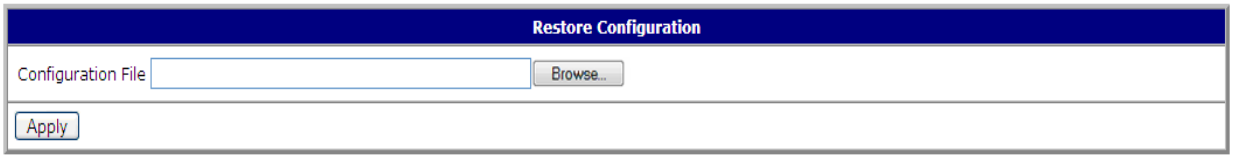
HTTP request will send to TCP connection on router port 80 which send SMS message *Test* on phone number *420712345678*. Authorization is in format "user:password" coded by BASE64, example is for root:root.

4.26. Backup Configuration

The ER-75i configuration is possible to save by help *Backup Configuration* menu item. After click on this menu it is possible to check a destination directory, where it will save the ER-75i configuration.

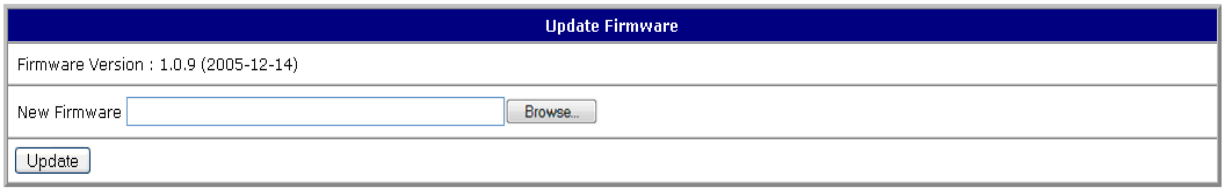
4.27. Restore Configuration

In case, that it is need restore the ER-75i configuration, it is possible in *Restore Configuration* menu item check configuration by help *Browse* button.

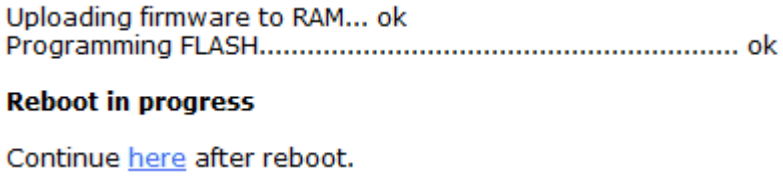


4.28. Update firmware

To view the information about the firmware version and instructions for its update select the *Update Firmware* menu item. The new firmware will be checked after pressing *Browse* button and update the following pressing the Update button.



After successful firmware updating it is list data following statement:

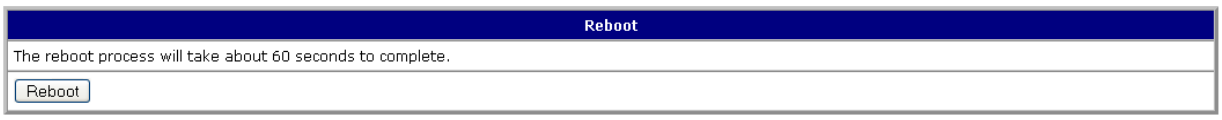


where it is information about updating of FLASH memory.

By firmware actualization from 1.1.1 version the router configuration is remains include IP address. By actualization older firmware than 1.1.1 the IP address will set on 192.168.1.1 and all values are in defaults state. Total update time lasts for 3 - 4 minutes. During updating of firmware it has to be reservation permanent power supply. We don't strongly recommended distant update because of blackout GPRS connection. After updating firmware it will IP address set on 192.168.1.1 and all values are in defaults state. Total update time lasts for 3 - 4 minutes. During updating of firmware it has to be reservation permanent power supply. We don't strongly recommended distant update because of blackout GPRS connection.

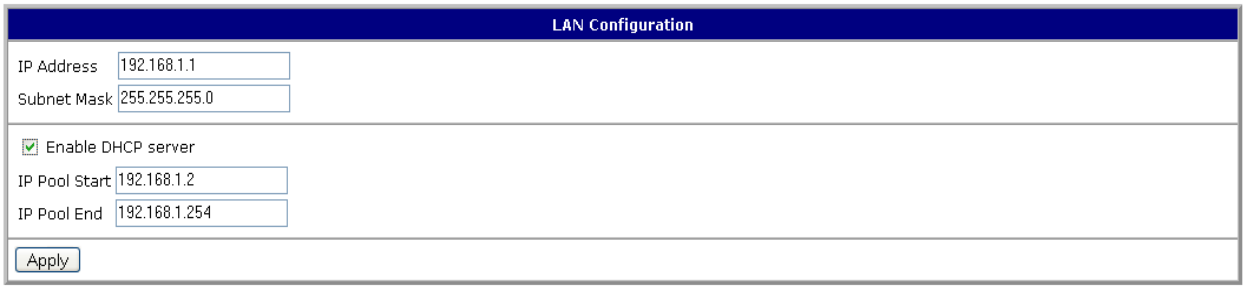
4.29. Reboot

To reboot the ER75i router select the *Reboot* menu item and then press the *Reboot* button.

