# 2N® EASYGATE
# UMTS GATEWAY

EASYGATE
UMTS

> **Dramatic cost saving**
> **Connection to UMTS and GSM Networks**
> **For PBX or Phone sets**
> **FSK CLIP**

WARRANTY 2 YEAR

Technical Support FREE OF CHARGE

2N®

TELEKOMUNIKACE

## *Dear customer,*

Let us congratulate you on having purchased the EasyGate UMTS Data system. This new product has been developed and manufactured to provide the maximum utility value, quality and reliability. We hope you will be fully satisfied with this UMTS/GSM gateway for a long time. Therefore, use your EasyGate UMTS Data for purposes it has been designed and manufactured for, in accordance herewith.

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

## *Safety Precautions*

Do not switch on EasyGate UMTS Data in the vicinity of medical apparatuses to avoid interference. The minimum distance of the antenna and pacemakers should be 0.5 m.

Do not switch on EasyGate UMTS Data aboard of a plane.

Do not switch on EasyGate UMTS Data near petrol stations, chemical facilities or sites where explosives are used.

Any mobile telephone use prohibition based on RF energy radiation applies to EasyGate UMTS Data too.

EasyGate UMTS Data may disturb the function of TV sets, radio sets and PCs.

Warning! EasyGate UMTS Data contains components that can be swallowed by small children  (USIM card, antenna, etc.).

The voltage value mentioned on the adapter may not be exceeded. If you connect EasyGate UMTS Data to another power supply, make sure that the voltage value is in the acceptable range.

When your EasyGate UMTS Data comes to the end of its operational life, dispose of it in accordance with applicable regulations.

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## *User Manual Versions*

| Version | Amendments to Earlier Versions |
|---------|-------------------------------|
| 1.00    | • The User Manual applies to EasyGate UMTS Data FW Version **2.20K** |

## *Upgrade*

The manufacturer continuously meets customer requirements by improving the firmware. For the latest EasyGate UMTS Data processor firmware, programming tool and User Manual see www.2n.cz. For a detailed description of the EasyGate UMTS Data firmware upgrade refer to the section devoted to the PC programming tool.

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## Packing List

An **EasyGate UMTS Data** delivery contains the following items:

| Item | Number of Pieces |
|---|---|
| EasyGate UMTS Data | 1 pc |
| Antenna for direct connection | 1 pc [1] |
| Magnetic Antenna with coax cable | 1 pc [1] |
| Supply adapter | 1 pc |
| Telephone cable | 1 pc |
| PC-connection USB cable | 1 pc |
| PC-connection serial cable ( only for gateway upgrade and programming) | 1 pc |
| Dowels | 2 pcs |
| Bolts | 2 pc |
| CD-ROM with User Manual and software | 1 pc [2] |
| Quick Installation Guide + mounting pattern | 1 pc |
| Warranty certificate | 1 pc |

### Notes:

1) *The delivery includes an antenna to be connected directly to the EasyGate UMTS Data SMA connector. An antenna with a cable should be used when UMTS/GSM signal is poor or in case of interference with other devices.*

2) *Enclosed software:*
   - *EasyGate UMTS Data PCManager*
   - *User Manual in pdf format*

# CONTENTS

# 1. EasyGate UMTS Data purpose

## 1.1. Basic Functions

- The primary purpose of EasyGate UMTS Data is to transmit voice between a UMTS or GSM network and an attached FXO-interface terminal (PBX, telephone, answering machine, etc.).
- You can establish fast internet HSDPA connection or GPRS connection.
- You can send an SMS to a pre-programmed number using the SMS sending input.
- EasyGate UMTS Data **can't establish data/fax connections!**

## 1.2. Advantages of EasyGate UMTS Data Use

- **Call cost cutting** – by forwarding UMTS/GSM calls to EasyGate UMTS Data you save a lot on PSTN – UMTS/GSM calls.
- **Easy installation** – EasyGate UMTS Data is designed for immediate use without programming.
- **You get all you need in the delivery** – your EasyGate UMTS Data delivery contains all you need to operate the system (the power supply adapter, telephone cable, PC serial cable and CD-ROM with software).
- **Solution for sites without telephone lines** – such as mountain chalets, exhibitions, conferences, etc.
- **CLIP** - EasyGate UMTS Data is equipped with the FSK-based CLIP feature, so if a terminal capable of receiving the CLIP is used you know the caller's number.
- **Fast internet connection** – EasyGate uses HSDPA for internet connection (max speed 7.2 Mbit/s). HSDPA connection and voice calls can run simultaneously on gateway
- **SMS sending input** – simply send an SMS to a pre-programmed number by closing the contact. Recommended for easy supervision, simple securing, etc.
- **Radiation hazard minimization** – you are not exposed to a direct effect of the antenna RF electromagnetic field while telephoning as opposed to mobile telephones.
- **Full UMTS/GSM coverage** – UMTS 2100MHz and GSM 850/900/1800/1900MHz.

# 2. Installation

## 2.1. Proper Location

- EasyGate UMTS Data is designed for vertical mounting on suspension holes (use the mounting pattern). This position is the best for signal reception because a vertical antenna is used. EasyGate UMTS Data can be operated in the horizontal position too where the UMTS signal is good.
- Install EasyGate UMTS Data with respect to the UMTS signal strength.
- Place EasyGate UMTS Data out of range of sensitive devices and human bodies for electromagnetic interference reasons.
- For the allowed range of operating temperatures refer to the "*Technical Parameters".*
- It is impossible to operate EasyGate UMTS Data on places exposed to direct solar radiation or near heat sources.
- EasyGate UMTS Data is designed for indoor use. It may not be exposed to rain, flowing water, condensed moisture, fog, etc.
- EasyGate UMTS Data may not be exposed to aggressive gas, acid vapours, solvents, etc.
- EasyGate UMTS Data is not designed for environments with high vibrations such as means of transport, machine rooms, etc.
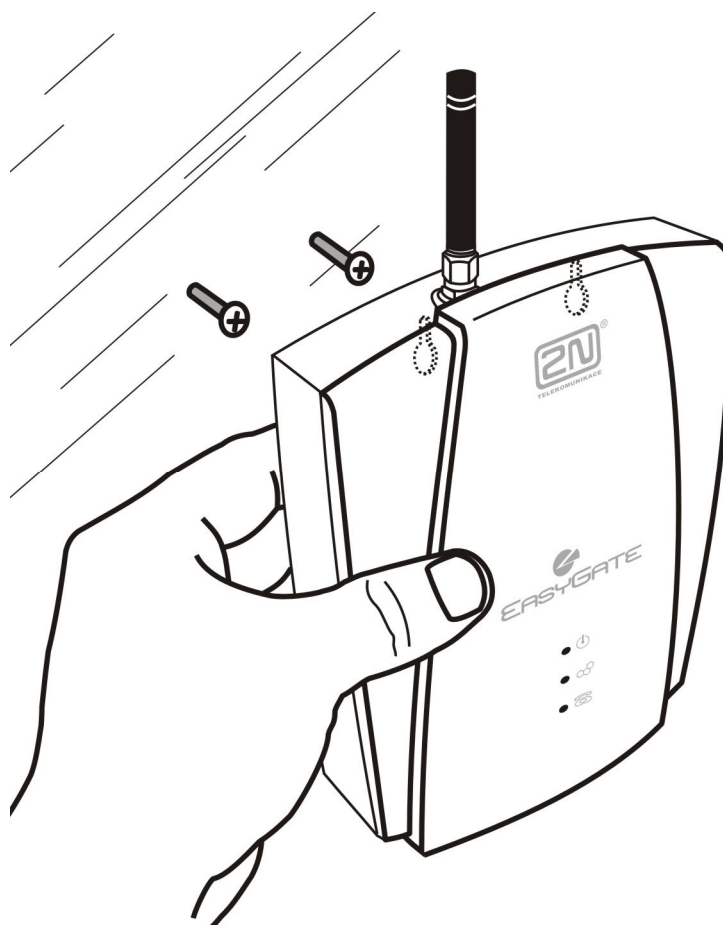
## 2.2. External Antenna Connection

