



# 2N<sup>®</sup> VoiceBlue MAX



## User Manual

**Firmware:**

**Version: 1.13**

[www.2n.cz](http://www.2n.cz)

The 2N TELEKOMUNIKACE a.s. 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<sup>®</sup> is a registered trademark of 2N TELEKOMUNIKACE a.s. Any product and/or other names mentioned herein are registered trademarks and/or trademarks or brands protected by law.



2N TELEKOMUNIKACE a.s. administers the FAQ database to help you quickly find information and to answer your questions about 2N products and services. On [www.faq.2n.cz](http://www.faq.2n.cz) you can find information regarding products adjustment and instructions for optimum use and procedures „What to do if...“.



2N TELEKOMUNIKACE a.s. hereby declares that the 2N<sup>®</sup> 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 (if enclosed) or our website at [www.2n.cz](http://www.2n.cz).



This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



The 2N TELEKOMUNIKACE a.s. is the holder of the ISO 9001:2009 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.

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# 1. Product Overview

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In this section, we introduce the **2N<sup>®</sup> VoiceBlue MAX** product, outline its application options and highlight the advantages following from its use. This section also includes safety instructions.

Here is what you can find in this section:

- **1.1 Product Description**
- **1.2 Safety Precautions**
- **1.3 Upgrade**
- **1.4 Terms and Symbols Used**

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## 1.1 Product Description

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**2N<sup>®</sup> VoiceBlue MAX** is a device that helps directly interconnect a SIP-supporting VoIP network with GSM networks and can be used for direct connection with a SIP telephone set. **2N<sup>®</sup> VoiceBlue MAX** contains 4x FXS ports for analogue telecommunication equipment. The voice mode, i.e. outgoing and incoming calls, is the basic function of the gateway. **2N<sup>®</sup> VoiceBlue MAX** is equipped with all voice mode functions and provides the highest user comfort. In addition to voice transmission, **2N<sup>®</sup> VoiceBlue MAX** enables you to send and receive text messages (SMS). You can use the web interface or AT commands for all the gateway settings. The programmable parameters are set in such a way that you can make calls the moment you connect the system to the Ethernet, connect an antenna and insert the SIM card. **2N<sup>®</sup> VoiceBlue MAX** can be combined with the **2N<sup>®</sup> Mobility Extension** service (remote GSM extension) for up to 8 users [1]. **2N<sup>®</sup> VoiceBlue MAX** also provides connection to the **2N<sup>®</sup> SIM Star** system [2].

### **2N<sup>®</sup> VoiceBlue MAX Basic Features**

- Compact size
- Four GSM/UMTS channels
- System rack installation option
- Intelligent incoming/outgoing call routing
- SMS sending/receiving (web, AT interfaces)
- User-friendly web interface
- A single antenna for 4 GSM modules
- Four FXS ports
- Automatic call records and detailed statistics
- **2N<sup>®</sup> Mobility Extension** support [2]
- **2N<sup>®</sup> SIM Star** support
- Possibility of SMS sending+receiving via web interface
- Tone detection
- SNMP error traps [1]

- Sending/receiving SMS via SMTP/POP3 [1]
- Sending/receiving SMS via SMPP [1]

[1] Depending on the available licence type

[2] Depending on the part number



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## 1.2 Safety Precautions

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- It is prohibited to use any transmitters, including the UMTS/GSM devices, in areas where explosives are used, such as quarries.
- It is prohibited to use the GSM gateways at petrol stations where mobile telephones are also prohibited.
- GSM phones may affect sensitive life-saving devices in medical centres. Therefore, it is forbidden to use GSM/UMTS devices, including the GSM gateways, in such facilities.
- In general, any prohibition regarding mobile phones based on RF energy radiation applies to GSM/UMTS devices too.
- If necessary, the GSM gateways may be installed at a safe distance from the prohibited area and connected with the original place through an Ethernet cable.
- Although GSM gateways are not intended for cars or aeroplanes, all relevant prohibitions and regulations regarding mobile phones apply to them too.

## 1.3 Upgrade

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

In response to the customers' requirements, the manufacturer constantly improves the software contained in the product (firmware). For the latest **2N<sup>®</sup> VoiceBlue MAX** firmware version and the User Manual refer to the **2N web sites**.

Manual Version	Upgrade
1.0	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.9.2</b> .
1.1	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.14.0</b> .
1.2	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.16.5</b> .
1.3	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.17.0</b> .
1.4	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.18.1</b> .
1.5	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.19.1</b> .
1.6	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.22.0</b> .
1.7	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.22.0</b> . Text correction.
1.8	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.23.0</b> .
1.9	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.24.0</b> .

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1.10	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.25.0</b> .
1.11	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.26.1</b> .
1.12	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.28.0</b> .
1.13	The User Manual relates to the <b>2N<sup>®</sup> VoiceBlue MAX</b> firmware version <b>1.29.1</b> .

## 1.4 Terms and Symbols Used

### Symbols in Manual

The following symbols and pictograms are used in the manual:

#### **Safety**

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

#### **Warning**

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

#### **Caution**

- Important information for system functionality.

#### **Tip**

- Useful information for quick and efficient functionality.

#### **Note**

- Routines or advice for efficient use of the device.

### Future Functions, Innovations

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

## 2. Description and Installation

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This section describes the proper 2N<sup>®</sup> VoiceBlue MAX product installation and connection.

Here is what you can find in this section:

- **2.1 Before You Start**
- **2.2 Factory Settings**
- **2.3 Brief Installation Guide**
- **2.4 IP Voice Transmission**
- **2.5 2N<sup>®</sup> VoiceBlue MAX Connection to VoIP**
- **2.6 Available 2N<sup>®</sup> VoiceBlue MAX Connections**

## 2.1 Before You Start

### Caution

- Make sure that you are equipped with all system components necessary for putting 2N<sup>®</sup> VoiceBlue MAX in operation (SIM card, VoIP phone and /or duly configured SIP line of your SIP Proxy, an available 100BaseT socket and a PC for initial settings, analogue telephone).

### Product Completeness Check

Before installing this product, check whether the 2N<sup>®</sup> VoiceBlue MAX delivery complies with the following packing list.

Package	pcs
2N <sup>®</sup> VoiceBlue MAX	1
Power supply adapter	1
Long antenna	1
Ethernet cable	1
Quick Start manual	1
Rubber feet	4

### Connector Lay-Out

The following connectors are mounted on the 2N<sup>®</sup> VoiceBlue MAX bottom:

- 10/100BaseT Ethernet connector
- 4xFXS connector RJ-45
- RESET button - press for a short time to restart the GSM gateway and for a long time to restart the GSM gateway and download the factory settings.
- Antenna connector for all GSM/UMTS channels


- SIM holder

Find a power supply connector (DC Jack 2.1mm) and type plates at the rear.




## Status LED Indicators


The 2N<sup>®</sup> VoiceBlue MAX states are indicated by LEDs on the front and system connector sides. For the LED types see the table below.

 <b>Power supply indicator</b>	
Blue shining	Connected, correct function
Blue flashing	Device error
No light	Disconnected, malfunction

 <b>UMTS / GSM</b>	
No light	Logged-in module, ready
Green shining	Active call
Green fast flashing	Module initialisation / communication
Green slow flashing	GSM/UMTS login process
Red shining	GSM module blocked / no SIM card
Red fast flashing	GSM module off
Orange shining	Initialisation upon GSM gateway power up

 <b>FXS</b>	
No light	Ready
Green shining	Picked up / active call
Green fast flashing	FXS calibration
Green slow flashing	Ringing
Red fast flashing	Error, out of service

<b>LAN</b>	
Green shining / Orange not shining	100BaseT Ethernet disconnected, no operation
Green shining / Orange flashing	100BaseT Ethernet connected, network operation
Green not shining / Orange shining	10BaseT Ethernet connected, no operation
Green flashing / Orange shining	10BaseT Ethernet connected, network operation

## SIM Card Placement

Insert a SIM card into one of the four SIM holders on the 2N<sup>®</sup> VoiceBlue MAX front making sure that the chip contacts are at the front bottom. The SIM holders are equipped with the push&pull technology for facilitation.





 **Caution**

- Remember to **set** call forwarding, call barring, preferential network(s), SMS centre and similar provider and SIM card services in your mobile phone **before inserting the SIM card** in 2N<sup>®</sup> VoiceBlue MAX.
- If two SIM cards are used, both of them **must have an identical PIN**, or **PIN request disable** must be selected.
- **Disconnect 2N<sup>®</sup> VoiceBlue MAX from the power supply** before inserting the SIM cards!

## Licences

2N<sup>®</sup> VoiceBlue MAX may contain time-limited software licences (SIP signalling, Mobility Extension, e.g.) that render services for limited hours only. Every gateway restart adds one hour to the internal licence counter. To check the current licence status, use the web interface of the gateway (refer to **Subs. 3.4**), or the AT interface of the Telnet protocol (refer to **Section 4**).

 **Caution**

- A GSM gateway with an expired licence cannot process any incoming and/or outgoing calls! To avoid this, ask your dealer for licence prolongation or an unlimited licence!

## GSM/UMTS Network Restriction

Some 2N<sup>®</sup> VoiceBlue MAX types may be restricted to certain GSM/UMTS networks only. If so, the red indicator at the given GSM/UMTS module is on and the 'netw-err' cause is detected. Contact your dealer please for more information.

 **Tip**

- Contact your dealer please for more information.

## Potential GSM/UMTS Troubles

All 2N GSM gateways work reliably under a long-time full load. The following problems may be caused by GSM/UMTS networks:

- *GSM/UMTS module(s) cannot log in, log in slowly, or log out occasionally. This problem may be caused by any of the following situations:*
  - The GSM/UMTS signal is low. The minimum signal level should be approximately **-80dBm**. If lower, change the antenna position or type!
  - The GSM/UMTS cell (BTS) to which the GSM/UMTS modules are trying to log in is overloaded. Change the antenna position or reduce the count of the logged-in GSM/UMTS modules.
- *One of the GSM/UMTS modules is permanently logged-out or fails to make outgoing calls:*
  - The problem indicates a GSM/UMTS network overload on the installation site. To eliminate the problem, set the **Relax delay** parameter to **2 seconds** (refer to the **GSM Basic Parameters** subsection). If the GSM module fails to log in or rejects to make outgoing GSM calls even after the gateway restart, consult your GSM provider for your SIM card/GSM module availability.

The manufacturer shall not be held liable for any SIM card or provider service unavailability in the case of a breach of the provider's SIM terms and conditions for the SIM card use.

## 2.2 Factory Settings

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Below are the factory settings for the key configuration parameters of the GSM gateway:

- IP address: 192.168.1.2
- IP mask: 255.255.255.0
- IP gateway: 192.168.1.1
- Username: Admin
- Password: 2n

 **Caution**

- Remember to **change** the username and password **during** the first gateway configuration to avoid unauthorised access!

## 2.3 Brief Installation Guide

### SIM Card Inserting/Removing

For the correct handling of SIM cards refer to the SIM Card Placement subsection.

 **Caution**

- Make sure that the GSM gateway is off before inserting and removing SIM cards to avoid the GSM/UMTS module damage.

### Installation Conditions

The following installation conditions have to be met for proper installation:

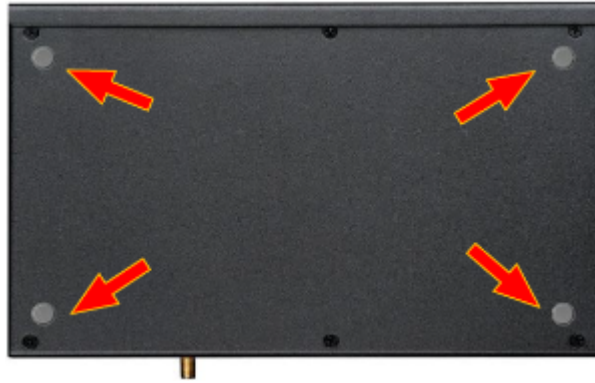
- 2N<sup>®</sup> VoiceBlue MAX is to be installed on a site with enough free space.
- 2N<sup>®</sup> VoiceBlue MAX can be mounted on a horizontal surface or into a system rack. It is possible to operate 2N<sup>®</sup> VoiceBlue MAX in another working position too, for a short time for servicing and testing purposes, for example.
- Any excess of the allowed working temperature may not affect the 2N<sup>®</sup> VoiceBlue MAX function immediately but may result in faster ageing and lower reliability. For the allowed working temperature and humidity ranges refer to Section 5
- 2N<sup>®</sup> VoiceBlue MAX is not designed for high-vibration environments such as means of transport, machine rooms, and similar.
- 2N<sup>®</sup> VoiceBlue MAX is not designed for dusty environments or places exposed to high humidity and temperature changes.
- 2N<sup>®</sup> VoiceBlue MAX may not be exposed to aggressive gases, acid and solvent vapours, and so on.
- 2N<sup>®</sup> VoiceBlue MAX is intended for indoor use. It may not be exposed to rain, flowing water, condensing moisture, fog, and so on.
- 2N<sup>®</sup> VoiceBlue MAX may never be exposed to direct sunshine or placed close to heat sources (radiators).

- A sufficient clearance must be kept over and under **2N<sup>®</sup> VoiceBlue MAX** for cabling and air flow to carry off the heat.
- A sufficient GSM/UMTS signal intensity has to be provided for **2N<sup>®</sup> VoiceBlue MAX**.
- An adequate capacity of the GSM/UMTS network has to be ensured (no BTS overload). Remember that multiple GSM gateways used in one location may overload the base transceiver station (BTS) you are currently logged in to. This may lead to a permanent or occasional rejection of GSM/UMTS calls!
- No strong electromagnetic radiation is allowed on the **2N<sup>®</sup> VoiceBlue MAX** installation site.
- No strong electromagnetic reflections are allowed on the **2N<sup>®</sup> VoiceBlue MAX** antenna installation site.
- An inappropriate location of **2N<sup>®</sup> VoiceBlue MAX** or its antenna close to television, broadcasting and/or other rf-sensitive sets may impair the function of these sets.
- Being a source of radio frequency emissions, the **2N<sup>®</sup> VoiceBlue MAX** antenna should not occur in the close vicinity of the human body. The health hazard is higher than with mobile phones as, generally, gateways shared by multiple users show a very high traffic.
- Make sure that the VoIP connection has been configured properly according to the SIP and other VoIP recommendations.
- It is recommended that the power supply adapter should be connected to a network with a UPS back-up and due overvoltage protection.

## Horizontal Mounting

**2N<sup>®</sup> VoiceBlue MAX** is ready for mounting on a horizontal support. You can stick rubber feet (included in the delivery) on the device if necessary. Follow the instructions below:

1. Put the GSM gateway carefully on a stable horizontal support with its bottom side up.
2. Stick the rubber feet into the corners as shown below.
3. Place the device on a stable horizontal support.



**Caution**

- Refer to the Proper Location subsection for correct placing!

## System Rack Mounting

2N<sup>®</sup> VoiceBlue MAX can be mounted into a system rack. Purchase the rack accessories separately under Part No. **5051099E**. The accessory pack includes the following components:

Components	Pieces
Short wing	2
Long wing	1
Rear connecting plate	1
Upper connecting plate	1
Mounting screws	12
Rack screws	4

## Single Mounting

Follow the instructions below to mount a single unit into a system rack:

1. Fit the rack wings to the right and left sides using four screws for each wing (included in the package). The positions of the long and short wings are optional and depend on the installation site conditions.



2. Having screwed the wings, place the GSM gateway into a free 1U place of the system rack fitting it with four rack screws (included in the package).



## Pair Mounting

Follow the instructions below to rack mount two GSM gateways into one 1U place:

1. Put the GSM gateways next to each other making their sides touch each other. Fit the short wings (included in the package) onto the free gateway ends with the screws enclosed.



2. Insert the connecting plates (BE CAREFUL! The rear and upper connecting plates have different drilled holes - the upper plate holes are larger and without threading) in the upper and rear holes of one GSM gateway first. Then connect the other unit.



1. Place the GSM gateway pair into a free 1U place in the system rack and fit it with four rack screws (included in the package).





 **Caution**

- The rear and upper connecting plates have different holes – the upper plate holes are larger and without threading.
- Make sure that the plate does not get into the device to avoid electric short-circuit inside the GSM gateway.
- Leave 2 cm free space at least over and under the GSM gateway for better ventilation (airflow)!

## Power Supply Connection

Use only the power supply adapter included. Make sure that the electric distribution network voltage is in compliance with the data on the supply adapter plate before plugging the adapter. First plug the supply adapter into the mains socket and only then connect the adapter connector to the gateway. Refer to the **status indicators**.

 **Warning**

- Connecting a defective or inappropriate power supply adapter may lead to a temporary or permanent 2N<sup>®</sup> VoiceBlue MAX error!
- Check whether the antenna is connected before plugging the adapter. **Feeding the device without antenna connection may result in the GSM module transmitter damage.**

## Antenna Connection

2N<sup>®</sup> VoiceBlue MAX is equipped with a SMA female antenna connector for all the GSM /UMTS modules. The external antenna should always be installed vertically on a site with a good wireless signal.

### ⚠ Warning

- Tighten the antenna connector gently with your hand - never use a wrench!
- Being a source of radio frequency emissions, the 2N<sup>®</sup> VoiceBlue MAX antenna should not occur in the close vicinity of the human body. The **health hazard** is higher than with mobile phones as, generally, gateways shared by multiple users show a very high traffic.

### ℹ Note

- The antenna has a sufficient gain for a trouble-free operation under normal conditions. If the signal is poor or you want to place your antenna separately from 2N<sup>®</sup> VoiceBlue MAX, you can use an antenna with an SMA-connector terminated cable. The antenna should be mounted vertically.
- Refer to the **Technical Parameters** section for the antenna and cable parameters.

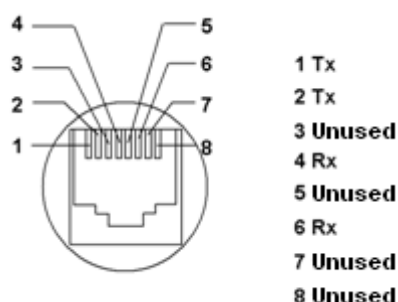
## Ethernet Cable Connection

To connect 2N<sup>®</sup> VoiceBlue MAX into an Ethernet network use a standard straight cable terminated with RJ-45 connectors (included in the package). The GSM gateway supports the 10BaseT and 100BaseT standards, the Ethernet connection status is indicated by the status LED indicators located on the RJ-45 connector (refer to **Subs. 2.1** for details).

For the Ethernet interface factory settings for 2N<sup>®</sup> VoiceBlue MAX refer to **Subs. 2.2**.

**Caution**

- Resetting factory values results in a change of the 2N<sup>®</sup> VoiceBlue MAX Ethernet interface configuration!
- Using a defective Ethernet cable may lead to a high packet loss rate in the Ethernet network and subsequent instability and poor quality of all GSM/UMTS calls!



RJ-45 connector for LAN connection

**Antenna Splitter**

The antenna splitter is a passive component that combines multiple GSM/UMTS channels into one antenna. In 2N<sup>®</sup> VoiceBlue MAX, it combines two/four antennae into one. The antenna splitter is placed in the installation box. It is a passive element - it has a characteristic signal attenuation value that the antenna connected must compensate. No antenna splitter is used for one-channel 2N<sup>®</sup> VoiceBlue MAX gateways.

**Licence Restrictions**

2N<sup>®</sup> VoiceBlue MAX may contain time limited software licences. See **Subs. 2.1** for more information.

## Firmware Upgrade

Please upgrade the 2N<sup>®</sup> VoiceBlue MAX firmware before installing the system. Check the [www.2n.cz](http://www.2n.cz) web sites for the latest firmware for this gateway type.

### Warning

- Use the **firmware certified** for this gateway type only! Any other firmware type may **damage 2N<sup>®</sup> VoiceBlue MAX irreversibly!**

Follow the instructions below to download firmware easily using the gateway web interface:

- Connect your PC and the gateway into the Ethernet network.
- Open the web browser (MS Internet Explorer 9 and higher or Mozilla Firefox 4 and higher are recommended).
- Enter the **http://IP\_address** to register at the web interface.
- Click on **Management / Firmware update**, then on **Browse** and select the new firmware file.
- Click on the **Download firmware** icon in the lower part of the web page.
- 2N<sup>®</sup> VoiceBlue MAX will upgrade the firmware automatically.

## 2.4 IP Voice Transmission

### Speech Encoding Methods

Voice transmission is strictly separated from signalling in VoIP networks. Modern VoIP networks mostly use the RTP (Realtime Transport Protocol) for voice transmission. The purpose of the RTP is only to transmit data (voice) from a source to a destination at real time. Codecs are used to save the channel data capacity. Codecs process the voice signal using variable algorithms to minimise the volume of user data. The degree of compression used by the codec affects the quality of voice transmission. Thus, the better voice transmission is required, the wider data range (the higher transmission rate) is needed. The MOS (Mean Opinion Score) scale is used for rating voice transmission quality, where 1 means the worst and 5 the best quality. For a survey of the codecs supported by 2N<sup>®</sup> VoiceBlue MAX refer to the table below.

Standard	Algorithm	Transmission rate [kbps]	MOS
G.711a	PCM	64	4.1
G.711u	PCM	64	4.1
G.729	CS-ACELP	8	3.92

For 2N<sup>®</sup> VoiceBlue MAX, quadruple the above mentioned rates (two fully duplex calls) and add the TCP and IP header transmission rate to the result to get the resultant transmission rate.

It is important to keep both a stable appropriate transmission rate during connection and a small and identical transmission time per data packet in order to maintain a high-quality voice transmission.

- G.711 - this codec is used in digital telephone networks. The PCM (Pulse Code Modulation) is used for voice signal encoding. The sampled signal is encoded in 12 bits and then compressed using a non-linear scheme into the resultant 8 bits. Europe uses the A-law compression system while North America and Japan obey the  $\mu$ -law. The resultant data flow is 64 kbps.
- G.729 - this codec uses the CS-ACELP (Conjugate-Structure Algebraic-Code-Excited Linear-Prediction) algorithm with the resultant transmission rate of 8 kbps. The speech signal is split into blocks of 10 ms each. The parameters of these blocks are then inserted in frames of the size of 10 bytes. 2-byte frames are generated for noise transmission.

