

*ISDN-GSM Interface*  
**AS52x**

**- Operation Manual -**

Thank you for using a GSM interface with your telecommunication system. This digital cellular telephone interface is designed for use in the GSM (Global System for Mobile communications) network. GSM is the international standard for cellular communication, available in most European countries and many other parts of the world. This product is in conformance with the CE approvals for GSM applications of the European Community.

**Please, read the manual!**

The AS 52X operates with radio signals which might be subject to interference. It is recommended to use the interface with the external antennas positioned outside of the building.

**Insert the plug-in SIM cards:**

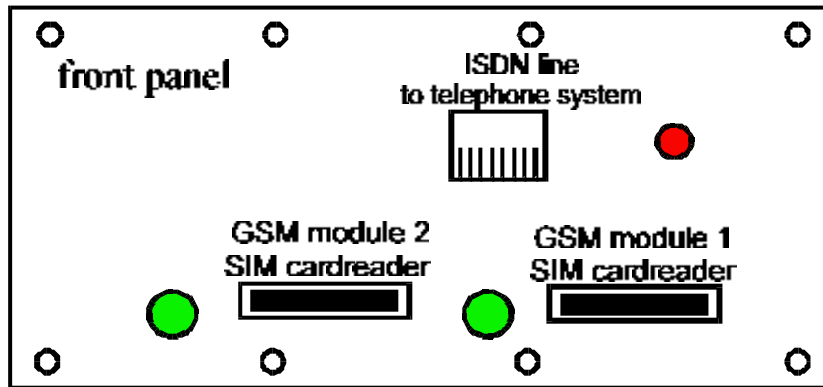
The AS 52X needs a valid (mini) plug-in SIM card (Subscriber Identification Module) from your service providers for each GSM transceiver.

Remove the card carrier by a push on the yellow button of the card reader terminal.  
Place the SIM-card into the carrier and put both back into the carriers slot.

Remark: Telephone numbers stored on your SIM card cannot be used by this interface!  
The PIN request of the SIM card can be answered by the interface if the PIN Code is programmed in the set up. This is necessary for the "stand-alone-mode".

- NOTICE! Before starting the setup configuration assure:
- that you know the PIN code of the SIM card
  - that the SIM does work in your network
  - that there is no call forwarding on this number
  - that call waiting functions are prohibited

**Operating elements and connectors on the frontpanel:**



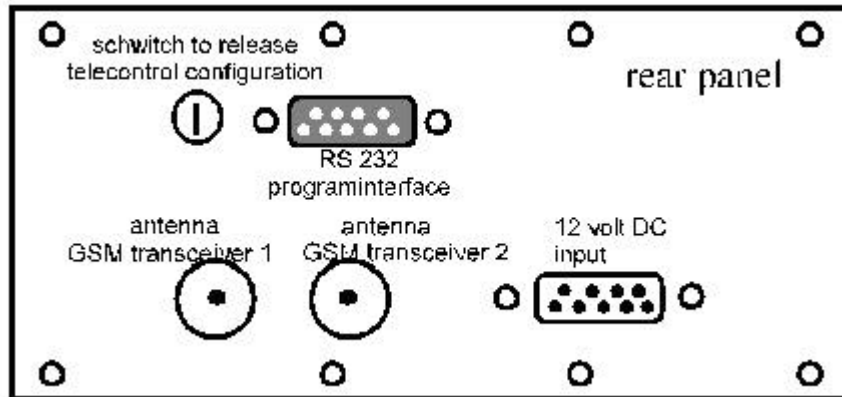
- |   |  |
|---|--|
| RJ 45 jack  | for connecting the ISDN line of the PABX, internal or external ISDN line, point to point or point to multipoint connection                   |
| green LED's   | on - assigned GSM transceiver is registered on the network<br>off - no GSM-service available<br>flashing quickly: AS 52X interface is in use |
| error messages:   |  |
| every 2 seconds 1 x flashing:   | GSM transceiver not installed  |
| every 2 seconds 2 x flashing:   | SIM card not installed   |
| every 2 seconds 3 x flashing:   | SIM card PIN not programmed  |
| every 2 seconds 4 x flashing:   | programmed PIN is unknown  |
| every 2 seconds 5 x flashing:   | programmed PIN is wrong  |
| every 2 seconds 6 x flashing:   | last try to enter PIN  |
| There is only one attempt left. To prevent that the SIM card is blocked the interface does not try a 3rd PIN entry. |  |
| 7 x flashing:   | more than 2 minutes not booked onto a GSM network  |
| 10 x flashing:  | error exchanging data  |
| red LED   | on - connection to telephone system works well   |
| error messages:   |  |
| every 12 seconds 3 x flashing:  | no S <sub>0</sub> connection to PABX   |
| After switching on 5 x flashing [only one time]:  | configuration memory error   |