Screw the antenna enclosed into the SMA antenna connector. Tighten the antenna connector gently with your hand - never use wrenches!

The antenna enclosed has a sufficient gain for trouble-free operation in normal conditions. If the UMTS signal is poor or you want to place your antenna separately from EasyGate UMTS Data, you can use an antenna with an SMA-connector terminated cable. The antenna should be mounted vertically.

The Antenna shall be located within the same building as the main equipment.

For antenna and cable parameters see the "*Technical Parameters*".

## 2.3. USIM Card Installation

Use the modern USIM cards designed for UMTS networks to avoid problems

Open the USIM card holder on EasyGate UMTS Data's backside, insert the USIM card and close it. Select the required UMTS provider and USIM card services, such as call forwarding, call barring, preferred networks, SMS service centre, etc. in your mobile phone before inserting your USIM card in EasyGate UMTS Data.
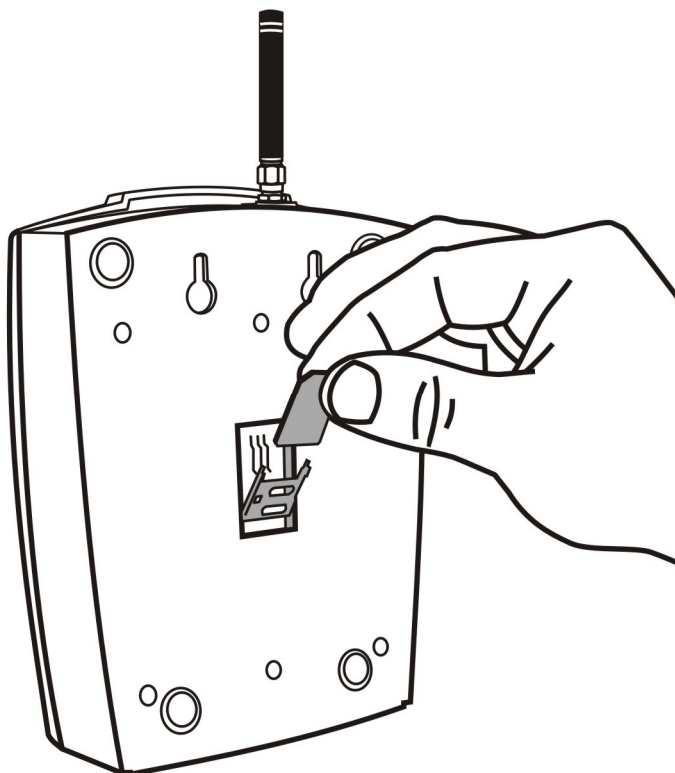
## 2.4. Connector description



① USB interface

② Telephone line
RJ 12, 6/2
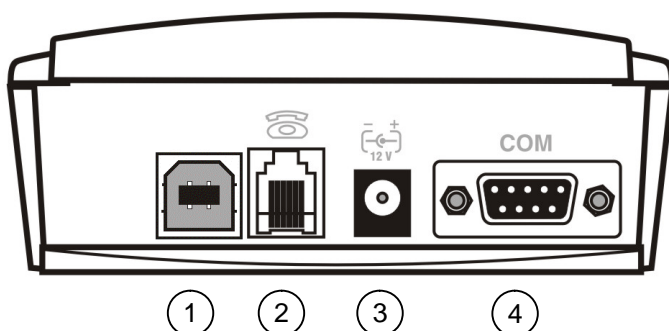
③ Power supply connector
DC Jack 2,1mm

④ RS232C serial line
D-Sub 9 pins

## 2.5. Telephone Line Connection

### 2.5.1. PBX Connection

Connect EasyGate UMTS Data to a free CO line of your PBX. Configure your PBX in such a manner that UMTS/GSM outgoing calls are routed to EasyGate UMTS Data.

EasyGate UMTS Data is equipped with the FSK-based CLIP function. If your PBX is able to process the caller's ID, you are advised to enable this function.

### 2.5.2. Telephone Set (Answering Machine, Coin Telephone Station) Connection

You can connect a standard telephone, answering machine or any other FXO-interface terminal to EasyGate UMTS Data.

EasyGate UMTS Data is equipped wit the FSK-based CLIP and so it is advantageous to connect a terminal that is able to display the CLI.

## 2.6. Power Supply Connection

EasyGate UMTS Data is fed with 10-16V DC. Where a source other than the included power supply adapter is used, the voltage range and polarity shown on the EasyGate UMTS Data power supply connector have to be maintained.

Do not activate the power supply until the antenna is connected to EasyGate UMTS Data to avoid the UMTS module damage.

## 2.7. PC Connection

USB cable for PC connection is included. You can use it for high speed internet access (using HSDPA), for GPRS access or for CSD connection. Included serial cable can be used only for programming and firmware upgrade of EasyGate UMTS Data. The serial cable is a modem cable where all of the 9 pins are 1:1 interconnected – in case you wanted to use another, longer cable. Make sure that a longer cable works properly to avoid errors at high transmission rates.

# 3. EasyGate UMTS Data Status Indication

## 3.1. Indication LEDs

| Name | Meaning |
|---|---|
| 🔵 ⏻ Power supply | • Light = EasyGate UMTS Data is powered.<br>• Flashes once in 2s = HW error, contact the manufacturer. |
| 🔵 ⬡ UMTS/GSM network | • Light = registered to UMTS/GSM<br>• Flashes once in 1s = not registered, USIM card inserted<br>• Flashes once in 3s = not registered, USIM card not inserted<br>• Flashes 4 times quickly = enter your PIN<br>• Flashes 8 times quickly = enter your PUK<br>• Flashes quickly continuously = all functions are blocked. Your USIM doesn't correspond to the operator lock |
| 🟡 ☏ Telephone line | • No light = standby<br>• Flashes quickly = seized line or ringing<br>• Light = call |

## 3.2. Telephone Line Tones

### 3.2.1. Operational Tones

EasyGate UMTS Data sends tones to the telephone line to indicate the line status.

