



2N[®] StarGate / BlueTower



User Manual

Firmware: 1.1.1

Version: 5.14

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.



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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 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[®] 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.



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

In this section, we introduce the **2N[®] StarGate / BlueTower** 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 Compatibility
- 1.2 System
 - 2N[®] BlueTower
 - 2N[®] StarGate
- 1.3 Product Description
- 1.4 Innovations
- 1.5 Upgrade
- 1.6 Terms and Symbols Used

1.1 Compatibility

This section describes compatibility of the earlier HW versions with the new CPU version. Obey the instructions included herein to make your 2N[®] StarGate / BlueTower system work correctly.

CPU

	New CPU version	Earlier CPU version
Serial number	M202-xxxxxxxxxxx	M112-xxxxxxxxxxx
Web interface	YES	NO
SIM Client (SIMStar Server support)	YES	NO
Integrated AUX	YES	NO
SMS sending/receiving account	YES	NO

PRI Board

- Use the PRI1/PRI2 card of version PRI132 and higher with the new CPU.



- Using a PRI card other than that described above may lead to the 2N[®] StarGate / BlueTower system malfunction.

VoIP Board

- The VIP172 VoIP card can be used both for the earlier and new CPU versions.

AUX Board

- The AUX card is no more available in the new 2N[®] StarGate / BlueTower system as the AUX interface is integrated in the CPU.



- Do not use the AUX card with your new CPU as the AUX card is not part of the 2N[®] StarGate / BlueTower system any more.

GSM/UMTS Board

- The new CPU is compatible with all the GSM/UMTS cards described in the 1.1 **Compatibility** subsection.



- The following cards only support the 2N[®] SIM Star service with the new CPU version.
 - UMTS board with 2 Telit UC864-G engines, 4SIM/channel, 2N[®] SIM Star support. Part No. 5070553E.
 - GSM board with 2 Wavecom Q55 (WMP100) engines, 4SIM/channel, 2N[®] SIM Star support. Part No. 5070550E.
- The 2N[®] SIM Star service is not available with the old CPU versions for the above mentioned cards.

1.2 System

This user manual is designed for two types of gateways. Both the gateways have the same features and differ in the maximum capacity of the GSM channels used.

- 2N® BlueTower
- 2N® StarGate

2N® BlueTower

Basic Dimensions

2N® BlueTower is the smallest of the 2N® PRI gateway family, featuring the capacity up to 8 GSM / UMTS channels. The system is integrated in a small 19" subrack of the height of 3U, width of 29HP and depth of 320mm. The front side is open, equipped with slots for plug-in boards with front panels. The panel includes the main switch. In case not all GSM/UMTS cards are plugged in, the vacant section of the front side must be covered with a fixed panel(s). An optional antenna splitter can be installed.

The whole backside is covered with a panel with a built-in safety-fuse box and power socket. The main power supply unit is inside the system and is fully designed for passive cooling. The bottom and upper sides are covered with EMC sheet.

The system bus is designed as a printed circuit board (PCB) with DIN connectors and fitted to the inner subrack carrier profiles.

Front Side Division

The subrack width is divided into 7x4HP-wide modules in the following sequence (from right to left):

VoIP version

- VoIP card - 4HP
- Basic or enhanced CPU card - 4HP
- Empty position - 4HP
- GSM or UMTS cards (one for two GSM/UMTS channels) - Remaining space (each 4HP)

ISDN version

- Empty position - 4HP
- Basic or enhanced CPU card - 4HP

- 1ISDN PRI or 2ISDN PRI card - 4HP
- GSM or UMTS cards (one for two GSM/UMTS channels) - Remaining space (each 4HP)

ISDN + VoIP version

- VoIP card - 4HP
- Basic or enhanced CPU card - 4HP
- 1ISDN PRI or 2ISDN PRI card - 4HP
- GSM or UMTS cards (one for two GSM / UMTS channels) - Remaining space (each 4HP)



- Please keep the GSM/PRI/CPU/VoIP card positions. The positions are fixed and may not be interchangeable.
- 4 positions are only designed for the GSM/UMTS cards (from left to right).

Examples of Used Types



Figure: 2N[®] BlueTower with 2 UMTS Boards, Enhanced CPU, VoIP Interfaces and Integrated Antenna Splitter



Figure: 2N[®] BlueTower with 2 UMTS Boards, Basic CPU, 2 ISDN PRI Interfaces and Integrated Antenna Splitter



Figure: 2N[®] BlueTower with 2 UMTS Boards, Basic CPU, 2 ISDN PRI, VoIP Interfaces and Integrated Antenna



Figure: 2N[®] BlueTower with 4 UMTS Boards, Basic CPU, 2 ISDN PRI, VoIP Interfaces

Note

- Please keep all cards in the right positions. Wrong positions will cause malfunction of whole system!
- In the case of VoIP card replacement by ISDN PRI (and vice versa) please read the instructions in Section **2.4 Installation**.

Power Supply

The system uses an industrial power supply unit with natural cooling and an auxiliary external fan, which is switched on automatically whenever the power supply temperature exceeds 70°C. The power supply unit is designed with a 30% reserve even under the maximum load.

Power supply types

- Internal 90-260V / 50 - 60 Hz (output 5V / 30A).

Caution

- Make sure that the incoming supply is matching the requested values!
- High voltage may cause a serious injury or death!

 **Tip**

- You are recommended to connect the gateway to the UPS system.

2N® StarGate

Basic Dimensions

2N® StarGate is the biggest GSM gateway in the 2N® PRI gateway family. The system is integrated in a 19" subrack of the height of 3U and depth of 360mm. The front side is open, equipped with slots for plug-in boards with front panels. The panel includes the main switch. In case not all GSM/UMTS cards are plugged in, the vacant front section must be covered with a fixed panel(s).

The whole backside is covered with a panel with a built-in active fan, which is automatically switched on whenever the power supply temperature exceeds 70°C. The main power supply unit is located in front of the fan. The bottom and upper sides are covered by perforated sheet and the assembly flanges are provided with handrails.

The system bus is designed as a printed circuit board (PCB) with DIN connectors and fitted to the inner subrack carrier profiles.

Front Side Division

The subrack width is divided into an 8HP-wide mains panel and 19x4HP-wide modules in the following sequence (from right to left)

VoIP version

- Fixed panel with a main switch (AC type) or power connectors (DC type) - 8HP
- VoIP card - 4HP
- Basic or enhanced CPU card - 4HP
- Empty position - 4HP
- GSM or UMTS cards (one for two GSM/UMTS channels) - Remaining space (each 4HP)

ISDN version

- Fixed panel with a main switch (AC type) or power connectors (DC type) - 8HP
- Empty position - 4HP
- Basic or enhanced CPU card - 4HP

- 1ISDN PRI or 2ISDN PRI card - 4HP
- GSM or UMTS cards (one for two GSM/UMTS channels) - Remaining space (each 4HP)

ISDN + VoIP version

- Fixed panel with a main switch (AC type) or power connectors (DC type) - 8HP
- VoIP card - 4HP
- Basic or enhanced CPU card - 4HP
- 1ISDN PRI or 2ISDN PRI card - 4HP
- GSM or UMTS cards (one for two GSM/UMTS channels) - Remaining space (each 4HP)

Examples of Used Types

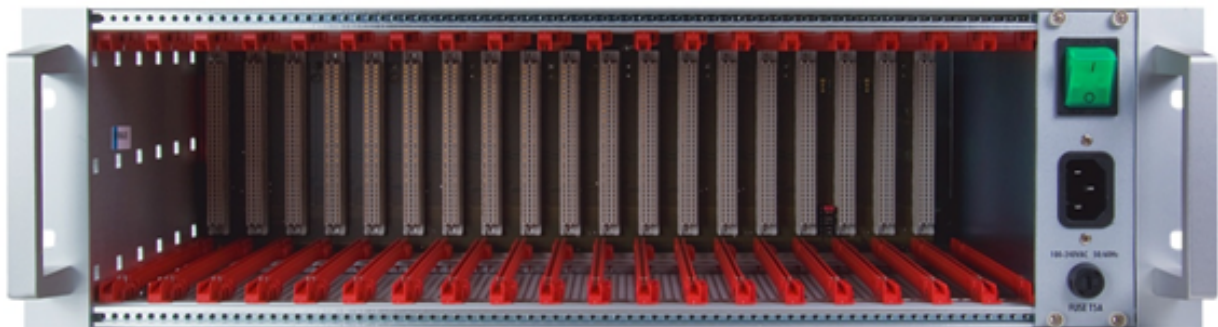


Figure: Empty 2N[®] StarGate Rack

⚠ Warning

- Make sure that the backside jumpers have been connected properly in the rack to make your system work correctly. Refer to **Gateway Rack Configuration** for more details.



Figure: 2N[®] StarGate with 16 GSM Boards, Enhanced Basic CPU, VoIP Interface and AC Power Supply



Figure: 2N[®] StarGate with 16 UMTS Boards, Enhanced CPU, 2 ISDN PRI Interfaces and AC Power Supply



Figure: 2N[®] StarGate with 16 UMTS Boards, Enhanced CPU, 2 ISDN PRI, VoIP Interfaces and AC Power Supply

Warning

- The PRI/CPU/VoIP card positions are fixed and may not be interchanged in the rack.

Note

- Please keep all cards in the right positions. Wrong positions will cause malfunction of the whole system!
- In the case of VoIP card replacement by ISDN PRI (and vice versa) please read the instructions in Section **2.4 Installation**.

Power Supply

The system uses an industrial power supply unit with natural cooling and an auxiliary external fan, which is switched on automatically whenever the power supply temperature exceeds 70°C. The power supply unit is designed with a 30% reserve even under the maximum load.

Power supply types

- Internal 90 - 260V / 50 - 60 Hz (output 5V / 30A).
- 2x Internal 90 - 260V / 50 - 60 Hz (output 5V / 30A) (redundant).
- Internal 48 DC (output 5V / 30A).

The type of the power supply unit to be used depends on the part number.

Caution

- Make sure that the incoming supply is matching the requested values!
- High voltage may cause a serious injury or death!

Tip

- You are recommended to connect the gateway to the UPS system.

1.3 Product Description

Basic Features

2N[®] StarGate / BlueTower is a compact yet highly sophisticated system. It supports full remote supervision and configuration via web interface or using an external modem over a BRI-ISDN and analogue line, or over a B channel in a PRI-ISDN trunk. The system has been designed and works with a lot of highly sophisticated functions, which make it fully client-oriented and highly reliable in cooperation with both GSM networks and ISDN. In addition, it provides full monitoring and comfortable (web interface) configuration without functional limitations. Configuration alterations can be made without resetting, i.e. under full operation. Hot-swappable plug-in GSM/UMTS boards, which can be swapped under full operation including SIM cards, are a matter of course. The use of up to eight SIM cards per GSM/UMTS module in combination with an intelligent SIM card switching tool and detailed statistics upgrade this system into a powerful LCR tool. There is also support of remote SIM cards (2N[®] SIM Star) and an external LCR machine (2N[®] External Routing Machine). High product stability is achieved by the fact that the gateway is programmed in the ASM, i.e. an OS-FREE system. The system also features easy installation, simple operation and easy replacement of defective parts as it is composed of plug-in boards that communicate independently along system buses. As already mentioned, the system allows for an easy detection of defective parts, automatic locking against use and easy replacement (hot-swap). Thanks to the above-mentioned properties, the system can be installed and configured successfully within one hour!

Advantages of 2N[®] StarGate / BlueTower

- Compact size, modularity and hot-swappable solution.
- Up to 32 GSM/UMTS modules (8 in BlueTower).
- Up to 256 SIM cards in a system (StarGate).
- Worldwide use - GSM/UMTS boards support all standard GSM (850/900/1800/1900MHz) and UMTS (850/1900/2100MHz) bandwidths.
- Antenna splitters and a high-gain antenna.
- Support of up to two ISDN PRI (DSS1) or one VoIP (SIP) connections.
- Sending/receiving SMS.
- A large memory for detailed Call Data Records (CDR), SMS Data Records (SDR).
- Detailed call statistics generating.

-
- Quick start - being free of an operating system (programmed in the processor code), the system is completely ready within 30 seconds after power on/restart. Of course, the full function time of all GSM modules depends on the current load and capacity of the GSM networks to which the gateway is connected.
 - Intelligent call processing - Least Cost Routing (LCR), SMS and Voice CallBack, Auto CLIP routing, DISA dial-in.
 - Intelligent selection of GSM/UMTS module to be used.
 - Support of remote SIM card function (**2N[®] SIM Star**).
 - Possibility to replace internal LCR with an external solution (**2N[®] ERM**).
 - Remote control, configuration and firmware upgrade.
 - High connection rate and ASR, low PDD.
 - AoC support.
 - Direct connection to GSM modules via Telnet protocol.
 - SNMP error traps.
 - Sending/receiving SMS via SMTP/POP3.
 - Sending/receiving SMS via SMPP.
 - Support of lock with defined BTS.

1.4 Innovations

- If you program your **2N[®]StarGate / BlueTower** parameters by means of a computer, you need a web browser (when using the CPU web interface).
- For the most recent firmware version refer to **www.2n.cz** and for necessary instructions see the **3.3.7 Others** subsection hereof.
- At **www.2n.cz** you will also find the most recent version of this manual in the popular PDF format. We recommend you to use it especially in connection with the firmware upgrade as it introduces new useful functions.
- Preliminary information on functions that are not yet available is typed on a light grey background or is printed in grey letters instead of black ones.

1.5 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[®] StarGate** firmware version and the User Manual refer to the **2N web sites**.

For a detailed description of the **2N[®] StarGate** firmware upgrade see the section devoted to the system installation.

Manual Version	Upgrade
5.3	The User Manual relates to the 2N[®] StarGate firmware version 1.14.0.x.x .
5.4	The User Manual relates to the 2N[®] StarGate firmware version 1.16.5.x.x .
5.5	The User Manual relates to the 2N[®] StarGate firmware version 1.17.0.x.x .
5.6	The User Manual relates to the 2N[®] StarGate firmware version 1.18.1.x.x .
5.7	The User Manual relates to the 2N[®] StarGate firmware version 1.19.2.x.x .
5.8	The User Manual relates to the 2N[®] StarGate firmware version 1.22.0.x.x .
5.9	The User Manual relates to the 2N[®] StarGate firmware version 1.22.0.x.x . Text correction.
5.10	The User Manual relates to the 2N[®] StarGate firmware version 1.23.0.x.x .
5.11	The User Manual relates to the 2N[®] StarGate firmware version 1.24.0.x.x .

Manual Version	Upgrade
5.12	The User Manual relates to the 2N [®] StarGate firmware version 1.25.0.x.x.
5.13	The User Manual relates to the 2N [®] StarGate firmware version 1.26.1.x.x.
5.14	The User Manual relates to the 2N [®] StarGate firmware version 1.28.0.x.x.

1.6 Terms and Symbols Used

Manual Symbols

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

A grey-marked text in this document specifies the 2N[®] StarGate/BlueTower functions that will be supported in the future.

2. Description and Installation

This section describes the 2N[®] StarGate / BlueTower product and its installation.

Here is what you can find in this section:

- 2.1 Plug-In Boards
 - Basic CPU Board
 - Basic CPU with AUX interface
 - GSM/UMTS Board
 - PRI Board
 - VoIP Board
- 2.2 Antenna and Antenna Splitters
- 2.3 Gateway Rack Configuration
- 2.4 Installation

2.1 Plug-In Boards

All the plug-in cards have defined positions in the system rack. Please keep all cards in their respective positions. Wrong positions may cause malfunction of the whole system. The type and quantity of the cards used in your 2N[®] StarGate / BlueTower gateway depend on the part number of the gateway and other components.

Note

- All the status LEDs (as described below) provide basic status information only. For detailed information use the terminal or web interface.

Here is what you can find in this section:

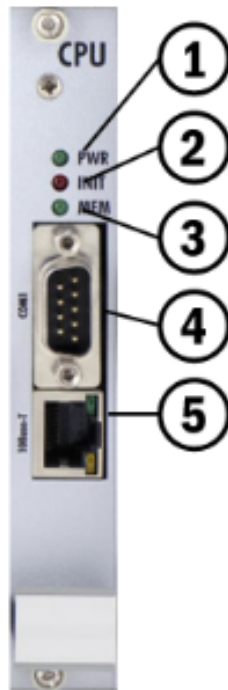
- Basic CPU Board
- Basic CPU with AUX interface
- GSM/UMTS Board
- PRI Board
- VoIP Board

Basic CPU Board

The basic CPU board carries only the main CPU, which supports all basic features of the gateway (web interface, 2N[®] SIM Star support, SMS). The advanced features of the enhanced version (SMS2Outlook, SNMP, SMS/Call simulator) are not available.

Board Description

The CPU board contains a processor system controlling the whole system. The board is designed on a 4-layer PCB of the size of 160x100mm. A simple COM1 serial interface, an Ethernet connector (100Base-T) and 5 board status LED indicators are located on the front panel.



1. Indicates board supply; the LED is green if the gateway is powered on and shows no malfunction.
2. Indicates board initialisation or malfunction.
3. Indicates CDR memory (not shining = empty; flashing 1:1 = 50% full memory; shining = 100% full memory).
4. 1st serial interface of the basic CPU.
5. 10BaseT Ethernet connection of the basic CPU.

COM1 Serial Interface Parameters

The COM1 interface is used as a local port for temporary connection of a PC (terminal) for installation and servicing purposes and permanent connection of the SMS server (supervision PC). It provides local monitoring, configuration, tracing and firmware upgrade.

- Transmission rate: 57.6 kbps
- Bit format: start, 8bit, stop (no parity)
- Signals: RXD, TXD, RTS, CTS, GND

Configuration Jumpers

The figure below shows the CPU configuration jumper. The JP1 jumper can be connected in one of the following three positions.

- CPU - COM1 communication port is active for communication with the CPU.
- eCPU - COM1 communication port is active for communication with the eCPU.
- DEF - used for CPU default reset.

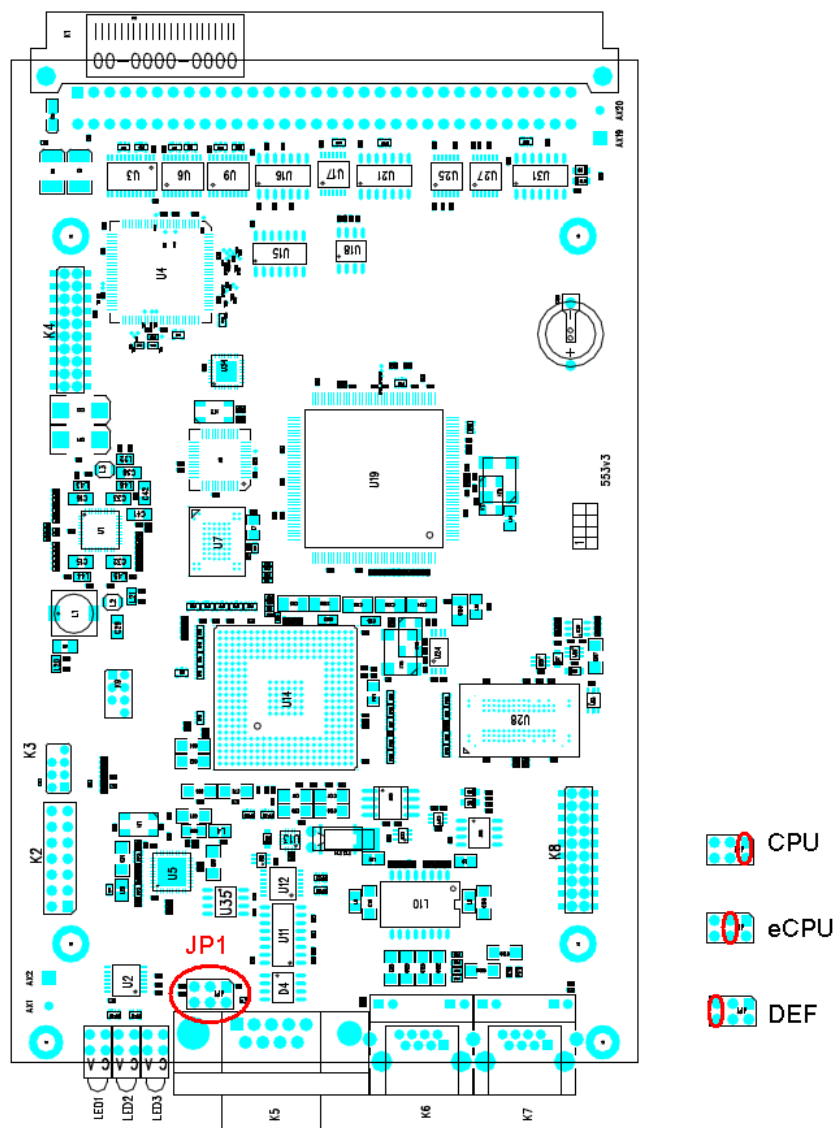


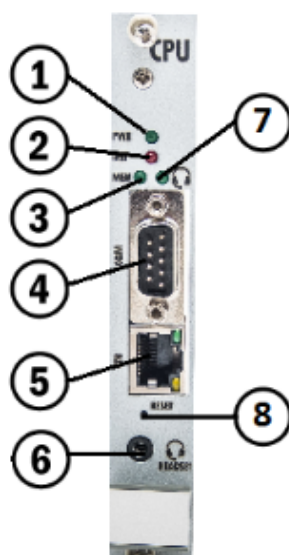
Figure: Configuration Jumpers

Basic CPU with AUX interface

The basic CPU board with AUX interface carries the main CPU, which supports all basic features of the gateway (web interface, 2N[®] SIM Star support, SMS messaging, monitoring). Moreover, **test calls** can be made via the AUX interface.

Board Description

The CPU board contains a processor system controlling the whole system. The board is designed on a 4-layer PCB of the size of 160x100mm. A simple COM1 serial interface, an Ethernet connector (100Base-T), AUX interface for jack 3.5mm and 4 board status LED indicators are located on the front panel.



1. Indicates board supply; the LED is green if the gateway is powered on and shows no malfunction.
2. Indicates board initialisation or malfunction.
3. Indicates CDR/SDR memory (not shining = empty; flashing 1:1 = 50% full memory; shining = 100% full memory).
4. Serial interface of the basic CPU.
5. 10BaseT Ethernet connection of the basic CPU.
6. AUX interface for Jack 3.5 mm. Intended for test calls. (**3.3.5 Utils**)
7. Indicates call via AUX interface.
8. Reset button.

COM1 Serial Interface Parameters

The COM1 interface is used as a local port for temporary connection of a PC (terminal) for installation and servicing purposes and permanent connection of the SMS server (supervision PC). It provides local monitoring, configuration, tracing and firmware upgrade.

- Transmission rate: 57.6 kbps
- Bit format: start, 8bit, stop (no parity)
- Signals: RXD, TXD, RTS, CTS, GND

Configuration Jumpers

The figure below shows the CPU configuration jumpers. The jumpers can be connected in one of the following two positions.