### **Diagnostics:**

The 'tracing' option can be started in the Windows configuration software through 'Maintenance' -> 'Dokumentation'. You can now view all the GSM and ISDN communication that the box is handling. By clicking in 'additionally write into file' you can specify a name and a directory in order to save the trace. After finishing the trace, you can send it by email to [produktion@kuhnt.de](mailto:produktion@kuhnt.de), after which our technicians can analyse the data and offer a solution.

While tracing, the AS52x needs to be connected to a PC by a serial cable. Furthermore, the product needs to be connected to the PBX

### **Operating elements and connectors on the rearpanel:**



BNC jacks	for connecting an external antenna Each GSM transceiver needs its own antenna!
9 way D type plug	12 volt input
9 way D type jack	to RS232 interface of a PC for setup programming the ISDN interface
switch beside RS 232	to allow remote controlled configuration by SMS

### **Connect the power supply:**

If you want to use the 230 volt power supply (order no. 200505), connect it to the 9 way D type plug on the backside of the interface.

If you want to use another power supply, it must have following technical ratings:

output voltage:	13,8 volt
fan-out current:	more than 2,5 ampere
pin seizure:	pin 1/2/6 positive pole pin 4/5/9 negative pole connection between pin 7 and pin 8

### **Connecting the antennas:**

There are two "BNC" jacks at the backpanel of the interface prepared to connect a dual antenna with each of the GSM module of the AS 52X. Please assure when mounting the antenna that the received field strength is satisfying.

### **Program interface:**

Via the 9 pin jack on the rear panel, connected to the RS 232 of a PC, the interface can be programmed. For programming-details refer to: Configuration on page 3 of this manual.

### **Remote controlled configuration setup:**

The AS 52X setup is also programmable by SMS messages via GSM from a wireless extension.

If the switch beside the 9 pin jack on the rear panel is for locking and unlocking this function. Only the manufacturer is able to program the interface by SMS.

### Connect the ISDN PABX:

The AS 52X must be connected to the ISDN port of an ISDN communication system. It is programmable to work at the internal S<sub>0</sub>, or at the external T<sub>0</sub> port of a ISDN telephone system. For details in programming look at point: Configuration program.

The pinning of the RJ 45 jack is switched through the configuration. This jack must be connected 1 : 1 to the standard ISDN connector of the communication system. The AS 52X works with EDSS 1 or QSIG protocol and therefore it is able to work with the most modern ISDN communication systems.

### Configuration program of the AS 52X:

Any operation mode of the interface can be set with this configuration software.

The screenshot shows the AS522 configuration software interface. It is divided into three main sections: Radio-settings, General settings, and ISDN-settings. The Radio-settings section includes fields for PIN (1, 2), Net-Code (1, 2), CLIR (Yes/No), Volume-Level (GSM -> PABX, PABX -> GSM) with 0 dB dropdowns, LF Operation-mode (Simplex/Duplex), Min. signal quality (%), and Timeout DTMF-recognition (600 ms). The General settings section includes Timeout for autostart (4 s), Amount of digits for autostart (11), Internat. area code, Country-code, Fix subscriber number, Delay of fix subscriber (Off), and four dialling tone dropdowns (Continuous, Single short, Special). It also has buttons for 'Edit routing-table' and 'Callback', and radio buttons for Traffic direction (Both directions, PABX -> GSM-network, GSM-Network -> PABX) and a checked 'Reset-function' checkbox. The ISDN-settings section includes Operation-mode of the S0-interface (Subscriber), Phone number for DTMF suffix dialling, Own subscriber number at PABX, Connection-check (Restart), and an 'Edit abbreviate dialling list' button. At the bottom are buttons for 'O.K.', 'Print', 'Help', and 'Cancel'.

