2N® EasyRoute

UMTS Data and Voice Gateway

User Manual

Version **1.06**

www.2n.cz

The 2N TELEKOMUNIKACE a.s. joint-stock company is a Czech manufacturer and supplier of telecommunications equipment.

The product family developed by 2N TELEKOMUNIKACE a.s. includes GSM gateways, private branch exchanges (PBX), and door and lift communicators. 2N TELEKOMUNIKACE a.s. has been ranked among the Czech top companies for years and represented a symbol of stability and prosperity on the telecommunications market for almost two decades. At present, we export our products into over 120 countries worldwide and have exclusive distributors on all continents.

2N TELEKOMUNIKACE administers the FAQ database to help you quickly find information and to answer your questions about 2N products and services. On faq.2n.cz you can find information regarding products adjustment and instructions for optimum use and procedures „What to do if...“.

Declaration of Conformity

2N TELEKOMUNIKACE a.s. hereby declares that the 2N® EasyRoute product complies with all basic requirements and other relevant provisions of the 1999/5/EC directive. For the full wording of the Declaration of Conformity see the CD-ROM enclosed and at www.2n.cz.

2N TELEKOMUNIKACE is the holder of the ISO 9001:2000 certificate. All development, production and distribution processes of the company are managed by this standard and guarantee a high quality, technical level and professional aspect of all our products.

Table of Contents

1 Product Overview

In this section, we introduce the 2N® EasyRoute product, outline its application options and highlight the advantages following from its use. This chapter also includes safety instructions.

Here is what you can find in this section:

- **Product Description**
- **Changes in Documentation**
- **Terms and Symbols Used**

1.1 Product Description

The 2N® EasyRoute GSM/UMTS gateway is a new product, which has been developed and manufactured to provide the maximum utility value, quality and reliability. We hope you will be fully satisfied with 2N® EasyRoute for a long time. Therefore, use your 2N® EasyRoute for purposes it has been designed and manufactured for, in accordance herewith.

2N® EasyRoute is available in two basic versions with different hardware capacities. The basic version is designed for Internet connection and UMTS/GSM calls. The FAX version, in addition, supports VoIP voice transmission and VoIP FAX transmission using the T.38 protocol. The parameters are distinguished as follows.

- **The 2N® EasyRoute basic version parameters are designated as ER.**
- **The 2N® EasyRoute FAX version parameters are designated as ERF (VoIP).**

Tip

- **You can identify your gateway easily: A gateway that enables FAX and VoIP calls is an ERF version.**
- **To make sure, select the SETUP > Telephony menu. If the menu includes the SIP and FAX submenus, your gateway is ERF. If not, it is ER.**

Basic Features

- **2N® EasyRoute combines the support of a circuit switched telephone network interface (FXO), Fast Ethernet switch and WiFi network support.**
- **2N® EasyRoute provides a continuous broadband Internet connection for multiple users via the Fast Ethernet switch or the 2N® EasyRoute WiFi network.**

Advantages of 2N® EasyRoute Use

- **Fast data connection**
  2N® EasyRoute transmits data using the high speed HSDPA connection (up to 7.2 Mbps).
- **Call cost cutting**
  Forwarding GSM calls to 2N® EasyRoute saves a lot on PSTN – GSM calls.

- **Easy installation**
  2N® EasyRoute is ready for immediate use without programming.
- **You get all you need in the delivery**
  Your 2N® EasyRoute delivery contains all you need to operate the system (power supply adapter, telephone cable, Ethernet cable, antenna, CD manual).
- **A solution for sites without telephone lines**
  2N® EasyRoute is a perfect solution for such sites as exhibition halls, mountain chalets, conference rooms, etc.
- **CLIP**
  2N® EasyRoute is equipped with the Calling line identification presentation (CLIP) feature, so if a terminal capable of receiving the CLIP is used you know the caller's number.
- **Radiation hazard minimisation**
  Unlike mobile phones, 2N® EasyRoute does not expose you to direct antenna RF electromagnetic field radiation while telephoning.
- **Full GSM/UMTS coverage**
  2N® EasyRoute supports all GSM bands (1900, 1800, 900, 850MHz). EasyRoute is available in version for all used UMTS bands (2100 1900, 900, 850MHz).
- **Fast Ethernet switch**
  2N® EasyRoute provides a 4-port Fast Ethernet switch for you to connect all the required devices (using an external switch for a larger port extension).
- **WiFi**
  2N® EasyRoute helps you connect a PC and other devices using the WiFi 2.4 GHz or 5 GHz interface. The 802.11a/b/g standards and maximum transmission rate of 54 Mbps are supported.
- **VoIP – fax version (ERF)**

  2N® EasyRoute enables directing calls from devices, connected to FXS port, into VoIP network.
- **FAX – fax version (ERF)**

  2N® EasyRoute provides an option to send FAX messages using the T.38 protocol. All FAX messages are routed to the VoIP network.

Safety Precautions

Do not switch on 2N® EasyRoute in the vicinity of medical apparatuses to avoid interference. The minimum distance of the antenna and pacemakers should be 0.5m.

Do not switch on 2N® EasyRoute aboard of a plane.

Do not switch on 2N® EasyRoute near petrol stations, chemical facilities or sites where explosives are used.

Any mobile telephone use prohibition based on RF energy radiation applies to 2N® EasyRoute too.

2N® EasyRoute may disturb the function of TV sets, radio sets and PCs.

Warning! 2N® EasyRoute contains components that may be swallowed by small children (SIM card, antenna, etc.).

The voltage value mentioned on the adapter may not be exceeded. If you connect 2N® EasyRoute to another power supply, make sure that the voltage value is in the acceptable range.

When your 2N® EasyRoute comes to the end of its operational life, dispose of it in accordance with applicable regulations.

1.2 Changes in Documentation

The manufacturer reserves the right to modify the product in order to improve its qualities.

Manual version	Changes
1.0	n The User Manual applies to FW Version 1.00 (Basic function).
1.02	n The User Manual applies to FW Version 1.02 (Extended function).
1.03	n The User Manual applies to FW Version 1.03 (Hotspot).
1.04	n The User Manual applies to FW Version 1.04 (FAX + VoIP - ERF).
1.05	n The User Manual applies to FW Version 2.00 (WAN port).
1.06	n The User Manual applies to FW Version 2.02. (IPsec, PPPoE)

Caution

- The manufacturer is committed to meeting customers' requirements by improving the firmware. For the latest 2N® EasyRoute processor firmware and the User Manual see www.2n.cz.
- For a detailed description of the 2N® EasyRoute firmware upgrade refer to the chapter devoted to the 2N® EasyRoute settings.

1.3 Terms and Symbols Used

Symbols in Manual

Safety Warning

- Always abide by this information to prevent injury of persons.

Warning

- Always abide by this information to prevent damage to the device.

Caution

- Important information for system functionality.

Tip

- Useful advice for quick and efficient functionality.

Note

- Routines or advice for efficient use of the device.

Future Functions

The grey-marked text in this document designates the 2N® EasyRoute functions that are under preparation or development at present.

Caution

- In future, ERF will be replaced with VoIP in the FAX version name. Thus, the FAX version will be designated as 2N® EasyRoute VoIP!

2 Description and Installation

This section describes the 2N® EasyRoute product and its installation.

Here is what you can find in this section:

- **Description**
- **Before You Start**
- **Mounting**
- **Telephone Line Connection**

2.1 Description

2N® EasyRoute consists of a plastic-encased GSM/UMTS gateway, removable antenna and telephone network/LAN connecting cables.

The 2N® EasyRoute status is indicated by the LED on its front side. All possible states are described in the following figure.

Figure 2.1
2N® EasyRoute LED Indicators

Power Supply

Blue light	Power supply is connected.
No light	Power supply is not connected.

GSM / WiFi Network

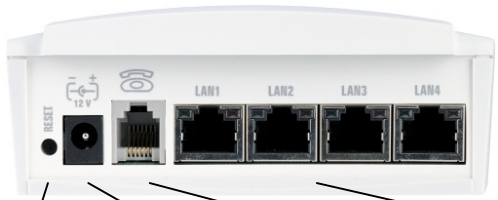
Yellow flashing	UMTS/GSM network is active *)
Yellow, no light	UMTS/GSM network is inactive.
Green flashing	WiFi network is active *)
Green, no light	WiFi network is inactive.

*) The LED lighting time depends on the data traffic intensity:
short flash ... active network, low traffic;
up to 1s flash ... peak network data traffic.

Telephone Line

No light	Standby (relax, on-hook)
Quick flashing	Off-hook or ringing
Light	Active call

Figure 2.2
2N® EasyRoute Connectors



Restart (Reset) button

Power supply connector (2.1 mm DC jack)

Telephone line connector (RJ 12, 6/2)

Four-port Fast Ethernet switch (RJ45)

2.2 Before You Start

Product Completeness Check

Please check the product for completeness before installation. The package should include the following pieces:

- **2N® EasyRoute**
- **1 GSM+UMTS antenna**
- **1 supply adapter**
- **1 telephone cable**
- **1 network cable (Fast Ethernet RJ45)**
- **Quick Start Manual**
- **CD containing User Manual and other information**

Installation Requirements

- **2N® EasyRoute is designed for vertical mounting on suspension holes (use the included template for wall drilling). This position is the best for signal reception because a vertical antenna is used. 2N® EasyRoute can be operated in the horizontal position too where the GSM signal is good.**
- **Install 2N® EasyRoute with respect to the GSM signal strength – check the signal strength using the 2N® EasyRoute web interface.**
- **Place 2N® EasyRoute out of range of sensitive devices and human bodies to minimize electromagnetic interference.**
- **For the allowed range of operating temperatures refer to the Technical Parameters chapter.**
- **It is impossible to operate 2N® EasyRoute on sites exposed to direct solar radiation or near heat sources.**
- **2N® EasyRoute is designed for indoor use. It may not be exposed to rain, flowing water, condensed moisture, fog, etc.**
- **2N® EasyRoute may not be exposed to aggressive gas, acid vapours, solvents, etc.**
- **2N® EasyRoute is not designed for environments with high vibrations such as means of transport, machine rooms, etc.**

Caution

- **Make sure that you are provided with all necessary technical devices – SIM with UMTS data connection support, an analogue telephone set or a PBX with a free external analogue interface (FXO), a PC, or a fax machine (for ERF).**

2.3 Mounting

External Antenna Connection

Screw the antenna included in the package into the SMA antenna connector.

Caution

- **Tighten the antenna connector gently by hand – never use wrenches!**

Note

- **The antenna has a sufficient gain for a trouble-free operation in normal conditions. If the GSM signal is poor or you want to place your antenna separately from 2N® EasyRoute, you can use an antenna with an SMA-connector terminated cable (not included). The antenna should be mounted vertically.**
- **The antenna should be located within the same building as 2N® EasyRoute.**

SIM Card Installation

Release the safety pin and open the SIM cardholder on the 2N® EasyRoute backside. Insert the SIM card and click the holder back into position.

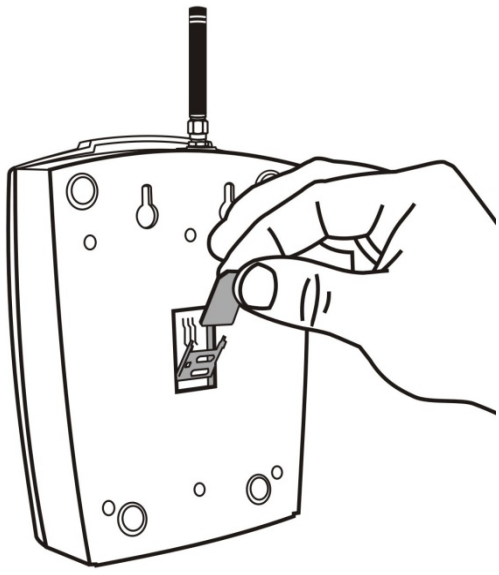


Figure 2.3 *SIM Card Installation*

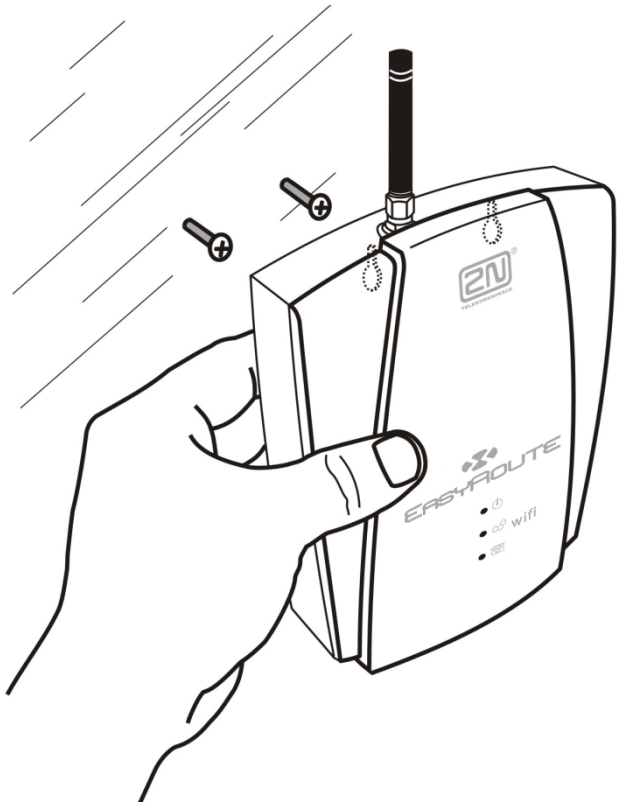
Cautions

- **Make sure that your GSM provider's SIM card is compatible with the GSM network supported by your 2N® EasyRoute version.**
- **Select the required GSM provider and SIM card services, such as call forwarding, call barring, preferred networks, SMS centre, etc. in your mobile phone before inserting your SIM card in 2N® EasyRoute.**

Wall Mounting

The 2N® EasyRoute cover backside is equipped with two wall-mounting holes.

Figure 2.4
2N® EasyRoute Wall Mounting



Power Supply

2N® EasyRoute is fed with 10–16V DC. Where a source other than the included power supply adapter is used, the voltage range and polarity shown on the 2N® EasyRoute power supply connector have to be maintained

Warning

- **Do not connect the power supply until the antenna is connected to 2N® EasyRoute to avoid the GSM/UMTS module damage.**

Restart (Reset) Button

The restart (reset) button is located to the left of the 2N® EasyRoute power supply plug. When pressed shortly, it restarts 2N® EasyRoute. When pushed longer (10 s at least), it resets 2N® EasyRoute to default values (factory setup).

Tip

- **You will find the default value setting useful, for example, when you forget the password or the gateway IP address for your web interface access.**

2.4 Telephone Line Connection

PBX Connection

Connect 2N® EasyRoute to a vacant CO line of your PBX. Configure your PBX in such a manner that UMTS and GSM (VoIP for EFR) outgoing calls are routed to 2N® EasyRoute.

Tip

- **2N® EasyRoute - ER is equipped with the FSK-based CLIP function. If your PBX is able to process the caller's ID, you are advised to enable this function.**
- **2N® EasyRoute - ERF is equipped with an FSK/DTMF-based Calling Line Identification (CLIP) function.**

Telephone Set (Answering Machine, Coin Telephone Station, Fax) Connection

You can connect a standard telephone, an answering machine or any other FXO-interface terminal to 2N® EasyRoute.

In addition to the above mentioned devices, you can connect an analogue FXO-equipped fax machine to your 2N® EasyRoute - ERF.

Tip

- **2N® EasyRoute - ER is equipped with the FSK-based CLIP function. If your PBX is able to process the caller's ID, you are advised to enable this function.**
- **2N® EasyRoute - ERF is equipped with an FSK/DTMF-based Calling Line Identification (CLIP) function.**

3 2N® EasyRoute Configuration

This section describes configuration of the 2N® EasyRoute product.

Here is what you can find in this section:

- **2N® EasyRoute Configuration**
- **Table of Programmable Parameters**

3.1 2N® EasyRoute Configuration

2N® EasyRoute is configured via a user-friendly network web interface. 2N® EasyRoute is factory set to make administration as easy as possible.

PC Connection

You have received a Fast Ethernet cable for PC connection. The DHCP server is active in the gateway and assigns your PC an IP address ranging from 192.168.1.100 to 192.168.1.200 by default. When your 2N® EasyRoute gets connected to the PC and reads the IP address, enter the IP address 192.168.1.1 into your web browser to get access to the 2N® EasyRoute web interface for configuration. The following login dialogue is displayed.

To enter the web interface enter the correct username and password. The default values for the Administrator are as follows:

- **Initial username:** ***Admin***
- **Password:** ***2n***

The Administrator has full access to all device settings except for the Operator password.

The default values for operator are as follows:

- **Initial username:** ***Operator***
- **Password:** ***2n***

The Operator is qualified to operate the time limited connection system – Hotspot. The Operator has access to the following menus only:

Hotspot > Sale - Time limited connection selling;

Status - Information about the mobile network connection;

Setting - Operator password settings.

The default values for the User are as follows:

- **Initial username:** *User*
- **Password:** *2n*

The User is authorised to work with SMS, access the call register and manage the User password.