- Position 1 - UNIV standart
- Position 2 - HUAWEI standart

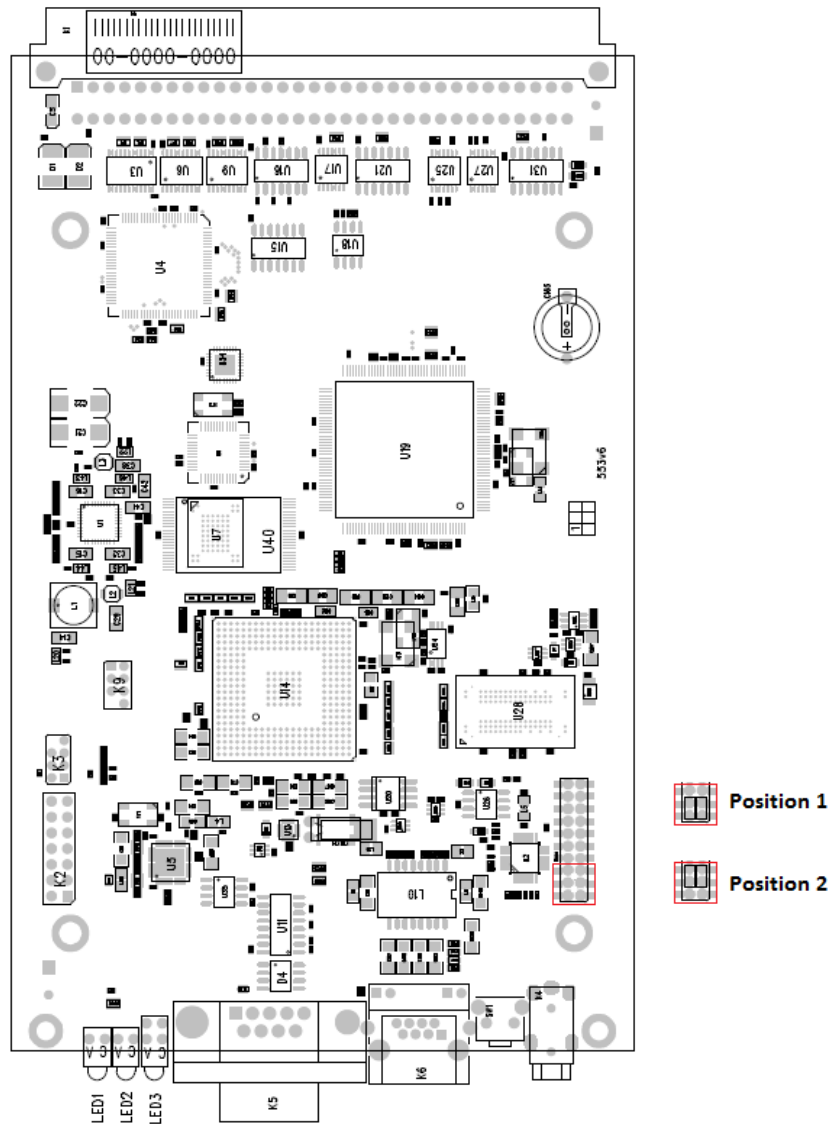


Figure: Configuration Jumpers

GSM/UMTS Board

eBoard Description

The GSM/UMTS board contains two GSM or UMTS wireless modules, circuits for their connection to the PCM bus, and DTMF receivers (+CPU in the case of board with the 2N[®] SIM Star support). The board is designed on a 4-layer PCB of the size of 160x100mm. Pins 1 and 32 are approximately 1 mm longer in the GSM board system

connector and are used for 'hot swap' power feeding, allowing to push the board in and out even during operation. This feature is especially handy while installing or replacing SIM cards. Two SMA antenna connectors and 5 board status indicators are located on the front panel.



1. PWR – Board supply indication
 - Shining: Switched on.
 - Flashing: Board in the sleep mode.
2. INIT – Board initialisation indication
 - Shining: Board faulty or not yet initialised.
 - Flashing: Board initialisation failure or system incompatibility.
3. SLP – Board sleep state indication
 - Shining: Both wireless channels manually blocked.
4. CH1/CH2 – Wireless engine state indication
 - Shining RED: Wireless engine blocked or switched off.
 - Flashing RED: Wireless engine restart in progress.
 - Shining GREEN: Proceeding call.
 - Flashing slowly GREEN: Call terminating or voice settings in progress.
 - Flashing quickly GREEN: Wireless engine trying to log in.
 - Light off: Wireless engine ready for calling.
5. SMA female antenna connector of wireless engines

 **Tip**

- For an easy SIM card replacement, all GSM / UMTS boards are designed as hot-swappable units.

Board Types

The 2N[®] StarGate / BlueTower gateway can use several types of GSM or UMTS boards. The board specification includes the type of wireless device(s), count of SIM cards channel and 2N[®] SIM Star support data.

Table of available GSM/UMTS cards (2016):

Order No.	GSM / UMTS card
5070554E	GSM board with 2xTelit GE910 engines, 4SIM/channel, 2N [®] SIM Star support
5070078E	GSM board with 2xTelit GE910 engines, 1SIM/channel, 2N [®] SIM Star support
5070551E	GSM board with 2 Cinterion MC55i-w engines, 4SIM/channel, 2N [®] SIM Star support (remote SIM, no IMEI change, no BTS Lock)
5070082E	GSM board with 2 Cinterion MC55i-w engines, 8SIM/channel, no 2N [®] SIM Star support
5070077E	GSM board with 2 Cinterion MC55i-w engines, 1SIM/channel, 2N [®] SIM Star support (remote SIM, no IMEI change, no BTS Lock)
5070555E	UMTS board with 2xTelit HE910-EUR engines, 4SIM/channel, 2N [®] SIM Star support
5070558E	UMTS board with 2xTelit HE910-NAR engines, 4SIM/channel, 2N [®] SIM Star support

Order No.	GSM / UMTS card
N/A	GSM board with 2 Wavecom Q55 (WMP100) engines, 4SIM/channel, no 2N [®] SIM Star support
N/A	GSM board with 2 Wavecom Q55 (WMP100) engines, 8SIM/channel, no 2N [®] SIM Star support
N/A	GSM board with 2 Wavecom Q55 (WMP100) engines, 1SIM/channel, 2N [®] SIM Star support
N/A	GSM board with 2 Wavecom Q55 (WMP100) engines, 4SIM/channel, 2N [®] SIM Star support, N/A.
N/A	UMTS board with 2 SierraWireless MC8790V engines, 4SIM/channel, no 2N [®] SIM Star support
N/A	UMTS board with 2 SierraWireless MC8790V engines, 1SIM/channel, 2N [®] SIM Star support
N/A	UMTS board with 2 Telit UC864-G engines, 4SIM/channel, 2N [®] SIM Star support

Note

- The GSM/UMTS boards can be locked for use in defined GSM/UMTS networks only. For additional information please ask your system supplier.

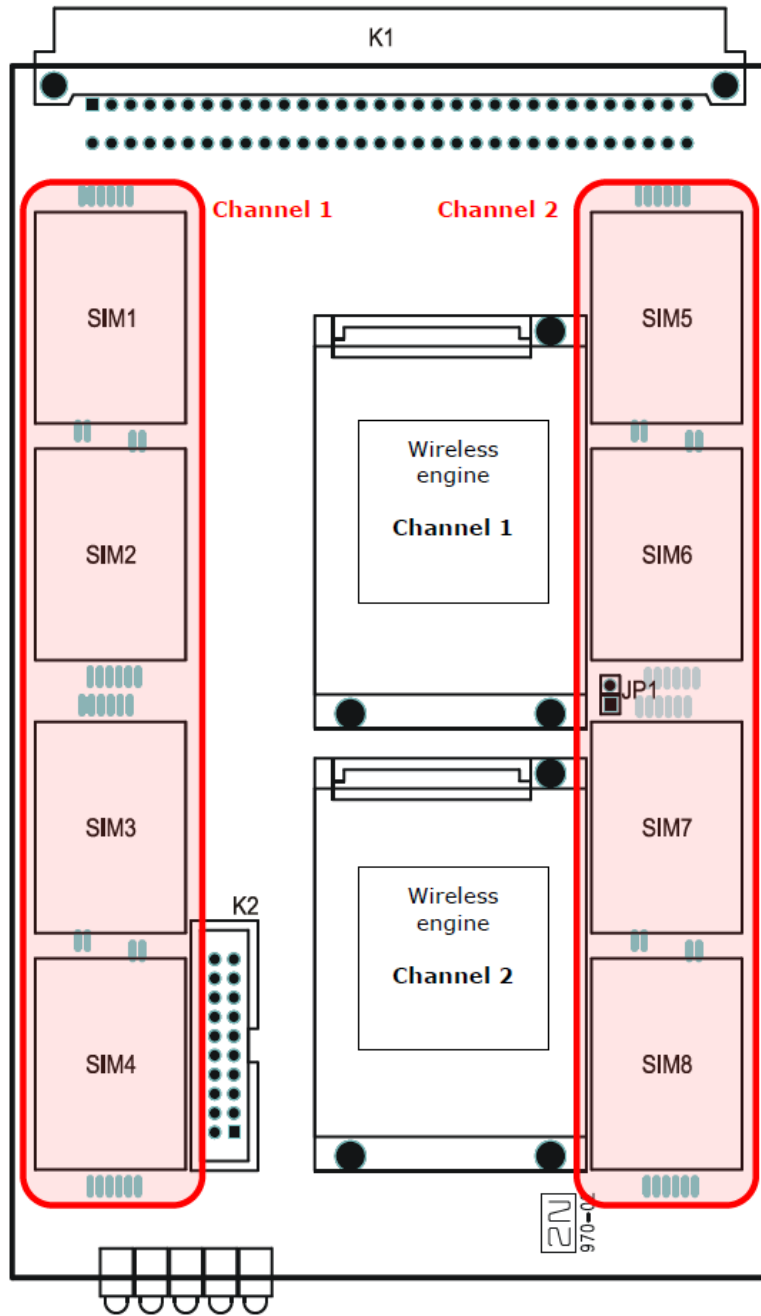


Figure: SIM Card Positions on 4SIM/Channel Boards

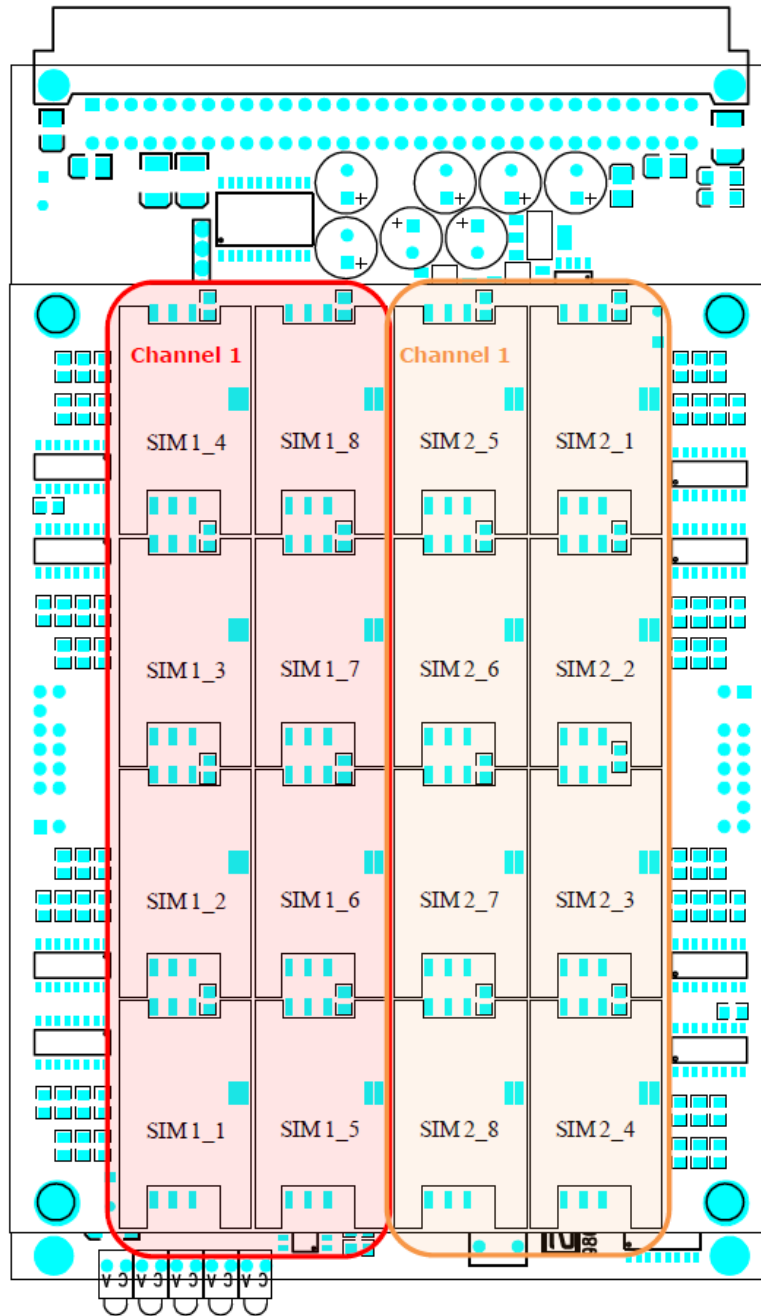


Figure: SIM Card Positions on 8SIM/Channel Boards

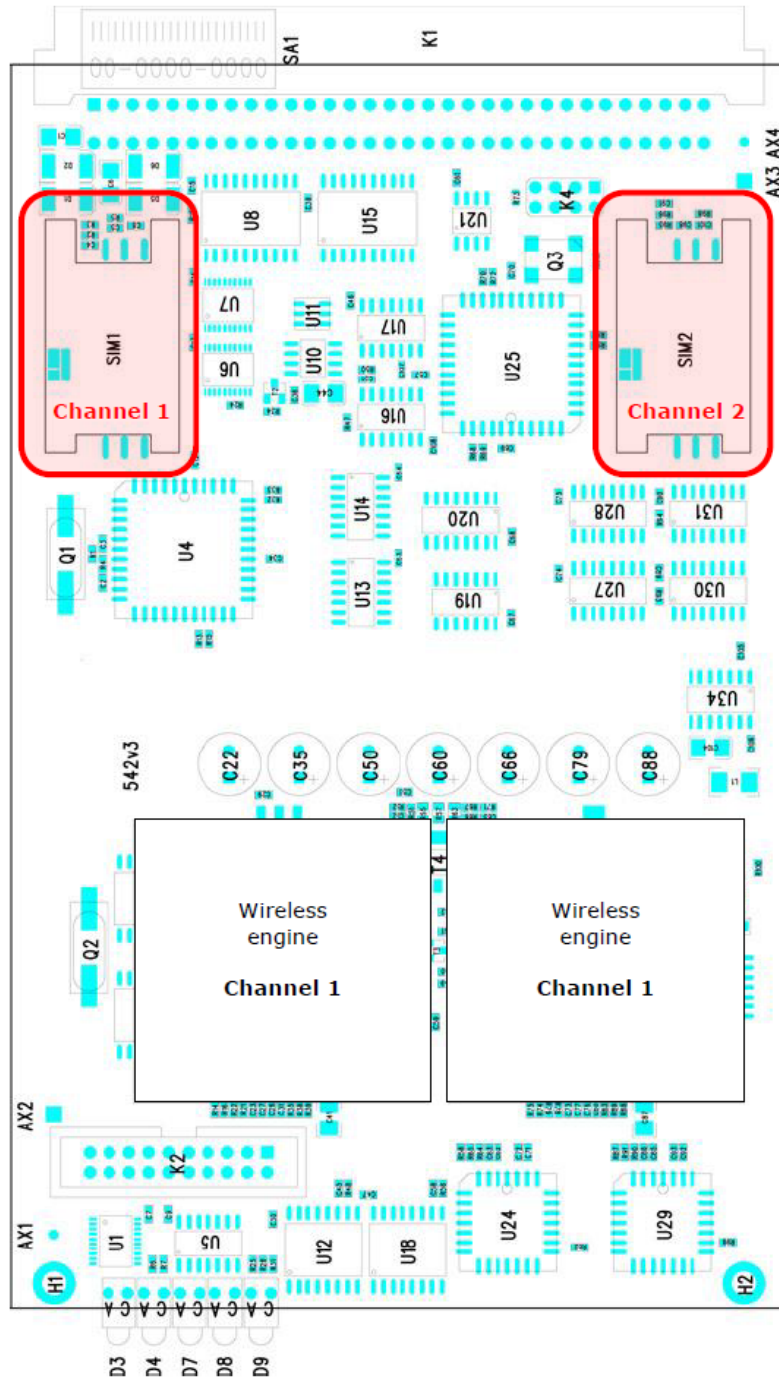


Figure: SIM Card Positions on 1SIM/Channel Boards

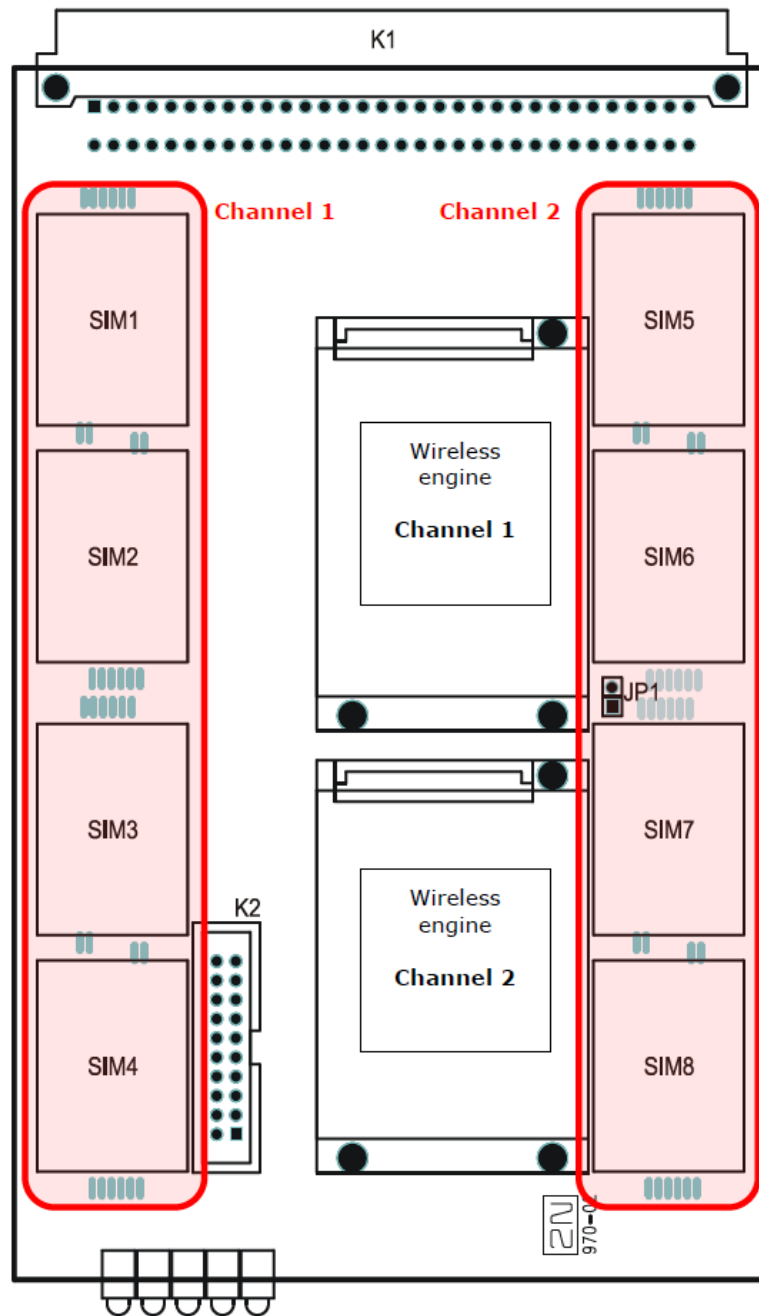


Figure: SIM Card Positions on 4SIM/Channel Boards

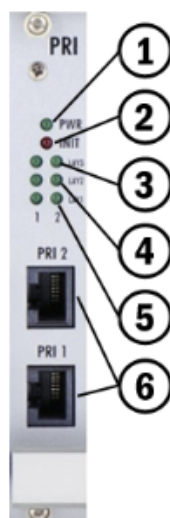
PRI Board

Board Description

The PRI board contains one or two (depends on the part number) ISDN interfaces and PCM bus timing circuits. PRI 1 is designed as an internal interface (with an activated LCR function) and PRI 2 as an external interface (all calls from the port are always routed to PRI 1). The interface can work in the MASTER or SLAVE mode (set the PRI 1

mode using the web interface and PRI 2 has always the opposite mode). The output can be configured as TERMINAL (TE) or NETWORK (NT) by jumpers (switching of wires - for software switch you have to use the web interface!). The settings of these jumpers HAVE TO match the PRI configuration - two NT and TE modes will cause malfunction of the PRI board or back-up connection* ! The board is designed on a 4-layer PCB of the size of 160x100mm. There are also 5 (or 8 in 2ISDN PRI) board status indicators, which are located on the front panel.

- The PRI board contains four switches (can be deactivated by jumpers), which provide hardware connection between PRI 1 and PRI 2 in case the system is switched off or inoperative.



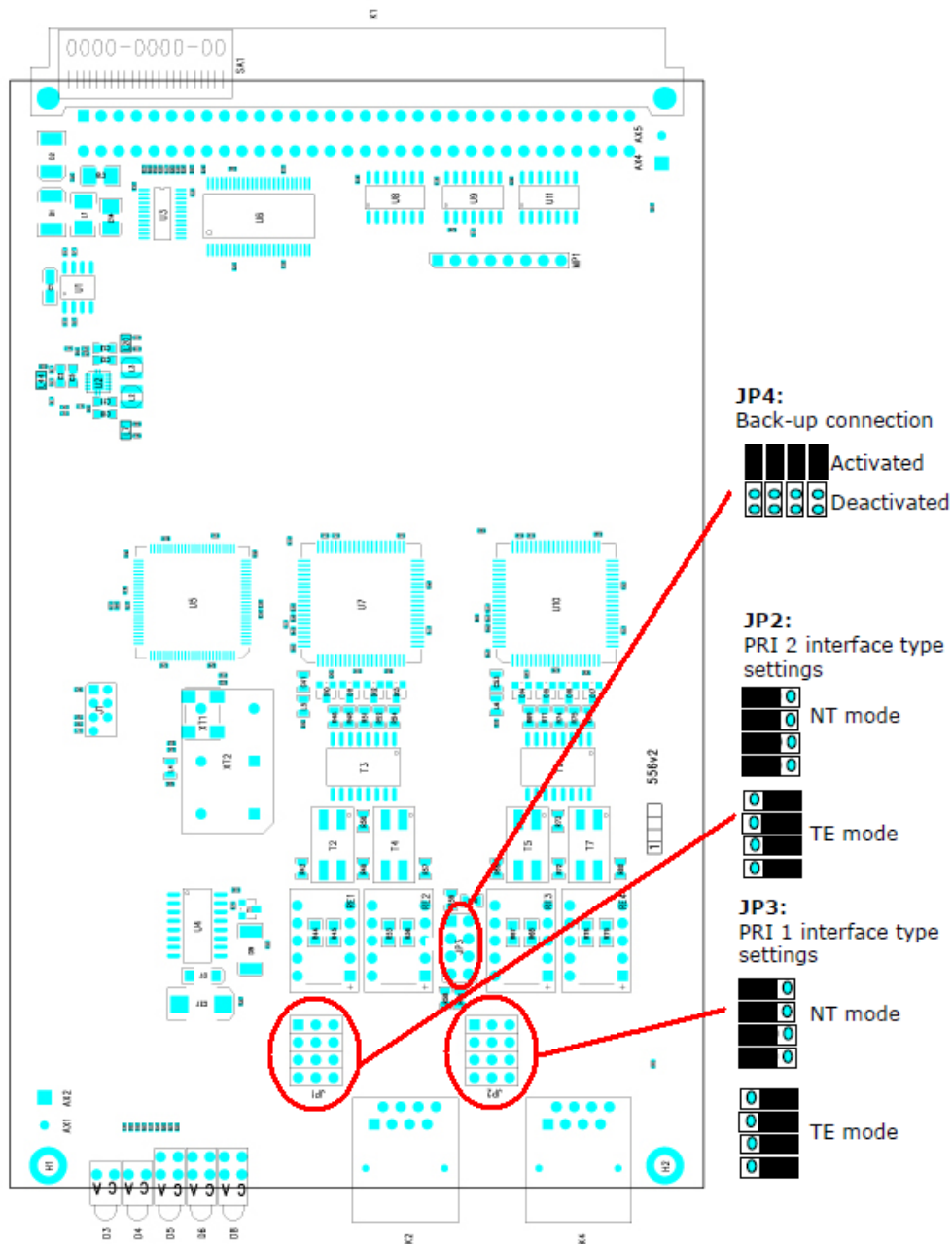
1. Board supply indication
 - Shining: Switched on
 - Flashing: Board in the sleep mode
2. Board initialisation or error state
 - Shining (up to 1 minute): Firmware upgrading
 - Continuous shining or flashing: Board initialisation failure
3. Status of ISDN layer 3 on PRI 1/2 interfaces
 - Shining: One or more calls are connected over selected interface
 - Flashing: B-channel in restartLight off: No active call
4. Status of ISDN layer 2 on PRI 1 (2) interfaces:
 - Shining: Layer 2 successfully established
 - Flashing: Layer 2 in the establishing process
 - Light off: Layer 2 disconnected

5. Status of ISDN layer 1 on PRI 1 (2) interfaces:
 - Shining: Layer 1 successfully established
 - Flashing: Layer 1 in the establishing process
 - Light off: Layer 1 disconnected
6. Physical RJ-45 connectors for ISDN PRI 1 and PRI 2 interfaces. Before you plug in your ISDN connection please check whether the wiring configuration matches the ISDN connection requirements!

