

INSYS GSM 4.3



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1 Preface

This manual allows for the safe and efficient use of the product. The manual is part of the product and must always be stored accessible for installation, commissioning and operating personnel.

1.1 Defects Liability Terms

A usage not according to the intended purpose, an ignorance of this documentation, the use of insufficiently qualified personnel as well as unauthorised modifications exclude the liability of the manufacturer for damages resulting from this. The liability of the manufacturer ceases to exist.

The regulations of our Delivery and Purchasing Conditions are effective. These can be found on our website (www.insys-icom.de/imprint/) under "General Terms and Conditions".

1.2 Marking of Warnings and Notes

1.2.1 Symbols and Key Words

Danger!



Risk of severe or fatal injury

One of these symbols in conjunction with the key word Danger indicates an imminent danger. It will cause death or severe injuries if not avoided.



Warning!



Personal injury

This symbol in conjunction with the key word Warning indicates a possibly hazardous situation. It might cause death or severe injuries if not avoided.

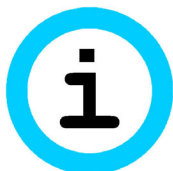
Caution!



Slight injury and / or material damage

This symbol in conjunction with the key word Caution indicates a possibly hazardous or harmful situation. It might cause slight or minor injuries or a damage of the product or something in its vicinity if not avoided.

Note



Improvement of the application

This symbol in conjunction with the key word Note indicates hints for the user or very useful information. This information helps with installation, set-up and operation of the product to ensure a fault-free operation.

1.3 Symbols and the Formatting in this Manual

This section describes the definition, formatting and symbols used in this manual. The various symbols are meant to help you read and find the information relevant to you. The following text is structured like a typical operating instruction of this manual.

Bold print: This will tell you what the following steps will result in

After that, there will be a detailed explanation why you could perform the following steps to be able to reach the objective indicated first. You can decide whether the section is relevant for you or not.

→ An arrow will indicate prerequisites which must be fulfilled to be able to process the subsequent steps in a meaningful way. You will also learn which software or which equipment you will need.

1. ***One individual action step: This tells you what you need to do at this point. The steps are numbered for better orientation.***

✓ A result which you will receive after performing a step will be marked with a check mark. At this point, you can check if the previous steps were successful.

ⓘ Additional information which you should consider are marked with a circled "i". At this point, we will indicate possible error sources and tell you how to avoid them.

➤ *Alternative results and steps are marked with an arrow. This will tell you how to reach the same results performing different steps, or what you could do if you didn't reach the expected results at this point.*

2 Safety

The Safety section provides an overview about the safety instructions, which must be observed for the operation of the product.

The product is constructed according to the currently valid state-of-the-art technology and reliable in operation. It has been checked and left the factory in flawless condition concerning safety. In order to maintain this condition during the service life, the instructions of the valid publications and certificates must be observed and followed.

It is necessary to adhere to the general safety instructions must when operating the product. The descriptions of processes and operation procedures are provided with precise safety instructions in the respective sections in addition to the general safety instructions.

Moreover, the local accident prevention regulations and general safety regulations for the operating conditions of the device are effective.

An optimum protection of the personnel and the environment from hazards as well as a safe and fault-free operation of the product is only possible if all safety instructions are observed.

2.1 Usage According to the Regulations

The product may only be used for the purposes specified in the function overview. In addition, it may be used for the following purposes:

- Usage and mounting in an industrial cabinet.
- Switching and data transmission functions in machines according to the machine directive 2006/42/EC.
- Usage as data transmission device for a PLC.

The product may not be used for the following purposes and used or operated under the following conditions:

- Controlling or switching of machines and systems, which do not comply with the directive 2006/42/EC.
- Usage, controlling, switching and data transmission of machines and systems, which are operated in explosive atmospheres.
- Controlling, switching and data transmission of machines, which may involve risks to life and limb due to their functions or when a breakdown occurs.

2.2 Permissible Technical Limits

The product is only intended for the use within the permissible technical limits specified in the data sheets.

The following permissible limits must be observed:

- The ambient temperature limits must not be fallen below or exceeded.
- The supply voltage range must not be fallen below or exceeded.
- The maximum humidity must not be exceeded and condensate formation must be prevented.
- The maximum switching voltage and the maximum switching current load must not be exceeded.
- The maximum input voltage and the maximum input current must not be exceeded.

2.3 Responsibilities of the Operator

As a matter of principle, the operator must observe the legal regulations, which are valid in his country, concerning operation, functional test, repair and maintenance of electrical devices.

2.4 Qualification of the Personnel

The installation, commissioning and maintenance of the product must only be performed by trained expert personnel, which has been authorised by the plant operator. The expert personnel must have read and understood this documentation and observe the instructions.

Electrical connection and commissioning must only be performed by a person, who is able to work on electrical installations and identify and avoid possible hazards independently, based on professional training, knowledge and experience as well as knowledge of the relevant standards and regulations.

2.5 Instructions for Transport and Storage

The following instructions must be observed:

- Do not expose the product to moisture and other potential hazardous environmental conditions (radiation, gases, etc.) during transport and storage. Pack product accordingly.
- Pack product sufficiently to protect it against shocks during transport and storage, e.g. using air-cushioned packing material.

Check product for possible damages, which might have been caused by improper transport, before installation. Transport damages must be noted down to the shipping documents. All claims or damages must be filed immediately and before installation against the carrier or party responsible for the storage.

2.6 Markings on the Product

The identification plate of the product is either a print or a label on a face of the product. Amongst other things, it contains the following markings, which are explained in detail here.



Observe manual

This symbol indicates that the manual of the product contains essential safety instructions that must be followed implicitly.



Dispose waste electronic equipment environmentally

This symbol indicates that waste electronic equipment must be disposed separately from residual waste via appropriate collecting points. See also Section Disposal in this manual.



CE marking

By applying a CE marking, the manufacturer confirms that the product complies with the European directives that apply product-specific.



Appliance Class II – double insulated

This symbol indicates that the product complies with Appliance Class II

2.7 Environmental Protection

Dispose the product and the packaging according to the relevant environmental protection regulations. The Waste Disposal section in this manual contains notes about disposing the product. Separate the packaging components of cardboard and paper as well as plastic and deliver them to the respective collection systems for recycling.

2.8 Safety Instructions for Electrical Installation

The electrical connection must only be made by authorised expert personnel according to the wiring diagrams.

The notes to the electrical connection in the manual must be observed. Otherwise, the protection category might be affected.

The safe disconnection of circuits, which are hazardous when touched, is only ensured if the connected devices meet the requirements of VDE T.101 (Basic requirements for safe disconnection).

The supply lines are to be routed apart from circuits, which are hazardous when touched, or isolated additionally for a safe disconnection.

2.9 General Safety Instructions

Caution!



Moisture and liquids from the environment may seep into the interior of the product!

Fire hazard and damage of the product.

The product must not be used in wet or damp environments, or in the direct vicinity of water. Install the product at a dry location, protected from water spray. Disconnect the power supply before you perform any work on a device which may have been in contact with moisture.

Caution!



Short circuits and damage due to improper repairs and modifications as well as opening of maintenance areas.

Fire hazard and damage of the product.

It is not permitted to open the product for repair or modification.

Caution!



Overcurrent of the device supply!

Fire hazard and damage of the product due to overcurrent.

The product must be secured with a suitable fuse against currents exceeding 1.6 A.

Caution!

Overvoltage and voltage peaks from the mains supply!
Fire hazard and damage of the product due to overvoltage.
Install suitable overvoltage protection.

Caution!

Damage due to chemicals!
Ketones and chlorinated hydrocarbons dissolve the plastic housing and damage the surface of the device.
Never let the device come into contact with ketones (e.g. acetone) or chlorinated hydrocarbons, such as dichloromethane.

Caution!

Antenna distance to persons!
A too close distance of GSM antennas to persons may affect the health.
Please observe that a minimum distance of 20 cm between a GSM antenna and a person must be maintained during operation.

Note**Restrictions within the area of validity of the FCC!****Possible loss of the FCC approval.**

Please observe that further approvals for the terminal device are required in the area of validity of the FCC if you use aerials with a gain of more than 8.41 dBi (GSM 1900 MHz) or 2.98 dBi (GSM 850 MHz) as well as when designing devices, which use other wireless communications besides GSM/GPRS (e.g. WLAN or ISM radio).

We are ready to offer consultation for further approval requirements in countries outside the EC.

3 Scope of Delivery

The scope of delivery for the INSYS GSM 4.3 includes all accessories listed below. Please check if all accessories are included in the box. If a part is missing or damaged, please contact your distributor.

- INSYS GSM 4.3
- Cable:
 - 1 serial cable with 9-pin D-Sub connector for the connection to the PC
- 1 manual

Optional Accessories

- CD-ROM
- GSM antenna
 - Outside mounted antenna, magnetic base antenna or patch antenna
- Configuration software HSComm
- AT Command Reference

4 General

The INSYS GSM 4.3 is available in two versions. These are

- INSYS GSM 4.3
- INSYS GSM 4.3 compact

The INSYS GSM 4.3 differs by a compact design housing for in-wall connection boxes and the missing audio interface from the INSYS GSM 4.3. Both versions are referred to as INSYS GSM 4.3 in the further course of this manual. If the INSYS GSM 4.3 compact differs from the INSYS GSM 4.3, this will be mentioned in particular in the respective sections.

5 Functional Overview

The INSYS GSM 4.3 offers the following functions:

- **Data buffer for serial data transmission**

The INSYS GSM 4.3 has a fast send and receive buffer (cache) to adjust the modem to the operating speed of the application.

- **Hardware and software data flow control**

The INSYS GSM 4.3 can transmit to the application via the control lines of the serial interface to interrupt the dataflow, if the buffers of the INSYS GSM 4.3 exceed a certain level. An application can also prompt the INSYS GSM 4.3 via a control line to interrupt the data flow. As an alternative, the INSYS GSM 4.3 can control the data flow via XOFF/XON characters in the data stream.

- **Selective call answer**

The INSYS GSM 4.3 can be set to accept only calls from phone numbers that were previously stored.

- **Configuration via SMS**

Numerous functions of the INSYS GSM 4.3 may be configured via SMS. This allows a configuration of the INSYS GSM 4.3 without PC and modem connection.

- **Comfortable Configuration of the SMS recipients**

For each alarm message, which is sent by the INSYS GSM 4.3, up to 10 recipient numbers may be assigned using a matrix. This allows for the creation of an alarm plan and the targeted notification of service personnel

- **Voice functionality (not INSYS GSM 4.3 compact)**

The voice functionality allows to establish voice connections with other phones using a connected phone receiver. This provides an easy communication with the service personnel at the site.

- **Automatic call acceptance for voice connections**

The INSYS GSM 4.3 enables to accept voice calls automatically. This allows for an automatic voice connection establishment, e.g. for emergency call or monitoring purposes.

- **Remote firmware update**

The firmware of the INSYS GSM 4.3 may be updated remotely. The settings, which are important for the operation, like the SIM PIN are maintained with this.

- **Remote configuration**

The INSYS GSM 4.3 can be configured remotely with the help of a common modem and a terminal program.
- **Sending messages via data connection, SMS or Fax**

The INSYS GSM 4.3 can send up to 10 previously entered messages to any defined recipient via an AT command. The dispatch can also be triggered by switching the alarm inputs. Several transmission paths are possible, such as Fax and SMS.
- **Pulse input to send up to 10 SMS messages**

The SMS to a previously defined recipient can be triggered via the number of pulses at an alarm input.
- **IO states retrievable via DTMF and SMS**

The state of the inputs and outputs may be retrieved remotely with the help of DTMF digits sent from a common phone or via an SMS with an AT command. The INSYS GSM 4.3 answers and replies with the status of the inputs and outputs via signal tones or SMS.
- **Remote switching of the outputs via DTMF and SMS**

The switching outputs at the INSYS GSM 4.3 can be set remotely with the help of DTMF digits sent from a common phone. The alarm inputs can be selected via a DTMF phone. Furthermore, the output may be switched via an AT command received by an SMS.
- **Switching inputs and alarm outputs for SMS dispatch and to establish an alarm data connection**

The INSYS GSM 4.3 has two potential-free switch outputs, which can be used to switch other functions in an application. The INSYS GSM 4.3 also has digital switch inputs, which are used to establish connections or to send messages via SMS and fax.
- **Switching the output via events like level drop at alarm input, GSM network failure, incoming call or switching on the device**

The INSYS GSM 4.3 can change the state of a switching output in case of events like GSM network failure, incoming call, switching on the device or connecting the alarm input to ground. This enables your application to react on these events.
- **Pulse output via switching outputs**

The switching outputs can be opened and closed sequentially. This enables to output so-called „counting pulses“ at the outputs of the INSYS GSM 4.3. The INSYS GSM 4.3 can output up to ten pulses per output.

- **Access control**

The INSYS GSM 4.3 can be protected from unauthorized access via a phone connection. An incoming connection must first be enabled with a password. Using security callback, the INSYS GSM 4.3 calls a previously defined phone number back, when a call comes in.
- **Idle connection control with Data Transmit Control**

Data Transmit Control enables the INSYS GSM 4.3 to terminate the connection, if no data is transmitted during a defined state. This will prevent unnecessary costs.
- **Integrated real-time clock**

The integrated real-time clock can be used to send alive messages time-controlled. Furthermore, the integrated real-time clock allows for a regular logout and login out of or into the GSM network.
- **Event history**

All occurred events are logged in a history with a maximum capacity of 200 entries.

New functions of the INSYS GSM 4.3:

- **Switching the outputs by establishing a modem connection**

The INSYS GSM 4.3 can change the state of a switch output by establishing a modem connection (enabling of the control line DCD). This enables your application to react on such events. The output will be reset to its initial state if the connection is released.
- **Switching the outputs via clear text commands**

The INSYS GSM 4.3 allows to assign clear text names (switch alias) to certain switch operations. These clear text names can easily be used to switch outputs via SMS or AT command.
- **Pulsing the outputs via DTMF**

The switch outputs at the INSYS GSM 4.3 can also be pulsed remotely from a usual telephone by entering DTMF digits now.
- **Buffering the alarm inputs**

Up to 5 alarm messages are buffered at the inputs and processed consecutively.
- **Reading out SCN from the SIM card**

The SMS Service Center Nummer (SCN) can easily be read out from the SIM card and stored.