Caution

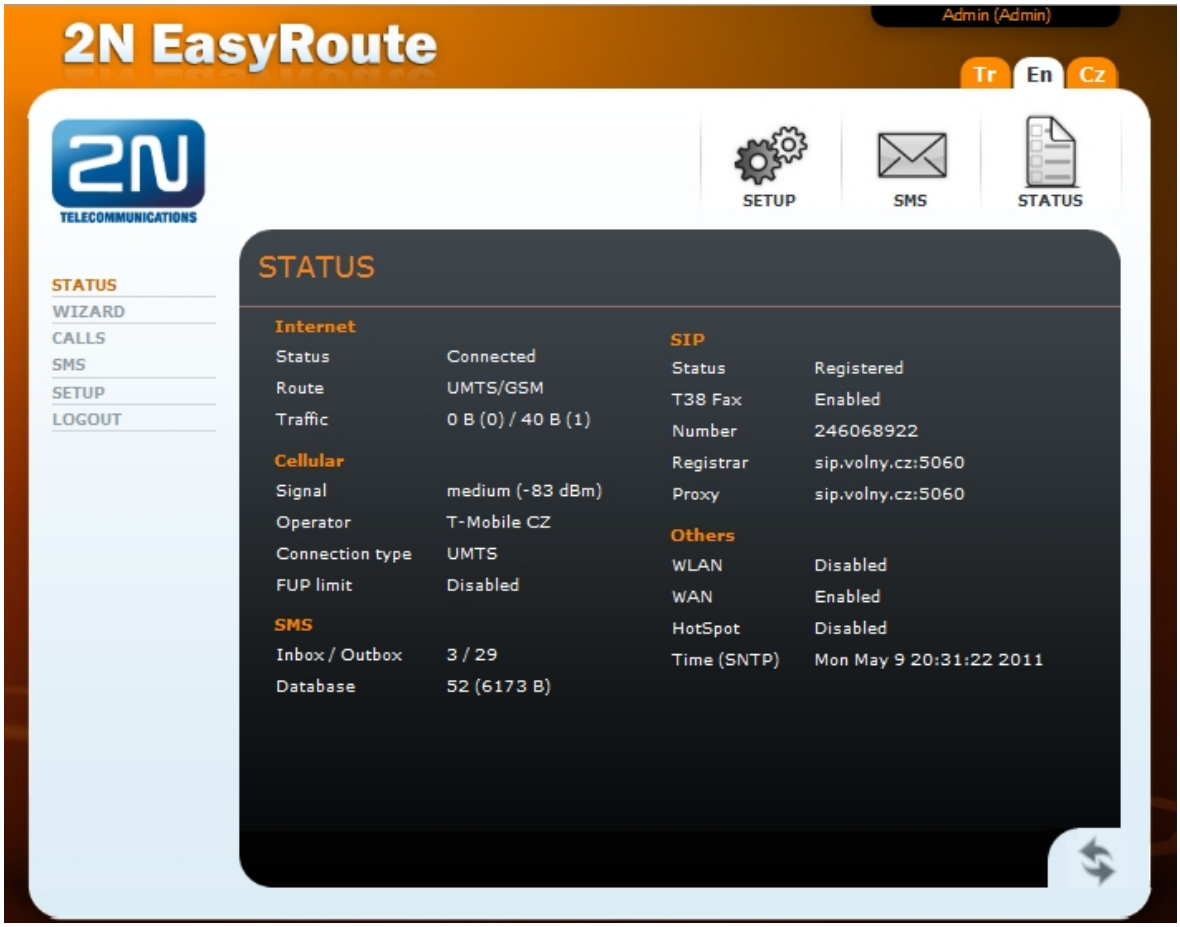
- **We recommend that you should change the web access username and password after the first power up!**

Caution

- **The default login parameters have been changed for product group unification reasons. If your firmware is lower than 2.xx.xxx, use the following login data:**
- **Name:admin Password: admin**
- **Name:operator Password: operator**
- **Name:user Password: user**

3.2 Table of Programmable Parameters

All programmable parameters of 2N® EasyRoute are listed in this subsection. The unit used, description of 2N® EasyRoute's behaviour upon a change, setting options, the setting step and the default (initialisation) setting are included for each parameter. The figure below gives an insight into the gateway configuration interface.



Basic Controls

Basic controls are available in the web configuration interface and have identical functions throughout the whole gateway, such as saving currently made changes. Get acquainted with them please and use them for convenience while working with 2N® EasyRoute.

Language Mutations

To select the language mutations of the configuration interface use the tags in the right-hand upper corner. Three language mutations are available at present – Czech, English and Turkish.

Icons

There are three navigation icons in the right-hand upper corner of the screen for you to access the SETUP, SMS and STATUS menus quickly and easily.

The following basic control buttons are located in the right-hand bottom corner of the configuration interface:

Refresh – update screen data.

Apply – use the set values. An alternative to the Save button.

Save / Export - save the settings into the gateway memory.

Tip

- **In some menus, such as Report, e.g., the Save button saves the displayed reports into your PC memory.**

Default – use the default values on the page.

Select all – tick off all items on the page.

Delete – erase the selected items.

Send – send the available SMS.

Update – download the latest firmware version.

Tip

- **You can use the Upgrade button for restarting too in case you are not located directly at the gateway. Before doing this, make sure that Automatic restart is enabled.**

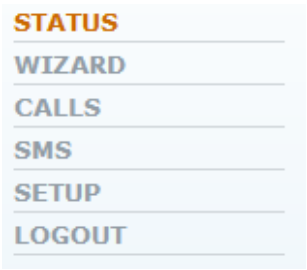
Connect – connect to the UMTS network manually.

Disconnect – disconnect from the UMTS network manually.

Sale – generate a new HotSpot ticket.

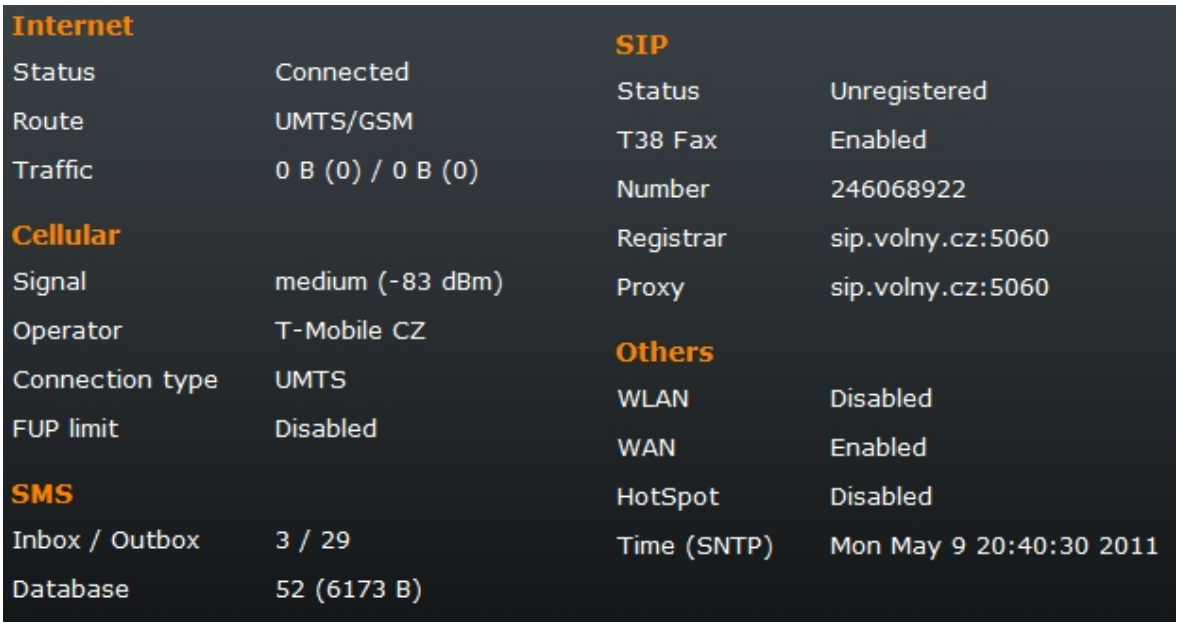
Menu

The left-hand section of the screen shows menus that can be opened by a mouse click. The WIZARD menu will help you configure the basic gateway functions quickly. The last item of the section called LOGOUT is used for disconnecting the configuration interface user.



STATUS Menu

This menu provides a list of function statuses.



Internet

Status

Displays the current status of data connection to the provider.

Disconnected	***Data connection has not been established.***
Connected	***Data connection has been established.***
Connecting	***Data connection is being established.***
Disconnecting	***Data connection is being cancelled.***

Route

Displays the currently used Internet connection technology.

WAN	***Data connection established through the WAN port.***
UMTS/GSM	***Data connection established through the wireless network.***
ADSL/PPPoE	***Data connection established through the ADSL modem.***

Traffic

Displays the current gateway traffic per second. Download/Upload. The value indicates the amount of transmitted data and the value in parentheses shows the count of transmitted packets.

Cellular

Signal

Displays the current strength of the receiving signal in [dBm].

Operator

Displays the name of the SIM card provider. If the SIM card cannot log in to a network (e.g. requires the PIN), the Limited service message is displayed.

Connection type

Displays the type of 2N® EasyRoute connection to a wireless network (GSM, EDGE, GPRS, UMTS, HSDPA/HSUPA, etc.).

FUP limit

Displays the counter capacity according to FUP parameters.

Disabled	***FUP not allowed.***
0 – 100%	***Counter filling percentage; 100% results in Internet disconnection.***

SMS

Received / Sent

Displays the count of SMS currently available in the received/sent SMS storage.

Database

Displays the total count of SMS in the gateway, including the storages of received/sent SMS and user-deleted SMS. The value in parentheses shows the current data space occupied by SMS in the gateway, including the storages of received/sent SMS and user-deleted SMS If the value reaches the defined limit, all user-deleted messages are removed and the free space is used for new incoming and outgoing SMS.

SIP ERF

Status

Displays the line registration state. A duly registered line is ready for use.

T.38 Fax

Displays the FAX send/receive support enable.

Tel. number

Displays the current telephone number for the registered line.

Registrar

Displays the current server to which the 2N® EasyRoute SIP account should register.

Proxy

Displays the current server via which the 2N® EasyRoute - VoIP provider SIP communication takes place.

Others

WLAN

Gateway WiFi network state.

Disabled	***WiFi network is deactivated.***
Enabled	***WiFi network is activated.***

WAN

Gateway WAN port state.

Disabled	***WAN port is deactivated.***
Enabled	***WAN port is activated.***

HotSpot

Current HotSpot state.

Disabled	***HotSpot is deactivated.***
Enabled	***HotSpot is activated.***

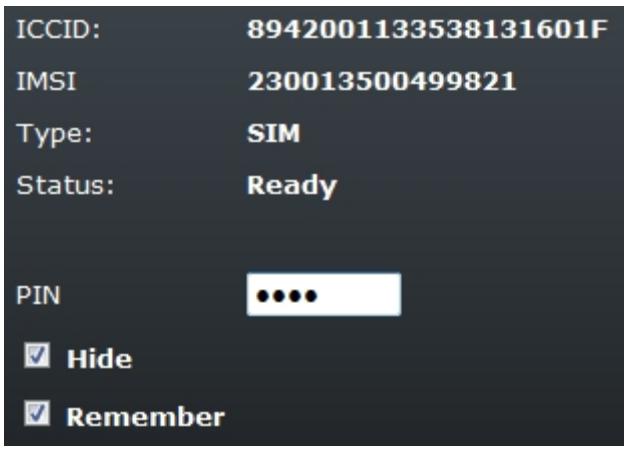
Time (SNTP/UMTS)

Source of current system time of the gateway.

WIZARD Menu

This menu helps you set the SIM card, connect to the Internet and activate the WiFi network quickly and easily. The parameters below are identical with those in the SETUP menu, but are arranged differently to facilitate setting. Refer to the SETUP menu for details. Now let us briefly introduce the Wizard and present the most important quick start settings.

SIM



ICCID and IMSI are unique SIM card codes assigned by mobile providers. There are no identical codes at one moment. Type displays the currently active SIM card in the gateway. These identifiers cannot be changed and are displayed for information only.

State displays the state of the SIM card inserted. There exist several SIM card states some of which are rare. Hence, let us mention the most frequent ones only: Unknown – SIM card damaged or not inserted, PIN – SIM card requests the PIN code.

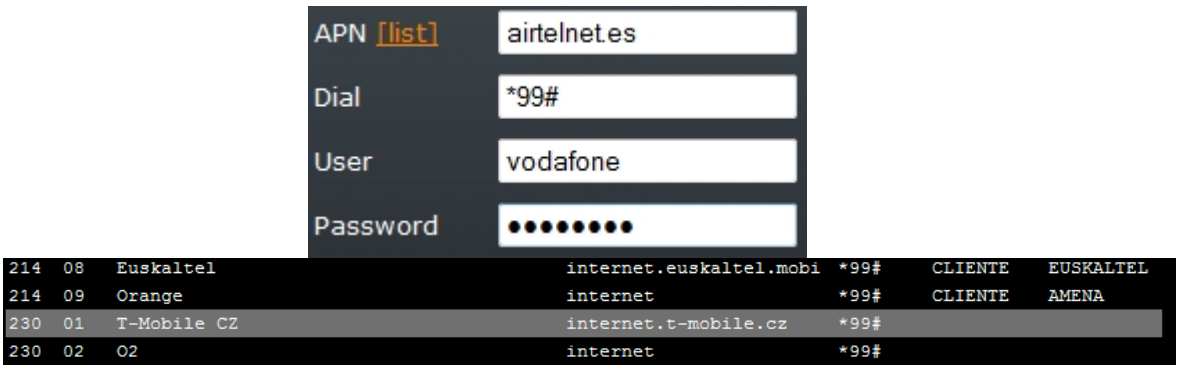
Enter the PIN into the PIN field. Unselect Hide to view the characters entered. Tick off Hide to cover the characters from view.

Select Remember to make 2N® EasyRoute save the PIN after a successful SIM login and enter the same automatically upon the next start. A wrong PIN is not remembered. When the SIM card has been replaced, 2N® EasyRoute tries to enter the saved PIN, thus wasting one PIN entering attempt. 2N® EasyRoute deletes the wrong PIN from its memory after finding its invalidity. To avoid this, configure the PIN correctly before inserting a new SIM card.

Now click on Apply to confirm the currently made changes. Having done this, you move to the next Wizard window and 2N® EasyRoute will, if the PIN is correct, log in to the wireless network.

Internet

This Wizard menu helps you configure the UMTS connection to the Internet. The procedure is similar to that in the ADSL network. Specify the access point and then verify the user name and password. You do not have to set anything on this page in most cases. The gateway finds all settings in its database. Click on the List link. A highlighted line signals that the gateway has found the required provider data. In that case, close the List window and proceed to the next page. If you need more settings or no provider data are available in the database, set the items below as instructed by your UMTS provider.



APN (Access Point Name) identifies the provider's Internet access code. Enter the required service access code into the Dial parameter. This telephone number is determined by the provider. '*99#' is used typically.

Fill in the User and Password items do define the user name and password for connection to the provider: 'internet' in most cases. When you have finished, click on Apply to proceed to the next page.

Wireless

Use this window to configure WiFi transmission easily. If you do not intend to enable the wireless network, set nothing and push Apply. If you want to enable the wireless network, set only the basic parameters here. The other parameters will be set to default values. Use the SETUP menu to change the default values.

Select/Unselect Enable to activate/deactivate the WiFi transmitter. SSID (Service Set Identifier) is the WiFi identifier that is sent to users. It is a unique network identifier in the given space.

System sets security to the 2N® EasyRoute WiFi interface. The available security levels include WEP, WPA, WPA2 and WPA+WPA2. The WiFi security

Key format options are ASCII or HEX, i.e. ASCII characters or digits respectively.

The WiFi security Key consists of a sequence of alphanumeric characters, or hexadecimal symbols as defined in the Key format.

Having set the values, click on Apply. Now your 2N® EasyRoute gateway is ready for basic operation. Refer to the subsections below or the HOW TO manuals for details on all programmable parameters.

CALLS Menu

All

The menu gives an overview of all gateway calls. It includes all answered outgoing calls plus answered and unanswered incoming calls. Unanswered incoming calls are signalled by the Missed note in the last column. Each page shows thirteen calls and to move between the pages use the page numbers in the bottom part of the screen. Use the >> symbol to jump onto the oldest call.

Direction

The Direction column specifies whether the call is an incoming or outgoing one.

Time

The Time column displays the date and time of the selected call. The time value refers to the off-hook time for answered incoming and outgoing calls and to the ringing start time for unanswered incoming calls.

Number

The Number column displays the called numbers for outgoing calls and the calling numbers for incoming calls.

Duration

The Duration column shows the duration of calls. This value refers to the call ringing time for unanswered incoming calls.

Incoming

The menu gives an overview of all incoming gateway calls, including both answered and unanswered calls. Unanswered incoming calls are signalled by the Missed note in the last column. The meanings of the menu columns correspond to those in the All section. To move between the pages use the page numbers in the bottom part of the screen. Use the >> symbol to jump onto the oldest call.

Outgoing

The menu gives an overview of all answered outgoing gateway calls. Unanswered call attempts are not filed. The meanings of the menu columns correspond to those in the All section. To move between the pages use the page numbers in the bottom part of the screen. Use the >> symbol to jump onto the oldest call.

Missed

The menu gives an overview of all missed incoming gateway calls. The meanings of the menu columns correspond to those in the All section. To move between the pages use the page numbers in the bottom part of the screen. Use the >> symbol to jump onto the oldest call.

SMS Menu

Inbox

The Inbox folder displays the received SMS messages and helps you read them including such details as the SMS sender number and delivery time. To delete a message, select it and push the Delete button. To move between the pages use the page numbers in the upper part of the screen.

Create

Phone number

Here enter the telephone number for SMS sending.

Setting options: ***1–15 characters (0–9, *, #, +)***

Default setting: ***Empty***

Text

Enter the text of the SMS to be sent. The SMS may also contain diacritic symbols and special characters as enabled in the coding scheme used. You can also send SMS messages longer than 160 characters without or 70 characters with diacritic symbols but remember that long messages are physically divided into the required count of SMS and you will have to pay for all of them.

Send SMS

Button is placed right bottom. Push this button to move your SMS to the To Send folder and send it as soon as possible.