During call set-up, a codec is selected automatically for voice transmission. **2N<sup>®</sup> VoiceBlue MAX** supports the codecs included in the table above. The type of codec to be used depends on your VoIP network (individual devices) and your **2N<sup>®</sup> VoiceBlue MAX** configuration. **2N<sup>®</sup> VoiceBlue MAX** is designed primarily for VoIP corporate networks and tries to meet the opponent's codec requirements. If a codec is requested that is incompatible with **2N<sup>®</sup> VoiceBlue MAX**, the call will be rejected.

The SIP and ITU-T H.323 recommended protocols are mostly used for connection establishing, maintaining and cancelling. **2N<sup>®</sup> VoiceBlue MAX** uses the SIP (Session Initiation Protocol) signalling.

 **Tip**

- In the case of separated direct connection of your SIP Proxy and **2N<sup>®</sup> VoiceBlue MAX**, use the G.711 codec to achieve a high voice quality.

## SIP Components

The following components are involved in the SIP message exchange:

- UAC (User Agent Client) - the terminal device client, which initiates SIP signalling.
- UAS (User Agent Server) - the terminal device server, which responds to SIP signalling from the UAC.
- UA (User Agent) - a SIP network terminal (SIP phones, gateways to other networks, etc.), which contains the UAC and UAS.
- Proxy server - receives connection requests from the UA and transfers them to the next Proxy server if the given station is not under its administration.
- Redirect server - receives connection requests, but, instead of sending them to the called line, sends them back to the requesting device asking for where to route the request.
- Location server - receives registration requests from the UA and updates the terminal database accordingly.

All the server components (Proxy, Redirect, Location) are mostly on one physical device called Proxy server, which is responsible for keeping a client database and connection establishing, maintaining and terminating, as well as call routing.

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The 2N<sup>®</sup> VoiceBlue MAX VoIP-GSM gateway acts as a UA in any case (has the same functions as a VoIP phone), i.e. receives call set-up requirements and, on the basis of its inner LCR table, routes calls to GSM networks.

None of the SIP-defined server components are integrated in the 2N<sup>®</sup> VoiceBlue MAX gateway.

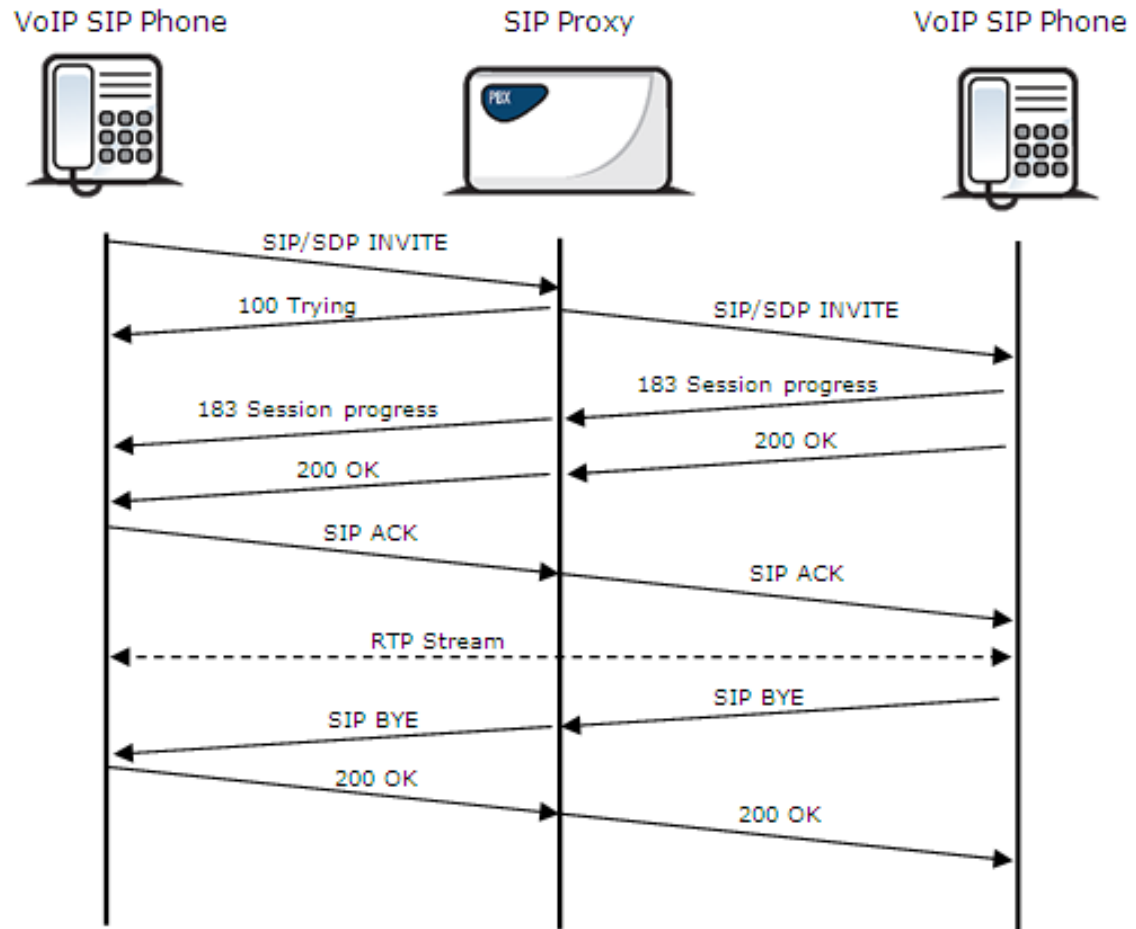
## SIP Signalling Messages

Below is a list of messages sent via the SIP:

- INVITE - connection set-up request;
- ACK - INVITE confirmation by the final message addressee;
- BYE - connection termination;
- CANCEL - failed connection cancellation;
- REGISTER - UA registration with the SIP Proxy;
- OPTIONS - server capability query.

The answers to the SIP messages are numerically coded as the case is with the http protocol. Below are the most important ones:

- 1XX - information messages (100 - trying, 180 - ringing, 183 - progress);
- 2XX - successful request completion (200 - OK);
- 3XX - request forwarding needed (302 - temporarily moved, 305 - use Proxy);
- 4XX - error (403 - forbidden, 486 - busy here);
- 5XX - server error (500 - Server Internal Error, 501 - not implemented);
- 6XX - global failure (606 - not acceptable).



SIP Message Sending during Call Set-up and Cancellation

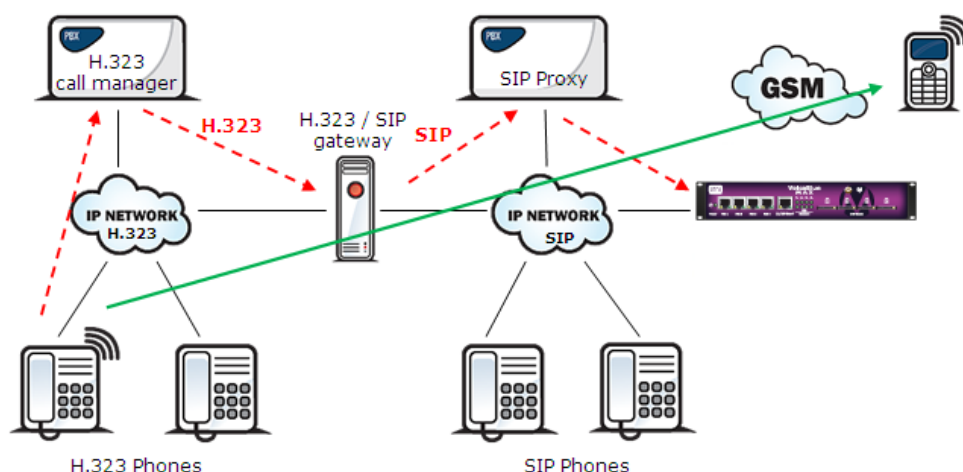


## 2.5 2N<sup>®</sup> VoiceBlue MAX Connection to VoIP

Since 2N<sup>®</sup> VoiceBlue MAX communicates using the SIP only, this subsection outlines solutions for its interconnection with networks working with the H.323 signalling protocols. 2N<sup>®</sup> VoiceBlue MAX can be used either in the Point-to-Point or Point-to-Multipoint mode with the SIP Proxy server.

### SIP/H.323 Interconnection

SIP-based devices cannot communicate with H.323 supporting devices directly, but through a SIP/H.323 gateway. This gateway transfers signalling messages from/to the protocols. Using the RTP for multimedia data transmission, the SIP and H.323 protocols can go on communicating directly when the SIP/H.323 gateway connection is established. Thus, the SIP/H.323 gateway helps integrate 2N<sup>®</sup> VoiceBlue MAX into the existing H.323 environment.

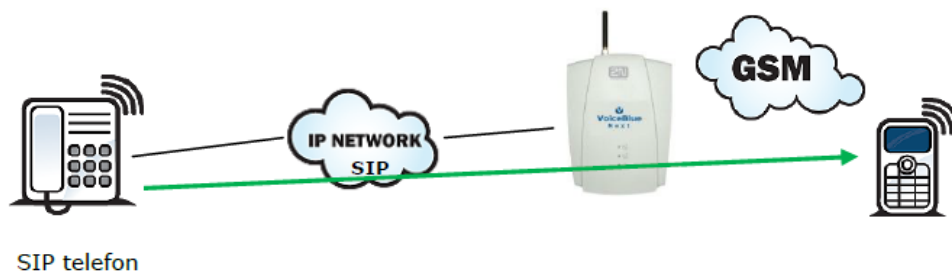


## Point-to-Point Configuration

2N<sup>®</sup> VoiceBlue MAX can communicate with just one SIP VoIP phone or device (a VoIP gateway, e.g.) in the PTP (Point-to-Point) mode. The IP address of the opposite party is always selected as the Proxy server IP address in 2N<sup>®</sup> VoiceBlue MAX for this mode. The 2N<sup>®</sup> VoiceBlue MAX PTP configuration is often used for testing purposes before implementation into the VoIP network. Refer to the figure below for the PTP scheme.

### ✓ Tip

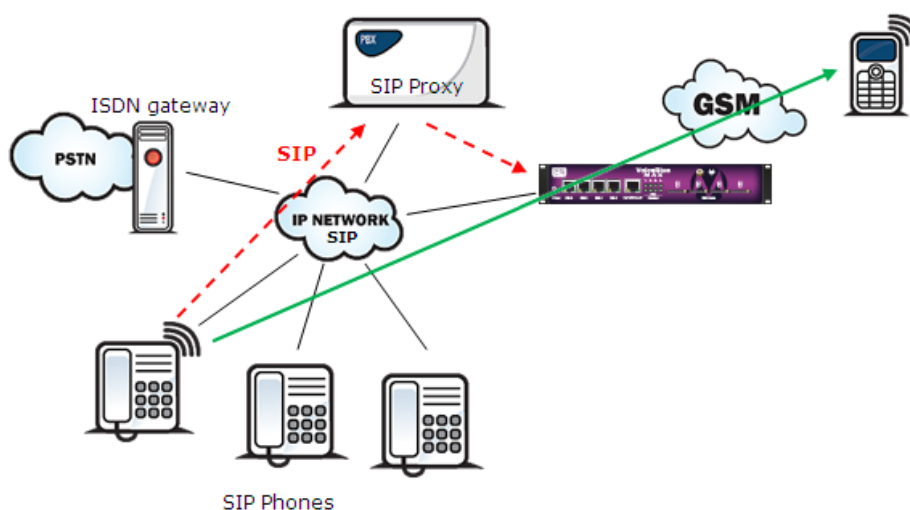
- If you set the incoming SIP Proxy IP address to '0.0.0.0' in the 2N<sup>®</sup> VoiceBlue MAX configuration, the GSM gateway will receive calls from any VoIP device.



All calls outbound to GSM are routed to the 2N<sup>®</sup> VoiceBlue MAX gateway in the Point-to-Point mode that uses 2N<sup>®</sup> VoiceBlue MAX.

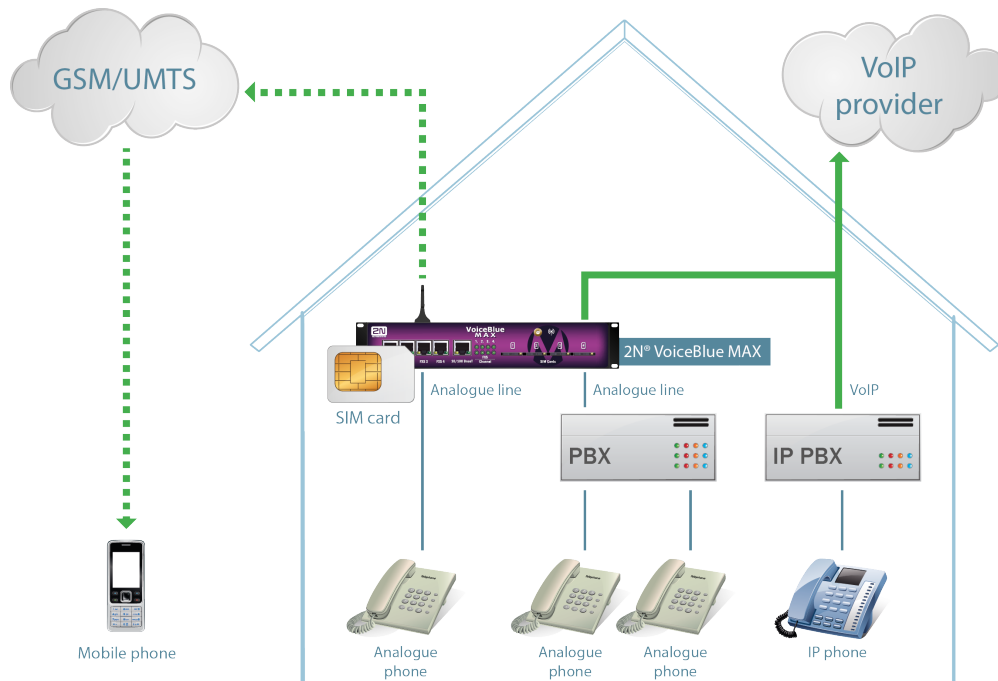
## Point-to-Multipoint Configuration

Point-to-Multipoint is a classical scheme of a distributed VoIP network with one or more SIP Proxy servers (VoIP gateway). The SIP Proxy server is a software PBX (or a standard PBX extended with VoIP services), which is responsible for all VoIP signalling. Multiple source devices (VoIP phones, e.g.) and multiple target devices (2N<sup>®</sup> VoiceBlue MAX, e.g.) can be used in this mode. An internal routing algorithm (Least Cost Router, LCR) of your SIP Proxy is used for routing outgoing GSM and other calls in this mode. Calls to GSM networks can be routed via the 2N<sup>®</sup> VoiceBlue MAX gateways. All SIP signalling is governed by the SIP Proxy server and the subsequent voice stream is based on the Point-to-Point RTP.



## 2.6 Available 2N<sup>®</sup> VoiceBlue MAX Connections

The figure below shows the gateway as DialThru router. PBX/Analogue phone is connected with the gateway by up to four analogue FXS ports, or by using Ethernet interface (SIP protocol). Incoming calls from PSTN are directly routed to selected port. Outgoing calls are using routing according to LCR table.



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## 3. VoiceBlue MAX Configuration

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This section describes the 2N<sup>®</sup> VoiceBlue MAX configuration.

Here is what you can find in this section:

- 3.1 Factory Reset
- 3.2 Basic Configuration - Step by Step
- 3.3 Call Routing
- 3.4 Web Configuration Interface
  - 3.4.1 Gateway Control
  - 3.4.2 Gateway Configuration
  - 3.4.3 Messaging
    - 3.4.3.1 SMTP/POP3 Basic Configuration - Step by Step
    - 3.4.3.2 SMPP Basic Configuration - Step by Step
  - 3.4.4 Monitoring
    - 3.4.4.1 List of SNMP traps
  - 3.4.5 Utils
  - 3.4.6 Management
  - 3.4.7 Others

## 3.1 Factory Reset

If you forget the password or set the IP interface incorrectly, you can press the RESET button placed on back side of the gateway (next to power connector).

Doing this, you restore the factory default configuration values for all parameters, including the Ethernet interface parameters and access data. Refer to **Subs. 2.2** for factory settings.

### Caution

- Resetting the factory configuration values results in changes of the Ethernet settings and subsequent necessity to reconfigure the gateway.



### Note

- To reset the factory values, press the Reset button until the LED indicators start flashing red.

### Note

- Push the RESET button for a short time (0.5 s) to restart the GSM gateway.

---

## 3.2 Basic Configuration - Step by Step

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This section will help put your 2N<sup>®</sup> VoiceBlue MAX gateway in operation for the first time. Refer to all **Section 3** subsections for detailed settings.

- Install the GSM gateway as instructed in **Subs. 2.3**. Before the first start, remove the SIM cards, or insert the SIM cards with the PIN request disable.
- Connect the GSM gateway to the Ethernet network to enable connection to the address mentioned in **Subs. 2.2** from the configuration terminal. If the gateway default IP address is not suitable for your Ethernet installation, reset the IP address as follows:
  - Disconnect the configuration terminal from the Ethernet network.
  - Disconnect the GSM gateway from the Ethernet network.
  - Prepare the Ethernet switches, or an Ethernet crossed cable.
  - With the Ethernet crossed cable, interconnect the configuration terminal with the GSM gateway directly.
  - With the Ethernet switch, connect the configuration terminal and GSM gateway to the pre-prepared Ethernet switch. We do not recommend connecting any other equipment.
  - Change the Ethernet IP setting in the configuration terminal, e.g.: IP=192.168.1.200, Net Mask: 255.255.255.0.
  - Open your web browser and enter the GSM gateway IP address.
  - Enter the factory login data.
  - Change the required settings in the **Gateway configuration / Ethernet configuration** menu and store the data into the GSM gateway.
  - Connect the GSM gateway to a standard Ethernet network.
  - Restore the configuration terminal IP setting and connect the configuration terminal to a standard Ethernet network.
- Enter the new GSM gateway IP address to get connected to the web interface.
- Enter the current time and date in the **Gateway control / Date/Time** menu for the GSM gateway.
- Make sure that the **Licence status** item is **unlocked** in the **Gateway control / Firmware/Licence** menu. If not, your GSM gateway does not contain the licence. Contact your dealer for the licence key.
- Set the correct PIN value in the **Gateway configuration / System parameters** menu. The value must comply with the SIM card PIN value.
- Set new login data in the **Gateway configuration / Login configuration** menu.
- Switch the GSM gateway off and insert the SIM cards. Connect an antenna to the GSM gateway and switch it on.

- 
- The GSM gateway contains the factory configuration settings that enable outgoing calls without additional settings. Now enter the IP address equal to the GSM gateway IP address on your SIP Proxy or IP terminal.

From now on, **2N<sup>®</sup> VoiceBlue MAX** will be ready to receive VoIP-SIP calls and route them to GSM/UMTS networks. If all the GSM modules are occupied, or logged out, the GSM gateway will reject all VoIP-IP and GSM/UMTS calls.

Should you get in troubles, follow the steps below please:

- Read the User Manual carefully and check all parameters.
- Find answers to the frequently asked questions at <http://faq.2n.cz>.
- Consult your servicing partner.

You are recommended to attend a **2N** certified training to improve your installation chances.



## 3.3 Call Routing

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Calls from a VoIP port to a GSM/UMTS network are routed to any GSM/UMTS port according to the LCR (Least Cost Routing) table. If an incoming call is routed via a busy port, other ports are checked automatically for availability (depending on the configuration) and in case no allowed outgoing port is available, the outgoing call is rejected.

The LCR algorithm identifies the outgoing call type, current time tariff rate, day in a week, and/or free minutes of GSM providers and routes outgoing calls accordingly.

Incoming calls from GSM networks are routed directly to the defined SIP address / FXS interface, or the DISA function is activated. Furthermore, calls can be routed according to the CLIP (caller's telephone number). And the CallBack service is also available.

### Mobility Extension

**2N<sup>®</sup> Mobility Extension** (ME) is a function that turns your mobile phone into an SIP phone taking advantage of all the PBX functions. To make your **2N<sup>®</sup> Mobility Extension** work efficiently, use the **2N<sup>®</sup> VoiceBlue MAX** gateway to assign your mobile phone an account with the same SIP parameters (ID/user/password) that help connect your office SIP phone to the SIP Proxy server. After this account gets registered with the SIP Proxy server via **2N<sup>®</sup> VoiceBlue MAX**, your mobile phone will work as **2N<sup>®</sup> Mobility Extension** and make use of the services described below.

Advantages:

- You never miss any important call as you are available at all times.
- You can get information SMS messages on missed calls.
- You can control your company PBX call forwarding services from your mobile phone.
- You can make use of a comfortable DTMF code control.
- You need not make complicated forwarding actions as the function is fully automatic.
- ME can work with any SIP Proxy PBX.
- ME can replace any standard VoIP phone.
- Calls to your mobile phone are free of charge or at a moderate cost (in case of VPN).
- You need not integrate a costly DECT system any longer.

## Model Situations

### “Follow me” function

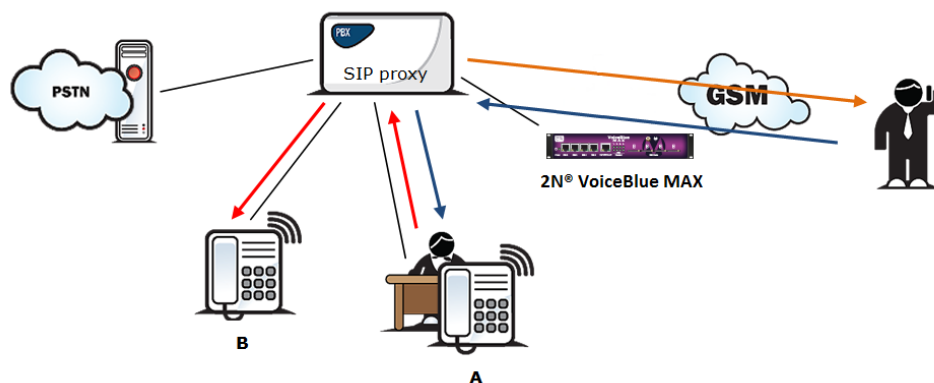


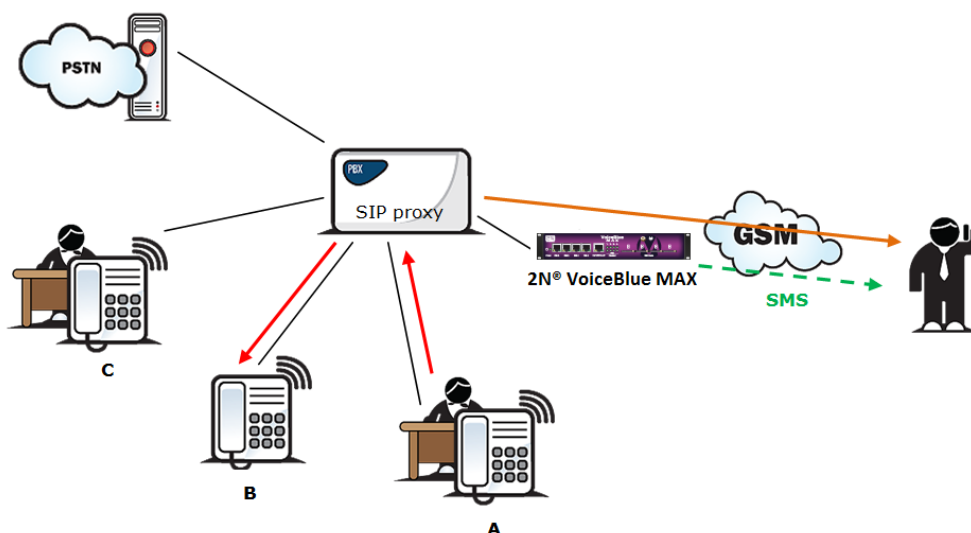
Figure 1: Follow Me Function

Fig. 1 shows routing of calls in the case of absence of a subscriber in the VoIP network.