6 Technical Data

6.1 Physical Features

All specified data was measured with a nominal input voltage, at full load, and an ambient temperature of 25 °C. The threshold value tolerances are subject to typical fluctuations.

Physical Feature	Value
Operating voltage	minimum 10 V DC maximum 60 V DC
Power input sleep	2 W
Power input connection	2.5 W
Maximum power input (during 577 µs lasting GSM transmit burst)	10 W
Level alarm inputs	Level HIGH = 4-12 V Level LOW = 0-1 V
Input current from GND to internal +5 V	typically 0.5 mA
Switch output, maximum switch voltage	30 V (DC) / 42 V (AC)
Switch output, maximum current load	1 A (DC) / 0.5 A (AC)
Minimum operating voltage SIM cars	3 V
Emitted radiation: EGSM 900: Class 4 GSM 1800: Class 1 EGSM 900: Class E2 GSM 1800: Class E2	2 W 1 W 0.5 W 0.5 W
Weight	270 g (INSYS GSM 4.3) 218 g (INSYS GSM 4.3 compact)
Dimensions (Width x Depth x Height)	55 x 110 x 75 mm (INSYS GSM 4.3) 82 x 58 x 84 mm (INSYS GSM 4.3 compact)
Temperature range	0 °C – 55 °C (INSYS GSM 4.3) -20 °C – 55 °C (INSYS GSM 4.3 compact)
Maximum allowed humidity	95% non-condensing
Protection Class	Housing IP40, Terminals IP20

Table 1: Physical Features

6.2 Technological Features

Technological Feature	Description
Data formats of the serial interface	7E1,7O1, 7N2, 8N1, 8E1, 8O1, 8N2,
Supported GSM audio encoding	HR,FR,EFR
Fax-Classes	Fax Class 1/2
Modulation types	V.22bis, V.32, V.34,V.23, V.110

Table 2: Technological Features

7 Display and Control Elements

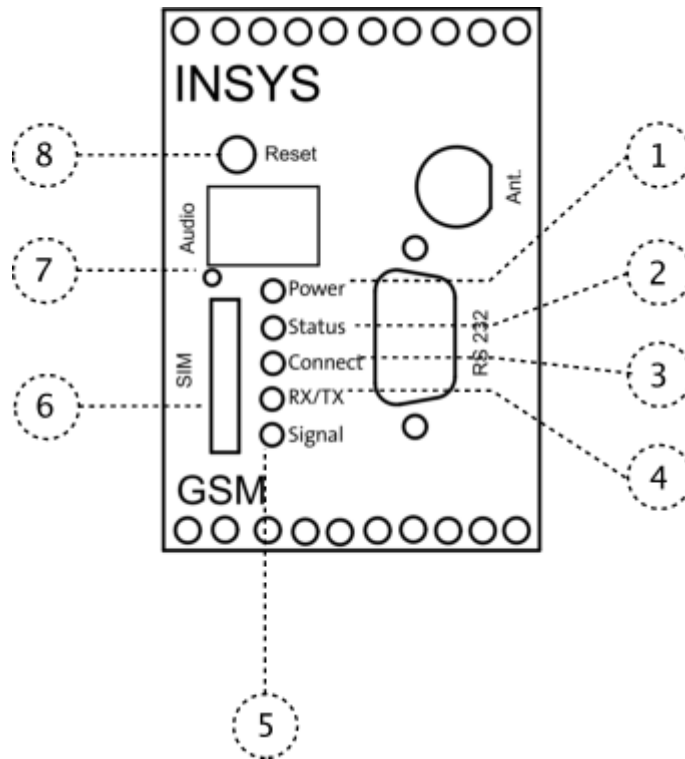


Figure 1: Control elements/displays (INSYS GSM 4.3)

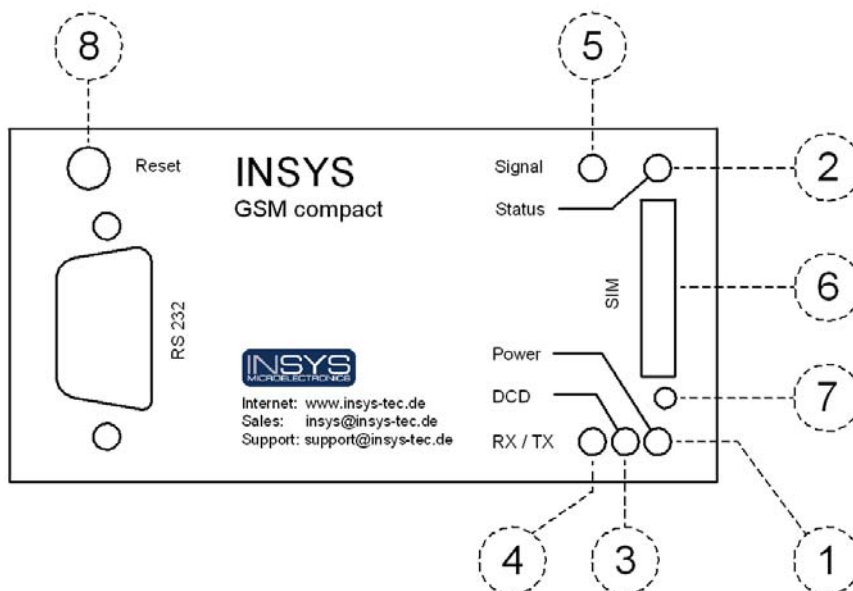


Figure 2 Control elements/displays (INSYS GSM 4.3 compact)

Position	Description
1	Power LED
2	Status LED
3	Connect LED / DCD LED (INSYS GSM 4.3 compact)
4	RX/TX LED
5	Signal LED
6	SIM card holder
7	SIM card holder eject key
8	Reset key

Table 3: Description of the LEDs on the front panel of the device

7.1 Meaning of the Displays

Description	Display	Meaning
Power LED	LED on	Supply voltage available
	LED off	No supply voltage
Status LED	LED on	INSYS GSM 4.3 is logged in into the cellular network
	LED flashes	Data connection established
	LED flashes quickly	Initialization, SMS dispatch, alarm processing
Connect LED / DCD LED (INSYS GSM 4.3 compact)	LED on	Connection to remote terminal is established
	LED off	No connection to remote terminal
RX/TX LED	LED on	INSYS GSM 4.3 transmits data via the serial interface
	LED off	No data is transmitted via the serial interface
Signal LED	LED on	GSM reception perfect
	LED flashes	Flashing frequency indicates the quality of the GSM reception (refer to Table 5).
	LED off	No GSM reception

Table 4: Meaning of the LED displays

Flashing Rate LED Signal	Value	Signal Quality
Always on	25 .. 31	Optimum
16.7 Hz (very quick)	23 .. 24	Very good
7.1 Hz	21 .. 22	
3.8 Hz	19 .. 20	Good
2.6 Hz (slow)	17 .. 18	Poor
off	<17 or 99 (not detectable)	Insufficient

Table 5: Flashing code of the Signal LED

7.2 Function of the Control Elements

Description	Operation	Meaning
Reset key	Press at least 1 second.	Resets the INSYS GSM 4.3 and restarts it.
	Press at least 25 seconds (you may release if the Connect or DCD and Status LEDs blink alternating).	Resets the INSYS GSM 4.3 to factory defaults and restarts it.
SIM card holder	Eject the card holder with the card holder eject key and remove the card holder, then. Observe the correct orientation of card holder and SIM card when inserting. The contacts of the SIM card face upwards in the card holder, The contacts of the SIM card must face to the left side of the device when inserting the card holder.	Receives the SIM card.
SIM card holder eject key	Press the card holder eject key with a thin tool.	Ejects the SIM card holder from the housing.

Table 6: Description of the functions and meaning of the control elements

8 Connections

8.1 Front Panel Connections

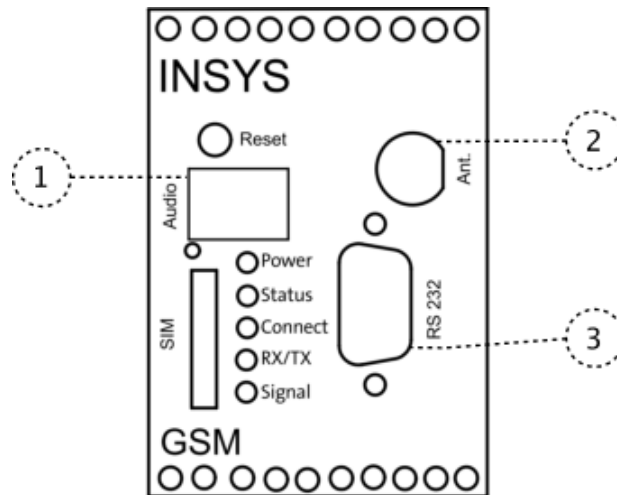


Figure 3: Connections on the front panel of the device (INSYS GSM 4.3)

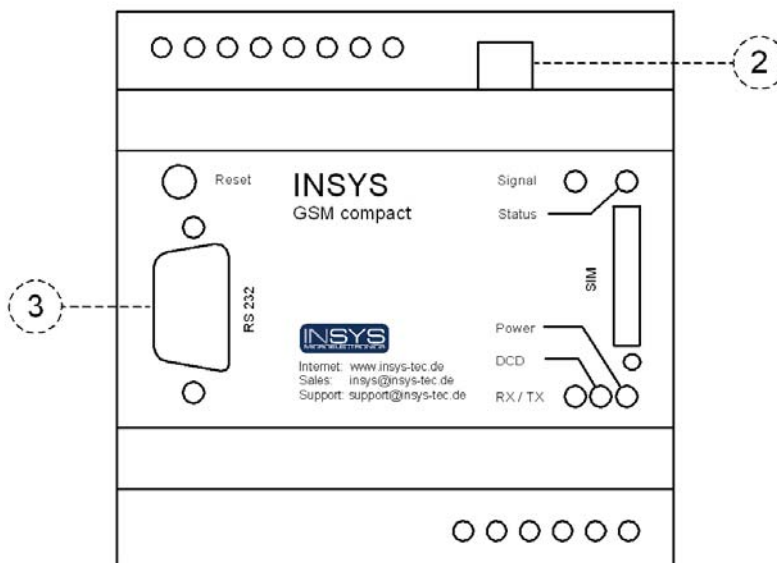


Figure 4: Connections on the front panel of the device (INSYS GSM 4.3 compact)

Position	Description
1	Audio connection (audio socket, not INSYS GSM 4.3 compact)
2	FME aerial socket
3	Serial Interface (RS232 jack)

Table 7: Description of the connections on the front panel of the device

8.2 Terminal Connections on the Top

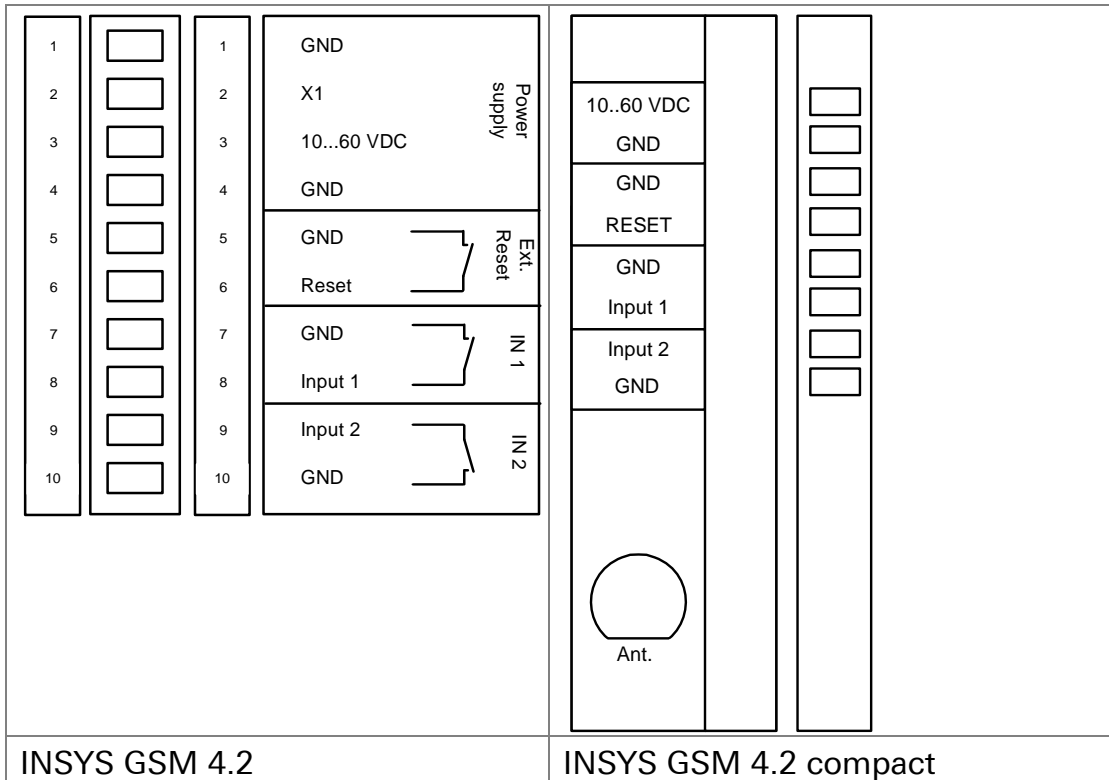


Figure 5: Connections on the top of the device

Terminal	Name	Description
1	GND	Ground (not INSYS GSM 4.3 compact)
2	X1	Reserved (not INSYS GSM 4.3 compact)
3	10 ... 60VDC	Power supply 10V - 60V DC
4	GND	Ground
5	GND	Ground
6	Reset	Reset input
7	GND	Ground
8	Input 1	Alarm input 1
9	Input 2	Alarm input 2
10	GND	Ground