 **Tip**

- The LED statuses provide basic information on the ISDN interface only. For details on the ISDN interface state refer to the web interface.

Configuration Jumpers



There are three configuration jumper blocks on the PRI board. JP2 and JP3 are used for hardware switching of the ISDN PRI connector into the TE/NT configuration. This operation means only swapping of the transmitting and receiving connector pairs, the interface configuration must be made using the web interface. With jumper JP4 you can activate/deactivate the back-up connection between PRI 1 and PRI 2 in case the system is switched off or the PRI board is not handled by system.

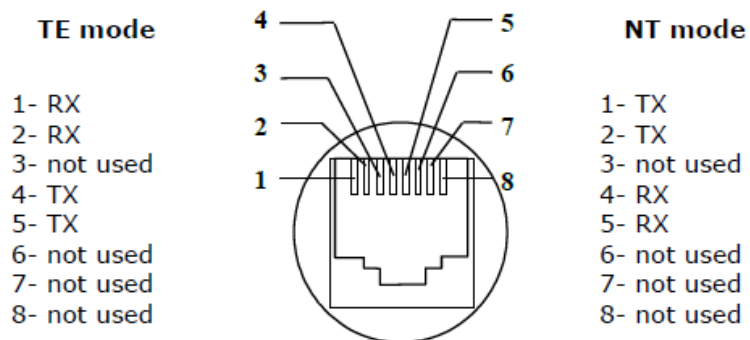
Warning

- The back-up connection (JP4) works only in case the wire settings of PRI 1 (JP3) and PRI 2 (JP2) are set in the opposite way (e.g. PRI 1 as NT, PRI 2 as TE).

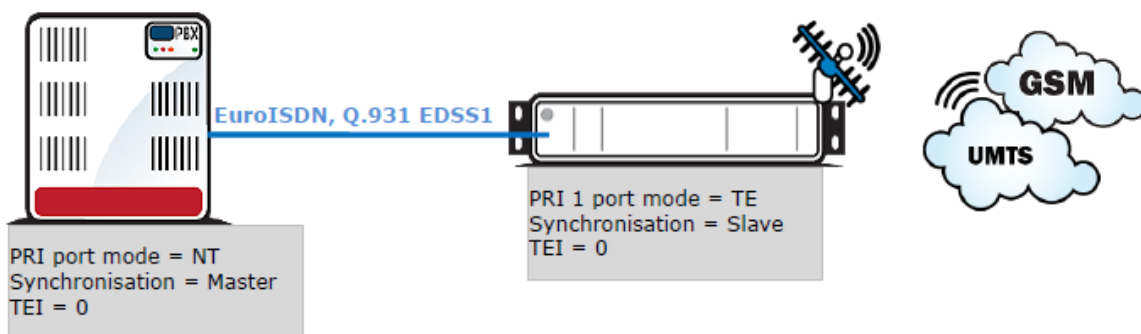
Note

- Boards with just one PRI interface (1PRI boards) have the same settings as the PRI 1 interface on 2PRI boards. And there is no back-up connection (JP4) either.

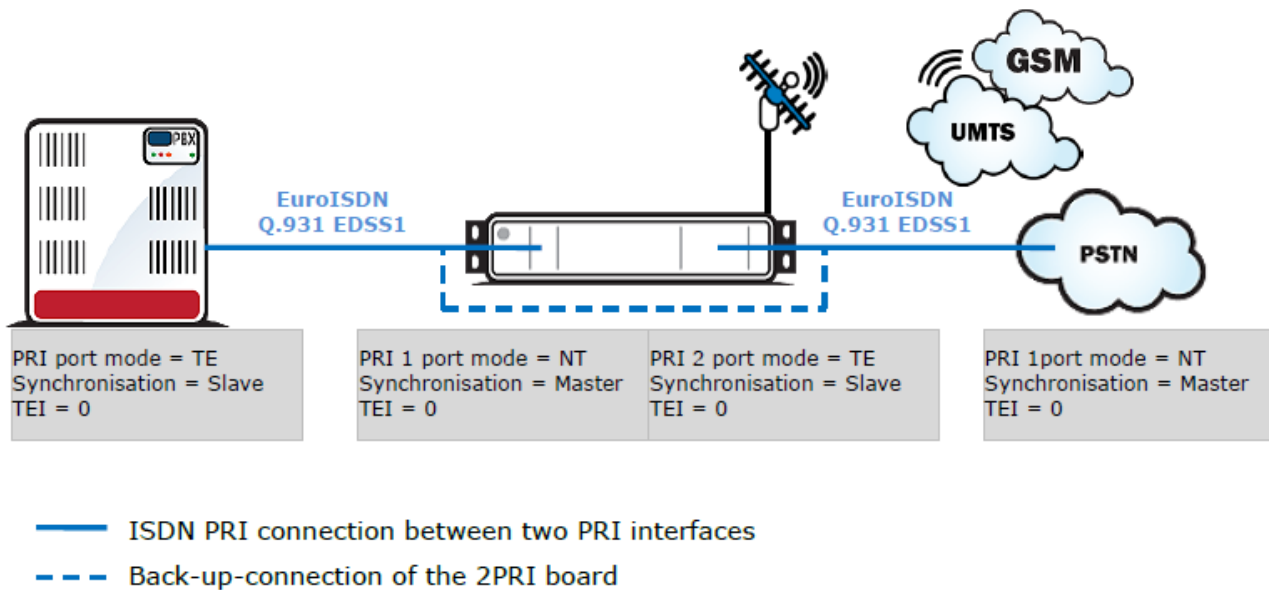
Positions of Tx and Rx Wires



Example of Connection with 1ISDN PRI Board



Example of Connection with 2ISDN PRI Board



Warning

- The ISDN port mode (TE or NT) and synchronisation type (Master/Slave) must be different on the PBX (PSTN) and on the gateway. The TEI number must have the same value (default = 0).

VoIP Board

Board Description

The VoIP board contains a digital signalling processor (DSP), 4x10/100BaseT Ethernet switch and a small carrier board with the licence chip. The main board is designed on a 6-layer PCB of the size of 160x100mm. Two board status LED indicators are located on the front panel. Configuration (e.g. used voice codecs, IP setting) is completely managed by the main CPU and made via a standard web interface. There is no fixed memory (EEPROM) for the VoIP card firmware. The firmware is saved on the basic CPU and uploaded to the VoIP card upon every VoIP card start/restart.



1. PWR – board supply indication
 - Shining: Switched on
 - Flashing: Board in the sleep mode
2. INIT – board initialisation indication
 - Shining for two minutes: Firmware uploading and configuration in progress
 - Continuous shining: Board initialisation failure
 - Light off: Board initialised successfully
3. Four RJ45 connectors of the internal 10/100BaseT Ethernet switch

The VoIP board is designed as a media gateway. It works only with media packets (RTP); signalling packets (SIP) must be routed to the basic CPU IP address.

 **Tip**

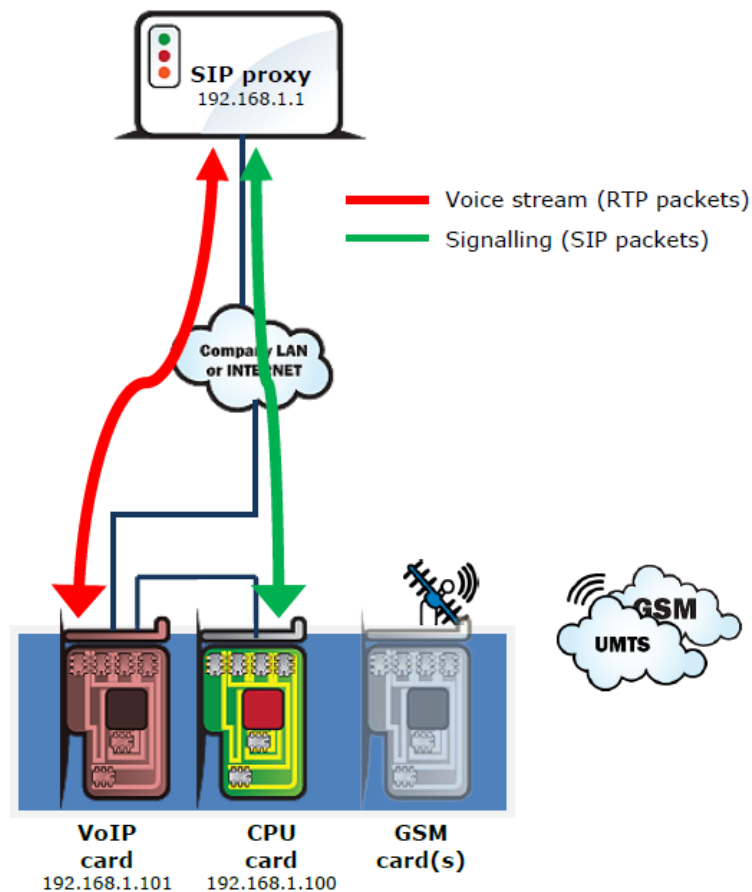
- You have to restart the VoIP card upon any VoIP configuration change.

Caution

- For a successful VoIP card initialisation, the VoIP board MAC address has to be filled in correctly and the basic CPU must be switched to the VoIP-SIP mode and contain the VoIP firmware file.
- The integrated Ethernet will not work until the VoIP card has been initialised successfully.

Configuration Jumpers

There are no configuration jumpers on the VoIP card.

Example of Correct VoIP Interface Connection

2.2 Antenna and Antenna Splitters

2N offers several antenna splitter and antenna models providing the best signal quality on all GSM/UMTS engines. All the systems are designed for all UMTS and GSM networks.

Antenna Splitter

The antenna splitter is designed for decreasing the number of antennas, antenna cables, outdoor antennas and roof mounting space. The antenna splitter is a passive unit suitable for GSM/UMTS gateways. The antenna splitter can be external (2N[®] StarGate) or internal (2N[®] BlueTower). Each splitter consists of one or more passive units, each of which has four/two inputs and one output.

Number of inputs	Number of outputs	Input-Output insertion loss	Unit high
32	2	<15 dB	2U
32	4	<11 dB	2U
32	8	<8 dB	2U
16	1	<15 dB	1U
16	2	<11 dB	1U
16	4	<8 dB	1U
12	3	<8dB	1U

Table: Standard External Antenna Splitter Configurations

Number of inputs	Number of outputs	Input-Output insertion loss	Unit high
4	1	<	3U

Table: Internal Antenna Splitters for 2N[®] BlueTower

Parameters	Value	Note
Connector type		
Input connector	SMA type, female	
Output antenna connector	N type, female	
RF parameters		
Impedance	50 Ohm	
Frequency	850 - 2100 MHz	
Insertion loss	< 8, 11, 15 dB	According to configuration
Isolation between two channels	> 20 dB	
Output overvoltage protection		
Device type	Gas surge arrester	
Protected voltage level	90 V	
Peak current	10 KA	
Insertion loss	0.2 dB	

Table: Technical Parameters of Antenna Splitters

Splitter Examples



Figure: Internal Antenna Splitter for 2N[®] BlueTower

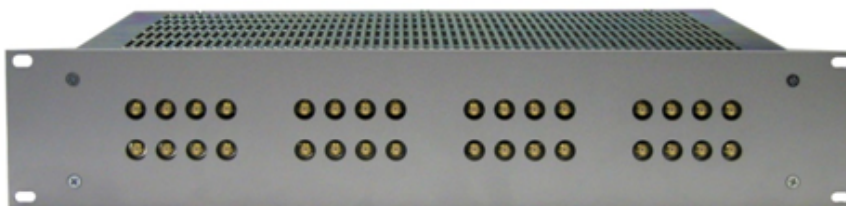
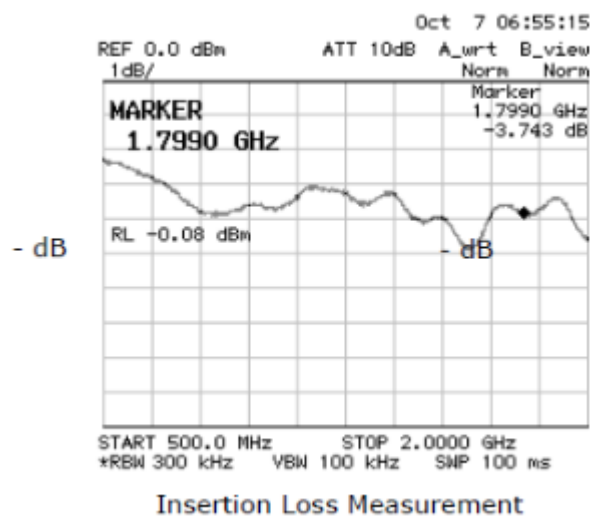


Figure: External Antenna Splitter for 2N[®] StarGate



Directional Antenna

The high-gain directional YAGI antenna is suitable for outdoor and indoor use.

- **Type** - CPY 9214
- **Number of elements** - 14
- **Frequency** - 824 - 896, 1770 - 2100 MHz
- **Gain** - 9.5 dB / 13 dB
- **Cable** - RG 58, 10m
- **V.S.W.R** - < 1.5 : 1
- **Connector** - N type, female

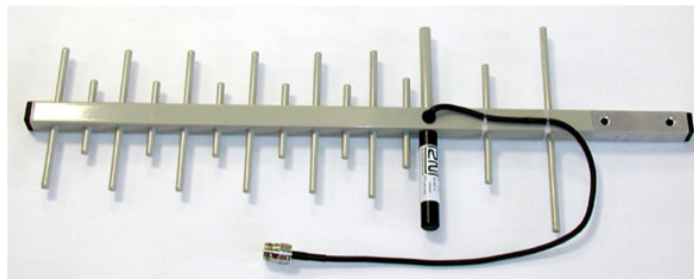


Figure: Directional Antenna



Figure: Example of Correct Installation of Directional Antennas

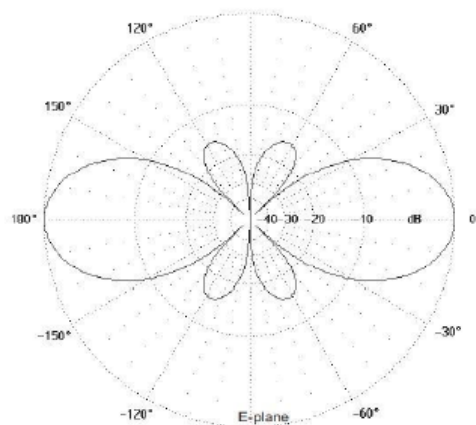
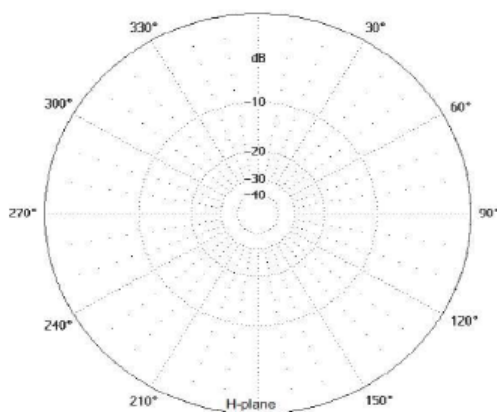
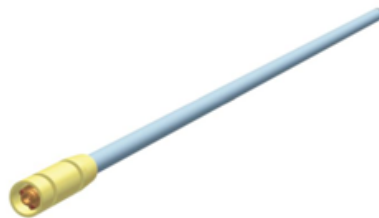
Warning

- The antenna has to be placed in accordance with the applicable overvoltage protection and grounding safety rules.

Omni-Directional Antenna

The omni-directional antenna is suitable for outdoor use.

- **Type** - KA 2290. 9214
- **Frequency** - 870 - 960, 1710 - 2170 MHz
- **Gain** - 3 dB
- **Polarization** - Vertical
- **Radiation angle in E-plane** - 30°
- **Radiation angle in H-plane** - omni-directional
- **V.S.W.R** - < 1.7
- **Length** - 420 mm
- **Weight** - 0.6 kg
- **Connector** - N female



Discreet Antenna

The small omni-directional antenna is designed for indoor use and provides a good GSM/UMTS signal quality.

- **Type** - Car antenna
- **Gain** - 2.5 dB
- **Cable** - Coax cable 174A (5 m)
- **Connector** - SMA (male)



Figure: Discreete antenna

Directional Antenna Connection Cable

2N offers you a special low-attenuation cable in variable lengths. The cable terminating connectors are of the N type.

- **Type** - H1000 PE coax cable
- **Impedance** - 50Ω
- **Operating frequency** - 5 - 2150 MHz
- **Used connectors** - N type (female)
- **Cable size** - 10.3mm
- **Operating temperature** - -40°C to +80°C
- **Total weight** - 120 g/m
- **Minimum installation temperature** - -5°C
- **Minimum static bend radius** - 75mm
- **Attenuation at 860MHz** - 14.1dB / 100m
- **Attenuation at 1000MHz** - 15.3dB / 100m
- **Attenuation at 1750MHz** - 21.3dB / 100m
- **Attenuation at 2050MHz** - 23.4dB / 100m

Installation recommendations

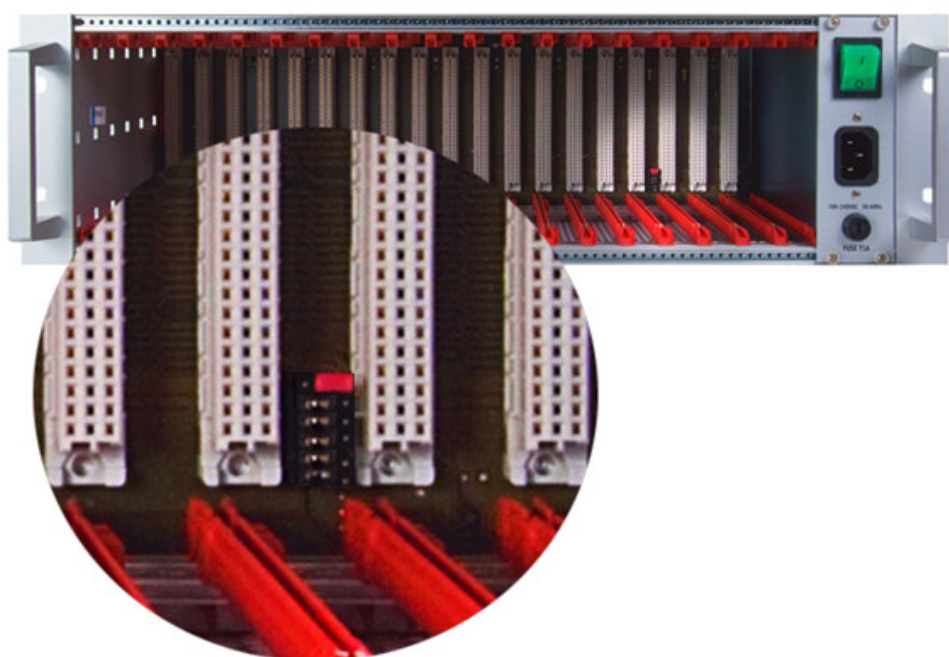
- Preserve polarization,
- Keep minimum distance from lightning conductor
- Keep minimum distance between antennas - half of antenna wave length, that is intended for longest wave length (lowest frequency).
- Consult angle and azimuth used with your provider, respecting location and BTS usage.
- Make sure that incoming performance is not above value, that may cause errors in transmission or even burn out of HF parts.

2.3 Gateway Rack Configuration

The 2N® StarGate / BlueTower gateways use different hardware rack types. For detailed information on the differences refer to the **1.2 System** subsection. All the systems can be distributed with a VoIP, ISDN or VoIP+ISDN interface. The main back bus located in the gateway hardware rack is pre-configured to a defined type of interface (VoIP, PRI and VoIP+ISDN). There are six jumpers on the main bus between the 3rd and 4th connector (from the right). The jumper lay-out shown below applies to all the connection types (VoIP, ISDN, VoIP+ISDN).



- Keep the jumpers connected as shown below to make your system work properly.



There are three setting options:

1. ISDN: The gateway is configured to work with the ISDN PRI card only as shown in the figure below:



2. VoIP: The gateway is configured to work with the VoIP card only as shown in the figure below:



3. VoIP+ISDN: The gateway is configured to work both with the VoIP and ISDN PRI cards.



 **Caution**

- Wrong jumper positions may cause malfunction of the whole system! Please make changes only if the system is powered off!

 **Note**

- The jumper settings are identical for all the gateway types (2N[®] StarGate / BlueTower).

2.4 Installation

Product Completeness Check

Before installing this product, check whether the delivery is complete according to the following packing list and read this manual thoroughly. The manufacturer cannot be held responsible for any damage incurred due to an incorrect use of this product in contradiction with this manual. The warranty terms do not cover damage to the product caused by rough handling, incorrect storage or exceeding the quoted technical parameters.

Item	Rack with AC power supply	Rack with DC power supply
Power cable 2.5m	1	-
Mounting set	1	1
Quick Start manual	1	1
Serial 9F-9F cable	1	1

Table: Basic Packing List Items

Included device	1PRI card	2PRI card	VoIP card	Basic CPU card	Enhanced CPU card
Ethernet cable 3m	1	2	1		
Ethernet cable 0.6m				1	2

Table: Additional Packing List Items

Tip

- The packing lists are the same for all the gateway types (2N[®] StarGate/BlueTower).

Installation Conditions

The following conditions must be met during system installation:

- Appropriate location (enough free space).
- GSM/UMTS signal intensity (minimum recommended signal level: **-80dB**). You can use the NET monitor on a mobile phone (e.g. Nokia, Siemens) or the diagnostics screen in the web interface for measuring the GSM/UMTS signal intensity.
- Unoverloadable GSM/UMTS cells to which the gateway modules are logged in; please keep in mind that up to 30 calls are set up at a time during full traffic (according to the gateway configuration).
- No strong electromagnetic radiation is allowed on the system installation site.
- No strong electromagnetic reflections are allowed on the antenna installation site.
- The ISDN PRI connection must be configured properly and meet the ITU-T Q.931-EDSS1 and related recommendations.
- The VoIP - SIP signalling must meet the required RFCs.
- Place the gateway into an environment that complies with the gateway working conditions (an air conditioned room or installation rack).
- An appropriate (according to the power supply unit used) power feeding with overvoltage protection and an on-line UPS are recommended.
- An Ethernet connection on the installation site is advisable for comfortable gateway administration.
- All the SIM cards to be used must have the same PIN code (or deactivated PIN code) and be activated by the GSM/UMTS provider.

Warning

- The outdoor antenna cable has to be connected according to the overvoltage protection and grounding safety rules.
- High temperatures on the installation site may cause short-time or permanent gateway errors!

Warning

- Do not cover the top, bottom and rear sides of the gateway to avoid overheating and gateway error!
- Protection against humidity and extreme temperatures: The appliance may never be placed close to heat sources (radiators) or places exposed to direct sunshine. Also places with high humidity (such as bathrooms and cellars), places with significant temperature fluctuation (next to doors, windows), dusty places (workshops) and places exposed to aggressive gases (accumulator rooms, boiler rooms) as well as places with intensive vibrations and places exposed to shocks (compressor rooms, heavy industrial operations) should be avoided. The system should be installed horizontally.