**Dial tone:** continuous or Morse A : ─ ──
- EasyGate UMTS Data is registered to UMTS/GSM network and ready to receive dialing.

**Ringing tone:** ─── ───
- The called subscriber's telephone is ringing.
- The UMTS/GSM network transmits this tone.

**Busy tone:** ─ ─ ─ ─ ─
- § The busy tone is transmitted in any of the following cases:
- § The USIM card has not been installed.
- § EasyGate UMTS Data is logged-out.
- § EasyGate UMTS Data is logged-in to a foreign network but roaming is disabled.
- § The called number has too many digits (more than 30).
- § The called number is barred.
- § The called subscriber line is busy.
- § The called subscriber has hung up (disconnection).

**Dialing end signaling:** −
- Dialing reception has been terminated. Connection is being established.

**PIN tone:** ---- ---- ----
- Enter the PIN code.
- This tone is transmitted upon power up if the PIN has to be entered manually.

**PUK tone:** -------- --------
- Enter the PUK code.
- This tone is transmitted upon repeated wrong PIN entering attempts. USIM card is blocked.

## 3.2.2. Programming Mode Tones

Tones confirming/refusing the values entered are transmitted during telephone line based programming. Each tone has a different melody.

**Confirmation:** ♫♪
- Confirms that the service password or parameter number entered is correct and has been accepted.

**Refusal:** ♪♫♪♫♪
- Incorrect parameter number;
- Incorrect parameter value
- Transmitted when a parameter is cancelled with a ⌗.

**Saving:** ♪♫♪
- Parameter value entered is correct and has been saved.

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# 4. USIM Card PIN protection

If a USIM card is PIN-protected and the PIN is not programmed in EasyGate UMTS Data, network LED indicates the state and the PIN tone is transmitted on telephone line.

## 4.1. PIN Entering by PCManager

Like other parameters, the PIN code can be entered using a PC programming tool. The PIN will be entered automatically upon next EasyGate UMTS Data power up.

## 4.2. PIN Entering via Telephone Line

To enter the PIN via a telephone line using the DTMF:
1. Hook off the telephone, you can hear the PIN tone.
2. Enter the PIN using the DTMF; to cancel the wrong PIN hang up before sending a ✳.
3. To confirm enter a ✳.
4. If you hear the busy tone in a while (a few seconds), you have entered the PIN correctly. Hook on and wait for registering to the UMTS/GSM network.
5. If you hear the PIN tone again in a while, you have entered a wrong PIN. Re-enter the PIN.
6. If you hear the PUK tone in a while, you have entered a wrong PIN and the USIM card is blocked. Use the mobile phone to unblock the USIM card.

A correctly entered PIN is stored in EasyGate UMTS Data's memory as if you had programmed it using the PCManager. The PIN will be entered automatically upon the next EasyGate UMTS Data power up.

## 4.3. Automatic PIN Entering

You need not enter the PIN upon power up if it is stored in EasyGate UMTS Data – it is entered automatically. This function is convenient in case of power failure; EasyGate UMTS Data is operable in a short time after power recovery without any intervention by the operating staff.

**Caution!** One PIN entering option is exhausted by the attempt to enter the PN automatically upon USIM card or PIN change. If wrong, the automatically entered PIN is cleared from the internal memory to avoid another false attempt upon next power on. There are still two manual PIN-entering attempts after such unsuccessful automatic entering. To prevent the unsuccessful automatic PIN entering, delete or program properly the EasyGate UMTS Data PIN using the PCManager in the case of USIM card change.

# 5. Voice function

Outgoing and incoming call establishing procedures for an analog telephone are described for illustration. The procedures are the same for the EasyGate UMTS Data-PBX connection, just remember to program call routing to EasyGate UMTS Data properly. Check EasyGate UMTS Data's function by connecting a telephone before.

Suppose that a USIM card has been inserted, the PIN code entered or not required the antenna connected and EasyGate UMTS Data registered to UMTS/GSM network – the network LED is permanently on and you can hear the dial tone upon off-hook.

## 5.1. Outgoing Call

1. Hook off the telephone, you can hear the dial tone and the Line LED starts flashing.
2. Dial the required UMTS/GSM subscriber number. Since EasyGate UMTS Data receives tone dialing by default, select the DTMF mode. If your telephone transmits pulse dialing only, program EasyGate UMTS Data to receive pulse dialing. The delay between digits to be dialed may not exceed 5 s (programmable parameter). The number is evaluated as complete and transmitted to the network after this timeout.
3. A short delay follows the last-dialed digit for EasyGate UMTS Data to await further dialing. Then, the dialing end is signaled and connection is established.
4. If the called subscriber is available, you can hear the ringing tone. If not, you can hear the busy tone or any of the provider's messages.
5. When the called subscriber answers the call, a call is established. The Line LED is permanently on during the call.
6. Hang up to terminate the call. The Line LED goes off. If the called subscriber is the first to hang up, you can hear the busy tone and hang up.

## 5.2. Incoming Call

1. Ringing signals an incoming call. The Line LED flashes during ringing. If programmed so, EasyGate UMTS Data transmits the CLIP by FSK between the first and second rings. Advanced telephone sets are able to display the CLI.
2. Hook off the phone to establish the call. The Line LED is permanently on during the call.
3. Hang up to terminate the call. The Line LED goes off. If the called subscriber is the first to hang up, you can hear the busy tone and hang up.

## 5.3. Automatic Call ("Baby Call")

If the Baby Call function is enabled, a pre-programmed period of time is counted down after off-hook. If you do not start dialing within this timeout, EasyGate UMTS Data signals dialing end and starts establishing a call to the pre-programmed number automatically – from now on EasyGate UMTS Data behaves as if a standard outgoing call had been established. Any dialing during the Baby Call timeout cancels this function and a standard outgoing call can be made.

## 5.4. Tariff pulses 16 or 12 kHz

EasyGate UMTS Data has tariff pulse transmitter. You can use tariff pulses for outgoing call pricing. EasyGate UMTS Data offer pseudo tariff only – tariff metering doesn't correspond to real price of call, tariff pulses are transmitted according to programmed parameters and call duration. You must program specific parameters in call table to set tariff metering for different prefixes of dialed numbers.

You can also program EasyGate UMTS Data to transmit tariff pulses as call connect/disconnect signaling if your PBX cannot receive telephone line polarity change signaling.

## 5.5. Configuration of network services

EasyGate provides some of network services to improve possibility of usage. The configuration is done by standard Star-Hash codes you can know from mobile phones.

To configure these services:
1. Hook off the telephone, you can hear the dial tone.
2. Enter the Star-Hash code described below.
3. Wait for information tone. You may wait about 3 seconds.
4. Hook on.