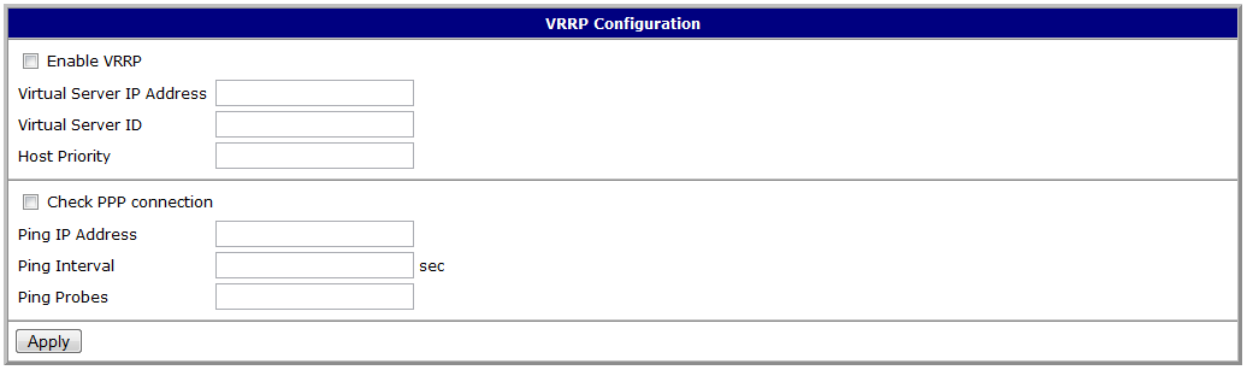


4.30. Default settings

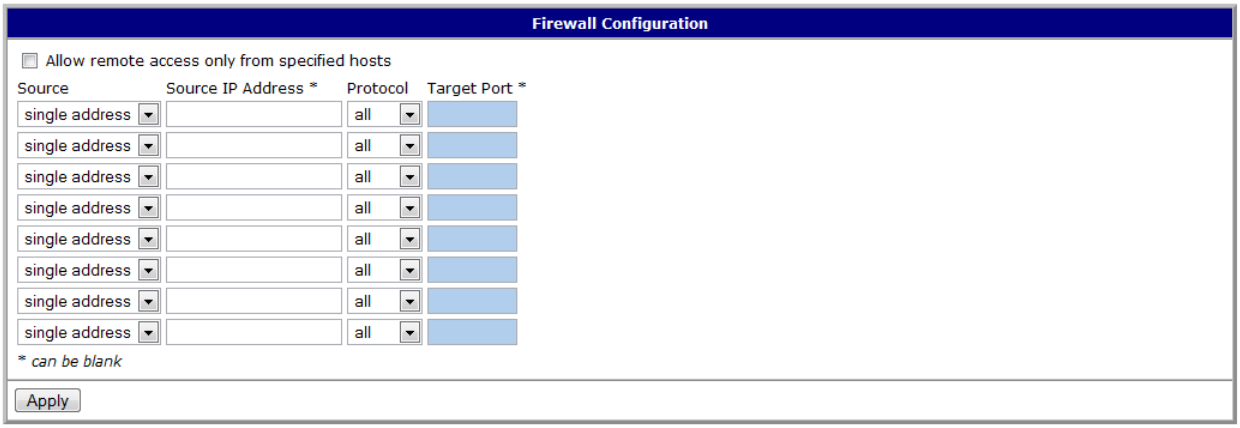
4.30.1. LAN Configuration



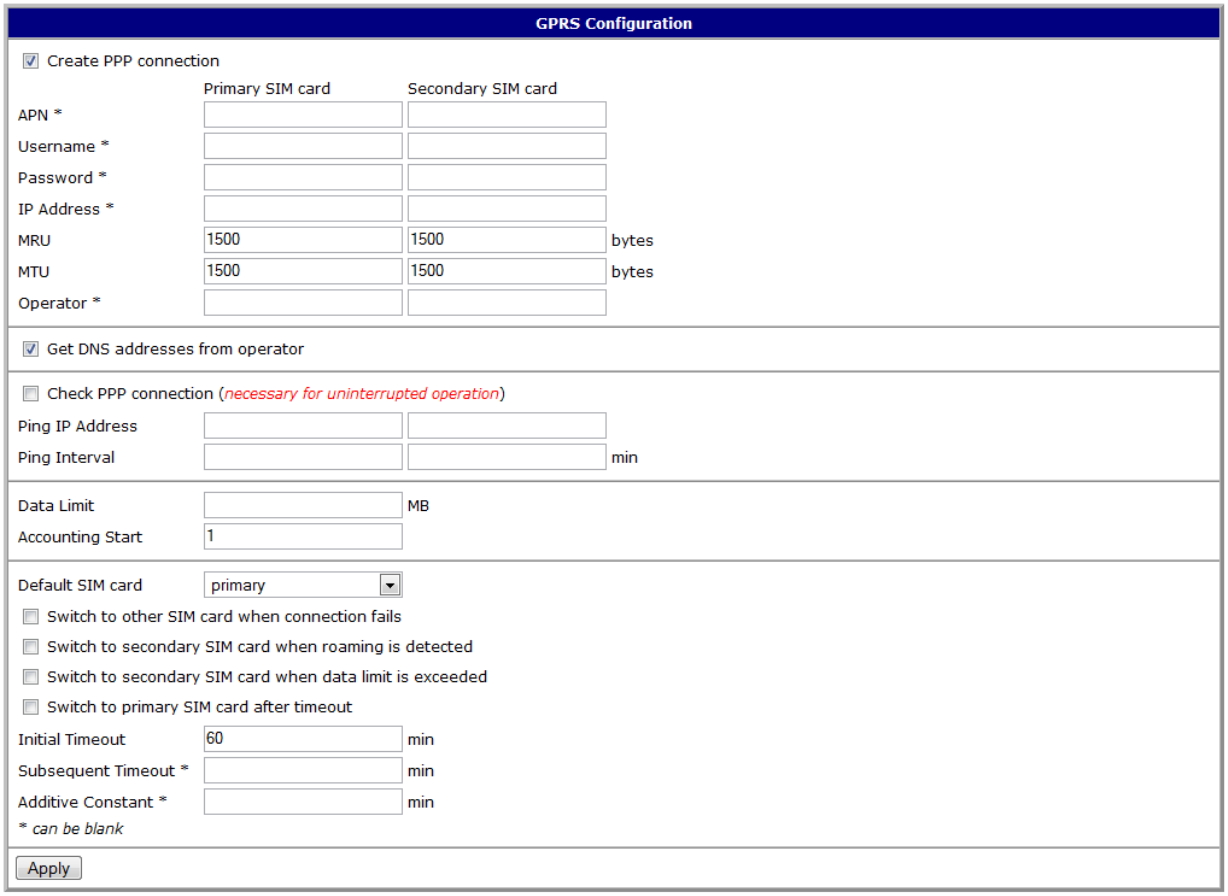
4.30.2. VRRP Configuration



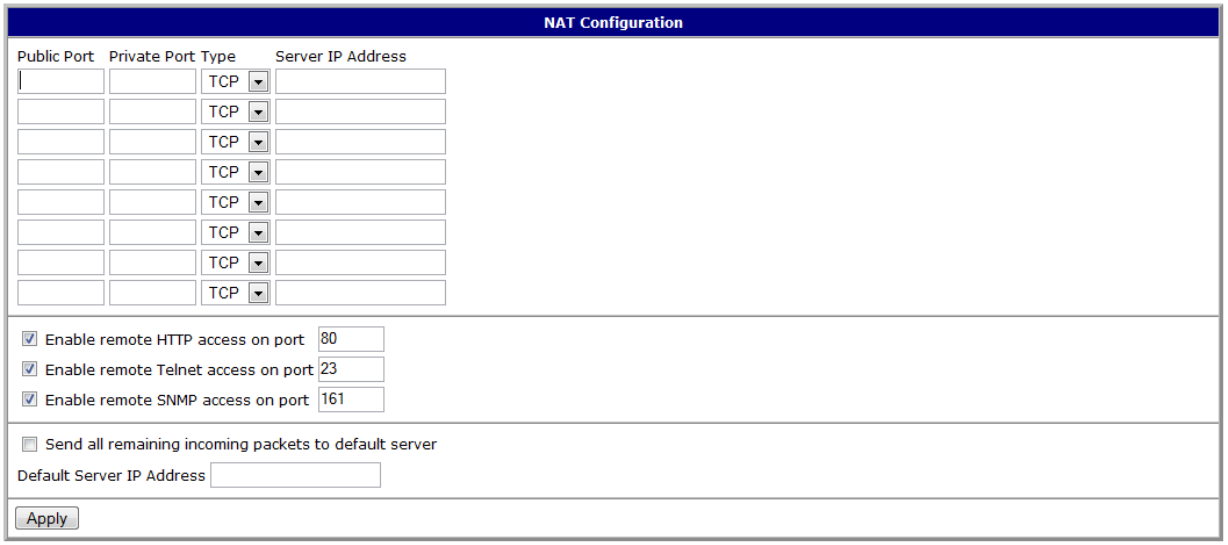
4.30.3. Firewall Configuration



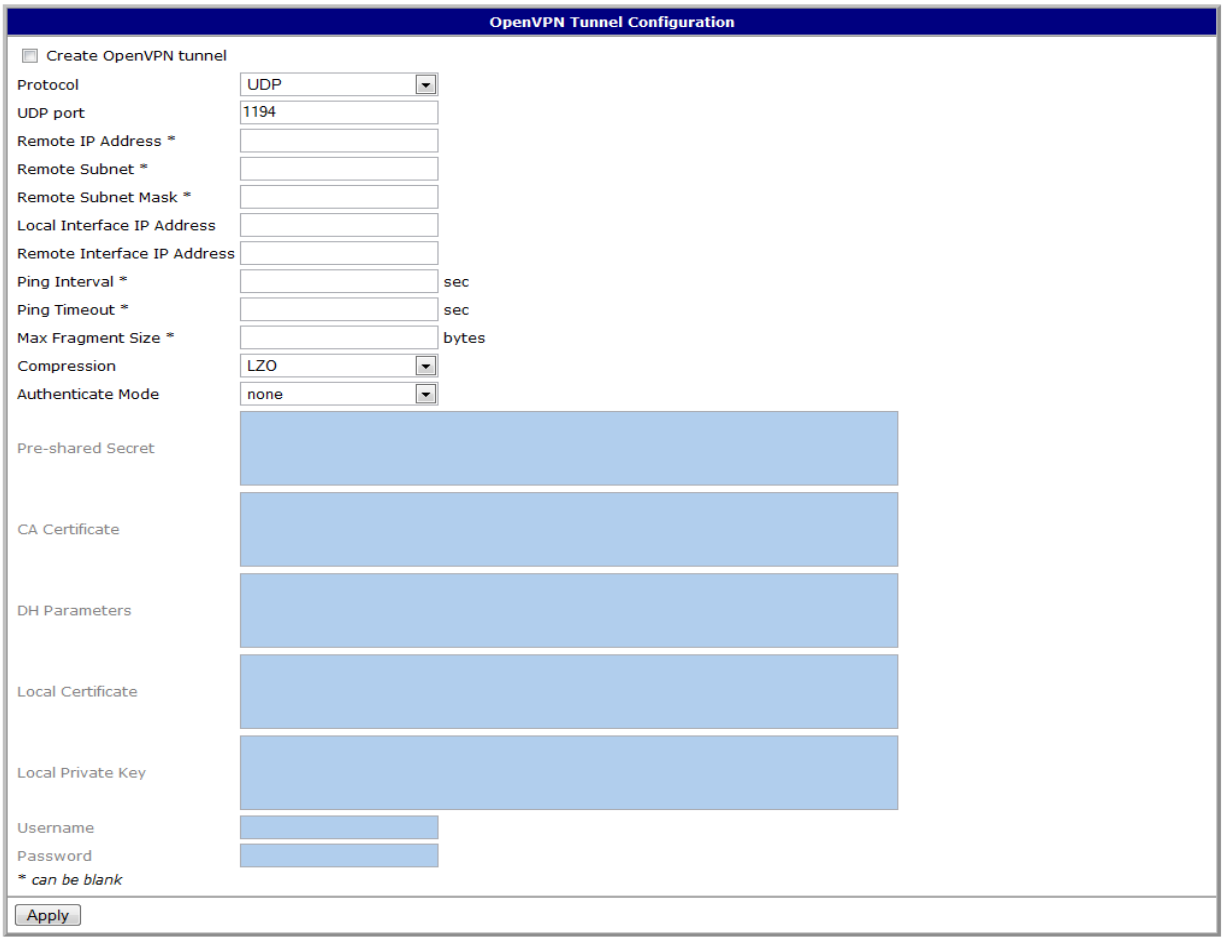
4.30.4. GPRS Configuration