VoIP Connection

All the gateway types have the same features. The only difference lies in the number of simultaneous calls through the VoIP card.

- **Voice codec support** – G.711u , G.711a , G.723 at 6.3/5.3bps , G.729a,b
- **Default RTP ports** – 8000–8998 (adjustable by web interface)
- **Supported signalling** – SIP
- **Default IP port for signalling** – 5060 (adjustable by web interface)
- **STUN protocol** – Supported IP address check
- **Interface for SIP** – 10BaseT Ethernet interface on basic CPU card
- **Interface for RTP streams** – 10/100BaseT Ethernet interface on VoIP card
- **Maximum number of simultaneous calls**
 - 2N[®] StarGate – 30
 - 2N[®] BlueTower – 8

The VoIP board is designed as a media gateway. It works only with media packets (RTP); signalling packets (SIP) must be routed to the basic CPU IP address.

TIP

- You have to restart the VoIP card upon any VoIP setting change.

⚠ Caution

- For a successful VoIP card initialisation, the VoIP board MAC address has to be filled in correctly and the basic CPU must be switched to the VoIP-SIP mode and contain the VoIP firmware file.
- The integrated Ethernet will not work until the VoIP card has been initialised successfully.

ISDN PRI Connection

The gateway can contain a PRI card with one or two ISDN PRI interfaces (depends on the part number). PRI 1 is always set as an internal interface (PBX connection) and PRI 2 as an external interface (PSTN connection). The Least Cost Routing (LCR) and additional routing mechanisms are activated on the internal interface. All incoming calls to the external interface are always routed directly to the internal interface.

- **Interface** - ISDN PRI (E1 frame)
- **Signalling** - Q.931 - EDSS1
- **Signalling channel (D-channel)** - 16.
- **Network interface type** - NT or TE (adjustable by web interface)*
- **TEI number** - 0 - 63 (adjustable by web interface)
- **CRC on Layer 1** - Activated/deactivated (adjustable by web interface)*
- **Connector type** - Switchable RJ45 (see Subs. 2.1)
- **Supported voice codec** - G.711a**
- **Supported B-channel services** - Only voice**

*The PRI 2 interface is always of the opposite type than the PRI 1 interface.

**Other streams are sent directly to the opposite PRI interface.

Installation Examples

There is an exact time source for synchronisation of the PRI interface lines on the PRI board. Even if you have synchronisation problems on the installation site (caused by specific and probably ill-configured PBXs with more than one active PRI interfaces), there is a solution as shown below. Before using this solution you are recommended to configure your PBX properly, or use the DialThru function. Red lines are calls to the PSTN, orange lines are calls to GSM/UMTS networks.

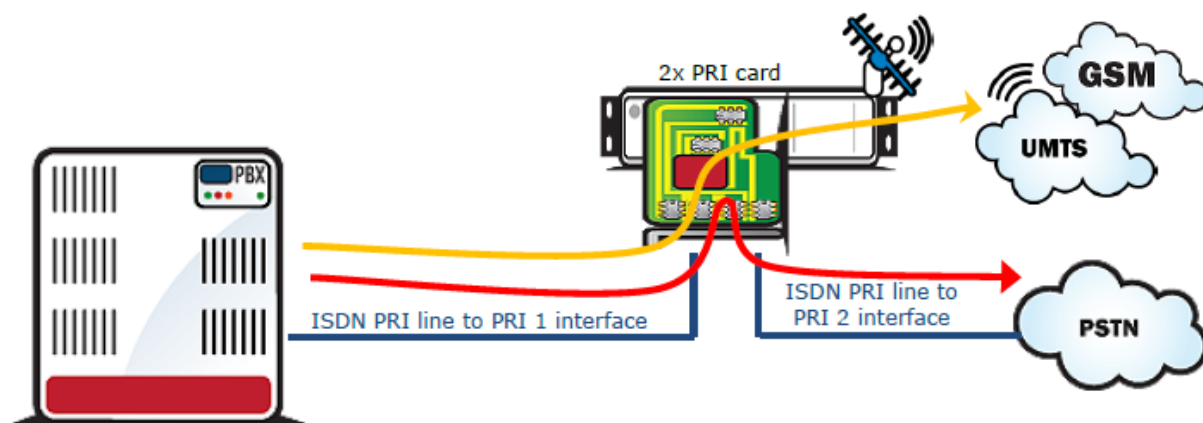


Figure: DialThru Function Installation

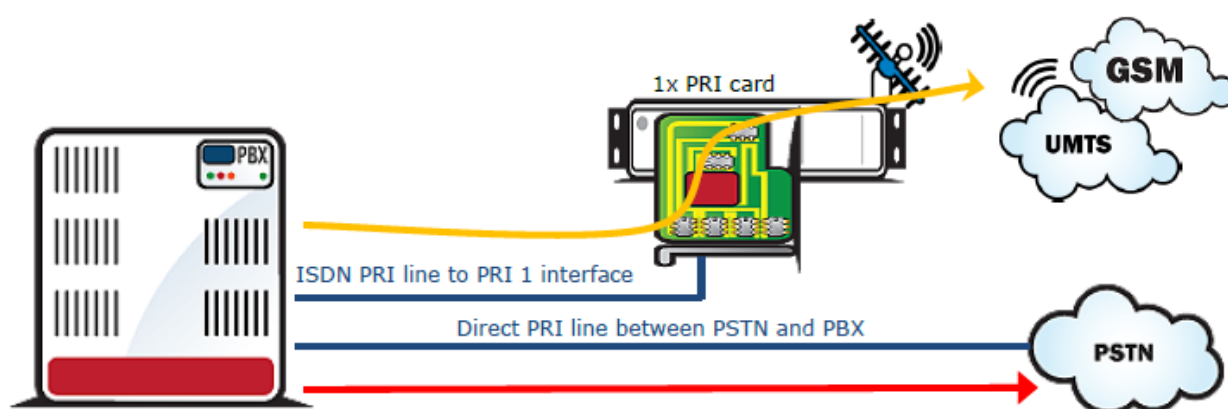


Figure: 1ISDN PRI Card Installation

External Synchronisation Option

There is an exact time source for synchronisation of the PRI interface lines on the PRI board. Even if you have synchronisation problems on the installation site (caused by specific and probably ill-configured PBXs with more than one active PRI interfaces), there is a solution as shown below. Before using this solution you are recommended to configure your PBX properly, or use the DialThru function.

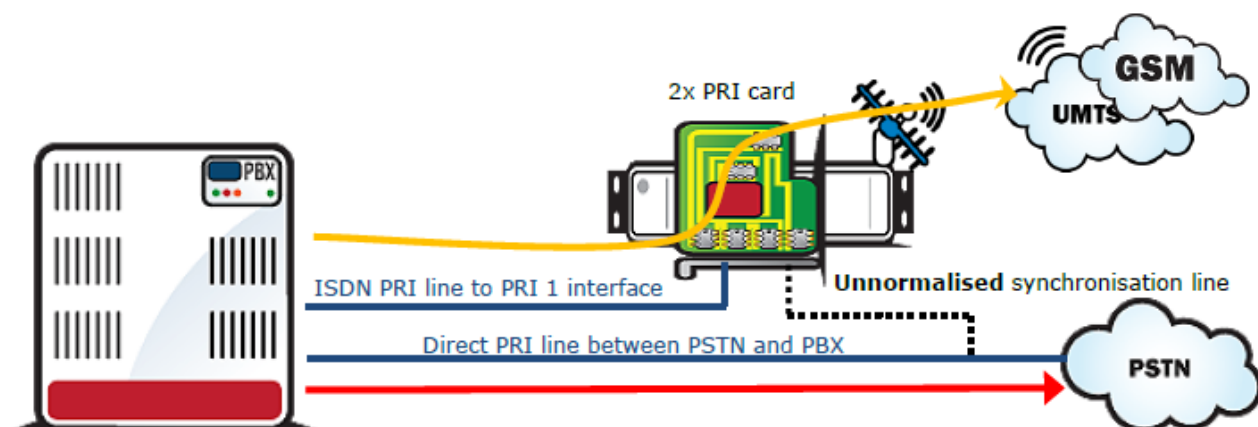


Figure: Unnormalised External Synchronisation

Connect only Tx wires to the 2PRI board because the ISDN PRI line is not designed for point-to-multipoint solutions (more than two devices on one ISDN line) like the BRI ISDN line. This solution is substandard! In case you detect a problem on the line between the PBX and PSTN (due to an additional connection to the PRI 2 interface), please disconnect PRI 2 from the line. These problems may be caused by changes in the line impedance.

Note

- Connecting Tx wires only (from the PSTN point of view) to the PRI 2 interface has no influence on signalling and voice calls. The PRI board just takes synchronisation pulses from the line.

Tip

- For an external synchronisation line you can use a standard cable with an RJ-45 connector. To disconnect the Rx wires just release the defined jumpers on the PRI 2 interface on the PRI board.

Simultaneous Use of PRI ISDN and VoIP Cards

The GSM gateway enables the VoIP and PRI ISDN interfaces to be used at the same time. This configuration requires additional incoming/outgoing call routing settings.

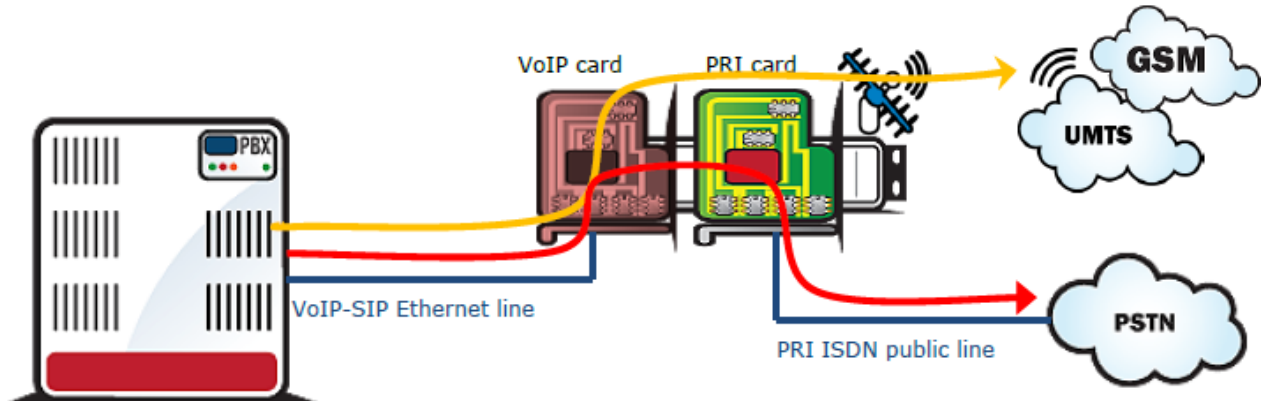


Figure: Installation with SIP proxy (Cisco Call Manager).

Licence Limitations

Some of the 2N products have time-limited software licences (e.g. DSS1 signalling, etc.). Moreover, every gateway restart adds one hour to the internal licence counter. To see the current licence status, use the CPU web interface (the standard licence validity is 850 hours).

You are recommended to contact your dealer before licence expiration to request for a new licence key to increase the gateway using time.

To upload a new licence code, use the CPU web interface.

Caution

- A gateway with an expired licence fails to accept calls from the VoIP /GSM/UMTS/PRI interface because the call control layer is deactivated.

GSM/UMTS Network Restriction

Upon the dealer's request, 2N can activate restrictions of use for selected wireless networks only. Thus, the gateway will be unable to log in successfully to the restricted wireless networks. This state is signalled by the red status LEDs on the GSM/UMTS cards and the 'netw-err' message on the web interface diagnostics screen.

 **Tip**

- To prevent this problem consult ask your dealer.

Basic CPU Firmware

Before installing your 2N[®] StarGate / BlueTower gateway, please upload new firmware to both the CPUs. Find the latest firmware version on our website www.2N.cz

 **Warning**

- To avoid gateway error please use only the firmware files that are designed for your type of gateway and certified by 2N.

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 **http://IP_address** to register to the web interface.
- Click on Upgrade, then on Browse and select the new firmware file.
- Click on the Download firmware icon in the lower part of the web page.
- 2N[®] StarGate / BlueTower will upgrade the firmware automatically.

 **Tip**

- You can also use 2N[®] SIM Star Server for remote upgrades for all connected gateways.

Potential Problems of GSM/UMTS Networks

The 2N gateway works reliably even under a 100% load. The following problems may be caused by GSM networks:

- **Wireless modules 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. We recommend the minimum signal level of approximately -80dBm . If lower, you have to change the antenna or gateway location!
 - The GSM/UMTS cell (BTS) to which the wireless module is trying to log in is overloaded. If you use directional antennas, you can direct them to more GSM cells than one. The possibility to choose a cell by antenna directing is considerably limited or eliminated in towns or densely populated areas where multiple signal reflections occur. It is also difficult to select a cell where the cells lie in a straight line before and behind the antenna. If no selection can be made, you have to use another available GSM/UMTS provider.

 **Caution**

- You are recommended to use 32 channels at most on one installation site for one GSM/UMTS provider to avoid wireless network overload problems on the installation site.

- **Some wireless modules are permanently logged-out from the network or fail to receive incoming calls:**
 - The problem indicates a wireless network overload due to heavy traffic. You can eliminate this problem by setting the **GSM basic parameters - Call delay** parameter in the web interface to '2 seconds'. This parameter extends the delay between the end of one call and the start of another call made via one and the same wireless module.
- **Some wireless modules cannot log in to the wireless network even after reset:**
 - Your GSM/UMTS provider may have located the SIM card, but refused the login to the wireless network because either too many calls are being made using this card, or the SIM card has been logged-in to one BTS for too long. This problem can be solved by an occasional exchange of SIM cards between wireless modules.

The manufacturer cannot be held responsible for any SIM card or service blocking problems of the GSM/UMTS provider caused by the GSM/UMTS provider's breach of a SIM card term agreement.

- ***DTMF transmission is not correct. Some numbers are not correctly recognized by called/calling party:***
 - DTMF tones (as all voice services) change codec during transfer to GSM/UMTS network voice channel (this codec change caused partially information lost which depends on used type of GSM/UMTS codec in wireless part of the network). To improve success rate of transferred tones, please check audio quality / level of called + calling party ; audio settings of opposite party; change source of DTMF tones (different length and volume can improve probability of successful DTMF transmission) or use DTMF transfer not in voice channel, but in signaling channel (regarding RFC XXXX). Refer to the **Gateway Control - GSM Basic Parameters** subsection for small changes in audio levels.

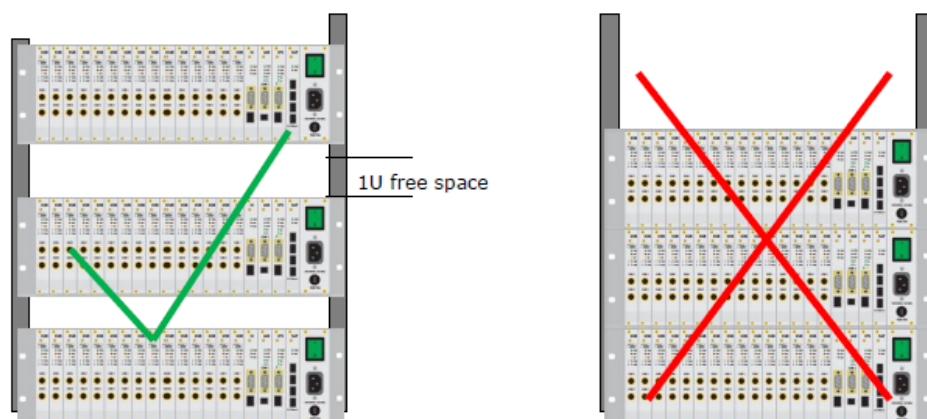
 **Note**

- Settings of GSM network and opposite called/calling party can involve DTMF transfer. 2N cannot guarantee successful DTMF transmission with using 2N GSM/UMTS gateway with PRI ISDN interface (where only voice channel transport of DTMF is allowed).

Mounting

2N recommends installing the gateway in a well ventilated area (rack) according to the installation conditions. The 2N[®] **StarGate** gateway is designed for rack installation with the minimum rack depth of 400mm and 3U (132mm). 2N[®] **BlueTower** is to be installed into a rack shelf.

To prevent gateway overheating, you are recommended to install the gateway into a rack with 1U free and uncovered space above and below the gateway (see the figures below):



⚠ Warning

- Do not cover the top, bottom and rear sides of the gateway to avoid overheating and gateway error!
- Protection against humidity and extreme temperatures: The appliance may never be placed close to heat sources (radiators) or places exposed to direct sunshine. Also places with high humidity (such as bathrooms and cellars), places with significant temperature fluctuation (next to doors, windows), dusty places (workshops) and places exposed to aggressive gases (accumulator rooms, boiler rooms) as well as places with intensive vibrations and places exposed to shocks (compressor rooms, heavy industrial operations) should be avoided. The system should be installed horizontally.

Main Installation

- Place the gateway into an environment that complies with the gateway working conditions.
- Configure the gateway properly using the configuration software included.
- The gateway mains supply must be backed-up and overvoltage-protected (a line-interactive or on-line UPS is recommended).
- Any of the available remote control tools (ISDN line, analogue line, Ethernet) are advised for a more comfortable gateway administration.

Control Ways

The system can be supervised and controlled locally or remotely as follows:

- Local control using a PC connected by a standard full crossed serial cable.
- Remote connection over the IP network using the Telnet protocol or web interface.
- Remote connection over a data call to the ISDN PRI interface (**not supported at present**).

Configuration Ways

The system can be configured by any of the following ways:

- Using extended AT commands (refer to the **4. List of AT Commands** subsection).
- Using the CPU web interface.

3. Configuration

This section describes configuration of the 2N[®] StarGate/BlueTower product.

Here is what you can find in this section:

- 3.1 Important Default Settings
- 3.2 Quick Step-by-Step Manual
- 3.3 Web Configuration Interface
 - 3.3.1 Gateway Control
 - 3.3.2 Gateway Configuration
 - 3.3.3 Messaging
 - 3.3.3.1 SMTP/POP3 Basic Configuration - Step by Step
 - 3.3.3.2 SMPP Basic Configuration - Step by Step
 - 3.3.4 Monitoring
 - 3.3.5 Utils
 - 3.3.6 Management
 - 3.3.7 Others
- 3.4 2N[®] External Routing Machine
- 3.5 2N[®] SIM Star System

3.1 Important Default Settings

The following table shows the default values of important parameters:

- IP address of basic CPU - 192.168.1.2
- IP mask of basic CPU - 255.255.255.0
- IP address of gateway - 192.168.1.1
- IP address of VoIP board - 0.0.0.0
- IP mask of VoIP board - Same as basic CPU configuration
- Username/Password of basic CPU - Admin/2n
- Username/Password of ERM - Admin/2n
- Transmission rate RS232 of CPU - 57600bps

Caution

- To prevent unauthorised access please change the default access username and password as soon as possible!

CPU Factory Reset

Follow the instructions below to set the default values for the CPU:

- Press and hold RESET button
- Wait until only green LED (PWR) is lit

Now the factory settings are restored on the CPU.

3.2 Quick Step-by-Step Manual

The following quick guide is intended for installation of a gateway with basic features only. For full configuration please read the whole user manual carefully. For a successful installation of the whole system we recommend you to have a training certificate from 2N.

Warning

- All SIM cards must have the same or disabled PIN code! The same PIN code must be defined in the gateway configuration.

Basic Configuration – Step by Step

This section will help put your 2N[®] StarGate / BlueTower gateway in operation for the first time. Refer to the **3.3 Web Configuration Interface** subsection for detailed settings.

- Install the GSM gateway as instructed in the **2.4 Installation** subsection. 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 the **3.1 Important Default Settings** subsection 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 factory configuration allows you to make outgoing calls without any additional programming. All you have to do is set the correct values for the PRI ISDN and VoIP interfaces.

From now on, 2N[®] **StarGate / BlueTower** will be ready to receive VoIP/ISDN 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/ISDN 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 Web Configuration Interface

Essential Data

The 2N[®] StarGate / BlueTower web interface supports the following web browsers:

- MS Internet Explorer v9
- Mozilla Firefox v4 and higher

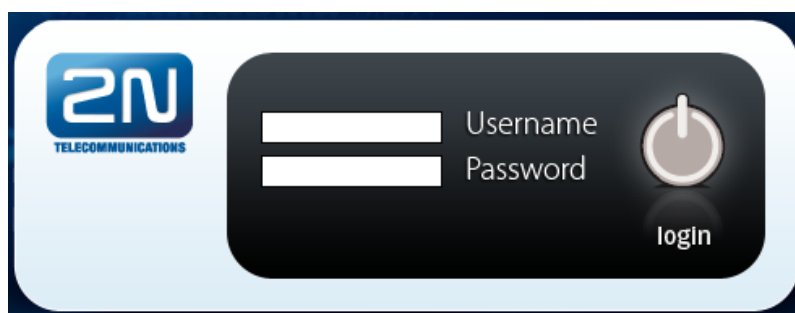
Any other web browsers may cause troubles. The recommended screen resolution is 1280x1024 and colour quality 32bit or higher. The configuration interface is available in the English language version only at present.

Tip

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

Login

For login to the 2N[®] StarGate / BlueTower web configuration interface, enter the server IP address into your web browser. The following login dialogue will get displayed.



Tip

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

Just one user may be logged in at a time. Refer to the **3.1 Important Default Settings Subs.** for details on the login factory settings.



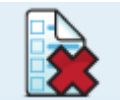



A five-minute login timeout is set automatically and recovered automatically upon every user activity on the web interface. After this timeout, the current user is logged out automatically. Click on the **Refresh** button to reset the maximum timeout value.

Auto logout in 300 seconds (**Refresh**)

✔ Tip

- Set the login timeout value in the **Gateway Configuration - Web Configuration** logout section.

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 five more sections in the right-hand upper menu:

- **SIM client** - for connection to the 2N[®] **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[®] **StarGate / BlueTower** Ethernet interface MAC address.

The screenshot displays the 2N StarGate Gateway control interface. The main content area is titled "Firmware/Licence" and is divided into three sections: "Firmware", "Ethernet", and "Information for gateway licence".

Firmware	
Firmware version:	1.17.0.20.3
Bootware version:	1.20
Firmware version of VoIP board:	4.2.1.0

Ethernet	
MAC address:	7C-1E-B3-59-9E-04
MAC address of VoIP board:	7C-1E-B3-00-8E-1F

Information for gateway licence	
Serial number:	M202-5005610097
Active:	DSS1 MONI G729 SIP TUN SMSU200 SMSS SMSE SNMP
Gateway limitation:	3704 hours (no limit)
Licence status:	Unlocked
Auto licence:	Yes
Networks:	(all)

The interface also includes a left-hand navigation menu with options like "Gateway control", "Gateway configuration", and "Logout". The top navigation bar includes "EN", "CZ", and "ES" language options, and a "Gateway" menu with sub-items: "SIM Client", "Messaging", "Monitoring", "Utils", and "Management".

3.3.1 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. Use the web interface to download a new licence via **Management / Licence**.

- **Firmware version** - current firmware version of the gateway connected.
- **Bootware version** - current bootware version of the gateway connected.
- **Firmware version of VoIP board** - current firmware version of the VoIP board connected.
- **MAC address** - Ethernet interface MAC address of the gateway connected.
- **MAC address of VoIP board** - Ethernet interface MAC address of the VoIP board connected.
- **CPU serial number** - GSM gateway serial number in the format M202-xxxxxxxxxx

- Active: licensed protocols:
 - **SIP** – SIP support.
 - **G729** – G.729ab voice codec support.
 - **TUN** – GSM-CSD remote supervision support.
 - **DSS1** – ISDN BRI DSS1 protocol support.
 - **MONI** – ISDN monitoring 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**

- When the licence code expires, the licence-based protocols will be locked!