Information tones:

**Confirmation - OK:** ♪♪
- Confirms that the service was configured correctly.

**Confirmation - bad:** ♪♪♪♪♪
- Service was not correctly configured
- Service isn't activated by your provider

**Confirmation - service activated:** ♪♪♪
- Confirms that the service was configured correctly and the service is activated.

**Confirmation - service deactivated:** ♪♪♪
- Confirms that the service was configured correctly and the service is deactivated.

## 5.6. Call forwarding

For forwarding activation you must specify <Telephone number> the calls will be forwarded to. You may specify <Call type>, if you want to forward specified call type only. You may specify <Delay time> in seconds for forwarding if no answer too.

Description of <Call type> field codes:

Voice: ① ①

Data: ② ⑤

Fax: ① ③

### 5.6.1. Call forwarding unconditional

If activated, incoming calls will be always forwarded to the configured telephone number.

Activation for all call types:

✱ ✱ ② ① ✱ <Telephone number> #

Activation for selected call type:

✱ ✱ ② ① ✱ <Telephone number> ✱ <Call type> #

Deactivation:

# # ② ① #

Status check:

✱ # ② ① #

### 5.6.2. Call forwarding if busy

If this option is activated, incoming calls will be forwarded to the configured telephone number if there is call in progress on EasyGate.

Activation for all call types:

✱ ✱ ⑥ ⑦ ✱ <Telephone number> #

Activation for selected call type:

✱ ✱ ⑥ ⑦ ✱ <Telephone number> ✱ <Call type> #

Deactivation:

# # ⑥ ⑦ #

Status check:

✱ # ⑥ ⑦ #

### 5.6.3. Call forwarding if no answer

If activated, incoming calls will be forwarded to the configured telephone number if incoming call isn't answered during specified timeout. Default timeout is 20 seconds.

Activation for all call types:

✱ ✱ ⑥ ① ✱ <Telephone number> #

Activation for selected call type:

✱ ✱ ⑥ ① ✱ <Telephone number> ✱ <Call type> #

Activation for all call types and specified delay time:

[*] [*] [6] [1] [*] <Telephone number> [*] [*] <Delay time> [#]

Activation for selected call type and specified delay time:

[*] [*] [6] [1] [*] <Telephone number> [*] <Call type> [*]
<Delay time> [#]

Deactivation:

[#] [#] [6] [1] [#]

Status check:

[*] [#] [6] [1] [#]

### 5.6.4. Call forwarding if not accessible

If activated, incoming calls will be forwarded to the configured telephone number if your EasyGate is not accessible in the GSM network.

Activation for all call types:

[*] [*] [6] [2] [*] <Telephone number> [#]

Activation for selected call type:

[*] [*] [6] [2] [*] <Telephone number> [*] <Call type> [#]

Deactivation:

[#] [#] [6] [2] [#]

Status check:

[*] [#] [6] [2] [#]

## 5.7. Call waiting

If the call waiting is activated the incoming call isn't refuse if there is call in progress on EasyGate. If there is the other incoming call during connected call it will be indicated by tone. See 5.8. for multiple calls management.

Activation:

[*] [4] [3] [#]

Deactivation:

[#] [4] [3] [#]

Status check:

[*] [#] [4] [3] [#]

## 5.8. Call hold

Check if your network supports the service before you use it.

This service relates to Call waiting described in 5.7. If there is call waiting on the line, you have more possibilities what to do. Every action is made by FLASH and DTMF code:

To terminate all held calls, or reject waiting call dial:

[R] [0]

To terminating active call and accept the held or waiting call dial:

[R] [1]

To place the active call on hold and accept the held or waiting call (switching between two calls) dial:

[R] [2]

To place all held calls to active calls and set up conference call dial:

[R] [3]

To connect the two calls (active and held) and disconnect the EasyGate from both calls dial:

[R] [4]

# 6. USB interface

You can use HSDPA or GPRS internet access or CSD connection when connecting Your EasyGate UMTS DATA with PC via USB interface.

## 6.1. *USB interface drivers instalation*

It is needed to install USB modem drivers for properly function of USB interface. When the gateway is connected with PC for the first time the Windows operating system will find automatically the new hardware. Choose the Find drivers in PC option and set the drivers' directory path. The modem drivers are on included CD in directory Data\EasyGate\Modem driver. First You need to unzip the file *3G USB Modem Drivers.zip* on Your hard drive. Choose to install drivers anyway when warning "driver's manufacturer is unknown" or "the driver is not signed" appears. You should install drivers for the following devices:

- Telit HSDPA USB Modem
- Telit Diagnostics Interface
- Telit Auxiliary Port

All this devices can be found in windows device manager (in Modems section and Ports (COM and LPT) section). If the Windows function of automatically hardware changes finding is disabled open Windows device manager, find new hardware without drivers (marked with orange exclamation mark), click on it with right mouse button and choose install driver options. Follow the instructions up to install drivers for all three interfaces.

## 6.2. *Connection settings and start*

For internet connection create new telephone modem connections using Telit HSDPA USB modem. Set up the modem using information from Your mobile operator.

## 6.3. *Combination of USB traffic with voice calls*

When using HSDPA internet access the voice calls are not affected. You can use the gateway for HSDPA connection and voice calls at the same time. When using GPRS connection the gateway is not accessible for incoming calls, outgoing calls interrupt the GPRS connection. After call ends the GPRS connection is renewed.

# 7. COM – Serial Interface

The complete serial interface RS-232C on a 9-pin connector is identical with any external modem.

The transmission rate is 115200 bps. Do not change it. (EasyGate UMTS Data doesn't supports autobauding.). The transmission setup must be 8 bits, no parity and one STOP bit (8N1).

EasyGate UMTS Data's central processor uses the same interface for establishing calls and so it must have the possibility to block an external serial interface-all PC SW must provide transmission hardware flow control (HW handshaking). COM can be used for EasyGate UMTS Data programming

## 7.1. Programming

Install the EasyGate UMTS Data PCManager software available on the included CD-ROM into your PC.

The program is designed for EasyGate UMTS Data parameter programming. It can read configuration data from the memory and store them in EasyGate UMTS Data. Moreover, all parameters can be saved in your PC file for backup or saving into another EasyGate UMTS Data system.

# 8. EasyGate UMTS Data Parameter Programming

All EasyGate UMTS Data parameters have such default values that meet most users' demands and need not be changed. To change EasyGate UMTS Data parameters in spite of that, you can either:

- Use a PC with the PCManager installed. All functions supported by EasyGate UMTS Data can be set using the PC.
- Or use the DTMF programming on a telephone line. Not all functions can be set in this way.

