

operation manual

AS52x

ISDN-GSM interface

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 AS52X operates with radio signals which might be subject to harmful interference. It is recommended to use the interface with external antennas positioned outside of the building.

Insert the plug-in SIM cards:

The AS 52X needs a valid (mini) plug-in 3V 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!

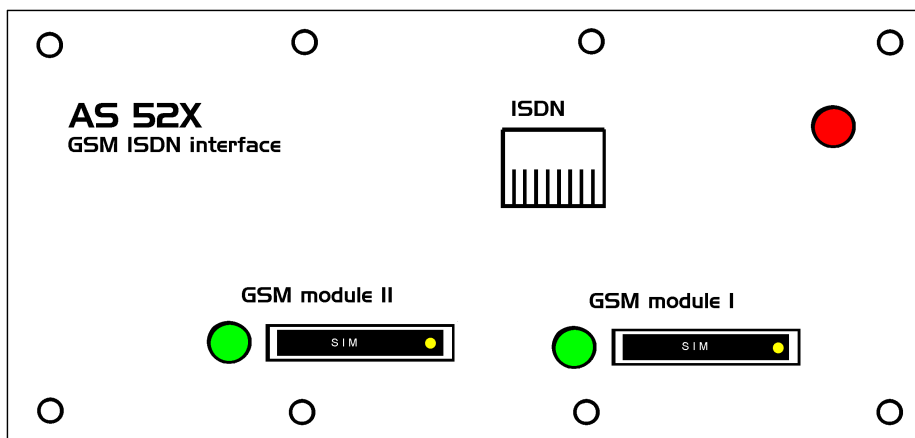
The PIN request of the SIM card can be answered by the interface if the PIN Code is programmed in the set up. This is necessary for the "stand-alone-mode".

NOTICE! Before starting the setup configuration assure:

- that you know the PIN code and all other information concerning the SIM cards and service providers
- that the SIM card do work in your network
- that there is no call forwarding on this numbers and call waiting functions are prohibited

Otherwise the AS52X might not work properly within your system.

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 multipoint connection	
Green LEDs	on:	assigned GSM transceiver is registered on the network
	off:	no GSM-service available
	flashing quickly:	AS52X interface is in use
error messages:	every 1 seconds 1 x flashing:	no minimum field strength (from software REV 3.0)
	every 2 seconds 1 x flashing:	GSM transceiver not installed or defective
	every 2 seconds 2 x flashing:	SIM card not installed or not readable
	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 false
	every 2 seconds 6 x flashing:	last try to enter PIN
		There is only one attempt left. To prevent that the SIM card gets blocked the interface does not try any further entry.
	7 x flashing:	more than 2 minutes not booked onto a GSM network
	10 x flashing:	error in data exchange
Red LED	on:	connection to telephone system works well
	every 12 seconds 3 x flashing:	no S ₀ connection to PABX
	After switching on 5 x flashing [one time only]:	configuration memory error.

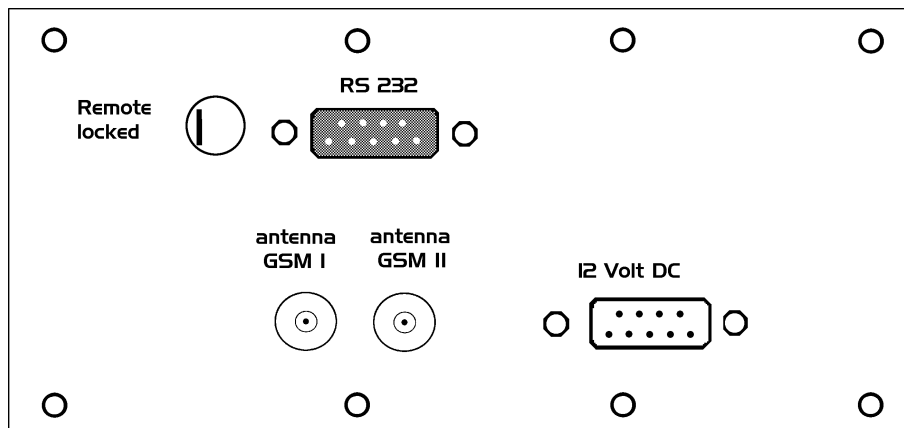
Diagnostics:

The 'tracing' option can be started in the Windows configuration software through 'Maintenance' -> 'Dokumentation'. This is useful if problems with the PABX system or the GSM network occur.