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

 **Caution**

- Auto licence is added via the **2N[®] SIM Star server**.
- If the current **Licence status** is **blocked** during automatic licensing, **2N[®] StarGate** will be restarted during licence adding.
- If the current **Licence status** is **unblocked** during automatic licensing, the Gateway limitation will be prolonged without **2N[®] StarGate** restart.

- **Networks** – displays the list of allowed/disallowed GSM/UMTS networks.

Caution

- Upon the dealer's request, the gateway may contain blocking of certain GSM/UMTS networks. This state is indicated by a red shining Ch 1 / Ch 2 LED on the GSM/UMTS board. The GSM module diagnostic window displays the „netw-err status.
- Contact your dealer for more information please.

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
21	GSM outgoing group 1	Calls via Out. GSM group 1	8
20	PRI 2 message	Message to PRI 2 in case of deactivated PRI 1	16
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

Index	Type of message	Use	Max. length(s)
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

- The PRI 2 connection message will be played only if the B-channel is opened.
- 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
**	8.10.12/08:51:48	BRDOUT	#14 3GM2TX DETECT
**	8.10.12/08:51:48	BRDRES	#14 3GM2TX DETECT
**	8.10.12/08:51:44	BRDOUT	#12 3GM2TX OK
**	8.10.12/08:51:39	BRDIN	#04 UNDEF DETECT
**	8.10.12/08:51:37	BRDIN	#03 GSM269 DETECT
**	8.10.12/08:22:09	POWER	[Software reset]
**	8.10.12/08:21:59	BRDRES	SYSTEM RESET CMD

Refer to the [5.4 List of LOG Events](#) subsection 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. 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. 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 the **5.1 List of Status Codes** subsection for status details.

Module Control

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

- **Statuses of layers 2 and 3** - statuses of the module communication layers
- **Network name** - name of the network where the module is currently logged in
- **Network ID** - ID number of the network (MCC+MNC) where the module is currently logged in
- **Network cell** - identification number of the GSM cell the module is currently logged in to.

Displayed code numbers in the A,BBB,CCC,DDDDD format are received from the wireless engine:

A = Status of wireless part:

0 - The wireless engine is currently not registered

1 - The wireless engine is registered to the home network

2 - The wireless engine is not registered, but is searching for a new provider

3 - The wireless engine registration was denied by the network

4 - The unknown reason

5 - The wireless engine is registered to a roaming network

BBB = LAC (Location Area Code) first byte in DEC format; CCC = LAC second byte in DEC format; DDDDD = cell identification code



- Registration to a roaming network is restricted by default. For roaming enable refer to Subs. **3.3.2 Gateway Configuration**.
- Upon the dealer's request, 2N can activate the restriction of use for selected wireless networks only. Thus, the gateway will be unable to log in successfully to the restricted wireless networks. This state is signalled by the red status LEDs on the GSM / UMTS cards and the „netw-err message on the configuration tool diagnostics screen.

- **Signal** – signal level
- **Module ID** – International Mobile Subscriber Identity (IMSI) or SIM card ID (SCID)
- **Module firmware** – wireless engine module firmware revision number
- **Module IMEI** – wireless engine international identification number
- **Number of active SIM card positions**

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. Statistics 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.

3.3.2 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[®] StarGate / BlueTower numerically in the CDR in case multiple devices generate the CDR in the network.
- **General selection of SIM** - select the cards for the SIM card holder to be used by the gateway. This parameter has no influence on the gateways connected to the 2N[®] SIM Star system.
 - **According to GSM groups** - select the SIM card according to the settings of the Outgoing GSM group to which the wireless module is assigned.
 - **SIM card in slot #** - hardware selection of the SIM card holder position. **This setting overrides the Outgoing GSM group setting!**
- **Number for remote control (PRI 1, PRI 2)** - enter the remote control number for data calls via the B-channel of the ISDN PRI 1 or PRI 2 interfaces.

Automatic Logout of GSM Modules

This function is used for automatic logout of wireless modules from the wireless network in a selected time interval. If the logged-in modules are occupied by a call, the logged-out modules log in automatically. If the traffic drops, the modules log out again from the network at random intervals.

- **Enable automatic logout** - enable/disable the feature.
- **Logout hour** - set the time interval for the wireless modules to start logging out randomly from the wireless network.
- **Login hour** - set the time interval for the wireless modules to start logging in back to the wireless network.
- **Min. logged-in modules** - set the minimum count of wireless modules that remain logged-in.

Summer / Winter Time

- **Automatically switch to summer/winter time** – enable an automatic change of the gateway system time at the time of transition to/from the daylight saving time.
- **Date of switch to winter time [dd.mm]** – transition day and month.
- **Date of switch to summer time [dd.mm]** – transition day and month.

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.

Others

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

Tip

- 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 „#.

List of Emergency Numbers

The window displays a list of emergency numbers, which are normally routed to the PRI interface. If the PRI line is disconnected, the emergency numbers are dialled automatically via any GSM/UMTS module according to the following rules:

- Search of a logged-in GSM/UMTS module (regardless of free minutes);
- Search of a blocked or network searching GSM/UMTS module.

The table includes an exact format of the number to be called (112,911, etc.). The 'x' placeholder stands for any digit in the number to be called. The '_' placeholder means the rest of the number. For example:

Format	Allowed numbers
123	123 only
14x0	1400, 1410, 1420, ...1490
999_	All numbers starting with 999

LED Indication

- **GSM signal mode** - set the GSM module signal LED indication.
 - None
 - Module1 only
 - Module2 only
 - All modules

VoIP Parameters

VoIP Functions

- **Day of deleting statistics on VoIP (every month)** - set the day for automatic deletion of call statistics via the VoIP interface. None = statistics will not be deleted automatically.

SIP Settings

- **Use CLIP from INVITE field** - define that CLIP from the 'Contact' or 'From' field shall be used for call routing to GSM/UMTS.
- **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 device in 2N[®] StarGate / BlueTower (for registration requiring equipment).
- **Replace CLIP from GSM with Caller ID.**
- **Deny DTMF according to RFC2833.**
- **Use SIP over TCP for registration.**

- Use SIP over TCP for calls.

SIP Registration

- **Registration expires [s]** - set the expiration time for the 2N[®] StarGate / BlueTower registration data with SIP proxy.
- **Reattempt registration [s]** - set the time interval after which the request shall be resent.
- **Registration domain (realm).**
- **Caller ID.**
- **Username** - registration data with SIP proxy.
- **Password** - registration data with SIP proxy.

Voice Parameters

- **First RTP port (even: 1024 - 65524)** - set the number of the first RTP port. The RTP port number must be even according to the recommendation.
- **Last RTP port (even: first RTP+10 - 65534)** - set the number of the last RTP port. The RTP port number must be even according to the recommendation. The recommended minimum RTP port range is 10.

Codec Settings

Additional settings for the voice codec used. For the default settings see the table below.

Codec	Number of blocks	VAD (Voice Activity Detection)
G.711	4	Deactivated
G.729	2	Deactivated
G.723 (6.3 kbps)	2	Deactivated

 **Caution**

- Using low rate codecs may deteriorate voice quality!
- You have to have a wide-band TCP/IP connection for using a high rate codec!
- You can use an Internet VoIP bandwidth calculator to calculate the actually required bandwidth (e.g. www.bandcalc.com).

Codec Priority

Set the types of the speech codecs to be preferred.

- Priority 1
- Priority 2
- Priority 3
- Priority 4

IP Addresses

- **VoIP board** - required IP address of the VoIP card of the connected gateway.
- **SIP proxy (IP / GSM)** - the SIP Proxy IP address from which 2N[®] StarGate / BlueTower awaits the GSM outgoing call requests.

 **Tip**

- If you keep the default values (0.0.0.0), 2N[®] StarGate / BlueTower will receive requests from any IP address.

- **SIP proxy (GSM / IP)** - the SIP Proxy IP address to which 2N[®] StarGate / BlueTower turns in the case of GSM incoming calls.
- **SIP registrar** - SIP registration server IP address.

 **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** - NAT firewall IP address.
- **STUN server** - STUN server IP address (Simple Traversal of UDP through NATs (Network Address Translation)) for obtaining the public IP address with which **2N[®] StarGate / BlueTower** operates in the Internet. You are recommended to complete this field if **2N[®] StarGate / BlueTower** is installed in a private network separated from the Internet via NAT or firewall. The pre-set port for sending requests to STUN is 3478.
- **Next STUN request (60-6553, 0=off) [s]** - update of information on the **2N[®] StarGate / BlueTower** public IP address. Use this parameter to configure the frequency of queries routed to the STUN server.

 **Note**

- In case the GSM gateway is installed behind the NAT, make proper routing settings in the NAT router for the relevant ports (SIP, RTP, STUN). Integrated firewalls can also affect VoIP calls!

 **Tip**

- Should you have call troubles (such as unilateral audibility, connection errors), make sure that all the active elements on the VoIP call route have been set properly. For easy troubleshooting, try the point-to-point connection with the software IP phone (SJ phone, e.g.) in your PC and, at the same time, apply network analyser tracing (WireShark - www.wireshark.org).
- Refer to the **3.3.7 Others** subsection for easy tracing by **2N[®] StarGate / BlueTower**.

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.

ISDN Parameters - General

Use this window to set the PRI ISDN port parameters.

PRI Mode Selection

Here define the PRI 1 (2) ISDN port type.

- **Synchronisation** - define that the gateway will send the synchronisation clock (MASTER), or receive the synchronisation clock from the connected line (SLAVE).

PRI1 / PRI2

- **Channel number select** - define the way of occupation of B-channels on a selected ISDN PRI interface. With the UPWARDS selection, the gateway will occupy the B-channels upwardly (from the selected B-channel number to the B-channel 32). With the DOWNWARD selection, the gateway will occupy the B-channels in the descending order (from the selected B-channel number to B-channel 1).
- **Preferred channel** - select a B-channel.

Note

- The PRI 1 port is always set as internal - the LCR function is activated. The PRI 2 port is always set as external - all calls from PRI 2 are rerouted to PRI 1. The PRI 2 port has a mode opposite to that of the PRI 1 port.
- In the case of ISDN port mode change, change the selection of the ISDN PRI card jumpers, see the PRI Board subsection.

PRI1 and PRI2

- **TEI address** - Terminal Equipment Identification number for the ISDN PRI line connected. The TEI must be identical for both devices on one ISDN PRI line. The default value is 0.
- **CRC** - enable/disable receiving CRC on Layer 1 on the ISDN PRI interfaces (in both modes the gateway sends the CRC).

Progress Indicator Value

Define which progress element value will be sent in the selected ISDN messages. The correct setting of these parameters depends on the current settings of the opposite device (PBX / Router). This parameter is primarily designed for opening the B-channel before call connection - transferring call state tones (e.g. ringing tone) from GSM / UMTS networks. The following table contains common values of progress elements.

Value	Meaning	Event
0	No progress element sending	B-channel closed
1	Call is not end-to-end ISDN or may be in-band information	B-channel opened
2	Destination call address is non-ISDN	B-channel opened
3	Origination call address is non-ISDN	B-channel opened
4	Call has returned to the ISDN	B-channel closed
8	In-band treatment has been applied	B-channel opened
10	Delay in response at the call interface	B-channel closed



Caution

- Wrong settings of these parameters may cause malfunction of the ISDN PRI line (call connection)!

PRI Functions

- **Day of deleting statistics on PRI (every month)** – set this value to enable deletion of statistic data on x-th day of a month.
- **Digits count in SETUP (en-block)** – set the number of digits to be sent in the SETUP message as ENBLOCK. The others digits will be sent in the OVERLAP dial mode. Example of use:

Called party number: 6012345678, digits count in SETUP = 7

Outgoing signalling messages: SETUP (contains 6012345)

INFO (6)

INFO (7)

INFO (8)

- **Receive dial number from Subaddress** – with this parameter activated, the gateway uses the digits in the Subaddress field instead of the Called party number for outgoing dialling.
- **Hungarian dial tone after 2 digits** – a specific feature designed for the Hungarian national dialling plan. The gateway activates a specific dialtone for second dialling after receiving two digits.
- **Don't send ConnectAck on TE** – when the ISDN PRI is in the TE mode, the gateway will not send the CONNECT_ACK message.
- **Use CLIR if requested from ISDN (SETUP)** – enable automatic CLIR resending to GSM/UMTS if required so by the ISDN.

Tone Signalling for Calls from ISDN

- **Dial tone to PRI1 with empty SETUP** – set the dial tone type to be generated by the PRI gateway.
- **Ring tone** – set the ring tone type to be generated by the PRI gateway.
- **Generate busy tone to PRI1** – set the busy tone type to be generated by the PRI gateway into the PRI 1 interface.
- **Generate busy tone to PRI2** – set the busy tone type to be generated by the PRI gateway into the PRI 2 interface.
- **Ring tone from PRI1 to PRI2** – set the ring tone type to be generated by the PRI1 interface into the PRI 2 interface.

Numbering Plan Settings

- **CDN, CGN** – use these parameters to set the Numbering plan for the called (CDN) and calling (CGN) numbers.

Binary value	Decimal value	Description
0000	0	Unknown numbering plan
0001	1	ISDN/Telephony numbering plan
0011	3	Sata numbering plan
0100	4	Telex numbering plan
1000	8	National standard numbering plan
1001	9	Private numbering plan
1111	15	Reserved for Extension

ISDN Parameters – Monitoring

Caution

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

PRI1 Alerts

- **Send SMS at state changes** - enable/disable alert sending upon PRI1 state change.

PRI2 Alerts

- **Send SMS at state changes** - enable/disable alert sending upon PRI2 state change.

PRI Common Settings

- **Timeout for ISDN line deactivation detection [s]** - an SMS alert on PRI1/PRI2 deactivation is sent after this timeout.
- **Timeout for ISDN line activation detection [s]** - an SMS alert on PRI1/PRI2 activation is sent after this timeout.
- **Numbers where SMS will be sent to** - list of numbers to which the SMS alert shall be sent.

- **Text of SMS** – SMS alert text with the following parameters:
 - %P(x|y), where 'x' represents any text concerning PRI1 and 'y' represents any text concerning PRI2.
 - %A(x|y), where 'x' represents any text for interface deactivation and 'y' represents any text for interface activation.

Alive SMS Interval Settings

- **Send Alive SMS** – enable/disable sending of ALIVE SMS.
- **Time [hh:mm]** – Alive SMS sending time.
- **Days interval** – Alive SMS sending interval.
- **Numbers where SMS will be sent to** – list of numbers to which the Alive SMS shall be sent.
- **Text of SMS** – Alive SMS text.

GSM Basic Parameters

GSM Selection

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

Caution

- The **Locked – peer to ISDN channel** selection has a higher priority than the LCR table. All outgoing/incoming calls are locked in the GSM-ISDN 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.

Number of Digits Dialed from ISDN

- **Minimum digits** – set the minimum count of digits to be dialled into the GSM network.
- **Maximum digits** – set the maximum count of digits to be dialled into the GSM network.

- **Wait for next digit [s]** – set the timeout for 2N[®] StarGate / BlueTower to wait for the next digit dialled from ISDN to GSM.

Calls

- **Relax timeout [s]** – set the timeout between the end of one and beginning of the next call via one and the same GSM module (incoming and outgoing calls are rejected during this timeout). The recommended relax value is 2 seconds – please do not change this setting unless absolutely necessary.
- **Timeout for ringing to GSM [s]** – set the 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.

Holiday List

List of days on which calls will be routed like on weekends in the LCR.

DTMF Settings

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

Tone Detector Settings

The GSM gateway can automatically detect user defined tones transmitted by GSM /UMTS for setting up outgoing calls to the GSM/UMTS networks. In general, these are tones of a transferred number. For the purpose of such detection, the GSM gateway automatically terminates the call and tries to set it up via another available outgoing group (if defined in the LCR).

- **Frequency 1;2;3;4** – define the frequencies for the tone to be detected.
- **Sequence list** – set the sequence of the tones to be detected.

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%.

Ericsson Module Settings

- **Transmission volume [dB]** – set the module volume for the outgoing direction.
- **Reception volume [dB]** – set the module volume for the incoming direction.

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.
- **Echo cancelling (MC55)** – enable/disable echo cancelling for Cinterion MC-55.

Wavecom Module Settings

- **GSM-band selection** – select the GSM frequencies for the mobile network.
- **Echo cancelling** – enable/disable echo cancelling for the module.
- **Transmission volume [dB]** – set the module volume for the outgoing direction.
- **Reception volume [dB]** – set the module volume for the incoming direction.
- **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.

Sierra Wireless 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.
- **Searching priority** – set the network type searching priority.
- **Init module after call** – initialise the module settings after call end.
- **Echo canceller mode** – enable/disable echo cancelling for the module.
- **Enable noise reduction** – enable/disable noise reduction for the module.

Telit Module Settings

- **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

- **Output audio level of GSM codec [dB]** - audio volume gain/loss to GSM.
- **Input audio level of GSM codec [dB]** - audio volume gain/loss from GSM.

Tones Generated for Incoming Calls from GSM/UMTS

- **Dial tone** - set the dial tone for incoming calls from GSM/UMTS.
- **Ring tone** - set the ring tone for incoming calls from GSM/UMTS.
- **Generate busy tone to GSM/UMTS** - enable busy tone generation for call termination.

 **Caution**

- If the Generate busy tone function is enabled, the duration of outgoing calls billed by the GSM/UMTS provider will be extended!

Error GSM/UMTS Causes

Set the ISDN release cause for each of the below mentioned statuses. Every call that meets any of the below mentioned requirements, will be rejected with a user defined cause (the ISDN cause number will be translated to VoIP as a SIP code as defined below).

- **Lack of digits in OVERLAP mode** – any call that fails to meet the minimum digits count requirement will be rejected.
- **Restricted number prefix** – any call whose prefix is not included in any of the prefix lists will be rejected.
- **Selected module / GSM group is not ready** – a call will be rejected in case there is no available GSM module in the selected (by LCR) outgoing GSM group.
- **Selected module / GSM groups are not ready** – a call will be rejected in case there is no available GSM module in the selected (by LCR) outgoing GSM groups.

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

ISDN cause value	Description	SIP code	Description
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
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

ISDN cause value	Description	SIP code	Description
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[®] 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 in the SMS text.
- **Text of SMS for all calls** - complete this parameter to make the GSM gateway send SMS to every called party regardless of whether or not the call was successfully connected. The %N string will insert the CLIP received from VoIP in the SMS text.
- **Save received SMS to** - select the storage for received SMS messages.
- **SIM card identification** - set the SIM Id (IMSI/SCID) to be entered in the CDR.
- **Disable CLIP from GSM/UMTS to VoIP** - enable/disable resending of the CLIP from GSM to VoIP.
- **Reject call with CHLD** - enable rejection of incoming calls from GSM/UMTS via AT+CHLD (subscriber 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

Here you can assign the GSM/UMTS modules to groups. You can assign incoming and outgoing calls separately using the parameters below.

GSM Outgoing Groups

- **Mode of switching SIM card** – define how to use the SIM cards in the selected GSM group:
 - **SIM #** – the SIM cards in position # will only be used in the selected GSM group. In this case, the **Maximum called minutes** and **Disconnect call** parameters are disabled.
 - **By time** – the SIM card will be switched according to the Time of use parameter and call timer limitations.
 - **Random** – the SIM card will be switched randomly at defined time intervals and according to call timer limitations.
 - **By time and limit; then SIM card 1** – the SIM card will be switched according to the Time of use parameter and call timer limitations. When all SIM cards on a selected wireless engine are discharged, the system will switch the wireless engine back to the SIM card in position 1.
 - **Random and by limit; then SIM1** – the SIM card will be switched randomly at defined time intervals and according to call timer limitations. When all SIM cards on a selected wireless engine are discharged, system will switch the wireless engine back to the SIM card in position 1.
- **Last searched SIM (8 – all SIM will be searched)** – Define the number of SIM holder positions to be checked for SIM by the gateway after the GSM / UMTS board start/restart. The SIM card holders that were not tested have the (undef) status in the diagnostics window of the web interface.
- **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.
- **SIM settings** – select the settings to be used for the SIM cards in positions 5–8:
 - SIM 5–8 is SIM 4 – all settings for the SIM cards in positions 5 – 8 will be the same as those for the SIM card in position 4.
 - SIM 5–8 is SIM 1–4 – all settings for the SIM card in position 5 will be the same as those for the SIM card in position 1. The SIM card in position 6 will use settings of the SIM card in position 2, SIM 3 = SIM 7 and SIM 4 = SIM 8.
- **Disable tone detection** – deactivate the alerting tone detectors on the GSM / UMTS boards. Used for the GSM / UMTS networks that send call statuses through the signalling channel.
- **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** – set the 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, GE910, HE910)!
- 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.

Block SIM

Set the rules for SIM switching in the event of SIM limit exceeding.

- **Tariff 0(...4) minutes limit exceeded** - enable/disable SIM switching when the tariff 0(...4) minutes limit has been exhausted.
- **SMS limit exceeded** - enable/disable SIM switching when the SMS limit has been exhausted.
- **Minutes limit exceeded** - enable/disable SIM switching when the maximum called minutes limit has been exhausted.
- **Daily minutes limit exceeded** - enable/disable SIM switching when the maximum daily minutes limit has been exhausted.

Send CLIP from VoIP/ISDN to GSM/UMTS

- **Transfer CLIP to GSM/UMTS** - enable/disable the function.
- **Separating char** - define the CDN/CLIP separating character.
- **Modify ('-' remove one digit)** - change the CLIP. The '-' character is used for deleting one character from the left.

Caution

- The Send CLIP from VoIP to GSM service must be supported by the GSM /UMTS provider's network. Otherwise, the call may be rejected by GSM /UMTS!

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.

Input	Note
<empty>	Roaming is restricted
2300	Roaming is restricted (minimum is five digits)
23002	Roaming is permitted for network with MCC+MNC code 23002
230XX	Roaming is permitted for network with MCC+MNC codes 23000 – 23099
XX001	Roaming is permitted for network with MCC+MNC codes 00001 – 99001
XXXXX	Roaming is permitted for any network

Note

- Before activating the roaming support, please check the SIM card for correct setting of the GSM / UMTS priority network list.

Caution

- Calls via roaming networks may cause additional call costs!

- **CLIR** – enable/disable presentation of the SIM CLIP on the called party's telephone. CLIR is recommended for the SIM card inserted in the GSM module to avoid CallBack problems.

Caution

- The **Temporary CLIP enable** and **Temporary CLIR enable** services must be supported by the GSM/UMTS provider's network. Otherwise, the call may be rejected by GSM/UMTS!

- **Maximum number of called minutes** - define the maximum count of minutes to be called within a month via the selected SIM card.
- **Count of SMS messages** - define the maximum count of SMS messages to be sent within a month via the selected SIM card.
- **Day of restoring call limit and delete statistics** - select a day in a month on which the Max count of called minutes and Count of SMS messages statistics shall be deleted.
- **First count** - set the length of the first pulse after which the pulse counting change starts as defined in the Next count parameter.
- **Next count** - set the length of one pulse in seconds after the time defined in the First count parameter elapses.

Note

- Set the two parameters above (**First count**, **Next count**) properly to count free minutes on SIM cards correctly. These parameters are used for limiting outgoing calls depending on free minutes. The CDRs contain real data.

- **Day limit of called minutes** - set the maximum count of minutes to be called within a day via the selected SIM card.
- **AOC sending interval** - set the interval to send AOC messages

Time Limits

There are two SIM use time limits in a GSM group.

Call tariffs - use this function to assign up to four independent free minute counters to a group of GSM modules (SIM cards), e.g.:

- **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 fixed network.
- **Tariff 4** = free minutes for calls within a closed user group (VPN).

Complete the LCR table (assign prefixes to tariffs) properly to make full use of this function. If routing to a tariff is not used, the global free minutes function will be used in the LCR table.

- **Free minutes** - set the free minutes for the tariff offered by the provider.
- **Transferred minutes** - set the maximum count of free minutes to be transferred to the next period.
- **AOC sending interval** - set the interval to send AOC messages.
- **Day of restoring free minutes** - set a day on which the free minute counters will be reset automatically. Select every 24 hours, a day in a month, or a day in a week.
- **Week of restoring free minutes in month** - set a week in which the free minute counters will be reset automatically. Set the week number only if the restoration takes place **every other Friday** in a month, e.g., or keep **Every** for the other cases.