Outbox

The Outbox folder displays the sent SMS messages and helps you read them including such details as the SMS addressee. To delete a message, select it and push the Delete button. To move between the pages use the page numbers in the upper part of the screen.

To Send

The To Send folder displays all pending SMS messages that have not been sent for whatever reason. When sent, the messages are transferred into the Outbox section. When sent unsuccessfully, they are transferred into the Errors folder. The menu helps you read the messages including such details as the SMS

addressee. To delete a message, select it and push the Delete button. To move between the pages use the page numbers in the upper part of the screen.

Trash

The Trash folder displays the SMS messages that have been deleted from other sections. This storage is an intermediate step before deleting SMS from the user-accessible storage areas to avoid unintentional deletions. The menu helps you read the messages including such details as the SMS sender or addressee. To delete a message, select it and push the Delete button. To move between the pages use the page numbers in the upper part of the screen. An SMS deleted here is moved to the storage of deleted SMS and, together with the other SMS messages, deleted automatically when the assigned data space is filled up.

Errors

The Errors folder displays the SMS messages that failed to be sent. The menu helps you read the messages including such details as the SMS addressee. To delete a message, select it and push the Delete button. To move between the pages use the page numbers in the upper part of the screen.

SETUP Menu > Cellular

SIM

ICCID

Unique serial numbers of the mobile providers' SIM cards. There are no identical numbers at the same time. They start with 8942 for the Czech Republic and have 19 positions altogether.

IMSI

The IMSI (International Mobile Subscriber Identity) is a unique worldwide identifier of the SIM card inserted.

Type

Type of the SIM card inserted. Options: SIM, USIM, or Unknown when 2N® EasyRoute cannot identify the SIM card.

Status

Status of the SIM card inserted. Some statuses are rather rare and so the most important SIM card statuses are mentioned only.

Unknown	*SIM card is not available.*
Ready	*SIM card is functional and ready for use.*
SIM PIN	*SIM card is PIN-secured; enter the PIN.*
SIM PUK	*SIM card has been blocked by entering an invalid PIN; enter the PUK for unblocking.*

The other potential statuses should not normally occur.

PIN

Fill in the PIN of the SIM card inserted.

Setting options: ***0, 4–8 characters (0–9)***

Default setting: ***None***

Hide

The PIN is displayed not in the text format but as a dot only.

Remember

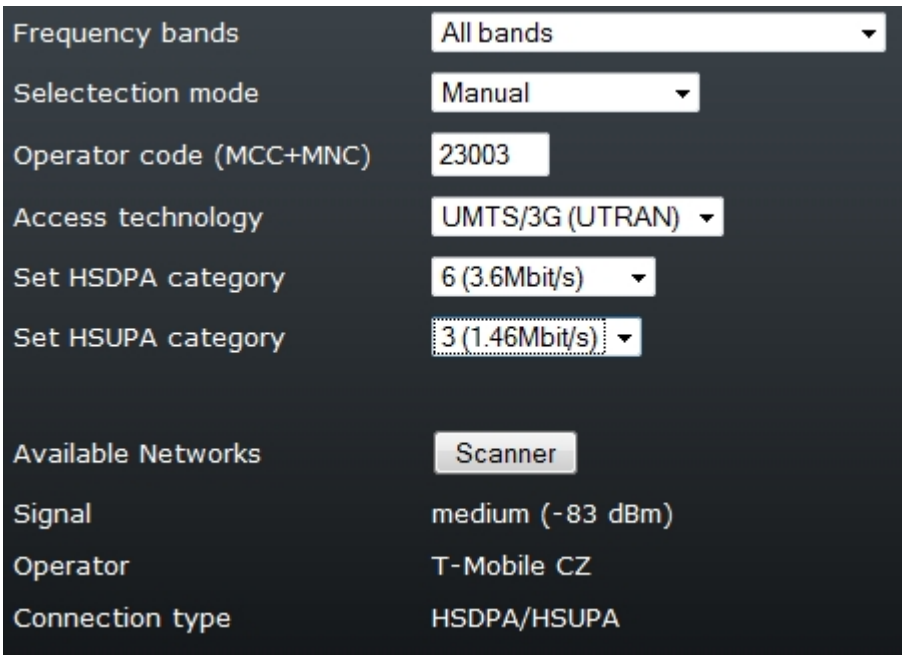
Select Remember to make 2N® EasyRoute save the PIN after a successful SIM login and enter the same automatically upon the next start. A wrong PIN is not remembered. When the SIM card has been replaced, 2N® EasyRoute tries to enter the saved PIN, thus wasting one PIN entering attempt. 2N® EasyRoute deletes the wrong PIN from its memory after finding its invalidity. To avoid this, configure the PIN correctly before inserting a new SIM card.

Caution

- **2N® EasyRoute remembers PINs for 10 last-inserted PIN-protected SIM cards. These PINs are stored in the internal gateway memory. A PIN that does not match the current SIM card PIN is deleted from the memory.**

Mobile network

Used for provider/network selection if, for example, 2N® EasyRoute with a SIM card is used for roaming. Normally, there is no need to modify anything in the menu as the gateway works autonomously. Consult the HOW TO manual in the case of connection troubles.



Frequency bands

Set the frequency bands to be used by 2N® EasyRoute for GSM connections. The available bands for the selected SIM, Module and Region are highlighted.

Caution

- **By setting a frequency band you disable 2N® EasyRoute from using the optimum frequency band, which may decelerate your data transmission and deteriorate the VoIP call and FAX transmission quality. 2N® EasyRoute continuously evaluates the signal intensity and adjusts the frequency bands accordingly to optimise the available connection options. Thus, we recommend you to keep the factory settings.**
- **This parameter does not affect the other settings on the page. It just specifies the frequency band for 2N® EasyRoute.**

Selection mode

Define how the provider should be selected: either Manually, in which case be sure to fill in the Provider code below, or Automatically, in which case the optimum provider is selected automatically, or Deregister, in which case the SIM logs out.

Operator code (MCC+MNC)

The provider code is an identifier consisting of the Mobile Country Code (MCC) and the Mobile Network Code (MNC). Use the parameter to select the provider to which 2N® EasyRoute with a SIM should log for roaming purposes. Just select a provider from the list of available networks and the provider code will be set automatically.

Setting options: ***5-6 characters [0-9], MCC – 3 digits, MNC – 2-3 digits***

Access technology

Select the GSM/UMTS login technology. This parameter does not affect the final Internet connection technology selection.

HSDPA/HSUPA settings

Select a category to define the GSM/UMTS module rate. Default values of modern high speed modules may cause troubles in some networks. If this is your case, select a lower data rate category here.

Available networks

List of available mobile networks to which your 2N® EasyRoute can log in. The gateway only works if logged in to a network that enables roaming for the gateway SIM card provider.

Tip

- **Click on Scanner to display the up-to-date list of available networks. Having searched the GSM/UMTS network according to the available band, access technology and provider settings, 2N® EasyRoute shall provide a list of available networks.**

Signal

Displays the current strength of the receiving signal in [dBm].

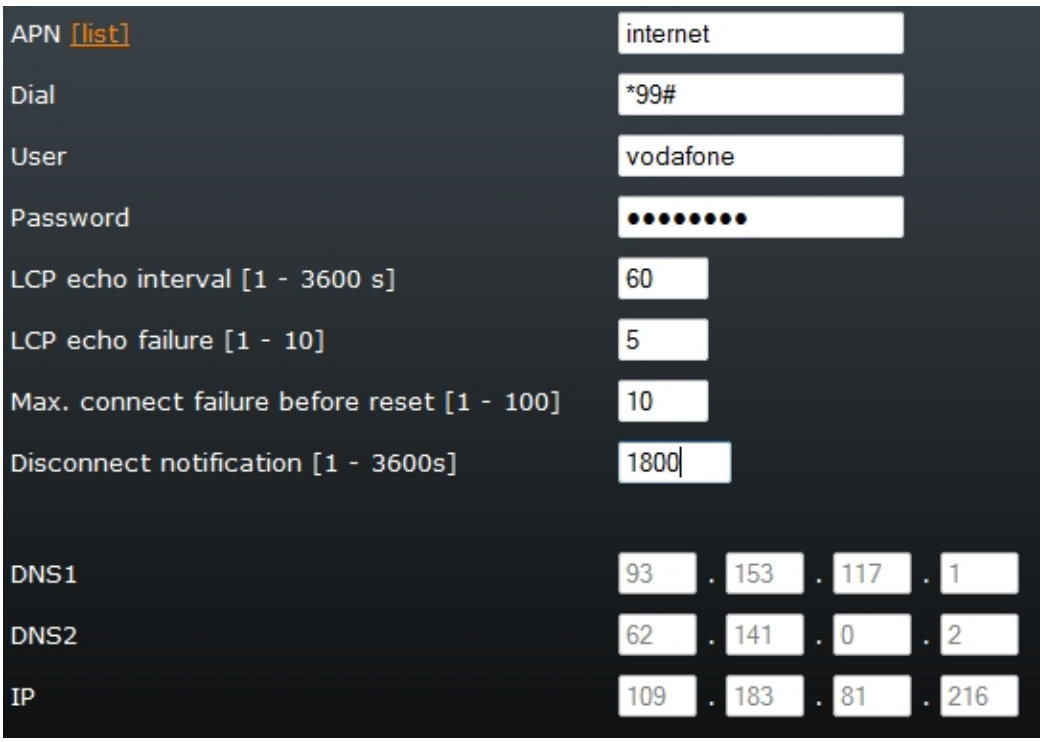
Operator

Displays the name of the provider to which the SIM is logged in. If the SIM card cannot log in to a network (e.g. requires the PIN), the Limited service message is displayed.

Connection type

Displays the type of 2N® EasyRoute connection to a wireless network (GSM, EDGE, GPRS, UMTS, HSDPA/HSUPA, etc.).

Internet



APN

The APN (Access Point Name) is the provider's Internet access code. If the item is not filled in by the user, the gateway uses data from its database.

Dial

Fill in the telephone number of the requested service. This parameter is determined by the provider.

User

Enter the username for connection to the provider. If you fail to fill in the name, the gateway uses data from its database.

Password

Enter the password for connection to the provider. If you fail to fill in the password, the gateway uses data from its database.

Note

- **To display the internal APN database, click on the List link. The currently used data are highlighted in the table. If no table row is highlighted, 2N® EasyRoute has no data on your provider. In that case, enter the data manually.**

LCP echo interval [0 – 3600 s]

Set the timeout after which the LCP echo should be sent.

LCP echo failures [0 - 10]

Set the count of unsuccessful LCP echo attempts after which the connection error should be detected. Subsequently, the PPP demon is restarted. The gateway tries to reconnect to the Internet.

Max connect failures before reset

Set the count of unsuccessful connection attempts after which the system is restarted.

Note

- **LCP echo is a function of the PPP demon, which is responsible for connection to the provider (UMTS/PPPoE). It sends packets in predefined intervals and expects responses to them. When the defined count of failed responses has been achieved, the PP demon is restarted and tries to reconnect to the Internet.**
- **As a matter of fact, LCP echo is a self-diagnostic function, which monitors connection and is able to repair errors if any. Moreover, SMS notification is associated with this state and so, when an error occurs, a notification SMS is sent.**

Disconnection notification [1 – 3600s]

A notification SMS is sent when the defined period of time elapses. Errors must come in a sequence to be considered. This means that the first correct attempt clears the counter even if the next one is wrong again.

DNS1/DNS2

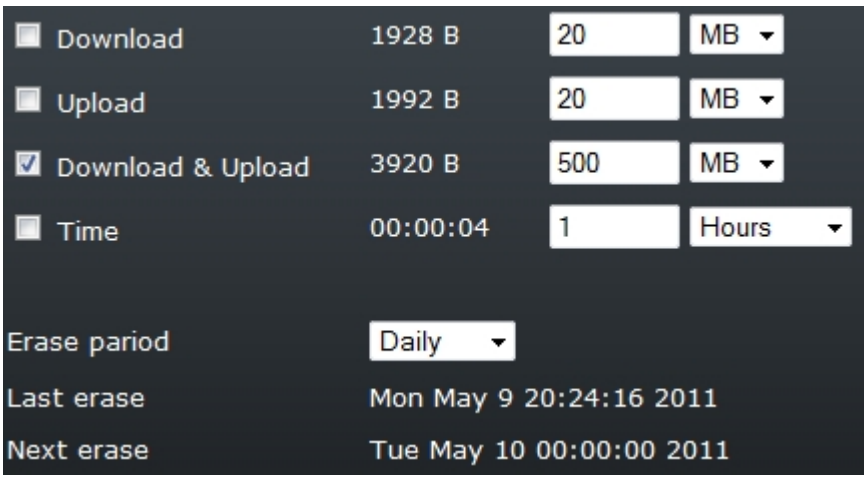
The IP address of the DNSs used as assigned by the provider upon network login. Cannot be programmed!

IP

The IP address of the default gateway used as assigned by the provider upon network login. Cannot be programmed!

FUP

The FUP (Fair User Policy) function is set in this menu. The maximum amount of data to be transmitted is defined for a certain period of time. The limit is 100 GB. One selection at least must be ticked off to make this service work. The service is OFF by default. Exceeding leads to Internet disconnection until the counters are reset.



Download

Enable that the preset limit should be applied to downloaded data. The second parameter is for information only and displays the current amount of data transmitted in the given direction. The third parameter sets the amount of data to be transmitted. The fourth parameter defines units.

Upload

Enable that the preset limit should be applied to uploaded data. The second parameter is for information only and displays the current amount of data transmitted in the given direction. The third parameter sets the amount of data to be transmitted. The fourth parameter defines units.

Download & Upload

Enable that the preset limit should be applied to downloaded and uploaded data. The second parameter is for information only and displays the current amount of

data transmitted in the given direction. The third parameter sets the amount of data to be transmitted. The fourth parameter defines units.

Time

Enable that the preset time limit should be applied to Internet connection. The second parameter is for information only and displays the current time of connection use. The third parameter sets the allowed connection time. The fourth parameter defines units.

Erase period

Define how often the FUP counter should be reset. Options: Now – immediate reset, Daily, Weekly, or Monthly.

Last erase

Displays the system time at which the counter was reset for the last time. From this time on, the next resetting period as set in the Reset period parameter is in progress.

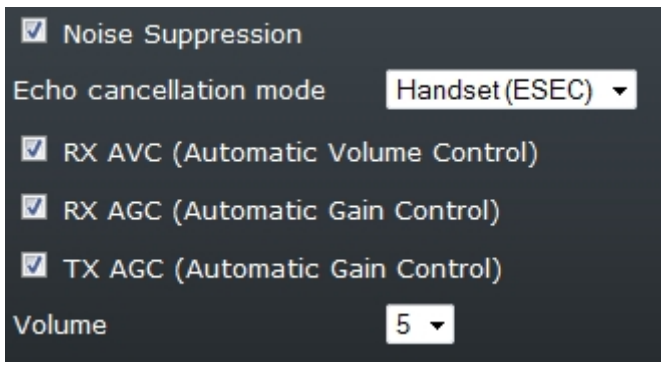
Next erase

Displays the system time at which the counter will be reset for the next time. This time depends on the Reset period and Last reset parameters.

Note

- **If you set multiple FUP limit parameters, e.g. Download and Time, the more exhausted limit is displayed in the STATUS menu. For example, if the Download use is 38% and the Time use is 87%, then the STATUS page will show 87%.**

Voices



Noise suppression

Use this parameter to enable/disable noise suppression.

Echo cancellation mode

Use this parameter to enable one of the predefined echo cancellation modes.

Setting options: ***OFF***

Handset (ESEC)

Headset
Car kit (AEC) – for noisy environments
Speaker

RX AVC (Automatic Volume Control)

Enable/disable the automatic setting of the receiving signal volume.

RX AGC (Automatic Gain Control)

Enable/disable the automatic setting of the signal receive gain.

TX AGC (Automatic Gain Control)

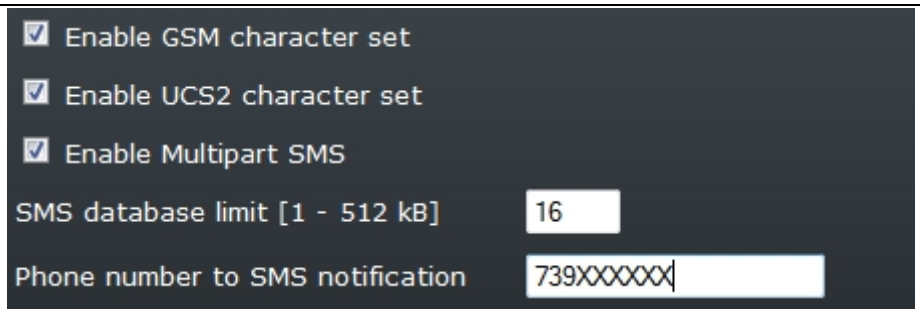
Enable/disable the automatic setting of the signal transmit gain.

Volume

Here set the transmission and sidetone volumes.

Setting options: ***0–7 (0 = muted, 7 = max)***

Services



Enable GSM character set

Here enable/disable the GSM character set for SMS coding. This option is automatically ticked off if none of the coding sets is selected.

Enable UCS2 character set

Here enable/disable the UCS2 (Unicode) character set for 16-bit SMS coding.

Enable multipart SMS

Here enable/disable sending of multipart SMS messages. A multipart SMS means a message longer than 160 characters without or 70 characters with diacritic symbols and special characters.