Table 8: Description of the connections on the top of the device

8.3 Terminal Connections on the Bottom

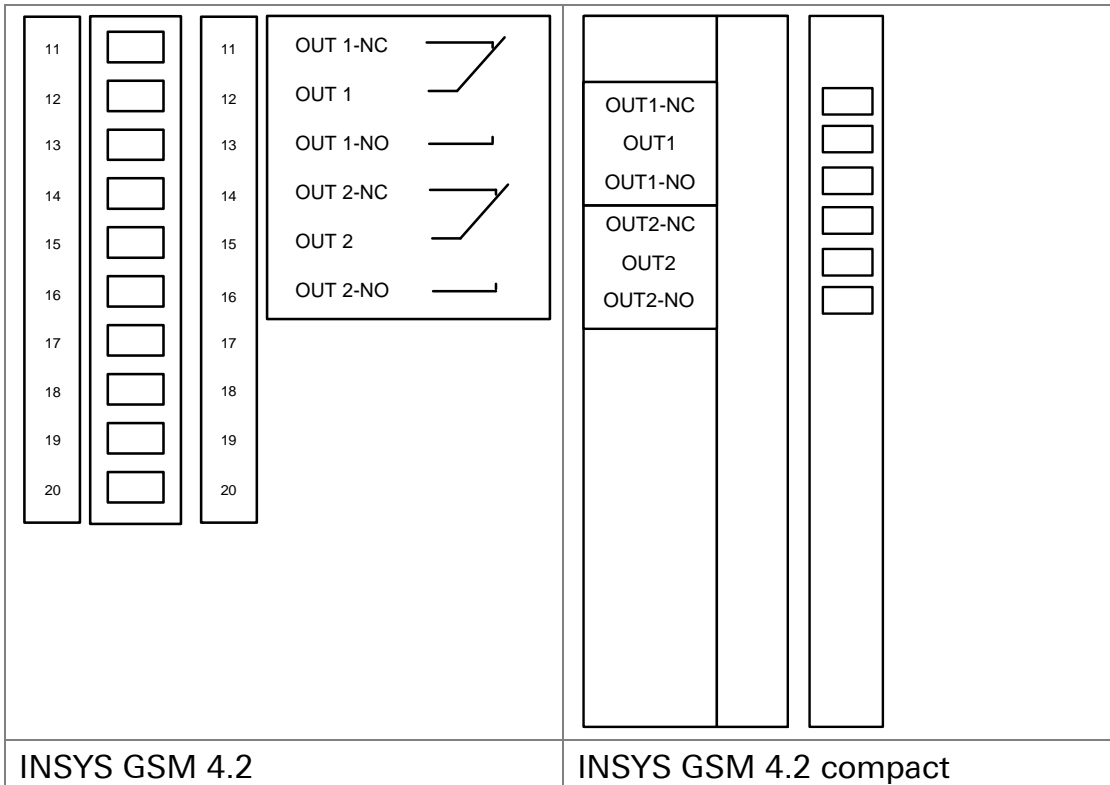


Figure 6: Description of the connections on the top of the device

Terminal	Name	Description
11	OUT 1-NC	Output 1 normally closed
12	OUT 1	Output 1
13	OUT 1-NO	Output 1 normally open
14	OUT 2-NC	Output 2 normally closed
15	OUT 2	Output 2
16	OUT 2-NO	Output 2 normally open

Table 9: Connections on the top of the device

8.4 Pin Assignment of the Serial Interface

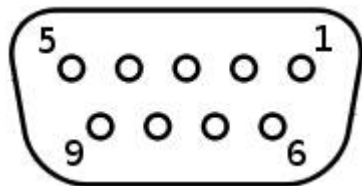


Figure 7: 9-pin D-Sub jack at the device

Pin	Signal	Description
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data set ready
7	RTS	Request to send
8	CTS	Clear To Send
9	RI	Ring Indication

Table 10: Description of the pin allocation of the D-Sub jack

8.5 Audio Connection (not INSYS GSM 4.3 compact)

Pin	Signal	Description
1	Microphone -	
2	Speaker -	
3	Speaker +	
4	Microphone +	

Table 11: Layout of the Western socket

9 Mounting

This section describes how to mount the INSYS GSM 4.3 to a DIN rail, connect the power supply and uninstall it again. Observe the instructions in the "Safety" section of this manual, in particular the "Safety Instructions for Electrical Installation" for that purpose unconditionally.

Caution!



Moisture and liquids from the environment may seep into the interior of the INSYS GSM 4.3!

Fire hazard and damage of the product.

The INSYS GSM 4.3 must not be used in wet or damp environments, or in the direct vicinity of water. Install the INSYS GSM 4.3 at a dry location, protected from water spray. Disconnect the power supply before you perform any work on a INSYS GSM 4.3 which may have been in contact with moisture.

Caution!



The device could be destroyed if the wrong power supply is used!

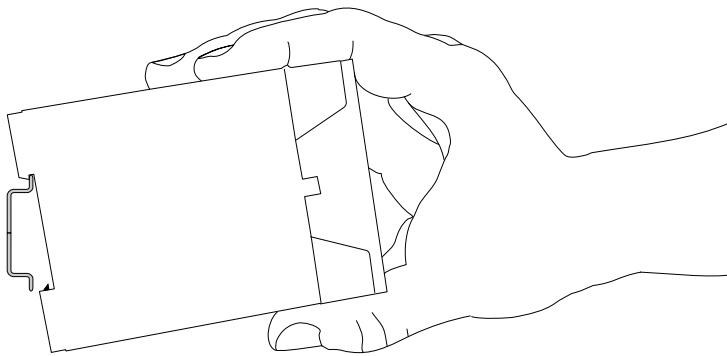
If the INSYS GSM 4.3 is operated with a power supply that supplies a voltage exceeding the permissible operating voltage of the INSYS GSM 4.3, the device will be destroyed.

Make sure that you use the suitable power supply. Refer to the Technical Data section for the proper voltage range of the INSYS GSM 4.3.

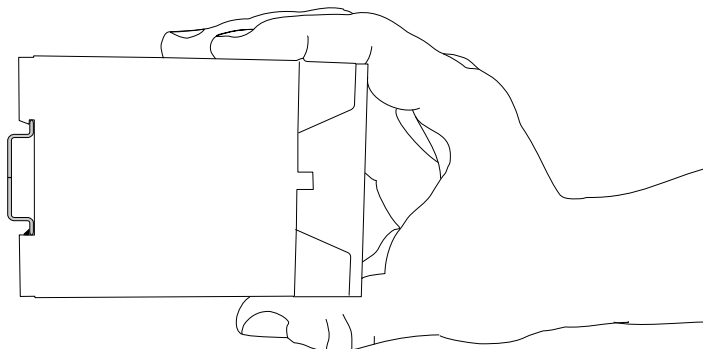
Mounting the device to the DIN rail

How to mount the INSYS GSM 4.3 to a DIN rail:

1. *Position the device at the DIN rail as seen in the following diagram. There are two snap-in hooks at the upper and lower edge of the DIN rail groove of INSYS GSM 4.3. Hook the upper one into place behind the upper edge of the DIN rail.*



2. *Lift the INSYS GSM 4.3 perpendicular to the DIN rail until the two lower, flexible snap-in hooks engage in the DIN rail.*



- ✓ The INSYS GSM 4.3 is now readily mounted.

Connecting the power supply

- The device has already been mounted to the DIN rail.
- The power supply is connected and switched off.

1. *Connect the ground lead of the power supply to the terminal "GND".*
2. *Connect the plus pole of the power supply to the terminal for the power supply.*

- ✓ The INSYS GSM 4.3 is now connected to the power supply.

Disconnecting the power supply

- The device is mounted to the DIN rail.
- The power supply is connected and switched off.

1. *Disconnect the ground lead of the power supply from the terminal "GND".*
2. *Disconnect the plus pole of the power supply from the terminal for the power supply.*

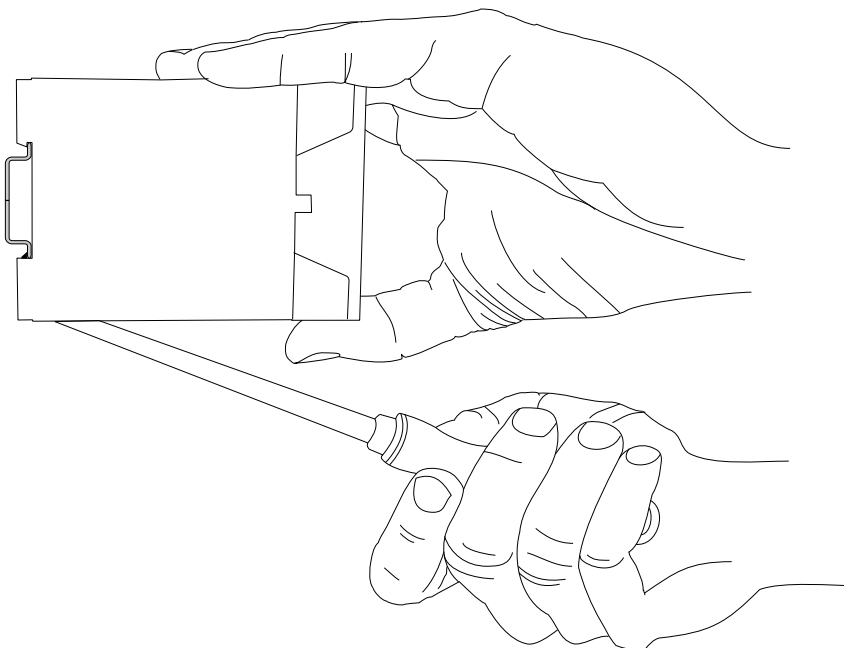
✓ The INSYS GSM 4.3 is disconnected from the power supply.

Uninstalling the device from the DIN rail

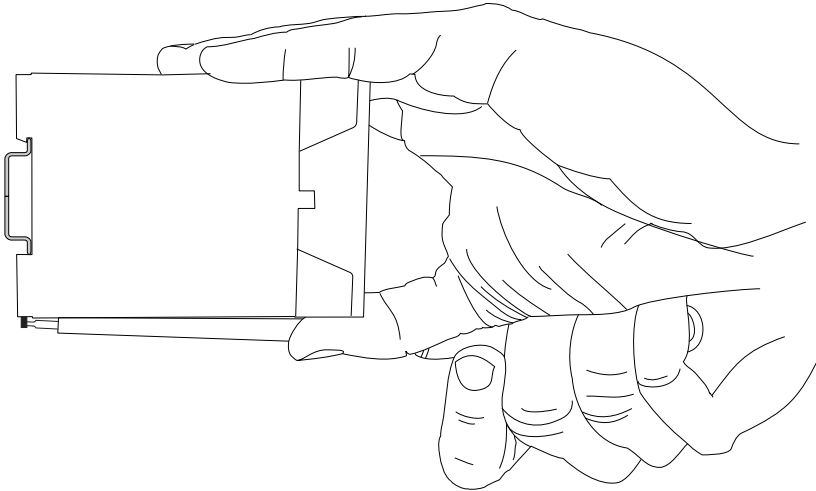
How to uninstall the INSYS GSM 4.3 from a DIN rail in a switch cabinet:

- You will need a Phillips screwdriver with a 4.5 mm blade.
- The power supply of the switch cabinet is switched off and secured against being switched on accidentally.
- All cables at the INSYS GSM 4.3 are disconnected.

1. *Insert the Philips screwdriver into the groove in the bottom of the INSYS GSM 4.3 as shown in the following figure.*



2. *Turn the Philips screwdriver into the direction of the INSYS GSM 4.3 as shown in the following figure.*



- ✓ The plastic spring of the snap-in hook is stretched.
3. *While you hold the plastic spring apart with the lower snap-in hooks, pull the INSYS GSM 4.3 away from the DIN rail.*
 4. *Un-hook the INSYS GSM 4.3 and take it off perpendicularly to the DIN rail.*
- ✓ The INSYS GSM 4.3 is now removed.

10 Initial Operation

This chapter describes how to commission the INSYS GSM 4.3, i.e. how to connect the INSYS GSM 4.3 to a PC, to log it into a mobile phone network, and how to test it.

Connect the INSYS GSM 4.3 to a PC

How to connect the INSYS GSM 4.3 to a PC via a serial interface.

- You will need the 9-pin serial cable.
- You will need a free serial interface at the PC.
 - ① Use preferably serial interfaces which are actually at the PC as "real" hardware. Virtual serial interfaces or USB-to-Serial solutions often cause problems.
- 1. *Connect the 9-pin serial cable with the INSYS GSM 4.3 and fasten the connection screws.*
- 2. *Connect the 9-pin serial cable to a free serial interface of your PC.*
 - ① Note or remember to which interface (COM1 or COM2) you connected the INSYS GSM 4.3 at the PC.

Insert a SIM card into the INSYS GSM 4.3

- You will need a SIM card
 - ① Please observe the notes in the Enter PIN of the SIM Card section of the Functions chapter concerning the PIN entry before inserting the SIM card to avoid an unintentional locking of the SIM card.
- 2. *Insert the SIM card into the INSYS GSM 4.3 and proceed as described in the Insert and Remove SIM Card section of the Functions chapter.*

Connect a GSM antenna to the INSYS GSM 4.3

- You will need a suitable GSM antenna
- 1. *Connect the GSM antenna with the FME connection on the front of the INSYS GSM 4.3.*

Test the INSYS GSM 4.3

- The INSYS GSM 4.3 is connected to the PC.
- The power supply of the INSYS GSM 4.3 is switched on (refer to the Installation section for the connection of the power supply).
- A GSM antenna is connected.

- A terminal program such as TeraTerm or HSComm (contains a terminal program) is installed at the PC.
- ✓ The Power LED light up green.
1. *Open your terminal program.*
 2. *Open the serial interface, to which the INSYS GSM 4.3 is connected.*
 - ⓘ The baud rate and protocol settings in the terminal program must correspond with the settings of the INSYS GSM 4.3.
The INSYS GSM 4.3 is configured to 19200 Baud, 8 data bits, 1 stop bit and no parity (8N1) by default.
 3. *Enter **AT** into your terminal program and confirm with the Enter key.*
 - ✓ The response will be **OK**.
 - *If you don't receive the response OK, check the connection and if the INSYS GSM 4.3 receives power. Repeat the test.*
 - ✓ The RX/TX LED light up while you type.
 - ⓘ If the RX/TX LED at the INSYS GSM 4.3 does not light up, while you type **AT** and receive an **OK**, the reason may be that you are connected to another modem (e.g. with the modem integrated in the laptop or the PC).
In this case, check to which interface your INSYS GSM 4.3 is actually connected and repeat the test.
 - ✓ The INSYS GSM 4.3 is successfully installed and ready for operation.