## 8.1. Telephone Line based Programming

1. Hook off the telephone, you can hear the dial tone or the busy tone, and the Line LED starts flashing.
2. Enter the service password (12345 by default, can be changed) with the DTMF; to cancel a wrong password hang up before sending the ⊠ character.
3. To confirm password enter a ⊠.
4. If you have entered a correct password, you hear the confirmation tone. If not, the dialed number may be sent to the network as a call. To prevent this, hang up when you do not hear the confirmation tone.
5. EasyGate UMTS Data shall remain in the programming mode until hang-up.
6. Enter the number of the parameter to be programmed and press a ⊠. If the parameter number is correct, you can hear the confirmation tone, if not, you get the refusal tone and can re-enter the parameter number.
7. When the parameter number is confirmed, enter the allowed parameter value and press a ⊠. If the parameter value is in the allowed range, you can hear the saving tone, if not, you get the refusal tone. You can enter another parameter number in either case.

Numeric parameters are programmed using numbers in units included in the parameter description. For YES/NO parameters use ①for YES and ⓪for NO.

To cancel any programming step in the programming mode, press a #. Having done so, you can hear the refusal tone and can enter a new parameter number. Parameters are saved when the saving tone is transmitted. Hang up to quit programming.

**Example:**

| | | |
|---|---|---|
| ①②③④⑤⊠ | ♪♪ | Password entering, OK |
| ①⓪⊠ | ♪♪ | Transmission volume parameter, OK |
| ③⊠ | ♪♪♪ | Set to medium level, saved |
| ⑤⑤⊠ | ♪♪♪♪♪ | Non-existent parameter number, refusal |

## 8.2. PC based Programming

For programming, connect EasyGate UMTS Data to a PC with a serial cable and make sure that the EasyGate UMTS Data PCManager is installed. Programming is intuitive and easy. All steps are accompanied with texts hints above all items you point at with the mouse.

EasyGate UMTS Data data uploading and storing, including firmware upgrade, are executed in a special mode, in which EasyGate UMTS Data waits for about 3s after power up (all LEDs are on). If instructed so by the PCManager during this timeout, EasyGate UMTS Data remains in this mode as long as it is necessary. If EasyGate UMTS Data is not reset after the PCManager is terminated, switch the system off and on again.



### 8.2.1. Basic Programming Instructions

1. Run the PCManager and select the language for displaying texts on the right-hand side.
2. Click on the CD-ROM icon for data handling on the left-hand side.
3. Load data from EasyGate UMTS Data – if EasyGate UMTS Data is not in its special programming mode, you are invited to switch EasyGate UMTS Data off and on again.
4. Click on the programming table icon on the left-hand side.
5. The parameters are arranged according to their functions in the tables. Set all parameters you want to change. If you point at a parameter with the mouse, help is displayed.
6. Click on the CD-ROM icon again for handling data.

7. Save data into EasyGate UMTS Data – if EasyGate UMTS Data is not in its special programming mode, you are invited to switch EasyGate UMTS Data off and on again.

### 8.2.2. Further Data Handling Options

In addition to the EasyGate UMTS Data memory, settings can be saved in a PC file and reloaded into the PCManager. This is recommended for backing up of current configurations or saving the same configuration in another EasyGate UMTS Data unit.

**Caution!** The table Security includes the PIN code and service password. These parameters have a special handling. They are not saved in a PC file for security reasons. If you load a PC file into the PCManager and then into EasyGate UMTS Data, the PIN and service password should not change unless you change them manually before saving.

**Caution!** All tables are filled-in with default values after PCManager start. It is recommended to load data from EasyGate UMTS Data before parameters programming and saving. If you only save data after PCManager start, all parameters except the PIN and service password in the EasyGate UMTS Data memory will have default values.

**Caution!** The PIN and service password can only be modified either manually or by full initialization.

### 8.2.3. Upgrade

The manufacturer responds to clients' requirements with periodical firmware updating. The current EasyGate UMTS Data firmware, PCManager and User Manual are available on www.2n.cz. The latest firmware version is always included in every new PCManager installation.

**Upgrading procedure:**
1. Run the PCManager, select the language for displaying texts on the right-hand side.
2. Click on the CD-ROM icon for data handling on the left-hand side.
3. Click on the upgrade – if EasyGate UMTS Data is not in its special programming mode, you are invited to switch EasyGate UMTS Data off and on again.
4. The upgrade takes place automatically. **Do not switch your PC or EasyGate UMTS Data off during the process of upgrading!**

**Caution!** The PCManager checks the software version in EasyGate UMTS Data and the upgrade file. If the version in the file is new, everything is all right. An identical or earlier software version is stored in EasyGate UMTS Data too but the PCManager requires confirmation to be on the safe side.

### 8.2.4. Monitoring

This function is not supported by EasyGate UMTS Data.

### 8.2.5. Other control buttons

In the bottom of PC Manager window there can be found buttons for closing the application, minimizing into the tray and showing information about application. You can change the COM port for communication with EasyGate with button Setup. The chosen port must be the same with which is EasyGate UMTS Data connected to PC. The settings Hardware version must agreed with Your EasyGate UMTS Data. The EasyGate

UMTS Date is made in version B only. After connecting EasyGate UMTS Data to PC the program checks the version settings. If the version is set wrong, the program asks You to change the settings.

## *8.3. Parameter Tables*

All programmable parameters are listed in this section. Each parameter is accompanied with the unit used, function number (if available) for programming via a telephone line, description of EasyGate UMTS Data's behavior, setting options, setting step and default (initialization) value.

### 8.3.1. Telephone Line Parameters

### 8.3.1.1 Dialing parameters

**Type of dialing**                                             Function No.:        -
Select the dialing type to be received by EasyGate from the PBX or telephone set. EasyGate accepts only the selected type of dialing, ignoring the others.
Setting options:
    DTMF       -EasyGate receives tone dialing only.
    Pulse        -EasyGate receives pulse dialing only
Default setting:   DTMF

**Time to dial** [s]                                             Function No.:        -
Timeout during which EasyGate waits for further digits to be dialed. It starts to establish connection when this timeout passes.
Setting options:   1-15 s
Setting step:      1 s
Default setting:   5 s

**Minimal On Hook** [ms]                                         Function No.:        -
The minimum line current discontinuation that EasyGate evaluates as hang-up.
Setting options:   100-1500 ms
Setting step:      100 ms
Default setting:   500 ms

**Beep after dialing end**                                       Function No.:        -
Select a beep to signal the end of dialing (beginning of outgoing call establishing).
Setting options:   YES/NO
Default setting:   YES

### 8.3.1.2 Signaling

**Line reversal indication for call in progress**                Function No.:        -
Select call in progress signaling by telephone line polarity reversal. There is voltage of reversed polarity on the telephone line during the whole call.
Setting options:   YES/NO
Default setting:   NO

**Tariff pulse when call starts/ends**                           Function No.:        -
Signaling of call start or end by tariff pulse.
Setting options:

| | |
|---|---|
| None | -EasyGate doesn't send tariff pulse as signaling of call start/end. |
| Call end | -EasyGate sends tariff pulse when call ends. |
| Call start | -EasyGate sends tariff pulse when call starts. |
| Call start and end | -EasyGate sends tariff pulse when call starts and ends too. |