SMS database limit

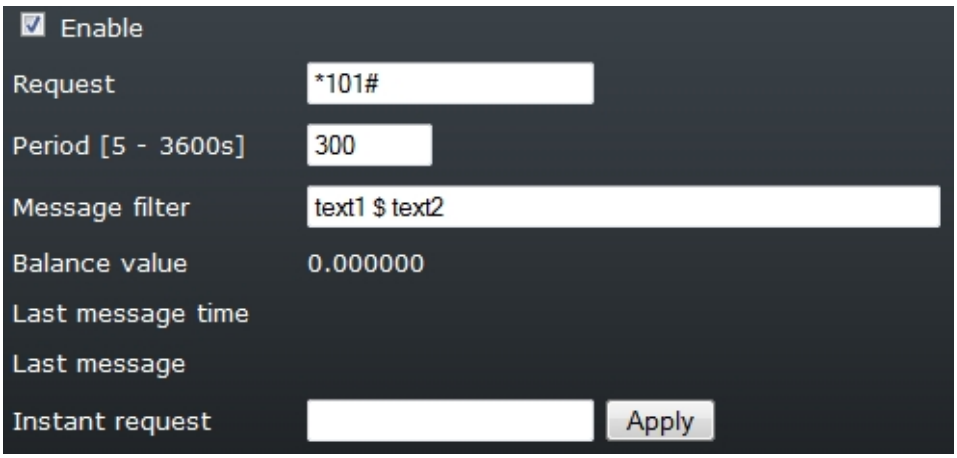
Here set the maximum size of the SMS storing database. After the database is filled up, incoming SMS messages are stored on the inserted SIM card and no more SMS are sent and/or received. The user is notified of this fact by an error message while sending SMS.

Setting options: ***8–512 kB***
Default setting: ***16 kB***

Phone number to SMS notification

Set up to 5 nine-digit numbers (e.g. 765123456) to which notification SMS on the 2N® EasyRoute state should be sent. All generated SMS will be sent to all the numbers entered here.

Balance



Enable

Enable USSD commands to be sent.

Request

Set your provider code to get your credit info. Check the provider settings for the provider code.

Period

Set the time intervals between individual USSD commands.

Message filter

Specify the location of the credit info in the incoming SMS text. If no filter is used, the date may be displayed instead of credit info. The program finds the first occurrence of the required number in the message.

Balance value

This item displays the current credit amount on the prepaid SIM card.

Last message time

This item displays the date and time of the last-received SMS.

Last message

This item displays the entire last-received SMS (without filter).

Instant request

Used for credit recharging, for example. Enter the command to be sent and click on Apply. The answer is displayed in the Last SMS parameter until the next immediate request is sent or the request is sent after the Period timeout elapses.

SETUP Menu > Telephony

SLIC - Basic Version ER

This section is split into two subsections to distinguish the two available 2N® EasyRoute versions – the basic version (standard, ER version) and the FAX version (ERF).

Dialling ER

Time to dial

Define a timeout for 2N® EasyRoute to await more digits to be dialled. The connection is established when this timeout elapses and no more digits are accepted.

Tone after disconnection

Define the tone played to the gateway user after the connection is terminated by the GSM network.

Dial pulse width

Define a pulse width to be identified as one dialling pulse. If the limits are set incorrectly, pulse dialling cannot be used.

Pause between pulses

Define a period of time to be identified as a delay between pulses.

Minimal pause between digits

Set the minimum interval between two digits dialled.

Minimal On Hook

Set the minimum line current discontinuation to be evaluated as hang-up by 2N® EasyRoute. If shorter, the discontinuation is ignored by the gateway.

Tones ER

Dialtone – frequency

Here set the frequency of the dialling tone in [Hz]. You can set up to two frequencies for a dual tone. The first frequency is obligatory, the other is optional.

Setting options: ***100–3,500 Hz***

Setting step: ***5 Hz***

Default setting: ***425 Hz for the first tone, the other tone is disabled.***

Dialtone – modulation

Set the dialtone modulation, choosing one of the predefined dialtone patterns.

Setting options: ***Continuous, 320/320/640/640 (Morse A)***

Default setting: ***Continuous***

Busy tone– frequency

Set the busy tone frequency in [Hz]. You can set up to two frequencies for a dual tone. The first frequency is obligatory, the other is optional.

Setting options: ***100–3,500 Hz***

Setting step: ***5 Hz***

Default setting: ***425 Hz for the first tone, the other tone is disabled.***

Busy tone – modulation

Set the busy tone modulation, choosing one of the predefined dialtone patterns.

Setting options: ***250/250, 330/330, 200/200, 375/375, 500/500***

Default setting: ***330/330***

Continuous tone – frequency

Set the continuous tone frequency in [Hz]. You can set up to two frequencies for a dual tone. The continuous tone can be used for setting the Disconnect tone parameter.

Setting options: ***100–3,500 Hz***

Setting step: ***5 Hz***

Default setting: ***425 Hz for the first tone, the other tone is disabled.***

Ringing and CLIP ER

Frequency

Here set the signal frequency for terminal or PBX ringing in the case of an incoming GSM call.

Setting options: ***10–60 Hz***

Setting step: ***1 Hz***

Default setting: ***50 Hz***

Modulation

Here set ringing signal modulation, choosing one of the predefined ringing patterns.

Setting options: ***1000/4000, 400/200/400/2000, 1500/3500,2000/4000***

Default setting: ***1000/4000***

CLIP

Set this item to enable sending of a calling GSM line identification. The function can be enabled if you have a FSK/ETSI receiving device on your telephone line.

Setting options: ***Disable***

2N® EasyRoute restricts CLI towards the telephone line.

FSK during ringing

2N® EasyRoute transmits the FSK-based CLI according to the ETSI EN 300 659 standard during ringing.

Replace '+' by

If this parameter is enabled, the '+' character is replaced with the defined string in the international prefix of the CLI. It is because the '+' character can neither be transmitted by the FSK protocol nor dialled in the DTMF format from a terminal.

Setting options: ***0–15 characters (0–9, *, #)***

Signalling ER

Pulse frequency

Set the tariff pulse frequency.

Setting options: ***12/16 kHz***

Tariff pulse when call starts

Enable/disable tariff pulse sending when the call begins. The pulse is sent when the call is answered in the GSM network.

Tariff pulse when call ends

Enable/disable tariff pulse sending when the call ends. The pulse is sent when the call is hung up in the GSM network.

Advanced ER

Receive Path High Pass Filter

Enable/disable the high pass filter for the signal receive path.

Transmit path high pass filter

Enable/disable the high pass filter for the signal transmit path.

Receive Path Gain

Set the gain for the receive path.

Setting options: ***0 dB***
3.5 dB
-3.5 dB
Muted

Transmit Path Gain

Set the gain for the transmit path.

Setting options: ***0 dB***
3.5 dB
-3.5 dB
Muted

Line Capacitance Compensation

Set the line capacitance compensation.

Setting options: ***Off***
4.7 nF

10 nF

Two-wire Impedance Synthesis

Adjust the telephone line to the FXS interface.

Setting options:
600 Ohm
900 Ohm
600 Ohm + 2.16 µF
900 Ohm + 2.16 µF
270 Ohm + 750 Ohm || 150 nF
220 Ohm + 820 Ohm || 120 nF
220 Ohm + 820 Ohm || 115 nF
370 Ohm + 620 Ohm || 310 nF
Disabled

Pulse Metering Hybrid Adjustment

Set the trans-hybrid feedback for tariff pulse metering. Use this function, for example, to eliminate penetration of tariff pulses into the wireless network and potential interference.

Setting options:
+4.08 dB
+2.50 dB
+1.16 dB
0 dB
-1.02 dB
-1.94 dB
-2.77 dB
Off

Audio hybrid adjustment

Set the audio trans-hybrid feedback. Use this function, for example, to suppress echo more efficiently.

Setting options: ***see above***

SLIC – FAX Version ERF

SLIC > Dialling ERF

Use the SLIC submenus to set the analogue line (FXS port) parameters.

Minimal onhook time

Set the minimum line current discontinuation to be evaluated as hang-up by 2N® EasyRoute. If shorter, the discontinuation is ignored by the gateway.

Minimal offhook time

Set the minimum time interval after which the off-hook state is detected.

Minimal flash time

Set the minimum time interval after which the Flash is detected.

Maximal flash time

Set the maximum time interval before which the Flash can be detected.

Minimal low pulse time

Set the minimum inactive pulse time.

Maximal low pulse time

Set the maximum inactive pulse time.

Minimal high pulse time

Set the minimum active pulse time.

Maximal high pulse time

Set the maximum active pulse time.

SLIC > Tones ERF

Dialtone - Frequency

Here set the dialtone frequency in [Hz]. You can set up to two frequencies for a dual tone. The first frequency is obligatory, the other is optional.

Setting options: ***100–4000 Hz***

Default setting: ***425 Hz for the first tone, the other is disabled***

Dialtone – Cadence

Set the dialtone cadency, choosing one of the predefined dialtone patterns.

Setting options: ***Continuous, 320/320/640/640 (Morse A), 330/330, 200/200, 250/250, 375/375, 500/500, 50/50, 1500/3000***

Default setting: ***Continuous***

Busy tone – Frequency

Set the busy tone frequency in [Hz]. You can set up to two frequencies for a dual tone. The first frequency is obligatory, the other is optional.

Setting options: ***100–4000 Hz***

Default setting: ***425 Hz for the first tone, the other is disabled***

Busy tone – Cadence

Set the busy tone cadency, choosing one of the predefined dialtone patterns.

Setting options: ***Continuous, 320/320/640/640 (Morse A), 330/330, 200/200, 250/250, 375/375, 500/500, 50/50, 1500/3000***

Default setting: ***200/200***

Call tone – Frequency

Set the ringing tone frequency in [Hz]. You can set up to two frequencies for a dual tone. The first frequency is obligatory, the other is optional.

Setting options: ***100–4000 Hz***

Default setting: ***425 Hz for the first tone, the other is disabled***

Call tone – Cadence

Set the ringing tone cadency, choosing one of the predefined dialtone patterns.

Default setting: ***1500/3000***

Error tone – Frequency

Set the tone frequency in [Hz]. You can set up to two frequencies for a dual tone. The first frequency is obligatory, the other is optional.

Setting options: ***100–4000 Hz***

Default setting: ***425 Hz for the first tone, the other is disabled***

Error tone – Cadence

Set the tone cadency, choosing one of the predefined dialtone patterns.

Default setting: ***50/50***

SLIC > Advanced ERF

Ring

Set the telephone line ringing voltage modulation, choosing one of the predefined ringing patterns.

Setting options: ***1000/4000, 400/200/400/2000, 1500/3500, 2000/4000***

Default setting: ***1000/4000***

CID

Set this item to enable sending of a calling GSM line identification. The function can be enabled if you have a FSK/DTMF (ETSI) receiving device on your telephone line.

Setting options: ***Disable***

2N® EasyRoute restricts CLI towards the telephone line.

ETSI FSK

2N® EasyRoute transmits CLI using FSK (Frequency Shift Keying) to a telephone line.

ETSI DTMF
2N® EasyRoute transmits the received CLI using the DTMF (Dual Tone MultiFrequency) signalling to a telephone line.

Default setting: ***ETSI FSK***

LEC

Enable or disable the echo cancelling function (Line Echo Canceller).

RX gain

Set the gain for the receive path.

Setting options: ***-24 to 24 dBms***
Setting step: ***1 dBms***
Default setting: ***-18 dBms***

TX gain

Set the gain for the transmit path.

Setting options: ***-24 to 24 dBms***
Setting step: ***1 dBms***
Default setting: ***0 dBms***

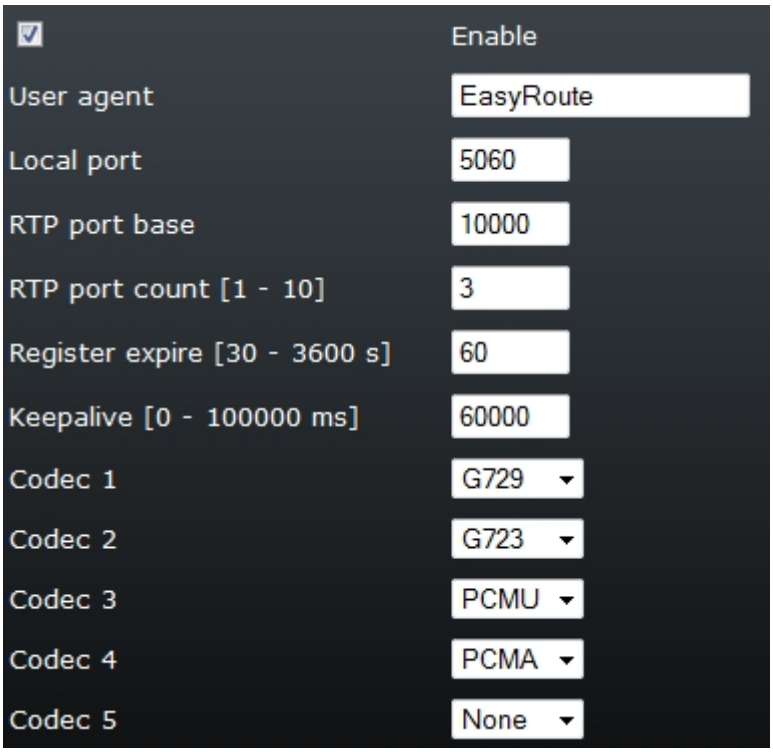
Jitter

Set the buffer jitter capacity.

Setting options: ***Fixed/Adaptive***

SIP > Basic ERF

Set login data for VoIP providers, codec priorities and other VoIP parameters in this menu.



Enable

Enable the use of the SIP account and VoIP routing.

User agent

Set the name to be displayed to the called subscriber.

Local port

Set the port to be used for SIP communication by 2N® EasyRoute.

RTP port base

Set the port for RTP stream sending.

RTP port count

Set the range of the RTP ports to be used. Range 1-10.

Register expire

When the preset time interval elapses, the gateway sends a new registration packet to the SIP proxy as defined in the *SIP > Account* menu. Range 30s-3600s.

Keepalive

When the preset time interval elapses, the gateway sends a KeepAlive packet to restore the gateway path storing time in the NAT router tables.
Range 0-100000ms.

Codec 1 to 5

Set the priorities of codecs 1 to 5. The lower the number, the higher the priority. If you set none, codec G.729 will be used.

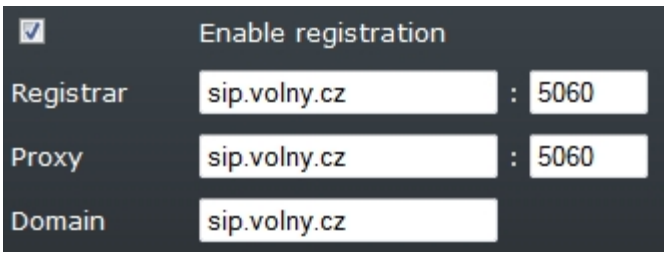
Setting options: ***G.729, G.723, PCMU, PCMA***

Default settings: ***Codec 1 – G.729***
Codec 2 – G.723
Codec 3 – PCMU
Codec 4 – PCMA
Codec 5 – Unused

Note

- **Currently, 2N® EasyRoute supports four types of codecs. They are: G.729, G.723, PCMU and PCMA. Codec 5 is reserved for future extension of the codec range. So do not change the default values of Codec 5 for the time being (Unused).**

SIP > Account ERF



Enable registration

Enable 2N® EasyRoute to register the selected account to the VoIP provider.

Registrar

Set the IP address or domain name for the registrar server.

Proxy

Set the IP address or domain name of the SIP proxy that 2N® EasyRoute uses for calling.

Port

Set the port to which the registration packet for the registrar and signalling for the SIP proxy are sent. Find this parameter behind the server address.

Domain

Set the IP address or domain name used by 2N® EasyRoute.

Display

Set the user or device name to be displayed to the opponent (if the network allows so).

Number

Set the user or device name to be displayed to the opponent (if the network allows so).

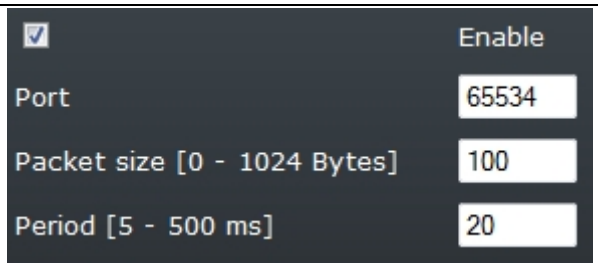
Username

Set the user name to be used for registration.

Password

Set the authorisation password for registration.

SIP > Flood ERF



Enable

Enable/disable the use of the Flood function.

Port

Set the port to which stimulation packets should be sent.

Packet size

Set the size of the stimulation packet.

Period

Set the time intervals for stimulation packet sending.

Tip

- **The Flood function has been developed to compensate the initial data transmission slowness in the UMTS network. Thus, 2N® EasyRoute sends stimulation packets at preset intervals to achieve the optimum data flow at initial stages of bulk data transmissions. The default value is Enabled.**
- **Do not disable this function to avoid connection errors at the beginning of VoIP and T.38 FAX calls.**

FAX > Basic ERF

Enable

Enable the FAX function.

Protocol

Set the protocol for FAX transmission.

Setting options: ***UDP/TCP***

Port

Set the port to be used for FAX data transmission.

Setting options: ***1 - 65535***

Default setting: ***10004***

Bitrate

Set the data flow to be preferred. The data flow set in here need not necessarily be used. If two opposite devices agree so during the FAX call setup, a lower value may be selected.

Setting options: ***2400 bps***

4800 bps

7200 bps

9600 bps

14400 bps

TCF

Define how to perform the training sequence according to the T.38 protocol.

Setting options: ***Local***

Training sequence is performed locally only.

Transferred

Whole training sequence is transmitted in the same way and under the same conditions as the following FAX message.

Default setting: ***Transferred***

Buffer size

Set the buffer size for UDP/TCP datagrams.

Default setting: ***200 B***

Datagram size

Set the maximum UDP/TCP datagram size.

Default setting: ***200 B***

Error correction

Define how to correct the errors in the FAX messages to be transmitted.