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 for an analysis. Our technicians can offer you a solution based on this data.

While tracing, the AS52x needs to be connected to a PC by a serial cable. Furthermore, the AS52x 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 suitable single band or a dual band antenna with each of the GSM module. You can use an antenna splitter. 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 7 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_0 or at the external T_0 port of a ISDN telephone system. For details in programming look at point: AS52X Service software (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 'AS52X Service'

The screenshot shows the 'AS522' configuration window. It has a title bar with 'AS522' and a small icon. The window is divided into three main sections: 'Radio-settings', 'General settings', and 'ISDN-settings'.
- **Radio-settings**: Contains fields for PIN (with a dropdown), Net-Code (1 and 2), Disp. Number (Yes/No), Volume-Level (GSM -> PABX and PABX -> GSM, both 0 dB), Echo cancelling (Off), Min. signal quality (%), and Timeout DTMF-recognition (600 ms).
- **General settings**: Contains 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 tone settings (Dialling tone PABX -> Radio, Proceeding tone PABX -> Radio, Dialling tone Radio -> PABX, and Special dialling tone). There are also buttons for 'Edit routing-table' and 'Callback'.
- **ISDN-settings**: Contains 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 of the window are four buttons: 'O.K.', 'Print', 'Help', and 'Cancel'.

You can make a free download of the 'AS52X Service' software at :

<http://www.mcs-nl.com/downloads.htm> or
<http://www.kuhnt.de/down/52xwin32.zip> (direct link)

Unzip the downloaded file and 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 \leftrightarrow 9 pin jack connected pin 1 \leftrightarrow 1, pin2 \leftrightarrow 2, pin3 \leftrightarrow 3 and so on).

Connect the AS 52X to the power supply. The AS52X 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.

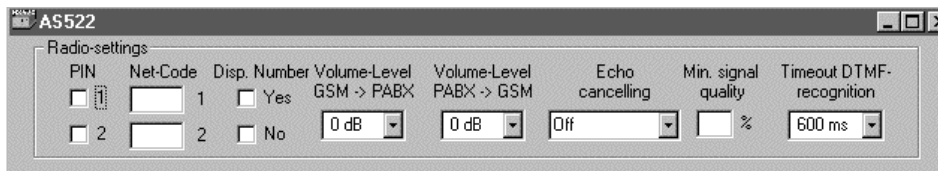
The following parameters can be switched or be adjusted:
(default menu items are shown according to the entry)

Radio settings:

- PIN code of SIM card used in module 1
- PIN code of SIM card used in module 2
- Net code 1: net lock for SIM1 to a specific network
- Net code 2: net lock for SIM2 to a specific network
- Display Number CLIP: Presentation of Calling Line Identification
- volume level GSM \leftrightarrow PABX
- volume level PABX \leftrightarrow GSM
- operation mode / echo cancelling
- minimum signal quality (field strength)
- timeout of DTMF-tone recognition via GSM

factory defaults:

no entry
no entry
no entry
no entry
no entry
0 db
0 db
on (duplex)
no entry
0,6sec.



