Operation Manual
ISDN-Terminal Adapter V.24/V.28

LOGES ® 64k
LOGES ® 64k/M
LOGES ® LGM 64k
LOGES ® LGM 64k/M
LOGES ® LGH 64k

Attention:

The versions: LOGES ® 64k and LOGES ® 64k/M
(desktops)

LOGES ® LGM 64k and
LOGES ® LGM 64k/M
(modules)

LOGES ® LGH 64k
(top rail version)

These versions are specified as LOGES 64k in the manual due to practical reasons. Specific features of the different versions are described separately in the operation manual.

$C\,E$ The product meets the rules of the conformity declaration at operational conditions that can be considered as normal use.

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General

Safety Instructions

Please read the following safety instructions carefully. They are ment for your own safety and for faultless function of your devices:

- Electronical devices are sensitive for electrostatical charges. Deflect any electrostatical charges before touching the board with your hands or tools.

- Disable the power supply before removing the housing (desktops) or the module casing.

- Boards may be only extracted after the S_0 connection has been disabled.

- Make sure that other units that you may wish to connect to your device meet all specifications.

About The Manual

This manual presents the features of the LOGES 64k product line concerning all functions and meaning of the DIP switches as well as the operational elements and the command language.
For commissioning please refer to chapter 2 „Easy Installation" that is designed to give the necessary help during the initial phase. More detailed information concerning specialized applications is given with the chapters 6 ... 9.

Operation Manual - ISDN Terminal Adapter V.24/V.28

1 INFO

1 Equipment Description

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INFO 1

1   Description of the LOGES 64k

The LOGES product line provides a trendsetting transmission system that allows for access to the world of ISDN as well as for changing from analog to digital technology.

The main targets of the product development were:

• **maximum compatibility to the ke modules** LGM 9600H1, LGM 14.4D1, LGM 28.8D1 bzw. LOGEM ® 996, LOGEM ® 914, LOGEM ® 928 and the correspondent German Telekom modems from the MDM/MDG product line.

  This is realized at the hardware side by using identical mechanical dimensions and allocation of the DIP switches and pincompatibility at the interfaces. At the software side an integrated communication processor that operates between modem or ISDN chip set and the serial interface towards the data terminal equipment (DTE). It transfers any chip specific alteration to a unitary command surface for the user. This maximum compatibility to analog modems allows for plug and play changeover from analog to digital ISDN technology.

• **realization of a solution for multifunctional operation** with automatical recognition of all operation modes (analog: V.21 ... V.34; ISDN: X.75, V.110).

The LOGES product line utilizes a B channel with 64 kbit/s and one D channel. The following protocols are supported:

B channel: HDLC SLIP/PPP
X.75 (transparent, T.70NL, BTX)
V.110 (bitrate adaption)
V.42/V.42bis (data protection and data compression)
MNP (data protection and data compression)

D channel: 1TR6 (national German ISDN)
DSS1 (euro ISDN)

INFO 1

Moreover the .../M versions are ISDN terminal adapters that have an additional V.34 Modem on board thus providing the user with a product that allows for communication with the analog as well as with the ISDN world.

The models LOGES ® 64k and LOGES ® 64k/M are external desktop versions. With dimensions of 110 x 36 x 170 mm (w x h x d) they are extremely small thus allowing for wall mounting as well.

The models LGM 64k and LGM 64k/M come as 19" modules with 3 HU. They are designed for insertion in any standard rack with 3 HU.

The LGH 64k is a terminal adapter for top rail mounting.

The devices are designed for implementation on switched lines and on structured digital leased lines for asynchronous and synchronous data transmission. An integrated memory for calling numbers, storage of user profiles, a variety of security mechanisms (password protection with/without callback) are implemented as well as a remote configuration facility and an auxiliary tool for commissioning of the ISDN access.

It often occurs during automatical remote polling applications that the remote station is not available. Due to the remote activation feature (optional) for the desktop versions the defined access protected activation of unmanned stations including remote servicing and automatical deactivation after the servicing activities is possible.

The devices are licensed for operation on public and private switched networks for the Federal Republic of Germany (BZT license number: **A 117 010 F**), the license number **D 127 419 H** is valid for the European Community (for the ISDN DSS1 protocol).
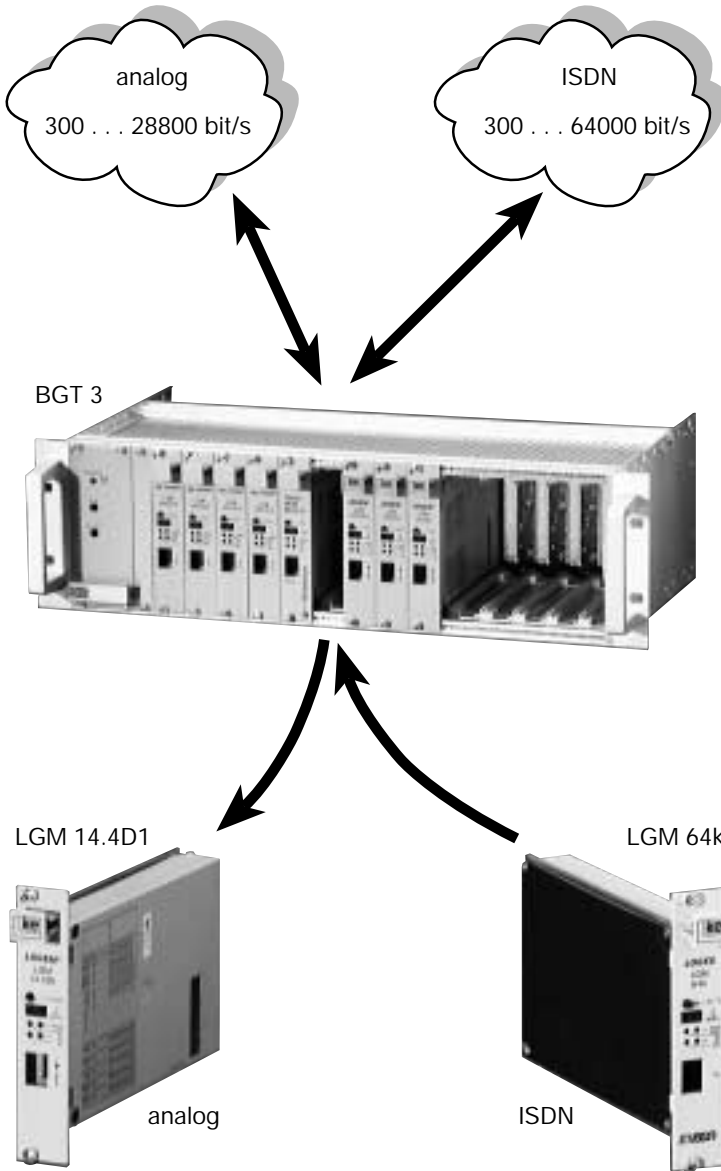
Fig.1: Plug and Play using the LOGES ® LGM 64k

1.1 Delivered Items LOGES ® 64k and LOGES ® 64k/M

The desktop versions are delivered with the items listed below:

- terminal adapter
- operation manual
- power supply adapter
- ISDN line cable RJ12 - RJ45
- DTE interface cable 25pin D-SUB

1.2 Delivered Items LGM 64k and LGM 64k/M

The 19" modules are delivered with the items listed below:

- terminal adapter
- operation manual

1.3 Delivered Items LGH 64k

- terminal adapter for top rail mounting
- operation manual
- DTE interface cable
- ISDN line cable RJ45

i **Additional Information:**
Please dispose of any packaging material in an environmental friendly manner.

2   Fast Installation

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2 Fast Installation LOGES 64k

This chapter describes all operating elements of the LOGES ® product line and their functions as well as the installation process for the different devices. In delivery state the terminal adapters operate with the AT command surface thus allowing utilization of a terminal software after successful installation.

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2.1 Installation of the LGM 64k and LGM 64k/M (rackmounted)

2.1.1 Connection and Commissioning

Disconnect the data terminal equipment (DTE) from power supply before installing the terminal adapter. Then insert the device into the selected slot of your terminal equipment. The S_0 connection is performed at the front panel using a RJ45 cable. The ISDN connection can be made via the VG connector at the reverse side of the modules as an alternative. Now the operating voltages of the terminal adapter and the DTE can be activated. During the internal test the LED "PM1" of the unit lights up. In delivery state the terminal adapter is preset as listed below:

DIP switches: all OFF

DTE interface: AT commands (register S80)
autobaud detection up to 57600 bit/s (register S51)
hardware flow control RTS/CTS (AT\Q2)

Transmission parameters:
automatical protocol detection on the D channel (register S99)
auto protocol on the B channel (V.110, X.75, X.75TL)

The AT command interface corresponds to the modems of the LOGEM product line. In delivery state automatical call acception is activated (S0 = 1). An outgoing dial up is initiated using the command "ATDxxx". If you have any doubts concerning the general adjustments of the terminal adapter it should be better to load the basic setting 0 or 8. Further information is given in the chapter "Loading of basic settings 0 or 8".

⚠️ **Information for the LGM 64k/M:**
For analog subscriber connections using the integrated modem chip the dial string has to start with an " * ". The parameter is defined in register S95.

2.1.2 Front Panel LGM 64k and LGM 64k/M

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Element	Function
button **Da/Te**	multifunctional button (ref. to S54)
jack **SERV**	earphone output for LGM 64k/M
LED **PM1**	test status
LED **ANS**	blinks at line connection
LED **M5**	state of interface line M5/DCD, lights up at existing connection
LED **S1**	state of interface line S1/DTR, lights up if DTE is operational
jack **S_0**RJ45	jack for ISDN S_0 connection

ke

LOGES

LGM 64k/M

Da/Te

SERV.