 **Caution**

- The recommended free minute counter value is X-5, where X is the number of free minutes obtained from the GSM/UMTS provider. Thus, you can avoid exceeding limits.
- The manufacturer is not responsible for additional call costs incurred as a result of exceeding your GSM/UMTS provider's free minute/SMS limit.

GSM Incoming Groups

2N[®] StarGate / BlueTower allows you to work with four groups of incoming calls. You can set different values for each of them.

General Settings

- **Mode** - set how the gateway shall process incoming calls from the GSM network.
 - **Reject incoming calls** - all incoming calls from the GSM network are rejected automatically.
 - **Ignore incoming calls** - all incoming calls from the GSM network are ignored. The calling party hears the check ring tone.
 - **Accept incoming calls + voice message** - incoming GSM calls are accepted by the gateway and, if programmed so, DTMF with a voice message is activated for them.
 - **Accept incoming calls + dialtone** - incoming GSM calls are accepted by the gateway and, if programmed so, DTMF with a simulated second dialtone is activated for them.

- **CallBack after ring / Reject** - CallBack will be made if the CLIP is included in the CallBack table. The other incoming calls will be rejected.
- **CallBack after ring / Ignore** - CallBack will be made if the CLIP is included in the CallBack table. The other incoming calls will be ignored.
- **Report to PC + voice message** - the GSM gateway sends information on the incoming call to a PC equipped with call routing application. If programmed so, DTMF with a voice message is activated for the incoming call.
- **Report to PC + dialtone** - the GSM gateway sends information on the incoming call to a PC equipped with call routing application. If programmed so, DTMF with a simulated second dialtone is activated for the incoming call.
- **Minimum digits in DTMF** - set the minimum count of digits to be requested by the gateway for DTMF.
- **Maximum digits in DTMF** - set the maximum count of digits to be accepted by the gateway for DTMF.
- **Timeout for entering DTMF digits [s]** - set the timeout for which the GSM gateway shall wait for the first/next DTMF digit. If you select '0', the incoming call will be automatically connected to the numbers included in the List of called numbers.
- **Day of deleting GSM group statistics** - set a day in a month on which the incoming call statistics shall be deleted.
- **Prefix before DISA** - set a numerical prefix to precede DTMF.
- **CLIP** - use this parameter to modify the incoming CLIP from GSM/UMTS. For international codes, '+' will be removed automatically. Use '-' to remove a digit. Examples (CLIP in GSM: +420600123456):

Parameter value	CLIP to VoIP/PRI 1	Note
Null	420261301500	No change in CLIP
+	+420261301500	Add + before CLIP beginning
00	00420261301500	Add 00 before CLIP beginning
--	0261301500	Remove two first digits from CLIP beginning
---99	99261301500	Remove first three digits and add 99 before CLIP beginning

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

Send CLIP from GSM/UMTS to VoIP/ISDN

- **Transfer CLIP from GSM/UMTS** – enable/disable the function.
- **Separating char** – set the separator for the SIM card CLIP and ID of the extension to be called.
- **Modify** – modify the extension ID.

Caution

- The **Send CLIP from VoIP to GSM** service must be supported by the GSM /UMTS provider's network. Otherwise, the call may be rejected by GSM /UMTS.

Others

- **Time to keep CLIP in table** – set the record keeping time for AutoCLIP routing.
- **Add record only for unconnected call** – enable storing of unconnected outgoing calls in the AutoCLIP table only.
- **Delete record for connected answer** – enable deletion of an AutoCLIP record in the case of successful CallBack.
- **Skip DTMF for numbers not in CLIP Routing table** – enable this option to set DTMF to the incoming calls only whose CLIP is included in the CLIP Routing table. 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 disable forwarding of incoming calls to the numbers included in the List of called numbers if rejected after DTMF.
- **Auto end to CallBack request** – enable that the incoming call whose CLIP meets the CallBack settings will be rejected. If not, the call will be ignored. The CallBack function will be retrieved after call end in both the cases.

List of Called Numbers

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

Prefixes

Use this window to adapt the gateway to calling to various GSM providers' networks. Set the call routing rules based on prefixes for up to 32 groups.

Prefix List 1-32

Assign up to 32 prefix groups in the LCR table.

Basic Settings

- **GSM network ID** – set the prefix list user code for easier orientation in the LCR.
- **Default count of digits** – default length of the number to be dialled into the GSM /UMTS networks for routing via the selected prefix list. Use this parameter in case the Digits count is not included in the Accepted prefixes table.

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 GSM/UMTS calls by overlap dialling via the **PRI NT/TE** interface, the **Count of digits** defines the maximum count of the digits to be dialled.
- For GSM/UMTS calls by block dialling via the **PRI NT/TE** interface, the **Count of digits** is ignored.

Table of Replaced Prefixes

Use this table to replace the prefix of the received number ('00' with '+', e.g.). You can only add or remove the prefix. This change is made before the prefix is searched for in the prefix table. Be sure to keep the '/' record in the table for a proper function.

Note

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

Table of Accepted Prefixes

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 prefix list.
- The maximum table record size is 9 characters.

Prefix Change for PRI 1 to PRI 2 Calls

A table of prefixes to be replaced in the case of PRI 1 to PRI 2 outgoing calls.

LCR Table

Table of outgoing Least Cost Routing (LCR) rules. Every outgoing call from the source interface is routed to the destination interface according to this table. For a call, the gateway checks the lines and if the called number prefix matches the prefix in the selected network list and the current time value is within time limitation limits, the call will be routed via the defined GSM group(s) or PRI 1/PRI 2/VoIP interface.

- **From (channels/groups)** - source channels or groups via which calls are routed to 2N[®] StarGate.
 - **GSM ALL** - any of the GSM incoming groups can be used for call routing.
 - **GSM GRP1-32** - define one GSM incoming group or a range of GSM incoming groups via which call routing will be enabled.
 - **PRI1 (pxx,P)** - any of the PRI1 channels can be used for call routing.
 - **PRI1 (p1-32)** - define one PRI1 channel or a range of PRI1 channels via which call routing will be enabled.
 - **PRI2 (exx,E)** - any of the PRI2 channels can be used for call routing.
 - **PRI2 (e1-32)** - define one PRI2 channel or a range of PRI2 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 32 prefix lists.
 - **Prefix list 1-32** - call routing will obey the rules set in Prefix list 1-32. The count of digits to be dialled is governed by the **Prefixes** setting.
 - **All prefixes** - all the prefix lists are permitted. Prefix lists 1-32 will be searched from 1 to 32. 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 dialed.
- **Time limitation** - set a 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** - define the outgoing GSM groups or interface via which outgoing calls will be routed from **2N[®] StarGate**. If the defined interface is inactive or the outgoing GSM group tariff is exhausted, the next row will be applied.
 - **GSM groups 1-32** - outgoing GSM groups. Set the tariff to be used. Refer to the GSM outgoing groups subsection for details.
 - **PRI1 (P)** - ISDN PRI1 interface. Refer to the **ISDN parameters** subsection for details.
 - **PRI2 (E)** - ISDN PRI2 interface. Refer to the **ISDN parameters** 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 PRI1/PRI1, PRI2/PRI2 and VoIP/VoIP is not supported. Such calls will be rejected by 2N[®] StarGate.

CLIP Routing Table + CallBack

Use the table to set a fixed CLIP assignment of incoming CLIPs from GSM to the numbers of extensions to which incoming calls are routed automatically. Also, set the CLIP list in the GSM network for which CallBack 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/ISDN** - VoIP/ISDN 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** for a proper function.
- The maximum count of CLIP routing table records is 96.

Ethernet Configuration

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

- **Use DHCP** - enable/disable the DHCP client function in **2N[®] StarGate / BlueTower**.
- **IP address** - fixed IP address (v4) of the **2N[®] StarGate / BlueTower** Ethernet interface.
- **Subnet mask** - subnet mask for the **2N[®] StarGate / BlueTower** Ethernet interface.
- **Default gateway** - 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[®] StarGate / BlueTower** configuration. To avoid this, restore the GSM gateway default settings. Refer to **Subs. Basic CPU Board** for details and Jumper for default.

Tip

- In case the gateway is in the DHCP client mode, the 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[®] StarGate / BlueTower 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** - change the login window graphic layout. 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.

3.3.3 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 if unsent within the timeout.
- **Received SMS expires in [hours] (1-10000, 0=off)** – delete a received SMS if undelivered 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.

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	4	5	6	7
SMS group:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Module:	8	9	10	11	12	13	14	15
SMS group:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Module:	16	17	18	19	20	21	22	23
SMS group:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Module:	24	25	26	27	28	29	30	31
SMS group:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

SMS groups to User groups assignment

SMS group:	0	1	2	3	4	5	6	7
User group:	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
SMS group:	8	9	10	11	12	13	14	15
User group:	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
SMS group:	16	17	18	19	20	21	22	23
User group:	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
SMS group:	24	25	26	27	28	29	30	31
User group:	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="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:
 - **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.
- **Login name (without domain)** - define the login name for the client Email.
- **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 16. 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:

Send messages as Flash SMS:

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 Information

- **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.
 - **Deliver to the first 10 users** - the SMS will be delivered to the first 10 users in the **Messaging/Users** table.
 - **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.

Incoming SMS routing

Add record

Disabled:

Message from SMS group:

Action type:

Deliver to user:

Time limitation: : - :

Days limitation: Mo Tu We Th Fr Sa Su

Clip mask:

Text begin:

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** – enable sending SMS from the selected user.
 - **Submit from all users** – enable sending SMS from all the SMS group users.
- **Submit from user** – select the user in case **Action type** = **Submit from 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.
- **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.
- 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.

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

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

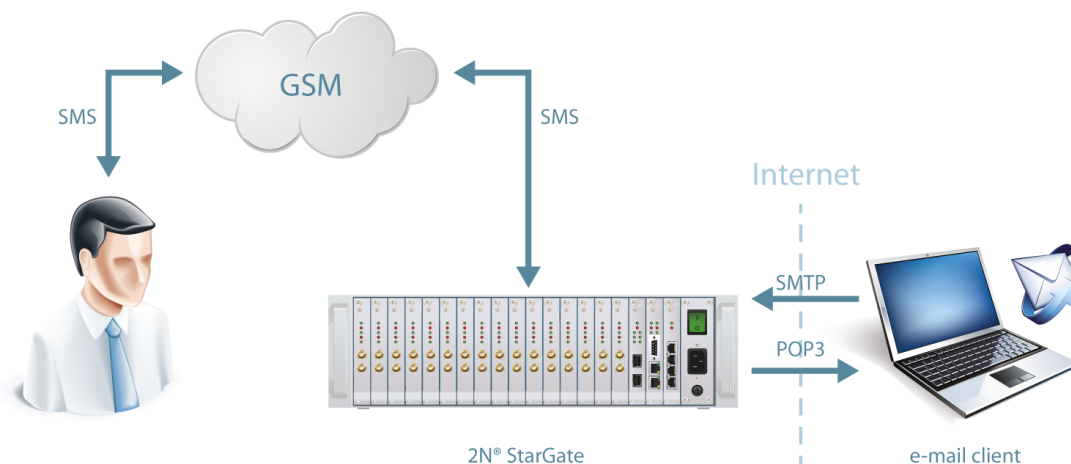
- The maximum message length is 10 SMS. The message can use 7-bit encoding (up to 1520 characters) or 16-bit encoding (up to 670 characters).

3.3.3.1 SMTP/POP3 Basic Configuration - Step by Step

This section helps you define the 2N[®] StarGate/BlueTower basic parameters for SMS sending/receiving via SMTP/POP3. Read the **3.3.3 Messaging** subsection carefully before setting details.

Figure 1 shows sending/receiving SMS via SMTP/POP3. Having created user accounts in 2N[®] StarGate, the users can access the accounts via the e-mail client and send SMS messages to 2N[®] StarGate 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[®] StarGate 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[®] StarGate to enable SMS sending/receiving:

- In the **Messaging / SMS grouping** menu:
 - Assign the selected GSM modules to the SMS groups (according to the GSM provider and SIM cards with identical tariffs, for example).
 - 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.
- Add users in the **Messaging / Users / Add** menu:
 - Assign the user to a **User group**.
 - Set **Access type: Email(SMTP/POP3)**.
 - Define the **Login name (without domain)** and **Password** to log in to the SMS server via your e-mail client.
- 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:

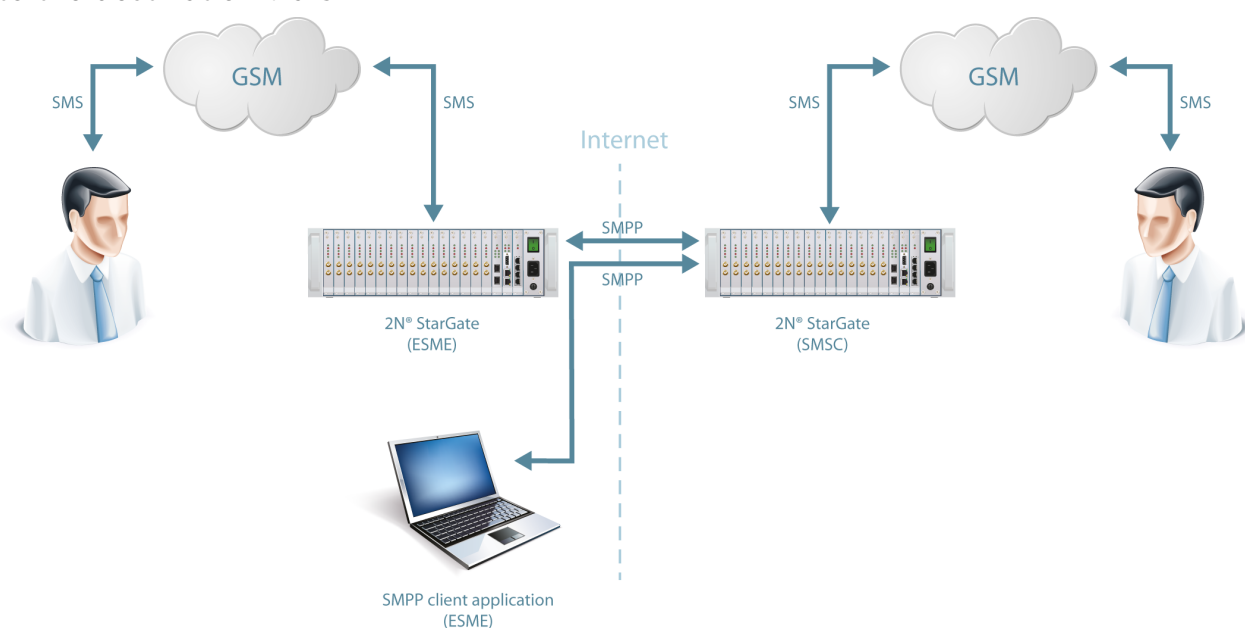
- Read the User Manual carefully and check all parameters.
- Find answers to the frequently asked questions at <http://faq.2n.cz>.
- Consult your servicing partner.

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

3.3.3.2 SMPP Basic Configuration - Step by Step

This section helps you define the basic parameters for SMS sending/receiving via SMPP in 2N[®] StarGate. Read the **3.3.3 Messaging** subsection carefully before setting details.

Figure 1 shows sending/receiving SMS via SMPP. Having created user accounts in 2N[®] StarGate, the users can send/receive SMS via SMPP. The figure shows an example with two SMSC accounts created in 2N[®] StarGate (to the right). Another 2N[®] StarGate (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[®] StarGate 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

Take the following basic steps in 2N[®] StarGate 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 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.

3.3.4 Monitoring

This section helps you configure sending of SNMP traps. Download the list of available 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. The SNMP agent on the CPU monitors the following states (some can be disabled by the user):

- GSM gateway accessibility;
- GSM/UMTS, PRI and VoIP card presence/absence;
- Count of active calls via PRI ISDN and VoIP;
- Received signal level for each GSM/UMTS module;
- ISDN line and GSM/UMTS module error states.

Refer to the **List of SNMP traps** for the list of all SNMP traps sent by 2N[®] StarGate.

⚠ Caution

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

✔ Tip

- You can also apply ISDN monitoring to monitor the ISDN PRI line state. Refer to **Gateway Configuration / ISDN Parameters - Monitoring** for details.

Common Settings

General

- **Number of used channels** - define the maximum/minimum count of active voice channels (VoIP, PRI ISDN). The SNMP trap is sent automatically whenever the defined values are exceeded.
- **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 buffer upper limit** - define the maximum filling capacity of the SMS storage. The SNMP trap is sent automatically whenever the defined value is exceeded.

Boards

Enable/disable the card positions to be monitored. The CPU card is always monitored and monitoring cannot be disabled.

Common settings

General

VoIP busy channel lower / upper limit:	0	/	0
PRI1 busy channel lower / upper limit:	0	/	0
PRI2 busy channel lower / upper limit:	0	/	0
Signal lower / upper limit:	-113 dBm	/	-51 dBm
SMS buffer upper limit:	0%		

Boards

GSM15	GSM14	GSM13	GSM12	GSM11	GSM10	GSM9	GSM8	GSM7	GSM6	GSM5	GSM4	GSM3	GSM2	GSM1	GSM0	PRI	CPU	VoIP
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.

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:	<input type="text" value="0.0.0.0"/>	:	<input type="text" value="162"/>	<input type="button" value="Set default port"/>
Second SNMP server:	<input type="text" value="0.0.0.0"/>	:	<input type="text" value="162"/>	<input type="button" value="Set default port"/>

Download MIB files

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

3.3.5 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[®] StarGate** interfaces can be tested. If your **2N[®] StarGate** is equipped with a CPU with the AUX interface, you can communicate with the aid of the included headset.

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[®] StarGate 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.

3.3.6 Management

Update

This section helps you upgrade your GSM gateway firmware. Select the SGN-x.x.x.x.x. bin files only. Refer to the **3.3.7 Others** subsection for more details.

Warning

- Use the firmware certified for this GSM gateway type only to avoid irreversible damage to your system!

When the new firmware file has been uploaded successfully, the GSM gateway will be restarted automatically.

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

Licence Key

This section helps you download the licence file/code to 2N[®] StarGate and provides information on the current licence file. Refer to **3.3.1 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[®] StarGate / BlueTower.

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

Configuration Download

The window helps you download the current 2N[®] StarGate / BlueTower configuration. The file format is CFG-M202-gateway_serial_number-rrrrmmdd-hhmmss.tar.

Configuration Upload

The window helps you upload new configuration settings into 2N[®] StarGate / BlueTower. 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 for the latest User Manual version!

3.3.7 Others

SIM Client

This section is displayed for those GSM gateways only that support the 2N[®] 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.

3.4 2N[®] External Routing Machine

Installation

CD Image

An automatic installation CD (part No. 507424E) has been created for installation purposes. This installation CD automatically prepares the system and installs the requested application.

Minimum PC Hardware Requirements

- **Processor:** Intel P4, 2.4GHz or higher
- **RAM:** 2048 MB RAM
- **HDD:** 60GB SATA
- **CD-ROM:** Only CD-R
- **LAN:** Ethernet 100BaseT

Note

- The ERM web interface is available in versions ERM v4 and higher!

Installation Procedure

Caution

- By using the installation CD you remove ALL data from the hard drive!

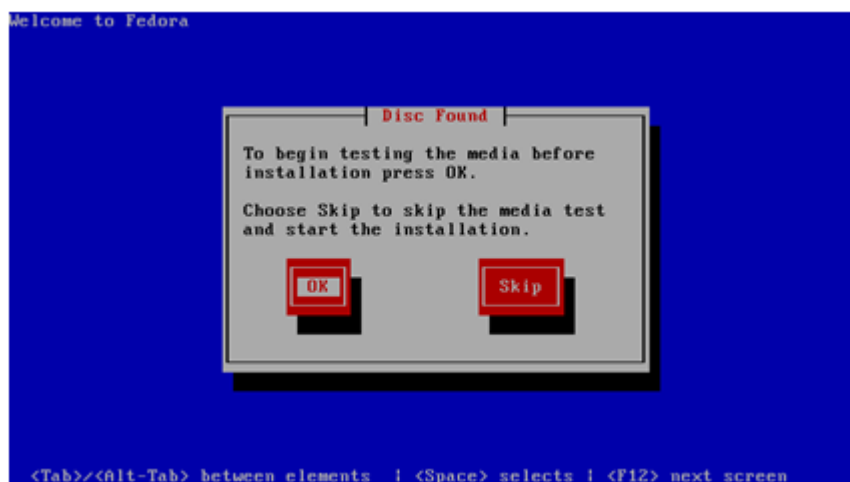
This installation is automatic and requires a very low user interaction.

Follow the instructions below to install a perfectly working system.

Set your PC to use the CD ROM as the default boot device.

Place the installation CD into the CD ROM.

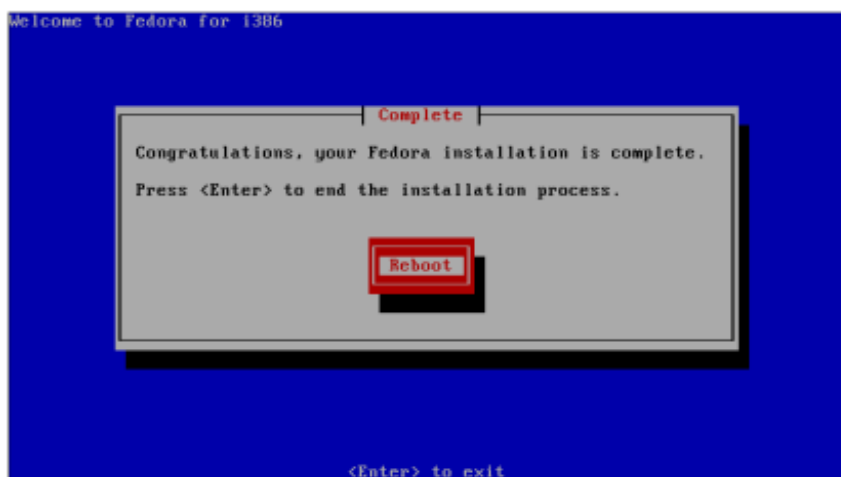
After starting your PC, you will get the following screen. You can choose any of the available booting options. Automatic installation is the first option and will start in 3 seconds.



You can test the installation CD before installation. Choose **OK** to test the CD or **Skip** to continue the installation process.

The installer will automatically format the hard drive and install all system files. When the installation is finished, the installer will wait for reboot confirmation. Press ENTER to continue.

Remove the CD from the CD ROM and let the new system boot.



To finish the system settings log in as the Admin user with the 2n password. The wizard will help you set the network and install the package correctly.

Network Settings

You can set the network during the first login. A graphical wizard will help you set the IP address, network mask and default gateway. Use **TAB** to move between options. Use **SPACE** to select or unselect options. You can also change the IP by running the command set-up.

Time Zone and Time Synchronisation

Because the routing rules are based on time and date, be sure to set the correct time zone and synchronise time. For time synchronisation use the NTP protocol and so you need the Internet connection.

Package Installation

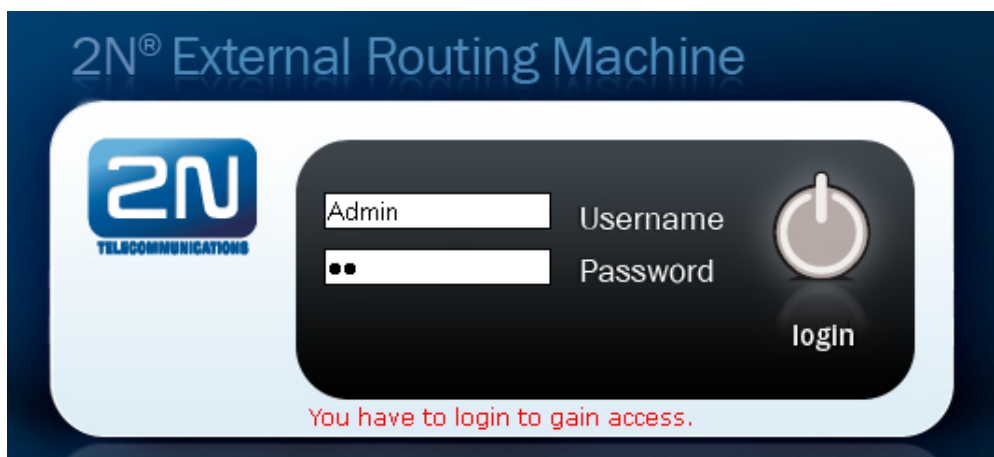
Choose the package to be installed. You can choose either the 2N[®] ERM or 2N[®] SIM Star Server application.