On the 3,5" disk you find the configuration software. You need to install it through setup.exe. Connect a COM port of the PC to the RS232 interface of the AS 52X by using a standard serial cable cord (9 pin plug ↔ 9 pin jack connected pin1↔1, pin2↔2, pin3↔3 and so on). Connect the AS 52X to the power supply. The AS 52X starts with auto-power on. If not, check the power supply (esp. bridge between pin 7 and 8 of the connector).

Now start the program.

The configuration software communicates with the AS 52X interface and you can upload the actual settings into the PC. If an error occurs try to change the COM port or check the connection from PC to AS 52X Interface.

In every program section there is detailed information about the available options.

After scanning the parameters of the interface, information about the type of interface, about the hard- and software version and the IMEI numbers of the installed GSM modules is shown.

The following parameters can be switched or be adjusted:  
(default menu items are shown according to the entry)

	<u>factory setting:</u>
- PIN code of SIM card used in module 1	no entry
- PIN code of SIM card used in module 2	no entry
- Netcode 1: locks SIM1 to a specific network	no entry
- Netcode 2: locks SIM2 to a specific network	no entry
- CLIP 1: Presentation of Calling Line Identification SIM1	SIM standard
- CLIP 2: Presentation of Calling Line Identification SIM2	SIM standard
- level of incoming volume from GSM	0db
- level of outgoing volume to GSM	0db
- operation mode of the interface	duplex
- minimum signal quality	no entry
- timeout of DTMF-tone recognition via GSM	0,6sec.
- time out for automatic hook up (outgoing calls)	4,0sec
- amount of digits for autostart (outgoing calls)	11
- remote reset function	on
- fix subscriber number for incoming call	no entry
- delay of fix subscriber number	off
- International accesscode for a + digit (international calls)	no entry
- routing table for outgoing calls	no entry
- callback	no entry

There are 15 different announcements, dialling tones or melodies available for the following three entries

- dialling tone during outgoing call from the telephone system	continuous tone
- tone after end of dialling from telephone system	single tone pulse
- dialling tone during connection set-up via GSM [incoming call]	special dialling tone
- traffic direction ( PBX→GSM / GSM→PBX / PBX ↔ GSM)	both directions
- operational mode of the ISDN-interface	Subscriber
[possible entries: 'Subscriber', 'Tie Line – DSS1/QSIG'	
'NT-Simulation, Point-to-Point' and 'NT-Simulation, Point-to-Multipoint']	
- own MSN in the communication system	no entry
- MSN for AS 52X as a telephone terminal	no entry
- 10 MSN for short-code dialling ( telephone terminal )	no entry

In case the operation mode of the interface is set as direct connection (Tie-line, point to point mode) the following new item will appear:

- dial number of the direct connection (point to point line)	no entry
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In case of the operation mode of the interface is set as network termination point to multipoint mode the following new items appear:

- lead dialling digits	no entry
- amount of digits GSM→PABX (incoming calls)	no entry

In case of the operation mode of the interface is set as network termination point to point mode the following new item appears:

- lead dialling digits	no entry
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After every setting the last item is:

- immediate simulation of voice-grade channel	off
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The programming of the interface can be terminated by entering a "1" to confirm the settings, with a "2" to cancel it or with a "3" make a printout. The AS 52X turns off after quit of program but it will turn on again few seconds later by itself and lock into the GSM network.