Subscriber A calls subscriber B, for whom the 2N<sup>®</sup> **Mobility Extension** function has been permitted with the active “Follow me” function. Subscriber B does not answer the call in the VoIP network and so the call is rerouted to its mobile telephone.

### “SMS at no answer” function

In the case of a missed call in the VoIP network, the 2N<sup>®</sup> **Mobility Extension** provides sending of an information text announcement. This function is called “SMS at no answer”. Like with call forwarding, it is possible to use the DTMF option to activate and deactivate the service of sending text announcements for missed calls.



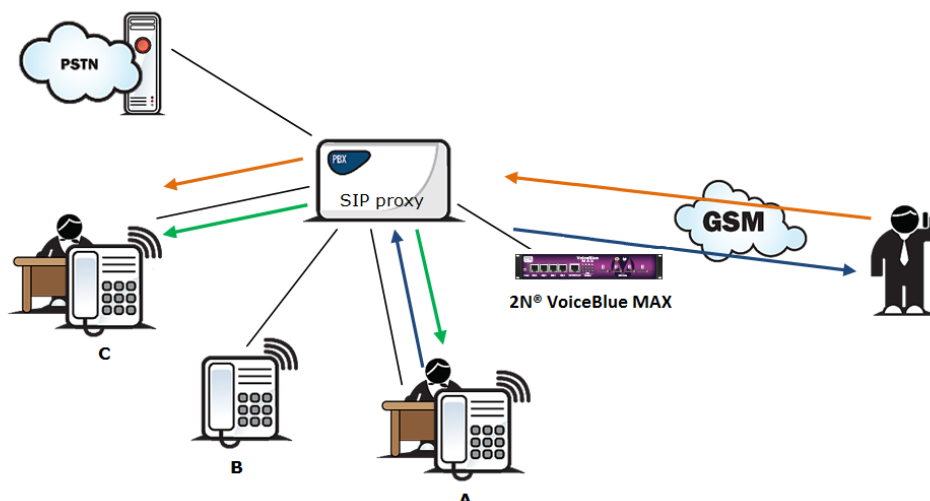
**Figure 2: SMS at No Answer Function**

Fig. 2 shows sending of information texts if an incoming call is not answered.

Subscriber A calls subscriber B, for whom the 2N<sup>®</sup> **Mobility Extension** has been permitted with activated “Follow me” and “SMS at no answer” services. Subscriber B does not answer the call in the VoIP network and so the call is rerouted to its mobile telephone. Subscriber B does not answer the mobile phone call and is sent a text announcing that the call from subscriber A has been missed.

## **“Call forwarding” function**

In addition to rerouting calls in the event of absence, the 2N<sup>®</sup> **Mobility Extension** allows calls to be forwarded within a VoIP network, which brings the services of the SIP Proxy to a mobile telephone. The description of this function is shown in Fig. 3.



**Figure 3:** Call Forwarding Function

In Fig. 3 subscriber A is talking to subscriber B, for whom the **2N<sup>®</sup> Mobility Extension** has been permitted. Subscriber A would like to be forwarded to subscriber C. For this reason, subscriber B holds the call with A (7\* in the default setting), dials the number of subscriber C, terminates dialling with the dialling end character (# in the default setting), notifies subscriber C of the call to be forwarded and hangs up to forward the call. If subscriber C does not want to talk to subscriber A, subscriber B terminates the call with C (9# in the default setting) and returns to the call with A.

### **"Quick call forwarding" function**

In Fig. 4 subscriber A is talking to subscriber B, for whom the **2N<sup>®</sup> Mobility Extension** has been permitted. Subscriber A would like to be forwarded to subscriber C. Subscriber B wants to forward the call without having to talk to subscriber C. So subscriber B puts the call with A on hold (7\* in the default setting), dials the quick forwarding character (default value #) and dials the telephone number of subscriber C, terminating the dialling with the dialling end character (default value #). Having received the dialling end character, **2N<sup>®</sup> VoiceBlue MAX** terminates the call between A and B and attempts to make a call between subscribers A and C. Subscriber A then receives the ring tone.

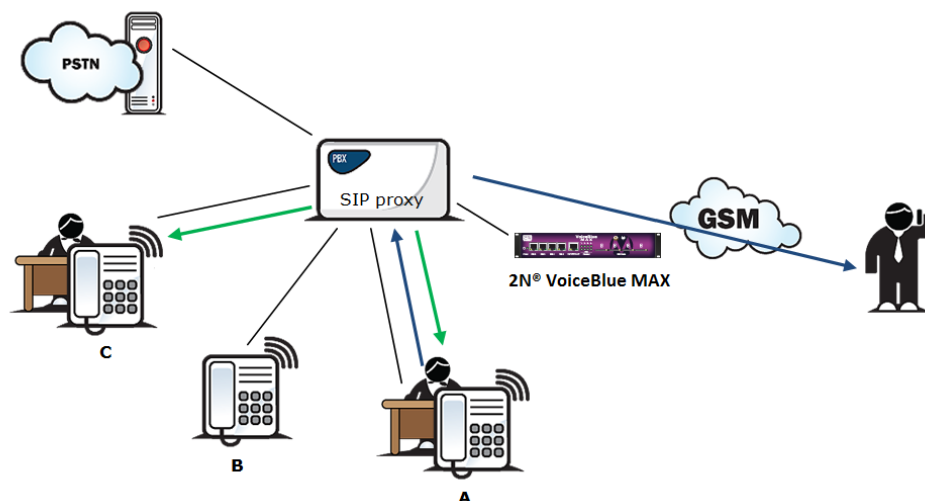


Figure 4: Quick Call Forwarding Function

### Correct ME configuration:

- Connect the GSM gateway to your PBX/SIP Proxy.
- Check whether the 2N<sup>®</sup> Mobility Extension licence key has been entered correctly.
- Enter all ME users in the **Gateway configuration / Mobility Extension** menu.
- Enter the prefix matching the ME user mobile number in the **Gateway configuration / prefixes** menu.

### LCR Table

The LCR (Least Cost Routing) table is the key telephone cost cutting tool. It helps you select call routes according to the called subscriber's number, daytime and weekdays. By adding bank holidays (with routing rules as on Sundays) to the LCR table you achieve even higher call cost savings.

To make your prefix and LCR routing work properly, enter the prefix of the number to be called to the GSM/UMTS network into the **Table of accepted prefixes** in the **Gateway configuration / Prefixes** menu. The number to be called may not exceed the **Default count of digits** or the higher priority **Count of digits** setting in the **Table of accepted prefixes**. The table is searched from top to bottom starting with the first match.

Apply the **Table of replaced prefixes** to modify the number to be called to the GSM/UMTS network. Every modification is displayed in the "**prefix**"/"**replace with**" format (99/+420, e.g.). The **Table of replaced prefixes** must always contain one record at least or the "/" record if no prefix modification is made. The digits removed from/added to the number in the **Table of replaced prefixes** are not included in the **Count of digits**. The table is searched from top to bottom starting with the first match.

**GSM network ID** is an optional parameter, which is assigned to each LCR record to make the LCR search more convenient. If this parameter is not completed, the list number is only used for identification (1-8).

### **Poznámka**

- **Count of digits** defines the minimum count of digits to be dialled. Hence, a call is successful if the count of the called number digits is equal to or higher than the value set in the **Count of digits**.
- The **Count of digits** does not include the digits removed from/added to the number in the Table of replaced prefixes.
- The **Count of digits** set in the Table of accepted prefixes has a higher priority than the **Default count of digits**.
- The **Table of replaced prefixes** must always contain one record at least or the "/" record if no prefix modification is made.

Make sure that the appropriate provider's SIM card is inserted in the GSM gateway. Assign the incoming and outgoing groups in the **Gateway configuration / GSM groups assignment** menu.

For a call setup, the LCR table is searched sequentially from top to bottom. Each LCR table row is assigned a **Prefixlist** in which the prefix match is searched for. If a match is found, the call will be routed according to the routing group parameters (**Groups** in the LCR table) as set in the **Gateway configuration / GSM outgoing groups** table. The call will be connected via the GSM module as assigned to the **GSM outgoing groups** in the **GSM groups assignment** table.

If the selected GSM/UMTS module is busy, the call is routed according to the next routing rule included in the **Groups** and defined by the **GSM outgoing groups** table. Again, the **GSM outgoing group** is assigned to a GSM module in the **GSM groups assignment** table.

The LCR row is checked in this way until a free GSM/UMTS module is found. If no available GSM/UMTS module (**GSM outgoing groups**) is found, the call is rejected.

## Routing Algorithm for Outgoing Calls

The GSM/UMTS outgoing call routing algorithm is launched whenever the SIP Proxy / FXS routes an outgoing call to 2N<sup>®</sup> VoiceBlue MAX. Outgoing calls are routed via 2N<sup>®</sup> VoiceBlue MAX as follows:

- The calling subscriber dials the subscriber number and the SIP Proxy / FXS routes it to 2N<sup>®</sup> VoiceBlue MAX depending on the SIP Proxy / FXS settings.
- The number prefix is checked against the prefixes in the **List of networks** tables in the ascending sequence, i.e. table 1 is searched first, followed by table 2 and so on.
- When a matching prefix is found in a **List of networks**, the LCR is checked for a valid row. Again, the LCR is searched upwardly, starting from the first row.
- If a **List of networks** number matches a valid number on the respective row, the call time is checked against the routing rule. If no match is found, the next LCR row is checked.
- If the **List of networks** number and call time meet the routing rules, the call is routed to the module selected in the **Assignment to GSM groups** table according to the first routing rule included in the **Groups** section and given in the **GSM outgoing groups** table.
- Moreover, call duration limiting timer can be selected for the outgoing call.
- If the selected GSM/UMTS module is occupied or has a low credit, the algorithm returns to the preceding step but considers the next **Groups** row instead of the first one. If no record is found in this section, the next LCR row is used.
- If the selected GSM/UMTS module is available and has a sufficient credit, the GSM gateway will start dialling the GSM number.
- If the calling subscriber number has an unknown prefix or all routes are occupied, 2N<sup>®</sup> VoiceBlue MAX rejects the connection request.
- The outgoing call is not billed until the called party answers the call.
- The GSM network signals the call answering moment and the GSM gateway transfers this information to the SIP Proxy / FXS.
- It can be set for GSM outgoing calls that the calling subscriber should be sent the connection tone\* instead of a silence between the request sending to GSM and the ringing tone.

\* This option can be activated for TC35i, MC55i(i-w) modules.

## Routing Algorithm for Incoming Calls

Incoming calls are processed according to the **Mode** parameter setting in the **GSM incoming groups** table. The following options are available:

- **Reject/Ignore incoming calls** – incoming calls are not routed to the VoIP / FXS port. On the GSM side, the connection request is either rejected or ignored (the caller hears the check ringing tone).
- If the above mentioned option is not selected, the CLIP routing table is checked. If the calling number is found, it is checked for CallBack first. If the CallBack function is enabled for this number, 2N<sup>®</sup> VoiceBlue MAX will ignore the incoming call and set up a CallBack to GSM after the caller hangs up. If the AutoDial function is enabled for the calling number, the caller will be routed directly to the extension number entered in the AutoDial item. If both the CallBack and AutoDial functions are activated, 2N<sup>®</sup> VoiceBlue MAX will ignore the incoming call and set up a call to GSM after the caller hangs up. Simultaneously, a call to the VoIP extension will be set up and then the calls will be connected. If the CallBack function is enabled and the caller fails to hang up within 10 s, 2N<sup>®</sup> VoiceBlue MAX will try to set up a call according to the AutoDial settings.
- In case the CLIP routing function is disabled or the calling number is not included in the CLIP routing table, the Dynamic CLIP routing table is checked. If the calling number is found, the incoming call is routed directly to the corresponding extension. To set the Dynamic CLIP routing function use the **GSM incoming groups** menu.
- If the incoming call is still not processed, the gateway will receive the call and send either a voice message or the dialtone to the caller. After that, 2N<sup>®</sup> VoiceBlue MAX awaits the required count of digits necessary for connection set-up. Set the minimum and maximum counts of DTMF digits in the **GSM incoming groups** menu.
- If 2N<sup>®</sup> VoiceBlue MAX does not receive the minimum count of digits and no other digit comes within the timeout set in the **DTMF dialling timeout** parameter, the call is forwarded to the operator as if the called extension number were unknown.
- If call forwarding to the operator is inactive, the incoming call will be rejected.

## DISA Welcome Note

If the DISA service is active and a welcome note has been recorded, the welcome note is played to every incoming call whose number is not included in the CLIP table or forwarded according to the Dynamic CLIP routing table. When the welcome note has been played, the gateway waits for the first DTMF digit for the period set in the **GSM incoming groups - DTMF dialling timeout** table. Having received the count of digits included in the **GSM incoming groups Minimum count of DTMF digits** table, the gateway will set up connection to the SIP Proxy. Use the GSM gateway web interface to upload the DISA welcome note.



## 3.4 Web Configuration Interface

### Essential Data

The 2N<sup>®</sup> VoiceBlue MAX web interface supports the following web browsers:

- MS Internet Explorer v9
- Mozilla Firefox v4 and higher

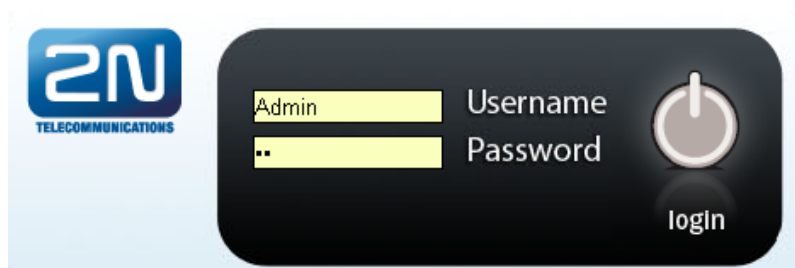
Any other web browsers may cause troubles. The recommended screen resolution is 1280x1024 and colour quality 32bit or higher. The configuration interface is available in the English language version only at present.

#### Tip

- Use the F11 key to activate the full-screen mode for better resolution.

### Login

For login to the 2N<sup>®</sup> VoiceBlue MAX web configuration interface, enter the server IP address into your web browser. The following login dialogue will get displayed.



Just one user may be logged in at a time. Refer to **Subs. 2.2** for details on the login factory settings.

#### Tip

- The user limitation applies to the web interface access only. The access to the Telnet interface is limited to ten simultaneous users.

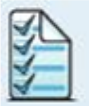





Auto logout in 7187 seconds (Refresh)

A three-minute login timeout is set automatically and recovered automatically upon every user activity on the web interface. After this timeout, the current user is logged out automatically. Click on the **Refresh** button to reset the maximum timeout value. Set the login timeout value in the **Gateway / Web configuration / Auto logout** section.

 **Caution**

- You are recommended to change the initial login data upon your first login to considerably increase your system security.

## Web Icons

Icon	Description
	Reset factory values
	Store current configuration into GSM gateway
	Restore previous GSM gateway configuration values
	Save onto local disk of connected terminal
	Refresh display data
	Confirmation (e.g. of configuration file storing to GSM gateway)

 **Caution**

- Push the **Save settings** button to save the changes. Otherwise you will **lose** the configuration changes after quitting the current configuration window!

## Home Page

Having logged in, you get to the **Gateway** home page as shown in the figure below. There is a menu on the left, which includes the Gateway control and Gateway configuration items. The right-hand upper corner displays the current state of the login timer and the **Refresh** button for automatic time limit refreshing.

The home page also includes the **Logout** button. You will be notified of successful logout after every logout action to avoid re-use of your login data.

There are four more sections in the right-hand upper menu:

- **SIM client** - for connection to the 2N<sup>®</sup> **SIM Star** system.
- **SMS** - for receiving/sending SMS via the web interface.
- **Messaging** - for receiving/sending SMS via SMPP or SMTP/POP3
- **Monitoring** - for gateway monitoring via SNMP
- **Utils** - including extending system tools (Network capture, Report capture).
- **Management** - for firmware update, license upload and configuration upload /download.

The main window displays information on the gateway licence status, firmware and bootware versions and the 2N<sup>®</sup> **VoiceBlue MAX** Ethernet interface MAC address. In addition, you can download a new licence here.

The screenshot shows the 'Firmware/Licence' page in the 2N VoiceBlue MAX web interface. The page is in Czech (CZ) and features a navigation menu with options like 'Brána', 'Zprávy', 'Monitoring', 'Nástroje', and 'Management'. A sidebar on the left lists various device management functions. The main content area is titled 'Firmware/Licence' and contains the following information:

Firmware/Licence	
<b>Firmware</b>	
Verze firmware :	1.17.0.20.3
Verze bootware:	1.20
<b>Ethernet</b>	
MAC adresa:	7C-1E-B3-00-8E-4F
<b>Informace o stavu SW licencí zařízení</b>	
Sériové číslo:	M204-5406360003
Povoleno:	FX G729 SIP TUN ME8 SMSU32 SMSS SMSE SNMP
Omezení licence:	368 hodin (bez limitu)
Stav licence:	Odemčeno
Automatická licence:	Ano
Omezení na síť operátora:	(žádné)

### 3.4.1 Gateway Control

This group helps:

- Monitor the current statuses of the GSM gateway components;
- Check and set the GSM gateway licence;
- View and save LOG files and CDR.

#### Firmware / Licence

This window provides information on the gateway licensing, firmware and bootware versions and Ethernet interface MAC address. A new licence code can be inserted here.

- Firmware version – current firmware version of the gateway connected.
- Bootware version – current bootware version of the gateway connected.
- MAC address – Ethernet interface MAC address of the gateway connected.
- CPU serial number – GSM gateway serial number in the format M204-xxxxxxxxxx
- Active: licensed protocols:
  - SIP – SIP support;
  - MEx – Mobility Extension support, 'x' gives the maximum count of users;
  - G729 – G.729ab voice codec support;

- TUN – GSM-CSD remote supervision support.
- SMSU – count of SMS users.
- SMSS – SMPP support.
- SMSE – SMS@email support.
- SMSW – SMS via web support.
- SNMP – SNMP monitoring support.
- Gateway limitation – gateway operation time (licence limitation if any).
- Licence status – current licence status (unblocked/blocked).

 **Caution**

- The licensed protocols will be blocked when the licence code has expired!

- Auto licence – current automatic licence status (No/Yes).

 **Caution**

- Auto licence is added via the 2N<sup>®</sup> SIMStar server.
- If the current **Licence status** is **blocked** during automatic licensing, 2N<sup>®</sup> VoiceBlue MAX will be restarted during licence adding.
- If the current **Licence status** is **unblocked** during automatic licensing, the Gateway limitation will be prolonged without 2N<sup>®</sup> VoiceBlue MAX restart.

- Networks – list of allowed/barred GSM/UMTS networks.

 **Tip**

- Upon the dealer's request, the gateway may contain blocking of certain GSM/UMTS networks. This state is indicated by a red shining LED. The GSM module diagnostic window displays the 'netw-err' status.
- Contact your dealer for more information please.

- Licence key for gateway – item for entering a new gateway connecting licence.

### **Caution**

- By entering a new licence code you restart the GSM gateway and discontinue all current calls!

## Date / Time

The Date / Time window enables you to set the current date and time for the gateway. Select the **Synchronise with local PC** item and the **Time** and **Date** items will be set automatically according to your PC data.

### **Caution**

- The internal back-up source is able to back up the internal clock source for a few hours only! Make sure that the gateway date and time values are correct after a long disconnection from the power supply!

## Voice Messages

This window is used for recording, checking and downloading voice messages. Supported format is PCM-Alaw, Mono, 8000 Hz, 8 bits.

Index	Type of message	Use	Max. length(s)
0	DISA message	Inc. calls from GSM/UMTS	64
1	ME"Hallo"	Mobility Extension calls	4
2	ME"Mobility extension"	Mobility Extension calls	4
3	ME"Please dial number"	Mobility Extension calls	4
4	ME"Text message"	Mobility Extension calls	4
5	ME"Activated"	Mobility Extension calls	4
6	ME"Deactivated"	Mobility Extension calls	4
7	ME"beep"	Mobility Extension calls	4

Index	Type of message	Use	Max. length(s)
8	ME"be,be,be"	Mobility Extension calls	4
21	GSM outgoing group 1	Calls via Out. GSM group 1	8
22	GSM outgoing group 2	Calls via Out. GSM group 2	8
23	GSM outgoing group 3	Calls via Out. GSM group 3	8
24	GSM outgoing group 4	Calls via Out. GSM group 4	8
25	GSM outgoing group 5	Calls via Out. GSM group 5	8
26	GSM outgoing group 6	Calls via Out. GSM group 6	8
27	GSM outgoing group 7	Calls via Out. GSM group 7	8
28	GSM outgoing group 8	Calls via Out. GSM group 8	8
30	Message 30	Voice message detector	8
31	Message 31	Voice message detector	8
32	Message 32	Voice message detector	8
33	Message 33	Voice message detector	8
34	Message 34	Voice message detector	8
35	Message 35	Voice message detector	8
36	Message 36	Voice message detector	8
37	Message 37	Voice message detector	8

You can choose which message will be uploaded or use detection by file name. Detection requires file name: "mess[index of message][optional remark].wav". You can upload more than one message in .tar file.