Default setting: None

**Tariff pulse frequency**                          Function No.:        -

Tariff pulse frequency setting.
Setting options:
    16 kHz       -EasyGate transmits 16 kHz tariff pulses
    12 kHz       -EasyGate transmits 12 kHz tariff pulses
Default setting:   16 kHz

### 8.3.1.3 Tone settings

**Dial tone – Double frequency tone**[Hz]                Function No.:        -

Set for double frequency tones
Setting options:  YES/NO
Default setting:   NO

**Dial tone – frequency** [Hz]                          Function No.:        -

Setting of frequency/frequencies of dial tone.
Setting options:  5-1275 Hz
Setting step:     5 Hz
Default setting:   425 Hz

**Dial tone - cadence**                                Function No.:        -

This tone is generated after Off-Hook in case EasyGate is ready to accept dialing.
Setting options:
    Continuous  -EasyGate generate continuous dial tone
    Morse A     -EasyGate generate dial tone with 320/320/640/640 ms cadence
Default setting:   Continuous

**Busy tone – Double frequency tone**[Hz]                Function No.:        -

Set for double frequency tones
Setting options:  YES/NO
Default setting:   NO

**Busy tone – frequency** [Hz]                          Function No.:        -

Setting of frequency/frequencies of busy tone.
Setting options:  5-1275 Hz
Setting step:     5 Hz
Default setting:   425 Hz

**Busy tone - cadence**                                  Function No.:          -

Busy tone cadence setting.

Setting options:

| 330/330 ms | -cadence 330 ms tone, 330 ms pause |
| 200/200 ms | -cadence 200 ms tone, 200 ms pause |
| 250/250 ms | -cadence 250 ms tone, 250 ms pause |
| 375/375 ms | -cadence 375 ms tone, 375 ms pause |
| 500/500 ms | -cadence 500 ms tone, 500 ms pause |

Default setting:    330/330 ms

**Tone after disconnection**                             Function No.:          -

If the remote subscriber hangs up first, the EasyGate subscriber can hear the tone selected here.

Setting options:

| Busy | -EasyGate transmits the busy tone upon call end. |
| Permanent | -EasyGate transmits the permanent tone upon call end. |

Default setting:    Busy tone

## 8.3.1.4 Volumes

**Transmission volume**                                  Function No.:          10

Volume setting for GSM transmission with a 4 dB step.

Setting options:   1-5

Setting step:      1

Default setting:   3 = medium volume level

**Reception volume**                                     Function No.:          11

Volume setting for GSM reception with a 4 dB step.

Setting options:   1-5

Setting step:      1

Default setting:   3 = medium volume level

## 8.3.1.5 Ringing signal settings

**Ringing signal – frequency** [Hz]                      Function No.:          -

Ringing signal frequency setting.

Setting options:

25 / 50 Hz

Default setting:   50 Hz

**Ringing signal - cadence**                             Function No.:          -

Ringing signal cadency setting.

Setting options:

| 1000/4000 ms | - 1 s ring, 4 s pause |
| 400/200/400/2000 ms | - 400ms ring, 200ms pause, 400ms ring, 2s pause |
| 1500/3500 ms | - 1,5 s ring, 3,5 s pause |
| 2000/4000 ms | - 2 s ring, 4 s pause |

Default setting:   1000/4000 ms

**Ringing signal – cadence DATA/Fax**　　　　　　Function No.:　　　-

This setting doesn't influence EasyGate UMTS Data. EasyGate UMTS Data doesn't support Data/Fax calls.

**CLIP**　　　　　　　　　　　　　　　　　　Function No.:　　　19

Set this item to enable/disable identification of a telephone line calling from a GSM network. The function can be enabled if you have a device on your telephone line that is capable of receiving FSK according to ETSI standards.

Setting options:

| | |
|---|---|
| Disable | -EasyGate does not transmit the CLI. |
| FSK during ringing | -EasyGate transmits the FSK-based CLI according to the ETSI EN 300 659 standard (transmission during ringing). |
| Tbd. | - prepared for future use |

Default setting:　Disable

**Replace character + in CLI by**　　　　　　Function No.:　　　-

If this parameter is filled, the + character in the international prefix of CLI is replaced by the defined string. The + character can neither be transmitted by the FSK protocol nor dialed by the DTMF from a terminal.

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

Default setting:　blank

### 8.3.1.6  Automatic call

**BabyCall number**　　　　　　　　　　Function No.:　　　-

A number to be dialed for the automatic call function. If this item is blank, the function is disabled.

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

Default setting:　blank

**BabyCall timeout** [s]　　　　　　　　Function No.:　　　-

Time between line Off-Hook and automatic call beginning (if enabled). During this timeout EasyGate waits for dialing that cancels the automatic call. You can make standard call if the BabyCall function is enabled.

Setting options:　0-15 s

Setting step:　　1 s

Default setting:　0 s

### 8.3.2. FXS routing parameters

All parameters related to the number dialed for an outgoing call are arranged in this table. According to the prefix you can:

- Bar the number to be dialed - the calling subscriber hears the busy tone;
- Accelerate connection establishing by knowing the number length for the given prefix;
- Accelerate connection establishing by allowing to terminate dialing with a #;
- Modify the number to be dialed by removing and/or adding digits.
- Set tariff metering for the given prefix.

Every table line includes a prefix (of variable length) plus parameters that define EasyGate UMTS Data's behavior in case the beginning of the dialed number matches this prefix. The table can contain up to 20 different prefixes.

There may be exceptions to the rule - a number may start with the same digits but has to be served in a different way. Any table line that starts with the same prefix followed by one or more digits is considered an exception of the line with shorter prefix.

Remember to complete the "Other numbers" line for a number whose prefix is not included in the table.

An example in the figure below shows how to bar all international calls with the exception of calls to Slovakia including dialing acceleration by selecting the number length parameter and tariff setting (5 impulses after call connect and then one impulse every 10 seconds). All other calls are enabled and their tariff is one impulse every 30 second.