ANS
PM1
S1
M5

S_0

ISDN
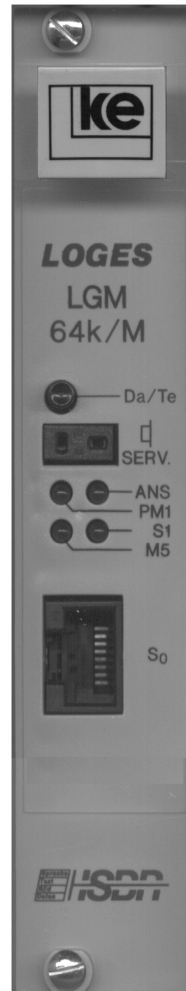
2.1.3   Allocation of the DIP Switches
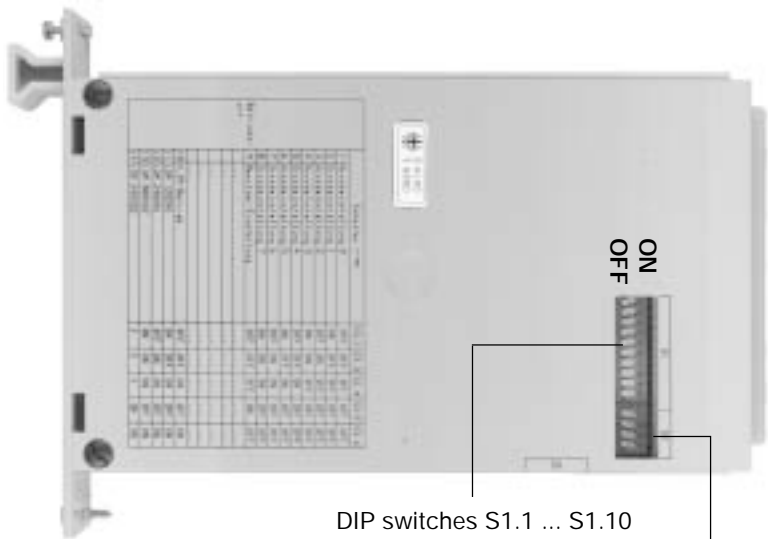
DIP switches S1.1 ... S1.10

DIP switches S2.1 ... S2.4

OFF
ON

DIP switches S3.1 ... S3.6

2.2 Installation of LOGES ® 64k and LOGES ® 64k/M (standalone)

2.2.1 Connection and Commissioning

Disconnect the data terminal equipment (DTE) from power supply before installing the terminal adapter. Now the units are connected to the DTE using the V.24 connection cable. The S_0 connection is performed using a RJ12/RJ45 cable. Now insert the 2 pole coded jack of the power supply adapter into the power supply connector at the reverse side of the desktop device and connect the adapter with your 230 V power supply. After activation of the DTE the LEDs M2, D1, and D2 light up. If you employ any data transmission software the LED S1 has to light up as well. The terminal adapter is now operational.

In delivery state the terminal adapter is preset as listed below:

DIP switches: all OFF

DTE interface: AT commands (register S80)
autobaud detection up to 115200 bit/s (register S51)
hardware flow control RTS/CTS (AT\Q2)

transmission parameters:
automatical protocol detection on the D channel (register S99)
auto protocol on the B channel (V.110, X.75, X.75TL)

The AT command surface corresponds to the modems of the LOGEM product line. In delivery state automatical call acception is activated (S0 = 1). An outgoing dial up is initiated using the command "ATDxxx".

If you have any doubts concerning the general adjustments of the terminal adapter it should be better to load the basic setting 0 or 8. Further information is given in the chapter "Loading of basic settings 0 or 8".

⚠️ **Information for the LGM 64k/M:**
For analog subscriber connections using the integrated modem chip the dial string has to start with an " * ". The parameter is defined in register S95.

2.2.2 Operating Elements LOGES ® 64k/LOGES ® 64k/M

Front panel
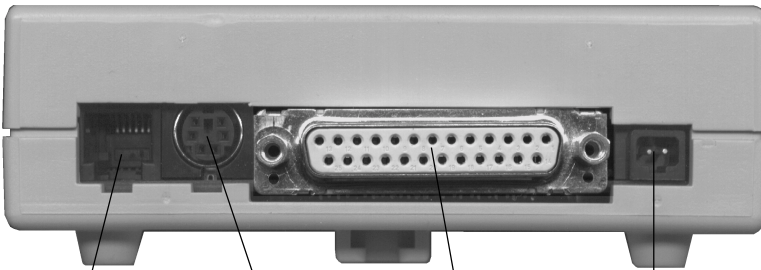
S0 connector RJ12 jack   mini DIN6 jack   V.24/V.28 interface   power supply

Reverse side
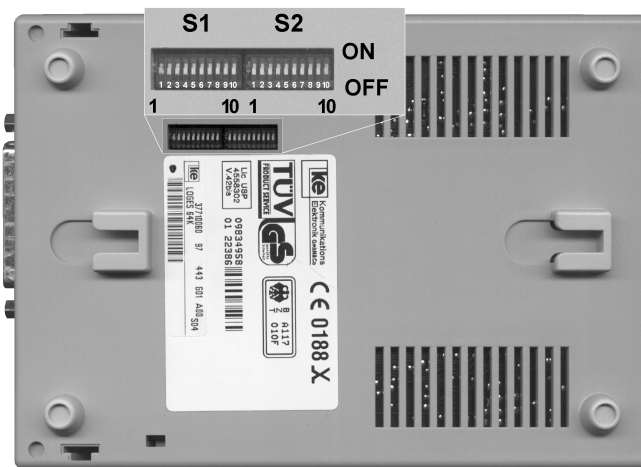
Bottom view

Element	Function
LED **S1**	state of interface line **S1/DTR** - shows **green**, if DTE is operational
LED **M2**	state of interface line **M2/CTS** - shows **green**, if DCE accepts data
LED **D1**	state of interface line **D1/TxD** - shows **green**, if DTE is connected - shows **red**, if data is received from DTE
LED **M5**	state of interface line **M5/DCD** - shows **green**, at established connection
LED **D2**	state of interface line **D2/RxD** - shows **green**, if DTE is operational - shows **red**, if data is transmitted to DTE
LED **A/O**	blinks during line connection (OFF HOOK)
button **Da/Te**	multifunctional button (refer to register S 54)
jack **S_0** **connector RJ12**	RJ12 connector for S_0 connection line
jack **mini DIN 6**	service connector
jack, 25pole **V.24/V.28**	connector V.24/V.28 (RS232C) for DTE
jack **power supply**	connector for low voltage part of power supply adapter 7 VAC/2.6 VA (4.4 VA for LOGES ® 64k/M)

Bank of Switches	Meaning
S1	bank of DIP switches S1.1 ... S1.10
S2	bank of DIP switches S2.1 ... S2.10

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2.3 Installation of the LOGES ® LGH 64k

2.3.1 Operating Elements of the LOGES ® LGH 64k

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Element	Function
LED **S1**	state of interface line **S1/DTR** - shows **yellow**, if DTE is operational
LED **M2**	state of interface line **M2/CTS** - shows **yellow,** if DCE accepts data
LED **D1**	state of interface line **D1/TxD** - shows **yellow,** if DTE is connected - shows **yellow,** if data is received from DTE
LED **M5**	state of interface line **M5/DCD** - shows **yellow**, at established connection
LED **D2**	state of interface line **D2/RxD** - shows **yellow,** if DTE is operational - shows **yellow**, if data is transmitted to DTE
LED **LB**	blinks during line connection (OFF HOOK)
button **Da/Te**	multifunctional button (refer to register S 54)
jack **S$_0$** **connector RJ12**	RJ12 connector for S$_0$ connection line
jack, 25pole **V.24/V.28**	connector V.24/V.28 (RS232C) for DTE
jack L + M **power supply**	connector for supply voltage 24 VDC

Bank of Switches	Meaning
S1	bank of DIP switches S1.1 ... S1.10
S2	bank of DIP switches S2.1 ... S2.10

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2.3.2 Connection and Commissioning

Disconnect the data terminal equipment (DTE) from power supply before installing the terminal adapter. Now the units are connected to the DTE using the V.24 connection cable. The S_0 connection is performed using a RJ45 cable. The supply voltage is connected using the L+ and M clamps at the front side of the devices. The module operates with 24 V DC. After activation of the DTE the LEDs M2, D1, and D2 light up. The LED S1 (DTR) signals only if the DTE has activated the interface line S1. The terminal adapter is now operational.

In delivery state the terminal adapter is preset as listed below:

DIP switches: all OFF

DTE interface: AT commands (register S80)
autobaud detection up to 57600 bit/s (register S51)
hardware flow control RTS/CTS (AT\Q2)

transmission parameters:
automatical protocol detection on the D channel (register S99)
auto protocol on the B channel (V.110, X.75, X.75TL)

The AT command surface corresponds to the modems of the LOGEM product line. In delivery state automatical call acception is activated (S0 = 1). An outgoing dial up is initiated using the command "ATDxxx". If you have any doubts concerning the general adjustments of the terminal adapter it should be better to load the basic setting 0 or 8. Further information is given in the chapter "Loading of basic settings 0 or 8".

3 AT

3   AT Commands

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3   AT Commands

The AT command set is an international standard developed by the US modem manufacturer Hayes. The commands of the so called Hayes standard (AT commands) start with the letters AT (ATTENTION, AT command set).
A command line may be typed either in capital or small letters. The AT has to be entered as AT or at due to the autobaud detection feature.

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The table shown here lists all AT commands in alphabetical order. The commands marked with an " * " are supported due to compatibility reasons but they do not have any meaning for ISDN operation.

Please refer to the rules listed below when typing AT commands:

n	is a decimal number
xxx	is a text block

The markers n and xxx may not be typed in addition to the commands to be entered.

command	parameter/ default	description
+++	-	**escape sequence**, switching from transparent to command mode
A/	-	repeat last command line
ATA	-	modem occupies line as "answerer" if an incoming call comes
ATBOOT	-	ref. to chapter 11
ATCLEAR	-	erases all EEPROM contents
ATDxxx	[1)]	dial command
ATEn	0, 1 / 1	**character echo**, 0=OFF, 1=ON
ATFn	[2)]	**transmission procedure** for B channel
ATHn	0, 1	**on hook** n=0 cancel existing data connection (on hook) n=1 report busy to caller. To be erased with ATH0.