### Note

- Voice messages with indexes 30 - 37 are used for detection of the mobile provider's voice message played before call connection. If a match is found of the voice message with any of the voice messages recorded in the gateway, the call is terminated automatically or established via the last GSM outgoing group set in the LCR table (on condition that the ITD - Ignore tone detection in last group parameter is active) in the **Gateway Configuration / LCR table** section. Refer to the **Gateway Configuration / GSM basic parameters / Voice message detector settings** for details.

## LOG file

The LOG file window helps read out the gateway LOG file. The bottom part of the window includes icons for saving the LOG file into a file and refreshing the LOG listing in the web window.

date	time	event	text
** 5.01.00/19:01:23		POWER	[Warn boot]
** 5.01.00/18:40:17		POWER	[Warn boot]
** 2.01.00/19:11:26		POWER	[Warn boot]
** 2.01.00/01:12:27		POWER	[Warn boot]
** 2.01.00/01:12:19		BRDRES	SYSTEM RESET CMD
** 2.01.00/01:10:03		POWER	[Warn boot]
** 1.01.00/00:00:00		POWER	[Warn boot]
** 1.01.00/00:00:00		INIT	Clock has been lost

Refer to **Subs. 4.3** for more details.

## CDR File

The CDR file window helps read out the Call Data Records (CDR) of the gateway. The bottom part of the window includes icons for saving the CDR into a file and refreshing the CDR listing in the web window. Refer to **Subs 4.4**. CDR line description for more details on the CDR format.

### Caution

- The maximum capacity is 100,000 call records. When this limit is reached, the oldest record(s) will be deleted automatically!
- The latest 1,000 call records are displayed in the web interface.
- Downloading of a high amount of CDR may take up to several tens of seconds.



## SDR File

The SDR file window helps read out the SMS Data Records (SDR) of the gateway. The bottom part of the window includes icons for saving the SDR into a file and refreshing the SDR listing in the web window. Refer to **Subs 4.5**. SDR line description for more details on the SDR format.

### Caution

- The maximum capacity is 100,000 SMS records. When this limit is reached, the oldest record(s) will be deleted automatically!
- The latest 1,000 SMS records are displayed in the web interface.
- Downloading of a high amount of SDR may take up to several tens of seconds.

## Module status

This window displays the current status of each GSM/UMTS channel. Refer to **Subs. 4.6** for status details.

## Module control

This window helps you control the selected GSM/UMTS module manually.

## Statistics

The window displays the current statistics on calls. The bottom part of the window includes icons for saving the LOG file into a file and refreshing the CDR listing in the web window. Refer to **Subs. 4.7** for format information.

## Current call info

The window displays the currently made calls. The bottom part of the window includes icons for saving the LOG file into a file and refreshing the listing in the web window.

## Connection state

The window displays the states of all available configuration sessions. The bottom part of the window includes icons for saving the LOG file into a file and refreshing the listing in the web window.

## AutoCLIP routing table

The window displays the current state of the AutoCLIP table. The bottom part of the window includes icons for saving the LOG file into a file and refreshing the listing in the web window.

### Note

- The maximum AutoCLIP routing table capacity is 256 records.

## SIP registration

The window displays the current SIP registration state of the gateway.

## Online report

The window displays on-line gateway tracing.

## 3.4.2 Gateway Configuration

### System Parameters

#### General

- **Saving call data (CDR)** - select the call types on which records are to be saved into the CDR file.
- **Gateway ID** - identifies 2N<sup>®</sup> VoiceBlue MAX numerically in the CDR in case multiple devices generate the CDR in the network.

#### System Restart

- **Enable system restart** - enable/disable the feature.
- **Time of system restart [hh:mm]** - set the time for system restart.

### Note

- If there are active calls, restart will be executed 10 seconds after the end of the last call.

## Mobility Extension (DTMF settings)

- **Start dialling (quick call forwarding)** – DTMF code for quick forwarding start.
- **End dialling (quick call forwarding)** – DTMF code for quick forwarding end.
- **Hold call** – DTMF code for active call holding.
- **Hang up call** – DTMF code for call termination.
- **Follow me activation** – activation of the **Follow me** function. The GSM gateway starts routing call to the defined GSM/UMTS subscriber number. The default value is \*55.
- **Follow me deactivation** – deactivation of the **Follow me** function. The default value is #55.
- **SMS at no answer activation** – activation of the **SMS at no answer** function for a registered user. The default value is \*33.
- **SMS at no answer deactivation** – deactivation of the **SMS at no answer** function for a registered user. The default value is #33.

### Tip

- The **SMS at no answer** and **Follow me** functions can be enabled/disabled using the above mentioned DTMF codes by calling the GSM gateway from a registered mobile user phone. The values of these functions can be changed using the configuration interface too (see below).

## Others

- **PIN** – PIN code for the SIM cards that request the PIN code.

### Caution

- A SIM card with a PIN code other than that set in the GSM gateway configuration will be blocked with the 'pin-err' cause. To unblock the so-rejected SIM card, enter the correct PIN on your mobile phone!

- **End of dialling (empty=off)** – a selectable DTMF code for DTMF dialling end in the event of a DISA incoming call. The default value is '#'.

## VoIP Parameters

### VoIP functions

- **Day of deleting statistics on VoIP (every month)** – the day of automatic deletion of call statistics on the VoIP interface. None = no deletion.

- **Default number of digits to VoIP** – default length of called party number for outgoing calls from FXS to VoIP interface.

## SIP protocol settings

- **Use CLIP from INVITE field** – the CLIP as set in the **Contact** or **From** field will be used for routing calls into GSM/UMTS networks.
- **Send 180 ringing instead of 183 session progress.**
- **Send 200 OK instead of 180/183.**
- **Send 200 OK and BYE when rejected from GSM.**
- **Send 200 OK on REGISTER request** – virtual registration of the device in 2N<sup>®</sup> VoiceBlue MAX (necessary for registration-requiring equipment).
- **Replace CLIP from GSM with Caller ID.**
- **Deny DTMF according to RFC2833.**
- **Forward DTMF for ME (Mobility Extension).**
- **Use SIP over TCP for registration.**
- **Use SIP over TCP for calls.**

## SIP registration

- **Registration expires [s]** – the timeout after which the 2N<sup>®</sup> VoiceBlue MAX registration data expire at the SIP Proxy.
- **Reattempt registration [s]** – time interval for re-sending the request.
- **Registration domain (realm).**
- **Caller ID.**
- **Username** – registration data for the SIP Proxy.
- **Password** – registration data for the SIP Proxy.

## Voice parameters

- **First RTP port (even: 1024 – 65524)** – number of the first RTP port. The number must be even as recommended.
- **Last RTP port (even: first RTP+10 – 65534)** – number of the last RTP port. The number must be even as recommended. The recommended minimum range of RTP ports should be 10.

## Codec settings

- detailed codec settings (G.711a/u, or G.729).

## Codec priority

- preferential speech codec setting:
  - Priority 1
  - Priority 2
  - Priority 3

## IP addresses

- **SIP Proxy (IP / GSM)** – IP address of the SIP Proxy from which 2N<sup>®</sup> VoiceBlue MAX awaits the GSM outgoing call requirements.

### ✓ Tip

- In case you keep the default values (0.0.0.0), 2N<sup>®</sup> VoiceBlue MAX will receive requests from any IP address.

- **SIP Proxy (GSM / IP)** – IP address of the SIP Proxy to which 2N<sup>®</sup> VoiceBlue MAX turns in the case of a GSM incoming call.
- **SIP registrar** – IP address of the SIP registration server.

### ✓ Tip

- You can use the domain name **Registration domain (realm)** for the **SIP proxy (IP / GSM)**, **SIP proxy (GSM / IP)** and **SIP registrar** IP addresses on condition that you complete the domain name **Registration domain (realm)** and set the **DNS server address** properly in the **Web configuration / Ethernet configuration** section. The **SIP proxy** and **SIP registrar** IP addresses must be set to the default value (0.0.0.0).

- **NAT firewall** – IP address for the NAT firewall.

- **STUN server** - IP address of the STUN (Simple Traversal of UDP through NATs (Network Address Translation)) server for obtaining the public IP address under which 2N<sup>®</sup> VoiceBlue MAX operates in the Internet network. You are advised to fill in this field if 2N<sup>®</sup> VoiceBlue MAX operates in a private network separated from the Internet using the NAT or firewall. The default port for sending requests to STUN is 3478.
- **Next STUN request (60-6553, 0=off) [s]** - used for refreshing information on the public IP address of 2N<sup>®</sup> VoiceBlue MAX . By editing this item you can configure the frequency of queries sent to the STUN server.

#### Note

- In case the GSM gateway is located behind the NAT, make sure that the NAT router routing settings for the appropriate ports (SIP, RTP, STUN) are made. The integrated firewalls may affect VoIP calls too!

#### Tip

- Should there occur call errors (one-way audibility, connection errors, e. g.), check the settings of all active elements on the VoIP call route. To detect the problems quickly, you can test the Point-to-Point connection with a software IP phone (SJ phone, e.g.) in your PC and use tracing by means of a network analyser (WireShark - [www.wireshark.org](http://www.wireshark.org) e.g.) at the same time.
- Refer to **Subs. 4.2** for easy tracing through 2N<sup>®</sup> VoiceBlue MAX .

## Tones generated to VoIP

- **Ring tone to VoIP** - generate a ringing tone of your own, or transmit a real ringing tone from the GSM/UMTS networks.

## FXS Interface

### Profiles

- **Line impedance profile** - select right impedance of analogue line (according to region where is the gateway installed)

- **Ring profile** – select right type of ringing profile (pattern, voltage, frequency) – (according to region where is the gateway installed)
- **Tone profile** – select right type of ringing tone (according to region where is the gateway installed)
- **Call ID profile** – select right type of Call ID profile (FSK mode) – (according to region where is the gateway installed)

## Functions

- **Day of deleting statistics (every month)** – the day of automatic deletion of call statistics on the VoIP interface. None = no deletion
- **Tariff pulse type (metering)** – possibility to set-up metering pulses sending (Disabled/12kHz/16kHz)
- **FXS line selection for incoming calls** – selection of destination FXS line(s) in case of incoming calls from VoIP or wireless networks
- **DTMF detector during call enabled** – enables/disables DTMF detection during connected call

### **Caution**

- Internal CLIPs for FXS ports are: FXS0-100; FXS1-101; FXS2-102; FXS3-103

### Volume settings

- **Analog to digital gain [dB]** – Voice processing settings
- **Digital to analog gain [dB]** – Voice processing settings

## GSM Basic Parameters

### GSM selection

- Assignment of GSM-channel
  - Cyclical
  - Locked – peer to FXS channel
  - Smart – least used minutes
  - Smart – most remaining minutes
  - Linear – always first free module

 **Caution**

- The **Locked - peer to FXS channel** selection has a higher priority than the LCR table. All outgoing/incoming calls are locked in the GSM-FXS channel pair. The GSM channel is selected cyclically for outgoing VoIP calls.
- The **Smart - least used minutes** and **Smart - most remaining minutes** rules are useful where different limit settings are used for SMS.

## Count of digits dialled from VoIP

- **Minimum digits from VoIP** - minimum count of digits to be dialled into GSM.
- **Maximum digits from VoIP** - maximum count of digits to be dialled into GSM.
- **Wait for next digit [s]** - timeout during which 2N<sup>®</sup> VoiceBlue MAX awaits further digits dialled from VoIP to GSM.

 **Note**

- Number of digits dialled from FXS line is a parameter used for GSM/UMTS calling in case the **Port modes** is set to **Locked - according to used ASL**. For other **Port modes** options, the **Count of digits** set in the **Gateway configuration/ Prefixes** defines the maximum count of digits to be dialled.

## Calls

- **Relax timeout [s]** - time interval between the end of the last call and the beginning of the next call via one and the same GSM module (all incoming and outgoing calls are rejected during this timeout). The recommended value is 2 seconds. Do not change this setting unless absolutely necessary.
- **Timeout for ringing to GSM [s]** - ringing timeout for outgoing calls to GSM. If not answered or terminated within this timeout, the call will be terminated automatically by the gateway when this timeout elapses.
- **Source interface for Callback** - select the Callback source interface for Callback routing. The LCR table must include the appropriate outgoing traffic rule: if, for example, a VoIP port is the Callback source interface, routing from VoIP to GSM must be defined in the LCR.
- **Delay for fast Callback [s]** - set the delay between the Callback request and outgoing call if Auto end to Callback request is active.



## Bank holiday list

A list of dates to which the weekend routing mode should be applied in the LCR table.

## DTMF settings

The minimum delay between two identical DTMF characters received [s/100].

## Tone detector settings

The GSM gateway can automatically detect user defined tones sent by the GSM/UMTS network during call setup. In general, user defined tones are tones of the number to be transmitted. Having detected such tone, the GSM gateway terminates the call automatically and attempts to set it up through the next available outgoing group (as defined in the LCR table).

- **Frequency 1;2;3;4** - defined frequency of the tone to be detected.
- **Sequence list** - sequence of the above defined tones for detection.

## Voice message detector settings

- **Minimum percent to match** - set the match percentage range in which the voice message is detected as identical with one of the voice messages recorded in the **Gateway control/Voice messages** section under index 30-37. The recommended value is 70-90%.

## Cinterion Module Settings

- **Transmission volume [dB]** - set the module volume for the outgoing direction.
- **Reception volume [dB]** - set the module volume for the incoming direction
- **Enable connection tone** - enable the connection tone.
- **End call with SHUP** - end calls with the SHUP command.
- **Enable HR codec** - enable the Half Rate codec for the GSM network.
- **Enable AMR codec** - enable the Adaptive Multi-Rate codec for the GSM network.

## Wavecom Module Settings

- **Transmission volume [dB]** - set the module volume for the outgoing direction.
- **Reception volume [dB]** - set the module volume for the incoming direction
- **GSM-band selection** - select the GSM frequencies for the mobile network.
- **Echo cancelling** - enable/disable echo cancelling for the module.
- **Enable HR codec** - enable the Half Rate codec for the GSM network.
- **Enable AMR codec** - enable the Adaptive Multi-Rate codec for the GSM network.

## Telit Module Settings

- **Transmission volume [dB]** – set the module volume for the outgoing direction.
- **Reception volume [dB]** – set the module volume for the incoming direction
- **Type of used networks** – select the network types for the module to log in.
- **Automatic band selection** – enable the automatic mobile frequency band selection.
- **GSM-band selection** – select the GSM frequencies for the mobile network.
- **UMTS-band selection** – select the GUMTS frequencies for the mobile network.
- **Enable HR codec** – enable the Half Rate codec for the GSM network.
- **Enable AMR codec** – enable the Adaptive Multi-Rate codec for the GSM network.
- **Enable FR AMR Wideband codec** – enable the Full Rate Adaptive Multi-Rate codec for UMTS.
- **Enable UMTS AMR Version 2 codec** – enable the Full Rate Adaptive Multi-Rate version 2 codec for UMTS.
- **Enable UMTS AMR Wideband codec** – enable the Adaptive Multi-Rate WideBand for UMTS.
- **Enable echo canceller** – enable/disable echo cancelling for the module.
- **Enable noise reduction** – enable/disable noise reduction for the module.

### **Warning**

- The GSM/UMTS codec and noise reduction settings of the above listed module types may affect the DTMF detection quality. Make sure that the settings comply with the mobile network used.

## Audio level DSP

Here you can set the voice level for calls in the signal processor of the GSM gateway.

- **Output audio level DSP [dB]** – audio volume gain/loss to VoIP
- **Input audio level DSP [dB]** – audio volume gain/loss to GSM

### **Caution**

- An excessively high volume may deteriorate the voice quality (distortion, echo, etc.) and wrong DTMF detection!

## Tone generated for incoming calls from GSM/UMTS

- **Dialtone** - the dialtone type for GSM/UMTS incoming calls.
- **Ring tone** - the ringing tone type for GSM/UMTS incoming calls.
- **Generate busy tone to GSM/UMTS** - generation of the busy tone for call end.

### **Caution**

- If the **Generate busy tone** function is enabled, the length of the outgoing calls billed by the GSM/UMTS operator increases

## Error GSM/UMTS causes

- Here you can set the ISDN release cause for the states mentioned below. The call that meets the below mentioned requirements will be rejected with a user-defined cause (the ISDN cause number will be transformed into a SIP code for VoIP according to the table shown below).
  - **Lack of digits in OVERLAP mode** - the call will be rejected that fails to meet the minimum digits requirement.
  - **Restricted number prefix** - the call will be rejected whose prefix has not been found in any of the prefix lists.
  - **Selected module / GSM group is not ready** - the call will be rejected in case no GSM module is available in the LCR-selected GSM outgoing group.
  - **Selected module / GSM groups are not ready** - the call will be rejected in case no GSM module is available in the LCR-selected GSM outgoing groups.

## Cause translation

Here you can convert the release cause received from GSM/UMTS into another ISDN release cause. The resultant ISN cause number will be transformed into a VoIP SIP code as included in the table below:

Conversion table:

ISDN cause value	Description	SIP code	Description
1	Unallocated number	410	Gone
3	No route to destination	404	Not found

ISDN cause value	Description	SIP code	Description
6	Channel unacceptable	503	Service unavailable
16	Normal call clearing	BYE	
17	User busy	486	Busy here
18	No user responding	480	Temporarily unavail.
19	No answer from user	480	Temporarily unavail.
21	Call rejected	603	Decline
22	Number changed	410	Gone
27	Destination out of order	404	Not found
28	Address incomplete	484	Address incomplete
29	Facility rejected	501	Not implemented
31	Normal, unspecified	BYE	
34	No circuit available	503	Service unavailable
38	Network out of order	503	Service unavailable
41	Temporary failure	503	Service unavailable
42	Switching equipment congestion	503	Service unavailable
44	Requested facility not subscribed	503	Service unavailable
47	Resource unavailable	503	Service unavailable
50	Requested facility not subscribed	503	Service unavailable
55	Incoming class barred within CVG	603	Decline

ISDN cause value	Description	SIP code	Description
57	Bearer capability not authorised	501	Not implemented
58	Bearer cap, unavailable at present	503	Not implemented
63	Service or option unavailable	501	Service unavailable
65	Bearer cap, not implemented	501	Not implemented
79	Service or option not implemented	501	Not implemented
87	User not member of CVG	603	Decline
88	Incompatible destination	400	Bad request
98	Invalid message	400	Bad request
102	Recover on timer expiry	408	Request timeout
XXX	The other received CAU from netw.	500	Internal server error

## Causes of Failed Calls

Define the GSM failed call causes for the 2N<sup>®</sup> SIM Star Server. If you enter no record into the **Causes of failed calls** table, every non-connected call will be evaluated as a failed call.

## Others

- **Text of SMS at no answer** – edit the text of the SMS to be sent to the calling party in case of no answer (if the function is active). The %N string will insert the CLIP received from VoIP/FXS in the SMS text.
- **Text of SMS for all calls** – fill in this parameter to make the GSM gateway send an SMS message to every called subscriber regardless of whether or not the call was connected. The %N string inserts the CLIP received from VoIP into the SMS.
- **Save received SMS to** – select the storage for SMS received.
- **SIM card identification** – select the SIM IMSI/SCID for CDRs.
- **Disable CLIP from GSM/UMTS to VoIP/FXS** – enable/disable resending the CLIP from GSM to VoIP/FXS.

- **Reject call with CHLD** - reject incoming GSM/UMTS calls by means of AT+CHLD (user busy) instead of standard ATH.
- **Network registration timeout [min]** - set the timeout after which the module must log in. The login process will be restarted after this timeout.

## GSM Group Assignment

You can assign the GSM/UMTS modules to groups separately for incoming and outgoing calls. See the two items below for outgoing and incoming group settings.

## GSM Outgoing Groups

2N<sup>®</sup> VoiceBlue MAX allows you to work with two groups of outgoing calls for each of which you can set variable connection set-up modes and count of used minutes and sent SMS messages for a selected period.

## General settings

- **Delay for CONNECT [s]** - define a delay before sending information on the connected call after receipt from GSM.
- **Minimum ring duration to send SMS at no answer [s]** - set the minimum ringing time for an outgoing call to GSM/UMTS before the SMS at no answer is sent.

### Note

- The **SMS at no answer** function works properly only if the INVITE message contains the called and caller numbers.

- **Delay for ALERTING [a]** - define a delay before sending information on ringing start.
  - **off** - no Alerting message will be forwarded.
  - **real** - the Alerting message will be forwarded as soon as the gateway receives Alerting from the wireless network or ring tone detectors detect the alerting tone (if active).
  - **1-20** - the Alerting message will be automatically sent after a predefined number of seconds after the call is dialled into wireless network.
- **Minute parameter** - select whether or not the GSM gateway should record the call length or count for outgoing call restriction.
- **Day of deleting statistics in group (every month)** - define a day on which statistics on disconnected calls should be deleted.
- **Generate virtual ring tone** - enable/disable generation of the virtual ringing tone to the VoIP interface.

- **Call length counting** - select whether the call should be counted in seconds or minutes.
- **After call relax delay** - interval between the current call termination and next call setup via the same GSM/UMTS module. 2 seconds is recommended for high-traffic installations.

## Network settings

- **BTS lock** - identify the BTS to which the GSM modules shall log in. Restart the selected GSM modules to execute the changes.

### **Caution**

- The BTS lock service work with specific GSM modules only (Q55, Q24, HE910, GE910)!
- If you set a wrong BTS lock, the selected GSM module(s) will not log in to GSM.

- **Network operator code (MCC+MNC)** - set the local mobile network provider code manually. If you do not enter a value, the provider will be selected automatically.
- **Number of registration attempts** - set the count of network registration attempts if the network rejects to register the +CREG:3 SIM responses.
- **Delay after registration denied (1-600) [s]** - set the registration delay, i.e. the timeout within which the network may send another response after rejecting +CREG:3.
- **Timeout for registration (10-600) [s]** - set the maximum timeout for the module to wait for network login in the NWAIT mode.
- **Next try for registration (0=off, 1-720) [m]** - set the interval between relogging attempts.
- **Enable USIM and SIM Application Toolkit** - enable/disable the USIM and SIM Application Toolkit services for the Telit HE/GE 910 modules.

## Disconnect Call

Set the rules for automatic disconnection of outgoing calls to a wireless network.