11 Operating Principle

This chapter describes the basic procedures for operating and configuring a INSYS GSM 4.3. It will also give you an overview of the control elements of the software HSComm.

You have several possibilities to operate and configure the INSYS GSM 4.3. In general, the INSYS GSM 4.3 is configured and operated via AT commands. You can enter these commands yourself with the help of a terminal program and the AT Command Reference. As an alternative, you can enter the most important functions easily with the help of the configuration software HSComm.

11.1 Operation via Terminal Program

In general, any terminal program may be used. We recommend the program TeraTerm by T. Teranishi. It is available free of cost on the Internet at <http://hp.vector.co.jp/authors/VA002416/teraterm.html>.

Configuration and settings of the INSYS GSM 4.3 with a terminal program

How to configure and operate the INSYS GSM 4.3 with a terminal program.

- The INSYS GSM 4.3 is connected to the PC and switched on.
- A terminal program is installed on the PC.

1. Start your terminal program.

2. Open the serial port, to which you connected the INSYS GSM 4.3.

i COM1 under Windows corresponds to /dev/ttyS0 under Linux.

3. Type the character string AT into the terminal program. Complete the entry by pressing the Enter key.

i Each command input starts with **AT** and is completed with the Enter key.

✓ The INSYS GSM 4.3 responds with **OK**.

➤ *If the INSYS GSM 4.3 does not respond, this may have several reasons:*

- a) The INSYS GSM 4.3 is switched off or*
- b) The INSYS GSM 4.3 is connected to a different serial port*
- c) The baud rate and/or protocol settings in INSYS GSM 4.3 and terminal program do not correspond (default: 19200, 8N1). Check it and repeat step 3.*

4. *Configure the INSYS GSM 4.3 with the help of the AT commands.*

- ① A reference of the AT commands can be found in the "AT Command Reference".

5. *Save your entries with AT&W.*

- ① Not all settings at the INSYS GSM 4.3 must be actively stored by entering **AT&W**. Some settings are automatically saved immediately. We still recommend sending the command **AT&W** to the INSYS GSM 4.3 as your last configuration step to ensure that all settings are stored safely and are available for the next restart.

11.2 Operation via SMS

The INSYS GSM 4.3 is able to receive and evaluate "AT**" commands via SMS message. It is also able to send the output or command reply via SMS optionally. The SMS command processing is performed every 60 seconds, if no data connection is established or another AT command is processed at the moment. The INSYS GSM 4.3 stores received SMS messages on the SIM cards. If this memory is full, it discards all other incoming SMS messages.

- ① If selective call acceptance is enabled, commands transmitted via SMS from mobile phones with a phone number, which is not entered in the CLIP number list, are rejected

Configuring the INSYS GSM 4.3 via SMS command

How to proceed principally to configure and operate the INSYS GSM 4.3 via SMS message.

- ① Not all commands can be used via SMS or a pre-configuration via terminal program or HSComm is necessary (refer to „AT Command Reference“).

- The INSYS GSM 4.3 is connected to the PC and switched on.
- Sufficient SMS memory is available and configured.
- The Service Center Number is entered into the INSYS GSM 4.3.
- You have a mobile phone available for sending SMS messages or a different possibility to send SMS messages to the INSYS GSM 4.3.

1. *Send an SMS with an AT** command in following syntax to the INSYS GSM 4.3: [Password],[AT**XXXXX],[CN: 017612345678]*

- ① When entering the SMS message, replace [Password] with your SMS password. Enter instead of AT**XXXXX an "AT**" command of the INSYS GSM 4.3. Replace the phone number after the "CN:" with the phone number, to which the INSYS GSM 4.3 sends the reply. Please observe that a blank must be entered between "CN:" and the phone

number. If no phone number is entered following the "CN:", the reply is sent to the sender phone number. In this case, it must be observed that no blank is allowed behind "CN:".

- ❗ You only need a password, if you have assigned an SMS password. The phone number for the reply is also optional. SMS processing also works without an SMS reply. If these parameters are missing, the commas as separators are also not necessary.
- ✓ The INSYS GSM 4.3 processes the command contained in the SMS message after a configured time (default setting is 60 seconds).
- ✓ You receive an SMS message with the return of the command, if you have entered a phone number for this.

11.3 Operation with HSComm GSM

Use the software HSComm to easily configure the INSYS GSM 4.3. HSComm offers an interface for the parameters of the most important AT commands of the INSYS GSM 4.3. The operation is mostly self-explanatory. You can download the software from the INSYS MICROELECTRONICS homepage (www.insys-tec.de).

Configuration and settings of the INSYS GSM 4.3 with HSComm

How to configure the INSYS GSM 4.3 with the software HSComm.

- The INSYS GSM 4.3 is connected to the PC and switched on.
- The software HSComm GSM is installed on the PC.

1. *Start the program HSComm GSM.*

- ✓ The program starts.
- ✓ A progress bar appears in the field on the right if the automatic recognition at program start is activated in the program settings of HSComm.
- *If this option is not activated, the settings can be read out with the **Read settings** button in the field on the right.*
- ❗ The program will now search for a connected INSYS GSM 4.3 and will attempt to read the settings.
- ✓ After a short time, the settings are read out. A status message "Settings read." appears.

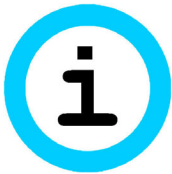
2. Click **OK** in the status message.
 3. Enter the required settings.
 4. Afterwards, click on the button **Send settings** in the field on the right.
- ✓ A progress bar appears above the button.
 - ⓘ The entered settings are sent to the INSYS GSM 4.3 and stored.
 - ✓ A dialog box with the message "transmission finished" is displayed.
5. Click **OK** in the status message.

12 Functions

12.1 Entering the PIN of the SIM Card

The INSYS GSM 4.3 requires a SIM card to be able to log into a GSM network. Usually, a PIN is necessary that the device is able to use the SIM card for logging into the GSM network. You may enter the PIN into the INSYS GSM 4.3 without inserting the SIM card. If the SIM card requires no PIN, you don't have to enter a PIN in the INSYS GSM 4.3. If you enter a PIN, it will be transmitted before every login attempt.

Note



Loss of function of the SIM card!

A falsely entered PIN may lock the SIM card directly after switching on the INSYS GSM 4.3, because the device will try to log into the GSM network for more than three times.

Take care, that the SIM PIN configured in the INSYS GSM 4.3 corresponds with the SIM card or disable the PIN request of the SIM card. A possibly false configured PIN has no effect if the PIN request is disabled.

Configuration with HSComm

In order to **enter the already existing PIN of the used SIM card**, use on the "Basic Settings" tab in the "GSM Connection" panel the entry field behind "new PIN".

In order to **use a new PIN in the INSYS GSM 4.3**, activate on the "Basic Settings" tab in the "GSM Connection" panel the check box "new PIN". Then enter a new PIN into the entry field behind.

In order to **delete the PIN in the INSYS GSM 4.3**, activate on the "Basic Settings" tab in the "GSM Connection" panel the check box "delete PIN".

Store your entries using the button "Send settings" in the field on the right, that they become effective.

Configuration with AT commands

In order to **set a PIN in the INSYS GSM 4.3**, use the command

```
AT**PIN<pin>
```

Replace <pin> with the (usually) four-digit PIN of your SIM card.

In order to **query whether a PIN is stored in the INSYS GSM 4.3**, use the command

```
AT**PIN?
```

In order to check the **status of the PIN request** between device and SIM card, use the command

AT+CPIN?

The following replies inform about the status of the PIN request:

No entry required

READY

PIN of the SIM card missing

SIM PIN

PUK entry required (after repeated incorrect entry of the PIN)

SIM PUK

SIM carte not or not correctly inserted

**+CME Error:
SIM not inserted**

12.2 Inserting and Removing the SIM Card

A SIM card must be inserted that your INSYS GSM 4.3 is able to log into the GSM network and transmit data. Moreover, the PIN of the SIM card must be entered into the INSYS GSM 4.3.

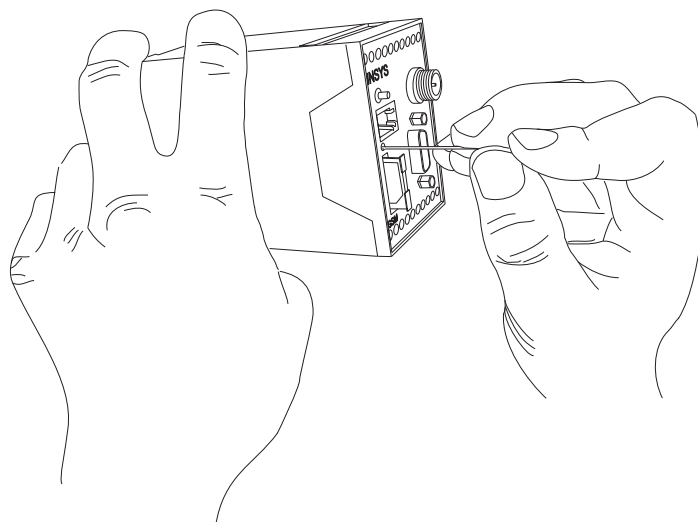
Insert SIM card

How to insert the SIM card into the INSYS GSM 4.3.

→ You will need a SIM card.

→ You will need a pointed tool, e.g. a ball pen refill.

1. ***Disconnect the power supply of the INSYS GSM 4.3.***
2. ***Press onto the SIM card holder eject key using the pointed tool.***



✓ The SIM card holder will be ejected.

3. ***Remove the SIM card holder.***
4. ***Insert the SIM card into the SIM card holder.***
5. ***Insert the SIM card holder with the inserted SIM card with the SIM card contacts facing left into the INSYS GSM 4.3.***

✓ The SIM card can now be used by the INSYS GSM 4.3.

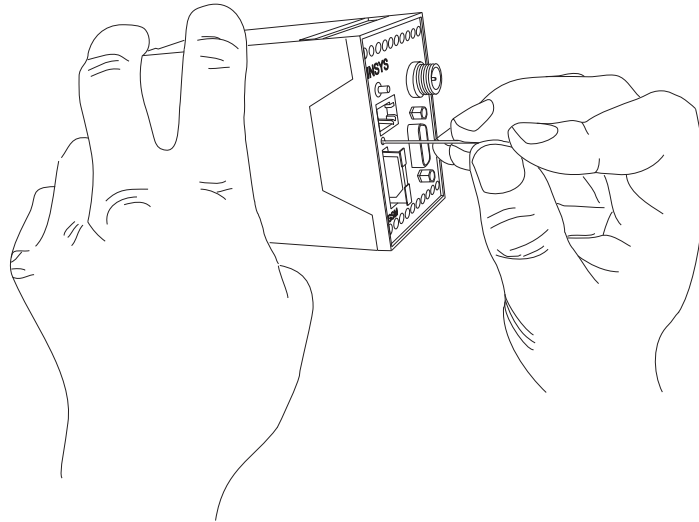
ⓘ Take care that the correct PIN is configured in the INSYS GSM 4.3. A wrong PIN may lead to the SIM card being locked after switching on the INSYS GSM 4.3.

Remove SIM card

How to remove the SIM card from the INSYS GSM 4.3.

→ You will need a pointed tool, e.g. a ball pen refill.

1. *Disconnect the power supply of the INSYS GSM 4.3.*
2. *Press onto the SIM card holder eject key using the pointed tool.*



✓ The SIM card holder will be ejected.

3. *Remove the SIM card holder.*
4. *Remove the SIM card from the SIM card holder.*
5. *Insert the SIM card holder back into the INSYS GSM 4.3.*

12.3 Checking the Status of the GSM Login

The INSYS GSM 4.3 logs in into the GSM network automatically with each restart of the device. The login status into the GSM network may be requested for test purposes. Then, you can see, whether the INSYS GSM 4.3 is logged out at the moment, whether a network search is performed, whether a login has been refused by the GSM network, or whether the device is logged in into a foreign network via roaming.

Configuration with HSComm

The **Login state** is indicated in text form in HSComm on the “Basic Settings” tab in the “GSM Connection” panel under “PIN active”.

Configuration with AT commands

In order to request the **Status of the GSM login**, use the command **AT+CREG?**

The Status is indicated in the reply by the second number following the comma.

Reply example **<+CREG: 0,3>**

The following status replies are possible:

Not logged in, no GSM network search	0
--------------------------------------	---

Logged in with the standard provider	1
--------------------------------------	---

Not logged in, INSYS GSM 4.3 searches for GSM network	2
---	---

GSM network refuses a login	3
-----------------------------	---

Logged into a foreign network via roaming	5
---	---

12.4 Checking the Signal Field Strength of the Mobile Phone Network

You can check the signal field strength at the location of the INSYS GSM 4.3. The signal field strength has an essential effect on the data transmission speed. If the signal field strength is too low, the transmission speed may drop too much or the connection may be terminated completely. The signal field strength is visible for you in three ways: via the flashing frequency of the signal LED, via HSComm, or via an AT command.

Configuration with HSComm

In order to open a dialog window with the **current signal field strength**, click on the "Basic Settings" tab in the "GSM Connection" panel the "detect GSM intensity" button.

Configuration with AT commands

In order to **display the signal field strength**, use the command **AT**SIGNAL**

12.5 Configure Serial Interface

The serial interface serves for communicating with the INSYS GSM 4.3. You must configure the interface to enable the INSYS GSM 4.3 for communicating with an application or a terminal program, the baud rate as well as the data format of the interface of the INSYS GSM 4.3 and the interface at the PC or the application must match exactly, that data can be transmitted successfully.

A baud rate of 19200 bps and the data format 8N1 is set by default.