Setting options: ***Redundancy***

2N® EasyRoute uses the Redundancy Error Correction.

FEC

2N® EasyRoute uses the Forward Error Correction.

FAX > Advanced ERF

Reinvite tone

Define to which of the detected tones the reinvite tone should be sent in the SIP protocol from the voice codec (G.729, e.g.) for T.38 transmission.

Setting options: ***CNG/CED/DIS***

Default setting: ***CNG***

Reinvite direction

Define which of the subscribers should make reinvite from the voice codec for T.38.

Setting options: ***Calling/Called***

Default setting: ***Called***

Allways reinvite on DIS

If this option is selected, T.38 reinvite is executed by DIS frame detection regardless of two previous options.

Setting options: ***Enabled/Disabled***

Default setting: ***Enabled***

Use old ASN notation

The transmission obeys the preset ASN standard.

Setting options: ***Enabled/Disabled***

Default setting: ***Enabled***

Disable ECM

Set error correction on the T.30 level for the devices that enable this function.

Setting options: ***Enabled/Disabled***

Default setting: ***Disabled***

Tip

- **Each network to which 2N® EasyRoute is connected may behave in a different way. If you have FAX transmission problems, you can probably resolve them by setting the above mentioned parameters properly.**

Output signal power

Set the output signal level for FAX modulation.

Default setting: ***10 dBm***

Data wait time

Set the total size of the buffer for the T.38 process.

Setting options: ***0 – 1000***

Default setting: ***500***

Data transmission redundancy (V.17, V.29, V.27)

Set the UDPTL protocol parameters. Define how many copies of the preceding packets should be used for error correction.

Setting options: ***0 - 4***

Default setting: *4*

Control transmission redundancy (V.21)

Set the UDPTL protocol parameters.

Setting options: *0 - 4*

Default setting: *4*

Duplication of T.30 indicator

Set how many times the indicator (CNG, CED, e.g.) should be copied.

Setting options: *0 - 4*

Default setting: *4*

Packets for FEC

Set the count of packets for calculation of the XOR packet for FEC.

Setting options: *0 - 3*

Default setting: *2*

Gain in upstream direction

Set the gain for the output signal.

Setting options: *30 - 180*

Default setting: *96*

Gain in downstream direction

Set the gain for the input signal.

Setting options: *30 - 180*

Default setting: *96*

Level for start modulation

Set the buffer filling level for the beginning of data modulation.

Setting options: *1 - 200*

Default setting: *200 ms*

Lever for data request

Set the buffer filling level for the moment another data request is sent.

Setting options: *1 - 200*

Default setting: *145 ms*

Demodulation buffer

Set the size of the demodulation buffer.

Setting options: *1 - 90*

Default setting: *20 ms*

Caution

- **The above mentioned parameters are used for precise setting and debugging of the T.38 modulation. Any unprofessional intervention may result in a modulation and/or FAX malfunction. These parameters have factory settings and need not be changed under normal conditions.**

n If necessary, ask a skilled technician for advice.

Baby Call

An off-hook initiates the countdown defined in the Dialling timeout parameter. If no dialling is made within this timeout, the pre-set telephone number is dialled automatically. If any digit is dialled, the Automatic call (also referred to as BabyCall) function is cancelled.

Enable

Here enable/disable the Automatic Call function.

Number

Here enter the number to be used for the Automatic Call.

Setting options: ***0–31 characters (0–9, *, #, +)***

Timeout

Set the time interval between the line off-hook and the beginning of the Automatic Call (if enabled). During this timeout, 2N® EasyRoute waits for a dialling to cancel the Automatic Call. Thus, you can make standard calls even if the BabyCall function is enabled.

Routing

Routing mode

The lower screen menu helps you set the mode of the routing table use.

Setting options:

All to GSM: 2N® EasyRoute routes all calls to the GSM network regardless of the routing table settings.

All to VOIP: 2N® EasyRoute routes all calls to the VoIP network regardless of the routing table settings. Available in the FAX version only.

Use table: 2N® EasyRoute routes all calls to the GSM or VoIP network according to the routing table settings.

Prefix

Enter the call type identifying prefixes (GSM, trunk, free, etc.). The Others row is used for calls with prefixes that are not included in the table. One empty row is

always available. When a prefix is entered and saved, another empty row is added. To remove a row, delete the prefix and save the data again.

Setting options: ***0–15 characters (0–9, *, #)***

Allow

Use this parameter to allow/bar calls with the prefixes specified on the given row.

VoIP ERF

Only in fax version of 2N® EasyRoute. Use this parameter to redirect calls with the prefixes specified on the given row to VoIP network.

Length

Use the Length parameter to define the expected length of a number including its prefix for the given row. This enables the start of a GSM dialling immediately after the last digit is dialled. If the telephone number to be dialled is shorter, the call will not be set up until the predefined timeout elapses. '0' means that the function is disabled.

Setting options: ***0-20***

#

Use the # parameter to enable call set-up whenever a '#' (hash) is received. This character is removed from the number to be dialled. If you want the '#' to be part of the dialled number, you cannot use this function for the given prefix.

Remove

Use the Remove parameter to enable automatic call forwarding. Define a number of digits (prefix) to be removed from the beginning of the number to be dialled.

Setting options: ***0–20***

Add

Use the Add parameter to enable automatic call forwarding. Define a string (prefix) to be added to the beginning of the number to be dialled.

Setting options: ***0–8 characters (0–9, *, #, +)***

Extra ER

Set the pseudo tariff metering rules independent of call duration. Set a fixed count of tariff pulses to be added to the pulses sent according to the call duration and the Tariff rate setting after the call start. This parameter helps set the minimum call cost.

Setting options: ***0–255***

Setting step: ***1***

Default setting: ***0***

Tariff ER

Set the pseudo tariff-metering rules based on call duration. Define how often (in seconds) you want to transmit tariff pulses. A lower number means a more expensive call. '0' means no tariff pulse metering according to call duration.

Setting options: ***0–255 s***

Setting step: ***1 s***

Default setting: ***0 s***

Tip

n **Refer to S. 4 of this User Manual for table setting examples.**

SETUP Menu > Hotspot

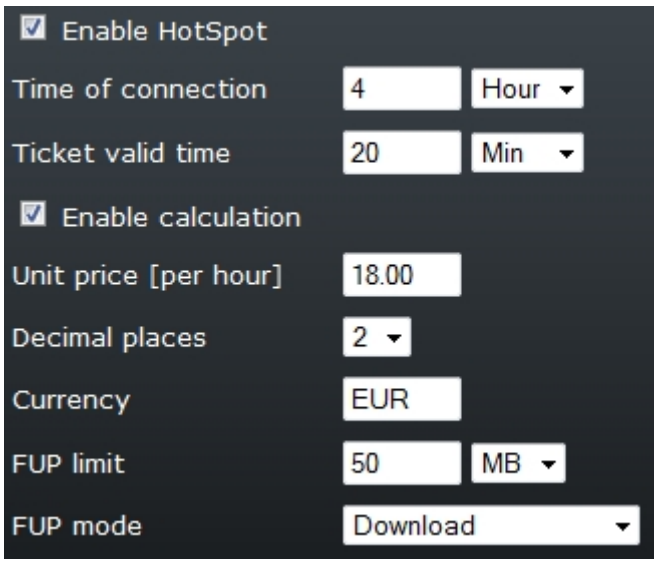
Hotspot is a function allowing a user to access, on a time or data (FUP) basis, the Internet with the aid of a valid access password (ticket). It is intended for Internet coffee bars and similar public facilities. This function makes it possible to calculate connection costs easily.

The SNTP (Simple Network Time Protocol) must be active for Hotspot to work reliably. The default setting is the NTP server 'ntp.nic.cz', or any other NTP server in the case of troubles.

After Hotspot activation, any user without the admin rights is redirected to the web page for filling in the access key.

The Sale item is accessible both for the Administrator and Operator.

Basic



Enable Hotspot

Enable the Hotspot function. The parameters set here will be used as default values for the Operator's sale.

Time of connection

Set the value of the time limited connection starting from the password-based login.

Setting options: ***1 minute to 60 days***

Ticket valid time

Set the time period during which the connection may be activated. After this time period passes, the ticket becomes invalid.

Setting options: ***1 minute to 60 days***

Enable calculation

Enable the connection cost calculation and ticket registration.

Unit price (per hour)

Set the unit price for the ticket cost calculation.

Setting options: ***0-4294967295 (refer to the setting below for the position of the decimal separator)***

Decimal places

Define the position of the decimal point in the unit price.

Setting options: ***0-4***

Currency

Set the unit of currency to be displayed.

Setting options: ***0-10 chars***

FUP limit

Set the limit for data transmission, which is used as the initial value for the ticket sale.

Setting options: ***1 kB – 100 GB***

FUP mode

Set the mode to be used for the FUP limit.

Setting options: ***None***
Download
Upload
Download & Upload

Trustees

MAC address table with remark

The users with the MAC addresses included in this table are not limited by the Hotspot system while accessing the Internet.

Setting options: ***MAC address – 12 hexadecimal symbols***

Append my MAC

Add the MAC address of PC to which the Administrator is currently logged in to the table.

Tickets

Overview of the generated tickets and their use – valid tickets only.

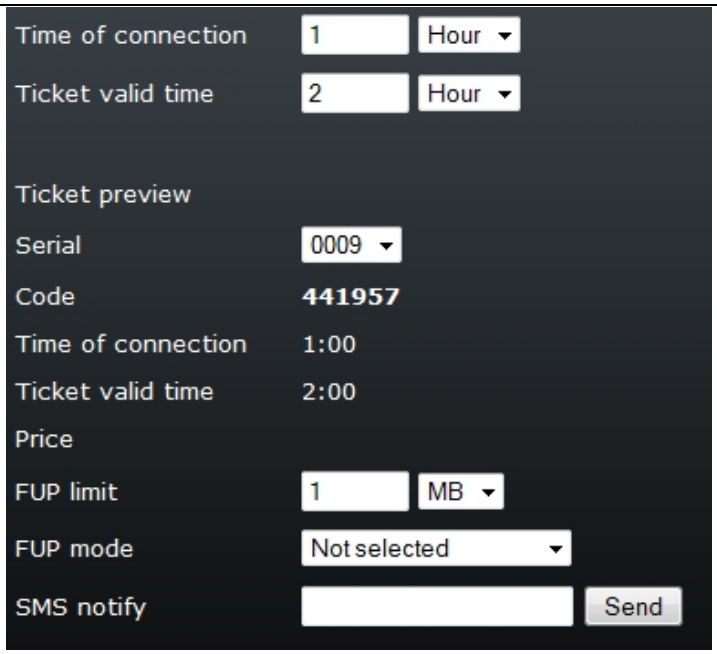
History

Serial	Date	Time	Code	MAC	Validity	Connection	Price []	Limit
0008	2011-04-11	21:47:15	467468		0:20	4:00		50 MB D
0007	2011-04-11	16:13:56	940901		2:00	1:00		
0006	2011-03-04	15:15:38	591386		0:02	0:01		525 kB U
0005	2011-03-04	15:15:31	564238		0:02	0:01		525 kB B
0004	2011-03-04	15:15:25	744371		0:02	0:01		525 kB D
0003	2011-03-04	15:15:00	413063		0:02	0:01		525 kB D
0002	2011-02-17	16:38:50	042442	00:0f:fe:55:c7:52	2:00	1:00		
0001	2011-02-17	16:33:09	856351	00:0f:fe:55:c7:52	2:00	1:00		

History review All Total time 7:04, Total price 0.00

Overview of the generated tickets and their use – including used and invalid tickets. This menu allows an export of records to Excel for future use. It gives an overview of prices of sold tickets. The maximum count of registered tickets is 1,000.

Sale (Accessible for Operator too)



Time of connection

Set the value of the time limited connection starting from the ticket-based login. The value predefined in the Basic menu is used by default.

Setting options: ***1 minute to 60 days***

Ticket valid time

Set the time period during which the connection may be activated. After this time period passes, the ticket becomes invalid. The value predefined in the Basic menu is used by default.

Setting options: ***1 minute to 60 days***

Ticket preview

Displays the parameters of the ticket to be generated and information on the last ten tickets generated.

Serial – ticket serial number, assigned automatically;

Code – connection code with a ticket;

Time of connection – time for connection;

Ticket valid time – ticket validity term;

Price – ticket price.

FUP limit

Set the data transmission limit for the given ticket. The value included in the Basic menu is displayed here. However, you can change the value any time during the ticket sale.

Setting options: ***1 kB – 100 GB***

FUP mode

Set the FUP limit mode for the given ticket.

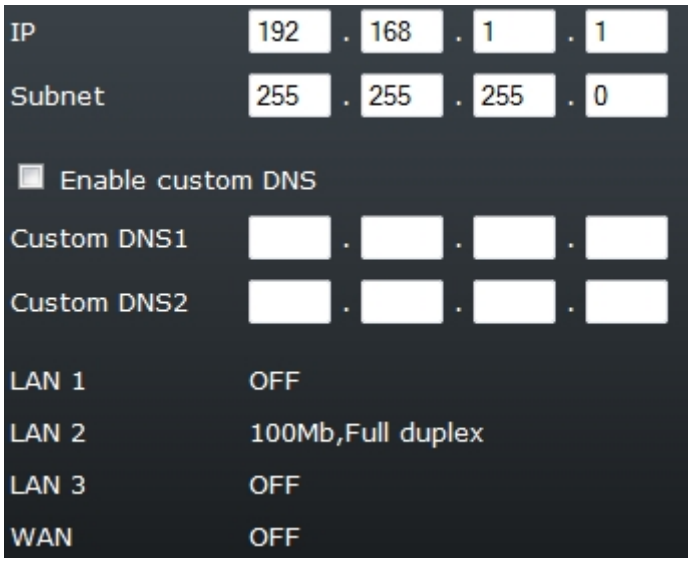
SMS notify

Fill in a phone number to which SMS information on the ticket should be sent. To send the SMS, push the Send button.

Setting options: ***Phone number of up to 20 digits***

SETUP Menu > Network

LAN



IP

IP address assigned to 2N® EasyRoute for gateway configuration or SMS/call administration via the web interface.

Default setting: ***192.168.1.1***

Subnet

Mask of the network in which 2N® EasyRoute is operating.

Default setting: ***255.255.255.0***

Enable custom DNS

Enable the functions for the selected DNSs. These servers will primarily be used for the functions.

DNS1 / DNS2

Set the IP addresses of the user-preferred DNS in the Internet.

Setting options: ***Valid network address of the DNS***

LAN1 – LAN4 / WAN

The interfaces connected are displayed. If you connect the cable to the 2N® EasyRoute switch, you get the connection rate and type for each port. If you enable the WAN port, LAN4 is converted into WAN.

WAN

Mode

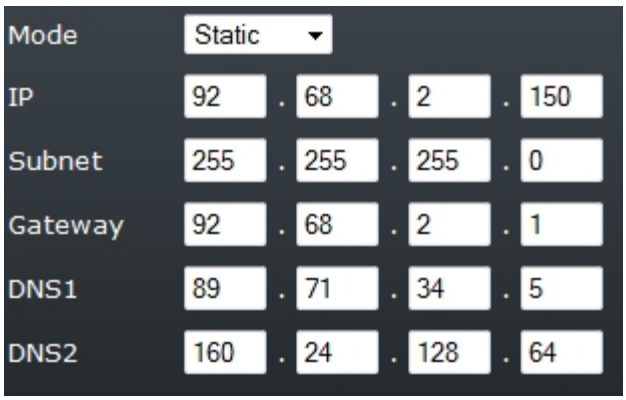
Used for enabling the WAN port function on your gateway. If you enable the WAN port, LAN4 is converted into WAN. There are three setting options:

- ***Off – disable the WAN function.***
- ***Static – enable the WAN function. Set the fixed WAN IP address. Useful especially when you use the cable or WiFi connection and know the IP address assigned to you.***
- ***PPPoE – enable the WAN function. Enter the login data to your provider. Used mainly for the ADSL connection where you are assigned the IP address by the provider after login authentication.***

Caution

n Important! The static IP and PPPoE cannot be used at the same time. Even if both the options are selected and saved in the database, the option that is programmed is applied.

Static



IP

IP address assigned to your 2N® EasyRoute WAN port as communicated by your Internet provider or network administrator.

Subnet

Mask of the network where your 2N® EasyRoute gateway will be operating as communicated by your Internet provider or network administrator.

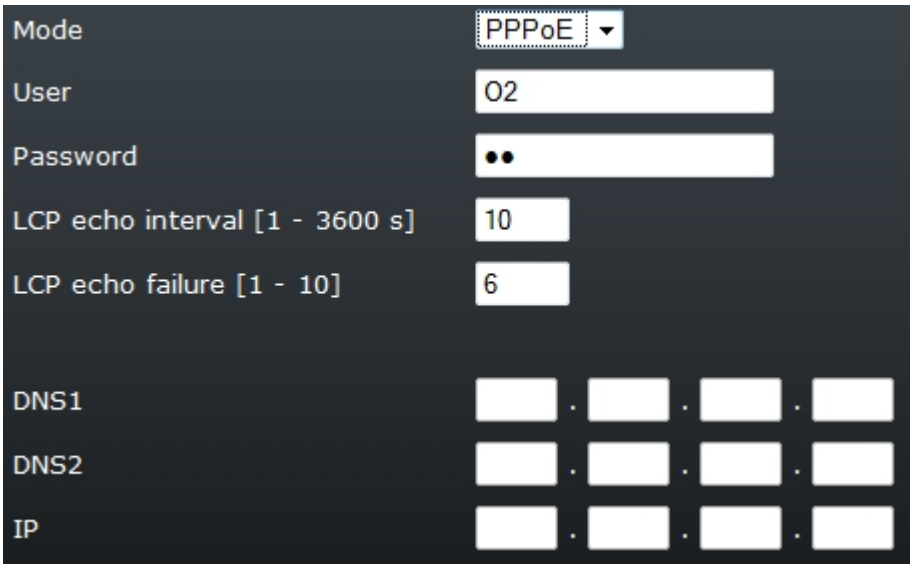
Gateway

Gateway IP address. The IP packets from 2N®EasyRoute are routed primarily to this IP address.