### **Routing table for outgoing calls:**

If two GSM transceivers are installed outgoing calls can be assigned to a fixed module through a certain prefix. For example if different network providers should be used. It is also possible to reserve one module for outgoing calls and the other one for incoming calls.

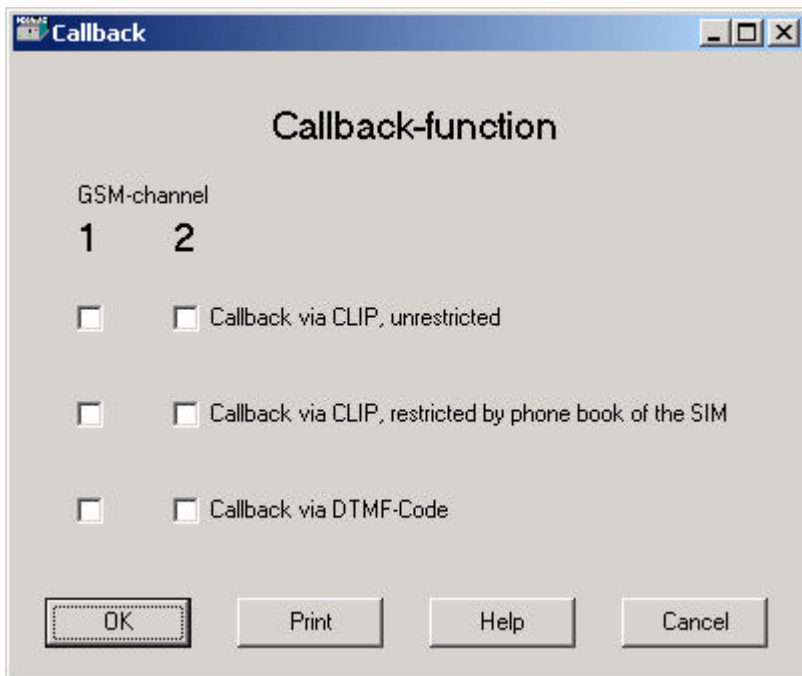
The preferences will be selected by the first digits of the dialled phonenumber. The routing table can be set for up to 7 different phonenumbers. Outgoing calls to defined phonenumbers or to every not defined phonenumber can be disabled.

The preferences includes:

- connection set-up preferably with GSM transceiver 1 or 2
- connection set-up exclusively with GSM transceiver 1 or 2
- no connection at all

There are different ways to route incoming and outgoing calls over the PABX to GSM resp. from GSM to PABX. The basic functions always stay similar, but it is a question of quality of performance you will come up to. With the AS 52X interface many options are available!

### **Callback (only available with special software within AS52X)**



The callback function can be activated per SIM [GSM Channel

#### **Callback via CLIP, unrestricted**

A person calls the GSM-number of the AS52x. The box recognises the caller (via CLIP) and does not answer the call [no charges apply]. The box now automatically calls the person back [within appr. 8 seconds].

#### **Callback via CLIP, restricted by phone book of SIM card**

On the SIM cards, a so called 'white list' can be created. Only those GSM numbers that appear on this SIM will be called back. This 'white list' can not be larger then the available positions on the SIM (e.g. 200 position on high capacity SIMs). The functionality is equal to the one described under 'unrestricted callback, only the extra restriction prevents misuse. For programming telephone numbers on a SIM, a special software tool can be used: PhoneFile PRO. For further information: [www.mcs-nl.com](http://www.mcs-nl.com)

## Callback via DTMF code

Also referred to as 'manual callback'. Works as described under 'Callback via CLIP, unrestricted', but now offers callers without CLIP the possibility to activate callback manually. Their phonenumber needs to be present on the SIM in order to achieve this. An external caller without CLIP will have to sub-dial a "\*" and his position on the SIM. E.g. his number is present on the SIM at position 5. He dials the number of the SIM Box and after the box has answered his call, he needs to dial "\*05" in order to activate the callback to his number. During this time, already costs occur. The box now disconnects and calls back. For programming telephone numbers on a SIM, a special software tool can be used: PhoneFile PRO. For further information: [www.mcs-nl.com](http://www.mcs-nl.com)

## **Connection to the internal S<sub>0</sub> port of the telephone system:**

### **Using as a telephone terminal (Subscriber, point to multipoint: PTM):**

First the user has to dial the MSN of the AS 52X interface in the telephone system, he will hear the dialling tone or an announcement. Now a call can be made via GSM by dialling the desired number (DTMF). The digits are generated by your telephone now. This might cause trouble when using systemexclusive phones.