Configuration with HSComm

In order to **change the settings of the serial interface of the INSYS GSM 4.3**, select on the "Basic Settings" tab in the "Serial Interface" panel the desired "baud rate" and "data format" from the respective drop-down lists. If you send the values to the INSYS GSM 4.3, the software will change the settings of the interface of your PC automatically.

The **current settings of the serial interface** of your PC are indicated in the status line of the program window.

In order to **adjust the settings of the serial interface of your PC**, use the menu item "Interface".

Configuration with AT commands

In order to **adjust the baud rate of the serial interface of the INSYS GSM 4.3**, use the command

```
AT**BAUD=<baudrate>
```

Insert instead of <baudrate> one of the following baud rates: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.

In order to **adjust the data format of the serial interface of the INSYS GSM 4.3**, use the command

```
AT**FORMAT=<frm>
```

Insert instead of <frm> one of the following formats: 7E1, 7O1, 7N2, 8N1, 8E1, 8O1, 8N2.

The settings of the baud rate and the data formats become effective immediately. If you change the baud rate or the data format via AT command, you must adjust the baud rate and the data format of your terminal program or your application as well afterwards.

12.6 Data Flow Control (Handshake)

The data flow control ensures that the data transfer is interrupted as soon as the modem buffer exceeds a certain level. Two data flow control options are available: Via the control lines RTS and CTS, or via the control characters XON/XOFF which are inserted into the data stream.

12.6.1 Hardware Data Flow Control (RTS/CTS)

The hardware data flow control works in two directions. When the critical buffer level is exceeded, the modem will set the CTS line to "low" and will thus indicate to the application to interrupt the data flow. When the buffer is emptied sufficiently for the INSYS GSM 4.3 to be able to receive data again, the CTS line is set to "high". Reversely, the application can also indicate to the INSYS GSM 4.3 to interrupt the data flow. This is done via the RTS line. If it is set to "low", the modem will interrupt the data flow to the application. The application will set it to "high" to request data from the INSYS GSM 4.3.

The data flow control with RTS/CTS behaviour is active by default.

Configuration with HSComm

Select the **type of data flow control** or switch it off completely on the "Basic Settings" tab in the "Handshake" panel.

Configuration with AT commands

To switch the data flow control on and to set the type to RTS/CTS , use	AT\Q3
---	--------------

To switch the data flow control off, use	AT\Q0
---	--------------

12.6.2 Software Data Flow Control (XON/XOFF)

When the input buffer of the modem exceeds a certain fill state, the modem will insert an XOFF character into the data stream to the application. This character will cause the application to send no more data. It will depend on the according application software if the XON/XOFF data flow control is supported.

After the input buffer of the modem is emptied so much that data can be received again, the modem will send an XON character to the application. This character will cause the application to send data to the modem again. Analogously, the application can insert XON/XOFF characters into the data stream to switch the data flow on and off. The XON/XOFF data flow control is only available when the transmitted data do not contain the characters XON or XOFF, which usually appear only in actual ASCII texts (7 bit). When binary data (programs, etc.) are transmitted, or in the XMODEM transmission protocol, for example, occasionally appearing XON or XOFF characters would disturb the operation.

Configuration with HSComm

Select the **type of data flow control** or switch it off completely on the "Basic Settings" tab in the "Handshake" panel.

Configuration with AT commands

To switch the data flow control on and to set the type to XON/XOFF , use	AT\Q1
--	--------------

To switch the data flow control off, use	AT\Q0
---	--------------

12.7 Configure Date and Time

The INSYS GSM 4.3 features a real-time clock for triggering timed activities, like the dispatch of a message or the scheduled logout and login from/into the GSM network. We recommend to check the set time at least once a month to ensure that your desired scheduled activities are performed in time. Deviations may occur due to the accuracy of the internal clock of the INSYS GSM 4.3.

Configuration with HSComm

In order to **set the time and date**, use on the “Basic Settings” tab in the “Date/Time” panel the drop-down menu “date” as well as the spinner “time”.

In order to **take over the time of your PC into the INSYS GSM 4.3**, click the “System clock (PC)” button.

Store your settings in the INSYS GSM 4.3 by clicking the “Send settings” button in the field on the right.

Configuration with AT commands

In order to **query the current date of the INSYS GSM 4.3**, use the command

ATDATE?**

In order to **set a date**, use the command

Replace **<dd>** with the two-digit number of the day, **<mm>** with the two-digit number of the month, and **<yy>** with the last two digits of the year.

ATDATE=<dd>.<mm>.<yy>**

To set the 01.01.08 for example, use the command

ATDATE=01.01.08**

In order to **query the current time of the INSYS GSM 4.3**, use the command

ATTIME**

In order to **set a time**, use the command

Replace **<hh>** with the two-digit hours, **<mm>** with the minutes, and **<ss>** with the seconds.

ATTIME=<hh>:<mm>:<ss>**

12.8 Configure Dial-Up Attempts for Message Dispatch

If the INSYS GSM 4.3 dispatches an alarm message via SMS or data connection, it establishes a data connection to an SMS Service Center or another remote station. If the connection establishment fails, the INSYS GSM 4.3 tries to establish a connection every 60 seconds. The INSYS GSM 4.3 performs as much dial-up attempts as configured. A maximum of 12 attempts can be configured.

Configuration with HSComm

In order to **configure the dial-up attempts for the connection establishment for message dispatch**, enter the desired number on the "Basic Settings" tab in the "GSM Connection" panel in the entry field "connection attempts".

Configuration with AT commands

In order to **configure the dial-up attempts for the connection establishment for message dispatch**, use the command

```
AT**DIAL=<count>
```

Replace **<count>** with the number of dial-up attempts.

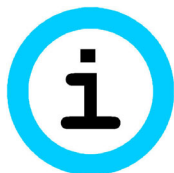
In order to **query the number of attempts**, use the command

```
AT**DIAL?
```

12.9 Configure Scheduled Logout/Login

The INSYS GSM 4.3 can logout from the GSM network at a scheduled time for a configurable period. This function serves for increasing the availability and ubiquity of the INSYS GSM 4.3 for a longer period.

Note



Undependable connection state!

If a regular logout and login of the INSYS GSM 4.3 is not performed, changes in the GSM network may result that the INSYS GSM 4.3 is not available any more.

Take care that the INSYS GSM 4.3 logs out and in again once a day.

If you configure a scheduled logout/login, the INSYS GSM 4.3 logs out from the GSM network daily at the configured time. It logs in into the GSM network after the configured delay duration.

You can connect the logout/login of the INSYS GSM 4.3 with a reset of the device. Then, the device restarts directly after logging out and logs in again immediately.

The logout is performed later in both cases, if the logout time interferes with an SMS dispatch or if a data connection to the INSYS GSM 4.3 is established. The scheduled logout/login will only be performed, if the SMS has been sent or an existing data or audio connection has been terminated.

Configuration with HSComm

In order to **enable the scheduled logout/login**, activate on the "Basic Settings" tab on the "System Monitoring" panel the check box "logout". Enter the time into the entry field "time" at which the INSYS GSM 4.3 logs out from the GSM network daily. Enter a time in minutes (minimum one minute, maximum 98 minutes), for which the device waits in logged out state before it logs in into the GSM network again, into the entry field "duration". If the value 0 is entered as time here, the scheduled logout/login will be disabled.

In order to **enable the scheduled logout/login with reset of the INSYS GSM 4.3**, activate on the "Basic Settings" tab on the "System Monitoring" panel the check box "logout with reset". Enter the time into the entry field "time" at which the INSYS GSM 4.3 logs out from the GSM network daily and performs a subsequent restart.

Configuration with AT commands

In order to **enable the scheduled logout/login**, use the command

Replace `<hh:mm>` with the desired time and enter a value for the logout duration between one and 98 minutes instead of `<t>`.

`AT**LOGOUT=<hh:mm>,<t>`

In order to **enable the scheduled logout/login with subsequent reset of the INSYS GSM 4.3**, use the command

`AT**LOGOUT=<hh:mm>,99`

In order to **disable the scheduled logout/login completely**, use the command

`AT**LOGOUT=`

In order to **query the scheduled logout/login**, use the command

`AT**LOGOUT?`

12.10 Establishing or Accepting a Data Connection

The INSYS GSM 4.3 can call another modem via the GSM network and establish a data connection. After dialling a phone number, the INSYS GSM 4.3 synchronises with the called modem and opens a data connection with the transmission speed allowed by the GSM network. This is usually 9600 bit/s.

The speed, which is set at the serial interface of the INSYS GSM 4.3 at the time of connection establishment, will not be changed.

All incoming characters are transmitted to the other (called) modem during the active data connection. Therefore, AT commands are not processed during a connection. The INSYS GSM 4.3 must be changed to command mode again using an "Escape sequence" that it processes AT commands again during an active connection. Then, the local INSYS GSM 4.3 processes the entered characters as AT commands and does not transmit them to the remote terminal. A remote INSYS GSM 4.3 can be changed to command mode during an active data connection using the function "Remote configuration".

The INSYS GSM 4.3 can accept an incoming connection in the same way. It answers after the configured number of ring tones and opens a connection.

Configuration with AT commands

In order to establish a data connection with the INSYS GSM 4.3, use the command	ATD<number>
Replace <number> with the phone number of the remote terminal.	
If the remote terminal accepts the connection, the INSYS GSM 4.3 indicates	CONNECT
If the remote terminal is busy, the INSYS GSM 4.3 indicates	BUSY
If the remote terminal is no modem, the INSYS GSM 4.3 indicates after the remote terminal has picked up	NO CARRIER
An incoming call is indicated with	RING
In order to change to command mode during a data connection, use the escape sequence	
No data must be transmitted for 1 second before and after that the INSYS GSM 4.3 changes to command mode.	+++
In order to change from command mode to normal data transmission again, use the command	ATO
In order to accept an incoming connection , use the command	ATA
In order to configure the number of ring tones after which the INSYS GSM 4.3 answers and accepts the connection, use the command	ATS0=<n>
Replace <n> with the number of ring tones (<n> = 2...255, <n> = 0 deactivates the function).	
In order to terminate a connection and cause the INSYS GSM 4.3 to hang up, use the command	ATH

12.11 Establish Voice Connection (not INSYS GSM 4.3 compact)

The INSYS GSM 4.3 can establish a voice connection to a normal telephone. For this, the used SIM card must support voice connections. If the SIM card supports only data connections, no voice connections can be established. In order to be able to use the voice functionality, you need to connect a standard phone receiver into the audio socket of the INSYS GSM 4.3. During dialling, an acoustic signal in form of a tone sequence can be heard in the receiver.

Configuration with HSComm

A **voice connection** can be established with the terminal program of the HSComm Software and AT commands by selecting the menu item "Terminal".

Configuration with AT commands

In order to **establish a voice connection**, use the command

Replace **<phonenumber>** with the desired phone number. Please note the semicolon at the end of the command.

ATD<phonenumber>;

In order to **terminate a voice connection**, use the command

ATH

12.12 Using USSD Codes

You can use so-called USSD codes with the INSYS GSM 4.3. The USSD codes can be used to configure call forwarding or enable or disable the calling line identification presentation (CLIP) for example. The codes you can use depend on your mobile communication operator / - provider. Refer to your provider for more information about the USSD codes.

Configuration with AT commands

In order to **enter the USSD codes**, use the command

Replace **<code>** by an USSD code. Note the semicolon at the end.

ATD<Code>;

In order to retrieve the IMEI of the INSYS GSM 4.3 for example, use the command

ATD*#06#;

12.13 Idle Connection Control with Data Transmit Control

Data Transmit Control (DTC) is a function of the INSYS GSM 4.3 which monitors the data transmission in online mode. This function prevents the INSYS GSM 4.3 from staying online for an unlimited amount of time, although no data is being transmitted anymore. The DTC function can define the time after which the INSYS GSM 4.3 will hang up as soon as there is no data transfer on the phone line.

Configuration with HSComm

In order to **enable Data Transmit Control**, enter the time, after which the INSYS GSM 4.3 shall hang up in case of missing data transmission on the Basic Settings" tab on the "GSM Connection" panel into the entry field "idle connection control".

Configuration with AT commands

To define the **time**, after which the INSYS GSM 4.3 should hang up, if no data transmission is available, use the command

You can select a value between 1 and 255 seconds for **<n>**. Please note that the timer will start running, as soon as the INSYS GSM 4.3 goes off-hook ("Connect" LED illuminates). We therefore strongly recommend not to configure a time less than 20 seconds.

ATDTC=<n>**

In order to **query the setting of this function**, use the command

ATDTC=?**

12.14 Automatic Call Acceptance

With the automatic call acceptance, the INSYS GSM 4.3 accepts every call after the configured number of ring tones.

Configuration with HSComm

In order to **enable the automatic call acceptance**, activate on the "Basic Settings" tab on the "GSM Connection" panel the check box "auto answer".

Enter the **desired number of ring tones**, after which the INSYS GSM 4.3 picks up into the entry field "number of rings before answer".

Configuration with AT commands

In order to enable the automatic call acceptance , use the command	ATS0=2
---	---------------

In order to disable the automatic call acceptance , use the command	ATS0=0
--	---------------

In order to configure the number of ring tones , after which the INSYS GSM 4.3 accepts the call, use the command	ATS0=<n>
---	-----------------------

Replace <n> with the number of ring tones (<n> = 2...255).

In order to query the state of this function , use the command	ATS0?
---	--------------

12.15 Selective Call Acceptance

The selective call acceptance enables to define, which calls are accepted by the INSYS GSM 4.3. If the selective call acceptance is activated, the INSYS GSM 4.3 will only accept calls from previously defined callers. The INSYS GSM 4.3 will identify the caller via CLIP. This must, however, be supported by the network provider. The list of phone numbers of the INSYS GSM 4.3 for identifying the callers has 30 storage locations altogether.

The INSYS GSM 4.3 checks in the phone number transmitted via CLIP, whether one of the numbers stored in the list is contained. The check will be started "from right", i.e. the end of the phone number transmitted via CLIP. This enables to recognize a phone number even if "+49" or "0049" or a different prefix has been put in front. Moreover, the number stored for recognition can remain variable using "wildcards" at certain positions. The stored phone number must not contain separators, like hyphens between area code and phone number for example.