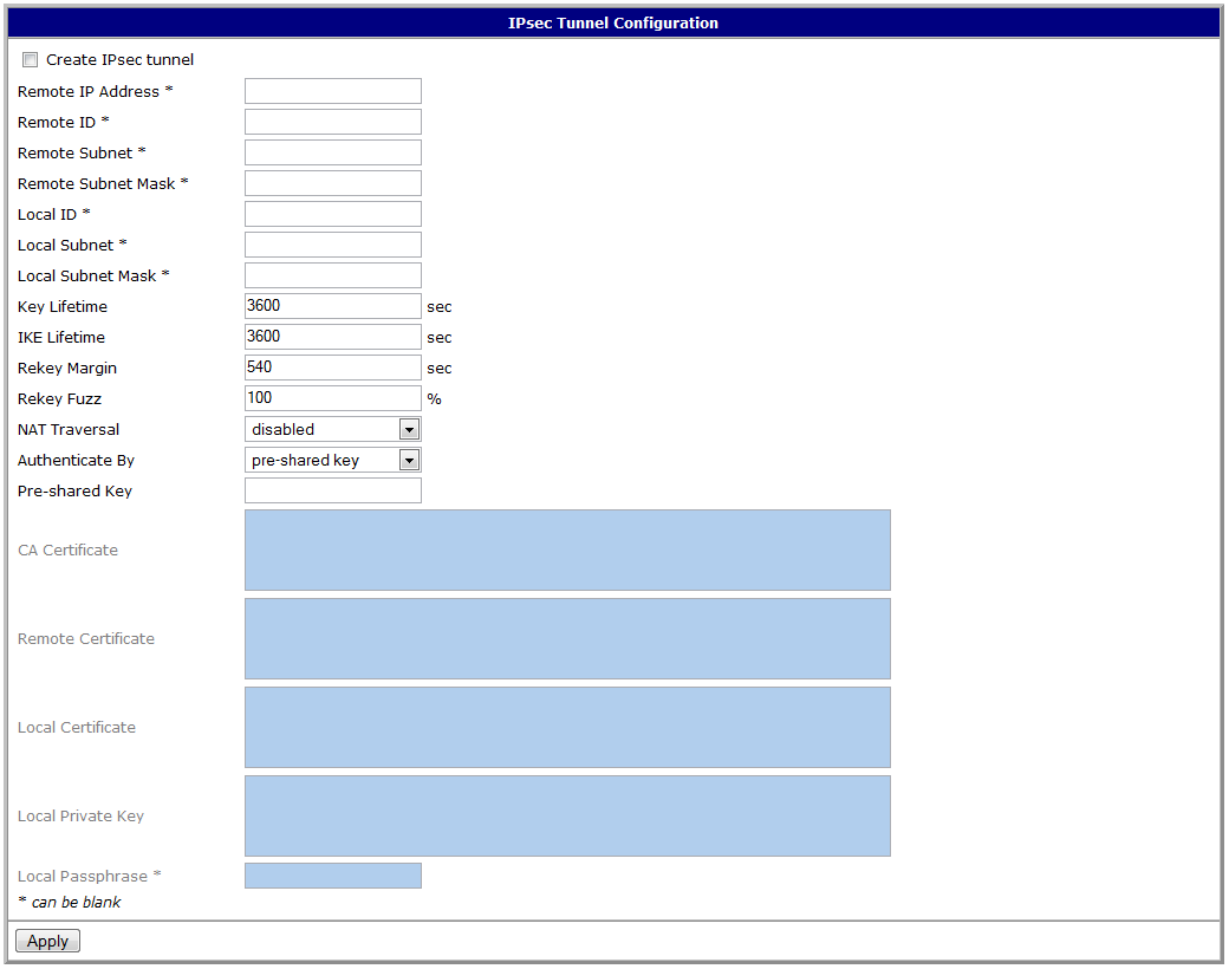
4.30.5. NAT Configuration



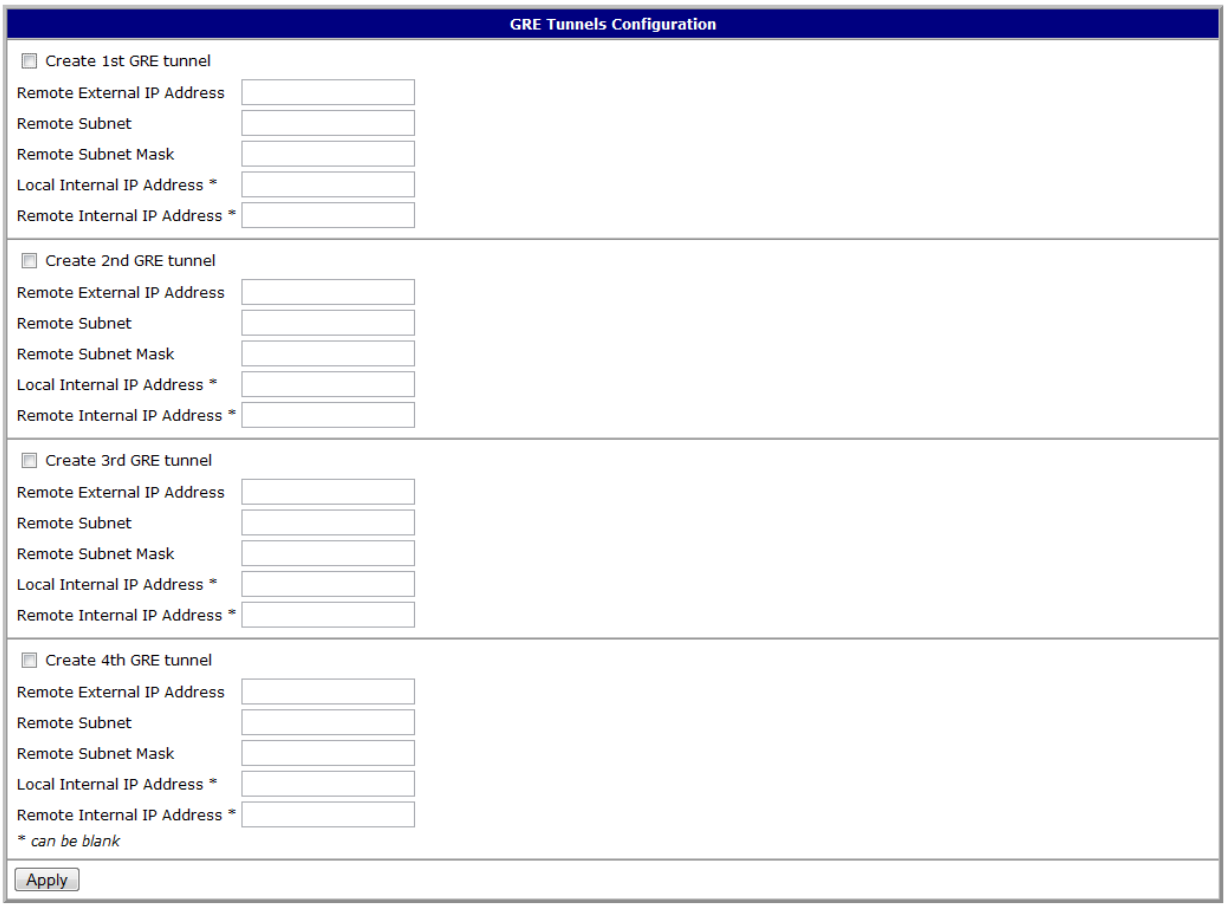
4.30.6. OpenVPN Tunnel Configuration



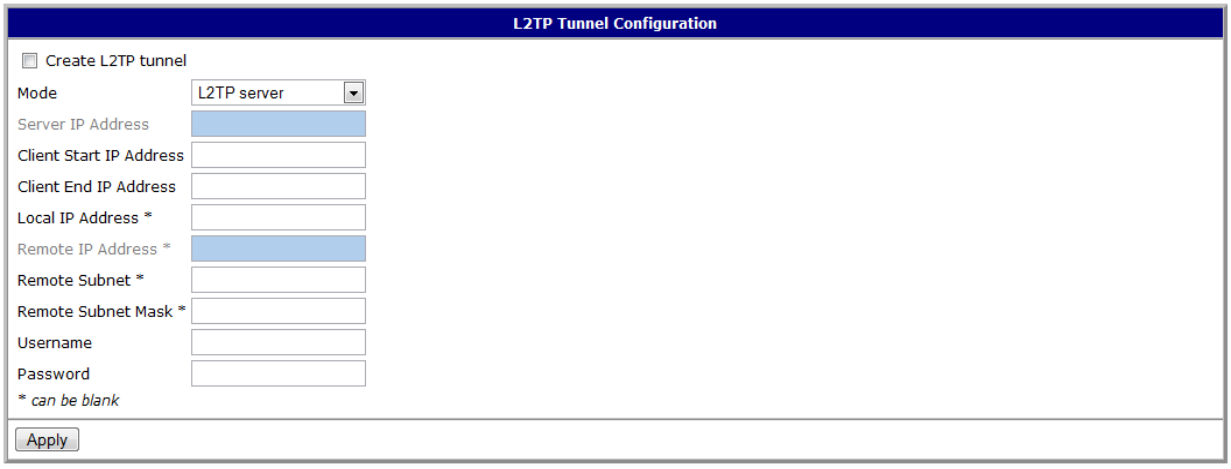
4.30.7. IPsec Tunnel Configuration



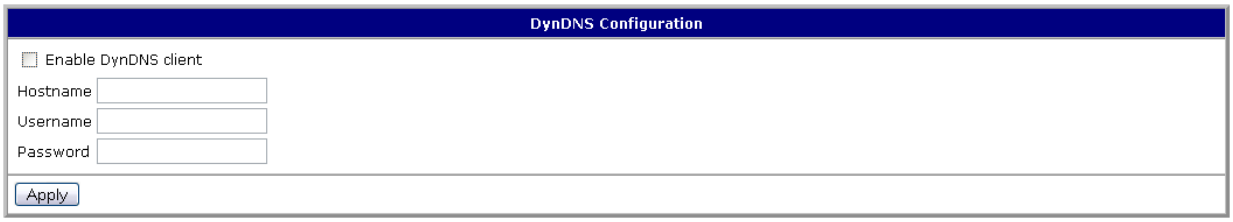
4.30.8. GRE Tunnel Configuration



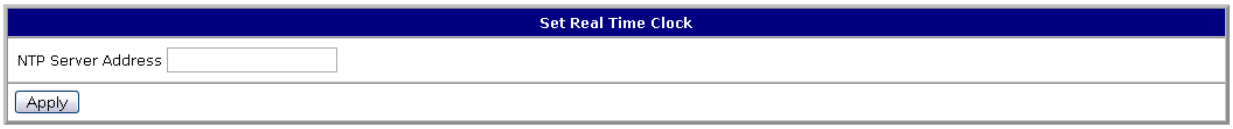
4.30.9. L2TP Configuration