Configuration via WEB interface

Enter `http://IP_address_PC/erm` into your browser address row to access the ERM web interface.

Caution

- The manufacturer supplies the gateways with a predefined default user account **Admin** with default password **2n**. Mind the Upper/Lower Case while entering the user name and password! The first thing you should do for safety reasons after putting your gateway in operation is to change the administrator password.



Gateway Connection

Access the ERM configuration via the web interface sections. Use this interface to fully configure the ERM and manage the database table records.

The configuration consists of the following sections:

- **Gateways** - section for information related to the gateway, the maximum number of connected gateways is 100.
- **Database** - for manage all database tables concerting ERM.
 - **INC tables** - routing of incoming calls from GSM/UMTS
 - **Out tables** - routing of outgoing calls according Calling party number (CLIP)
 - **Black & White tables** - outgoing calls routing according to Black & White CDN list
 - **Clip tables** - routing of outgoing calls according to Called party number
 - **Phonebook** - telephone directory table (for 2N[®] NetStar system only).
- **ERM Management** - section for general configuration of ERM.



- The 2N[®] ERM server will not become functional until the ERM licence file is uploaded.

Licence

The ERM licence is per gateway connection. The licence is generated by the 2N Technical Support and based on the gateway serial number.

Upload the current licence file via the ERM web interface (ERM Management - Licence).

ERM Server - license

[← Back](#)

Upload new license file

No file chosen

Current license

Black&White list: 1
Remote DB: 1

Gateway Serial number	License limit	Publish date (yyyy/mm/dd)
05-0485-0016	unlimited	-
06-1514-0021	unlimited	-
M112-0903500005	unlimited	-
M201-5401230039	unlimited	-
M201-1501270011	unlimited	-
M113-0408700015	unlimited	-

Gateway Section

The Gateway section contains the following items:

Gateway

Enabled	<input type="checkbox"/> ?
Name	SG ?
IP address	192.168.22.143 ?
IPport	23 ?
Username	Admin ?
Password	2n ?
Inc_table	inc001 ?
Inc_table_enabled	<input checked="" type="checkbox"/> ?
Other_CLIP	<input type="checkbox"/> ?
Out_table	out001 ?
Out_table_enabled	<input checked="" type="checkbox"/>
Out_CLIP_table_a	clip001a ?
Out_CLIP_table_b	clip001b ?
Out_CLIP_table_c	clip001c ?
Log	<input checked="" type="checkbox"/> ?
Debug	<input checked="" type="checkbox"/> ?
Release_CAU	21 - Call rejected ?
Phonebook table	None ?

Key	Value	Description
Enabled	0 or 1	Activates (1) or deactivates (0) the use of the gateway.
IPAddress	IP address in format xxx.xxx.xxx.xxx	Remote GSM gateway IP address. Set this connection for ERM remote control.
IPport	IP port number	Remote gateway communication port (default=23).
Username	String	Username for gateway access through the Telnet protocol (default=2n).
Password	String	Password for gateway access through the Telnet protocol (default=2n).
Inc_table	inc001 to inc100	Name of the table that includes record for incoming GSM call filtering. One table may be shared by multiple GSM gateways.
Inc_table_enabled	True or False	Enables (True) or disables (False) filtering of incoming calls.

Other_CLIP	0 or 1	Determines whether an identified GSM CLIP shall be rejected (0) or received (1).
Out_table	out001 to out100	Name of the table used for outgoing call routing. One table may be shared by multiple GSM gateways.
Out_CLIP_table	clip001 to clip100	Name of the table used for outgoing call routing. One table may be shared by multiple GSM gateways.
Out_table_enabled	True or False	Enables (True) or disables (False) the use of the Out_table.
Log	0 or 1	Activates (1) or deactivates (0) LOG generation.
Debug	0 or 1	Activates (1) or deactivates (0) debug generation.
Release_CAU	Number 1-255	ISDN releases CAU which is sent if a call is rejected (default=21).
Phonebook table	phonebook001- phonebook100	Name of the telephone directory table (for the 2N [®] NetStar system only).

Inc Table

This table is used for filtering incoming calls from GSM networks.

Calling party number: ?

Accept this call: ?

Time from: : ?

Time to: : ?

Days:

Mon	Tue	Wed	Thu	Fri	Sat	Sun
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Apply Cancel

- **CLIP** - enter the strings to be directly compared with the CLIP received.
- **Restriction** - enter the value to be assigned to each CLIP determining whether the incoming call with the CLIP shall be rejected (0) or received (1).

- **Time from** – set the beginning value of the time interval (hh:mm) for the selected rule.
- **Time to** – set the end value of the time interval (hh:mm) for the selected rule.
- **Day** – define a day in the week on which the rule shall be applied (1= Monday, ..., 7 = Sunday).

Incoming table structure:

CLIP	Restriction	Time from	Time to	Day
+420605234354	1	00:00	12:00	1234567
+420775234091	0	12:00	24:00	1234567

Out Table

This table is used for identification of the subgroup from which the call is coming. The search result is used for search in the clip_table.

Calling party number (CLIP): ?

Outgoing call ERM group (Company): ?

Time from: : ?

Time to: : ?

Days:

Mon	Tue	Wed	Thu	Fri	Sat	Sun
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- **CGP** – enter the strings to be directly compared with the CLIP received. The '_' character is used as a masking character for one numeric character.
- **Company** – set the value to be assigned to each CGP determining to which subgroup the CGP is assigned. If there is no match, the received CGP is assigned to subgroup 0.
- **Time from** – set the beginning value of the time interval (hh:mm) for the selected rule.
- **Time to** – set the end value of the time interval (hh:mm) for the selected rule.
- **Day** – define a day in the week on which the rule shall be applied (1= Monday, ..., 7 = Sunday).

Out table structure:

CGP	Company	Time from	Time to	Day
261301__	1	00:00	12:00	1234567
2353215__	2	12:00	24:00	1234567
261333111	100	00:00	24:00	1234567
261333222	101	00:00	24:00	12345

Clip Tables

Called party number/prefix:	<input type="text"/>	?														
Outgoing call ERM group (Company):	<input type="text"/>	?														
Add/Replace CDN prefix:	<input type="text"/>	?														
Delete last x digits from CDN:	<input type="text"/>	?														
Outgoing GSM group/module (gateway):	<input type="text"/>	?														
Tariff:	<input type="text"/>	?														
Time from:	<input type="text"/> : <input type="text"/>	?														
Time to:	<input type="text"/> : <input type="text"/>	?														
Days:	<table border="1"> <thead> <tr> <th>Mon</th> <th>Tue</th> <th>Wed</th> <th>Thu</th> <th>Fri</th> <th>Sat</th> <th>Sun</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	Mon	Tue	Wed	Thu	Fri	Sat	Sun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mon	Tue	Wed	Thu	Fri	Sat	Sun										
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	<input type="button" value="Apply"/>	<input type="button" value="Cancel"/>														

- **Prefix** – define the received called number or a part of it (the number is checked from the left).
- **Company** – use this parameter to define to which subgroup the rule is to be applied.
- **Change prefix** – use this parameter to modify the number to be dialled. The '-' character removes one character from the left side of the called number. The other characters are added to the called number beginning.
- **Delete last** – use this parameter to remove characters from the right-hand side of the called number. The value defines how many characters should be removed.
- **Out group** – use this parameter to specify the outgoing group for call routing. If the group is set to 0, the call will be rejected. For direct routing to a selected GSM module, use G##, where ## is the GSM module number.
- **Tariff** – use this parameter to specify the Tariff number.

- **Time from** - set the beginning value of the time interval (hh:mm) for the selected rule.
- **Time to** - set the end value of the time interval (hh:mm) for the selected rule.
- **Day** - define a day in the week on which the rule shall be applied (1 = Monday, ..., 7 = Sunday).

Clip table structure:

Prefix	Company	Change prefix	Delete last	Out group	Time from	Time to	Day
605205697%	1		0	129	00:00	12:00	1234567
605205697#%	4		1	9	12:00	24:00	1234567
605%	1	#31#	0	129	00:00	24:00	1234567
605%	2	+420	0	349	00:00	24:00	1234567
0605%	3	-#31#	0	59	00:00	24:00	1234567
608%	1	#31#+420	0	0	00:00	24:00	1234567
%	1		0	9	00:00	24:00	1234567
%	100		0	G10	00:00	24:00	1234567
%	101		0	G1	00:00	12:00	1234567
%	101		0	G12	12:00	24:00	1234567

Black & White Tables

Set the rules to disable routing for calls that failed to meet the set parameters before, such as unconnected calls, short calls, rejected calls, and so on.

Black & White tables

Bwtable	Off	?
BwrejectCAU	21 - Call rejected	?
BwAttempts	5	?
BwAlerting	3	?
BwBuildTime	30	?
BwCallLength	0:30	?
BwValidityHours	5	?
BwAddNoRing	0	?
BwAddRejected	1	?
BwAddOnlyRing	1	?
BwAddShortCall	1	?
BwResetGood	0	?
BwAddGoodToWL	0	?
BwMaxRow	7000000	?

Black & White tables		
Bwtable	BW001- BW100	Name of the B&W table.
BwrejectCAU	Number 1- 255	ISDN releases CAU to be sent if a call is rejected (default=21).
BwAttempts	1 - 50	Number of attempts before the record change to restricted.
BwAlerting	0 - 30	Minimum length of the Outgoing call alerting state.
BwBuildTime	0 - 45	Maximum length of Call building.
BwCallLength	mm:ss	Minimum length of the active call.
BwValidityHours	0, 1-999	Validity time of a record in the database. If you set 0 there is no time limit for records.
BwAddNoRing	0, 1	Call with no ringing state will be marked as "faulty".

Black & White tables		
BwAddRejected	0, 1	Rejected call will be marked as "faulty".
BwAddOnlyRing	0, 1	Call with ringing state and no active state will be marked as "faulty".
BwAddShortCall	0, 1	Short call will be marked as "faulty".
BwResetGood	0, 1	One outgoing call that is not marked as "faulty" will restore BWAttempmts counter back to "0".
BwAddGoodToWL	0,1	One outgoing call that is not marked as "faulty" will be automatically added to the whitelist.
BwMaxRow	0, 20000-7000000	Maximum number of records in the selected database table.

The BW table records can have three different states.

- 0 - **White list** - the record is enabled.
- 1 - **Counting** - the record is in the state of counting. When the threshold value is reached, a change in the Black List will occur.
- 2 - **Black list** - the record is disabled.

B&W table structure:

Called party number	Length of Alerting state	Buildtime	Length of connected call	Release cause	Number of "wrong" calls	TimeStamp	State of record
601123456	15	10	00:33:00	1	3	2012-10-22 13:21:05	1

Note

- The maximum count of Black & White table records is 7000000.

ERM Management

The screenshot displays the ERM Management interface with the following sections:

- Management Options:** About ERM, Logger, Licence file, Restart, ERM update, Time, User accounts, and Connections.
- Versions:**
 - Version: 5.0.13
 - Database type: PostgreSQL
 - Database version: 8.4.9
- Times:**
 - Server local time: 2012/10/11 - 11:42:19 CEST
 - Server GMT: 2012/10/11 - 9:42:19 GMC
 - Uptime: 0y 0m 0d 3h 58m 19s
- Online:**
 - Gateways: 0 / 100
 - Admins: 1 / 1
 - Editors: 0 / 1
 - Users: 0 / 0

Versions

This section provides information on the firmware versions.

- **Version** - gives information on the firmware version.
- **Build** - gives information on the firmware build version.
- **Database type** - gives information on the database type.

Times

This section provides information on the **2N® ERM Server** times.

- **Server local time** - gives the **2N® ERM Server** local time derived from the time zone defined.
- **Server GMT** - gives the **2N® ERM Server** time without time shift. GMT stands for the Greenwich Mean Time and is taken over directly from the BIOS.
- **Uptime** - gives the time from the last OS power up.

Online

This section provides information on the count of currently connected gateways and users.

About ERM

The menu provides essential contact information on the 2N TELEKOMUNIKACE a.s. company. You will find here the address, telephone and fax numbers and e-mail address of the Sales Department and Technical Support as well as a link to the 2N web sites.

Logger

The menu provides view LOG records in 2N[®] ERM Server. The records are marked with a timestamp.

```
-----  
ERM Server v5.0.13 stable, log file  
-----  
2N TELEKOMUNIKACE a.s., Copyright (c) 2011, www.2n.cz  
  
Configuration settings:  
enabled = 1  
IpAddress = 192.168.22.143  
IpPort = 23  
username = Admin  
password = 2n  
inc_table = inc001  
inc_table_enabled = 1  
other_CLIP = 0  
out_table = out001  
out_table_enabled = 1  
log_enabled = 1  
debug_enabled = 1  
release_CAU = 21  
out_CLIP_table_count = 3  
out_CLIP_table_a = clip001a  
out_CLIP_table_b = clip001b  
out_CLIP_table_c = clip001c
```

Licence File

Some 2N[®] ERM Server functions and GSM gateway connections are subject to licences. To manage the licences use this menu.

- **Current licence limitations** - check whether your current licence includes the following two system functions. These functions are subject to licence:
 - **Black&White list**
 - **Remote DB**
- **Licensed gateways** - displays a list of serial numbers of all the GSM gateways that may be used with 2N[®] ERM Server. 2N[®] ERM Server cannot be connected to gateway types other than those listed here. Every record also includes information on the licence expiry.

- **Upload new licence file** – helps you upload a new licence file. Select the file location using the **Browse** button and push **Upload licence file**.

Restart

- **Restart ERM Server** – use this option to restart 2N[®] ERM Server.
- **Load default configuration and restart ERM Server** – use this option to load default configuration and restart 2N[®] ERM Server.
- **Load default database configuration** – use this option to load default configuration 2N[®] ERM Server.

ERM Update

This section helps you update your 2N[®] ERM Server. Select the file location using the **Browse** button and push **Upload update file**.

Time

This section helps you set the 2N[®] ERM Server time.

User Accounts

This section helps you add/remove/edit the user accounts. The following two accounts are available in the default setting.

Username	Password	Privileges
2n	2n	Editor
Admin	2n	Admin

Connections

This section helps you monitor the connected users.

ERM Control

The `erm` user is used for administration purposes. To log in as the `erm` user use the `ermserver` password. The ERM is controlled and administered by the `erm` utility. To launch this utility use the following syntax (the statement values are not case sensitive):

erm statement parameters

Statement	Action
<code>start</code>	Launches the <code>ermserver</code> service. If the service is running, it writes out a report and terminates operation.
<code>stop</code>	Terminates the <code>ermserver</code> service. Unfinished requests, if any, are completed.
<code>restart</code>	Restarts the <code>ermserver</code> service.
<code>Status</code>	Writes out the <code>ermserver</code> service status, i.e. whether or not it is running.
<code>import <db_name> <CSV_file> <replace_duplicates></code>	Imports a new record into database table: <code><db_name></code> - name of the database table to be used for import. <code><CSV_file></code> - name of the CSV file to be used for import. If the file is unavailable in the current directory, the full path has to be listed. The CSV file values are separated with a comma (0x2C). The structure of all related tables is described in the ERM database structure section. <code><replace_duplicates></code> - sets whether duplicate lines should be replaced (True) or kept (False). Example of usage: <code>erm import clip001 clip001.csv true</code>
<code>export <db_name> <CSV_file></code>	Exports the database table to the CSV file. Example of usage: <code>erm export clip001 clip001_backup.csv</code>
<code>Erase <db_name></code>	Deletes the content of a selected database table. Example of use: <code>erm erase clip001</code>
<code>Copy <source_db_name> <dest_db_name></code>	Copies the database table: <code><source_db_name></code> - name of the source table; <code><dest_db_name></code> - name of the destination table. Example of usage: <code>erm copy clip001 clip002</code>

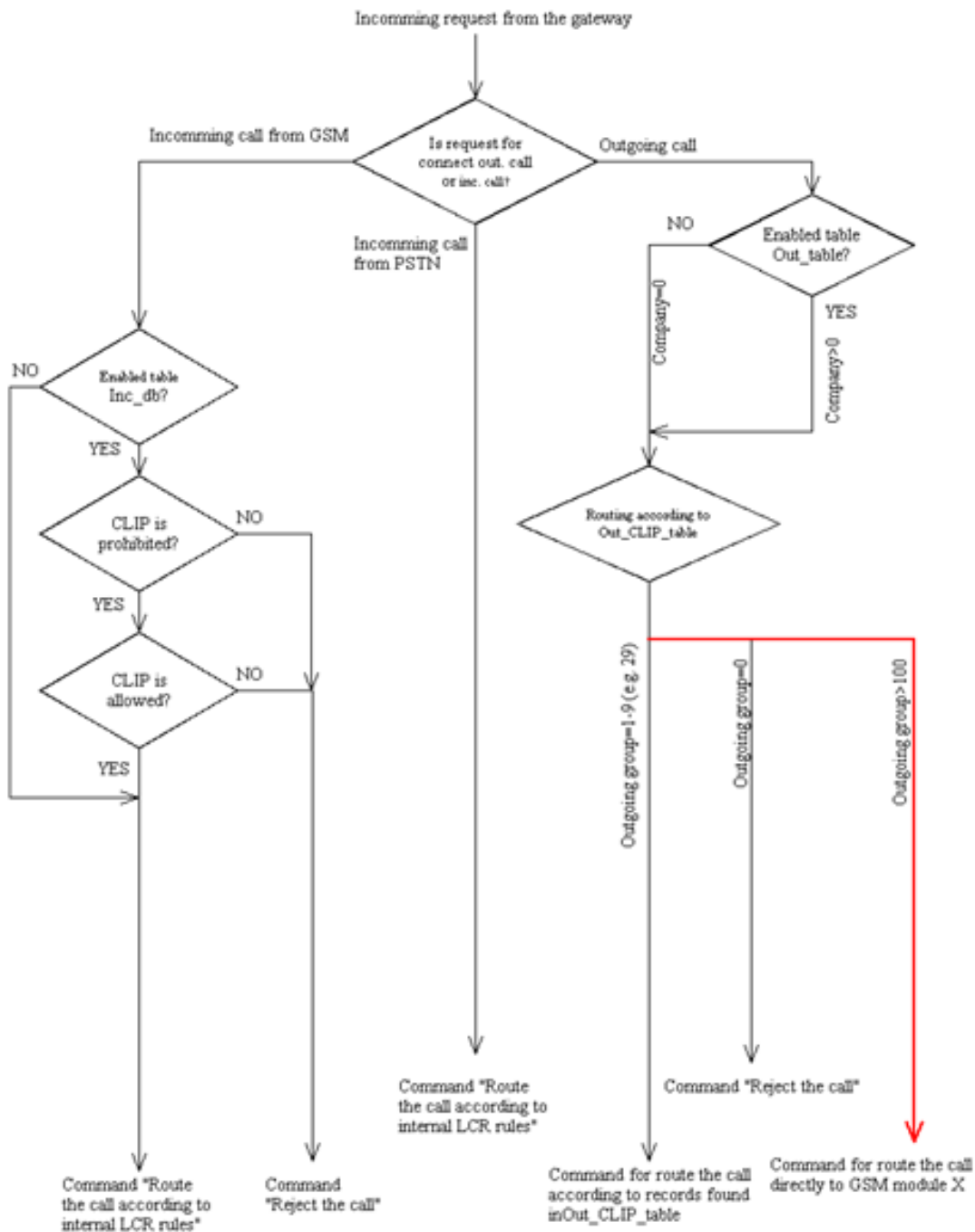
Description of ERM Function

After start, the ERM is connected automatically to the defined GSM gateways, activating the external call routing process in them. During this process, the GSM gateway automatically sends information on any new call to the ERM and awaits reply with call instructions within 2 seconds. If no reply comes from the ERM within this timeout, the call is routed according to the internal routing tables.

Note

- You can increase the timeout to up to 6 seconds if the gateway - server communication is too slow.

The functional diagram below shows the request processing procedure:



3.5 2N[®] SIM Star System

Product Purpose

2N[®] SIM Star offers:

- Central administration for all of your SIM cards.
- Central and safe location for all of your SIM cards.
- Elimination of SIM card replacement costs for GSM/UMTS gateway locations.
- High capacity for your SIM cards due to extensive scalability.
- Simple integration in your existing IP solution due to standard Ethernet interface connection.

2N[®] SIM Star Key Components

- CPU-SIM Client - the card converts data from/to the GSM/UMTS card on the Ethernet interface.
- SIM Star GSM/UMTS board - a card designed for the 2N[®] StarGate / BlueTower gateway. This card replaces the existing GSM/UMTS cards in the respective gateway. The new solution enables connection to the SIM Client card.
- SIM board - includes as many as 32 SIM cards, converts data from/to the Ethernet interface.
- SIM board box - a 3U rack designed for up to 18 SIM boards. The SIM box works as a traditional Ethernet switch that provides comfortable connection and storage of SIM boards.
- 2N[®] SIM Star Server - a rack-mounted PC that provides seamless integration of the system and allocates the GSM/UMTS module SIM cards according to the user-defined rules. 2N[®] SIM Star Server includes a web interface for easy and user-friendly system configuration and control.

SIM Client Configuration

The SIM Client service is launched automatically upon the CPU start and need not be configured. As the service uses **the same IP address / access name / password as the CPU**, you have to know these data before configuring 2N[®] SIM Star Server. For additional information refer to the 2N[®] SIM Star User Manual.

The SIM Client communicates with the other **2N[®] SIM Star** parts via an Ethernet interface and using the following IP ports:

TCP/UDP port	Description
1500 / TCP	Connection with 2N[®] SIM Star Server
10000-10031 / UDP	Connection with SIM boards
12349 /TCP	Connection of eCPU Call simulator to 2N[®] SIM Star Server

Remember to activate and correctly set the SIM Client process to ensure a proper function of the gateway in the **2N[®] SIM Star** system.

The **2N[®] SIM Star** system takes over some features from the basic CPU system. For additional information refer to the **2N[®] SIM Star** User Manual.

4. List of AT Commands

The protocol is derived from a standard AT protocol used for modems and GSM modules. The command format is AT[command]<CR>, or AT[command]<CR><LF> irrespective of the case. The response contains no or a few text lines, an empty line <CR><LF> and the response type: OK, ERROR or BUSY. To repeat the last command, enter A/<CR>.