Routing table

| Row | Prefix | Enable | Length | End with # | Remove | Add | Extra tariff | Tariff [s] |
|-----|--------|--------|--------|-----------|--------|-----|-------------|-----------|
| 1. | 00 | ☐ | 0 | ☐ | 0 | | 0 | 0 |
| 2. | 00421 | ☑ | 14 | ☐ | 0 | | 5 | 10 |
| 3. | | ☑ | 0 | ☐ | 0 | | 0 | 0 |
| 4. | | ☑ | 0 | ☐ | 0 | | 0 | 0 |
| 5. | | ☑ | 0 | ☐ | 0 | | 0 | 0 |
| 6. | | ☑ | 0 | ☐ | 0 | | 0 | 0 |
| 7. | | ☑ | 0 | ☐ | 0 | | 0 | 0 |
| 8. | | ☑ | 0 | ☐ | 0 | | 0 | 0 |
| 9. | | ☑ | 0 | ☐ | 0 | | 0 | 0 |
| Other | | ☑ | 0 | ☐ | 0 | | 0 | 30 |

**Routing table enable**                                    Function No.:        20

Enable the use of the routing table with this parameter. Disabling this parameter you put the table out of use.
Setting options:  YES/NO
Default setting:   NO

**Prefix**                                              Function No.:         -

A prefix identifying the call type (GSM, trunk call, free call, etc.). "Other numbers" line is used for calls with prefixes that are not included in the table.
Setting options:   0-14 characters (0-9,*,#)
Default setting:   blank

**Call enable**                                         Function No.:         -

This parameter allows/bars calls with prefixes included on the same line.
Setting options:  YES/NO
Default setting:   YES

**Number length**                                       Function No.:         -

The parameter defines the expected length of a number with a prefix included on the same line. This enables to start dialing into a UMTS/GSM network immediately after the last digit is dialed. If the telephone number to be dialed is shorter, a timeout is respected. The "0" setting means that the function is disabled.
Setting options:  0, 3-15
Setting step:      1
Default setting:   0

**End with #**                                          Function No.:         -

This parameter enables to establish the call when a # is received. The # character is removed from the dialed number. If a # should be part of the dialed number, this function cannot be used for the given prefix.
Setting options:  YES/NO
Default setting:   NO

**Remove**                                              Function No.:         -

The Remove parameter is used for automatic call routing. A defined count of digits (prefix) is removed from the number beginning.
Setting options:  0-20
Setting step:      1
Default setting:   0

**Add**                                                 Function No.:         -

The Add parameter is used for automatic call routing. A defined string (prefix) is added to the beginning of the number to be dialed.
Setting options:  0-8 characters (0-9,*,#,+)
Default setting:   blank

**Extra tariff**                                        Function No.:       -

Pseudo tariff metering setting (tariff is based on call duration). The Extra tariff parameter defines transmitting of fixed quantity of tariff pulses after call start. This parameter sets minimal call cost.

Setting options:   0-255
Setting step:       1
Default setting:    0

**Tariff [s]**                                        Function No.:       -

Pseudo tariff metering setting (tariff is based on call duration). The Tariff parameter sets the call cost according to call duration. Set how often in seconds do you want to transmit pulses. Smaller number means more expansive call. 0 means not to transmit pulses according to call duration.

Setting options:   0-255 s
Setting step:       1 s
Default setting:    0 s

### 8.3.3. Data/Fax routing parameters

This setting doesn't influence EasyGate UMTS Data. EasyGate UMTS Data doesn't support Data/Fax calls.

### 8.3.4. SMS Sending Input Parameters

This setting doesn't influence EasyGate UMTS Data. EasyGate UMTS Data doesn't have SMS sending input. The parameter telephone number for SMS is common for service SMS and credit checking SMS.

### 8.3.5. GSM/UMTS & USIM Parameters

**GSM operator lock**                                Function No.:       -

Provider blocking is set by manufacturer in EasyGate. If EasyGate is blocked to a GSM provider, no other GSM provider's SIM card can be used. If an unacceptable SIM card is used, the GSM modules does not registered to GSM and the GSM network LED flashes quickly on the EasyGate panel.

**CLIR - incognito**                                Function No.:       41

Sets the calling line identification restriction (CLIR) for outgoing calls from EasyGate. Attention, before enabling it is necessary to activate this feature by GSM operator, otherwise outgoing calls can be rejected by GSM network.

Setting options:
    -According to provider -    depending on how the function is selected in the GSM network
    -Activation           - ID is not sent.
    -Suppression          - ID is always sent.
Default setting:          According to provider

**Roaming enable/disable**                          Function No.:       42

You can make EasyGate work even if it is registered to a foreign GSM network.

Setting options:
 -Disable  -The GSM module logs out of a foreign network and attempts to register again in within 5 minutes.
 -Enable  -EasyGate works in any GSM network.
Default setting: Disable

**Incoming calls enable**        Function No.:  43
With this parameter you can reject all incoming calls.
Setting options:
 Enable     - Incoming calls ring on the telephone line.
 Disable     - Incoming calls are rejected.
Default setting: Enable

**Call Handover workaround**      Function No.:  -
This parameter offers a workaround to prevent problems during call handover into the 1900 MHz (or 1800 MHz) band, caused by non-conforming configurations of the 1900 MHz (or 1800 MHz) GSM network.
Setting options:
 -Disable -Disable workaround.
 -Enable -Enable workaround.
      Select only when handover into a 1800/1900MHz band fails.
Default setting: Disable

## 8.3.5.1 Low credit checking in prepaid USIM

**Time period for low credit checking** [h]   Function No.:  -
Set to change time interval between credit checks. If your credit drops under defined value, EasyGate sends SMS "LOW CREDIT". The "0" setting means that the function is disabled.
Setting options: 0-255 h
Step:    1 h
Default setting: 0

**Code for credit checking**      Function No.:  -
Credit in prepaid SIM cards is checked by network function, which displays text message on mobile phone display. Code of network function must be terminated with "#" symbol.
ATTENTION - find out if you have to pay for this function. Every check can lower your credit.
Setting options: 0-8 characters (0-9,*,#,+)
Default setting: blank

**Minimal credit**         Function No.:  -
Set minimal credit value to send warning SMS "LOW CREDIT". If credit is lower than given value, warning SMS is send after every credit check, until you recharge your SIM card.
Setting options: 0-999
Step:    1
Default setting: 0

**Credit value position in received SMS**          Function No.:          -

If there are more numbers except credit value in text answer (e.g. date, time and so on) EasyGate seeks the number corresponding with credit value from given position in text. The seek algorithm skips every non-number character. If credit value is the first number in text you can leave setting 0. If there are other numbers before credit value, set parameter to text position, from which the algorithm will seek.

Setting options:  0-180
Step:         1
Default setting:  0

**Telephone number for service SMS**          Function No.:          -

Telephone number for service SMS. The number is common for GGMC SMS and "LOW CREDIT" SMS on prepaid SIM cards.

Setting options:  0-16 characters (0-9,*,#,+)
Default setting:  blank

## 8.3.6.  Service Parameters

**Hardware version**                                      Function No.:        -
EasyGate UMTS Data hardware version - for information only (cannot be modified). Must be used for communication with the manufacturer.

**Firmware version**                                      Function No.:        -
EasyGate UMTS Data firmware version - EasyGate UMTS Data central processor program version. The manufacturer can issue upgrades to extend functions. To load new firmware into EasyGate UMTS Data use the Upgrade function. Keep communicating with the manufacturer.

**Serial number**                                         Function No.:        -
EasyGate UMTS Data serial number - for information only (cannot be changed). Must be used for communication with the manufacturer.

**GSM/UMTS operator lock**                                Function No.:        -
Refer to UMTS & USIM Parameters.

**COM enable**                                            Function No.:        50
This setting doesn't influence EasyGate UMTS Data. COM interface is only for programming EasyGate UMTS Data parameters and for gateway firmware upgrade. This possibility is accessible regardless of this setting.