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command	parameter/ default	description

ATIn	0...2 / 10...12	**modem identification**
		n=0 modem software version
		n=1 V.42/MNP software version
		n=2 revision level modem chip
		n=10 display of specific data (type, serial number, etc.)
		n=11 state of last connection
		n=12 charge status of last dial up
		         0 = no charges
		         1 = charges

ATLn	1...3 / 1	**loudspeaker volume** (for desktops with modem chip only) n=1 low n=2 medium n=3 loud
ATMn	0...2 / 1	**loudspeaker control** (for desktops with modem chip only) n=0 OFF n=1 ON up to CONNECT report n=3 ON constantly
ATO	-	change to transparent mode
ATP*	-	**pulse dialing** (not for ISDN operation)
ATPPPn	0, 1 / 0	**PPP protocol support** n=0 deactivated n=1 activated
ATQn	0, 1 / 0	**quiet mode** n=0 messages or result codes n=1 no messages or result codes
ATSn=n	-	**set S registers**. Only registers displayed with AT&V can be altered.
ATSLIPn	0,1 / 0	**SLIP protocol support** n=0 deactivated n=1 activated
ATT*	-	**tone dialing** (not for ISDN operation)
ATUn	0, 1 / 0	**dial tone sequence** (only with modem chip) n=0 V.8 sequence as dial tone n=1 normal dial tone The dial parameter "U" overwrites this setting temporariliy.

command	parameter/ default	description
ATVn	0, 1 / 1	**verbose result codes** n=0　numerical report codes n=1　text report codes
ATXn	0...4 / 4	**result codes normal/extended** n=0　result codes 0...4 n=1　result codes 0...38 and 90...104 n=2　result codes 0...65 and 90...124 n=3　result codes 1...144 n=4　result codes num. 0...144 and for text form with protocol information e.g.CONNECT2499/COM/REL/MNP5
ATZn	0...2	software reset, **load user setup** from EEPROM
AT&B	-	deactivate command phase
AT&Cn	0...2 / 2	**M5 (DCD) option** n=0　M5 is constantly active n=1　M5 follows carrier signal (receive signal) n=2　M5 is on during transparent mode (recommended setup)
AT&D	0...6 / 1	**S1 (DTR) option** n=0　S1 is ignored (internally active) n=1　at S1 OFF commands are received, incoming calls are **not** received, an ON/OFF change terminates the existing connection n=2　an ON/OFF change terminates the connection, no line switching at S1 OFF n=3　an ON/OFF change causes an reset (ATZ) n=4　at an ON/OFF change the number from short dialing register Z0 is dialed (direct call); incoming calls are not accepted! n=5　an ON/OFF change causes a hardware reset (POWER ON reset) n=6　as &D1; call acception allowed at S1 OFF

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command	parameter/ default	description
AT&Fn	0...8	**load factory default** user setting 2 is loaded with AT&F8
AT&G*	0...2 / 0	**guard tone** (not for ISDN operation)
AT&Hn	0, 1 / 0	**hx simulation** acc. to ITU-T V.13 n=0 no hx simulation n=1 hx simulation active

AT&In	0...2 / 0	speed indication at CONNECT report
		 n=0 speed acc. to ATF setup
		 n=1 DTE rate (e.g. CONNECT
		        115200/MNP5)
		 n=2 transmission rate
		        (e.g. CONNECT 14400/REL)

AT&Ln	0...11 / 0	**line switching** n=0 switched line n=1 leased line (initiated with ATA/ATD) n=2 leased line "originator" n=3 leased line "answerer" n=4...11* no function for ISDN operation

AT&Mn	0, 1 / 0	**selection of transparent operation mode**
		 n=0 command and data transmission
		        phase asynchronous
		 n=1 command phase asynchronous,
		        data transmission phase synchronous

AT&Rn	0...2 / 1	**M2 (CTS) option** n=0 M2 (CTS) follows S2 (RTS) n=1 M2 is always active n=2 M2 is only active during data transmission phase
AT&Sn	0...2 / 0	**M1 (DSR) option** n=0 M1 is always active n=1 M1 is only ON during data transmission phase n=2 M1 is ON before CONNECT report
AT&Tn	4, 5 / 4	**test loops** n=4 accept remote loop (PS2) n=5 reject remote loop (PS2)
AT&Vn	0...4	**display of AT commands and S registers** n=0 display active RAM configuration n=1 display RAM and EEPROM config. n=2 display basic setting 0...2 n=3 display basic setting 3...5 n=4 display basic setting 6, 7 and user setting

command	parameter/ default	description
AT&Wn	0...2	**store user configuration in EEPROM** n=0 store in EEPROM bank 0 n=1 store in EEPROM bank 1 n=2 store as basic setting 8 (via DIP switch at POWER ON)
AT&Xn	0...2 / 0	**clock at synchronous operation** n=0 internal clock T2/114 n=1 external clock T1/113* (only with modem chip) n=2 receive clock T4/115
AT&Yn	0...2 / 0	**load configuration at POWER ON** n=0 load user setting 0 n=1 load user setting 1 n=2 load user setting 2, = basic setting 8
AT&Zn= xxx [1]	n=0...19	store number in short dial register
AT&Z=x	T, V, / T	function of the short dial memory x=T phone number memory x=V charges memory (ref. to AT commands for control of charges polling)
AT&Z?	-	display all short dial registers
AT&Zn	-	display short dial register n
AT&ZCLEAR	-	erase short dial and charges register
AT%An	0...127 / 0	autoreliable fallback character
AT%Cn	0...3 / 1	**select data compression** n=0 no data compression n=1 V.42bis/MNP5 active n=2 V.42bis only for transmit data n=3 V.42bis only for receive data
AT%D	-	display of temporarily blocked numbers
AT%En*	0, 1 / 1	**retrain** (not for ISDN operation)
AT%F	-	**initiate remote configuration** (ref. to chapter 6)
AT%Gn	0...2 / 2	**control output ON/OFF** n=0 control output OFF n=1 control output constantly ON n=2 control output ON during CONNECT phase

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command	parameter/default	description
AT%In	0...2 / 2	**outgoing info octet** n=0　info octet is ignored n=1　info octet acc. to telekom specification n=2　info octet acc. to telekom specification and extendend ke definition
AT%Kn	0...2 / 2	**incoming info octet** n=0　info octet is ignored n=1　info octet acc. to telekom specification n=2　info octet acc. to telekom specification and extendend ke definition
AT%Ln	0...2 / 2	**layer 1 handling** n=0　layer 1 is generated on request n=1　layer 1 is constantly active
AT%L1?	-	layer 1 status polling report:　　OK=layer 1 is activated 　　　　　ERROR= layer 1 cannot be activated. An OK is given additionally as command acknowledgement.
AT%Mn/ password	0, 1	**activate password protection** n=0　no password protection n=1　activate password protection (ref. to chapter 5)
AT%Nn	0, 1 / 0	**transfer of calling numbers** (only for DSS1) n=0　transfer own calling number n=1　no transfer of own calling number (secret number)
AT%P	-	**change remote configuration password** (ref. to chapter 4)
AT%Rn	0, 1 / 0	**rate change** n=0　no rate change n=1　rate change
AT%U	-	display charges for last connection
AT%Vn	0, 1 / 0	display date/time at outgoing connection n=0　no display n=1　display (e.g. CONNECT 64000/REL #06.03.98 11:38:32)

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command	parameter/ default	description
AT%Wn	0...90 / 42	**dial up digital/analog** default: 42 = " * " n=0 digital dial up n=1 analog dial up n=2...90 The selected ASCII character is the dial parameter. If the parameter is not part of the dial string a digital connection is established. If the parameter is a part of the dial string an analog connection is established. Example: ATD1234 -- calls a digital partner ATD*1234-- calls an analog partner Only for versions with integrated modem chip (64k/M) and for outgoing dial up. Incoming automatical detection.
AT%Xn	0...8 / 0	**report of calling numbers** n=0 number of calling modem is not reported n=1 add number to RING report, e.g. RING#05116747390 n=2 add number to CONNECT report, e.g. CONNECT 28800/COMP/V.42bis# 05116747390 n=3 variant 1 and 2 n=4 as 2, for outgoing dialing (own calling number) n=5 as 3, for outgoing dialing n=6 as 1, + ISDN service label n=7 as 2, + ISDN service label n=8 as 1 + 2, + ISDN service label Service label: 1. voice (ISDN) 2. analog (3.1 kHz) 3. digital (64 kbit/s)

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command	parameter/ default	description
AZ%Yn	0...3 / 2	**report of CAUSE values**
		n=0 no report of CAUSE values
		n=1 report CAUSE values with BREAK reports
		n=2 report CAUSE values and RINGING
		n=3 report CAUSE values and RINGING
AT%Z=x	-	**store MSN number**
		(ref.to chapter 12.5)
AT%Z?	-	display MSN number
AT\An	0...3 / 1	select MNP block length
		n=0 max. 64 characters/block
		n=1 max. 256 characters/block
		n=2 max. 256 characters/block
		n=3 max. 256 characters/block
AT\Bn	1...9 / 3	**break signal length**
		n=1 BREAK signal 100 ms
		n=2 BREAK signal 200 ms
		n=3 BREAK signal 300 ms
		n=4 BREAK signal 400 ms
		n=5 BREAK signal 500 ms
		n=6 BREAK signal 600 ms
		n=7 BREAK signal 700 ms
		n=8 BREAK signal 800 ms
		n=9 BREAK signal 900 ms
AT\Cn	0..3 / 3	automatical MNP detection (originator) [3]
		n=0 function deactivated
		n=1 detection active, no data buffering
		n=2 not allocated
		n=3 detection active with 200 characters buffer
AT\Gn	0, 1 / 0	**flow control** between terminal adapters (only for normal mode AT\N0)
		n=0 no flow control
		n=1 flow control XON/XOFF active
AT\Kn	0...3, / 3	**BREAK handling**
		n=0 ignore BREAK
		n=1 transfer BREAK, erase data buffer
		n=2 transfer BREAK immediately
		n=3 send BREAK immediately

command	parameter/ default	description
AT\Ln	0, 1 / 0	**MNP mode** n=0 stream link mode n=1 block mode
AT\Mn	0, 1 / 0	**X.75 frame counter** n=0 modulo 8 n=1 modulo 128
AT\Nn	0...9 / 3	**error corrcetion procedure** n=0 normal mode, no error correction n=1 direct mode, no error correction, no data buffer n=2 reliable mode, mandatory error corr. n=3 autoreliable mode n=4 reliablemode with V.42 data protection n=5 reliable mode with MNP data prot. n=6 X.75 transparent n=7 X.75 T.70NL n=8 X.75 btx operation n=9 HDLC + V.110 autom. detection
AT\Qn	0...3 / 2	**data flow control** 64k---DEE n=0 no data flow control n=1 software flow control with XON/XOFF n=2 hardware flow control with RTS/CTS (S2/M2) n=3 hardware and software flow control
AT\S	-	configuration display (ref. to chapter 7.2)
AT\Xn	0, 1 / 0	**XON/XOFF character transfer** n=0 no XON/XOFF character transfer n=1 XON/XOFF character transfer

AT!OK=n	0, 1 / 0	command acknowledgement
		n=0 command acknowledgement OK
		         or ERROR
		n=1 acknowledgement with OK (even
		         for wrong commands)

AT!TIME	-	**display internal clock**
AT!TIME=	HH:MM	**set clock** HH hours MM minutes Seconds are set to 00.