DNS1 / DNS2

IP addresses of the user-preferred DNSs in the Internet.

PPPoE



User

User name used for authorisation as instructed by the Internet provider.

Password

Password used for authorisation as instructed by the Internet provider.

LCP echo interval [1 – 3600s]

Set the LCP echo sending intervals.

LCP echo failure [1 - 10]

Set the count of failed responses to LCP queries after which the PPP demon is restarted.

DNS1, DNS2, IP

These parameters cannot be programmed. They are for information only and provide the data that 2N® EasyRoute received from the ADSL provider after authorisation.

Note

- **LCP echo is a function of the PPP demon, which is responsible for connection to the provider (UMTS/PPPoE). It sends packets in predefined intervals and expects responses to them. When the defined count of failed responses has been achieved, the PPP demon is restarted and tries to reconnect to the Internet.**

WLAN > Basic

Enable

Enable/disable the WiFi transmitter.

Network name (SSID)

SSID (Service Set Identifier) is a string of up to 32 characters sent as a unique WiFi network identifier to users.

Channel

Set the channel to be used in the particular WiFi bandwidth (2.4/5 GHz) manually or automatically.

Setting options: ***Auto***
Available channels

Tx power

Set the Tx power for the gateway WiFi transmitter.

Setting options: ***Auto***
Max
0–17 dBm

Beacon

Set the beacon frame for regular SSID sending onto the WiFi interface.

Setting options: ***15–65,535 ms***

RTS

The RTS value gives the packet size limit in bytes below which the CSMA/CA and above which the RTS/CTS flow control should be used. Set the parameter to the maximum value in the AP mode.

Setting options: ***0–2346 B***

Frag

Set the maximum size of packets for a wireless network.

Setting options: ***0–2,346 B***

WLAN > Security

System

Set the 2N® EasyRoute WiFi interface security system.

Setting options: ***OFF***
WEP
WPA
WPA2
WPA+WPA2

Key format

Set the WiFi interface security key format.

Setting options: ***ASCII/HEX***

Key

The WiFi security key consists of a sequence of alphanumeric characters or hexadecimal symbols (as defined in the Key format).

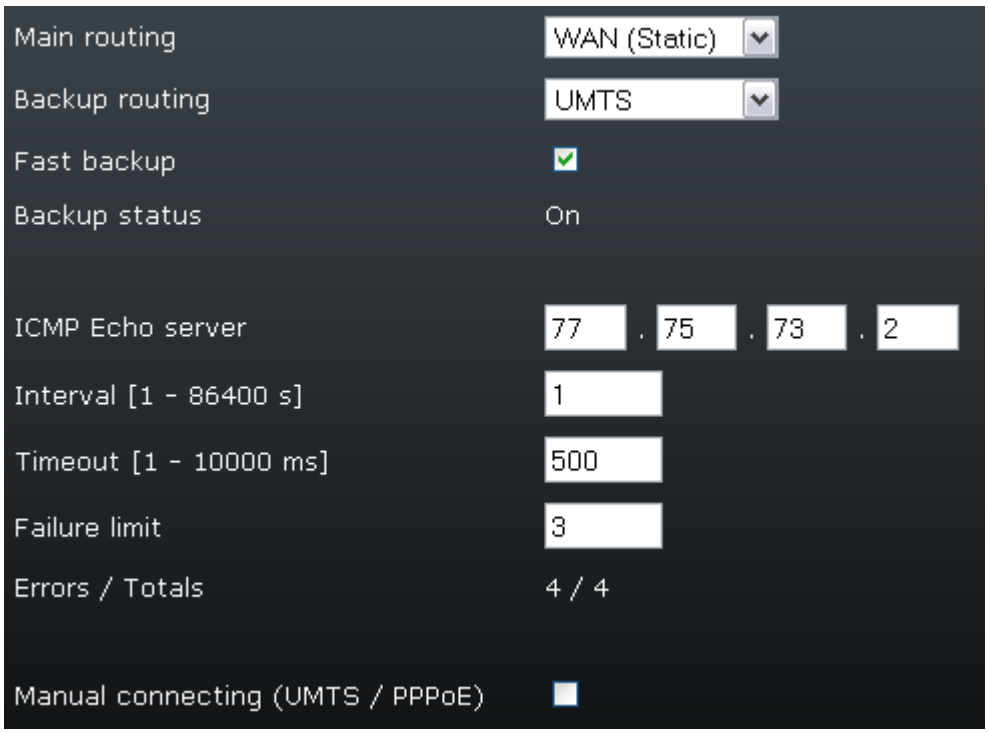
Setting options:

For WEP key:
Enter 5, 13 or 16 alphanumeric characters, or 10, 26 or 32 hexadecimal symbols.

For WPA/WPA2 key:
Enter 8 to 63 alphanumeric characters, or 64 hexadecimal symbols.

Routing

Set the back-up connection switch parameters in this menu. You will need back-up connection when your main provider is unable to provide full connectivity. When the main connection fails, the gateway cannot establish the main server connection and switches to the back-up system. Set the Error rate parameter to define the count of error responses and the switching time. The main route is restored when the first correct response comes from the ICMP server.



Main routing

Set the parameter for routing outgoing traffic to the Internet if your primary connection is ok. Options: WAN (PPPoE), WAN (Static), UMTS and None.

Backup routing

Set the parameter for routing outgoing traffic to the Internet if the main route is unavailable. Options: WAN (PPPoE), WAN (Static), UMTS and None.

Fast backup

Set a faster switching to back-up connection. If you select this option, your gateway will keep connected to the UMTS network although the main route will not be via the WAN port. This accelerates switching to the back-up UMTS by a few seconds as the module does not have to log in.

Backup status

Indicator of used routing path. Off means that 2N® EasyRoute is using main routing. On means that 2N® EasyRoute is using Backup routing.

ICMP Echo server

Set the IP address of a reliable, almost continuously accessible server to be used as a reference point. PING requests are sent to this server and responses are evaluated. Having received the defined count of error responses in a sequence, 2N® EasyRoute switches to the back-up connection.

Setting options: ***Valid public IP address***

Interval

Set the PING sending interval.

Timeout

Set the ICMP server response timeout. If no response is received within this timeout, an error is detected.

Failure limit

Set the limit for error responses to PING queries. When this limit is reached, the back-up connection is enabled.

Errors/Totals

This parameter is for information only. It counts wrong and correct PINGs. The counter is reset whenever the first correct PING is received after a sequence of errors.

Manual connecting

Specify how the user should get connected to the Internet. If you select Manual connection, 2N® EasyRoute will not connect to the Internet until you push the Connect button in the STATUS menu.

Caution

To make the system work properly, make sure that:

- **The WAN port is set and connected properly.**
- **The UMTS-registered SIM card is inserted.**
- **The back-up route is set.**
- **An available ICMP Echo server is set.**

Firewall > Basic

Enable Firewall

Here enable/disable the Firewall for communication from an internal network (LAN, WiFi) to the Internet.

Enable remote administration

Enable/disable remote control of your gateway. This means that the gateway can be configured not only from an internal network (LAN, WiFi) but also from the Internet via the UMTS connection or the WAN port.

Check TCP

Enable/disable the check of TCP packets passing through the gateway.

Check SYN-flood

Enable/disable protection against the SYN-flood attack. This type of attack is based on sending of an excessive quantity of packets with the SYN flag to the server, which then receives no replies to its confirmation requests. The server, however, has already allocated the communication-establishing means and becomes flooded by an excessive count of such requests.

Check Spoofing

Enable/disable protection against the so-called IP-spoofing attack. A spoof address is included in the SYN requests and sent to the server. The server then sends its connection confirmation request to this address, but receives no reply. The server, however, has already allocated the communication-establishing means and becomes flooded by an excessive count of such requests.

Varování

- **Be sure to disable this protection when you access 2N® EasyRoute remotely via the WAN port to avoid gateway response failures.**

Check ICMP

Enable/disable the check of the ICMP packets passing through the gateway. The ICMP (Internet Control Message Protocol) packets are used by the network equipment operating systems for sending error messages (PING queries/responses, e.g.).

Enable NAT

Enable/disable Network Address Translation(NAT).

Firewall > Port Forwarding

Used for routing packets coming from the Internet to specified ports, routed to specified internal addresses and ports. The function is often designated as the static NAT.

Input

Define the port to be forwarded. If a packet routed to this port comes to the gateway, it is automatically forwarded to the destination specified in the Target column.

Setting options: ***0-65,535***

Target

Define the target destination to which packets routed to specified ports are forwarded. Obligatorily, the destination includes the IP address and the port.

Setting options: ***Valid IP address and port***

Enable

Enable/disable port forwarding as defined in the table above the parameter.

Firewall > Port Filter

Used for restricting the gateway access in the LAN > WAN direction. If the Firewall is active and the Port filter is enabled in this menu, the access through the gateway is possible via selected ports only.

Protocol

Specify the protocol type for the packet to be filtered.

Setting options: ***TCP, UDP, Both***

Port (Service)

Define the port to be used for the internal network – Internet communication. If the selected port is associated with a service, the service is given in the parentheses behind the port number, e.g. 23 (Telnet).

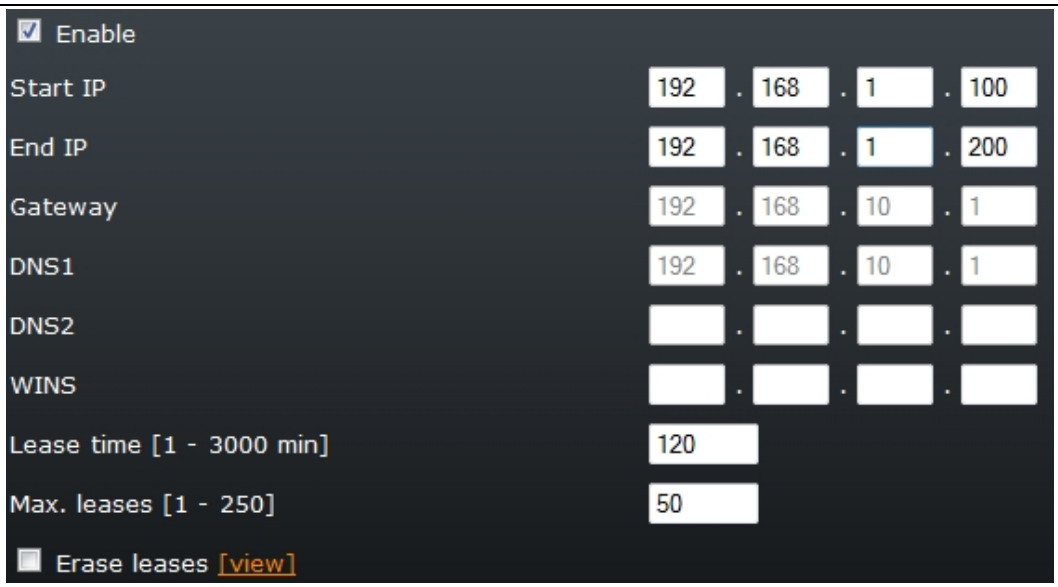
Setting options: ***0-65,535***

Enable

Enable/disable port filtering according to the rules defined above the parameter.

SETUP Menu > Services

DHCP



Enable

Enable the DHCP (Dynamic Host Configuration Protocol) for 2N® EasyRoute. With the DHCP enabled, the connected devices can be assigned IP addresses automatically from the required range.

Start IP

First address in the block of addresses that the DHCP server may assign. Its setting is adjusted automatically according to the set gateway IP address.

End IP

Last address in the block of addresses that the DHCP server may assign. Its setting is adjusted automatically according to the set gateway IP address.

Gateway

IP address of the currently used gateway. The item can include either an IP address defined by the user in the LAN menu or the 2N® EasyRoute IP address.

DNS1/DNS2

IP addresses of the currently used DNSs. The item can include the servers defined by the user in the LAN menu or assigned by the GSM provider, or the 2N® EasyRoute IP address.

WINS

WINS (Windows Internet Name Server) address. The WINS is responsible for the list of communication IP addresses and corresponding PC names.

Lease time

This parameter determines the time of leasing the IP address to a network device. After this time, the network device has to send a new IP address assignment request to the DHCP server.

Max. leases

Here define the maximum count of network devices that are assigned the IP address dynamically by the DCHP. Further addresses may be assigned statically only.

Erase leases

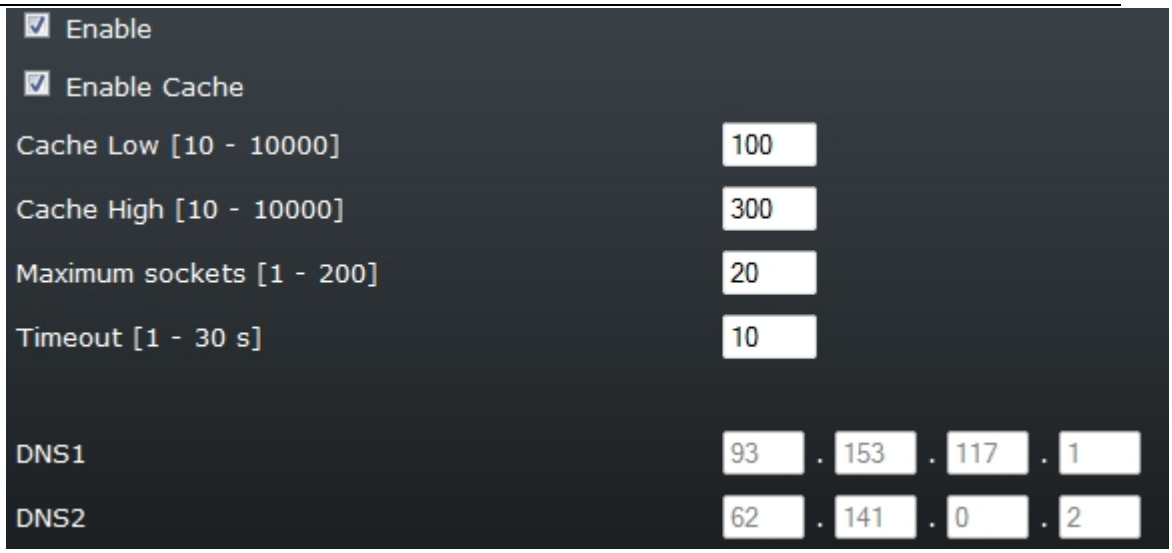
Use this parameter to clear already assigned IP addresses from the table. Recommended when you change the gateway IP address during operation.

Note

- **In that case, disable the DHCP server function.**
- **Cancel the leased addresses.**
- **Set a new address range.**
- **Enable the DHCP server function.**
- **The user will experience a short disconnection from the Internet. The connection will then recover automatically and work normally.**

MAC	IP	Expires
00:00:00:00:00:00	192.168.10.100	0:00:00
00:19:d2:58:74:e4	192.168.10.102	0:00:00
00:17:a4:d7:11:15	192.168.10.101	0:00:00
00:16:d3:ea:ba:47	192.168.10.103	1:58:01
00:17:31:d7:da:a0	192.168.10.104	0:00:00

DNS



Enable

Here enable/disable the 2N® EasyRoute DNS.

Enable cache

Enable/disable the 2N® EasyRoute cache memory for DNS entries.

Cache low

Minimum number of DNS entries in the cache memory.

Cache high

Maximum number of DNS entries in the cache memory. When this limit is reached, entries are deleted down to the minimum number of entries as provided by the Cache low parameter.

Maximum sockets

Maximum number of requests that the DNS server can handle simultaneously.

Timeout

Time limit for the DNS server response. If the DNS server fails to respond within this timeout, a reply comes back saying that the address is unknown or invalid.

DNS1/DNS2

Mobile provider's servers or user-defined (LAN menu) servers to which the gateway DNS refers for replies to queries.

DDNS

Dynamic DNS is a system that is used for updating the server records on the Internet domain in real time. The DDNS allows you to use a stable DNS name instead of a variable IP address.

Enable

Enable/disable the use of the dyndns.org server by 2N® EasyRoute.

Username

Enter the username for DDNS connection. The user must be registered with the dyndns.org server.

Password

Enter the access password for DDNS connection. The password must correspond with the user password on the dyndns.org server.

Host Name

Enter the name that will be part of the gateway domain name on the DDNS. A complete domain name is as follows: here_enter.dyndns.org

Period

Set a time interval for periodical DDNS data updating. After this time, the gateway sends updated IP address information to the dyndns.org server.

VRRP

VRRP (Virtual Router Redundancy Protocol) is a protocol increasing the availability of the default gateway, which provides the user service in a certain network segment. For a correct function, there must be two servers at least in the segment – one master and one backup.

Enable

Enable/disable the use of the VRRP in 2N® EasyRoute.

Virtual IP

Set the IP address of the virtual server. One and the same address should be set here for all the devices that are to work as servers.

ID

Set the gateway ID to be displayed as server identification in the given network segment. Each server should have a unique ID.

Priority

Set the server priority. A higher number means a higher priority. The device with priority 255 must be available in the network and is regarded as the master. The other priority numbers need not be assigned sequentially. Priorities should not be multiplied in the given network segment.

Enable preempt mode

Enable/disable return to the master upon its recovery.

Enable authentification

Enable/disable the use of another device-specifying parameter within the VRRP network. Authentication is a sort of safety lock against unintentional misuse of devices with identical IDs rather than a password or unauthorised access prevention.