Configuration with HSComm

In order to **enable selective call acceptance**, activate on the "Basic Settings" on the "GSM Connection" panel the check box "auto answer" first.

Enter the **desired number of ring tones**, after which the INSYS GSM 4.3 picks up, into the entry field "number of rings before answer".

Activate on the "Access Control" tab on the "CLIP Numbers" panel the check box "only calls from the following numbers are accepted".

Enter the **phone numbers of the permitted callers** into the entry fields "number".

In order to **store your settings**, click the "Send settings" button in the field on the right.

Configuration with AT commands

In order to enable the selective call acceptance , use the command	AT**CLIP=1
In order to disable the selective call acceptance , use the command	AT**CLIP=0
In order to display the state of the selective call acceptance , use the command	AT**CLIP=?
In order to display a complete list of stored phone numbers for the selective call acceptance, use the command	AT**CLIP?
In order to store the phone number <nr> to the storage location <n>, use the command	AT**CLIP<n>=<nr>
In order to allow the numbers +49941686920, 0941686920, 0049941686920 as caller, only store 941686920 to location no. 1 for example.	AT**CLIP1=941686920
For each variable digit in the phone number , an asterisk "*" can be entered. To keep the last two digits variable, e.g. to allow callers from extensions, use two "*" characters.	AT**CLIP1=9416869**
In order to delete a single storage location , overwrite the storage location with an empty entry after the "=" character	AT**CLIP<n>=

12.16 Configure Security Callback

The function "Security Callback" allows that a call at the INSYS GSM 4.3 initiates a call to a pre-defined phone number. The function will trigger a callback after successful authentication using a password. The password is absolutely necessary for the security callback. The INSYS GSM 4.3 establishes a data connection after triggering the security callback. **Therefore, the security callback is only functional, if your SIM card supports outgoing data connections.** A security callback with a voice connection is not possible.

Configuration with HSComm

In order to **enable security callback**, configure the authentication password on the "Access Control" on the "Password for" panel using the "set password" button under "data connection, security callback". Enter the phone number to be called back into the entry field "Callback number". You enter the phone number here, which is called by the INSYS GSM 4.3 as a reply to an incoming call.

Enable the "automatic call acceptance" and enter the desired number of ring tones until pick up as described in the respective section.

Configuration with AT commands

In order to **enable the security callback** and configure the phone number to be called back, use the command

ATCALLBACK=<Number>**

In order to **disable the security callback**, use the command

ATCALLBACK=**

In order to **query the configured security callback number**, use the command

ATCALLBACK?**

In order to **set the password**, use the command

ATPASSD=<np>,<rp>**

Replace <np> with the password and <rp> with the repetition of the password.

In order to **change the password**, use the command

ATPASSD=<p>,<np>,<rp>**

Replace <p> with the current password, <np> with the new password and <rp> with the repetition of the new password.

Automatic call acceptance must be enabled to accept calls.

ATS0=2

In order to store the settings , use the command	AT&W
--	-----------------

Triggering a "Security Callback"

How to trigger a security callback of the INSYS GSM 4.3:

- You will need another modem or another INSYS GSM 4.3 to be able to establish a connection to the INSYS GSM 4.3.
- The security callback function at the INSYS GSM 4.3 is configured and enabled.
- The automatic call acceptance of the INSYS GSM 4.3 is enabled.
- ① Use the function "selective call acceptance" to be able to restrict the number of callers who can trigger a security callback.
- ***If you use another INSYS GSM 4.3 to trigger a security callback at a INSYS GSM 4.3, the access control must be deactivated at one of the devices.***
- Your second INSYS GSM 4.3 or modem can be reached using the number stored in the INSYS GSM 4.3. It must be able to accept calls.
- You will need a terminal program.

1. *Establish a connection to the INSYS GSM 4.3.*

- ✓ The INSYS GSM 4.3 responds the incoming call.
Connect
SECURITY CALLBACK
REMOTE PASSWORD:
- ✓ The INSYS GSM 4.3 prompts you to enter the password.

2. *Enter the password.*

- ✓ The INSYS GSM 4.3 will hang up after successful password entry.
- ✓ Your terminal program will indicate: "No Carrier".
- ✓ After 10 seconds, the INSYS GSM 4.3 will dial the stored phone number.
- ① The INSYS GSM 4.3 performs 3 dialling attempts with 10 seconds pause before each subsequent attempt.
- ✓ If the called modem responds, a normal data connection is established.

12.17 Alarm Inputs

The INSYS GSM 4.3 has two digital inputs, which can trigger an “alarm” when connected to GND. When an alarm occurs, the INSYS GSM 4.3 can send a message either via a data connection or SMS, or establish a voice connection.

The INSYS GSM 4.3 will evaluate a connection of the input to GND as a pulse. This will only consider a falling edge. Two “pulse types” are available: “simple pulses” and “count pulses”, i.e. a pulse sequence. If no rising edge is detected for at least 4 seconds, a “simple alarm” is processed. The INSYS GSM 4.3 can react on this event with the dispatch of a single message or the establishment of a voice connection. “Count pulses” are periodic connections to GND, which do not last longer than two seconds. The length of a pulse or the pause respectively can have a duration between 0.3 and 2 seconds. The complete evaluation of several pulses is performed after a pause of 5 seconds (refer to Figure 8 Duration of inter-pulse periods). Depending on the number of count pulses, the INSYS GSM 4.3 addresses the messages 1 to 10 and sends it to the respective recipients. Up to 5 alarms are buffered at the inputs and processed consecutively.

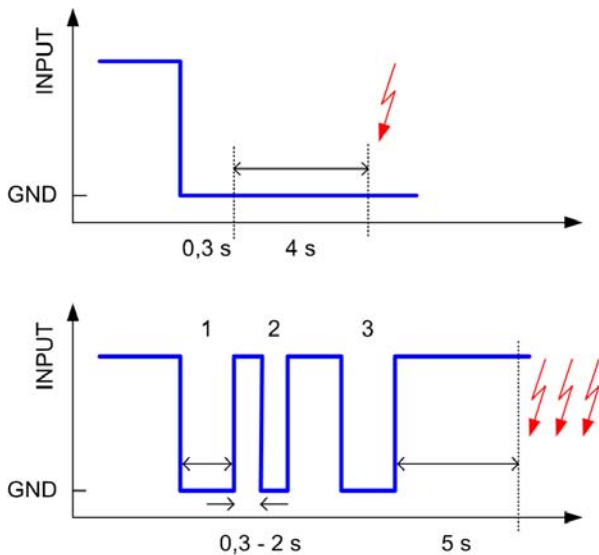


Figure 8 Duration of inter-pulse periods

The sent messages consist of the collective message and the according message 1 to 10. It is thus possible to specify the system with the collective message and to specify the reported system part in the pulse message. Moreover, a message can be sent to up to 20 recipients.

For control purposes, simple and pulse alarms may be triggered via AT commands. The status of the alarm inputs can be queried by AT commands or via DTMF tones.

Configuration with AT commands

In order to request the input states, use the command **AT**IN?**

12.18 Configure Alarms

The INSYS GSM 4.3 can react with the dispatch of an alarm message on switch events using its digital inputs. The INSYS GSM 4.3 uses a single, long pulse or a sequence of short pulses to trigger the message dispatch. The INSYS GSM 4.3 can establish a voice connection as an alternative to the single message dispatch via the single pulse. The number of pulses is used to address up to ten messages per input and send them to one individual or several recipients. You are able to assign one individual recipient as well as up to 20 additional recipients to each message for each input. The alarm events are processed separately for each input. The maximum length of the alarm text with preceding collective message is 140 characters. The INSYS GSM 4.3 can send alarm messages either as SMS to a GSM device (mobile phone or another INSYS GSM 4.3), or via a data connection to a modem. If SMS dispatch is used, the INSYS GSM 4.3 must be configured with the phone number of an SMS Service Center (refer to the GSM – Service Center Numbers section at the end of this manual). For sending a message with a single alarm, the data connection can either be kept open as long as the alarm input is active (“long data connection”) or closed immediately after sending the message (“short data connection”). You can communicate with INSYS GSM 4.3 or the device connected to the serial interface as long as the data connection is open. In case of an alarm by a “pulsed alarm input”, the data connection will be closed immediately after the message has been sent.

Configuration with HSComm

In order to configure the **SMS Service Center Number**, click on the “Basic Settings” tab on the “GSM Connection” panel the “read SCN” button or enter it manually into the entry field “Service Center Number”.

In order to configure the **dispatch of a single message** via one “single alarm”, select on the “Alarm” tab for the respective alarm input of the INSYS GSM 4.3 “single alarm” in the drop-down list “alarm trigger”. Select the **medium for the alarm transmission** via the drop-down list “alarm transmission by”. Enter the alarm text into the entry field “individual message”. Enter the number of the message recipient into the entry field “recipient number”. In order to **send the single message to further recipients**, change to the “Additional Recipients” tab. Activate the check box for the respective recipient and enter the numbers of the additional recipients into the entry fields “recipient 1-20”

In order to **delete the assignments for additional recipients**, click onto the “delete all connections” button.

In order to configure the **dispatch of several messages** by a “pulsed alarm”, select on the “Alarm” tab for the respective alarm input of the INSYS GSM 4.3 “pulsed alarm input (1 to 10)” in the drop-down list “alarm trigger”. Select the **medium for the alarm transmission** via the drop-down list “alarm transmission by”. Enter a general alarm text into the entry field “collective message”. Enter the specific alarm text for the respective pulse number into the entry field “individual message”. Enter the number of the respective message recipient in the entry field “recipient

ent number". In order to **send the message to further recipients**, change to the "Additional Recipients" tab. Activate the check box in the matrix of the respective input for the respective recipient and the number (corresponds with the number of pulses) of the message. Enter the number of the additional recipient into the entry fields "recipient 1-20".

In order to **delete the assignments for additional recipients**, click onto the "delete all connections" button.

In order to **establish a voice connection to a specified phone number** in case of an alarm at the input, select on the "Alarm" tab for the respective alarm input of the INSYS GSM 4.3 "single alarm" in the drop-down list "alarm trigger". Select "voice" as **medium for the alarm transmission** via the drop-down list "alarm transmission by". Enter the phone number, to which the voice connection is to be established, into the entry field "recipient number".

Configuration with AT commands

In order to **configure the behaviour of the INSYS GSM 4.3 in case of an alarm at the inputs**, use the command

Replace here

<in> with the input number

<mode> with the number of the action,

where the following is valid:

0 for no action (no dispatch)

1 for single SMS dispatch

2 for single message dispatch via data connection

3 for message output via data connection, hang up after message dispatch

4 for pulse-based SMS dispatch

5 for the establishment of a voice connection

ATINPUT<in>=<mode>**

In order to **read out and store the phone number of the SMS Service Center from the SIM card**, use the command

ATSCN=S**

Please note that a capital "S" must be entered!

In order to **enter the phone number of the SMS Service Center**, use the command

Replace <number> with the phone number of the SMS Service Center. If no number is entered behind the "=", the SMSC number will be deleted.

ATSCN=<number>**

In order to **enter the messages**, use the command

Replace **<in>** with the number of the input, to which the alarm message is to be assigned, **<n>** with the index number 0-10 of the alarm message, and **<text>** with the alarm message text. The alarm message with the index number 0 will precede all alarm messages, which are assigned to the respective input. If you enter no message index number, the message will be written to index 1. If you enter no information for the input **<in>**, the message will be assigned to the index of the first input.

```
AT**MSG<in>,<n>=<text>
```

In order to **enter the recipient number of a message**, use the command

Replace **<in>** with the number of the input, to which the alarm message is to be assigned, **<n>** with the index number 1-10 of the alarm message and **<number>** with the phone number of the recipient.

```
AT**DST<in>,<n>=<number>
```

In order to **enter the phone numbers of additional recipients of a message**, use the command

Replace **<index>** with the index number 1-20 of the recipient phone number and **<number>** with the phone number of the recipient.

```
AT**POOL<index>=<number>
```

In order to **assign a message to additional recipients**, use the command

Replace **<in>** with the number of the input, **<n>** with the index number 1-10 of the alarm message, and **<index>** with the two-digit index number 01-20 of a recipient from the phone number index pool.

```
AT**COMBINE<in>,<n>=<index>
```

12.19 Switching Outputs

The INSYS GSM 4.3 has two switching outputs, OUT1 and OUT2. They can be controlled individually via AT commands, which can be transmitted to the INSYS GSM 4.3 via a terminal program or SMS. Besides this, the INSYS GSM 4.3 can switch the outputs, if a call comes in, an alarm is present at an input, a modem connection is established (control line DCD is enabled), or the GSM network is not available anymore. In addition, you can control the outputs via phone using DTMF tones.

Configuration with HSComm

In order to **select the event, which switches the state of the respective switch output N**, use on the "Control Output" tab for the respective output of the INSYS GSM 4.3 on the Control output" panel the check boxes under „activated by“. You can select "alarm at alarm input", "incoming call (RING)", "Switching with connection" or "GSM network loss" together. If you select "by command (AT, SMS, DTMF)", you can only change the state using AT commands via a terminal program, SMS message or DTMF tones.

Configuration with AT commands

In order to **configure the outputs**, use the command

Replace the parameters as follows:

<output> with

1 for control output 1

2 for control output 2

if the information is missing, output 2 is used

<man>, manual activation (AT/SMS/DTMF)

with

0 for not released

1 for released

```
AT**OUTPUT<output>=<man>[,<ri>,<net>,<alarm>]
]
```

<ri>, switching on incoming call (RING signal) with

0 for not enabled

1 for enabled

2 for modem connection (DCD) active

<net>, switching on loss of GSM network

with

0 for not enabled

1 for enabled (only if AT**GSMREQ=1).