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[1] **Valid Parameters for Dial String:**

parameter	meaning
=	programmable dial pause, the duration is selected in register S8
<	dial pause 1 s
: or W	dial tone recognition
& or !	short line time-out (flash impulse), only during tone dialing
>	activation of ground key for 255 ms
0 ... 9	digits for calling number and labels
#, A, B, C, D	special functions for tone dialling
;	separation character for calling number and label
SPACE	group separation character (blank)
P	pulse dialing
T	tone dialing
*	outgoing analog dial up (ref. to chapter 10)

The parameters listed here are supported due to compatibility reasons concerning recent analog modems.
The parameters P, T, :, A, B, C, D, !, &, <, >, = are not necessary for dial up.

[2] The ATF command accepts the values listed below for the parameter n:

1	V.21 (300 dx)	35	V.Fast (24000 dx)
2	V.22 (1200 dx)	36	V.Fast (26400 dx)
3	V.22bis (2400 dx)	37	V.Fast (28800 dx)
4	not for use	40	V.34
5	V.23 (1200/75 dx)	41	V.34 (2400 dx)
7	V.23 (1200 hx)	42	V.34 (4800 dx)
8	V.26bis, A (2400 hx)	43	V.34 (7200 dx)
9	V.26bis, B (2400 hx)	44	V.34 (9600 dx)
10	V.26bis, A, S (2400 hx)	45	V.34 (12000 dx)
11	V.26bis, B, S (2400 hx)	46	V.34 (14400 dx)
12	V.27ter, L/L (4800 hx)	47	V.34 (16800 dx)
13	V.27ter, L/L (2400 hx)	48	V.34 (19200 dx)
14	V.27ter, L/S (4800 hx)	49	V.34 (21600 dx)
15	V.27ter, L/S (2400 hx)	50	V.34 (24000 dx)
16	V.29 (9600 hx)	51	V.34 (26400 dx)
17	V.29 (7200 hx)	52	V.34 (28800 dx)
18	V.29 (4800 hx)	53	V.34bis
20	V.32	54	V.34bis (31200)

21	V.32 (4800 dx)	55	V.34bis (33600)
22	V.32 (7200 dx)	60	V.110 (300 dx)
23	V.32 (9600 dx)	61	V.110 (1200 dx)
25	V.32bis	62	V.110 (2400 dx)
26	V.32bis (12000 dx)	63	V.110 (4800 dx)
27	V.32bis (14400 dx)	64	V.110 (9600 dx)
30	V.Fast	65	V.110 (19200 dx)
31	V.Fast (14400 dx)	66	V.110 (38400 dx)
32	V.Fast (16800 dx)	67	V.110 (48000 dx)
33	V.Fast (19200 dx)	68	V.110 (56000 dx)
34	V.Fast (21600 dx)	70	64000 bit/s
		245	autom. from V.32
		255	autom. detection

3 AT

The parameters 1…52 are supported to guarantee for command compatibility of the ATF command concerning recent analog modems manufactured by ke. This is an emulation of the V.-recommendations for applications without installed modem chip or whenever outgoing analog dialing is not selcted definitely. Please refer to chapter 10 for further information. After an emulation of the related analog modulation procedure the terminal adapter sends a CONNECT report after successful dial up, e.g. CONNECT28800/REL.

3) During operation in autoreliable mode (AT\N3) the terminal adapter attempts to establish a data protection protocol acc. to V.42 or MNP after the physical dial up. For this purpose the device sends a data sequence to the remote terminal adapter. The originator is controlled using the command AT\C if he receives an autoreliable fallback character from the remote station. This character (default: hex 00) is defined using the command AT%An. If the terminal adapter receives an autoreliable fallback character and the command AT\C1 or AT\C3 is selected a protocol request is not issued and the data transmission commences in normal mode.The fallback character is not evaluated if the command AT/C0 is set. The transmission commences in normal mode if the protocol request is not answered.

AT 3

3.1   Help Commands for the AT Command Phase

AT?   After typing the command the terminal screen displays all available help commands. The help text is only available in german language.
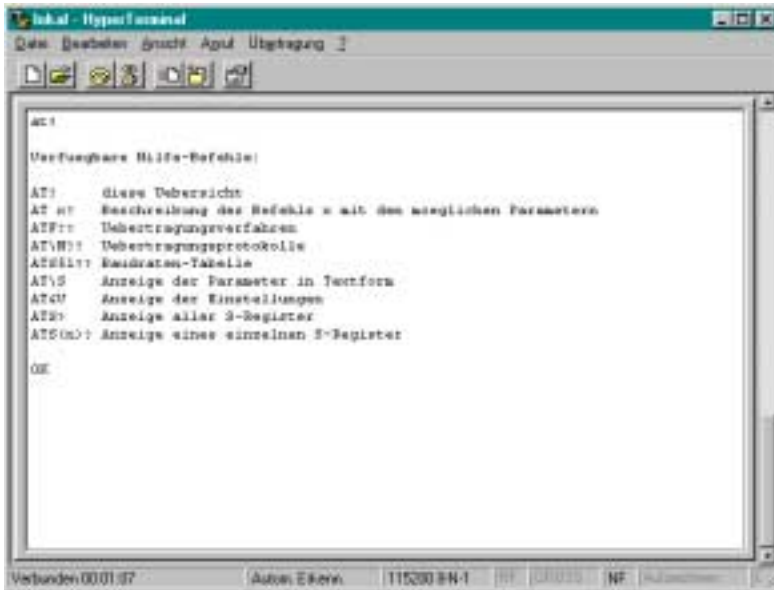
Display for the AT? Command

ATx?   The parameter x has to be replaced with a valid command (without the AT prefix). The current settings will be displayed.

```
ATF?
255     autom. Erkennung

OK
AT\N?
6       ECC mode (0...9)
OK
```

Display for the ATx? command

AT\N?? The valid parameters and their description are displayed
ATF? after typing one of these commands.
ATS51??

```
AT\N??
0       normal mode
1       direct mode
2       reliable mode
3       autoreliable mode
4       reliable mode (V.42)
5       reliable mode (MNP)
6       X.75 transparent
7       X.75 T.70NL
8       X.75 BTX
9       HDLC + V.110
OK
```

Display for the AT\N?? command.

After typing the command **AT\S** the current settings of the terminal adapter towards the DTE are displayed.

```
at\s
Konfiguration :
 F Betriebsart ............. Auto      %C Kompressions-Mode.. 1      &M Sync.Betrieb ............... 0
 L Lautstaerke ................... 1   %E Retrain ...................... 1   &R M2-Option .................... 1
 M Lautsprecher ............... 1      %G Steuerkontakt ........... 2      &S M1-Option .................... 1
 Q Meldungen .................. 0      %I Info-Okt. Abgehend .... 2       &T Testeinstellungen .......... 5
 V Text/Numerisch ............ 1       %K Info-Okt. Ankommend. 2          &X Taktvariante .................. 0
 X Meldungsart ................. 4     %M Passwort-Modus ...... 0          &Y Start-Profil .................... 0
\A MNP-Blocklaenge ........ 1         %R Rate-Change ............. 0      Autobaud ........................... 1
\C MNP-Handshake ......... 0         %W Analog/Digital-Wahl.. 42         DEE-Baudrate ............ 57600
\G Modem-Flusskontrolle . 0          %X Rufnummernausgabe.0             Fernkonfig ........................... 0
\K Break-Handling ........... 3       &C M5-Option .................. 2   AT/V.25bis-Befehle ............. 0
\L Block/Stream-Mode ..... 0         &D S1-Option ................... 2   Testtaste ............. Datentaste
\N ECC-Modus ................ 3       &H Simuliert Hx ............... 0   Rufannahme ........................ 1
\Q DEE-Flusskontrolle ...... 2        &I CONNECT-Meldung..... 0          Auto-Protokoll .............. DSS1
\X XON/XOFF-Weitergabe..0            &L Standleitung ............... 0   MSN...................... ...............
OK
```

Display for the AT\S command

After typing the command **AT&V** all AT commands and S registers of the current setting of the terminal adapter are displayed:

```
at&v
Version 4.00 D   Option: Modem-Chip
F255 E1 L1 M1 Q0 X4 V1 P \Q2 \G0 \A1 \C0 \L0 \M1 \N3 \X0 \K3 \B3 %C1 %E1 %G2 %I2
&Y0 %K2 %M0 %R0 %S0 %X0 %Y0 &L0 &I0 &X0 &G0 &M0 &C2 &D2 &H0 &R1 &S1 &T5
S00=001 S01=000 S02=043 S03=013 S04=010 S05=008 S07=100 S08=002 S10=050 S12=045
S20=255 S26=004 S28=000 S37=000 S39=017 S40=019 S45=000 S47=003 S50=255 S51=255
S54=001 S60=000 S61=000 S80=000 S81=002 S90=005 S91=000 S93=000 S95=042 S96=001
S99=002 S100=042 S101=000 S102=000
EAZ: 1
OK
```

ATS? Display of S registers with current setting

ATSn? Display of S register n

```
ATS?
S000...001    S001...000    S002...043    S003...013    S004...010
S005...008    S006...002    S007...100    S008...002    S009...006
S010...050    S011...095    S012...045    S013...000    S014...014
S015...000    S016...000    S017...048    S018...000    S019...000
S020...255    S021...073    S022...069    S023...000    S024...001
S025...080    S026...004    S027...000    S028...000    S029...130
S030...000    S031...048    S032...075    S033...006    S034...000
S035...168    S036...001    S037...000    S038...000    S039...017
S040...019    S041...000    S042...000    S043...000    S044...000
S045...000    S046...000    S047...003    S048...006    S049...000
S050...255    S051...255    S052...001    S053...002    S054...001
S055...000    S056...000    S057...250    S058...000    S059...000
S060...000    S061...000    S062...030    S063...006    S064...001
S065...004    S066...016    S067...000    S068...000    S069...000
S070...000    S071...000    S072...000    S073...000    S074...000
S075...000    S076...000    S077...000    S078...000    S079...000
S080...000    S081...002    S082...000    S083...000    S084...000
S085...000    S086...000    S087...000    S088...000    S089...000
S090...005    S091...000    S092...000    S093...000    S094...000
S095...042    S096...000    S097...000    S098...099    S099...002
Weiter mit Space      Ende mit Return
OK
```

3.2 User Information for the ATI Command

Some specific information i.e. software versions or manufacturing data can be displayed using the ATI command. Moreover some information concerning the last dial up is available. These data may be interesting during automatical computer controlled data transmission e.g. to check the current cost situation. The following information is available with the terminal adapters:

3 AT

ATI 0   **software version**
Version 4.00 15.03.96
Dok.Nr:0202.01
OK

ATI 1   **software version V.42/MNP module**
REL V3.95
OK

ATI 2   **revision level modem chip**
DP V1.00
OK

ATI 10   **display of specific data**
LOGES without label
Version   :255
Alterations   :255
Manufacturing   :KW 255/255
Serial Number   :255255255255
OK

ATI 11   **state of last connection**
last connection state
calling number   :*89W7242909
connection state   :analog outgoing CONNECT 28800/COMP/V.42bis B1
break report   :384F
charges   :48 units/85 seconds
time   :10.04.96 11:31:55 1

ATI 12   **charges status of last dial up**

The command displays 0 (no charges) or 1 (charges). The command is acknowledged with an OK.