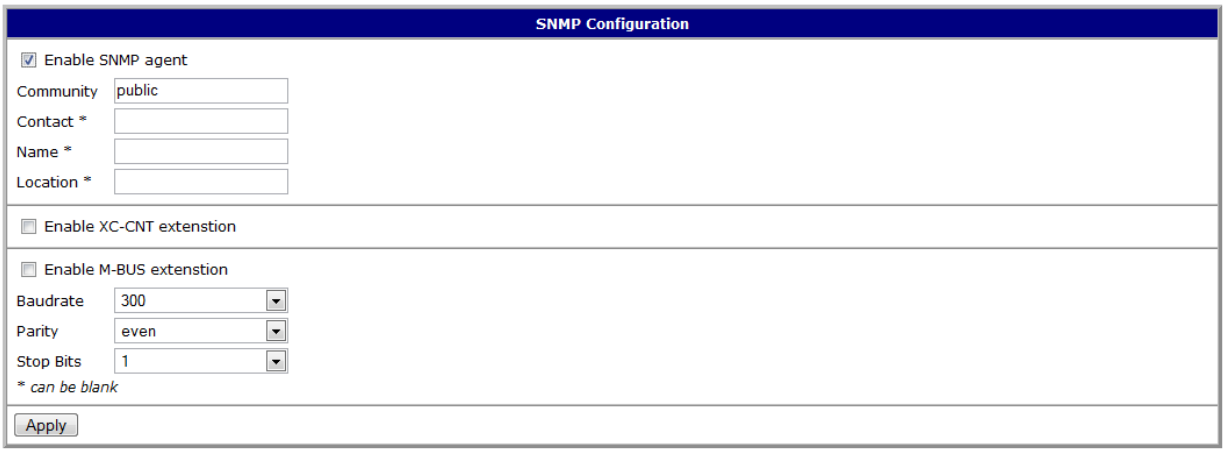
4.30.10. DynDNS Configuration



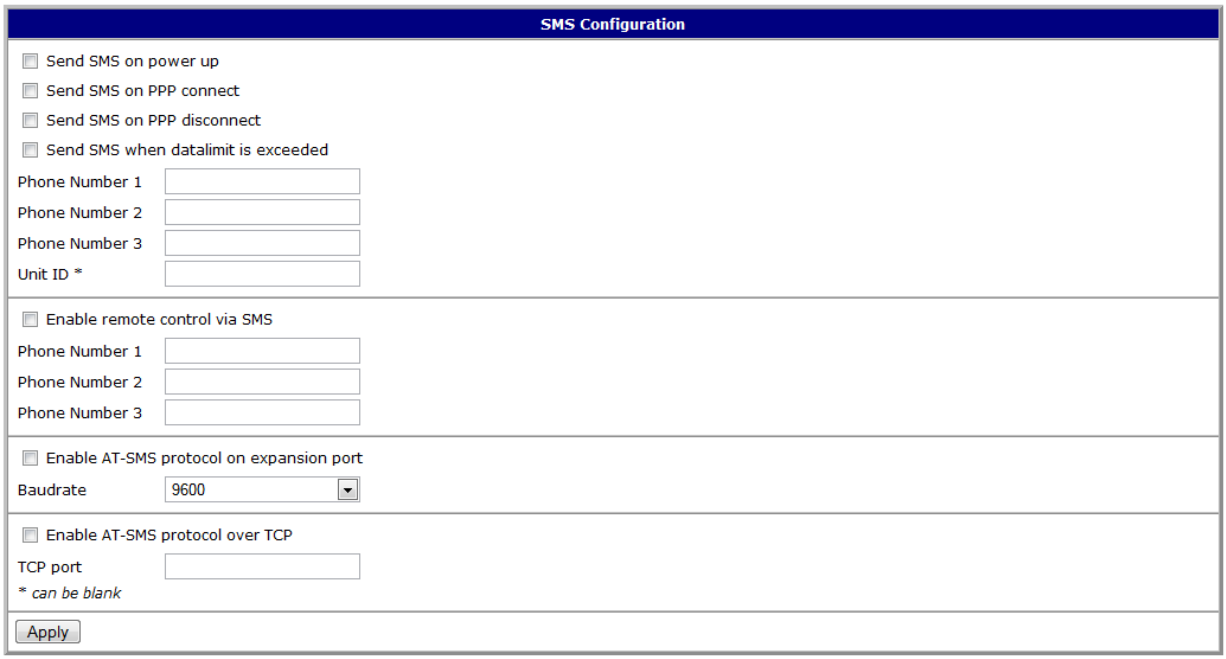
4.30.11. NTP Configuration



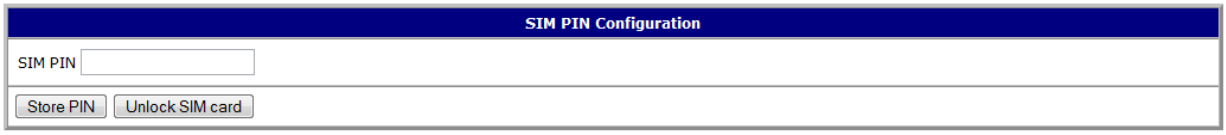
4.30.12. SNMP Configuration



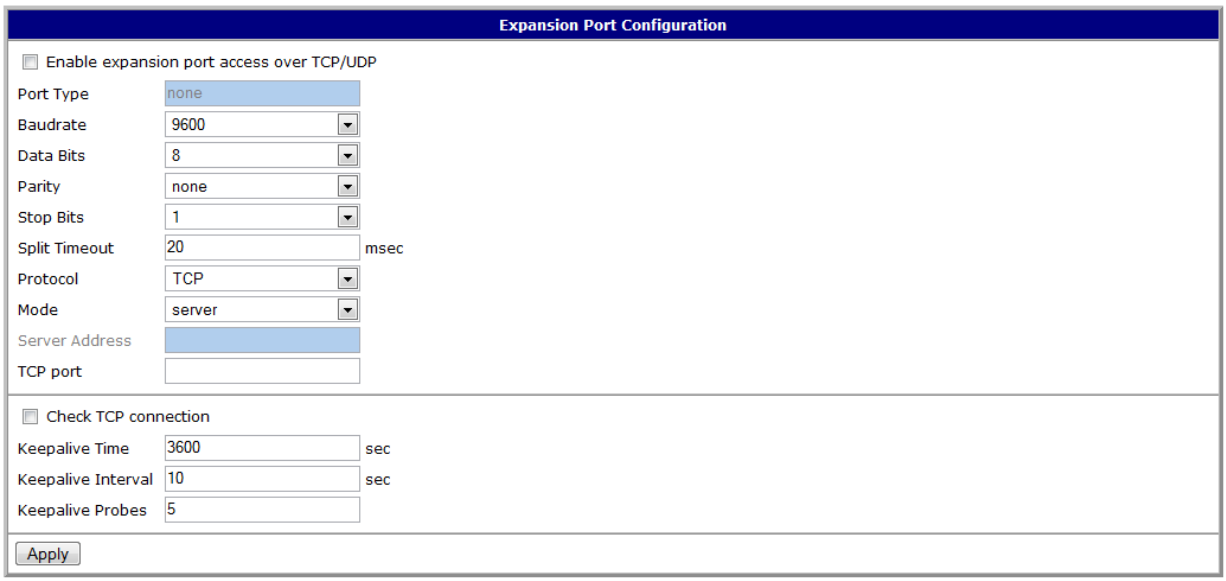
4.30.13. SMS Configuration



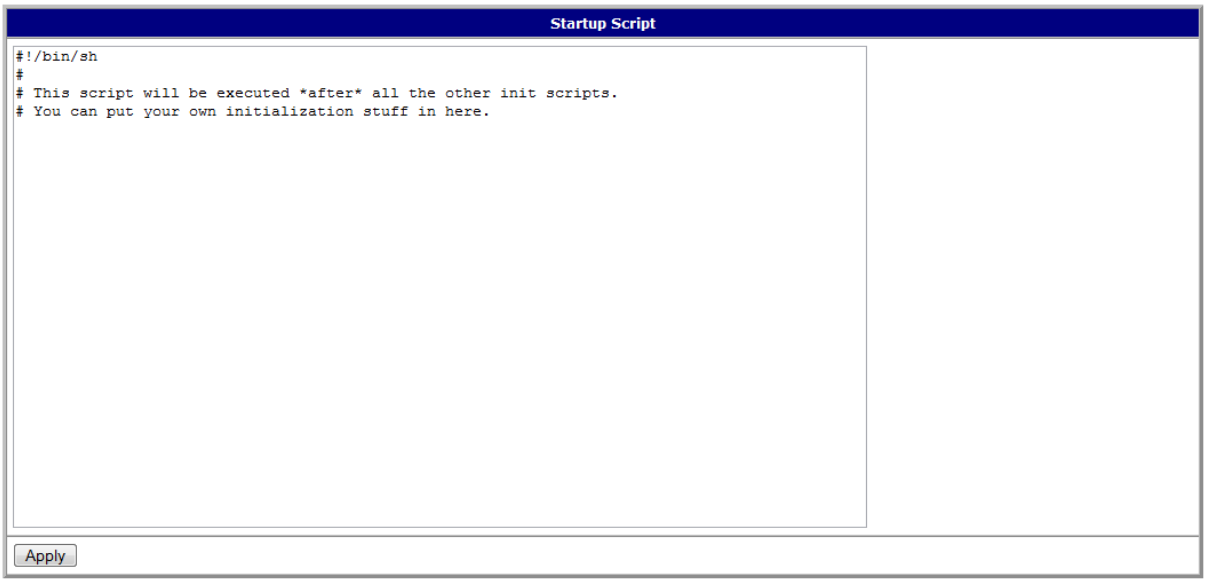
4.30.14. SIM PIN Configuration