- **SIM limit exceeded** - automatic call disconnection when the active SIM card call limit is exceeded.
- **Time limit exceeded** - automatic call disconnection when the active SIM card time of use is exhausted.
- **No ALERTING before CONNECT** - automatic call disconnection when the gateway receives the call connect message without alerting.

## Send CLIP from VoIP to GSM/UMTS

- Transfer CLIP to GSM/UMTS – enable/disable the function.
- Separating char – the CDN / CLIP separating character.
- Modify (" removes one digit) – you can change the CLIP. The "- character is used for deleting one char from the left.

### Caution

- The **Send CLIP from VoIP to GSM** service must be supported by the GSM /UMTS provider. If not, the provider's network may reject the call!

## GPRS activation

- APN string – define the Access Point Name (APN) for GPRS connectivity.

## Basic settings

- Roaming enabled for network code – set the international network identifier for roaming purposes consisting of the following two codes:
  - MCC – Mobile Country Code – country code (Czech Republic – 230);
  - MNC – Mobile Network Code – GSM code (T-Mobile – 01, 0202, Vodafone – 03).

Hence, the international identification code for T-Mobile CZ is 23001. Leave this field empty to disable roaming.

String	Note
<empty>	Roaming is disabled
2300	Roaming is disabled (5 digits is the minimum count)
23002	Roaming is enabled for networks with MCC+MNC code 23002
230XX	Roaming is enabled for networks with MCC+MNC codes 23000 – 23099
XX001	Roaming is enabled for networks with MCC+MNC codes 00001 – 99001
XXXXX	Roaming is enabled for any network



**Note**

- Check the GSM/UMTS searching priorities on the SIM card using your mobile phone before enabling roaming.

**Caution**

- Calls via a roaming network may increase your telephone bill!

- **CLIR** – fill in this parameter to define whether or not the called subscriber should be displayed the calling SIM card telephone number. It is recommended that the telephone number of the SIM card inserted in the GSM module should not be displayed to the called subscriber to avoid problems with CallBack from GSM.

**Caution**

- The **Temporary CLIP** and **Temporary CLIR** enable services must be supported by the GSM/UMTS provider. If not, the provider's network may reject the call!

- **Maximum count of called minutes** – set the maximum count of minutes to be used via the SIM card per month.
- **Count of SMS messages** – set the maximum count of SMS messages to be sent via the SIM card per month.
- Day to restore call limit and delete statistics – set the day in a month on which the statistics of the **Maximum count of called minutes** and **Count of SMS messages** parameters should be deleted.
- **First count** – set the length of the first pulse after which the pulse counting will be changed as set in the **Next count** parameter.
- **Next count** – set the length of one pulse in seconds after the time as defined in the **First count** parameter elapses.

**Note**

- A correct setting of the **First count** and **Next count** parameters guarantees a correct counting of remaining minutes on SIM cards. These parameters help limit outgoing calls according to free minutes. The CDR includes real data.

- **Day limit of called minutes** - set the maximum count of minutes to be called via the SIM card per day.

## Time limits

Define the SIM card use time limits for the GSM group.

**Call tariffs** - use this function to assign up to four independent free minute counters to each GSM module (SIM card) group:

- **Tariff 1** = free minutes for calls to own GSM/UMTS network
- **Tariff 2** = free minutes for calls to other GSM/UMTS networks
- **Tariff 3** = free minutes for calls to the PSTN
- **Tariff 4** = free minutes for calls within a closed user group (VPN).

Set the LCR table (assign prefixes to tariffs) correctly to ensure full functionality of this feature. If routing to a specific tariff is not applied in the LCR table, global free minutes will be used.

- **Free minutes** - count of free minutes for a specific tariff offered by the provider.
- **Transferred minutes** - maximum count of unused free minutes to be transferred to the next period.
- **Day of restoring free minutes** - day on which the free minute counters are to be reset automatically. Choose every 24 hours, a day in a month, or a day in a week for restoring.
- **Week of restoring free minutes in month** - define the week in which the free minute counters are to be reset automatically. This setting is useful when counter reset takes place on 'every other Friday in month'. Otherwise, leave the 'every' value.



### Caution

- We recommend you to set the free minute counter value to X-5, where X is the count of free minutes obtained from the GSM/UMTS provider to avoid limit excesses.
- The manufacturer is not liable for any additional call costs in case the GSM/UMTS provider's free minute/SMS limits are exceeded.

## GSM Incoming Groups

2N<sup>®</sup> VoiceBlue MAX allows you to work with two groups of incoming calls for each of which you can set variable connection set-up modes.

## General settings

- **Mode** - set how the gateway should process incoming GSM calls:
  - **Minimum digits in DTMF** - set the minimum count of digits to be required by the gateway for DTMF dial-in.
    - **Reject incoming calls** - all incoming GSM calls are automatically rejected.
    - **Ignore incoming calls** - all incoming GSM calls are ignored. The calling subscriber gets the check ringing tone.
    - **Accept incoming calls + voice message** - incoming GSM calls are received and, if preset so, the DTMF dial-in with a voice welcome note is activated.
    - **Accept incoming calls + dialtone** - incoming GSM calls are received and, if preset so, the DTMF dial-in function with a simulated secondary dialtone is activated.
    - **CallBack after ring / Reject** - in case the CallBack table includes the CLIP, a CallBack is made. CLIP-less incoming calls are rejected.
    - **CallBack after ring / Ignore** - in case the CallBack table includes the CLIP, a CallBack is made. CLIP-less incoming calls are ignored.
    - **Report to PC + voice message** - the GSM gateway sends information on incoming calls to a PC equipped with the call routing software. The DTMF dial-in with a voice welcome note can be activated for incoming calls.
    - **Report to PC + dialtone** - the GSM gateway sends information on incoming calls to a PC equipped with the call routing software. The DTMF dial-in with a simulated secondary dialtone can be activated for incoming calls.
- **Maximum digits in DTMF** - set the minimum count of digits to be accepted by the gateway for DTMF dial-in.
- **DTMF dialling timeout [s]** - set the time for the GSM gateway to wait for the first / next DTMF digits. If you set this parameter to 0, the incoming call is automatically connected to the numbers included in the **List of called numbers**.
- **Day of deleting GSM incl. group statistics** - define a day in a month on which the statistics on incoming calls should be deleted.
- **Prefix before DISA dial-in** - enter a numerical prefix to be automatically inserted before the DTMF dial-in.
- **CLIP** - use this parameter to modify the CLIP from GSM/UMTS networks. '+' is removed automatically from international identifiers. Use '-' to remove a digit. Examples (GSM CLIP +420600123456):

Parameter	CLIP to VoIP/PRI 1	Note
Null	420261301500	No CLIP change
+	+420261301500	+ inserted before CLIP received
00	00420261301500	00 inserted before CLIP received

-	0261301500	First two digits removed from CLIP received
---99	99261301500	First three digits removed from CLIP received, prefix '99' added

- **Looping of voice message** - set the voice message playing time.

## Send CLIP from GSM/UMTS to VoIP

- **Transfer CLIP from GSM/UMTS** - enable/disable the function.
- **Separating char** - enter the character to separate the calling SIM card CLIP and ID extension to be called.
- **Modify** - modify the ID extension.

### **Caution**

- The **Send CLIP from VoIP to GSM** service must be supported by the GSM /UMTS provider. If not, not, the provider's network may reject the call!

## Others

- **Time to keep CLIP in table** - set the time for which records are to be kept in the AutoCLIP routing table.
- **Add record only for unconnected call** - unconnected outgoing calls are stored in the AutoCLIP table only.
- **Delete record for connected answer** - if the CallBack is successful, the corresponding AutoCLIP record will be deleted.
- **Skip DTMF for numbers not in CLIP Routing table** - enable this function to define that only the incoming calls whose CLIPs are stored in the CLIP Routing table will be able to use DTMF dial-in. Make sure that the called number table includes one record at least to make the function work.
- **Skip list of called numbers after failed call to wanted number** - enable this function to define that the incoming call will not be forwarded to the number(s) included in the List of called numbers in case the call is rejected after the preceding DTMF dial-in.
- **Auto end to CallBack request** - any incoming call whose CLIP matches the CallBack setting will be rejected and all the other incoming calls will be ignored. In either case, the CallBack function will be invoked after the incoming call ends.

## List of called numbers

List of dialled numbers if DTMF dial-in was not used. Search the table from top to bottom. If the called user is inaccessible, use the following table record.

## Prefixes

The window helps you adapt the gateway to calling to variable GSM networks. You can set the prefix-based call routing rules here and identify up to sixteen different groups for routing.

## Prefix list 1-16

Sixteen prefix groups to be assigned in the LCR table.

## Basic settings

- **GSM network ID** - name the prefix list for convenience.
- **Default count of digits** - the default length of the number to be dialled into GSM/UMTS when routing via the selected prefix list. Use this parameter if the **Count of digits** parameter is not included in the **Table of accepted prefixes**.

### Note

- The number to be dialled to the GSM/UMTS network must meet the **Count of digits** condition.
- For **VoIP** calls, the count of digits to be dialled must be equal to or higher than the value set in the **Count of digits**.
- For calls via the **FXS** interface, the **Count of digits** defines the maximum count of the digits to be dialled.

## Table of replaced prefixes

This table helps you change the prefix of the number received (from 00 to +, e.g.). You can just add or remove a prefix using this table. This change is performed before the prefix table search is initiated. Keep the „/ „ record at least in the table for a proper function.

**Note**

- The maximum count of records in the **Table of replaced prefixes** is 14 for each prefixlist.
- The maximum table record size is 9 characters for the prefix and 9 characters for the replaced number.

**Table of accepted prefixes**

A list of prefixes of called destinations to which the selected prefix list applies.

**Note**

- The maximum count of records in the **Table of accepted prefixes** is 138 for each prefixlist.
- The maximum table record size is 9 characters.

**LCR Table**

The Least Cost Routing (LCR) table helps you route calls according to the called party number, time and days in a week.

- **From (channels/groups)** - source channels or groups via which calls are routed to 2N<sup>®</sup> VoiceBlue MAX.
  - **GSM ALL** - any of the GSM incoming groups can be used for call routing.
  - **GSM GRP1-4** - define one GSM incoming group or a range of GSM incoming groups via which call routing will be enabled.
  - **FXS (pxx,P)** - any of the FXS channels can be used for call routing.
  - **FXS (p1-4)** - define one FXS channel or a range of FXS channels via which call routing will be enabled.
  - **VoIP (vxx,V)** - calls are routed via the VoIP interface.
- **Prefix list** - prefixes to be used for a selected LCR row. Set up to 16 prefix lists.
  - **Prefixlist 1-16** - call routing will obey the rules set in Prefix list 1-16. The count of digits to be dialled is governed by the **Prefixes** setting.
  - **All prefixes** - all the prefix lists are permitted. Prefix lists 1-16 will be searched from 1 to 16. The first match will be used routing. For incoming GSM calls, the Count of digits from the **GSM incoming group** parameter will be applied.

- **Count of digits** – all the prefixes are permitted. Routing is only limited by the count of digits to be dialled.
- **Time limitation** – time validity limitation for a selected LCR row.
- **Weekend usage** – enable/disable a row on weekends.
- **Call duration limit** – set the maximum duration (minutes) for an outgoing call to the GSM/UMTS network.
- **Groups** – outgoing GSM groups or interface via which outgoing calls will be routed from 2N<sup>®</sup> VoiceBlue MAX. If the defined interface is inactive or the outgoing GSM group tariff is exhausted, the next row will be applied.
  - **GSM groups 1-4** – outgoing GSM groups. Set the tariff to be used. Refer to the GSM outgoing groups subsection for details.
  - **FXS (P)** – analogue FXS interface. Refer to the **FXS interface** subsection for details.
  - **VoIP (V)** – VoIP interface. Refer to the **VoIP parameters** subsection for details.
- **Tariffs** – select the tariff group (free minute counter) to be used for the outgoing call. Refer to the GSM outgoing groups subsection for details.
- **Ignore tone detection in last group** – having detected a user defined tone (refer to GSM basic settings), the GSM gateway automatically terminates the call and seeks for another call setup way. If this parameter is activated, the GSM gateway ignores the tone detection results and sets up a call when this is the only possible call establishing way.

#### **Note**

- If you use tariff routing, set the tariffs properly in the GSM outgoing groups subsection.
- The maximum count of LCR table records is 64.
- The rules are applied to calls sequentially, starting from the first rule. If all the set rules are met in a row, the call is routed according to the row.
- Call routing from FXS/FXS and VoIP/VoIP is not supported. Such calls will be rejected by 2N<sup>®</sup> VoiceBlue MAX.

## **CLIP Routing Table + CallBack**

The table permanently assigns CLIPs to the extensions to which incoming calls are to be routed automatically and set the CLIP list for the GSM network for which the CallBack function is enabled.

- **GSM number (CLIP)** – user Id in GSM/UMTS.
- **Used service**

- **Autodial** – enable/disable CLIP routing for the selected CLIP.
- **Reject call** – reject call for the selected CLIP.
- **Ignore call** – ignore call for the selected CLIP.
- **Tone dial-in** – incoming GSM calls is accepted + dialtone is activated for the selected CLIP.
- **DISA message dial-in** – incoming GSM calls is accepted + voice message is activated for the selected CLIP.
- **Dial to VoIP/FXS** – VoIP destination number for the CLIP routing function.
- **Auto CallBack** – enable/disable the CallBack function for the selected CLIP according to the **Gateway configuration / GSM basic settings / Calls / Source interface for CallBack** setting.
- **Call duration limit** – set the maximum call duration (minutes).

 **Tip**

- CallBack detects the CLIP from right to left. Thus, configure 10 rules for all the incoming CLIPs to make CallBack work properly. Each of the rules must contain one of the CLIPs: 0,1,2,3,4,5,6,7,8,9.

 **Note**

- Remember to activate the CallBack mode in the **GSM incoming groups** window for a proper CallBack function.
- The maximum count of CLIP routing table records is 96.

## Mobility Extension

The table registers the Mobility Extension users.

- **Name** – enter the user name for calling to VoIP.
- **User** – enter the registration user name for VoIP.
- **Password** – enter the registration user password for VoIP.
- **GSM number (CLIP)** – enter the user SIM card CLIP.
- **Follow me function** – enable/disable call forwarding to a mobile user station (based on CLIP).
- **SMS at no answer function** – enable/disable sending of information SMS on missed calls.



**Note**

- You are recommended to read the Mobility Extension section on page carefully before using the Mobility Extension function.

## Ethernet Configuration

This window helps you configure the Ethernet interface of your gateway.

- **Use DHCP** - enable/disable the DHCP client function in 2N<sup>®</sup> VoiceBlue MAX .
- **IP address** - the fixed IP address (v4) of the 2N<sup>®</sup> VoiceBlue MAX Ethernet interface.
- **Subnet mask** - the subnet mask for the 2N<sup>®</sup> VoiceBlue MAX Ethernet interface.
- **Default gateway** - The IP gateway IP address (v4) in the Ethernet network.
- **DNS server1** - primary DNS server.
- **DNS server2** - secondary DNS server. Used as a back-up when DNS server 1 is not functional.

**Caution**

- Incorrect settings, e.g. enabling the **DHCP client** service, may result in a denial of access to the 2N<sup>®</sup> VoiceBlue MAX configuration. To avoid this, restore the GSM gateway default settings. Refer to **Subs. 3.1** for details.

**Tip**

- In case the gateway is in the DHCP client mode, current assignments obtained from the DHCP server are displayed in the **IP address**, **Subnet mask** and **Default gateway** items.

## Login Configuration

The window helps you set the access password and name for the 2N<sup>®</sup> VoiceBlue MAX web interface. Use the same data for Telnet connection too.

### Caution

- Remember to **change** the username and password **during** the first gateway configuration to avoid unauthorised access!

### Note

- The username and password may have up to 30 characters in total.

## Web Configuration

Set additional parameters for the gateway web interface.

- **Auto logout** - set the count of minutes in which the current user should be logged out automatically.
- **Enable web session lock** - by default, one Admin user may only be connected to the GSM gateway at a moment. If another authorised user tries to log in, the previous session will be aborted automatically. By activating this function you disable such automatic logout and block any further access attempts.
- **Simple login form** - here you can change the login window graphic lay-out. Upon activation, the GSM gateway login page will have an anonymous appearance. This function is recommended for connecting the gateway to the Internet directly.
- **Use SMS user for SMS operations on the web** - enable/disable the user authorised for SMS sending/receiving only.
- **SMS user name/password** - the gateway enables independent connection of a user authorised for SMS receiving/sending only.

## Report Configuration

This window is used for setting details on automatic tracing generated by the GSM gateway.

## Time Synchronisation

Set the NTP server time synchronisation.

## General

- **Type** - enable/disable synchronisation.
- **Ntp server** - NTP server address and port.
- **Timezone** - set the time change from UTC.

## Summer/Winter Time

- **Automatically switch to summer/winter time** - enable/disable automatic winter /summer time transition.
- **Switch to summer time** - set the summer time transition date and time.
- **Switch to winter time** - set the winter time transition date and time.

### 3.4.3 Messaging

This group helps:

- Set the GSM gateway to send/receive SMS via SMTP/POP3 or SMPP
- Define the routing rules for incoming and outgoing SMS messages
- Check the GSM gateway SMS database filling capacity

#### **Caution**

- This service is file-licensed. Refer to **Management / Licence key** for the current GSM gateway licence details.

## Modules Grouping

### Global settings

- **SMS server enabled** - enable/disable the SMS server at the GSM gateway (keep disabled if you select another SMS processing method).
- **AutoCLIP routing expires [hours] (1-10000, 0=off)** - set the maximum time for keeping of the automatic SMS routing record (response) in the AutoCLIP table.
- **Not sent SMS expires in [hours] (1-10000, 0=off)** - delete an SMS in case it was not sent within the timeout.
- **Received SMS expires in [hours] (1-10000, 0=off)** - delete a received SMS in case it was not delivered to the e-mail / SMPP user within the timeout.
- **Delivery Report expires in [hours] (1-10000, 0=off)** - delete an SMS waiting for delivery report and make an error record in the SDR table in case no delivery report arrives within the set period of time.
- **Waiting for delivery expires in [minutes] (1-10000, 0=off)** - set the maximum delivery waiting time.

- 
- **Delay for change of SIM in [seconds] (0-120)** - set the time during which the currently blocked SIM stays logged in (IDLE), ready to receive SMS/deliveries.

### **Caution**

- **0=off** means disabled expiry, i.e. records are saved into the AutoCLIP routing table for an indefinite period of time. Therefore, make sure that the routing priorities are set properly for incoming SMS. Refer to **Incoming SMS routing** for details.

## Detection of Delivery Report

- **Number of digits (1-20) from the right** – set a count of digits to be detected from the SMS text end in the case of positive evaluation according to Begin of text of received SMS. The found number is compared with the addressees of the outgoing messages.
- **Begin of text of received SMS** – any SMS whose text beginning matches this parameter is evaluated as a delivery report.

### **Note**

- If multiple SMS are sent to one and the same number, delivery reports are assigned to them according to the sending time, starting from the oldest one.

## Modules to SMS groups assignment

This section helps you assign GSM modules to SMS groups (according to the GSM provider, e.g.) to facilitate incoming/outgoing SMS routing.

## SMS groups to User groups assignment

This section helps you assign SMS groups to User groups for SMS sending/receiving purposes. The GSM gateway can contain up to four User groups.

**Modules to SMS groups assignment**

Module:	0	1	2	3
SMS group:	0 ▼	0 ▼	0 ▼	0 ▼

**SMS groups to User groups assignment**

SMS group:	0	1	2	3
User group:	1 ▼	1 ▼	1 ▼	1 ▼

**⚠ Caution**

- The count of user accounts is file-licensed. Refer to **Management / Licence key** for the current GSM gateway licence details.

## Users

This section helps you manage the SMS users. Select a communication protocol for user adding (SMTP/POP3 or SMPP).

### Add user

- **User group** – assign the user to a User group.
- **User full name** – define the system user name.
- **Replace dial for outgoing SMS** – define the number (CPN) to which the user's outgoing SMS messages shall be sent.
- **Access type** – select the communication protocol for SMS processing:
- **Login name (without domain)** – define the login name for the client Email.
  - **Email (SMTP/POP3)** – use SMTP for SMS sending and POP3 for SMS receiving.
  - **SMPP (SMSC)** – set the GSM gateway into the 'SMS centre' mode.
  - **SMPP (ESME)** – set the GSM gateway into the 'ESME – External Short Messaging Entity' mode.
  - **Web** – define an account for sending SMS via the SMS web interface.
- **System ID** – SMSC user ID.
- **Password** – SMSC/SMTP user password.
- **System ID (for authentication on remote side)** – ESME user ID.
- **Password (for authentication on remote side)** – ESME user ID.
- **TCP type** – set the TCP parameter into the client/server mode.
- **Server address** – set the server IP address and TCP server transport port.
- **Message direction of Esme** – set the ESME user details:
  - **Transceiver** – ESME works as a transmitter/receiver.
  - **Transmitter** – ESME works as a transmitter.
  - **Receiver** – ESME works as a receiver.
- **Address range** – set this parameter if required so by SMSC for SMS receiving .
- **SMPP timeout** – set the EnquireLink timeout for active connection keeping.
- **Delivery status required** – set the SMS sending request for outgoing SMS delivery confirmation .

- **Send message as Flash SMS** – activate the Flash SMS function for outgoing SMS messages.

### **Note**

- You can set the **Delivery status required** parameter only if the SMTP /POP3 protocol is used.
- With SMPP, the delivery information is active automatically in case the service is required by the SMPP counterparty or via an incoming SMS message from the GSM/UMTS network.
- The user count is licence-limited. The highest possible count of licensed users is 200. Refer to **Management / Licence key** for the current GSM gateway licence details.
- The maximum count of SMPP user accounts is 32. With the Email/Web user accounts, the maximum count is 200 as specified in the licence.

**Add record**

User group:	1
User full name:	
Replace dial for outgoing SMS:	
Access type:	SMPP (ESME)
Login name (without domain):	
System ID:	
Password:	
System ID (for authentication on remote side):	
Password (for authentication on remote side):	
Tcp type:	Server
Server address:	0.0.0.0 : 2775
Message direction of Esme:	Transceiver
Address range:	
Delivery status required:	<input type="checkbox"/>
Send messages as Flash SMS:	<input type="checkbox"/>

Ok Cancel

## **User Group**

This section helps you edit the User group and set the routing rules for the group's incoming and outgoing SMS.