Here is what you can find in this section:

- **4.1 Basic Commands**
- **4.2 Configuration Commands**

4.1 Basic Commands

System Information

- AT+I3 - Firmware version and copyright
- AT+I4 - 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
- AT+T###W# - Statistics of tariff # for module ##
- 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, CDR and SDR List

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

4.2 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#=grpout0 + grpout1, grpin0 + grpin1
 - # is the board number
 - grpout0..1, grpin0..1 - outgoing and incoming groups of modules 0 and 1
- AT&VQ## - Overview of GSM group ## settings (#=1-32)
- 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 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%S93=x** - Global selection of SIM card and X:
 - 0 - according to GSM group
 - 1-8 - number of SIM holder
- **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 count 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&Bxx=DOWN** - Transfer of GSM board xx into the sleep mode
- **AT&BPR=DOWN** - Transfer of PRI board into the sleep mode
- **AT&BALL=DOWN** - Transfer of all GSM boards into the sleep mode
- **AT&Bxx=RESET** - Reset of GSM board xx
- **AT&BPR=RESET** - Reset of PRI board
- **AT&BALL=RESET** - Reset of all GSM boards
- **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

ISDN PRI Board

- **AT%I00=** - ISDN PRI port type (TE/S; TE/M; NT/S; NT/M) or VoIP = SIP
- **AT%I01=x,y**
 - X - TEI ISDN PRI connections (0-63)
 - Y - CRC (0=off, 1=on)
- **AT%I05=c1,c2,c3,c4** - Number of causes sent to ISDN PRI (in ReleaseComplete) whenever an incoming call from ISDN PRI is rejected
- **AT%I11=** - MSN for remote control via PRI 1

- **AT%I12=** - MSN for remote control via PRI 2
- **AT%I04=x,y** - Channel select for PRI 1 / PRI 2
- **AT%I06=c1,c2,c3,c4** - Progress messages
- **AT%i09=day,bits,enb**
 - Day - day of statistics reset
 - Bits
 - 0 - no dial tone
 - 1 - continuous
 - 3 - discontinuous

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** - SIM card switching mode
 - 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
- **AT%G#3=netid,clir,min,sms,sec,sec2,pseudo** - Basic parameters of SIM card in slot 3
- **AT%G#4=netid,clir,min,sms,sec,sec2,pseudo** - Basic parameters of SIM card in slot 4
- **AT%G#5= from/to[/from,to/w+]** - Time intervals for using SIM card in slot 1, one or two intervals (from=to=hh:mm), w+(w-) parameter 'w+' (all weekend), or 'w-' (no weekend) for enabled/disabled SIM on weekends. In case AT%G#0=6 from/to= min/max limit for generating random time for SIM switching
- **AT%G#6= from/to[/from,to/w+]** - Time intervals for using SIM card in slot 2
- **AT%G#7= from/to[/from,to/w+]** - Time intervals for using SIM card in slot 3
- **AT%G#8= from/to[/from,to/w+]** - Time intervals for using SIM card in slot 4

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##=net,hh:mm/hh:mm/w,gr*** - Settings of line ## (0..63) of LCR table
 - net - number of network list (0..8)
 - hh:mm/hh:mm/w* - line using time limitation
 - gr - GSM group numbers

Test Calls

- **AT!SPxx=dial** - Initiate a testing call from AUX interface (xx is the called interface)
 - 1-15, 17-31 - B-channel
 - 32 - rotating B-channel
- **AT!SGxx=dial** - Initiate a 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!WPxx** - Connect the following call from interface xx to AUX interface
 - 1..15, 17-31 - from B-channel No.
 - 32 - first incoming calls from ISDN
- **AT!WGxx** - Connect the following call from interface xx to AUX interface
 - 00..31 - from GSM No.
 - 32 - first incoming calls from GSM
- **AT!D** - Terminate a call on AUX interface

Trace

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

- **AT!RE** - Start tracing of error messages on the 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 the used session

- 55 - deactivate control via the 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 - wireless engine number
 - sim - currently used SIM number: 0-none, 1-8-holder 1-8
 - sts3 - layer 3 status
 - sts2 - layer 2 status
 - phs2 - layer 2 substatus
 - type - wireless engine type
- **AT^MI=ch** - Module info ch = 0 -31
- ***minfo: ch,sim,netid,"oper",new,cnt** - Response to AT^MI
 - netid - network ID of the active wireless network
 - oper - name of the active wireless network
 - new - number of received and saved MS on SIM card
 - cnt - total count 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 the 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** - SMS message content
 - len - SMS message length (number of bytes in PDU) PDU - message content 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 the 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 the 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 the 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

5. Advanced Configuration

This section contains description of the call data records and statistics generated by the 2N[®] StarGate / BlueTower gateway. A guide to the advanced gateway configuration using AT commands is also available.

Here is what you can find in this section:

- 5.1 List of Status Codes
- 5.2 Trace
- 5.3 Tracing
- 5.4 List of LOG Events
- 5.5 CDR Line Description
- 5.6 SDR Line Description
- 5.7 Statistics
- 5.8 List of SNMP traps

5.1 List of Status Codes

Plug-In Boards

Board Types

- **NONE** - (no board)
- **VIP172** - VoIP board
- **CPU** - (CPU board is not displayed)
- **PRI 132** - 2PRI port NT/TE board
- **GSMxxx** - 2GSM module + (2SIM board)
- **INIT** - HW board reset and init of respective SW parts in progress (follow OK /CHECK)
- **ERROR** - Board in wrong slot or defective board HW (follow board reset)
- **POWER** - Only upon system power on or AT!Bxx=RESET command (follow DETECT)
- **OK** - Rest status, HW is working on board (full operation) (follow DISC)
- **UNDEF** - Empty slot (follow DETECT)
- **CHECK** - Board firmware check (AUX only) (follow ERASE)
- **ERASE** - Board firmware erasing (AUX only) (follow PROF)
- **PROG** - New board firmware loading (AUX only) (follow OK)
- **DETECT** - New board plug-in detected (follow INIT)
- **DOWN** - Frozen status, HW is working on board but no new calls are started (follow board reset)
- **MODEMO** - Parameter S80 sent to modem (AUX only) (follow MODEM1)
- **MODEM1** - Parameter S81 sent to modem (AUX only) (follow OK)
- **DISC** - Board plug-out detected (follow UNDEF)

ISDN Layer Statuses

ISDN Layer 2

- **DEACT** - Deactivation - no signal received
- **ACTIVE** - Activation - full synchronisation achieved (frame,multiframe,crc)
- **SIGNAL** - Signal received - no synchronisation
- **SYNC** - Signal received - only partial synchronisation (frame)

ISDN Layer 2 (Name and Name According to Q.921)

- NOTEI - TEI Unassigned
- AWTEI - Assigned Awaiting TEI
- AWTEST - Establish Awaiting TEI
- OKTEI - TEI Assigned
- AWEST - Awaiting Establishment
- AWREL - Awaiting Release
- OKEST - Multiple Frame Established
- TIMREC - Timer Recovery

ISDN Layer 3

Name	Name According to Q.931	NT Description	TE Description
NULL	Null	Rest status, ready for call	
CINIT	Call Initiated	Call from PRI indicated	Call to PRI started
OVSEND	Overlap Sending	Gradual dialling receiving	Gradual dialling sending
OPROC	Outgoing Call Proceeding	Dialling from PRI terminated	Dialling to PRI terminated
CDELIV	Call Delivered	Call from PRI ringing	Call to PRI ringing
CPRES	Call Present	Call to PRI started	Call from PRI indicated
CRECV	Call Received	Call to PRI ringing	Call from PRI ringing
CONREQ	Connect Request	Call to PRI answered	Call from PRI answered
IPROC	Incoming Call Proceeding	Dialling to PRI terminated	Dialling from PRI terminated
ACTIVE	Active	Connected call	
DISREQ	Disconnect Request	End of call from PRI	End of call to PRI

Name	Name According to Q. 931	NT Description	TE Description
DISIND	Disconnect Indication	End of call to PRI	End of call from PRI
RELREQ	Release Request	Channel release request	
OVRECV	Overlap Receiving	Gradual dialling sending	Gradual dialling receiving
RSTREQ	Restart Request	Channel restart request sent	
RSTART	Restart	Channel restart request received	

ISDN Layer Management Statuses

- INIT - Initialisation upon PRI board reset
- IDLE - Activation - rest status, necessary for layers 2 and 3
- DISC - Deactivation

GSM Layer Statuses

GSM Layer 2

- INIT - GSM module initialisation start (follow PINREQ)
- SIMO - 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

5.2 Trace

With tracing activated, the internal system messages (transmitted between processes), messages received on and sent to the PRI / VoIP ports, and AT commands and replies sent to GSM modules are written out. The listing of a message related to a specific call starts with the B-channel and GSM module numbers and an arrow showing the message direction. The right arrow (->) means a message received on an interface (PRI, GSM, LAN) or a message directed from a lower layer process to a higher layer process (indication, confirmation). The left arrow (<-) designates a message sent to an interface (PRI, GSM, LAN) or a message directed from a lower layer process to a higher layer process (request, response). The message type (layer 3 messages are shifted by a space to the right, layer 4 messages by two spaces to the right) and the message content follow.

ISDN Messages

Typically Used ISDN Messages (Q.931)

- **!alertin** - Alerting
- **!callproc** - Call proceeding
- **!progress** - Progress
- **!setup** - Setup
- **!connect** - Connect
- **!setack** - Setup acknowledge
- **!connack** - Connect acknowledge
- **!disconn** - Disconnect
- **!restart** - Restart
- **!release** - Release
- **!restack** - Restart acknowledge
- **!relcompl** - Release complete
- **!facility** - Facility
- **!notify** - Notify
- **!stsreq** - Status enquiry
- **!info** - Information
- **!status** - Status

Typically Used ISDN Elements - Cause (Q.850)

ID	Name	Whole name
1	Unassnumb	Unassigned number
6	Unaccchan	Channel unacceptable
16	Clear	Normal call clearing
17	Userbusy	User busy
21	Reject	Call rejected
27	Destout	Destination out of order
28	Invformat	Invalid number format
30	Stsenqresp	Response to StatusEnquiry
31	Normal	Normal, unspecified
34	Noanychan	No channel available
41	Tempfail	Temporary failure
42	Swcongest	Switching equipment congestion
44	Noreqchan	Requested channel not available
65	Nobearer	Bearer capability not implemented
81	Callref	Invalid call reference value
88	Dest	Incompatible destination
96	Elemmiss	Mandatory information element is missing
97	Message	Message type non-existent or unimplemented

99	Element	Information element / parameter non-existent or unimplemented
100	Elemerror	Invalid information element contents
101	Incmess	Message incompatible with call state
102	Timeout	Recovery on timer expiry
127	Undefined	Interworking, unspecified

5.3 Tracing

2N[®] StarGate / BlueTower 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.).

5.4 List of LOG Events

Table of LOG events:

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: stack 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)
HW-ERR		(##...address of chip, RD...read value WR...expected value)	
	Codec ##, RD/WR	Error in initialisation of codec on GSM,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
SYSERR	User stack error!	SW error: stock integrity failure
BRDIN	#08 TYP STS	Board inserted (number of gsm board, type, status)
BRDOUT	#08 TYP STS	Board disconnected
BRDRES	#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

Type	Text	Description
L1-ERR		(reserved)
L2-ERR		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)
L3-ERR	tout sts # (p##)	Error of isdn layer 3: timeout in status # on channel p##
G2-ERR	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)
G3-ERR	tout sts # (g##)	Error of isdn layer 3: timeout in status # on module g##
C4-ERR	tout sts # (p##/g##)	Error of connecting layer 4: timeout in status # on call between channel p## and GSM module g##

5.5 CDR Line Description

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:** date/time of call start
- **Column 3:** type of call
 - 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:** number of used channel/number of used GSM module
- **Column 6:** used GSM group (C= CallBack to PRI 1 , E= call via PRI 2 interface)
- **Column 7:** call setup time
- **Column 8:** call duration in mmm:ss (max 255:59) or error cause for unconnected calls
- **Column 9:** call cost (will be implemented in a higher firmware version)
- **Column 10:** gateway id (optional)
- **Column 11:** called number
- **Column 12:** calling number
- **Column 13:** slot number/IMSI* of used SIM card

5.6 SDR Line Description

Refer to the **Gateway / Gateway control / SDR** file section for the current SDRs 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
 - SISD - ISDN alert SMS
 - SALV - alive SMS
 - SSIM - simulation SMS was sent via 2N[®] SIMStar server
 - RSIM - simulation SMS was received 2N[®] 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

5.7 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

- **Pri/grp** - type of calls.
- **Reset** - date of last reset the statistics.
- **Minutes** - number of minutes.
- **Hhhh:mm:ss** - 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** - 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).

[Statistic of calls in groups]

```
group  (reset)  minutes  hhhh:mm:ss  calls  reject  failed  c.off  errors
-----
#i1 inc (31.12) 0 0:00:00 0 0 0 0 0
#i2 inc (31.12) 0 0:00:00 0 0 0 0 0
...
#i32 inc (31.12) 0 0:00:00 0 0 0 0 0
group  (reset)  minutes  hhhh:mm:ss  calls  reject  failed  red.in  redout
-----
#g1 out (31.12) 0 0:00:00 0 0 0 0 0
#g2 out (31.12) 0 0:00:00 0 0 0 0 0
...
#g32 out (31.12) 0 0:00:00 0 0 0 0 0
```

[Statistic of incoming calls on all modules]

module	brd	minutes	hhhh:mm:ss	calls	smsses	minutes	hhhh:mm:ss	calls	smsses	

#00	#01	00	0	0:00:00	0	0	0	0:00:00	0	0
#02	#03	01	0	0:00:00	0	0	0	0:00:00	0	0
...										
#30	#31	15	0	0:00:00	0	0	0	0:00:00	0	0

*each line is for two wireless modules

[Statistic of outgoing calls on all modules]

module	brd	minutes	hhhh:mm:ss	calls	smsses	minutes	hhhh:mm:ss	calls	smsses	

#00	#01	00	0	0:00:00	0	0	0	0:00:00	0	0
#02	#03	01	0	0:00:00	0	0	0	0:00:00	0	0
...										
#30	#31	15	0	0:00:00	0	0	0	0:00:00	0	0

*each line is for two wireless modules

[Statistic of calls on GSM module ##]

sim/dir	net/grp	minutes	hhhh:mm:ss	calls	reject	failed	c.offfs	sms

#1	inc /1	0	0:00:00	0	0	0	0	0
#2	inc /1	0	0:00:00	0	0	0	0	0
...								
#8	inc /1	0	0:00:00	0	0	0	0	0

#1	out /1	0	0:00:00	0	0	0	0	0
#2	out /1	0	0:00:00	0	0	0	0	0
...								
#8	out /1	0	0:00:00	0	0	0	0	0

[Statistic of calls on GSM module ##] - limit

sim	net/grp	minutes	hhhh:mm:ss	calls	limit

#1	out /1	0	0:00:00	0	0
#2	out /1	0	0:00:00	0	0
...					

#8 out /1 0 0:00:00 0 0

[Statistic of calls on GSM module ##] - tariff

sim min0:ss limit min1:ss limit min2:ss limit min3:ss limit

#1 0:00 0 0:00 0 0:00 0 0:00 0

#2 0:00 0 0:00 0 0:00 0 0:00 0

...

#8 0:00 0 0:00 0 0:00 0 0:00 0

5.8 List of SNMP traps

VoIP board

- VoIP board missing
- VoIP board inserted
- VoIP board ERROR
- VoIP board OK
- Too many busy VoIP channels
- Number of busy VoIP channels decreased under maximum level
- Too low number of busy VoIP channels
- Number of busy VoIP channels increased over minimum level
- VoIP SIP line is not registered
- VoIP SIP line is registered

PRI board

- PRI board missing
- PRI board inserted
- PRI board ERROR
- PRI board status: OK
- PRI 1 link unplugged, layer1 deactivated
- PRI 1 link plugged in, layer1 activated
- PRI 1 link layer 2 not established
- PRI 1 link layer 2 established
- PRI 2 link unplugged, layer1 deactivated
- PRI 2 link plugged in, layer1 activated
- PRI 2 link layer 2 not established
- PRI 2 link layer 2 established
- Too many number of busy B-channels on PRI 1 link
- Number of busy B-channels on PRI 1 link decreased under maximum level
- Too low number of busy B-channels on PRI 1 link
- Number of busy B-channels on PRI 1 link increased over minimum level
- Too many number of busy B-channels on PRI 2 link
- Number of busy B-channels on PRI 2 link decreased under maximum level
- Too low number of busy B-channels on PRI 2 link
- Number of busy B-channels on PRI 2 link increased over minimum level

GSM slots

- GSM board in slot missing
- GSM board in slot inserted
- GSM board ERROR
- GSM board in slot, status: OK
- First GSM module on GSM board: ERROR
- First GSM module on GSM board: OK
- First GSM module on GSM board has too strong signal level
- First GSM module on GSM board decreased under level of too strong signal level
- First GSM module on GSM board has weak signal level
- First GSM module on GSM board increased over level of too weak signal level
- Second GSM module on GSM board: ERROR
- Second GSM module on GSM board: OK
- Second GSM module on GSM board has too strong signal level
- Second GSM module on GSM board decreased under level of too strong signal level
- Second GSM module on GSM board has weak signal level
- Second GSM module on GSM board increased over level of too weak signal level

Power supply

- Power supply fail
- Power supply 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

6. Technical Parameters

This section provides technical conditions for the 2N[®] StarGate / BlueTower installation.

- 6.1 2N[®] StarGate Technical Parameters
- 6.2 2N[®] BlueTower Technical Parameters

6.1 2N® StarGate Technical Parameters

Subrack

- **Dimensions (W x H x D):** 482 x 133 x 360 mm (84HP x 3U x 360 mm)
- **Weight (full configuration):** 9,800 g
- **Power supply:** 100-240V AC / 50-60Hz, or 48 DC
- **Power input:** up to 230VA

GSM / UMTS

- **Mobile network type:** GSM phase II or UMTS
- **Transmission output per channel:** 900MHz / 2W, 1800MHz / 1W or 850MHz / 2W, 1900MHz / 1W or 850MHz / 900MHz / 1700MHz / 1900MHz / 2100MHz UMTS
- **SIM cards:** Plug-in small 3V
- **VF connector:** GSM and UMTS boards with Cinterion MC55i-w, Telit GE910, Telit HE910-EUR, Telit HE910-NAR with module connector – SMA 50ohm
- **Antenna splitter:** Only external models

PRI Interface(s)

- **Interface:** 1 PRI or 2 ISDN PRI
- **Frame:** E1
- **CRC:** Supported
- **Signalling:** Q.931-EDSS1
- **Type (NT or TE):** Switchable NT or TE
- **TEI number:** 0-63
- **Clock (master or slave):** Master/Slave
- **Connector RJ 45, Rxpin, Txpin:** Switchable RJ45 (Rx-1,2 Tx-4,5 / Rx-4,5 Tx-1,2)
- **D channel timeslot:** 16

VoIP Interface

- **Interface:** Switch 4x 10/100BaseT FullDuplex
- **Signalling:** SIP
- **Voice compression:**
 - G.723.1; MP-MLQ at 6.3, ACELP at 5.3 kbps
 - G.729 Annex A, B; CS-ACELP at 8kbps

-
- G.711; PCM at 64kbps (u-Law/A-Law)
 - **Number of voice channels:** 30
 - **Connector type:** 4 RJ45 (Ethernet switch)
 - **Adaptive Jitter Buffer**
 - **Jitter buffer size:** 200 ms
 - **The jitter fixed delay:** 60 ms

Temperature

- **Working temperature range:** 0°C to + 40°C
- **Relative humidity:** up to 95% at 40°C
- **Air-condition:** Recommended

Remote Control Line Types

- **Type of line:**
 - Serial line (COM1)
 - Ethernet 100baseT - Telnet
 - ISDN PRI (PRI 1, PRI 2)
 - Web interface - HTTP

6.2 2N® BlueTower Technical Parameters

Rack

- **Dimensions (W x H x D):** 160 x 185 x 320 mm (29HP x 3U x 320 mm)
- **Weight (full configuration):** 4.1 kg
- **Power supply:** 100-240V AC / 50-60Hz
- **Power input:** up to 50VA

GSM / UMTS

- **Mobile network type:** GSM phase II or UMTS
- **Transmission output per channel:** 900MHz / 2W, 1800MHz / 1W or 850MHz / 2W, 1900MHz / 1W or 850MHz / 900MHz / 1700MHz / 1900MHz / 2100MHz UMTS
- **SIM cards:** Plug-in small 3V
- **VF connector:** GSM and UMTS boards with Cinterion MC55i-w, Telit GE910, Telit HE910-EUR, Telit HE910-NAR with module connector – SMA 50ohm
- **Antenna splitter:** Only external

PRI Interface(s)

- **Interface:** 1PRI or 2ISDN PRI
- **Frame:** E1
- **CRC:** Supported
- **Signalling:** Q.931-EDSS1
- **Type (NT or TE):** Switchable NT or TE
- **TEI number:** 0-63
- **Clock (master or slave):** Master/Slave
- **Connector RJ 45, Rxpin, Txpin:** Switchable RJ45 (Rx-1,2 Tx-4,5 / Rx-4,5 Tx-1,2)
- **D channel timeslot:** 16

VoIP Interface

- **Interface:** Switch 4x 10/100BaseT FullDuplex
- **Signalling:** SIP
- **Voice compression:**
 - G.723.1; MP-MLQ at 6.3, ACELP at 5.3 kbps
 - G.729 Annex A, B; CS-ACELP at 8kbps

- G.711; PCM at 64kbps (u-Law/A-Law)
- Number of voice channels: 30
- Connector type: 4 RJ45 (Ethernet switch)
- Adaptive Jitter Buffer
 - Jitter buffer size: 200 ms
 - The jitter fixed delay: 60 ms

Temperature

- Working temperature range: 0°C to + 50°C
- Relative humidity: up to 95% at 40°C
- Air-condition: Recommended

Remote Control Line Types

- Type of line:
 - Serial line (COM1)
 - Ethernet 100baseT - Telnet
 - ISDN PRI (PRI 1, PRI 2)
 - Web interface - HTTP

7. Supplementary Information

This section provides supplementary information on the product.

Here is what you can find in this section:

- **7.1 Troubleshooting**
- **7.2 List of Abbreviations**
- **7.3 Regulations and Directives**
- **7.4 General Instructions and Cautions**

7.1 Troubleshooting



For the most frequently asked questions refer to faq.2n.cz.

- *Calls to GSM / UMTS still go over the PRI 2 interface*
 - The prefix you are calling is not included in any prefix list.
 - There is no rule in the LCR table connecting this prefix list with at least one GSM outgoing group.
 - The call type is not voice (FAX, DATA).
 - The used voice codec is uLaw (the gateway supports aLaw only).
- *SMS at no answer does not contain the **Calling party number***
 - The **Text of SMS at no answer** parameter must contain **%n**, which represents the calling party number.
- *The Init LED is flashing on the GSM / UMTS board*
 - You are using a GSM / UMTS card from a different type of gateway (for example, you are using a 2N[®] BlueTower card in 2N[®] StarGate).

7.2 List of Abbreviations

List of Abbreviations in the document:

- **APN** - Access Point Name - necessary for the GPRS service
- **CLIP** - Calling Line Identification Presentation
- **CSD** - Circuit Switched Data
- **COM** - PC serial port
- **DTMF** - Dual Tone Multi Frequency - tone dialling
- **EG** - StarGate/BlueTower
- **ESME** - External Short Messaging Entity
- **FSK** - Frequency Shift Keying
- **FXO** - an interface electrically identical with a standard telephone (opposite side = FXS interface)
- **FXS** - a telephone interface allowing standard telephone connection (opposite side = FXO interface)
- **FW** - Firmware - similar to SW, a term for the central microprocessor program
- **GSM** - Group Switched Mobile system - the present standard digital mobile telephone network
- **GPRS** - General Packet Radio Service - high-speed data transmission for GSM networks
- **HW** - Hardware - an electronic device, circuit, board, component, etc. in this context
- **P(A)BX** - Private (Automatic) Branch Exchange
- **PC** - Personal Computer (based on the IBM PC standard)
- **PIN** - Personal Identification Number - a SIM card securing password
- **POP3** - Post Office Protocol v3
- **PUK** - Personal Unblocking Key - a password used to unblock a blocked SIM card after repeated wrong PIN entering
- **RS-232C** - a PC serial port standard
- **SIM** - Subscriber Identity Module - a chip-equipped module to be inserted in a GSM device for identification
- **SMPP** - Short Message Peer to Peer
- **SMSC** - Short message service center
- **SMTP** - Simple Mail Transfer Protocol
- **SMS** - Short Message Service, a term for the system and one unit (message)
- **SW** - Software
- **TTL** - Transistor-Transistor Logic - a standard digital technology defining voltage for levels 0 and 1

-
- **PSTN** - Public Switched Telephone Network

Europe

2N[®] StarGate 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.

7.4 General Instructions and Cautions

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

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

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

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

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

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

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

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

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

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

All applicable legal regulations concerning the product 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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