AT 3

4 Register Description

Contents **Page**

4 REG

REG **4**
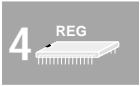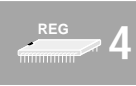
4   Register Description

The terminal adapters LOGES ® LGM 64k/LOGES 64k features a number
of S registers for configuration. The list shown below contains all registers
that may be implemented to adjust the device. For register alteration just
type the command

$$ATSn=y$$

The register number is represented by the n (0<=n<=102) while the y is
the new register value. A S register can have values from 0...255. The
valid register contents are given in the following list.
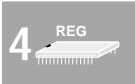
All registers marked with an " * " have no effect during ISDN operation.
These registers are supported due to compatibility reasons.

Attention:
The default values given here refer to delivery state. This corresponds to
basic setting 0 and can be altered using the AT&F0 command.

register	values/ default	description
S0	0...5 / 1	**automatical call acception** y=0 no autom. call acception y=1...5number of RINGS to line occupation
S1	-	**count of rings** (read only register)
S2	0...255 / 43	**escape character**, default "+" (not for direct mode)
S3	0...255 / 13	**carriage return** (CR, ENTER)
S4	0...255 / 10	line feed (LF)
S5	0...255 / 10	**backspace** (BS)
S7	10...100/100	**carrier detect time** (unit: 1 s)
S8*	1..30 / 2	**dial pause** (unit: 1)
S10*	2...100 / 50	**carrier loss time** (unit: 100 ms)
S12	1...255 / 45	break sequence guard time (unit: 20 ms), not for direct mode

S20	0...255 / 255	**dial abortion character**
		 y=0 no abortion, all characters from DTE
		            are ignored
		 y=1...254 corresponding character from
		            DTE causes abortion
		 y=255 all characters cause abortion

REG **4**

register	values/ default	description
S26	0...255 / 4	**S2/M2 (RTS/CTS) delay time** (unit: 10 ms)
S28	0...127/ 0	autoreliable fallback character
S37	0...255 / 0	**inactivity abortion time** (unit:1 min) y=0 no abortion y>0 abortion after y mins.
S39	0...255 / 17	**XON character** (CTRL-Q)
S40	0...255 / 19	**XOFF character** (CTRL-S)
S44	0...255 / 10	**delay time** for RING report until line occupation (unit: 100 ms)
S45	0, 1 / 0	**remote configuration** y=0 no remote configuration y=1 remote configuration
S46	0,10...255/60	**hx inactivity timeout** (unit: 1 s, ref. to chapter 6)
S47	0...3 / 3	**compatibility** y=0 LGM 9600H1 y=1 LGM 14.4D1 y=2 LGM 28.8D1 y=3 terminal adapter 64k
S50	2...255 / 255	**transmission procedure** for B channel (for range of values ref. to ATF command)
S51	0...15 , 255 / 255	V.24 interface rate y=0 idle y=1 idle y=2 300 y=3 1200 y=4 2400 y=5 4800 y=6 7200 y=7 9600 y=8 12000 y=9 14400 y=10 16800 y=11 19200 y=12 38400 y=13 57600 y=14 76800 y=15 115200 y=255 autom. detection up to 57600 [a]

ke

register	values/ default	description
S54	0...5 / 1	**function of Da/Te button** y=0 activate test loops y=1 data button y=2 direct call y=3 direct call/disconnect y=4 data button/disconnect y=5 button locked
S60 [b]	0...11 / 1	**data format online phase** y=0 8 data bits, no parity, 1 stopbit y=1 8 data bits, odd parity, 1 stopbit y=2 8 data bits, even parity, 1 stopbit y=3 8 data bits, no parity, 2 stopbits y=4 8 data bits, odd parity, 2 stopbits y=5 8 data bits, even parity, 2 stopbits y=6 7 data bits, no parity, 1 stopbit y=7 7 data bits, odd parity, 1 stopbit y=8 7 data bits, even parity, 1 stopbit y=9 7 data bits, no parity, 2 stopbits y=10 7 data bits, odd parity, 2 stopbits y=11 7 data bits, even parity, 2 stopbits
S61 [b]	0...11 / 0	**data format command phase** (range of values acc. to S60)
S69	0...255 / 40	**terminal fax timeout** (unit: 100 ms)
S75	0...255 / 33	**terminal fax dial parameter** default: 33, = " ! " y=0 no teminal fax y=1 dial up with terminal fax y=2...255 outgoing terminal fax, if this character occupies the first position of the dial string, i.e. ATD ! xxx
S80 [b]	0...3 / 0	**command interpreter** y=0 AT command set y=1 AT and V.25bis commands y=2 AT and V.25bis commands, V.24 interface signals acc. to V.25bis y=3 as 2, with support of DNL sequences

4 REG
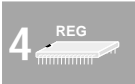
register	values/ default	description
S90	0...5 / 5	**max. DCE rate for fax operation** (only with modem chip) y=0 2400 bit/s y=1 4800 bit/s y=2 7200 bit/s y=3 9600 bit/s y=4 12000 bit/s y=5 14400 bit/s
S91	0, 1 / 1	**ECM mode for fax operation** (only with modem chip) y=0 no error correction y=1 error correction
S92	0, 1 / 0	**function for autom. dial up** (fax/data) if DTE sets AT+FAA=1 y=0 default data mode y=1 dafault fax
S93	1...3, 9, 10, / 3	**B channel selection** y=1 prefer B channel 1 y=2 prefer B channel 2 y=3 use any B channel y=9 only B channel 1 y=10 only B channel 2
S94 [a]	1...3 / 3	**incoming B channel** y=1 B channel 1 y=2 B channel 2 y=3 any B channel

[a] For implementation of 2 LOGES ® 64k at one S_0 connector for incoming operation (i.e. mailbox) it is recommended to set one device to S94=1 and the other device to S94=2. This allows for high reliability and prevents calling conflicts.

register	values/ default	description
S95	0...90 / 42	**dial up digital/analog** default: 42 = " * " y=0 digital dial up y=1 analog dial up y=2...90 The selected ASCII character is the dial parameter. If the parameter is not part of the dial string a digital connec- tion is established. If the parameter is a part of the dial string an analog connection is established. Example: ATD1234 -- calls a digital partner ATD*1234-- calls an analog partner Only for versions with integrated modem chip (64k/M) and for out- going dial up. Incoming automatical detection (ref. to AT%Wn)
S96	0...9 / 0	**EAZ for incoming calls** y=0 all inccoming calls with EAZ=0 are accepted (global call) y=1...8 incoming calls with defined EAZ and EAZ=0 are accepted y=9 night function; all incoming calls are accepted
S97	1...7 / 7	mask register for service indicator y=1 analog services y=2 voice ISDN y=4 64 kbit/s data ISDN
S99	0, 1 / 0	**D channel protocol** y=0 DSS1 (EURO-ISDN) y=1 1TR6 (national protocol) y=2 automatical detection
S100	0...255 / 42	**echo character for password input** (default: " * ")
S101	read only	**counter for wrong password inputs** (is erased at POWER ON)
S102	0, 1 / 0	M3 (RI) function **during password protection** y=0 M3 is not reported y=1 M3 is reported
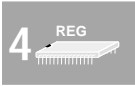
register	values/ default	description
S151	0...2, 63... 130 / 130	**X.75/HDLC transparent block size** [C)] y=0 128 byte y=1 256 byte y=2 512 byte y=63...130 block size in bytes
S152	1...7 / 7	**X.75 window size** [C)]
S153	0...255 / 3	**X.75 link address A** [C)]
S154	0...255 / 1	**X.75 link address B** [C)]
S156	0...2 / 0	**X.75 options** for automatical protocol detection y=0 X.75 tranparent y=1 X.75 T.70NL y=2 If the first received X.75 frame is in T.70 transparent format the protocol is switched to X.75 transparent.

[a)] The automatical detection of the LGM 64k and LGM 64k/M operates up to 57600 bit/s.

[b)] If register S80 is not 0 the V.24 interface rate has to be selected constantly in register S51.
For asynchronous data formats without 8 data bits, no parity, 1 startbit and 1 stopbit the V.24 interface rate has to be set in register S51. Then the data format can be choosen using the registers S60 and S61.

[c)] These S registers are available with software version 4.01.

5 Result Codes

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5 CONNECT 64000/
REL/X75

CONNECT 64000/
REL/X75

5

5   Result Codes and Result Texts

result code	text	description
0	OK	correct input
1	CONNECT	data connection
2	RING	incoming call
3	NO CARRIER	no/weak receive signal
4	ERROR	wrong input
5	CONNECT 1200	data connection 1200 bit/s
6	NO DIALTONE	no dial tone
7	BUSY	busy tone received
8	NO ANSWER	no answer tone received
10	CONNECT 2400	data connection 2400 bit/s
15	ABORT	no loop current
26	BLACKLISTED	autom. dialing blocked
27	DELAYED CALL	autom. dialing delayed
30	CONNECT 9600	data connection 9600 bit/s
31	CONNECT 4800	data connection 4800 bit/s
32	CONNECT 7200	data connection 7200 bit/s
33	CONNECT 12000	data connection 12000 bit/s
34	CONNECT 14400	data connection 14400 bit/s
35	CONNECT 16800	data connection 16800 bit/s
36	CONNECT 19200	data connection 19200 bit/s
37	CONNECT 75/1200	data connection 75/1200 bit/s
38	CONNECT 1200/75	data connection 1200/75 bit/s
40	CONNECT 1200/HDX	HX data connection 1200 bit/s
41	CONNECT 2400/HDX	HX data connection 2400 bit/s
42	CONNECT 4800/HDX	HX data connection 4800 bit/s
43	CONNECT 9600/HDX	HX data connection 9600 bit/s
50	CONNECT 300/REL	data connection 300 bit/s
51	CONNECT 1200/REL	data connection 1200 bit/s
52	CONNECT 2400/REL	data connection 2400 bit/s
53	CONNECT 9600/REL	data connection 9600 bit/s
54	CONNECT 4800/REL	data connection 4800 bit/s
55	CONNECT 7200/REL	data connection 7200 bit/s
56	CONNECT 12000/REL	data connection 12000 bit/s
57	CONNECT 14400/REL	data connection 14400 bit/s
58	CONNECT 16800/REL	data connection 16800 bit/s
59	CONNECT 19200/REL	data connection 19200 bit/s
60	CONNECT 38400/REL	data connection 38400 bit/s
61	CONNECT 57600/REL	data connection 57600 bit/s
62	CONNECT 21600/REL	data connection 21600 bit/s
63	CONNECT 24000/REL	data connection 24000 bit/s
64	CONNECT 26400/REL	data connection 26400 bit/s
65	CONNECT 28800/REL	data connection 28800 bit/s