Password

Enter the VRRP device password. It is included in every VRRP packet transmitted by the device.

Setting options: ***1-8 alphanumeric characters***

Advertisement interval

Set the interval for sending state notifications to IP address 224.0.0.18.

SNTP

SNTP (Simple Network Time Protocol) provides time synchronisation with the selected server. A client supporting the SNTP only cannot be a server for other clients.

Enable

Enable/disable the use of the NTP server as defined below.

Setting options: ***ON/OFF***

Default setting: ***OFF***

NTP server name

Enter the NTP server domain name or IP address.

Update period

Enter the synchronisation interval for the selected NTP server.

Setting options: ***5-43,200 min***

Current local time

If time synchronisation was successful, this item shows the local date and time. The parameter cannot be configured. If the NTP server is not configured, the date and time data are reset to Thu Jan 1 00:00:00 2009 after every gateway restart.

SSH - Basic

The SSH (Secure Shell) protocol provides encoded connection with the SSH-supporting servers. 2N® EasyRoute always works in the client mode.

Enable SSH client

Enable the use of the SSH protocol.

SSH server name

Enter the name of the SSH server to which 2N® EasyRoute is to be connected.

Client public key

A key generated by 2N® EasyRoute (represented by a code), which can be stored on a disk.

Host public key

A key generated by the server (represented by a code), which can be stored on a disk.

Always accept remote host key

Enable this field to make the key acceptable before connecting to a server not used so far. If this field is not Enabled, the server's public key is checked for match with an earlier stored key when the server is used repeatedly and if no match is found, the connection is rejected. This enhances security and prevents some types of attacks.

Erase host key database

Whenever a change in the server's public key occurs, delete the stored list of keys to enable the key check as described above.

Generate private key

Generate a key of your own for server connection. The key is displayed in the Public key field.

Type

Select a type of the key to be generated: RSA/DSS.

Size

Set the size in bits for the key to be generated.

Setting options: ***As required by the server operator, we recommend you to keep the value 1024. After a key of the required value is stored, the size is reset to 1024.***

SSH - Forwarding

The SSH forwarding function allows for port forwarding using the SSH tunnel.

Location

Select the side to initiate the connection: Remote/Local.

Port

Set the port number to which requirements of the device connected to 2N® EasyRoute should be routed.

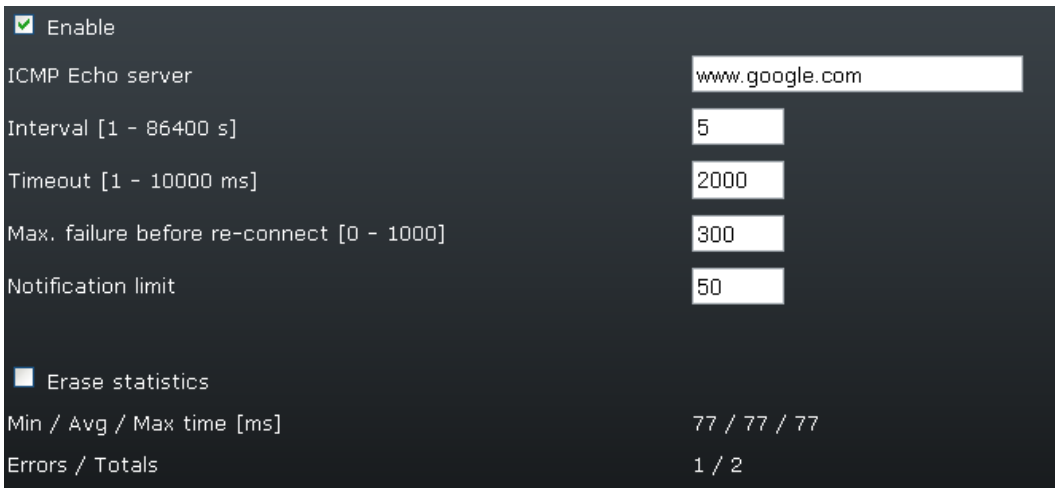
Target

Set the IP address and port to which the connection is routed.

Setting options: ***IP address:port number***

PING

The PING function allows for checking the connection with the defined server.



Enable

Enable the function.

ICMP echo server

Define the server to be checked by the PING service.

Setting options: ***server name or IP address***

Interval

Set the checking interval for the server connection check.

Timeout

Set the maximum server response time.

Max failures before re-connect

Set the maximum count of attempts before the Peer-to-Peer Protocol (PPP) is restarted in 2N® EasyRoute.

Setting options: ***0 to 1,000 (0 – no restart, 0 is not displayed)***

Notification limit

A notification SMS is sent when the set value is reached. The PINGs must come in a sequence to be considered.

Erase statistics

Set the PING rate statistics deleting command.

Min / Avg / Max time

The counter showing the response returning time from the server is displayed.

Count of errors / Total count

The counter showing all PINGs and errors is displayed. The statistic data are floating.

GRE

Here set the VPN tunnel between two 2N® EasyRoute units, or between one 2N® EasyRoute unit and a GRE-supporting device.

The principle is that you set a subnet and a public IP address on one device and then the same on the other, thus creating an exclusive VPN tunnel between these two devices.

Enabled

Enable/disable the GRE tunnelling function.

Network

Set the opposite subnet IP address and mask in the CIDR format, e.g. 192.168.24.0/21.

Endpoint

Set the public IP address of the opponent.

Warning

- **Do not use the GRE tunnel together with the WiFi HotSpot function.**

IPsec

IPsec is a function that enables two devices to communicate in a secure manner, through encryption. 'Secure' means not only to prevent anyone from seeing the content of your packets but also identify any intruder or violator. IPsec is capable of protecting you reliably in this respect. IPsec has two modes – the Main mode and Quick mode. The Internet Key Exchange (IKE) security protocol works in the Main mode, verifying the two sides of the encrypted connection and establishing the initial secure communication. No data are transmitted in the main mode. 2N® EasyRoute uses the ISAKMP for this phase. The Quick mode is used for data transmission, which is the essence of IPsec. There is also a simplified Aggressive mode, a combination of the Main and Quick modes with a slightly limited security level used for connection of clients without a fixed IP address (from dial-up, e.g.). A lower security level, however, is compensated by additional authorisation (xauth – cross authorisation).

IPsec connection is point-to-point only. If you want to interconnect three points, use three IPsec connections, two per IPsec gateway. Or, select one central point and connect all the other points to it. The advantage of this solution is just one tunnel per endpoint (extension) but more tunnels at the central point. The extensions see each other through the central point but the data flow between them loads the central line twice – it is the so-called delta configuration. Keep this in mind while building your network and always choose the proper method.

Caution

Setting the IPsec function is rather difficult. Therefore, we are not going to present any precise tunnel setups but only describe the parameters.

Refer to the dedicated IPsec HOW TO manual at www.2n.cz or on the enclosed CD for more details.

IPsec - VPN

Definition

Select one of eight available IPsec tunnels.

Enable

Enable/disable the selected IPsec tunnel.

Connection type

Define when the IPsec tunnel should be established. If you do not want to use UMTS due to a low data rate, use the WAN port only. The IPsec tunnel will then be established only in case the main or back-up connection via WAN is active.

Exchange mode

Set one of the connection establishing modes mentioned above: Basic, Main or Aggressive.

Identifier

Define the identifier for authorisation at the opponent's. Options: Address, FQDN or USER FQDN. The PSK table setting is verified.

NAT Traversal

Enable the use of NAT: 2N® EasyRoute always finds the whole route and use of NATs.

Passive
Tick off to define that this party will not initiate connection.

Phase 1
Set phase 1 keying for negotiating details on IP connection, gateway, and similar.

Phase 2
Set encryption for data transmission.

Remote LAN address
Set the IP address of a remote network or an IP address from the range of the remote network.

Remote LAN mask
Remote network mask.

Remote public gateway
Public IP address of the opposite gateway.

IPsec - Manual

Caution

Setting the IPsec function in this menu is rather difficult. Refer to the dedicated IPsec HOW TO manual at www.2n.cz or on the enclosed CD for more details.

IPsec – PSK

In this menu set the pre-shared security keys. The keys are included in the table below according to the identifier settings in the VPN menu.

	Identifier	Pre-shared key
1.	89.24.2.229	dnjwu83o
2.	89.24.0.97	u208fbjw2

Identifier
The same as in the VPN menu. A matching key is then assigned to the identifier. Enter any ASCII characters to form a word, IP address, e-mail address, or a sequence of random characters.

Pre-shared key
Use this parameter to define the security key for packet encryption between the IPsec tunnel parties.

SETUP Menu > System

Password

User

Name of the user whose password is to be changed. The gateway supports the admin user at present.

Setting options: ***1-31 alphanumeric characters***

Actual password

Enter the currently valid password for the gateway configuration interface connection.

New password

Enter a new password to be used for the gateway configuration interface connection.

Password confirmation

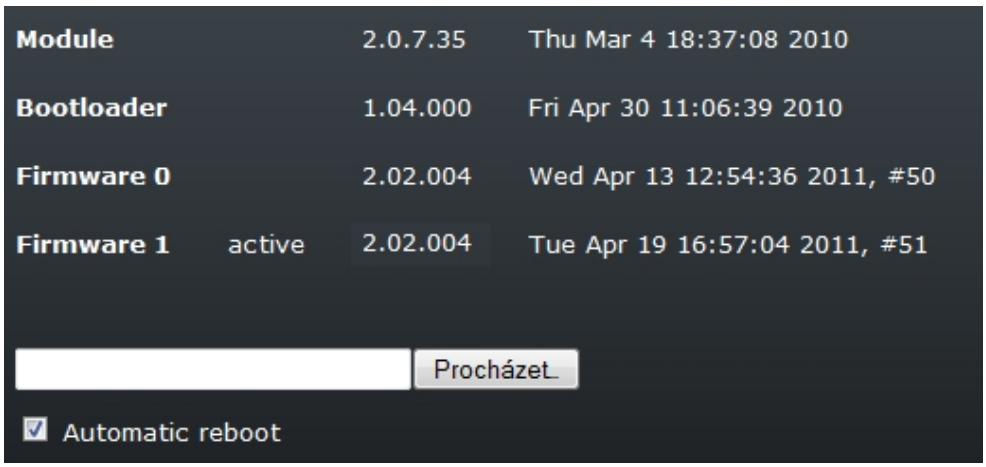
Re-enter the new password for confirmation and prevention of typing errors. If the re-entered password fails to conform to the preceding parameter, no change is executed.

Apply button

Push this button to save the new settings. (Button is placed bottom right.)

Firmware

This menu is used for downloading the current gateway firmware, module or bootloader versions into 2N® EasyRoute.



Module

Information on the module version and date of issue.

Bootloader

Information on the bootloader version and date of issue.

Firmware 0 / 1

Information on the firmware version, date of issue and downloading instance number (behind the '#' symbol). An Active note is added to one of the firmware instances to indicate the currently used one. The new firmware is stored automatically, replacing the preceding one, and becomes active after restart. Thus, whenever restarted, the gateway operates with the firmware version with the highest serial number.

Choose...

Push this button to choose the path to firmware for upgrading.

Automatic reboot

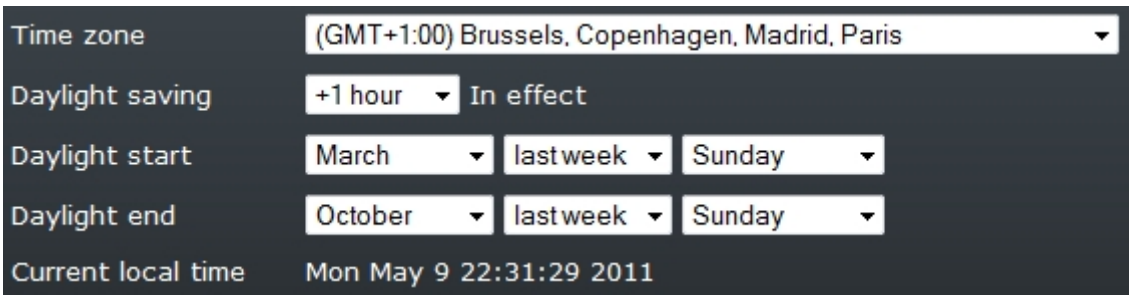
Enable/disable the automatic gateway restart after firmware downloading.

Tip

- **Use the Update button with the Automatic restart option to restart the gateway remotely.**

Time

Remember to set the SNTP server to make the system time work properly. If the SNTP server is unavailable, system time is obtained from the GSM/UMTS provider's module.



Time zone

Set the time zone according to the UTC standard and/or a shift with respect to GMT 0.

Daylight saving

Set whether the daylight saving (summer) time should be respected in the system time and specify the count of hours for the shift.
Used – displayed in the daylight saving time mode.

Setting options: ***OFF***
+1 hour
+2 hours

Daylight start

Set a month, week and day in the week for daylight saving time activation to optimise its use.

Default setting: ***March, Last week, Sunday***

Daylight end

Set a month, week and day in the week for daylight saving time deactivation to optimise its use.

Default setting: ***October, Last week, Sunday***

Current local time

Current gateway system time depending on the SNTP, time zone and daylight saving time settings.

Configuration

Operation

This choice enables import/export of 2N ® EasyRoute setinngs or SMS databaze. The operation is done after clicking on the Save button placed right bottom on the screen.

File to import

Select path to the file with configuration or SMS database.

Licence

FW version

Current firmware version used by the gateway.

FW date

Date of issue of the current firmware version used by the gateway.

Serial

Gateway serial number.

Parameters

Information on the hardware parameters. Individual parameters are separated with a comma.

Parameters: ***2***
Signals the use of hardware with two WiFi antennas.

LAN MAC

MAC address of the LAN interface.

WAN MAC

MAC address of the WAN interface. Available only if the WAN port is active.

WiFi MAC

MAC address of the WiFi interface.

IMEI

IMEI (International Mobile Equipment Identity) is a unique identification code for gateway GSM modules.

IMSI lock

MSI (International Mobile Subscriber Identity) is a unique identification code for SIM cards. Using the IMSI lock, the gateway locks a selected SIM card, rejecting the other ones.

Capture

This menu helps you capture events on your gateway network elements. Packets are saved into files dimensioned by the Pool parameter according to the Filter and Interface selection. The files are saved in the .pcap format in a standard network sniffer such as Wireshark.

Enabled

Enable saving into a file as set in the row.

Interface

Select the interface for trace capturing.

Setting options: ***LAN, Ethernet, WiFi, UMTS, WAN (static), WAN (PPPoE)***

Pool [kB]

Set the maximum file size. When this value is exceeded, a new file is created.

Filter

Select the filter for packet/protocol capturing. Select standard protocols such as sip, tcp, udp, etc. If you select none, all events will be captured on the selected interface.

Status

The parameter shows the count and total size of the files created. Push the Refresh button in the lower part of the screen to refresh the parameter. A file downloading option will be offered to you too.

Report

This menu provides the gateway LOG files. Export these files using the All submenu. The other submenus include a 'live view' of this information.

Report - All

Here specify the content of the package to be generated after you click on Save. The following information can be included:

Application LOG

Add the 2N® EasyRoute log to the package.

System LOG

Add the system log to the package.

Configuration

Add the current gateway configuration to the package.

Network interface capture

Add the .pcap files to the package. In the ERF version, the SIP .pcap files are added. The files created in the Capture menu shall be added in the future too.

Licence information

Add the gateway licence file data to the package.

Additional, Debug and More debug information

Add more debugging files.

Report – EasyRoute, System, VoIP/FAX

Select a 'live view' of the selected file. Click on the appropriate button to save the file into the PC or update.

EasyRoute

System reports from the 2N Telekomunikace program module (settings, calls, SMS, etc.).

System

System reports from other program modules running in 2N® EasyRoute (VRRP, SNTP, etc.).

VoIP/FAX

System reports from the 2N Telekomunikace program module (registrations, calls, faxes, etc.).

Note

- **The Event reporter is identical for either 2N® EasyRoute version. The 2N® EasyRoute and System logs are only supported in the basic version. The other logs are useless because the functions are not supported.**

4 Function and Use

This section describes the basic and extending functions of the 2N® EasyRoute product.

Here is what you can find in this section:

- **Voice Function**
- **Ethernet Switch and WiFi Interface**
- **SIM Card PIN Protection**
- **FAX Sending/Receiving**

4.1 Voice Function

Outgoing and incoming call set-up procedures for an analogue telephone are described for illustration. Use the same procedures for the 2N® EasyRoute–PBX connection, just remember to program call routing to 2N® EasyRoute properly. Check the 2N® EasyRoute function by connecting a telephone.

Suppose that a SIM card has been inserted, the PIN code entered or not required, the antenna connected and 2N® EasyRoute logged-in to the GSM network – the GSM network LED is flashing and you can hear the dialtone upon off-hook. A VoIP account is configured and the gateway is logged in to the provider in the ERF version.

Outgoing Call

1. **Hook off the telephone, you can hear the dialtone and the Line LED starts flashing.**
2. **Dial the required GSM subscriber number. Since 2N® EasyRoute receives tone dialling by default, select the DTMF mode. If your telephone transmits pulse dialling only, program 2N® EasyRoute to receive pulse dialling. The inter-digit delay may not exceed 5 s (or as pre-programmed - ER). The number is evaluated as complete and transmitted to the GSM network after this timeout.**
3. **A short delay follows the last-dialled digit, 2N® EasyRoute awaits further dialling. Then, the dialling end is signalled and connection is established.**
4. **If the called subscriber is available, you can hear the ringing tone. If not, you can hear the busy tone or any of the GSM provider's messages.**
5. **When the called subscriber answers the call, a call is established. The Line LED is permanently on during the call.**
6. **Hang up to terminate the call. The Line LED goes off. If the called subscriber is the first to hang up, you will hear the busy tone and hang up.**

Incoming Call

1. **Ringing signals an incoming call. The Line LED keeps flashing during ringing. If programmed so, 2N® EasyRoute transmits the FSK-based CLIP between the first and second rings (FSK or DTMF for ERF). Advanced telephone sets are able to display the CLI.**
2. **Hook off the phone to establish the call. The Line LED is permanently on during the call.**
3. **Hang up to terminate the call. The Line LED goes off. If the called subscriber is the first to hang up, you will hear the busy tone and hang up.**

Automatic Call (BabyCall)

If the Automatic Call (BabyCall) function is enabled, a pre-programmed period of time is counted down after off-hook. If you do not start dialling within this timeout,

2N® EasyRoute signals dialling end and starts establishing a call to the pre-programmed number automatically – from now on 2N® EasyRoute behaves as if processing a standard outgoing call. Any dialling during the BabyCall timeout cancels this function and a standard outgoing call can be made.