4.30.15. External Port Configuration



4.30.16. Startup Script



5. Configuration setting over Telnet

Attention! If the SIM card isn't included in the ER 75i router, it is impossible for the ER 75i router to operate. The Included SIM card must be activated for GPRS transmissions. Insert the SIM card when the ER 75i router is switched off.

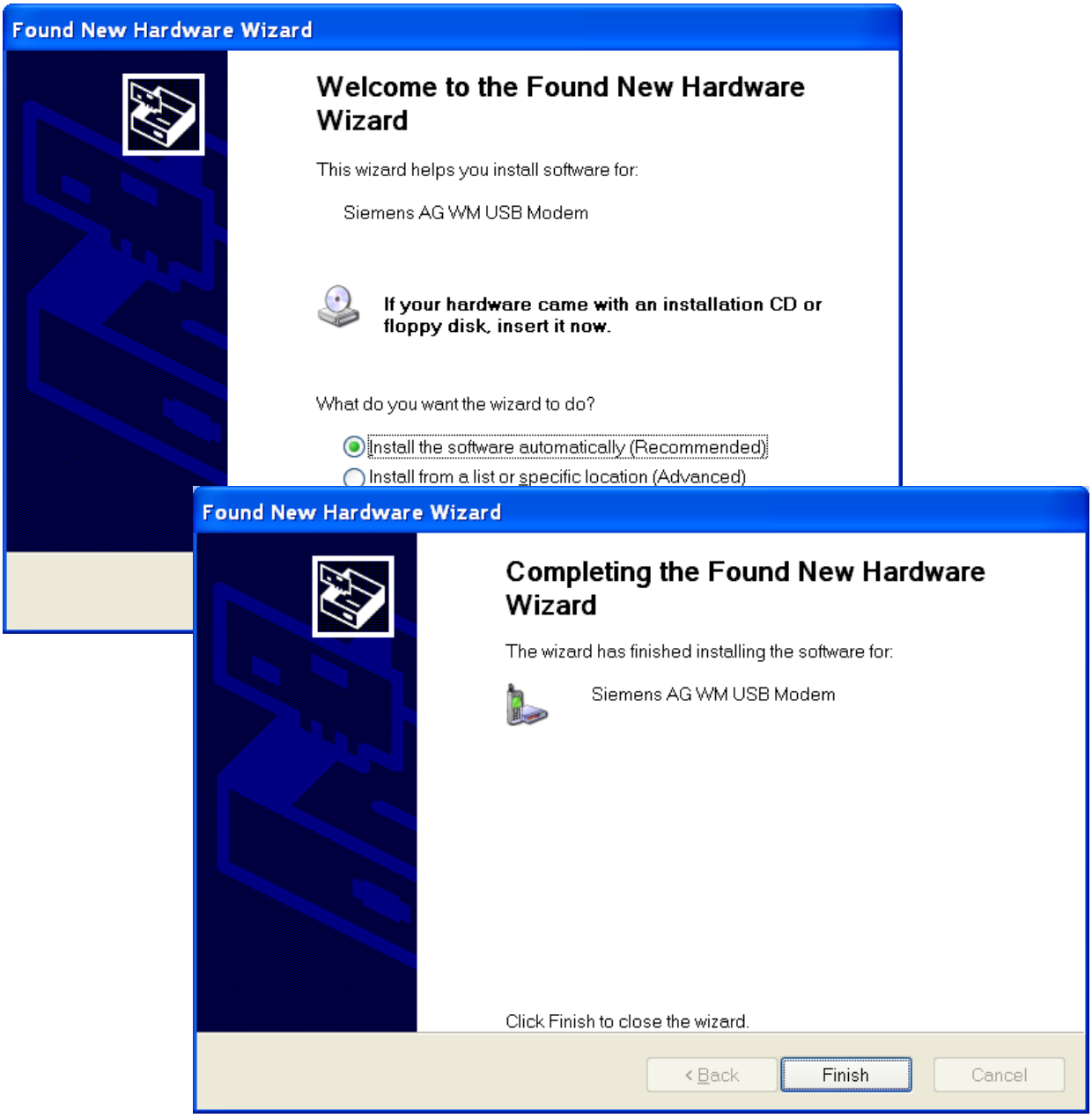
Monitoring of status, configuration and administration of the ER 75i router can be performed by means of the Telnet interface. After IP address enter to Telnet interface is possible configure router ER 75i by the help of commands. The default IP address of the modem is 192.168.1.1. Configuration may be performed only by the user "root" with initial password "root".