5 CONNECT 64000/REL/X75

result code	text	description
66	CONNECT 31200/REL	data connection 31200 bit/s
67	CONNECT 33600/REL	data connection 33600 bit/s
70	CONNECT 300/COMP	data connection 300 bit/s
71	CONNECT 1200/COMP	data connection 1200 bit/s
72	CONNECT 2400/COMP	data connection 2400 bit/s
73	CONNECT 9600/COMP	data connection 9600 bit/s
74	CONNECT 4800/COMP	data connection 4800 bit/s
75	CONNECT 7200/COMP	data connection 7200 bit/s
76	CONNECT 12000/COMP	data connection 12000 bit/s
77	CONNECT 14400/COMP	data connection 14400 bit/s
78	CONNECT 16800/COMP	data connection 16800 bit/s
79	CONNECT 19200/COMP	data connection 19200 bit/s
80	CONNECT 38400/COMP	data connection 38400 bit/s
81	CONNECT 57600/COMP	data connection 57600 bit/s
82	CONNECT 21600/COMP	data connection 21600 bit/s
83	CONNECT 24000/COMP	data connection 24000 bit/s
84	CONNECT 26400/COMP	data connection 26400 bit/s
85	CONNECT 28800/COMP	data connection 28800 bit/s
86	CONNECT 31200/COMP	data connection 31200 bit/s
87	CONNECT 33600/COMP	data connection 33600 bit/s
90	CONNECT 21600	data connection 21600 bit/s
91	CONNECT 24000	data connection 24000 bit/s
92	CONNECT 26400	data connection 26400 bit/s
93	CONNECT 28800	data connection 28800 bit/s
94	CONNECT 38400	data connection 38400 bit/s
95	CONNECT 57600	data connection 57600 bit/s
96	CONNECT 31200	data connection 31200 bit/s
97	CONNECT 33600	data connection 33600 bit/s
100	CONNECT 48000	data connection 48000 bit/s
101	CONNECT 56000	data connection 56000 bit/s
102	CONNECT 64000	data connection 64000 bit/s
103	CONNECT 76800	data connection 76800 bit/s
104	CONNECT 115200	data connection 115200 bit/s
120	CONNECT 48000/REL	data connection 48000 bit/s
121	CONNECT 56000/REL	data connection 56000 bit/s
122	CONNECT 64000/REL	data connection 64000 bit/s
123	CONNECT 76800/REL	data connection 76800 bit/s
124	CONNECT 115200/REL	data connection 115200 bit/s
140	CONNECT 48000/COMP	data connection 48000 bit/s
141	CONNECT 56000/COMP	data connection 56000 bit/s
142	CONNECT 64000/COMP	data connection 64000 bit/s
143	CONNECT 76800/COMP	data connection 76800 bit/s
144	CONNECT 115200/COMP	data connection 115200 bit/s

/REL indicates an error protected connection.
/COMP indicates a connection with data compression (MNP5 or V.42bis).

CONNECT 64000/ REL/X75 5

5.1 Error Causes of the ISDN Network

The list printed below presents some of the ISDN specific error reports, the so called causes, and their meanings.

Location ISDN network (0x34XX):

The reports listed below are issued by the local exchange and refer to processes within the ISDN network.

Cause:	Meaning:
0x3400:	Normal disconnect, no cause given by network
0x3480:	Normal disconnect, no cause given by network
0x3481:	Invalid CR value
0x3483:	Bearer service not implemented
0x3487:	Unknown caller identity
0x3488:	Call Identity already suspended
0x3489:	No channel available
0x348a:	No channel available
0x3490:	FAC Code unknown in this network
0x3491:	Requested service rejected
0x34a0:	Outgoing calls barred
0x34a1:	User access busy
0x34a2:	Nonexistent CUG
0x34a3:	Nonexistent CUG
0x34A5:	Invalid or unknown destination
0x34b5:	Destination not obtainable
0x34b8:	Number changed
0x34b9:	Out of order
0x34ba:	No user responding
0x34bb:	User busy
0x34bd:	Incoming calls barred
0x34be:	Call rejected
0x34d8:	Invalid destination address
0x34d9:	Network congestion
0x34da:	Remote user initiated
0x34f0:	Local procedure error
0x34f1:	Remote procedure error
0x34f2:	Remote suspended
0x34f3:	Remote not suspended
0x34ff:	Local reject of User to User info

5 CONNECT 64000/
REL/X75

Location subscriber terminal adapter or S_0 access (0x33XX):

Cause: **Meaning:**

Cause	Meaning
0x3301:	D channel layer 1 setup error
0x3302:	D channel layer 2 setup error
0x3303:	B channel layer 1 setup error
0x3304:	B channel layer 2 setup error
0x3305:	D channel layer 1 shutdown
0x3306:	D channel layer 2 shutdown
0x3307:	D channel layer 3 shutdown
0x3308:	B channel layer 1 shutdown
0x3309:	B channel layer 2 shutdown
0x330A:	B channel layer 3 shutdown
0x330B:	B channel layer 2 reestablished
0x330C:	B channel layer 3 reestablished

CONNECT 64000/
REL/X75

5

ke

6   Remote Configuration

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6
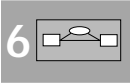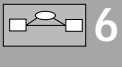
6   Remote Configuration

The LOGES ® LGM 64k/LOGES ® 64k are prepared for remote configuration with the basic setting 8. You can establish connections e.g. from a remote station to the modem and activate the remote configuration by issuing a special password.

The features listed below are of general importance for remote configuration of the terminal adapter 64k.

Register S45:   The register determines if the terminal adapter is ready for remote configuration which is only possible if register S45=1.

Password: During existing connections any terminal adapter to be remotely configured must have a password. For this reason only authorized staff can perform any configurations with the terminal adapter 64k. In delivery state the password "FERN" is preset. If you employ the remote configuration feature you should change the password using the command AT%P.

Data Protection: Remote configuration is only possible in reliable mode implementing the data protection protocols acc. to V.42 or MNP.
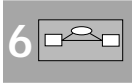
Application 1:

The remote LOGES ® LGM 64k/LOGES ® 64k is configured from remote by a second LOGES ® LGM 64k/LOGES ® 64:

Here the local terminal adapter 64k has to be switched during the existing connection to command phase using the break sequence "+++". The remote configuration starts after the modem has issued an OK report and after typing the command AT%F or AT%F/PASSWORD. After successful establishment the local terminal adapter reports CONNECT REMOTE.
From now on the remote LOGES ® LGM 64k/LOGES ® 64 interprets any input as a command.
Any command line has to start with an AT and must be terminated with CR (carriage return). The AT commands in this manual are valid with only a few exceptions that will be mentioned later.
The terminal adapter 64k is prepared for complete reconfiguration. To keep any changes permanently they must be stored with an AT&W command. New configurations get active after a reset (ATZ(n)) or OFF/ON switching of the power supply.

Attention!   If you set the operation mode during configuration of the remote terminal adapter to e.g. V.26bis or if you deactivate the data protection protocols for V.22bis operation and the parameters are saved with AT&W the device does not accept any further remote configurations after the connection is deestablished.
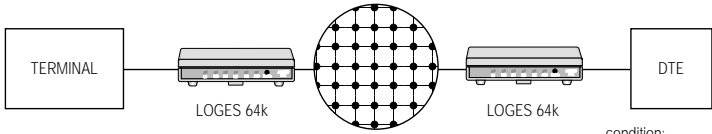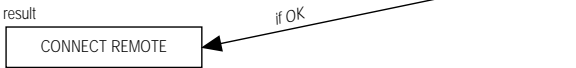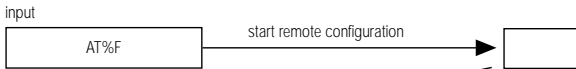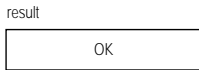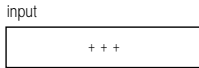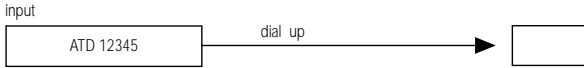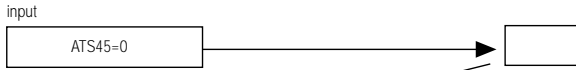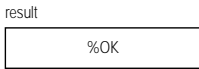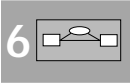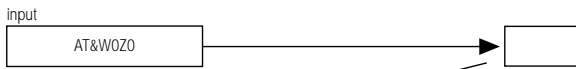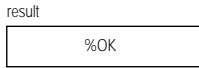
Application 2:

Complete reconfiguration after commissioning

During commissioning the user setting 2 or basic setting 8 have to be loaded at POWER ON. Now the terminal adapter is ready for remote configuration. The newly installed LOGES ® LGM 64k/LOGES ® 64 is called from a central using a terminal or PC. The operating modes may be set according to the actual application.
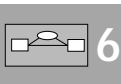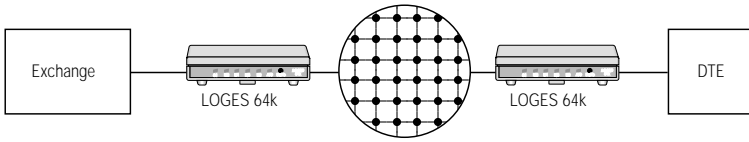
| Exchange | | LOGES 64k | | LOGES 64k | | DTE |

| dial up |

input

| + + + |

result

| OK |

input

| AT%F/PASSWORT |

result

| CONNECT REMOTE |

initiation
of
remote
configuration

input

| AT <C$_R$> |

result

| %OK |

input

| AT ..... C$_R$ |

result

| %OK |

reconfiguration
and
saving

input

| AT&WZ |

result

| NO CARRIER |

| end of connection |
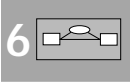
Application 3:

The remote terminal adapter 64k is to be remotely configured by a non LOGES terminal adapter. For this application the local terminal and the local data transmission software must be capable to send a BREAK signal.