**Time period for GGMC SMS** [h]                          Function No.:        -
Time interval for GGMC SMS sending. GGMC = GSM Gateway Monitoring Centre. The "0" setting means that the function is disabled.
Setting options:   0-255 h
Step:              1 h
Default setting:   0

**Telephone number for service SMS**                      Function No.:        -
Telephone number for service SMS. The number is common for GGMC SMS and "LOW CREDIT" SMS on prepaid SIM cards.
Setting options:   0-16 characters (0-9,*,#,+)
Default setting:   blank

## 8.3.7.  Initialization
All programmable parameters are arranged in tables according to their functions. You can initialize either all parameters at once or one table of parameters.
For initialization via a telephone line fill in the function number according to the type of initialization and enter the service password as the parameter.

**Telephone line initialization**                         Function No.:        91
Initialization of all parameters necessary for the telephone line function.

**Call table initialization**                             Function No.:        92
Initialization of all parameters related to dialed telephone number.

**Initialization of GMS/UMTS & USIM**                                     Function No.:        94

    Initialization of all parameters related to the UMTS/GSM network and USIM card (except for the PIN code).

**SMS input initialization**                                            Function No.:        93
    Initialization of all parameters for SMS sending upon SMS input activation.

**Global initialization**                                              Function No.:        99
    Initialization of all EasyGate UMTS Data parameters including the PIN and service password.

## 8.3.8. Security Parameters

**PIN - value**                                        Function No.:        40

Fill in the PIN value for automatic PIN entering upon EasyGate UMTS Data power up. It is applied only if the USIM card is PIN secured. If the given PIN fails to match the USIM, it is deleted automatically. If entered via a telephone line upon EasyGate UMTS Data start, the PIN is stored automatically.

Setting options:          0, 4-8 characters (0-9)
Upon full initialization:   blank

**Service password**                                   Function No.:        90

Fill the service password for programming via a telephone line. Some parameters can be programmed by DTMF dialing and so the access to programming must be password-protected.

Setting options:          4-8 characters (0-9)
Upon full initialization:   12345

# 9. Troubleshooting

**No LED is on after power up**
- Check the power supply.

**All LEDs are on. No call is currently in progress.**
- EasyGate UMTS Data is in the special PCManager-based programming mode - exit the PCManager to reset EasyGate UMTS Data.
- Try to switch EasyGate UMTS Data off and on, the LEDs should go off in 3s and signal the status of EasyGate UMTS Data.

**EasyGate UMTS Data does not register to UMTS/GSM**
- Check the USIM card.
- Check the PIN.
- Check the antenna connection.
- Select a place with a good UMTS/GSM signal.

**No tone can be heard after line off-hook**
- Check the telephone line connection.
- EasyGate UMTS Data is not initialized properly upon start (approx. 10s after power up).
- EasyGate UMTS Data is not supplied with power.

**EasyGate UMTS Data keeps transmitting a tone during dialing, not receiving the dialing**
- Select the correct dialing type (DTMF or pulse).

**EasyGate UMTS Data does not communicate with PC**
- Check the serial cable connection.
- Check the COM number setting on PC.
- Check the COM parameters (115200 bps, 8N1).
- EasyGate UMTS Data is not registered to the network.
- A dialing or outgoing call establishing process takes place on EasyGate UMTS Data.
- An incoming call is ringing on EasyGate UMTS Data.

# 10. List of Abbreviations

- **CLIP** - Calling Line Identification Presentation
- **COM** - PC serial port
- **DTMF** - Dual Tone Multifrequency - tone dialing
- **EG** - EasyGate UMTS Data
- **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 - USIMilar to SW, a term for the central microprocessor program
- **GSM** - Group Switched Mobile system - the present standard digital mobile telephone network
- **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 USIM card securing password
- **PSTN** - Public Switched Telephone Network
- **PUK** - Personal Unblocking Key - a password used to unblock a blocked USIM card after repeated wrong PIN entering
- **RS-232C** - a PC serial port standard
- **USIM** - Subscriber Identity Module - a chip-equipped module to be inserted in a UMTS device for identification
- **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
- **USB** - Universal Serial Bus, PC port

# Technical Parameters – UMTS EasyGate:

## UMTS/GSM:

| | |
|---|---|
| UMTS module, bandwidth | UC 864-E  UMTS 2100, EGSM 850/900, GSM 1800/1900 MHz<br>UC 864-G  UMTS 850/1900/2100, EGSM 850/900, GSM 1800/1900 MHz |
| Transmission power | 0.25W UMTS 850/1900/2100 MHz<br>2 W EGSM 850 / 900 MHz<br>1W GSM 1800 / 1900 MHz |
| Receiver sensitivity | -108.2 dBm UMTS 850/1900/2100 MHz<br>-107 dBm GSM 850/900 MHz<br>-106 dBm GSM 1800/1900 MHz |
| Audio | HR+FR+EFR+AMR Half rate+Full rate+Enhanced full rate+Adaptive Multirate<br>Echo cancellation, Echo suppression<br>WDCMA AMR Adaptive Multirate |
| DATA | WCDMA/HSDPA category 8, MS Class A(USIMultaneous Voice and Data),<br>downlink max. 7.2Mbps<br>EGPRS/GPRS Class 12, MS Class B, 85.6 kbps downlink<br>CSD max. 14.4 kbps |
| Antenna | 850/ 900/ 1800/ 1900/2100 MHz  50 Ω<br>SMA antenna connector |
| USIM card | 3V plug-in |

## Power Supply:

| | |
|---|---|
| Mains supply | 230/12V; 2A adapter |
| DC power supply | 10 to 16V DC |
| 12V consumption | Standby 100mA<br>Call max. 650mA<br>Data max. 950mA |
| Supply connector | DC Jack 2.1mm |

## TELEPHONE INTERFACE:

| | |
|---|---|
| Interface type | 2-wire analog, FXS |
| Telephone connector type | RJ 12, 6/2 |
| Call impedance | 600 Ω |
| Loop voltage | 48 V DC |
| Loop current | max. 40 mA |
| Loop resistance | max. 800 Ω |
| Tone frequency | adjustable, default 425 Hz |
| Dialing type | tone (DTMF) and pulse |
| Ringing voltage | 42 Vrms  50/25 Hz |
| Calling line identification | CLI during ringing according to ETSI FSK |
| Tariff pulses | f=16/12 kHz ; Umin=100mVef on 200 Ω |
| Answer supervision | polarity reversal, 12/16 kHz pulses |

## SERIAL INTERFACE:

| | |
|---|---|
| Interface type | USB 2.0 full speed interface, RS-232C(only for upgrade) |
| Connector | USB type B, D-Sub 9 pins(only for upgrade) |

## OTHERS:

| | |
|---|---|
| Dimensions (w/o connectors) | 170 x 130 x 45 mm |
| Operating temperature | 0°C to 45°C |
| Operating status signaling | 3 LEDs (on, GSM network, line) |