## **General settings**

Set the basic parameters for SMS sending via SMTP/POP3 or SMPP.

## Optional informations

- **Description** – set the User group details
- **Identical SMS limit** – set the check of identical SMS messages, i.e. sequentially sent messages with identical SMS PDUs. When the set limit is exceeded, the excessive SMS messages are discarded without being sent.

## Email settings

- **Domain** – define the domain name for SMS sending/receiving via SMTP/POP3. The maximum domain length is 63 characters.
- **POP3 – Subject of email** – set the message subject to be added automatically to the SMS loaded from the GSM gateway via POP3.
- **POP3 – Subject of email (delivery acknowledgement)** – set the SMS delivery acknowledging message subject.
- **POP3 – Subject of email (not delivered)** – set the SMS non-delivery acknowledging message subject.
- **POP3 – Subject of email (send error)** – set the SMS sending failure message subject.

### Tip

- The following options are available for subject modification:
  - %% – Insert the "%" character
  - %n – CLIP number
  - %u – Login name
  - %f – User full name
  - %d – Date and time
  - %s – SIM IMSI
  - %m – Module
  - %g – Group

- **SMTP – Maximum SMS per email** – set the maximum count of SMS messages to be sent within one Email message. Any characters exceeding the set length will be ignored.
- **SMTP – Add "From" to SMS** – add 'From' from the Email message to the outgoing SMS. The sender information will be displayed at the beginning of the SMS message.
- **SMTP – Add "Subject" to SMS** – add 'Subject' from the Email message to the outgoing SMS. The subject information will be displayed at the beginning of the SMS message.



**Optional informations**

Description:

Identical SMS limit:

**Email settings**

Domain:

POP3 - Subject of email:

POP3 - Subject of email (delivery acknowledgement):

POP3 - Subject of email (not delivered):

POP3 - Subject of email (send error):

SMTP - Maximum SMS per email:

SMTP - Add "From" to SMS:

SMTP - Add "Subject" to SMS:

## SMPP address modification

- **Source address of message incoming from SMPP** – set how to modify the message sender ID received via SMPP.
  - **Never replace original address**
  - **Replace if the original address is empty**
  - **Always replace original address**
  - **address** – enter sender's new ID
  - **TON** – type of number
  - **NPI** – numbering plan indicator
- **Destination address of message incoming from SMPP** – set how to modify the message addressee telephone number received via SMPP.
  - **Never replace original address**
  - **Replace if the original address is empty**
  - **Always replace original address**
  - **address** – enter addressee's new telephone number
  - **TON** – type of number
  - **NPI** – numbering plan indicator
- **Source address of message outgoing to SMPP** – set how to modify the message sender ID to be sent via SMPP.
  - **Never replace original address**
  - **Replace if the original address is empty**
  - **Always replace original address**
  - **address** – enter sender's new ID
  - **TON** – type of number
  - **NPI** – numbering plan indicator

- **Destination address of message outgoing to SMPP** – set how to modify the message addressee telephone number to be sent via SMPP.
  - **Never replace original address**
  - **Replace if the original address is empty**
  - **Always replace original address**
- **address** – enter addressee's new telephone number
- **TON** – type of number
- **NPI** – numbering plan indicator

## Incoming SMS routing

This section helps you set the incoming SMS routing rules, which are included in the incoming SMS routing table.

### Add record

- **Disabled** – enable/disable the selected routing rule.
- **Message from SMS group** – select the SMS group that receives the SMS.
- **Action type** – select the action for the received SMS:
  - **Autoclip routing** – the incoming SMS will be routed according to the AutoCLIP table records.
  - **Deliver to user** – the SMS will be delivered to the selected user.
  - **Drop message** – the SMS will be dropped.
- **Deliver to user** – select the SMS addressee. This option is valid only if **Action type = Deliver to user** is selected.
- **Time limitation** – set the rule validity time.
- **Days limitation** – set the days in a week on which the rule shall be valid.
- **Clip mask** – set the filter for the SMS sender telephone number (CLIP). If the selected mask matches the CLIP, the SMS will be routed according to the rules set above. If not, the SMS will be dropped. The \* character replaces any string of characters (789789789=789\*, e.g.). The ? character replaces any character (789789789=789??????, e.g.).
- **Text begin** – set the string to be matched against the SMS text beginning. If a match is found, the SMS will be routed according to the rules set above.

### **Note**

- The rules are applied to incoming SMS sequentially, starting from the first rule. If all the set rules are met in a row, the SMS is routed according to the row.
- Sending SMS depends on the outgoing routing rules set in **Messaging / User group / Outgoing SMS routing** and limits defined in **Gateway / Gateway configuration / GSM outgoing group**. When the limits get exhausted, the SMS will be stored in the outgoing SMS database until the set limits are restored.

**Incoming SMS routing**

**Add record**

Disabled:

Message from SMS group:

Action type:

Deliver to user:

Time limitation: 00 : 00 - 24 : 00

Days limitation: Mo Tu We Th Fr Sa Su

Clip mask:

Text begin:

Ok Cancel

## **Outgoing SMS routing**

This section helps you define the outgoing SMS routing rules, which are included in the outgoing SMS routing table.

### **Add record**

- **Disabled** - enable/disable the selected routing rule.
- **Message to SMS group** - select the SMS group via which the SMS will be sent.
- **Action type** - select the action for the outgoing SMS: **Submit from user** - select the user in case **Action type = Submit from user** is selected.
  - **Submit from user** - enable sending SMS from the selected user.
  - **Submit from all users** - enable sending SMS from all the SMS group users.
- **Time limitation** - set the rule validity time.
- **Days limitation** - set the days in a week on which the rule shall be valid.

- **Dial mask** – set the filter for the SMS addressee telephone number (Dial). If the selected mask matches the Dial, the SMS will be routed according to the rules set above. If not, the SMS will be rejected and deleted. The \* character replaces any string of characters (789789789 = 789\*, e.g.). The ? character replaces any character (789789789 = 789??????, e.g.).
- **Text begin** – set the string to be matched against the SMS text beginning. If a match is found, the SMS will be routed according to the rules set above.

### **Note**

- The rules are applied to outgoing SMS sequentially, starting from the first rule. If all the set rules are met in a row, the SMS is routed according to the row.

## Outgoing SMS routing

**Add record**

Disabled:

Message to SMS group:

Action type:

Submit from user:

Time limitation:  :  -  :

Days limitation:  Mo  Tu  We  Th  Fr  Sa  Su

Dial mask:

Text begin:

## Control

This section helps you monitor the system. It includes storage filling information and AutoCLIP records.

## SMS queues

The subsection displays the current SMS storage state.

## Incoming SMS database

The subsection displays current information on the incoming SMS storage filling percentage and maximum count of incoming storage records.

### **Caution**

- The POP3 protocol enables you to set how long a copy of the loaded message shall be kept in the SMS server. The SMS keeping time depends on your e-mail client setting. Make sure that you have chosen a correct time value to avoid database overfilling. When the storage has been filled up, no new SMS messages will be received!

## Outgoing SMS database

The subsection displays current information on the outgoing SMS storage filling percentage and maximum count of outgoing storage records.

## User table

The table shows the count of incoming and outgoing SMS stored in the above-mentioned databases from the user's point of view and helps you delete the SMS stored.

User table					
Index	User	Incoming SMS count		Outgoing SMS count	
0	[0] User	0 / 0 / 0 / 0	Erase	0 / 0 / 0	Erase

User table items:

- **Incoming SMS count** - Received / Ack OK / Ack error / Failed
  - **Received** - count of received common SMS messages
  - **Ack OK** - count of SMS delivery acknowledging messages
  - **Ack error** - count of SMS non-delivery acknowledging messages
  - **Failed** - count of SMS sending failure messages (failed due to network error, invalid number, etc.)
- **Outgoing SMS count** - Waiting / Sending / Sent
  - **Waiting** - count of waiting SMS messages
  - **Sending** - count of currently sent SMS messages
  - **Sent** - count of sent SMS messages waiting for delivery acknowledgement
  - **Not complete** - count of long incomplete SMS waiting for more parts from SMPP.

**Note**

- If the GSM network shows a temporary error or unavailability, short SMS are sent three times and long (multipart) SMS five times. If none of the SMS sending attempts is successful, the SMS will be deleted from the outgoing SMS database and an **Incoming SMS count - Failed** message is generated by the gateway.

## AutoCLIP routing table

The window displays the current state of the AutoCLIP table.

## Send SMS

This section includes a web interface for SMS sending via the available user accounts. Sending SMS depends on the outgoing routing rules set in **Messaging / User group / Outgoing SMS routing** and limits defined in **Gateway / Gateway configuration / GSM outgoing group**.

- **User** - select the user account for SMS sending.
- **Phone number** - enter the SMS recipient's phone number.
- **Message** - enter the SMS text to be sent.

**Note**

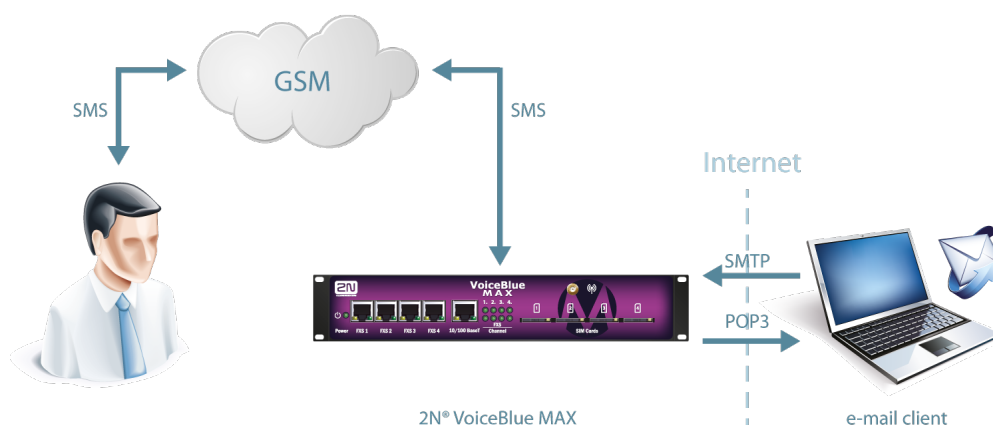
- The maximum message length is 10 SMS. The message can use 7-bit encoding (up to 1520 characters) or 16-bit encoding (up to 670 characters).

### 3.4.3.1 SMTP/POP3 Basic Configuration - Step by Step

This section helps you define the 2N<sup>®</sup> VoiceBlue MAX basic parameters for SMS sending/receiving via SMTP/POP3. Read the **Messaging** subsection carefully before setting details.

**Figure 1** shows sending/receiving SMS via SMTP/POP3. Having created user accounts in 2N<sup>®</sup> VoiceBlue MAX, the users can access the accounts via the e-mail client and send SMS messages to 2N<sup>®</sup> VoiceBlue MAX via SMTP. The gateway receives the messages and resends them to the GSM users according to the predefined routing rules.

A message coming to 2N<sup>®</sup> VoiceBlue MAX from GSM is routed according to the incoming SMS rules and delivered to the user via POP3.



SMTP/POP3 Communication

#### Note

- You can send an SMS message of any length to up to 100 users at the same time from the e-mail client. The maximum SMS count per e-mail is only limited by the **User group / General settings SMTP / Maximum SMS per email** settings.

Take the following basic steps in 2N<sup>®</sup> VoiceBlue MAX to enable SMS sending /receiving:

1. In the **Messaging / SMS grouping** menu:
  - a. Assign the selected GSM modules to the SMS groups (according to the GSM provider and SIM cards with identical tariffs, for example).
  - b. Assign the SMS groups created in step 1.a above to the User groups if you use messaging with different routing rules to different company departments, for example.
2. Add users in the **Messaging / Users / Add** menu:
  - a. Assign the user to a **User group**.
  - b. Set **Access type: Email(SMTP/POP3)**.
  - c. Define the **Login name (without domain)** and **Password** to log in to the SMS server via your e-mail client.
3. Set the Domain in the **Messaging / User Group / General settings / Email settings / Domain** menu.
  - a. Set the user domain. The domain is automatically assigned to the user name in the selected User group and represents the user e-mail address. Example: Suppose a user was created in step 2.c with **Login name: USER** and domain **Domain: email.com**, then the e-mail address of the user with the right to access the SMS server will be **USER@email.com**. The @ character is completed automatically and is not included in the Domain: field.
4. Create the incoming SMS routing rules in the **Messaging / User Group / General settings / Incoming SMS routing / Add** menu:
  - a. Select the group to receive the SMS via the **Message from SMS group**.
  - b. Select the **Action type** to define how to process incoming SMS. Example: Set **Action type: Deliver to user** to deliver SMS to selected users.
  - c. Set **Deliver to user** to define the SMS receiving user.
5. Create the outgoing SMS routing rules in the **Messaging / User Group / General settings / Outgoing SMS routing / Add** menu: Enable the SMS server in the **Messaging / Modules grouping / SMS server enabled** menu.
  - a. Set the **SMS group** via which the outgoing SMS will be routed in the **Message to SMS group** menu.
  - b. Select the **Action type** to define how to process outgoing SMS. Example: Set **Action type: Submit from user** to send SMS from selected users.
  - c. Set **Submit from user** to define the SMS sending user.



Should you get in troubles, follow the steps below please:

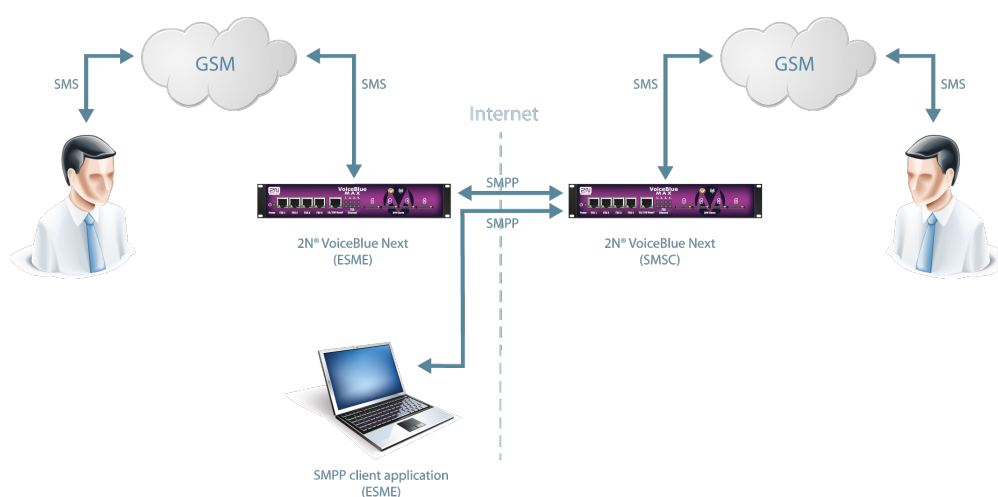
- Read the User Manual carefully and check all parameters.
- Find answers to the frequently asked questions at <http://faq.2n.cz>.
- Consult your servicing partner.

You are recommended to attend a 2N certified training to improve your installation chances.

### 3.4.3.2 SMPP Basic Configuration - Step by Step

This section helps you define the basic parameters for SMS sending/receiving via SMPP in 2N<sup>®</sup> VoiceBlue MAX. Read the **Messaging** subsection carefully before setting details.

Figure 1 shows sending/receiving SMS via SMPP. Having created user accounts in 2N<sup>®</sup> VoiceBlue MAX, the users can send/receive SMS via SMPP. The figure shows an example with two SMSC accounts created in 2N<sup>®</sup> VoiceBlue MAX (to the right). Another 2N<sup>®</sup> VoiceBlue MAX (ESME) gateway and a PC on which the SMPP (ESME) application is running are connected to these accounts via SMPP. An SMS coming to 2N<sup>®</sup> VoiceBlue MAX via SMPP is routed according to the gateway outgoing routing rules and sent to GSM. An SMS coming from GSM is routed according to the gateway incoming routing rules and sent to the destination via SMPP.



SMPP Communication

 **Note**

- You can send an SMS message of any length to up to 100 users at the same time from the e-mail client. The maximum SMS count per e-mail is only limited by the **User group / General settings SMTP / Maximum SMS per email** settings.

Take the following basic steps in 2N<sup>®</sup> VoiceBlue MAX to enable SMS sending /receiving:

1. In the **Messaging / SMS grouping** menu:
  - a. Assign the selected GSM modules to the SMS groups (according to the GSM provider and SIM cards with identical tariffs, for example).
  - b. Assign the SMS groups created in step 1.a above to the User groups if you use messaging with different routing rules to different company departments, for example.
2. Add users in the **Messaging / Users / Add** menu:
  - a. Assign the user to a **User group**.
  - b. Set **Access type: SMPP (SMSC)**.
  - c. Set **System ID** and **Password** to access the GSM gateway SMS server via ESME.
  - d. Set **TCP type: server**.
3. Create the incoming SMS routing rules in the **Messaging / User Group / General settings / Incoming SMS routing / Add** menu:
  - a. Select the group to receive the SMS via the **Message from SMS group** menu.
  - b. Select the **Action type** to define how to process incoming SMS. Example: Set **Action type: Deliver to user** to deliver SMS to selected users.
  - c. Set **Deliver to user** to define the SMS receiving user.
4. Create the outgoing SMS routing rules in the **Messaging / User Group / General settings / Outgoing SMS routing / Add** menu: Enable the SMS server in the **Messaging / Modules grouping / SMS server enabled** menu.
  - a. Set the **SMS group** via which the outgoing SMS will be routed in the **Message to SMS group** menu.
  - b. Select the **Action type** to define how to process outgoing SMS. Example: Set **Action type: Submit from user** to send SMS from selected users.

- c. Set **Submit from user** to define the SMS sending user.

Should you get in troubles, follow the steps below please:

- Read the User Manual carefully and check all parameters.
- Find answers to the frequently asked questions at <http://faq.2n.cz>.
- Consult your servicing partner.

You are recommended to attend a 2N certified training to improve your installation chances.

### 3.4.4 Monitoring

This section helps you configure sending of SNMP requests and traps. Download the list of available requests and traps, i.e. the MIB table, from the gateway web interface. The main purpose of SNMP monitoring is to observe your GSM gateway states continuously and send state information to the defined IP addresses whenever an error occurs.

Refer to the **List of SNMP traps** for the list of all SNMP traps sent by 2N<sup>®</sup> VoiceBlue MAX.

#### **Caution**

- This service is subject to licence! Refer to **Management / Licence key** for the current GSM gateway licence state details.

#### **Information**

- SNMPv2 protocol is supported.
- It is possible to send *GETRequest*, *GETNextRequest* and *SETRequest* requests.

## Common Settings

### General

- **Signal level** – define the maximum/minimum level of the signal received by the GSM/UMTS module. The SNMP trap is sent automatically whenever the defined values are exceeded.
- **SMS bufer upper limit** – define the maximum filling capacity of the SMS storage. The SNMP trap is sent automatically whenever the defined value is exceeded.



## SNMP

### General

- **Enabled** - enable/disable the SNMP service.
- **Community** - SNMP community is a group that owns the device and control stations on which SNMP is running. Default value = public.

### Servers

- **First SNMP server** - the addressee's primary IP address and transport port for SNMP traps (default port = 162). Please make sure that the parameters have been completed correctly to avoid SNMP malfunction.
- **Second SNMP server** - the addressee's secondary IP address and transport port for SNMP traps (default port = 162). If these parameters are correctly completed, the SNMP traps will be sent both to the primary and secondary IP addresses.

### Identification

It is possible to configure following contact details in this section:

- Contact
- Name
- Location

### Download MIB files

This section helps you download the MIB files that are necessary for a proper function of your MIB browser.

## SNMP

### General

Enabled:

Community:

### Servers

First SNMP server:  :

Second SNMP server:  :

### Download MIB files

[TEL2N-MIB.txt](#)  
[TEL2N-TC-MIB.txt](#)  
[VBM-MIB.txt](#)

### **Caution**

The SNMP service works properly on condition that

- SNMP is licensed in the **Management** section.
- The primary IP address, transport port and community parameters are completed.
- SNMP is enabled in the **Monitoring** section.

### 3.4.4.1 List of SNMP traps

#### VoIP

- VoIP SIP line is not registered
- VoIP SIP line is registered

#### GSM

- First GSM module: ERROR
- First GSM module: OK
- First GSM module has too strong signal level
- First GSM module decreased under level of too strong signal level
- First GSM module has weak signal level
- First GSM module increased over level of too weak signal level
- Second GSM module: ERROR
- Second GSM module: OK
- Second GSM module has too strong signal level
- Second GSM module decreased under level of too strong signal level
- Second GSM module has weak signal level
- Second GSM module increased over level of too weak signal level
- Third GSM module: ERROR
- Third GSM module: OK
- Third GSM module has too strong signal level
- Third GSM module decreased under level of too strong signal level
- Third GSM module has weak signal level
- Third GSM module increased over level of too weak signal level
- Fourth GSM module: ERROR
- Fourth GSM module: OK
- Fourth GSM module has too strong signal level
- Fourth GSM module decreased under level of too strong signal level
- Fourth GSM module has weak signal level
- Fourth GSM module increased over level of too weak signal level

#### FXS

- FXS line 1 ERR
- FXS line 1 OK

- FXS line 2 ERR
- FXS line 2 OK
- FXS line 3 ERR
- FXS line 3 OK
- FXS line 4 ERR
- FXS line 4 OK

## **SMS buffer**

- Number of SMS/SMPP messages in memory exceeds defined max level
- Number of SMS/SMPP messages in memory decreased under defined max level
- Number of SMS/SMPP messages in memory exceeds defined max level
- Number of SMS/SMPP messages in memory decreased under defined max level

## **3.4.5 Utils**

This section provides extra functions of the GSM gateway. At present, the GSM gateway offers the Ethernet interface tracing (Network trace) and gateway communication tracing functions. These functions help detect gateway installation troubles (SIP communication debugging). The file format is PCAP, which is readable in the Wireshark (<http://www.wireshark.org/>) program, for example.

## **BTS Lock**

This section helps you set the BTS lock if the GSM/UMTS module supports this function. The BTS ID containing cells are marked blue to indicate that the module supports BTS. Set the BTS lock manually by selecting a BTS or depending on the BTS signal intensity.

## **Send USSD Command**

This section helps you send USSD commands to a mobile network and display subsequent replies.

 **Tip**

- The USSD menu helps you, for example, obtain SIM credit or other information from the provider. The USSD menu can contain multiple levels. Use the semicolon ';' to access the next level. A USSD command can be as follows, e.g.: \*123#;1;2.