Procedure: The local terminal has to send a BREAK signal after the establishment of a connection when both ISDN boards are in the data transmission phase. The remote configuration password terminated with a CR has to be part of the next 40 characters to be transmitted within 10 seconds. After detection of the password the remote LOGES ® 64k acknowledges the remote access mode with an %OK. The further procedure is according to application 1 after the CONNECT REMOTE report.

6

| TERMINAL | | TERMINALADAPTER | | | LOGES 64k | | DTE |

dial up

| send BREAK | BREAK-Signal | |

input

| Passwort C_R | |

result

%OK
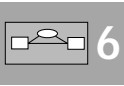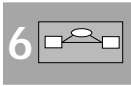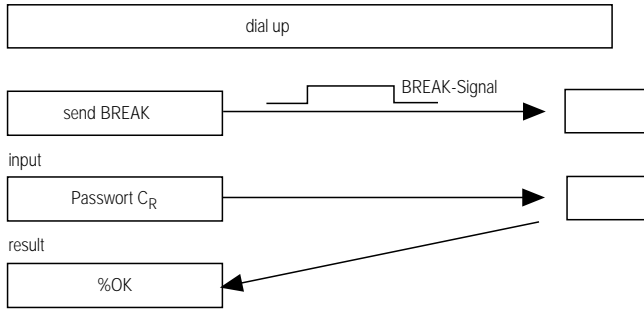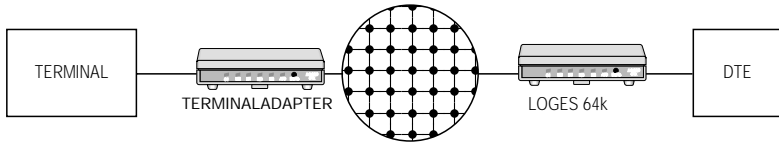
The commands listed here may not be used during remote configuration.

ATA
ATD
AT\B
AT\O
AT\Y
AT\Z

The commands will be acknowledged with an ERROR report.

Attention:

• Any changes that have not been stored before terminating a
   connection are lost and have no further effect.

• If you have any doubts concerning the correctness of alterations you
   should terminate the connection without saving any parameters.

• As there are no limitations concerning remote configuration some
   commands only allow for single remote access.

Examples:

• The commands AT\N0 or AT\N1 deactivate the data protection
   protocols.

• Register S45 is set to 0.
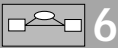
7 Password Protection

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7   Password Protection

The password protection feature comes with three different operation modes that may be combined freely.

A)   direct switching after password typing or with callback to a defined callback number
B)   after correct password typing:
               callback with facultative typing of callback number
C)   with forced callback; the callback number is available on request

The password storage records max. 20 numbers. The operation mode may be defined freely for any record.
Due to the super password the records are protected against alterations (hacker protection). Moreover a register counts the wrong passwords.

7.1   Activation/Deactivation of Password Protection

The command AT%Mn is implemented for activation/deactivation of the password feature. The super password is always necessary to prevent any reconfigurations of the password protection by unauthorized users. The super password is created by typing AT&Z0=\PASSWORD.

Attention:
The super password stored in the short dial register Z0 is utilized as a valid password at online requests.

AT%M0/super password	no password protection
AT%M1/super password	password protection

Changing of password and/or callback numbers is possible using the remote configuration feature. The remote configuration password is not identical with the super password! At activated password protection (AT%M1) the passwords are not displayed during the listing of the short dial registers Z00 ... Z19. You have to enter the super password on request if you perform any alterations.

7.2   Configuration of Password Protection

Password and callback numbers are stored in the 20 short dial registers Z00 ... Z19. The short dial register Z00 is of special significance. The password stored here is the super password of the command AT%M. To select operation modes the callback number must have a prefix of two characters (letters).

Operation Mode Label ZA:

For this operation mode password and callback numbers are stored permanently in the short dial register. If a user types the correct password he is connceted to the host directly or if the password has a callback number the subscriber is called back.

Attention: The operation mode label ZA must not be prefixed to the calling number generally to be downward compatible to recent software versions.

Operation Mode Label ZB:

This is an enhancement of the password protection feature. After correct typing of the password an individual callback number can be set as an option.

user input	modem reaction
<RETURN>	callback with number allocated to password (AT&Z(n))
(phone number) <RETURN>	callback with phone number ...
0 <RETURN>	direct switching to the HOST

Operation Mode Label ZC:

This operation mode operates generally with the callback feature. It uses either a number stored in the short dial register or a phone number entered online.

user input	modem reaction
<RETURN>	callback with number allocated to password (AT&Z(n))
(phone number) <RETURN>	callback with phone number ...

Example:

AT&Z1=123456789/GEHEIM

                                                password
                                         callback number (optionally)
                                         operation mode label

Attention:
The password may contain max. 11 characters. Small letters are automatically changed to capital letters after typing.

Example:

The command line: AT&ZC123456789/geheim\<ENTER\>

is altered to: AT&ZC123456789/GEHEIM

This alteration takes place during configuration of the passwords and during operation (at online password polling) as well.

The operation mode labes described here may be different for any of the 20 password storages. This feature allows for different access modes for any of the passwords.

Additional information for operation modes ZB and ZC:
If the terminal adapter operates with a PABX system the procedure of central office access is very important for the callback feature. As the way of central office access might not be known by subscribers from outside central office access can be defined using the dial prefix AT&ZP=xxx. An authorized subscriber has to type only his individual callback number (area code and subscriber number). The LOGES ® 64k sets the necessary prefix for the calling number automatically.

Example: The terminal adapter 64k is adjusted for operation mode ZB with password protection. The PABX system needs the prefix 89 for central office access. After central office access the device has to wait for the dial tone (parameter:W).

1. Step: Enter passwords:
                 AT&Z0=ZB123456/MEIER (super password)
                 AT&Z1=ZB05116747390/WURST
                 ...
                 ...
                 AZ&Z9=ZB089558006/GEIGE

2. Step: select prefix:
AT&ZP=89W

3. Step: activate password protection:
AT%M1/MEIER

Dial up procedure:

1.   An external user establishes a connection to the
LOGES ® 64k.

2.   Enter "GEIGE" as password.

3.   Type "05116747590" as callback number.

The connection is deestablished after typing of the new calling number.
The device generates the dial command "ATD89W05116747590" and
initiates a dial up.

The callback number defined in Z9 is not altered!
The standard callback number should be stored in the short dial register.
If the newly entered callback number starts with a " . " (point) e.g. ".590"
the calling number has no prefix. This is important for calls inside PABX
systems to suppress the central office access.
The operation mode labels described here are available with software
version 4.00.
A configuration without prefix labels is possible to allow for downward
compatibility. The terminal adapter operates in those cases according to
operation mode ZA.
Please enter passwords and callback numbers acc. to the example shown
below:

Without callback:

      AT&Z2=/PASSWORT

With callback:

      AT&Z3=T05116747390/SUPPORT

Additional information:

If you type a password without a callback number the "/" (slash) must be set generally.

The super password (from Z0) is necessary in the following cases:

- for utilization of the AT%M command

- for alteration of callback numbers and passwords in the password protected operation modes

During activated password protection passwords/callback numbers are not displayed after typing the AT&Z command.

If the calling number storage does not contain any information concerning operation mode labels and callback number the device switches directly to the host if the password was entered correctly.

The callback number has to be typed generally after entering the password if the callback number was not selected for the operation mode ZC (AT&Z(n)=ZC/PASSWORT).

After a dial up to a password protected modem the calling station is prompted with "PASSWORT" to enter a password. The connection is deactivated in the following cases:

- the correct password was not entered within 3 minutes or,

- three incorrect passwords were entered

An active connection is signalled to the HOST after a correct password was entered of if the callback was successful (i.e. DCD is active).

During password protected operation the RING report and the active interface line RI (M3) is not reported to the HOST. Please refer to register S 102 to receive these reports.

Password Protection

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8 V.25bis Command Phase

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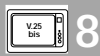
8 V.25bis Command Phase

During compatible mode only V.25bis commands are available. For the software mode you can use either AT or V.25bis commands. If you change from the AT to the V.25bis command set register S80 must be set to 1, 2 or 3.

Commands are transfered during the asynchronous command phase with the data format: 7 data bits, even parity, 1 start and 1 stop bit. The command line has to be terminated with the ASCII character "line feed" (L_F, $0A_{hex}$) or "carriage return line feed" ($C_R L_F$, 0D $0A_{hex}$).

Supported V.25bis Commands:

command	description
CIC	connect incoming call
DIC	disregard incoming call
CRI xxx; label [1]	dial number xxx with own label
CRN xxx [1]	dial a phone number xxx
CRS n [2]	dial up with short dial register
PRN n; xxx	write characters xxx to short dial register n
RLN	transfer list of short dial numbers to DTE

Table 1: V.25bis Commands

V.25bis reports from the terminal adapter 64k:

report	meaning
INC	incoming call
INV	invalid input
VAL	valid input
CFIAB	call fail indicator, call or dial up aborted
CFICB	call fail indicator, line busy
CFIFC	call fail indicator, blacklisted
CFINT	call fail indicator, no answer tone
CFIET	call fail indicator, subscriber busy

Table 2: V.25bis Reports

[1] **Valid Parameters for Character String xxx:**

parameter	meaning
=	programmable dial pause, the duration is selected in register S8
<	dial pause 1 s
: or W	dial tone recognition
& or !	short line time-out (flash impulse), only during tone dialing
>	activation of ground key for 255 ms
0 ... 9	digits for calling number and labels
#, A, B, C, D	special functions for tone dialling
;	separation character for calling number and label
SPACE	group separation character (blank)
P	pulse dialing
T	tone dialing
*	outgoing analog dialup (ref. to chapter 10)

Table 3: Dial Command Parameters

The parameters listed here are supported due to compatibility reasons concerning recent analog modems.
The parameters P, T, :, A, B, C, D, !, &, <, >, = are not necessary for dial up.

Example for CRI Command:

CRI T > : 05116747390 ; 05116747590$_{LF}$

label
separation character
subscriber number
dial tone recognition
ground key for central office access of the PABX
tone dialing
dial command
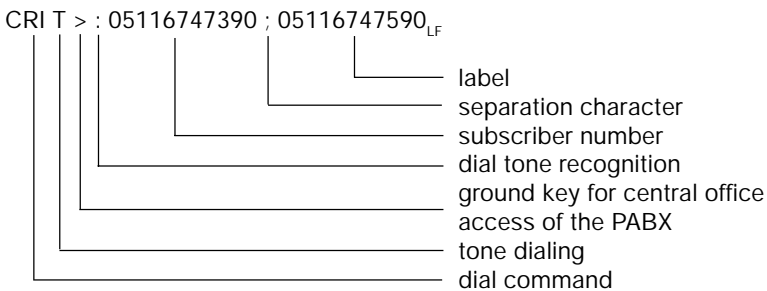
[2] the parameter n can have the numerical values 0...19.