16 or 12 kHz Tariff Pulses

2N® EasyRoute has a tariff pulse transmitter. You can use the pulses for outgoing call metering and/or billing. 2N® EasyRoute offers pseudo tariff metering only – its tariff pulses do not correspond to the provider's call tariffs but are transmitted according to the pre-programmed parameters. Remember to program the routing table parameters in order to set tariff metering for calls with different prefixes.

You can also program 2N® EasyRoute to transmit tariff pulses as call connect/disconnect signalling if your PBX cannot receive telephone line polarity reversal signalling.

4.2 Ethernet Switch and WiFi Interface

2N® EasyRoute is equipped with a 4-port Fast Ethernet switch and a WiFi card. These interfaces allow a PC/LAN to be connected to 2N® EasyRoute. A proper network address and mask settings are needed for correct LAN and Internet connections. Use the UTP or STP cables of the CAT5 category at least for connecting devices to the 2N® EasyRoute Ethernet switch.

Static Network Configuration

If you are using static configuration for all of your LAN devices, you can disable the 2N® EasyRoute DHCP server using the Network > DHCP > Enable options. Remember to assign your LAN devices the addresses that fall into the same address area as the IP address assigned to 2N® EasyRoute in order to ensure a correct function of the Internet connection. To set the IP address and network mask, use the Network > LAN programming tool menus and the IP and Network mask options.

Dynamic Network Assignment

IP addresses can also be assigned dynamically to network devices. Enable the 2N® EasyRoute DHCP server in the Network > DHCP >Enable menus and set the automatic IP address obtaining for your network devices connected to 2N® EasyRoute. Set the 2N® EasyRoute IP address and network mask in the Network > LAN menus using the IP and Network mask parameters, and define the range of addresses to be assigned to your network devices by the DHCP server in the Network > DHCP menus using the Start IP and End IP options. All the addresses to be assigned and the 2N® EasyRoute address must fall into one and the same address area.

Combination of Static and Dynamic IP Address Assignment

It is possible to combine dynamic and static IP address assignments. Set the static IP address for the selected network devices. Enable the automatic IP address obtaining option for all the other devices. Set the 2N® EasyRoute IP address in the Network > LAN menus using the IP and Network mask parameters, then enable the DHCP server in the Network > DHCP > Enable menus and finally set the range of the dynamically assigned addresses in the Network > DHCP menus using the Start IP and End IP parameters. All the static and dynamic addresses to be used must fall into one and the same address area and each address may be assigned just once for the network to work properly.

WiFi Interface

2N® EasyRoute's WiFi card operates in the 2.4 a 5 GHz bandwidths, supports the 802.11a/b/g standards and provides the transmission rate of up to 54Mbps. To configure the WiFi card use the Wireless menu. You can set all wireless network parameters, including WiFi security modes and keys.

4.3 SIM Card PIN Protection

Web Interface PIN Entering

Like other parameters, the PIN code can be entered using the 2N® EasyRoute web interface. If you store the PIN in the 2N® EasyRoute memory using the web interface, the PIN is entered automatically upon every gateway power up.

Automatic PIN Entering

You do not have to enter the PIN upon power up if it is stored in the 2N® EasyRoute memory - it is entered automatically. This function is convenient in case of power failure; 2N® EasyRoute is operable in a short time after power recovery without requiring interventions from the operating staff.

Warning

- **One PIN entering option is exhausted by the attempt to enter the PIN automatically upon SIM card replacement or PIN change. If wrong, the automatically entered PIN is cleared from the internal memory to avoid another false attempt upon the next power up. There are still two manual PIN-entering attempts after such unsuccessful automatic entering. To prevent the unsuccessful automatic PIN entering, delete or properly program the 2N® EasyRoute PIN using the web interface in case of SIM card exchange.**

4.4 FAX - ERF

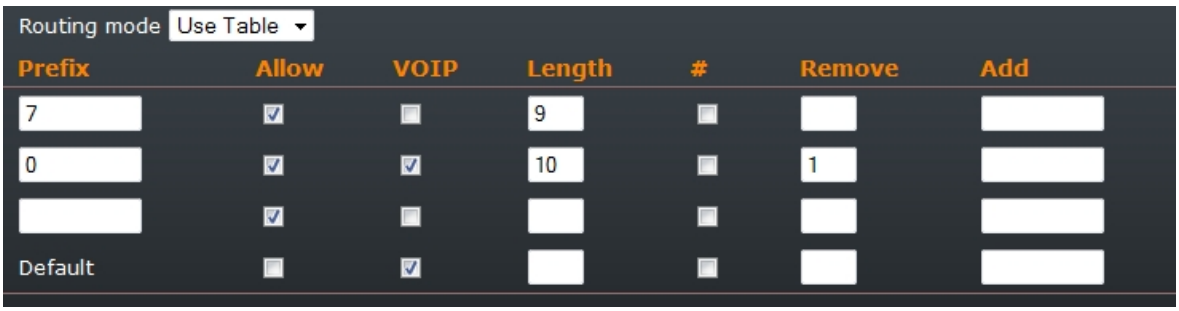
Suppose the SIM card is inserted, the PIN entered or not requested, an antenna connected and 2N® EasyRoute logged in to a GSM network – the UMTS/GSM network indicator is flashing and, having seized the line, you hear the dialtone. Suppose the VoIP account is configured and the gateway is logged in to a T.38 fax transmission supporting VoIP provider.

Warning

Before programming fax transmission, make sure that:

- **Your VoIP account is set and registered properly.**
- **The numbers to which you send fax messages are routed to the SIP line.**
- **Your VoIP provider supports the T.38 protocol.**

Remember that 2N® EasyRoute is (technically) incapable of sending a standard analogue fax message to a GSM network. All outgoing FAX calls have to be routed to the VoIP network. Therefore, make sure that your VoIP account is configured properly. The routing table may not include prefix collisions that might route FAX calls to GSM. If you still want to send a FAX message to a number whose calls are routed to a GSM network, create a new routing table row for the number and enter a specific prefix or a '#' character at its end.



Outgoing FAX

1. **Insert the document to be sent in your fax machine.**
2. **Dial the VoIP/PSTN/GSM subscriber number. Then push the FAX starting button on your fax machine.**
3. **Your fax machine now starts sending the pre-inserted document.**
4. **If the called subscriber is available, you will hear the ringing tone. If the subscriber is busy, you will get the busy tone or one of the GSM/VoIP provider's voice messages.**
5. **When the called subscriber answers, the FAX call is established. The line is switched into the T.38 mode and the FAX transmission starts. During**

transmission you can hear the fax machine 'beeping'. Beeping is normal; it is a sequence of predefined T.38 tones. The Line indicator keeps shining during the whole FAX transmission process.

6. **Typically, you are informed of your FAX transmission success or failure through a success or failure report printout.**

Incoming FAX

1. **The incoming fax process is even simpler. A majority of fax machines provide automatic answering after a predefined count of rings. The device answers the call and, if connection is established successfully, prints out the incoming document.**

5 Technical Parameters

This section describes the technical parameters of the 2N® EasyRoute product.

5.1 Technical Parameters

GSM

UMTS/GSM module, UMTS/GSM bandwidth	MC8790V	850 / 1 900 / 2 100 MHz UMTS WCDMA / HSDPA 850 / 900 MHz EGSM / GPRS / EDGE 1 800/1 900 MHz GSM / GPRS / EDGE
	MC8791V	2 100 MHz UMTS WCDMA / HSDPA 850 / 900 MHz EGSM / GPRS / EDGE 1 800/1 900 MHz GSM / GPRS / EDGE
	MC8792V	900 / 1 900 / 2 100 MHz UMTS WCDMA / HSDPA 850 / 900 MHz EGSM / GPRS / EDGE 1 800/1 900 MHz GSM / GPRS / EDGE
	MC8795V	850 / 900 / 1900 / 2100 MHz UMTS WCDMA / HSDPA 850 / 900 MHz EGSM / GPRS / EDGE 1 800/1 900 MHz GSM / GPRS / EDGE
Maximum transmission power		2 W EGSM 850 / 900 MHz, 1W GSM 1 800 / 1 900 MHz 0,25W UMTS 850 / 1 900 / 2 100 MHz
Receiver sensitivity		-110.5 dBm UMTS 2 100 / 1 900 MHz -111.5 dBm UMTS 850 MHz -107.5 dBm GSM 850 / 900 MHz -106.5 dBm GSM 1 800 / 1 900 MHz
Audio		HR+FR+EFR Half rate+Full rate+Enhanced full rate Echo cancellation, Echo suppression, WDCMA AMR Adaptive Multirate
DATA		GPRS/EDGE Class B, max 5 slots total, multislot class 12 CSD max 14.4 kb/s; Coding scheme CS 1–4, MCS 1–9 WCDMA/HSDPA category 8, MS Class A (Simultaneous Voice and Data), downlink max 7.2Mbps, uplink max 2Mbps
Antenna		850 / 900/ 1 800/ 1 900 MHz, 50 Ω SMA antenna connector
SIM card		3 V/1.8 V plug-in

Power Supply

Mains supply	100–240 V/12 V; 2A adapter
DC power supply	10 to 16V DC
12 V consumption	Standby 350 mA Voice call 450 mA Data connection 400 mA Voice and data 500 mA
Supply connector	DC Jack 2.1 mm

Phone Interface – basic version (ER)

Interface type	2wire analogue FXS
Telephone connector type	RJ 12, 6/2
Call impedance	Adjustable worldwide, default 600 Ω
Loop voltage	48 V DC
Loop current	Max 20 mA
Tone frequency	Adjustable, default 425 Hz
Dialling type	Tone (DTMF) and pulse
Ringing voltage	42 Vrms 10–60 Hz
Calling line identification	CLIP during ringing according to ETSI FSK
Tariff pulses	f=16/12 kHz
Answer supervision	12/16 kHz pulses

Phone Interface – fax version (ERF)

Interface type	2wire analogue FXS (for telephone / FAX/ PBX CO line)
Telephone connector type	RJ 12, 6/2
Loop voltage, on-hook	48 V DC
Loop current	Max 20 mA
Tone frequency	Adjustable, default 425 Hz
Dialling type	Tone (DTMF) and pulse
Ringing voltage	42 Vrms

Calling line identification	**CLIP during ringing according to ETSI FSK / DTMF**

Ethernet Switch

Interface type	**4-port Fast Ethernet switch 100Mbps**
Connector	**RJ-45**

WiFi

Bandwidth	**2,5 / 5 GHz**
Standard	**802.11a/b/g**

Others

Dimensions (w/o connectors)	**170×130×45 mm**
Operating temperature	**0° C to 45° C**
Operating status signalling	**3 LEDs (On; Network and WiFi status; Line)**

6 Supplementary Information

This section provides supplementary information on the product.

Here is what you can find in this section:

- **Directives, Laws and Regulations**
- **Troubleshooting**
- **List of Abbreviations**
- **General Instructions and Cautions**

6.1 Directives, Laws and Regulations

2N® EasyRoute conforms to the following directives, laws and regulations:

- **Act No. 22/1997 Coll. Of January 24, 1997 on technical requirements of products and amendments to some laws**
- **Directive 1999/5/EC of the European Parliament and of the Council, of 9 March 1999 – on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity**
- **Governmental Regulation No. 426/2000 Coll. on technical requirements of radio and telecommunications terminal equipment**
- **Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits**
- **Governmental Regulation No. 17/2003 Coll. on technical requirements of low voltage electrical equipment**
- **Directive 2004/108/EC of the Council of 15 December 2004 on the harmonisation of the laws of Member States relating to electromagnetic compatibility**
- **Governmental Regulation No. 616/2006 Coll. on technical requirements of products in terms of electromagnetic compatibility**
- **Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment**
- **Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No. 793/93 and Commission Regulation (EC) No. 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC**
- **Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment**

6.2 Troubleshooting

For tips for the solution of other potential problems see faq.2n.cz.

- ***No LED is on after power up.***
  - **Check the power supply.**
- ***2N® EasyRoute is not logging into the GSM network.***
  - **Check the SIM card.**
  - **Check the PIN.**
  - **Check the antenna connection.**
  - **Select a place with a good GSM signal.**
- ***The 2N® EasyRoute Internet connection has not been established.***
  - **Check the setting of the APN assigned to the SIM card by the provider.**
- ***No tone can be heard after line off-hook.***
  - **Check the telephone line connection.**
  - **2N® EasyRoute has not been initialized properly (approx. 10 s after power up).**
  - **2N® EasyRoute is not supplied with power.**
- ***2N® EasyRoute is ignoring the user dialling, transmitting the dialtone.***
  - **Select the correct dialling type (DTMF/pulse).**
  - **Adjust the width of the dialling pulses.**
  - **Adjust the delay value between the pulses.**
- ***2N® EasyRoute is not communicating with the PC.***
  - **Check the Ethernet cable connection.**
- ***Do you need to set some functions 2N® EasyRoute?***
  - **Try to find help on HOW TO manuals. Current and new manuals can always be found on** www.2n.cz

6.3 List of Abbreviations

- **APN (Access Point Name)**
  Necessary for the GPRS service.
- **CLIP (Calling Line Identification Presentation)**
- **CSD (Circuit Switched Data)**
- **DTMF (Dual Tone MultiFrequency)**
  Tone dialling.
- **FSK (Frequency Shift Keying)**
  A transmission protocol using variable signal frequencies for logic level encoding.
- **FXO**
  An interface electrically identical with a standard telephone (opposite side = FXS interface).
- **FXS**
  A telephone interface allowing a standard telephone connection (opposite side = FXO interface).
- **FW (Firmware)**
  Similar to SW, a term for the central microprocessor program.
- **GSM (Group Switched Mobile system)**
  The present-day standard digital mobile telephone network.
- **GPRS (General Packet Radio Service)**
  High-speed data transmission for GSM networks.
- **HW (Hardware)**
  An electronic device, circuit, board, component, etc. in this context.
- **PC (Personal Computer)**
  A personal computer based on the IBM PC standard.
- **PIN (Personal Identification Number)**
  A SIM card securing password.
- **PUK (Personal Unblocking Key)**
  A password used for releasing a blocked SIM card after repeated wrong PIN entering.
- **SIM (Subscriber Identity Module)**
  A chip-equipped module to be inserted in a GSM device for identification.
- **SMS (Short Message Service)**
  A term for the system and one unit (message).
- **TTL (Transistor-Transistor Logic)**
  A standard digital technology defining voltage for levels 0 and 1.
- **PSTN**
  Public Switched Telephone Network.
- **LEC (Line Echo Canceller)**
  An echo cancelling function during calls.

6.4 General Instructions and Cautions

Please read this User Manual carefully before using the product. Follow all instructions and recommendations included herein.

Any use of the product that is in contradiction with the instructions provided herein may result in malfunction, damage or destruction of the product.

The manufacturer shall not be liable and responsible for any damage incurred as a result of a use of the product other than that included herein, namely undue application and disobedience of the recommendations and warnings in contradiction herewith.

Any use or connection of the product other than those included herein shall be considered undue and the manufacturer shall not be liable for any consequences arisen as a result of such misconduct.

Moreover, the manufacturer shall not be liable for any damage or destruction of the product incurred as a result of misplacement, incompetent installation and/or undue operation and use of the product in contradiction herewith.

The manufacturer assumes no responsibility for any malfunction, damage or destruction of the product caused by incompetent replacement of parts or due to the use of reproduction parts or components.

The manufacturer shall not be liable and responsible for any loss or damage incurred as a result of a natural disaster or any other unfavourable natural condition.

The manufacturer shall not be held liable for any damage of the product arising during the shipping thereof.

The manufacturer shall not make any warrant with regard to data loss or damage.

The manufacturer shall not be liable and responsible for any direct or indirect damage incurred as a result of a use of the product in contradiction herewith or a failure of the product due to a use in contradiction herewith.

All applicable legal regulations concerning the product's installation and use as well as provisions of technical standards on electric installations have to be obeyed. The manufacturer shall not be liable and responsible for damage or destruction of the product or damage incurred by the consumer in case the product is used and handled contrary to the said regulations and provisions.

The consumer shall, at its own expense, obtain software protection of the product. The manufacturer shall not be held liable and responsible for any damage incurred as a result of the use of deficient or substandard security software.

The consumer shall, without delay, change the access password for the product after installation. The manufacturer shall not be held liable or responsible for any damage incurred by the consumer in connection with the use of the original password.

The manufacturer also assumes no responsibility for additional costs incurred by the consumer as a result of making calls using a line with an increased tariff.

Electric Waste and Used Battery Pack Handling

Do not place used electric devices and battery packs into municipal waste containers. An undue disposal thereof might impair the environment!

Deliver your expired electric appliances and battery packs removed from them to dedicated dumpsites or containers or give them back to the dealer or manufacturer for environmental-friendly disposal. The dealer or manufacturer shall take the product back free of charge and without requiring another purchase. Make sure that the devices to be disposed of are complete.

Do not throw battery packs into fire. Battery packs may not be taken into parts or shirt-circuited.

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