## Test Call

This section helps you test calls via the gateway interfaces or verify the LCR settings. Both incoming and outgoing calls to/from all the 2N<sup>®</sup> VoiceBlue MAX interfaces can be tested.

## Status

- **Call status Connection channel** – display the channel for the selected interface for outgoing test calls.
  - NULL – no action.
  - CPRES – call setup request.
  - IPROC – call setup initiation.
  - CRECV – called user ringing.
  - ACTIVE – active call.
  - DISREQ – call end request.
  - OVRECV – call setup request rejection due to non-fulfilment of the LCR conditions.
- **Waiting channel** – display the test channel for an incoming call via the selected 2N<sup>®</sup> VoiceBlue MAX interface.

## Control

- **Action type** – set the test call type.
  - **Make call** – the gateway will make an outgoing test call.
  - **Wait call** – the gateway will await an incoming test call.
- **Destination channel** – select a channel for the outgoing call interface. The LCR settings do not affect the call.
- **Source channel** – select the source channel for the outgoing call interface. Only if **Destination channel - According to LCR** is used.
- **Wait on channel** – select the channel for the incoming call interface.
- **Dial** – called number.



- Clip – calling number.

### 3.4.6 Management

#### Firmware update

In this menu you can store new firmware into the GSM gateway. Select the **VBM-xx.xx.xx.bin** files only. Refer to the Firmware Upgrade subsection on page **Brief Installation Guide** for more firmware information.

#### Warning

- Use the **firmware certified** for this gateway type only! Any other firmware type may **damage 2N<sup>®</sup> VoiceBlue MAX** irreversibly!

After the new firmware file is stored and sent, the GSM gateway is restarted automatically.

Firmware file uploaded successfully.  
Gateway is restarting for new firmware run.  
Wait for 10 seconds please ...

#### Licence key

This section helps you upload the licence file/code to **2N<sup>®</sup> VoiceBlue MAX** and provides information on the current licence file. Refer to **Gateway Control** for more details.

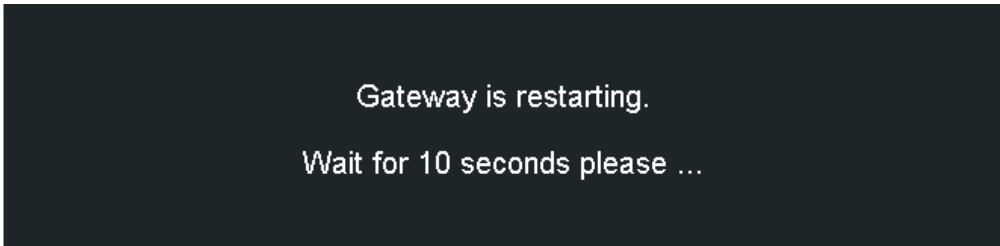
New licence key for gateway is set.  
Gateway is restarting for licence key reload.  
Wait for 10 seconds please ...

### **Caution**

- By inserting a new licence code you restart the GSM gateway and discontinue all the currently made calls!

## Restart

This subsection provides information on a forced restart of 2N<sup>®</sup> VoiceBlue MAX.



Gateway is restarting.  
Wait for 10 seconds please ...

## Configuration download

The window helps you download the current 2N<sup>®</sup> VoiceBlue MAX configuration. The file format is CFG-M204-gateway\_serial\_number-rrrrmdd-hhmmss.tar.

## Configuration upload

The window helps you upload new configuration settings into 2N<sup>®</sup> VoiceBlue MAX configuration. The Ethernet interface and login data remain the same!

### **Warning**

- Be sure to upload the configuration file intended for the selected GSM gateway only to avoid malfunction of the GSM gateway and the necessity to restart the system.

## Configuration Reset

This subsection helps you restore the default configuration (except for Ethernet and login).

- **Including LCR table** - enable/disable keeping of the LCR table records.

- Including **CLIP routing table** - enable/disable keeping of the CLIP routing table records.

## Documentation

Download the User Manual saved in the gateway.

### **Caution**

- The User Manual version will not change during the gateway firmware upgrade. Click on the link to [www.2n.cz](http://www.2n.cz) for the latest User Manual version!

## 3.4.7 Others

### SIM Client

This section is displayed for those GSM gateways only that support the 2N<sup>®</sup> SIM Star system connection - remote SIM card function.

### SMS

This subsection helps you send and receive SMS via the modules.

### **Tip**

- You can also use the SMS user account for SMS sending/receiving. Refer to the Web Configuration subsection for SMS user configuration details.

### **Note**

- This menu is inactive if the SMTP/POP3 or SMPP messaging licence is active. In this case, use the **Messaging / Send SMS** menu for sending SMS via the web interface.

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## 4. Advanced Configuration

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This section describes communication with 2N<sup>®</sup> VoiceBlue MAX using a terminal.

Here is what you can find in this section:

- 4.1 Terminal-Based Communication
- 4.2 AT Interface
- 4.3 LOGs
- 4.4 CDR
- 4.5 SDR
- 4.6 Available Status Messages
- 4.7 Statistics
- 4.8 External SMS Control
- 4.9 Tracing

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## 4.1 Terminal-Based Communication

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2N<sup>®</sup> VoiceBlue MAX allows for communication via the TCP/IP Telnet protocol. The maximum count of active Telnet sessions is ten. If there are more Telnet connection requests than ten, the GSM gateway rejects the connection.

### Terminal

2N<sup>®</sup> VoiceBlue MAX acts as an ANSI terminal with echo. Text commands are entered in one of the following formats: AT[command]<CR>, or AT[command]<CR><LF>. The answer consists of up to several rows, an empty row with <CR><LF> and the reply type: OK, ERROR, or BUSY. Use A/<CR> to repeat the command.

The gateway requests a password by displaying the **Login:** and **Password:** prompts. It uses an extended set of AT commands for configuration. Refer to **Subs.4.2** for the list of terminal AT commands.

#### Example of a login window:

- [ VoiceBlue MAX ] V-1.9.0.11.0 B-1.20
- Date/time: 4.1.2013/20:56:53.98
- SNumber: M204-5401270008
- Login: Admin
- Password: \*\*

### Access Data

2N<sup>®</sup> VoiceBlue MAX receives Telnet requests on port 23. Port 23 can not be reconfigured.

The access password and name are identical with those of the web interface. The access data cannot be changed from the gateway Telnet interface (only from the web interface) for security reasons.

Refer to **Subs. 2.2** for access data factory settings.

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## 4.2 AT Interface

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2N<sup>®</sup> VoiceBlue MAX uses the list of AT commands derived from the standard AT set for configuration and monitoring purposes.

The configuration entering commands start with AT%parameter\_id.

The configuration writing out commands start with AT&section.

The following list of AT commands is universal and some commands may not be included in 2N<sup>®</sup> VoiceBlue MAX.

### Basic Commands

#### System Information

- ATI3 – Firmware version and copyright
- ATI4 – Factory number

#### Statistics

- AT&T – Statistics of calls via PRI interface
- AT&TIN – Statistics of incoming calls via GSM modules
- AT&TOUT – Statistics of outgoing calls via GSM modules
- AT&T### – Statistics of calls via SIM cards of GSM module ##
- AT%TPR=mi,ci,mo,co – Setting of statistics via PRI
- AT%TGO=mi,ci,0,0 – Setting of statistics of incoming calls via all GSM modules in GSM group 0
- AT%TG#=mi,co,ri,ro – Settings of statistics of GSM group #
- AT%TGALL=mo.co,ri,ro – Settings of statistics of all GSM groups
- AT%T###=#,mi,ci,si,mo,co,so – Settings of statistics of SIM card # of GSM module ##
- AT%T###=ALL,mi,ci,si,mo,co,so – Settings of statistics of all SIM cards of GSM module ##
- AT%TALL=ALL,mi,ci,si,mo,co,so – Settings of statistics of all SIM cards of all GSM modules
- AT%T###F=#,m,a,m,a,m,a,m,a – Settings of statistics of tariffs for module ## and SIM card #
- AT%T###F=ALL,m,a,m,a,m,a,m,a – Settings of statistics of tariffs for module ## and all SIM cards

- **AT%TALLF=ALL,m,a,m,a,m,a,m,a** - Settings of statistics of tariffs for all modules and SIM cards
- Description of parameters:
  - **Mi/mo** - Minutes of incom./outg
  - **callsCi/co** - number of connected incom./outg
  - **callsRi/ro** - number of re-routed incom/outg
  - **calls in groupSi/so** - number of received/sent SMS messages
  - **m** - called minutes of the current period
  - **a** - unused minutes of the last period

### **Caution**

- When you change these parameters, all the other counters will be reset!

## Wireless Engines

- **AT&Q##** - Received GSM signal level (##=00-15)
- **AT&QALL** - Received GSM signal level from all GSM modules
- **AT&Gxx=atcmd** - Send command for AT commands directly to the GSM module
- **AT&Gxx=at+cnum** - SIM card telephone number
- **AT&Gxx=at+cpin="xxxx"** - PIN entering
- **AT&Gxx=at+clck="sc",1"xxxx"** - PIN request enable
- **AT&Gxx=at+clck="sc",0"xxxx"** - PIN request disable

## LOG and CDR List

- **AT&L** - Log file listing (PRIGW awaits pressing of the Space bar in every 20 rows)
- **AT&C** - Call file listing (PRIGW awaits pressing of any key in every 20 rows)
- **AT&CR** - Call file listing and deleting (PRIGW awaits pressing of the # key to delete this row /with call info/ from memory and sends the next row)
- **AT&CS** - Call file listing (PRIGW awaits pressing of any key in every 20 rows)
- **AT&CSR** - Call file listing and deleting (PRIGW awaits pressing of the # key to delete this row /with call info/ from memory and sends the next row)

## Configuration commands

### Status Information

- **AT&V** - Overview of all system settings
- **AT&VI** - Overview of ISDN PRI settings
- **AT&V0** - Overview of basic GSM settings
- **AT&V#** - Overview of GSM group # settings (#=1-8)
- **AT&VB** - Overview of module assignment to groups
  - format: B#=grpout, grpin
  - # is the module number
  - grpout, grpin - outgoing and incoming groups of module
- **AT&VALL** - Overview of all GSM group settings
- **AT&VE** - Overview of VOIP parameters
- **AT&N#** - Overview of parameters of network list # (#=1-8)
- **AT&NALL** - Overview of parameters of all network lists
- **AT&R** - Overview of LCR lines

### Default Reset

- **AT&FRES** - Reset with gateway factory settings

### System Settings

- **AT%S70=x.x.x.x** - IP address
- **AT%S71=x.x.x.x** - IP address mask
- **AT%S81=** - Initialisation string for setting of mode connected to the gateway COM2
- **AT%S90=x** - Type of assignment of B-channels to GSM modules and X
  - 0 - rotating
  - 1 - locked
  - 2 - according to credit
- **AT%S91=x,y** - Way of call information recording
  - X:
    - 0 - no record
    - 1 - successfully connected outgoing call
    - 2 - successfully connected incoming calls
    - 3 - successfully connected incoming and outgoing calls
    - 5 - all outgoing calls



- 6 - all incoming calls
- 7 - all incoming+outgoing calls
- Y - to each call add NET info (1) or no (0)
- **AT%S98=xxxx** - PIN code for SIM cards inserted in the gateway
- **AT%S99= dd.mm.yy.w/hh:mm:ss** - Gateway date and time settings
- **AT%X00=hout,hin,min** - Automatic logout of GSM modules
  - hout - hour when the modules start to log out randomly
  - hin - hour when the modules start to log in randomly
  - min - minimum number of modules in a group (2..15) that always remain logged-in
- **AT%X80=name/pass** - Username/password for access via IP port (this parameter is write only - you cannot see its value)

## System Control

- **AT&BSYS=RESET** - Reset of PRIGW
- **AT&Gxx=RESET** - Reset of GSM module xx
- **AT&Gxx=BLOCK** - Block of GSM module xx
- **AT&Gxx=DOWN** - Transfer of GSM module into the sleep mode
- **AT&Gxx=ON** - Transfer of GSM module into the idle mode

## Basic GSM Settings

- **AT%G00=rr,gggggg,gggggg, gggggg,gggggg,gggggg** - g,r = Number of GSM group for each GSM module
- **AT%G01=mode,atms,atfs** - Voice processing settings (for GM22 GSM modules only)
  - mode - algorithm (0-none, 1-semiduplex, 2-fullduplex)atms,
  - atfs - transit, receive gain (3=+5dB, 1=+2.5dB, 0=0dB, 2=-2.5dB, 4=-5dB)
- **AT%G02=mode,atms,atfs** - Voice processing settings (for TC35 GSM modules only)
  - mode - algorithm (2-echo canceller)atms,
  - atfs - transit, receive gain (3=+5dBm, 1=+2.5dB, 0=0dB, 2=-2.5dB, 4=-5dB)
- **AT%G06=mmdd,...mmdd...** - List of holiday days (mm-month;dd-day), max length of line is 63 chars!
- **AT%G07=mmdd,...mmdd** - Net list of holiday days
- **AT%G08=delay,min,max,tout** - Parameters of dialling from ISDN to GSM
  - delay - relax delay between calls
  - min - minimum length of number dialled from ISDN
  - max - maximum length of number dialled from ISDN

- tout - delay between dialled digits

## GSM Settings (X-GSM Group)

- **AT%G#0=sim** - Mode of switching SIM card
  - sim = 0: 0 - OFF - group is turned-off
  - sim > 0:
    - 1-4 - SIM card 1-4
    - 5 - switching by time
    - 6 - switching at random time
- **AT%G#1=netid,clir,min,sms,sec,sec2,pseudo** - Basic parameters of SIM card in slot 1 netid-network number
  - clir
    - 0 = default
    - 1 = enabled
    - 2 = disabled
  - min - maximum number of minutes called
  - sms - maximum number of SMS sent
  - sec - minimum call length (not for cdr info)
  - sec2 - accuracy of call length measurement (not for cdr info)
  - pseudo - default = 0
- **AT%G#2=netid,clir,min,sms,sec,sec2,pseudo** - Basic parameters of SIM card in slot 2

## List of Networks

- **AT%N#0=op/np,...op/np** - List of prefixes replaced by new prefixes (#-number of netlist; op-old prefix;np-new prefix)
- **AT%N#1=pr/n,...pr/n** - List of prefixes dialled into ISDN (to be used for LCR table) pr=prefix n=length of number (parameter /n is optional)
- **AT%N#2..7=pr/n,...pr/n** - Other 7 lists of prefixes dialled into ISDN
- **AT%N#9=net,max** - Net-network number, max-default length of number dialled from ISDN

## LCR Table

- **AT&R** - Shows LCR table
- **AT%R##=source,net,hh:mm/hh:mm/w,gr,limit,tariffs** - Settings of line ## (0..63) of LCR table
  - source - source interface
  - net - number of network list (0..32)

- hh:mm/hh:mm/w\* - line using time limitation
- gr - outgoing group
- limit - time limit
- tariffs - tariff settings

## Test Calls

- **AT!SGxx=dial** - Initiates testing call from AUX interface (xx is the called interface):
  - 00..31 - GSM module
  - 32 - to GSM via GSM module according to call prefix
- **AT!WGxx** - Connects the following call from interface xx to AUX interface
  - 00..31 - from GSM No.
  - 32 - first incoming calls from GSM
- **AT!D** - Terminates call on AUX interface

## Trace

Trace can be activated for only one session at a time.

- **AT!RE** - Start tracing of error messages on active interface
- **AT!Lx** - Start tracing of LAN & Telnet on layer x
  - x=2 - Layers IP, TCP, Telnet
  - x=3 - Layers TCP, Telnet
  - x=4 - Layer Telnet
- **AT!Rx** - Start tracing of ISDN PRI & GSM on layer x
  - x=1 - Layers 1,2,3,4
  - x=2 - Layers 2,3,4
  - x=3 - Layers 3,4
  - x=4 - Layer 4
- **AT!RR** - Start tracing (AT!R2) to COM1 interface
- **AT!RX** - Stop tracing (AT!R2) to COM1 interface

## SMS Control

SMS control can be activated for only one session at a time.

- **AT!G=#**
  - A6 - activate control via used session
  - 55 - deactivate control via used session
  - 99 - deactivate control on all sessions
- **AT^MS=ch** - Module status ch=0 - 31

- **\*module: ch,sim,sts3,sts2,phs2,type** – Response to AT^MS:
  - ch – number of wireless engine
  - sim – number of currently used SIM: 0-none, 1-8-holder 1-8
  - sts3 – status of layer 3
  - sts2 – status of layer 2
  - phs2 – substatus of layer 2
  - type – type of wireless engine
- **AT^MI=ch** – Module info ch = 0 -31
- **\*minfo: ch,sim,netid,"oper",new,cnt** – Response to AT^MI
  - netid – network ID of active wireless network
  - oper – name of active wireless network
  - new – number of received and saved MS on SIM card
  - cnt – total number of sent SMS messages according to statistics
- **\*smsinc: ch,ix,sts,mem** – SMS message has been received and saved
  - ix – index number of saved SMS (0-250)
  - sts – status of SMS (from +CMGL: ix.sts.len)
  - mem – type of used storage (1,2,3)
- **\*smsrep: ch,ix,sts,mem** – SMS status confirmation has been received
  - sts – reserved (0)
- **\*smsout: ch[/id],ref,req** – SMS message was sent and not saved to SIM card
  - ref – reference number of SMS (0-255) – to be used in status confirmation messages
  - ID – third party identification number of SMS
- **\*smspdu: ch,ix,sts,len,pdu,csum** – Content of SMS message
  - len – length of SMS message (number of bytes in PDU)PDU – content of message in PDU format
  - csum – checksum of all PDU bytes (2 hexa digits) calculated without carry
- **\*smsdel: ch,ix** – SMS message deletion confirmation
- **\*smserr: ch[/id],ix,req,err,cms** – Fault command response, or SMS not sent
  - req – required wireless engine or GSM group
  - err – error code (6-busy,40-write,41-read,42-delete,43-list)
  - cms – error cause from wireless engine
- **\*smssel: ch,cnt** – SMS storage change confirmation
- **AT^SX=ch** – SMS listing - request for listing of all SMS messages and status confirmations saved on SIM card. Possible answers: \*smserr (busy,list) or \*smsinc (ix=1..255) for each saved SMS or status SMS , end of list or empty SIM card - \*smsinc (ix=0).
- **AT^SR=ch.ix** – SMS read - request for reading of an SMS message or SMS status saved on SIM card. Possible answers: \*smserr (busy,read) or \*smspdu

- 
- **AT^SD=ch,ix** - SMS delete - request for deletion of an SMS message (or SMS status message). Possible answers: \*smserr (busy,delete) or \*smsdel
  - **AT^SM=ch,len,pdu,chsum** - SMS to module - request for sending a message via GSM module 0..31 or via any GSM module (ch=32). Possible answers: \*smserr (busy,write) or \*smsout
  - **AT^SG=grp[/id],len,pdu,csum** - SMS to group - request for sending an SMS message via GSM group 1..8. Possible answers: \*smserr (busy,write) or \*smsout
  - **AT^SS=ch,mem** - Command for changing SMS storage. Mem (1;2;3) = type of SMS storage  
Siemens:1=SM, 2=ME, 3=ME  
Ericsson:1=SM, 2=ME, 3=ME  
Wavecom:1=SM, 2=ME, 3=SR  
Huawei:1=SM, 2=SM, 3=SM  
SierraWir.:1=SM, 2=ME, 3=SR  
Motorola:1=IM, 2=IM, 3=IM

## 4.3 LOGs

For the current LOG records see the **Gateway / Gateway control - LOG file** section or use the AT&L AT command for Telnet sessions. The following list of LOG statuses is universal and some LOGs may not be included in 2N<sup>®</sup> VoiceBlue MAX:

Type	Text	Description	
POWER	[Power on]	System switched on	
	[Power off]	System switched off	
	[Warm boot]	Restart of system, unknown cause	
	[Watchdog]	Restart of system by watchdog	
	[BKPT code]	CPU error: break code detected	
	[Stack error]	CPU error: stock integrity failure	
	[Divided by zero]	CPU error: dividing by zero	
	[RETI code]	CPU error: illegal using of instruction reti	
	[NMI intr]	CPU error: wrong interrupt	
	[VOID intr]	CPU error: wrong interrupt	
	[Upgrade reset]	Start of upgrade firmware procedure	
	[Software reset]	Reset by AT commands (at&fres...)	
	INIT	Eeprom	Initialisation of eeprom (configuration)
		Flash	Initialisation of flash memory (firmware)

<b>HW-ERR</b>		(##...address of chip, RD...read value/WR...expected value)
	Codec ##,RD /WR	Error in initialisation of codec on GSM,AUX board
	COM2 #####, RD/WR	Error in initialisation of COM2 on AUX board
	Duart #####, RD/WR	Error in initialisation of serial controller on GSM board
	Hscx #####, RD/WR	Error in initialisation of HDLC controller on AUX board
	Pri #####,RD /WR	Error in initialisation of PRI controller
<b>SYSERR</b>	User stack error!	SW error: stock integrity failure
<b>BRDIN</b>	#08 TYP STS	Board inserted (number of gsm board, type, status)
<b>BRDOUT</b>	#08 TYP STS	Board disconnected
<b>BRDRES</b>	#08 TYP STS	Reset the board by AT command
	ALL GSM RESET CMD	Reset all GSM boards by AT command
	SYSTEM RESET CMD	Reset the system by at&bsys command
<b>L1-ERR</b>		(reserved)
<b>L2-ERR</b>		Error of ISDN layer 2 by Q.921
	A: unsol.RX(F)	Received packet RR,RNR,REJ with unexpected bit F=1
	B: unsol.DM (F)	Received packet DM with unexpected bit F=1

	C: unsol.UA (F)	Received packet UA with unexpected bit F=1
	D: unsol.UA(-)	Received packet UA with unexpected bit F=0
	E: unsol.DM(-)	Received packet DM with unexpected bit F=0
	F: peer re-est	Received packet SABME in status OKEST
	G: repeated SABME	Repeated unsuccessful send of packet SABME
	H: repeated DM	Repeated unsuccessful send of packet DM
	I: failed (TIMREC)	Unsuccessful breaking-up of status TIMREC
	J: N(R) error	Received wrong value N(R) - numbering of packets
	K: recv.FRMR	Received packet FRMR (information about error)
	L: undef.frame	Received packet of unknown type
	M: (I field)	Received wrong I-packet (numbered packet)
	N: frame size	Received packet with wrong length
	O: N201 error	Value N201 was exceeded (max length of packet)
<b>L3-ERR</b>	tout sts # (p##)	Error of isdn layer 3: timeout in status # on channel p##
<b>G2-ERR</b>	ATD/ERROR init (g##)	Error of isdn layer 2: restart of module g## after rejected command ATD by GSM network
	GSM Cause 150 (g##)	Error of isdn layer 2: restart of module g## after cause 150 was received (call barred by GSM network)
<b>G3-ERR</b>	tout sts # (g##)	Error of isdn layer 3: timeout in status # on module g##



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C4-ERR	tout sts # (p##/g##)	Error of connecting layer 4: timeout in status # on call between channel p## and GSM module g##
--------	-------------------------	---

## 4.4 CDR

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For the current CDRs see the **Gateway / Gateway control / CDR file** section or use the AT&C / AT&CR AT commands for Telnet sessions.