<alarm>, switching on alarm on respective alarm input with

0 for not enabled

1 for enabled

In order to **enable output 1 "manually"**, use the command **AT**Out1=1**

In order to **disable output 2 "manually"**, use the command **AT**Out2=0**

In order to **pulse output 1**, use the command

Replace **<nn>** with the desired number of pulses. The pulse interval is approximately one second.

```
AT**OUT1=PULSE<nn>
```

12.19.1 SWITCH Command for Controlling the Control Outputs

The INSYS GSM 4.3 provides the command **SWITCH** for switching the control outputs using clear text names (switch alias). The clear text commands can then be transmitted to the INSYS GSM 4.3 via terminal program or SMS, to execute the respective switch operations. For this, the clear text names must be assigned to the respective SWITCH command before.

- ❗ The clear text names may have a length of up to 15 characters. Only the letters A-Z as well as the digits 0-9 may be used. They must also contain no empty spaces. Capitalization is ignored. If a clear text name is defined more than one time, only the first command with this clear text name will be executed.

Configuration with HSComm

In order to use clear text names for switch commands, select on the "Control Output" tab on the "Control output" panel the activation "by command".

In order to **assign a clear text name to a switch command**, enter on the "Control Output" tab on the "Switch alias definition" panel the desired clear text name (switch alias) into the entry field of the respective action.

Configuration with AT commands

In order to assign a clear text name to a switch operation, use the command

Replace the parameters as follows:

<output> with

1 for control output 1, and
2 for control output 2

```
AT**SWITCHENTRY<output>
>,<action>=<text>
```

<action> with the number of the respective pulse number or "0" for a continuous activation of the output

<text> with the desired clear text name

In order to assign the clear text name "Pump" to the switch command "Pulse output 1 3x" for example, use the command

```
AT**SWITCHENTRY1,3=Pump
```

In order to assign the clear text name "LightON" to the switch command "Enable output 2" for example, use the command

```
AT**SWITCHENTRY2,0=LightON
```

In order to execute a switch command with a previously assigned clear text name, use the command

Replace **<text>** with the respective clear text name.

```
AT**SWITCH <text>
[<oper>]
```

If you don't use a pulse output, but a switch output, replace **<oper>** with the operator "1" or "On" to enable or "0" or "Off" to disable the output.

In order to pulse the output 1 three times for example and if it has been assigned as in above example before, use the command

```
AT**SWITCH Pump
```

In order to enable output 2 for example and if it has been assigned as in above example before, use the command

```
AT**SWITCH LightON 1
```

In order to disable output 2 for example and if it has been assigned as in above example before, use the command

```
AT**SWITCH LightON 0
```

You can also send the SWITCH command via SMS as AT command to the INSYS GSM 4.3, as described in the Operation via SMS section. You can then also do without the prefix **AT****.

12.20 Activate Switching / Querying of the Outputs / Inputs via DTMF

The outputs at the INSYS GSM 4.3 can be switched via the DTMF tones of a conventional telephone. The inputs can also be queried via DTMF tones. The input states as well as the responses of the switching processes will be transformed acoustically into tone sequences of well differentiated high and low tones.

Configuration with HSComm

In order to **enable the DTMF function**, activate on the "Basic Settings" tab on the "GSM Connection" panel the check box "DTMF processing".

After changing the DTMF settings, a reset must be performed that the changes become effective. For this, click on the "Reset" button in the field on the right.

Configuration with AT commands

In order to enable DTMF mode , use the command	AT**DTMF=1
In order to disable DTMF mode , use the command	AT**DTMF=0
In order to query the state of this function , use the command	AT**DTMF?
After changing the DTMF mode, the INSYS GSM 4.3 must be reset that the changes become effective. For this, use the command	AT**RESET

- ❗ If the DTMF processing is enabled, automatic call acceptance does not have to be enabled explicitly, because the INSYS GSM 4.3 accepts voice calls automatically in any case.

Switching and querying the outputs and inputs via DTMF can be protected with the optional DTMF PIN. The DTMF PIN protects the access for switching and querying the inputs/outputs via DTMF tones during a voice connection. The DTMF PIN consists of 4 digits.

- ❗ The DTMF PIN must not be mixed up with the PIN of the SIM card. These are two independent PINs.

Configuration with HSComm

In order to **enable the DTMF PIN**, click on the "Access Control" tab on the "Password for" panel on the "set PIN" button under "output control by DTMF". Enter the PIN into the "new PIN:" field and again into the "confirm PIN:" field and click the "OK" button.

In order to **change the DTMF PIN**, click on the "Access Control" tab on the "Password for" panel on the "set PIN" button under "output control by DTMF". Enter the old PIN into the "old PIN:" field and the new PIN into the "new PIN:" field and again into the "confirm PIN:" field and click the "OK" button. If you do not enter a new PIN, the DTMF PIN will be disabled.

Configuration with AT commands

In order to **set the PIN**, use the command

```
AT**PASST=<newPIN>,  
<newPIN>
```

Replace <newPIN> with the PIN and with the repetition of the PIN.

In order to **change the PIN**, use the command

```
AT**PASST=<oldPIN>,  
<newPIN>,<newPIN>
```

Replace <oldPIN> with the current PIN, and <newPIN> with the new PIN and with the repetition of the PIN.

In order to **delete the PIN**, use the command

```
AT**PASST=<oldPIN>
```

Replace <oldPIN> with the current PIN. If you do not enter a new PIN, the DTMF PIN will be disabled.

12.21 Switching the Outputs / Querying the Inputs via DTMF

This section describes how the outputs of the INSYS GSM 4.3 can be switched or pulsed with the help of the DTMF tones of a conventional telephone. The INSYS GSM 4.3 responds with a tone.

Acoustic responses of the INSYS GSM 4.3:

OK = short low tone, short high tone

ERROR = long low tone

Input ACTIVE = medium long high tone

Input INACTIVE = medium long low tone

The following commands (keys) are defined:

- 0* terminate connection
- 1*1 switch output 1 to NO
- 1*0 switch output 1 to NC
- 1#***<x>** pulse output 1 (<x> = number of pulses)
- 2*1 switch output 2 to NO
- 2*0 switch output 2 to NC
- 2#***<x>** pulse output 2 (<x> = number of pulses)
- 3* request alarm inputs

Login at the INSYS GSM 4.3 with a remote phone

- The DTMF mode at the INSYS GSM 4.3 is enabled.
- The selective call acceptance is deactivated or allows calls from the extension of the phone which you use to switch the outputs.
 - ① The acoustic "OK" is a short low tone, followed by a short high tone.
 - ① The acoustic "ERROR" is a long low tone.

2. Call the INSYS GSM 4.3.

- ✓ The INSYS GSM 4.3 will accept the call after a configured number of ring tones.
- ✓ The INSYS GSM 4.3 sends an acoustic "OK".
- ① The INSYS GSM 4.3 will now expect that the PIN is entered.

3. Enter the DTMF PIN.

- ✓ You will hear the acoustic signal for "OK" again.

- *If the wrong DTMF PIN has been entered, you will hear the acoustic signal for "Error" and the INSYS GSM 4.3 hangs up. Return to step 2.*

Switching the outputs

How to switch the outputs of the INSYS GSM 4.3 via DTMF.

- You are connected to the INSYS GSM 4.3 via phone.
- The DTMF mode is enabled.
- 1. *Press the numeric key "1" to select the output 1 or press the numeric key "2" to select the output 2 of the INSYS GSM 4.3 for switching.*
- 2. *Press the key "*" at the phone.*
- 3. *Press the numeric key "1" to activate the selected output; press the numeric key "0" to deactivate the selected output.*

✓ The INSYS GSM 4.3 responds with an acoustic "OK":

Pulsing the outputs

How to pulse the outputs of the INSYS GSM 4.3 via DTMF.

- You are connected to the INSYS GSM 4.3 via phone.
- The DTMF mode is enabled.
- 1. *Press the numeric key "1" to select the output 1 or press the numeric key "2" to select the output 2 of the INSYS GSM 4.3 for switching.*
- 2. *Press the key "#" at the phone.*
- 3. *Press the key "*" at the phone.*
- 4. *Press the numeric key "1" for the desired number of pulses, which are to be output at the selected output.*

ⓘ The numeric keys "1" and "0" must be pressed consecutively for 10 pulses. Therefore, the execution of 1 pulse is processed with a delay.

✓ The INSYS GSM 4.3 responds with an acoustic "OK":

Querying the inputs

How to query the inputs of the INSYS GSM 4.3 via DTMF.

- You are connected to the INSYS GSM 4.3 via phone.
- The DTMF mode is enabled.
- 1. *Press the numeric key "3" at the phone.*

2. *Press the key "*" at the phone.*

- ✓ The INSYS GSM 4.3 will output its input states. First input 1, then input 2. For the HIGH state, a long, high ton is produced; for the LOW state a low, long tone.

Terminating the connection

How to terminate the connection to the INSYS GSM 4.3.

1. *Press the numeric key "0" at the phone.*

2. *Press the key "*" at the phone.*

- ✓ The INSYS GSM 4.3 hangs up.
- ⓘ The INSYS GSM 4.3 will also terminate the connection automatically, if no entry was made for 25 seconds.

12.22 Remote Configuration of the INSYS GSM 4.3

In order to configure the INSYS GSM 4.3 remotely, a data connection with the INSYS GSM 4.3 to be configured must be established. This can be achieved by a call with any modem at the INSYS GSM 4.3. After changing into remote configuration mode, AT commands for configuring the INSYS GSM 4.3 can be transmitted.

A data connection between the modem and the INSYS GSM 4.3 must exist to change into remote configuration mode. A dedicated connection type is not required. We recommend using only error corrected connections for remote configuration to avoid transmission failures with the AT commands.

Configuration with HSComm

In order to **enable the remote configuration**, activate on the "Basic Settings" tab on the "GSM Connection" panel the check box "auto answer".

You can configure a password, which is queried after changing into remote configuration mode. In order to **enable the password**, click on the "Access Control" tab on the "Password for" panel the "set password" button under "remote configuration, control by SMS". Enter the password into the "new Password:" field and again in the "confirm Password:" field and click the "OK" button.

In order to **change the password**, click on the "Access Control" tab on the "Password for" panel the "set password" button under "remote configuration, control by SMS". Enter the old password into the "old Password:" field and the new password into the "new Password:" field and again in the "confirm Password:" field and click the "OK" button. If you do not enter a new password, the password will be disabled.

The selective call acceptance function allows for restricting the access to the INSYS GSM 4.3 for dedicated phone numbers.

Configuration with AT commands

In order to enable the remote configuration, the automatic call acceptance (after 2 ring tones for example) must be enabled.

ATS0=2

In order to **set the password**, use the command

ATPASSC=<newPW> , <newPW>**

Replace <newPW> with the password and with the repetition of the password.

In order to **change the password**, use the command

Replace **<oldPW>** with the current password, **<newPW>** with the new password and with the repetition of the new password.

```
AT**PASSC=<oldPW>,<newPW>,<newPW>
```

In order to **delete the password**, use the command

Replace **<oldPW>** with the current password. If you do not enter a new password, the password will be disabled.

```
AT**PASSC=<oldPW>
```

Perform the remote configuration

In the following, we show how you can configure the INSYS GSM 4.3 remotely.

→ You will need a modem which you can use to establish a connection to the INSYS GSM 4.3.

→ You will need a terminal program.

1. *Open your terminal program.*

2. *Establish a connection to the INSYS GSM 4.3. Use the local modem to dial the phone number of the INSYS GSM 4.3 with ATD<phonenumber>.*

✓ The local modem establishes a connection.

3. *After the connection has been established, enter * (three asterisks). This will switch you into remote configuration mode. Wait at least 1 second before and after entering *** and do not finish the entry with the Enter key.***

✓ If you have configured a password, you will now need to enter it now.

✓ After you successfully entered the password, the INSYS GSM 4.3 will send a prompt in form of an ">".

✓ You can now configure the INSYS GSM 4.3 remotely.

ⓘ Some AT commands are not available in remote configuration mode (refer to the AT Command Reference).

4. *Finish the remote configuration by entering ATEXIT.***

✓ The INSYS GSM 4.3 is now in the normal data connection mode. You can now exchange data between your local modem and the INSYS GSM 4.3, or terminate the connection.

ⓘ Enter *** to re-initiate a remote configuration.

12.23 Configure Remote Configuration via SMS

You are able to send the extended INSYS AT** commands to the INSYS GSM 4.3 via SMS as well.

The commands sent via SMS will be executed as soon as the INSYS GSM 4.3 is in command mode.

- ❗ If selective call acceptance is enabled, commands, which are sent from mobile phones with a phone number, which is not entered in the CLIP list, are rejected.

Configuration with HSComm

In order to **enable the remote configuration via SMS**, activate on the "Basic Settings" tab on the "GSM Connection" panel the check box "automatic SMS processing".

You can configure a password, which is queried after changing into remote configuration mode. In order to **enable the password**, click on the "Access Control" tab on the "Password for" panel on the "set password" button under "remote configuration, control by SMS". Enter the password into the "new Password:" field and again in the "confirm Password:" field and click the "OK" button.

In order to **change the password**, click on the "Access Control" tab on the "Password for" panel on the "set password" button under "remote configuration, control by SMS". Enter the old password into the "old Password:" field and the new password into the "new Password:" field and again in the "confirm Password:" field and click the "OK" button. If you do not enter a new password, the password will be disabled.

Configuration with AT commands

In order to **enable automatic SMS processing**, use the command

```
AT**SMSRX=1
```

In order to **enable automatic SMS processing** and keep SMS not intended for the INSYS GSM 4.3 in the memory, use the command

```
AT**SMSRX=2
```

In order to **disable automatic SMS processing**, use the command

```
AT**SMSRX=0
```

In order to **set the password**, use the command

```
AT**PASSC=<newPW> , <newPW>
```

Replace <newPW> with the password and with the repetition of the password.

In order to **change the password**, use the command

Replace **<oldPW>** with the current password, **<newPW>** with the new password and with the repetition of the new password. If you do not enter a new password, the password will be disabled.

```
AT**PASSC=<oldPW>,<newPW>,<newPW>
```

12.24 Configure Periodic Alive Message

The INSYS GSM 4.3 can send an alive message daily, weekly, or monthly as SMS message to a specified phone number.

Configuration with HSComm

In order to configure the dispatch of a periodic alive message, enter on the "Basic Settings" tab on the "System Monitoring" panel into the entry field "recipient" the phone number, to which the message is to be sent via SMS.