General settings:

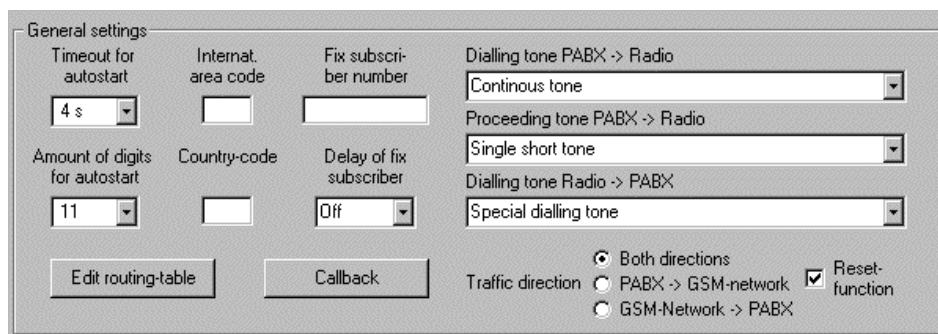
- time out for automatic hook up (outgoing calls)
- amount of digits for autostart (outgoing calls)
- international area code (International accesscode for + digit)
- fix subscriber number
- delay for fix subscriber number
- routing table (menu)
- callback (menu)
- reset function
- traffic direction (PABX \leftrightarrow GSM / GSM \leftrightarrow PABX / PABX \leftrightarrow GSM)

4,0sec
11
no entry
no entry
off
no entry
no entry
on
both directions

There are various announcements, dialling tones, melodies and announcements available for the following three entries:

- dialling tone PABX \leftrightarrow Radio (GSM network)
- proceeding PABX \leftrightarrow Radio
- dialling tone Radio \leftrightarrow PABX [incoming call]

continuous tone
single tone pulse
special dialling tone



ISDN settings:

- | | |
|---|------------|
| - operational mode of the S ₀ - ISDN - interface | subscriber |
| [available entries: 'Subscriber', 'Tie Line – DSS1/QSIG', 'NT-Simulation, Point-to-Point' and 'NT-Simulation, Point-to-Multipoint'] | |
| - own subscriber number at PABX | no entry |
| - phone number for DTMF suffix dialling | no entry |
| - connection check | restart |
| - abbreviated dialling list (menu) | no entry |
| - advice of charge | no entry |
| - causes (menu not available for subscriber mode) | 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 |
| - advice of charge | no entry |
| - immediate simulation of connection | on |

In case of the operation mode of the interface is set as **network termination point to multipoint mode** the following new items appear:

- | | |
|--|----------|
| - prefix DTMF suffix dialling GSM ↔ PABX | no entry |
| - amount of digits for DTMF suffix dialling GSM ↔ PABX | no entry |
| - advice of charge | no entry |
| - immediate simulation of connection | on |

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

- | | |
|--|----------|
| - prefix DTMF suffix dialling GSM ↔ PABX | no entry |
| - advice of charge | no entry |
| - immediate simulation of connection | on |

Routing table for outgoing calls:

If two GSM transceivers are installed outgoing calls can be assigned to a fixed module resp. SIM 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 phone number. The routing table can be set for up to 7 different phone numbers. Outgoing calls are routed to defined phone numbers or all not defined phone number can be disabled and so on. The first two digits should always be the international area code.

Beginning of dialled number	Selection start up PABX -> GSM
+41	No connection start up
+42	... preferably via GSM-module 1
+43	... exclusively via GSM-module 2
+44	... preferably alternating
+45	... choose GSM-module according to ISDN-B-channel, exclusively
+46	... choose GSM-module according to ISDN-B-channel, preferably
+47	No instruction
Others	No instruction