For Telnet exists the following commands:

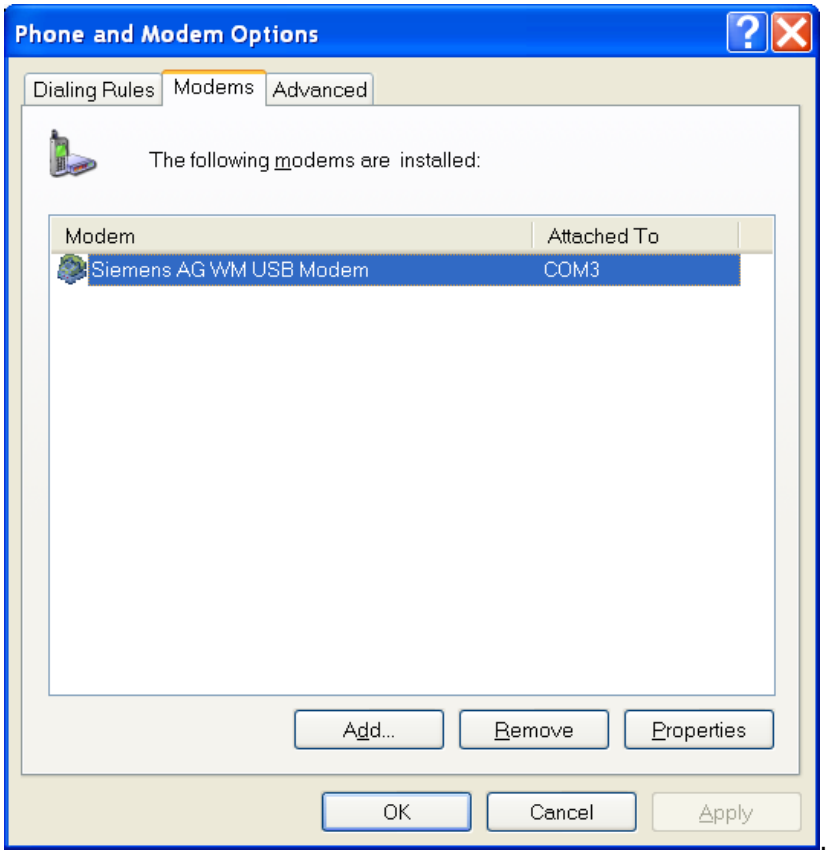
Command	Description
cat	file contain write
cp	copy of file
date	show/change of system time
df	displaying of informations about file system
dmesg	displaying of kernel diagnostics messages
echo	string write
free	displaying of informations about memory
gsmat	AT commend send
gsminfo	displaying of informations about signal quality
gsmsms	SMS send
hwclock	displaying/change of time in RTC
ifconfig	displaying/change of interface configuration
ip	displaying/change of route table
iptables	displaying/modification of NetFilter rules
kill	process kill
killall	processes kill
ln	link create
ls	dump of directory contain
mkdir	file create
mv	file move
ntpdate	synchronization of system time with NTP server
passwd	password change
ping	ICMP ping
ps	displaying of processes information
pwd	dump of actual directory
reboot	restart
rm	file delete
rmdir	directory delete
route	displaying/change of route table
service	start/stop of service
sleep	pause on set seconds number
slog	displaying of system log
tail	displaying of file end
tcpdump	monitoring of network
touch	file create/actualization of file time stamp
vi	text editor

6. Driver installation

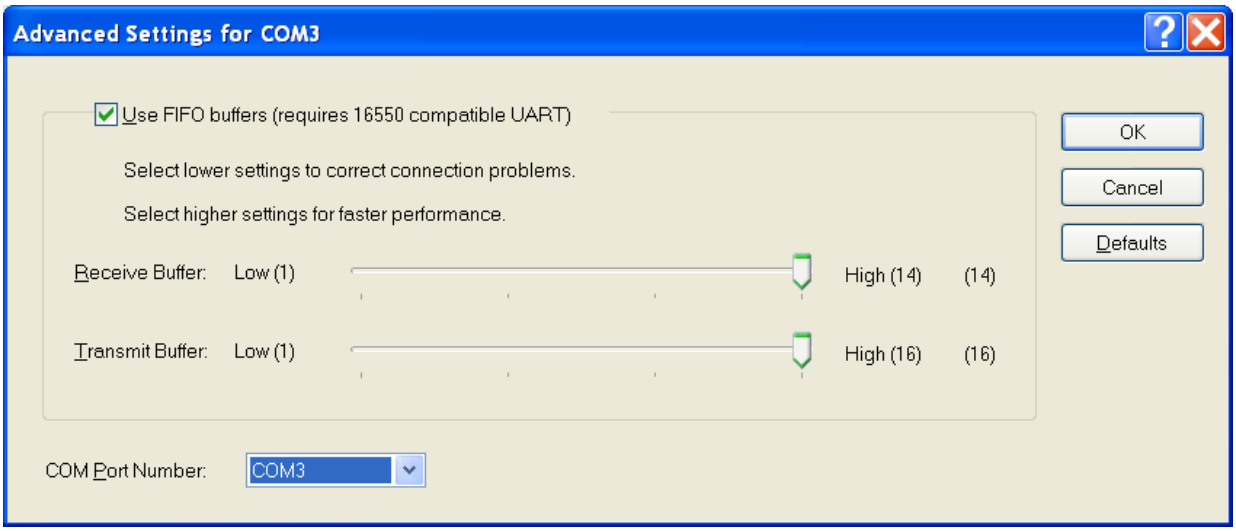
Connect the USB cable to the ER75i router and to the PC. Windows detects ER75i as a new USB modem, starts the *Add Hardware* wizard and requests the driver for "MC75" or „Siemens AG WM USB Modem“. Follow the instructions of the wizard and enter the path to the "usbmodem.inf" file. Windows will copy the needed files to your computer and configure the modem by assigning a free COM port. After completion of copying the files click on the *Finish* button.



You will find the installed modem in the Phone and modem options control panel (Start | Settings | Control Panel | Phone and Modem Options | Modems).



You can change the assigned COM port in the *Device Manager*. Select “Siemens AG WM USB Modem” in the installed devices list, click on *Properties*, select the *Details* tab and click on the *Advanced port settings* button. Then select the required free COM port from the *COM port number* menu. The change of COM port setting will apply only after disconnection and reconnection of the USB cable.



7. Control by AT commands

Modem ER75i is controlled and programmed by AT commands. Structure of the AT command match used module MC75. AT commands is possible on website www.siemens.com/wm

8. Possible problems

At some network cards is able to set in situation, when it is not possible connect ER75i. This problem it is possible solve the following steps:

- hand by selection communication rates 10 MB/s in property network cards,
- connect ER75i over switch,
- start computer till after finalization start ER75i.

9. Reference

[1] Siemens**: MC75_ATC_V03.010 – AT command Set, 2006**

10. FAQ

- I can't get from internet on equipment, which is connected to router and I have NAT enabled.
  - *The device's gateway has to be configured as the router ER75i.*
- Router resets itself, connection on Ethernetu fails.
  - *It is necessary to use antenna, which will far from power supply.*
- I don't get on web server at NAT.
  - *The remote http access of the router has to be disabled, default server address has to be your web server and the gateway of the web server has to be the IP of ER75i.*
- GPRS connection fails.
  - *Check signal power. If signal power is weak, you will use a better antenna. If the environmental cells have similar signal it will necessary to use directive antenna.*
  - *It is necessary to set ping, which will checks connection and in case of fail ping restart connection.*
- GPRS connection won't be established.
  - *Recheck GPRS settings - APN, name, password and IP address.*
  - *Try to enter PIN – verification if the SIM card hasn't set PIN code.*
  - *In private APN it is appropriate to switch the DNS server send off.*
  - *Switch log system on and observe where the error turns up.*
- Connection fails on Ethernet or connection isn't establishing.
  - *On ethernet interface of ER75i it is possible switch auto negotiation off and set a rate and duplex by hand.*
- How it is possible enter AT commands?
  - *It is necessary to use USB connection, but it is impossible connect to GPRS from ER75i together.*