**\*\*Date Time Type Cause From/to Groups conn. durat. aoc-info gid CDN CGN IMSI /SCID**

- **Column 1:** \*\*
- **Column 2:** call date and time
- **Column 3:** call status
  - O-OK – successful outgoing call
  - O-FD – unsuccessful outgoing call
  - I-OK – successful incoming call
  - I-FD – unsuccessful incoming call
  - OSIM – successful outgoing simulated call
  - RSIM – successful incoming simulated call
  - ESIM – unconnected outgoing simulated call
- **Column 4:** GSM release cause
- **Column 5:** used channel number / used GSM module
- **Column 6:** used GSM group (C=CallBack)
- **Column 7:** connection time
- **Column 8:** call duration mmm:ss (max. 255:59), or error cause for unconnected call
- **Column 9:** call cost (to be implemented in higher firmware versions) / gateway ID (optional)
- **Column 10:** called party number (CDN)
- **Column 11:** calling party number (CGN)
- **Column 12:** SIM card slot number / SIM card IMSI or SCID

## 4.5 SDR

Refer to the **Gateway / Gateway control / SDR file** section for the current SDRs section or use the AT&CS / AT&CSR AT commands for Telnet sessions.

\*\* **date time type error usr/gr/mo ssec date time pn/pt gid**

- **Column 1:** \*\*
- **Column 2:** date/time - SDR record creation time
- **Column 3:** type of SMS
  - R-OK - delivered OK - SMS received
  - S-FD - sending ERROR - SMS sending error
  - S-OK - send OK - SMS was sent but no SMS delivery receipt was required
  - S-TO - sending timeout - SMS was not sent within the set timeout
  - D-ER - delivery ERROR - SMS delivery error
  - D-OK - delivered OK - SMS delivered
  - D-TO - delivery timeout - SMS was not delivered within the set timeout
  - SANS - SMS after successful call
  - SNOS - SMS at no answer
  - SWEB - SMS was sent via web interface
  - SSIM - simulation SMS was sent via 2N<sup>®</sup> SIMStar server
  - RSIM - simulation SMS was received 2N<sup>®</sup> SIMStar server
- **Column 4:** error type
  - for (D-OK): SMS receipt status (typically E - 000)
  - for (D-ER): SMS receipt error code
  - for (S-FD): module +CMS ERROR (typically E - 028)
  - for (S-FD): internal error (E - 902 = no rule to send)
- **Column 4:** user id/SMS group/GSM module
- **Column 5:** SMS sending time
- **Column 6:** date/time
  - First row - SMS sending time or total sending time for all parts of a long SMS
  - Second row - time of SMS adding to the outgoing/incoming SMS database
- **Column 8:** part number/total
- **Column 9:** gateway id

---

## 4.6 Available Status Messages

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The following list of statuses is universal and some messages may not be included in 2N<sup>®</sup> VoiceBlue MAX.

### GSM Layer Statuses

#### GSM Layer 2

- **INIT** - GSM module initialisation start (follow PINREQ)
- **SIM0** - Module switch to internal SIM card (follow INIT)
- **PINREQ** - Module PIN request (follow PINSET)
- **PINSET** - PIN value sending to module (follow INFO)
- **BLOCK** - Module blocked temporarily or permanently (see Layer 2 information) (follow INIT)
- **SETUP** - Module configuration running (follow IDLE)
- **SLEEP** - Module sleep running (transition to BLOCK status) (follow BLOCK)
- **NWAIT** - Awaiting GSM log-in (follow SETUP)
- **IDLE** - Rest status, can start/receive call, execute AT&G command (follow CALL /CMD)
- **CALL** - Call running (call establishing, connected call, call end) (follow IDLE)
- **CMD** - Communicating with module upon AT&G command (follow IDLE)
- **INFO** - Information loading from module and SIM card (follow NWAIT)

#### GSM Layer 2 Info for BLOCK

- **(block)** - Blocked by AT&G command, terminated by module, board or system reset
- **Netw-reg** - GSM log-in refused (not activated SIM), next attempt in 5..60 minutes
- **Clir-err** - CLIR activation request refused, next attempt in 2..10 minutes
- **Mod-err** - Defective or unconnected GSM module, next attempt in 2 minutes
- **Pin-err** - Wrong PIN, permanently in BLOCK status
- **Sim-err** - Defective or non- inserted SIM card, next attempt in 2 minutes
- **Log-out** - Temporarily logged-out according to parameter X00
- **Puk-req** - SIM card requires PUK
- **(undef)** - This position of SIM card was not checked by gateway

---

## GSM Layer 3

- NULL - Rest status, ready for call
- CINIT - Request of call to GSM (from Layer 4)
- OPROC - Call to GSM is connected
- CDELIV - Call to GSM is ringing
- CPRES - Indication of call from GSM (from Layer 2)
- CRECV - Call from GSM is ringing on ISDN interface
- IPROC - Call from GSM is processed by ISDN interface
- ACTIVE - Connected call
- DISREQ - Disconnection request (to Layer 2)
- DISIND - Indication of disconnection (from Layer 2)
- RELREQ - Module release for another call (to Layer 2)
- OVRECV - Reading of DTMF dialling from GSM (from Layer 2)
- RELIND - Indication of module release (from Layer 2)

## Link Layer Statuses

### Layer 4

- NULL - Rest status, ready for call
- MORE - Call request received from GSM or ISDN, awaiting further dialling or timeout
- SETUP - Call request sent to opposite interface
- PROC - Call request confirmed, awaiting call answer
- ACTIVE - Connected call
- DISC - Call disconnection in progress

## Command Shell Statuses

### Command Shell

- IDLE - Rest status, awaiting AT commands
- REQUEST - Communication with GSM module upon AT&G command is displayed
- REPORT - Active tracing
- LOGFILE - Content of log file is being written out
- CALLFILE - Content of call file is being written out
- CALLREAD - Call file records are read
- AUTOFILE - Content of incoming call auto routing chart is being written out

- QUERY - (not used so far)
- SCREEN - (not used so far)
- MATRIX - Active matrix screensaver
- FUNCFILE - Content of debug file is being written out
- LCRFILE - (not used so far)

## Telnet Layer

- LOGOUT - User logged-out
- LOGIN - User is entering name
- PASSW - User is entering password
- IDLE - User logged-in

## Records of Events and Calls

### Record Type in Log File

- POWER - System power on, power off or reset
- INIT - Initialisation of EEPROM (configuration) or Flash (upgrade)
- HW-ERR - HW error of plugged-in board
- SYSERR - System error (memory error, etc.)
- BRDIN - Board plugged-in
- BRDOUT - Board plugged-out
- BRDRES - Board reset using AT!B command
- L1-ERR - PRI port layer 1 error (ISDN1)
- L2-ERR - PRI port layer 2 error (ISDN2)
- L3-ERR - PRI port layer 3 error (ISDN3)
- G2-ERR - GSM module layer 2 error (gate2)
- G3-ERR - GSM module layer 3 error (gate3)
- C4-ERR - Link layer error (call4)

### Record Type in Call File

- I-FD - Unconnected incoming call attempt
- I-OK - Connected incoming call
- O-FD - Unconnected outgoing call attempt
- O-OK - Connected outgoing call

## 4.7 Statistics

---

The GSM gateway automatically generates statistic data on all outgoing and incoming calls. These data can be deleted on the user level or through configuration (automatic deletion on a selected day).

### Explanation of Columns

- **Group/network/module** - type of calls
- **Reset** - date of last reset the statistics
- **Minutes** - number of minutes hhhh:mm:ss, same number converted to time
- **Calls** - number of calls
- **SMS** - number of sent SMS messages
- **Reject** - number of unconnected calls (no available free GSM module-call rejected with cause 41(42))
- **Failed** - number of unconnected calls (rejected by GSM network)
- **C.off**s - number of unconnected calls (terminated by calling party)
- **Errors** - number of unconnected calls (wrong requests - disallowed prefix, etc.)
- **Red.in** - number of connected calls (rerouted to this GSM group)
- **Redout** - number of connected calls (rerouted to another GSM group)

### Explanation of Rows

- **#i1 inc** - incoming group 1
- **#g1 out** - outgoing group 1
- **#fs inc** - all incoming calls via FXS
- **#fo inc** - all incoming calls via FXO (for gateways with the FXO interface)
- **#vi inc** - all incoming calls via VoIP
- **#grpinc** - all incoming calls via GSM/UMTS
- **#fs out** - all outgoing calls via FXS
- **#fo out** - all outgoing calls via FXO (for gateways with the FXO interface)
- **#vi out** - all outgoing calls via VoIP
- **#grpout** - all outgoing calls via GSM/UMTS
- **#m0 inc** - incoming calls via m0 module - local SIM
- **#m0 out** - outgoing calls via m0 module - local SIM
- **#m0 day** - m0 module limit statistics
- **#m0 fre** - m0 module tariff statistics
- **#m0 rem** - remote SIM statistics

## Statistics of Outgoing and Incoming Groups

[Statistics of calls in groups]

group (reset) minutes hhhh:mm:ss calls reject failed c.offfs errors

-----

#i1 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#i2 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#i3 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#i4 inc ( 2.01) 0 0:00:00 0 0 0 0 0

group (reset) minutes hhhh:mm:ss calls reject failed **red.in** redout

-----

#g1 out ( 2.01) 0 0:00:00 0 0 0 0 0

#g2 out ( 2.01) 0 0:00:00 0 0 0 0 0

#g3 out ( 2.01) 0 0:00:00 0 0 0 0 0

#g4 out ( 2.01) 0 0:00:00 0 0 0 0 0

## Statistics of Incoming Calls on All GSM Modules

[Statistics of incoming calls on all modules]

network (reset) minutes hhhh:mm:ss calls reject failed c.offfs errors

-----

#fs inc ( 0.00) 0 0:00:00 0 0 0 0 0

#fo inc ( 0.00) 0 0:00:00 0 0 0 0 0

#vi inc ( 0.00) 0 0:00:00 0 0 0 0 0

#grpinc ( 0.00) 0 0:00:00 0 0 0 0 0

group (reset) minutes hhhh:mm:ss calls reject failed c.offfs errors

-----

#i1 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#i2 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#i3 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#i4 inc ( 2.01) 0 0:00:00 0 0 0 0 0

module (reset) minutes hhhh:mm:ss calls reject failed c.offfs smses

-----

#m0 inc ( 2.01) 0 0:00:00 0 0 0 0 0



#m1 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#m2 inc ( 2.01) 0 0:00:00 0 0 0 0 0

#m3 inc ( 2.01) 0 0:00:00 0 0 0 0 0

## Statistics of Outgoing Calls on All Modules

[Statistics of outgoing calls on all modules]

network (reset) minutes hhhh:mm:ss calls reject failed c.offfs errors

-----

#fs out ( 0.00) 0 0:00:00 0 0 0 0 0

#fo out ( 0.00) 0 0:00:00 0 0 0 0 0

#vi out ( 0.00) 0 0:00:00 0 0 0 0 0

#grpout ( 0.00) 0 0:00:00 0 0 0 0 0

group (reset) minutes hhhh:mm:ss calls reject failed **red.in** redout

-----

#g1 out ( 2.01) 0 0:00:00 0 0 0 0 0

#g2 out ( 2.01) 0 0:00:00 0 0 0 0 0

#g3 out ( 2.01) 0 0:00:00 0 0 0 0 0

#g4 out ( 2.01) 0 0:00:00 0 0 0 0 0

module (reset) minutes hhhh:mm:ss calls reject failed c.offfs smses

-----

#m0 out ( 2.01) 0 0:00:00 0 0 0 0 0

#m1 out ( 2.01) 0 0:00:00 0 0 0 0 0

#m2 out ( 2.01) 0 0:00:00 0 0 0 0 0

#m3 out ( 2.01) 0 0:00:00 0 0 0 0 0

## Statistics of Calls on Specific GSM Modules

[Statistics of calls on module #0]

module (reset) minutes hhhh:mm:ss calls reject failed c.offfs smses

-----

#m0 inc (12.03) 0 0:00:00 0 0 0 0 0

#m0 rem (12.03) 0 0:00:00 0 0 0 0 0

module (reset) minutes hhhh:mm:ss calls reject failed c.offfs smses

---

-----  
#m0 out (12.03) 0 0:00:00 0 0 0 0 0

#m0 rem (12.03) 0 0:00:00 0 0 0 0 0

module (reset) minutes hhhh:mm:ss calls limit

-----

#m0 day (12.03) 0 0:00:00 0 0

#m0 rem (12.03) 0 0:00:00 0 0

module (reset) min0:ss limit min1:ss limit min2:ss limit min3:ss limit

-----

#m0 fre (12.03) 0:00:00 0 0:00:00 0 0:00:00 0 0:00:00 0

#m0 rem (12.03) 0:00:00 0 0:00:00 0 0:00:00 0 0:00:00 0

## 4.8 External SMS Control

If this function is enabled for the active Telnet session, the GSM gateway automatically sends information on an incoming SMS message. An SMS message can also be sent using special commands.

- **AT** - 'basic keep alive' command (answer 'OK')
- **AT!G=A6** - Activation of SMS control (can be activated only in one session at same time)
- **AT!G=A55** - Deactivation of SMS control
- **AT^MS=ch** - GSM module [ch] status
- **AT^MI=ch** - GSM module [ch] info
- **AT^SX=ch** - Request to list all SMS messages and status confirmations saved in the SIM card / GSM module. Possible answers: \*smserr(busy,list) or \*smsinc (ix=1-255) for each saved SMS or status SMS. End of list or empty storage - \*smsinc (ix=0), or \*smserr 255
- **ST^SR=ch,ix** - Request to read an SMS message or SMS status saved on the SIM card. Possible answers: \*smserr (busy,read) or \*smspdu
- **AT^SD=ch,ix** - Request to delete an SMS message (or SMS status message). Possible answers: \*smserr (busy,delete) or \*smsdel
- **AT^SM=ch,len,pdu,csum** - Request to send a message via GSM module 0..31 or via any GSM module (ch=32). Possible answers: \*smserr (busy,write) or \*smsout
- **AT^SG=grp[/id],len,pdu,csum** - Request to send an SMS message via GSM outgoing group 1..8. Possible answers: \*smserr (busy,write) or \*smsout
- **AT^SS=ch,mem** - Command for an SMS storage change. Ch (0-31) = module number. Mem (1;2;3) = SMS storage type

### SMS Storages

- **Siemens/Cinterion:** 1=SM, 2=ME, 3=ME
- **Ericsson:** 1=SM, 2=ME, 3=ME
- **Wavecom:** 1=SM, 2=ME, 3=SR
- **Huawei:** 1=SM, 2=SM, 3=SM
- **SierraWir.:** 1=SM, 2=ME, 3=SR
- **Motorola:** 1=IM, 2=IM, 3=IM

(SM = SIM card, ME = module, SR = status report memory, IM = inbox memory)

### Information Messages

- **\*smsinc: ch,ix,sts,mem** - An SMS message was received and saved into the SMS storage.

- 
- **\*smsrep: ch,ix,sts,mem** - An SMS status confirmation was received.
  - **\*smsout: ch[/id],ref,req** - An SMS message was sent and not saved into the SMS storage.
  - **\*smspdu: ch,ix,sts,len,pdu,csum** - Content of SMS message or status confirmation.
  - **\*smsdel: ch,ix** - An SMS message or status confirmation was deleted from position ix.
  - **\*smserr: ch[/id],ix,req,err,cms** - Response to an error command.
  - **\*smssel: ch,cnt** - Confirmation of an SMS storage change.

## 4.9 Tracing

2N<sup>®</sup> VoiceBlue MAX allows for operation tracing (VoIP, SIP, GSM). Tracing is accessible in one session only at a time, the other tracing requests are rejected with BUSY. With regard to a rather extensive volume of data, we recommend that the **Write communication into file** function should be activated before tracing. Any Telnet-supporting terminal (HyperTerminal, Putty, etc.) can be used.

### ✓ Tip

- You are advised to synchronise your GSM gateway with the SIP Proxy, or a PC before tracing.

### AT Command

- **AT%S92=x** - Description AT%S92=x Set the tracing details. Refer to the table below for value X
- **AT!R2** - Start tracing via the active session
- **Any character** - Terminate tracing

Layer 3 and 4 Status Listing	Timestamp Write-Out	SMP Packet Write-Out	Layer 2 Status Listing	LCR Listing
1	2	4	8	16

The resultant value X is a sum of the required functions (X= timestamps+LCR = 16+2 = 18, e.g.).

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## 5. Technical Parameters

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### Dimensions

- **Dimensions (W x H x D):** 220x45x140 mm
- **Weight:** 957 g

### Power Supply

- **Type:** External power adapter (SELF type) 90–230V, 50–60Hz to 12V DC 2A
- **Connector:** DC Jack 2.1mm
- **Power input:** Up to 20W

### Interface

- **Protocols:** TCP,UDP,IP,RTP,TELNET,http,DHCP
- **Connector:** 1x 10/100BaseT Ethernet, 4x FXS RJ-45
- **Administration:** AT commands, web interface

### VoIP

- **Signalling:** SIP
- **DTMF:** RFC2833
- **Count of voice channels:** 4
- **Voice codecs:** G.711 PCM at 64 kbpsG.729 Annex AB
- **PCM companding:** A-law/u-Law (optional)

### Wireless Interface

- **Count of channels:** 4
- **Bandwidth:**
  - GSM 850/900/1800/1900 MHz
  - UMTS 800/850/900MHz/2100 MHz
- **GSM:** Cinterion MC55i-W or Telit (depending on the module) UMTS
- **Audio:** HR/FR/EFR/AMR
- **USIM/SIM card:** Small plug-in 3V

- 
- **Antenna:** One external antenna (integrated antenna splitter) SMA FEMALE connector

#### Others

- **Working temperature:** 5°C-45°C
- **Air humidity:** Max 95% at 40°C

## 6. Supplementary Information

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This section provides supplementary information on 2N<sup>®</sup> VoiceBlue MAX.

Here is what you can find in this section:

- 6.1 Troubleshooting
- 6.2 List of Abbreviations
- 6.3 Regulations and Directives
- 6.4 General Instructions and Cautions



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## 6.1 Troubleshooting

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For the most frequently asked questions refer to [faq.2n.cz](http://faq.2n.cz).

- - *No LED is shining on 2N<sup>®</sup> VoiceBlue MAX.*
    - 2N<sup>®</sup> VoiceBlue MAX is disconnected from the power supply.
  - *2N<sup>®</sup> VoiceBlue MAX fails to log in to the GSM network.*
    - Check the SIM card.
    - Check the PIN.
    - Check the antenna connection.
    - Select a place with a good GSM signal.
  - *2N<sup>®</sup> VoiceBlue MAX is not communicating with the PC.*
    - Check the Ethernet cable connection and the Ethernet interface settings in your PC.

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## 6.2 List of Abbreviations

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Following abbreviations are used within manual:

- **API** (Application Programming Interface)
- **ASR** (Answer Seizure Ratio)
- **BIOS** (Basic Input-Output System)
- **CD** (Compact Disc)
- **CDR** (Call Data Record)
- **CLIR** (Calling Line Identification Restriction)
- **COM** (PC serial interface)
- **CPU** (Central Processor Unit)
- **DHCP** (Dynamic Host Configuration Protocol)
- **DNS** (Domain Name Server)
- **DTMF** (Dual Tone Multifrequency)
- **eCPU** (enhanced CPU)
- **ESME** (External Short Messaging Entity)
- **FW** (Firmware)
- **FXS** (Foreign eXchange Subscriber)
- **GMT** (Greenwich Mean Time)
- **GSM** (Group Switched Mobile system)
- **GPRS** (General Packet Radio Service)
- **GW** (Gateway)
- **HW** (Hardware)
- **IMEI** (International Mobile Equipment Identity)
- **IMSI** (International Mobile Subscriber Identity)
- **IP** (Internet Protocol)
- **IVR** (Interactive Voice Response)
- **LAN** (Local Area Network)
- **LED** (Light Emitting Diode)
- **NAT** (Network Address Translation)
- **PC** (Personal Computer)
- **PCB** (Printed Circuit Board)
- **PCM** (Pulse-code modulation)
- **PIN** (Personal Identification Number)
- **POP3** (Post Office Protocol v3)
- **PRI** (Primary Rate Interface)

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- **PUK** (Personal Unblocking Key)
  - **SB** (SIM Board)
  - **SC** (SIM Client)
  - **SIM** (Subscriber Identity Module)
  - **SIP** (Session Initiation Protocol)
  - **SMPP** (Short Message Peer to Peer)
  - **SMSC** (short message service center)
  - **SMTP** (Simple Mail Transfer Protocol)
  - **SMS** (Short Message Service)
  - **SSH** (Secure Shell)
  - **SW** (Software)
  - **TCP** (Transmission Control Protocol)
  - **UCMD** (UDP commands)
  - **UDP** (User Datagram Protocol)
  - **UMTS** (Universal Mobile Telecommunication System)
  - **UPS** (Uninterruptible Power Supply)
  - **USSD** (Unstructured Supplementary Service Data)
  - **VoIP** (Voice over Internet Protocol)
  - **WAN** (Wide Area Network)

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## Europe

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2N<sup>®</sup> VoiceBlue MAX conforms to the following directives and regulations:

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

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

Directive 2004/108/EC of the Council of 15 December 2004 on the harmonisation of the laws of Member States relating to electromagnetic compatibility

Commission Regulation (EC) No. 1275/2008, of 17 December 2008, implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 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 2012/19/EC of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment.

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## 6.4 General Instructions and Cautions

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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 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 short-circuited either.



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