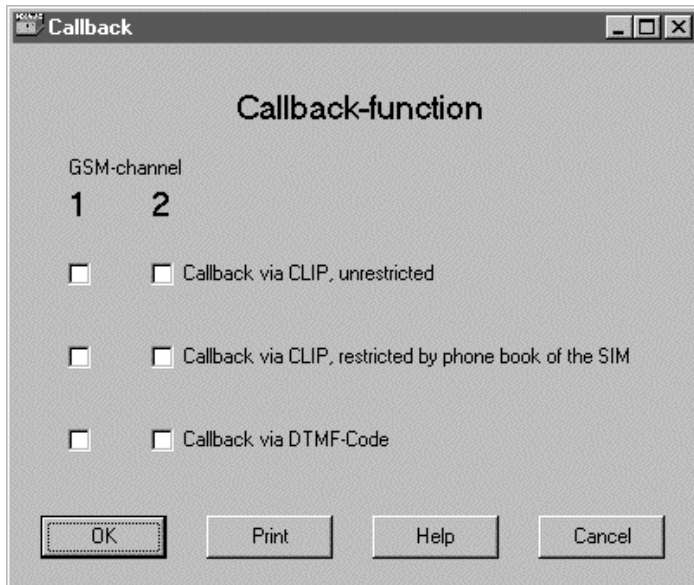
O.K. Print Help Cancel

The preferences includes:

- *No connection start up*
- *... preferably via GSM-module 1 or 2*
- *... exclusively via GSM-module 1 or 2*
- *... preferably alternating*
- *... choose GSM-module according to ISDN-B-channel, exclusively*
- *... choose GSM-module according to ISDN-B-channel, preferably*
- *No instruction*

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 (or any similar SIM card editor). For further information: 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 phone number 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 (or any similar SIM card editor). For further information: www.mcs-nl.com.

**Connection to the internal S₀ 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-mobilephone-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 in the abbreviat dialling list.

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 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 T₀ 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 S₀ port with EDSS1 or QSIG protocol.

The user has to set up a connection to the external line to which the AS 52X interface is attached to.

After receiving the exchange from the interface he could listen to a dialling tone or an anouncement from the AS52X. 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 receives a call from GSM network by autoanswering.

The calling party can hear the tone or the announcement that 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 a call is charged from the moment the AS52x hooked it up.

Meaning, calls are charged even if there is no connection to any extension of the PABX and when dialling the DTMF tones.

New select if subscriber extension is busy:

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

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

If no one answers your call or to terminat a running call you can switch back to the dialling tone by typing " *0 " and select another subscriber's extension number by DTMF dialling.

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 calling party can select a subscriber's extension number by dialling DTMF tones. If this time passed and no DTMF tone is recognised the call will be routed to the fixed number that was programmed at menu point *"fix subscriber number"*

Technical data:

The AS 52X interface is available with one or two GSM transceivers

AS520

mobile phone:	Siemens A1 nach GSM-Phase II
frequency range:	890-915 / 935-960 MHz (GSM900)
transmitting power:	2W/Class 4
sensitivity:	-106dBm
SIM card:	3V plug in SIM with or without PIN request
fax-/dataservice:	not support

AS522

mobile phone:	WAVECOM Dual-Band Modul GSM-Phase II
frequency range:	890-915 / 935-960 MHz (GSM900) 1710-1785 / 1805-1880 MHz (DCS1800)
transmitting power:	2 W (GSM900 - Klasse 4) 1 W (DCS1800 - Klasse 1)
sensitivity:	-106dBm W
SIM card:	3V plug in SIM with or without PIN request
fax-/dataservice:	not support

ISDN interface:

So telephone terminal, EDSS 1
S0 tie line, EDSS 1 or QSIG
T0 digital terminal, PTP or PTM, EDSS 1

Connectors:

ISDN S0/T0 : RJ45 jack (8pin)

switch:

lock and unlock remote

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 transceivers)

Power consumption:

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

APPENDIX:

Software Licence Agreement

ATTENTION:

THE USE OF THE SOFTWARE IS SUBJECT TO THE FRIEDRICH KUHNT GMBH SOFTWARE LICENSE TERMS SET FORTH BELOW. USING THE SOFTWARE INDICATES YOUR ACCEPTANCE OF THESE LICENSE TERMS. IF YOU DO NOT ACCEPT THESE LICENSE TERMS, YOU MUST RETURN THE SOFTWARE FOR A FULL REFUND. IF THE SOFTWARE IS SUPPLIED WITH ANOTHER PRODUCT, YOU MAY RETURN THE ENTIRE UNUSED PRODUCT FOR A FULL REFUND.