Notice! Always type the complete telephone number including the area code, because you are using the GSM-mobilphone-network.

Within the AS 52X you can program up to ten different MSN's which could be allocated to different telephone numbers as a kind of short dial code.

For example:

MSN 10	dials phone number 12345
MSN 11	dials phone number 23456
MSN 12	dials phone number 34567 and so on.

### **Using as a tie line (point to point: PTP – DSS1/QSIG):**

If the interface is set as a tie line (also named as point to point connection) the complete dialling information for the AS 52X is transmitted as a digital string on the data channel of the ISDN bus. No extra DTMF dialling is necessary. The use of least cost routing functions and short code dialling right out the memory of the communication system improves your telephone comfort via GSM.

## **Connection to the external T<sub>0</sub> port (NT simulation) of the telephone system:**

This connection type should only be used with telephone systems that are not able to provide an internal S<sub>0</sub> port with DSS 1 or QSIG protocol.

First the user has to dial the exchange line to which the AS 52X interface is connected to. After receiving the exchange from the interface he hears a dialling tone. Now a call can be made via GSM by dialling the desired number. The use of least cost routing functions and short code dialling right out the memory of the communication system improves your telephone comfort via GSM.

## **Incoming calls from the GSM-network:**

For handling incoming calls via the GSM-network it does not matter whether the AS 52X interface works at the internal or at the external ISDN port of the telephone system.

## **The interface accepts a call from GSM by autoanswering.**

The caller hears what is set at item: "dialling tone during connection set-up via GSM"

Select the subscriber's extension number you want to speak with by typing in DTMF tones

**Notice!** In this mode you already have to pay for the call while dealing DTMF tones. Meaning, you will be charged even if there has been no voice communication.

## **New select if subscriber is busy:**

If the subscriber's extension number is busy, your call falls automatically back to the chosen dialling tone. You can select another subscriber's extension number by DTMF dialling or hang up the call.

**New select if subscriber doesn't answer or during a running call:**

If no one answers your call you can switch back to the chosen dialling tone by typing “ \* 0 ” and select another subscriber's extension number by DTMF dialling. You can also use this function during a conversation. The first conversation will be terminated.

**Number of fix subscriber's extension number:**

Using the configuration software you can program a fix subscriber number. Every incoming call via GSM will be routed to this number.

**Time delay for call to fix subscriber's extension station:**

During a pre-selected period, the caller can select a subscriber's extension number by dialling DTMF.tones If there is no DTMF tone recognised during this period the call will be routed to the fixed number that was programmed at menu point “fix subscriber number”

**Technical data:**

The AS 52X interface work with one or two GSM transceivers

mobile phone:	GSM Dual transceiver module ( GSM phase II)
	Transmitting power: 2 watt
	Sensitivity: -106 dBm
	SIM card: plug in SIM with or without PIN request

ISDN interface:	S <sub>0</sub> telephone terminal, EDSS 1
	S <sub>0</sub> tie line, EDSS 1 or QSIG
	T <sub>0</sub> digital terminal, PTP or PTM, EDSS 1

Connectors:	ISDN S <sub>0</sub> /T <sub>0</sub> :	RJ45 jack (8pin)
	RS 232 Programming interface:	female 9pin Sub D
	12V power supply:	male 9 pin Sub D
	antenna:	2 x BNC jack female

Size: appr. 80 x 150 x 245 cm

Weight: appr. 1650 g (incl. battery and two tranceivers )

Power consumption:	appr. 200 mA stand-by	
	max. 1 A	*not incl. battery-charging