- DynDNS not function.
  - *In private APN not function.*
  - *If it is recorded the same IP address in your canonic name as dynamically assign address, means it that the operator use NAT or firewall.*
  - *NAT is possible verify by the help of ping on address of your any server with static IP address and by the help of ER75i address verify and address in ping.*
  - *Firewall is possible verify for example by remote access on web interface.*
  - *The operator doesn't give out address DNS servers and without DNS server's is impossible connect to server dyndns.org. In log system will this message:*
    - DynDNS daemon started
    - Error resolving hostname: no such file or directory
    - Connect to DynDNS server failed
- IPSec tunnel is establishing but communication doesn't function.
  - *Probably it is bad set up routes conditionals of connected equipments or it is bad set up GW.*
- FTP doesn't function.
  - *ER75i doesn't support the active FTP mode, support the passive mode only.*
- RS232 don't function.
  - *It is necessary verify present the expansion port RS232.*
  - *Verify present the expansion port RS232 in ER75i configuration in menu „external port", or verify connection locally by the help Telnet-Hyper terminal.*
- L2TP or IPSec isn't establishing.
  - *Verify the reason in log system.*
- How I get to know that EDGE is function?
  - *If download is higher than 85.6 kb/s then EDGE is function.*

11. Customer's care

Up to date information about product are on website:

http://www.conel.cz/

Upkeep-advices:
With SIM-card may be handled carefully as with credit card. Do not train, do not scratch on this and do not parade to static electricity.
During clean of the modem do not use aggressive chemicals, solvents and abrasive cleaner!

Conel Company following declared that the modem narrated in this user's guide fit all basic demands of directive 1999/5/EC (R&TTE).

Declaration about consistency was issue and is possible get it at producer.

12. Product disposal informations

The WEEE (Waste Electrical and Electronic Equipment: 2002/96/EC) directive has been introduced to ensure that electrical/electronic products are recycled using the best available recovery techniques to minimise the impact on the environment. This product contains high quality materials and components which can be recycled. At the end of it's life this product MUST NOT be mixed with other commercial waste for disposal. Check with the terms and conditions of your supplier for disposal information.

13. Guarantee Claim Guidelines

Dear customer,

The product that you have purchased was tested by the manufacturer and, before it was sold, the product's functions were checked once more by our company's technician. However if, in spite of the above-mentioned measures, a breakdown of this product occurs during the guarantee period, which makes proper utilization of the product impossible, we ask you to observe the Guarantee Claim Guidelines when asserting a guarantee claim.

To facilitate the possible guarantee claim procedure, please, when taking over the product, make sure that the seller, who is selling you the product, has properly filled in the relevant parts of the guarantee certificate, including the date of sale, stamp and signature.

This guarantee claim procedure applies to the products that have been purchased. This guarantee claim procedure does not apply to the services that have been provided.

Guarantee periods of products

Guarantee of the purchased device, power supply unit, antenna, data cable, and possible accessories is provided, with a guarantee period of 24 months from the date of sale. The date of sale is at the same time the date of acceptance of the product by the customer.

Lodging a guarantee claim

The guarantee claim must be lodged at the seller from whom the relevant object of the guarantee claim has been purchased. When lodging the guarantee claim, the customer is to submit the properly filled-in guarantee certificate and the complete object of the guarantee claim. The object of the guarantee claim should be submitted in a state corresponding to the state at the sale.

Caution!

The seller does not guarantee that individual settings or data stored in the object of the guarantee claim will be retained.

When lodging the guarantee claim, the customer is obligated to specify the particular defect of the guarantee claim object, possibly its symptoms and, furthermore, the particular right resulting from the liability for defects that he is asserting.

Settling a guarantee claim

Depending on the circumstances, the seller shall ensure the defect removal free of charge; possibly, the seller shall exchange the object of the guarantee claim for a new product or, possibly, settle the guarantee claim in a different way which is in compliance with the Civil Code and with the Consumer Protection Act.

At the moment when the customer has lodged the guarantee claim and the object of the guarantee claim has been accepted by the seller, running of the guarantee period is interrupted. Running of the guarantee period shall continue from the date of acceptance of the repaired object of the guarantee claim or of the exchanged faultless product by the customer or, in the event that neither of the two has been accepted by the customer, from the date when the customer was obligated to accept the repaired object of the guarantee claim or the exchanged product. In the event that a guarantee claim resulting from a defect covered by the guarantee has been lodged and the defective object of the guarantee claim has been

exchanged by the seller for a new product (including the exchange of the IMEI), the ownership of the original object of the guarantee claim is passed hereupon onto the seller, and the ownership of the new product, onto the buyer. A new guarantee period starts running from the date of acceptance of the new product. In the event that the seller, upon agreement with the customer, has settled the guarantee claim by exchanging the object of the guarantee claim for a faultless product, the new guarantee of the product shall expire as follows:

1. After the expiration of a period of 12 months from the date of acceptance of the exchanged product by the customer.
2. On the date when the guarantee period of the original product (the object of the guarantee claim) would have expired if the original product had not been exchanged, whichever is later.
3. The guarantee claim is not justified if the defect being claimed has not been detected by the seller within the framework of the guarantee claim settlement, or if the guarantee does not apply to the defect of the product pursuant to Article 4 of the Guarantee Claim Guidelines.
4. If the defect being claimed has not been detected, and the functional state of the guarantee claim object has been demonstrated to the customer, the customer is obligated to refund the provable expenses incurred in connection with expert assessment of the defect being claimed.
5. If, during the process of assessment of justifiability of the guarantee claim, a defect of the product is detected which is not covered by the guarantee (a repair not covered by the guarantee), the seller shall notify of this fact the customer, and the customer shall notify the seller whether he wants to have this defect removed at a price quoted by the seller. Precise conditions of the repair not covered by the guarantee will be specified in a drawn-up report signed by the customer and seller. If the customer does not require the defect removal by a repair not covered by the guarantee under the conditions communicated by the seller, the device will be returned to the customer, after he has refunded the provable expenses incurred in connection with the expert assessment of the claimed defect.

The guarantee does not apply to the defects caused by the following:

1. Mechanical damage (e.g. by a fall, etc.).
2. Utilization of power supply units and other accessories that are not suitable, possibly, are not recommended for the particular product.
3. Interconnecting the product with non-standard accessories.
4. Installation or utilization of the product in contradiction to the operating instructions, or utilization of the product for purposes that are not usual for this type.
5. Incompetent handling, possibly intervention into the product by an unauthorized person or by a repair shop that has not been authorized by the manufacturer.
6. Damage caused by the natural elements (flooding, fire, etc.) or by other local effects (storm, mains over voltage, etc.).
7. Storage under conditions outside the temperature range.
8. Operation in a chemically aggressive environment.

Other guarantee claim conditions

The fact that the object of the guarantee claim does not correspond to parameters that have been set for other similar types of products can not be considered to be a defect. For the assessment whether a defect has occurred, the product parameters included in the technical documentation of the product are decisive.

The guarantee shall be terminated in the event of any modification of the object of the guarantee claim or in the event that the serial number of the object of the guarantee claim has been damaged or is illegible due to other reasons.

14. Guarantee certificate

Type of the device	
Serial number	
Guarantee period (in months)	
Seller	
Date of sale	
Stamp of the seller	

	1	2	3	4	5
Date of reception of the guarantee claim by the seller					
Number of the guarantee claim report					
Date of reception of the device into the repair shop					
Date of completion of the repair by the repair shop					
Number of the receipt form of the repair shop					
Guarantee repair	**YES – NO**	**YES – NO**	**YES – NO**	**YES – NO**	**YES – NO**
New serial number of the device (IMEI)					
Comments					
Stamp of the repair shop					