Enter the text, which is to be sent in the alive message via SMS into the entry field "text".

Enable the periodic alive message by configuring a daily, weekly, or monthly dispatch time using the drop-down list "time".

Configuration with AT commands

In order to configure the number for the periodic alive message, use the command	AT**ALIVEDST=<number>
--	------------------------------------

In order to configure the text for the periodic alive message, use the command	AT**ALIVEMSG=<text>
--	----------------------------------

In order to enable the periodic alive message, use the command

Enter the following for <mode>:

Daily alive message:

<mode> = **D**,<time>

<time> = time in format hh:mm

Weekly alive message:

<mode> = **W**,<day>,<time>

<day> = weekday (MO, TU, WE, TH, FR, SA, SU)

<time> = time in format hh:mm

ATALIVE=<mode>**

Monthly alive message:

<mode> = **M**,<day>,<time>

<day> = day (1...31)

<time> = time in format hh:mm

In order to disable the periodic alive message, use the command

ATALIVE=**

12.25 Configure Power-Up SMS

If this function is enabled, the INSYS GSM 4.3 sends an SMS after each interruption of the power supply for more than 5 seconds (not reset).

The INSYS GSM 4.3 adds date and time to the power-up SMS.

Configuration with HSComm

In order to **configure the dispatch of a power-up SMS**, activate on the "Basic Settings" tab on the System Monitoring" panel the check box "Power-Up-SMS" and enter into the entry field "Destination" the phone number, to which the power-up SMS is to be sent, as well as in the entry field "Message" the text to be sent.

Configuration with AT commands

In order to enable the power-up SMS , use the command	AT**POWER=1
In order to configure the number for the power-up SMS , use the command	AT**POWERDST=<number>
In order to configure the text for the power-up SMS , use the command	AT**POWERMSG=<text>
In order to disable the power-up SMS , use the command	AT**POWER=

12.26 Manual Sending of Messages

The collective message or the individual pulse messages can be sent manually.

Configuration with HSComm

A manually triggered dispatch of the messages with the HSComm software is not possible.

Configuration with AT commands

In order to **send the commands**, use the command

Replace **<input>** with the number of the input, for which the SMS is to be sent.

```
AT**SMS=<input>,<pulse_no>
```

Replace **<pulse_no>** with the pulse number, for which the SMS is to be sent (1...10). If a single alarm is configured, 1 must be entered here.

If the messages 1 to 10 are triggered, the sent message will always consist of the collective message and the attached pulse message. The message will be sent to the configured recipient number as well as all possibly configured additional recipients.

12.27 Operation with a PLC

The INSYS GSM 4.3 can be operated at a programmable logic controller. Settings recommended by INSYS for a INSYS GSM 4.3, which is used at the PC to communicate with the PLCs, are available for certain controllers. The respective configuration files can be found under <http://www.insys-tec.de/en/en/plc/> or in the "Configuration for PLC" section of the CD delivered with the unit.

Configuration with HSComm

You may load setting files into HSComm under the menu item "PLC". Moreover, you can store settings for the PLC to a file. You can send these settings to the INSYS GSM 4.3 then.

Configuration with AT commands

You can also perform these settings with AT commands. The settings depend on you PLC and cannot be given here generally therefore.

12.28 Event History

The INSYS GSM 4.3 provides a history function to record events. This takes up to 200 entries chronologically as circular buffer (FIFO), i.e. the oldest messages are overwritten in case of more than 200 entries.

Configuration with HSComm

In order to display the history, click on the "History" tab on the "History" button.

Configuration with AT commands

In order to **display the history**, use the command

ATHISTORY?**

After reading out the history, the entries are displayed chronologically starting with the oldest entry (if the real-time clock has been set or reset before, entries with an "earlier" date may be displayed later). If the list contains less than 200 entries, only these are displayed.

The history contains the following information:

- **Num** Number of the entry in the history
- **Date/Time** Time stamp of the history
- **Reason** Event that has led to the entry
- **Detail** Specification of the event that has led to the entry
- **Dir** Direction of the event (if applicable)
IN = incoming call or SMS
OUT = outgoing call or SMS)
- **Number** Phone or alarm input number related to the event (if applicable)

Table 12 on page 82 lists the recorded events and thus the possible entries in the history.

Reason	Detail	Description
SYSTEM	RTC ERROR	Internal real time clock empty (time stamp empty)
	RTC RESET	Internal real time clock has been reset since the goldcap was discharged (power reserve exhausted) time stamp: 00:00:00 01.01.03
	GSM ERROR	Instruction from controller to GSM engine could not be processed correctly (e.g. AT command, dial-up, SMS dispatch...)
	SIGNAL ERROR	Field strength not ascertainable (AT**SIGNAL?: 99)
	LOGOUT	GSM engine logged out (update interval like STATUS LED)
	LOGIN	GSM engine logged in (update interval like STATUS LED)
	REMOTE PARAM	Remote configuration starts (***) detected)
	ALIVE	Alive SMS process starts
	Reset	Software / hardware reset
	POWER UP	Power up; power supply restored
SECURITY	DPW ERROR	Data password has been entered wrong or timeout expired
	PPW ERROR	Configuration password has been entered wrong or timeout expired
	TPW ERROR	DTMF PIN has been entered wrong or timeout expired
	CLIP ERROR	Call with invalid (rejected) phone number
	SECURITY CALL-BACK	Security callback process starts
ALARM	Start	Alarm at alarm input detected
	Quitt	Acknowledgement of an alarm message performed
	End	Alarm at alarm input processed
VOICE	Start	Outgoing voice connections Incoming voice connections for activated DTMF processing Number for outgoing calls Number for incoming calls for activated selective call acceptance
	End	Voice-Verbindung beendet
DATA	Start	Datenverbindung aus- bzw. eingehend; eingehende Nummer nur bei aktivierter selektiver Rufannahme verfügbar
	End	Voice connection terminated
SMS	Power-Up	Power up SMS dispatched
	-----	Alarm or periodic alive SMS dispatched
	PARAM	SMS for configuration has been received*
	QUITT	SMS with the text QUITT has been received*
	QUITT	SMS for acknowledging an configuration SMS has been sent*
DTMF	PARAM	DTMF command has been detected

Table 12: History - possible entries

*) Automatic SMS processing must be activated.

12.29 Reset of the Device

There are several methods to reset (restart) the INSYS GSM 4.3: by briefly cutting off the supply voltage, by pushing the Reset button on the front of the device, by connecting the Reset terminal with the GND terminal, by using an AT command and by using the HSComm software. Resetting to factory defaults is also possible by pushing the Reset button on the front of the device or connecting the Reset terminal with the GND terminal for at least 25 seconds, as well as by using an AT command or the HSComm software.

Configuration with HSComm

To **restart** the INSYS GSM 4.3, click on the button “Reset” in the field on the right.

To reset the INSYS GSM 4.3 to **factory defaults**, click on the button “Send default settings” in the field on the right.

Configuration with AT commands

To **restart** the INSYS GSM 4.3, use the command

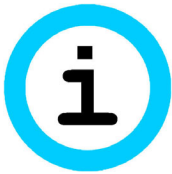
ATRESET**

To reset the INSYS GSM 4.3 to **factory defaults**, use the command

ATDEFAULT**

12.30 Firmware Update

Note



Function loss due to faulty update!

The INSYS GSM 4.3 may lose its function, if it is updated with a wrong firmware or if the transfer of the firmware was faulty.

Before updating the firmware of the INSYS GSM 4.3, contact the INSYS MICROELECTRONICS support department. They will provide you with the suitable firmware version for your INSYS GSM 4.3.

The firmware of the INSYS GSM 4.3 can be updated to add more functions to the INSYS GSM 4.3 or to improve the existing functions. A firmware update can be performed with the help of a terminal program that supports ASCII uploads (e.g. TeraTerm).

Firmware-Update mit einem Terminalprogramm

How to load new firmware to the INSYS GSM 4.3.

- You will need a terminal program that supports ASCII file transfers, such as TeraTerm or the terminal function of HSComm.
- You will need the firmware that is suitable for your INSYS GSM 4.3.
- The INSYS GSM 4.3 is connected to the PC.

1. *Start your terminal program.*
2. *Activate hardware handshake in the terminal program.*
3. *Set the baud rate in the terminal program to 19200 baud and the protocol to 8N1.*
4. *Enter "AT" and confirm with "Enter".*

✓ The INSYS GSM 4.3 responds with **OK**:

➤ *If the INSYS GSM 4.3 does not respond, check the connection and if the device receives power at all. Continue with step 4.*

ⓘ The firmware upload can not function without the hardware handshake. The input buffer at the serial interface of the INSYS GSM 4.3 flows over and the INSYS GSM 4.3 resets itself. In this case, you will hear the relays click after the upload. It is possible that an error message is displayed.

ⓘ Before you start with the upload, ensure that no other programs are

active on your system, which could interrupt the data flow at the serial interface. Opening a DVD drive, playing music or connecting a USB device can also disturb or interrupt the data flow. As a result, the INSYS GSM 4.3 may fail to function, and only INSYS MICROELECTRONICS might be able to restore it.

5. Type `ATFLASH` to start the firmware upload.**

- ✓ The modem reports "start update with ESC, Reset with @".

6. Press the Esc key to start the update.

- ✓ The modem reports "Expecting download with 8N1"
- *If the firmware is damaged or protocol and/or baud rate are unknown, you can also perform a reset and press the Esc key within a second then to enable the bootloader. This can only be made locally.*

7. Send the MHX file with the firmware now with the terminal program.

- ① If you use the terminal function of HSComm, you have to use the function "Send file ..." in the File menu.

- ✓ The upload progress is displayed by dots in the terminal window.

- ✓ The INSYS GSM 4.3 reports the successful upload of the firmware loader, for example with

```
BL: ACFA
FR: 01D0
FB: 78FE-01D0
```

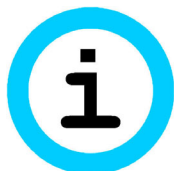
Ready

- ✓ The INSYS GSM 4.3 resets automatically and is then ready for operation again.

- *If you didn't receive the previous message for a successful upload, the upload has most probably failed. Try to reset the INSYS GSM 4.3 and to repeat the process from step 5. If this fails and the INSYS GSM 4.3 does no longer react to AT commands, please contact the INSYS MICROELECTRONICS support department.*

13 Firmware History

Note



Function loss due to faulty update!

The INSYS GSM 4.3 may lose its function, if it is updated with a wrong firmware or if the transfer of the firmware was faulty.

The INSYS GSM 4.3 is based on a different hardware than its predecessor product INSYS GSM 4.2. Uploading a firmware version before 2.40 is not possible.

Date	Version	Description
27.03.2009	2.40	<ul style="list-style-type: none"> • Adaption to an extended HW platform • Extension of the DTMF functions • Buffering the alarm inputs • Reading out the SCN from the SIM card • Automatic determination of the callback number • Increase of the CLIP entries to 30 • Switching the outputs via clear text commands • Switching the outputs via the control line DCD • Manual SMS dispatch also to additional recipients

Table 13: Firmware history

14 Maintenance, Repair and Troubleshooting

14.1 Maintenance

The product is maintenance-free and does not require special regular maintenance.

14.2 Troubleshooting

If a failure occurs during the operation of the product, you will find troubleshooting tips in the "Knowledge Base" on our web site (<http://www.insys-icom.de/knowledge/>). If you need further support, please contact the INSYS icom Support. You can contact our support department via e-mail under support@insys-tec.de and via phone under +49 941 58692-0.

14.3 Repair

Send defect devices with detailed failure description to the source of supply of your device. If you have purchased the device directly from INSYS icom, send the device to: INSYS MICROELECTRONICS GmbH, Waffnergasse 8, 93047 Regensburg.

Caution!



Short circuits and damage due to improper repairs and modifications as well as opening of products.

Fire hazard and damage of the product.

It is not permitted to open the product for repair or modification.

15 GSM Service Center Numbers

The following is an overview of the most important mobile phone providers in Germany, Austria and Switzerland. All information is without guarantee of correctness and completeness. The specified numbers may only be valid for certain contracts with the mobile phone provider. More recent information and information about other providers can easily be taken from the internet.

You'll find the current data for your SIM card in your contract documents.

Country	Operator	Network	Short message center number (SMSC)	Fax prefix	Number of the e-mail gateway
D	T-Mobile	T-D1	+49 171 076 0000 +49 171 209 2522	99 (German) 98 (English)	8000
D	Vodafone D2	D2 Vodafone	+49 172 227 0000 +49 172 227 0042 +49 172 227 0111 +49 172 227 0010 +49 172 227 0222 +49 172 227 0333	99	3400
D	E-Plus	E-Plus	+49 177 061 0000 +49 177 060 0000 +49 177 062 0000	1551	767 62 45
D	O2	O2	+49 176 0000 443 +49 176 0000 433	329	6245
D	Mobilcom	D1	+49 171 076 0315	1091	1090
D	Mobilcom	D2	+49 172 227 0880	1091	
D	Mobilcom	E-Plus	+49 177 061 0000	1551	
A	Mobilkom	A1	+43 334 0501 +43 664 0501	-	-
A	max.mobil		+43 676 021	6762	6761
A	One (Connect)		+43 699 000 1999	-	-
CH	Orange	Orange	+41 78 777 7070		
CH	Swisscom	Swiss GSM	+41 79 499 900 0 +41 79 499 812 3		
CH	TDC	sunrise	+41 76 598 0000		

16 Waste Disposal

16.1 Repurchasing of Legacy Systems

According to the new WEEE guidelines, the repurchasing and recycling of legacy systems for our clients is regulated as follows:

Please send those legacy systems to the following address, carriage prepaid:

Frankenberg-Metalle
Gaertnersleite 8
D-96450 Coburg
Germany

This regulation applies to all devices which were delivered after August 13, 2005.

17 Declaration of Conformity

This device complies with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility 2004/108/EC and the Council Directive relating to Low Voltage 2006/95/EC as well as the Council Directive R&TTE 1999/5/EC.

We will gladly send you a copy of the declaration of conformity on request.

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