FRIEDRICH KUHNT GMBH SOFTWARE LICENSE TERMS

The FRIEDRICH KUHNT GMBH grants you a license to use one copy of the software. You may not modify the software or disable any licensing or control features. The software is owned and copyrighted by the FRIEDRICH KUHNT GMBH or its third party suppliers. Your license confers no title or ownership in the software and is not a sale of any rights in the software. The FRIEDRICH KUHNT GMBH 's third party suppliers may protect their rights in the event of any violation of these License Terms.

1. You may only make copies or adaptations of the software for archival purposes or when copying or adaptation is an essential step in the authorized use of the software.
2. No Disassembly or Decryption. You may not disassemble or decompile the software unless a prior written consent from the FRIEDRICH KUHNT GMBH is obtained. In some jurisdictions, this consent may not be required for disassembly or decompilation. You may not decrypt the Software unless decryption is a necessary part of the operation of the Software.
3. Your license will automatically terminate upon any transfer of the software. Upon transfer, you must deliver the Software, including any copies and related documentation, to the transferee. The transferee must accept these License Terms as a condition to the transfer.
- 4 The FRIEDRICH KUHNT GMBH may terminate your license upon notice for failure to comply with any of these License Terms. Upon termination, you must immediately destroy the Software, together with all copies, adaptations and merged portions in any form.

LIMITED WARRANTY STATEMENT

1. The FRIEDRICH KUHNT GMBH warrants to you, the end-user customer, that FRIEDRICH KUHNT GMBH 's hardware, accessories and supplies, will be free from defects in materials and workmanship after the date of purchase, for the period specified above. If the FRIEDRICH KUHNT GMBH receives notice of such defects during the warranty period, the FRIEDRICH KUHNT GMBH will, at its option, either repair or replace products which prove to be defective.
2. The FRIEDRICH KUHNT GMBH warrants to you that the FRIEDRICH KUHNT GMBH software will not fail to execute its programming instructions after the date of purchase, for the period specified above, due to defects in material and workmanship when properly installed and used. If FRIEDRICH KUHNT GMBH receives notice of such defects during the warranty period, the FRIEDRICH KUHNT GMBH will replace software media which does not execute its programming instructions due to such defects.
3. The FRIEDRICH KUHNT GMBH does not warrant that the operation of their products will be uninterrupted or error free. The FRIEDRICH KUHNT GMBH products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use. If the FRIEDRICH KUHNT GMBH is unable, within a reasonable time, to repair or replace any product to a condition as warranted, you will be entitled to a refund of the purchase price upon prompt return of the product.
4. Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by FRIEDRICH KUHNT GMBH, (c) unauthorized specifications for the product, or (e) improper site preparation or maintenance.
5. THE REMEDIES IN THIS WARRANTY STATEMENT ARE YOUR SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL THE FRIEDRICH KUHNT GMBH BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Current legal regulations:

This agreement is subject to the laws of the Federal Republic of Germany. This agreement only can be changed by an additional licensing agreement delivered with this license or a written document signed by both you and Friedrich Kuhnt GmbH or with limited liability by a third party. Please, if you should have questions on this agreement or if you want to get in connection with the Friedrich Kuhnt GmbH for other reasons, consult:

Friedrich Kuhnt GmbH, Stubbenweg 15, 26125 Oldenburg (Germany) Tel.: +49 441 30005-0, Fax: +49 441 30005-30, info@kuhnt.de, www.kuhnt.de

TM WINDOWS 95, 98, NT, 2000 and XP are registered trademarks of the MICROSOFT Corporation, One Microsoft Way, Redmond, Washington 98052-6399 U.S.A.