9 Analog Operation

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Operation Manual - ISDN Terminal Adapter V.24/V.28

9 Analog Operation LOGES ® 64k/M

The terminal adapter supports data transfer with modems within the analog network due to the implemented V.34 data pump.
For outgoing and incoming operation this allows for data transfer with a line rate of max. 33600 bit/s. Due to the implementation of data protection protocols and data compression the transmission rate rises about the factor 4.
Analog fax operation acc. to group 3 class 2 is implemented as well. This operation mode supports transmission ranges up to 14400 bit/s (V.17).

9.1 Configuration Information for Data Operation

The terminal adapter operates principially with only one configuration profile. Any switching of the operation modes between digital and analog transmission is performed using register S95 and the AT%Wn command.

Please check the settings of the ATFn and AT\Nn commands before any dial up. A connection to an analog modem is not possible if the modulation procedure (ATFn) is set to V.110/19200 bit/s. This operation mode is only possible during ISDN transmission. If any incorrect settings occur the terminal adapter sets the values for the corresponding commands as listed below:

ATF Command:

If the terminal adapter is preset only for ISDN transmission rates and you try to attempt a connection to an analog modem the device switches to automatical detection (ATF255).

AT\N Command:

Whenever the X.75 protocol was selected the terminal adapter switches to autoreliable mode (AT\N3) during dial up to an analog partner.
During computer controlled data transmission the dial up should commence with a unique initializing string that sets the modulation procedure (ATFn), protocol (AT\Nn) and the service recognition AT%Wn) as required for the connection. Then the connection ist set up correctly with the dial string. If the range of values for n is set to 2....90 with the command AT%Wn the dial command controls the switching from analog to digital connection. The examples listed below present some procedures for automatical dial up.

9.2   Dial Up To Digital Subscriber

Init string: ATF70\N6%W0 (CR)

Dial string: ATDxxx (CR)

A connection with the service label "64k data service" is established. The protocol (AT\N6) is X.75.

9.2.2   Dial Up To Analog Subscriber

Init string: ATF40\N4%W1 (CR)

Dial string: ATDxxx (CR)

The connection is established as a/b service (AT%W1) to an analog modem with V.34 (ATF40) and data protection acc. to V.42bis /AT\N4).

9.2.3   Dial Up With Automatic Change Of Service

The terminal adapter has an integrated feature for automatic outgoing initialization for those cases where an individual initialization before the dialing process is not possible. Just type the following init string:

ATF70\N6%W42 (CR)

Now the terminal adapter operates with 64k data service with the X.75 protocol. The command AT%W42 defines the ASCII character " * " as switching character for the service label 64k or a/b service within the dialing command. The next dial up is labelled as a/b service if this character is a part of the dial string. Moreover the command ATFn is set to 255 and AT\N to 3 internally. Now the terminal adapter operates with automatical detection of the modulation procedure and protocol (MNP or V.42).

ATD * 05117647390   dial up to an analog partner

ATD 05116747731   dial up to a digital partner

9.2.4 Analog Dialing During Compatible Mode

If the terminal adapter is preset using the DIP switches to compatible mode LGM 1200H1, LGM2400H1, LGM 4800H2 or LGM 2400D2 dialing is only possible with the V.25bis commands "CRIxxx" or "CRN...". By inserting the asterisk " * " these operation modes allow for analog dial up.

Example:

CRI * 123456;05116747391 (LF)

or

CRN * 123456 (LF)

9.2.5 Analog Dialing With Short Dial Register

If short dial registers are employed for dial up outgoing dialing with service switching to the analog network is possible according to the calling number entry. The short dial register must contain the following entries:

AT&Z3=* 05116747390/ke-box

or

PRN3; * 05116747390

This short dial register entry allows for outgoing dialing with anlog dial up to a duplex modem. The dial is initiated with an AT command:

ATDS=3 (CR)

or

ATD/ke-box (CR)

or

CRS 3 (LF)

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9

10　Firmware Bootloading

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10 The Bootloader of the Terminal Adapter 64k

The terminal adapters are equipped with a flash EPROM that allows for software download of any firmware updates directly to the devices.

A part of the flash EPROM contains the bootloading programm that allows for CRC protected storing of new firmware directly to the flash EPROM after activation. The bootloading program is stored in a specially protected part of the EPROM to prevent any modification or even erasing.

The bootloader can be activated either with the AT command "ATBOOT" or with the corresponding DIP switches.

After activation of the bootloader the terminal adapter waits for new data to be transfered using the terminal program as an ASCII upload to the device. The firmware file is an ASCII file with the Motorola "S1 record" format. Each S1 line is automatically supplied with a checksum which is checked by the device. Any checksum errors are reported immediately. At the end of the transmission a checksum is issued that has to match the checksum of the upload file.

Please refer to the items listed below for firmware upload:

• The terminal adapter firmware has to be installed on the hard disk.

• A terminal software operating with 115200 bit/s at the serial interface should be installed.

• Operation with 19200 bit/s at the serial interface is possible during DIP switch mode.

10 BOOT-LOADER

10.1   Start Loading with Software Command

Please perform the following steps for the desktops LOGES ® 64k and LOGES ® 64k/M:

1.   Set the interface rate to 115200 bit/s.

2.   **AT** _{CR}   An OK has to be issued.

     ATBOOT _{CR}   The bootloader is started. The following
                            screen display should be visible:
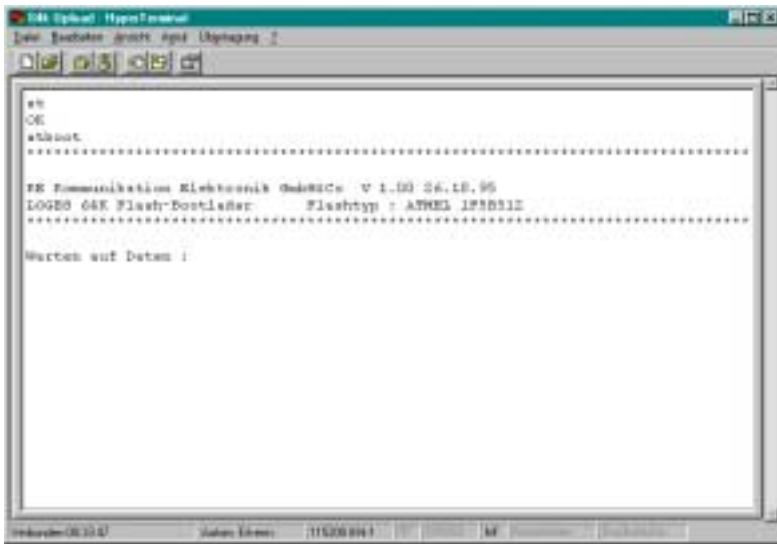
Now you can start the ASCII upload.

The ke firmware file ends with an "s" for S1 record.

The file name means:

L64d   LOGES ® 64k, german
202   software version

The S1 records are transfered to the terminal adapter after the start of transmission. After 30 kByte transmit data the device acknowledges the received data with a " . ".
Data flow control RTS/CTS must be activated for transmission!

The terminal adapter displays a status report after the file transmission:
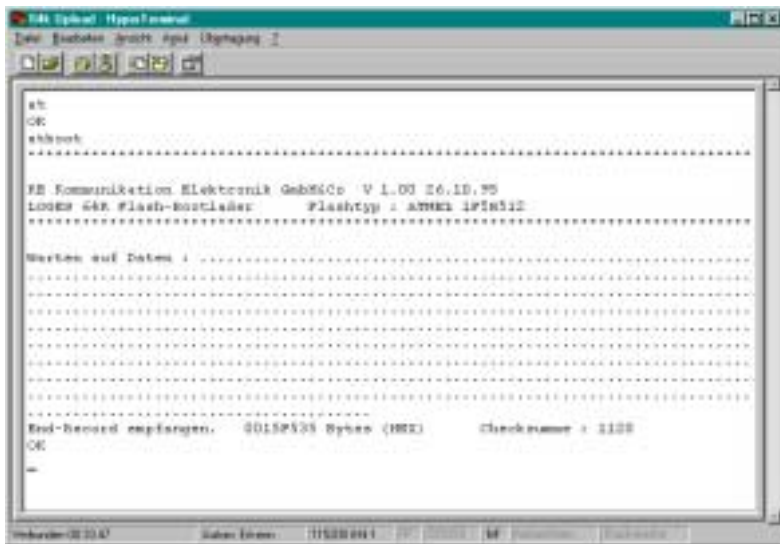
Additional information for LGM 64k and LGM 64k/M (modules):

Select the items listed below to prepare the modules for software upload:

•   Set terminal rate to 57600 bit/s
•   Enter: AT&F51=15; set LGM 64k to 115200 kpbs
•   Set terminal rate to 115200 bps
•   Enter: ATBOOT; start upload

The further procedure is according to the information given above.

10 BOOT-LOADER

10.2 Loading with DIP Switches

After this procedure the bootloader is active immediately after POWER ON. Now the device does not accept any AT commands. The terminal adapters (desktops and modules) allow for the following DIP switches positions:

S1.1	S2.4	function
ON	ON	activate bootloader

The serial DTE interface is defined with the next two switches:

S2.1	S2.2	function
OFF	OFF	reports to DTE, baud rate 115200 bit/s
OFF	ON	reports to DTE, baud rate 19200 bit/s
ON	OFF	no reports to DTE, baud rate 115200 bit/s
ON	ON	no reports to DTE, baud rate 19200 bit/s

The DIP switch 2.3 is employed to select the type of device:

S2.3	function
OFF	desktop 64k (64k/M)
ON	module 64k (64k/M)

The DIP switches not mentioned here must be left in position OFF!

Please proceed the steps listed below for firmware upload:

1.   Deactivate the terminal adapter. Set the DIP switches acc. to the table shown above.

2.   Start the terminal software. Adjust baud rate correctly.

3.   Restart the terminal adapter.
        After the self test the screen displays the same text as in the figure bootloader start.

4.   Start ASCII upload.
        Attention: RTS/CTS handshake must be selected!

5.   The terminal adapter sends a report after correct transmission.

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LOADER **10**

10.3 Troubleshooting for the Loading Process

Please refer to the table below if any problems occur during firmware uploading:

problem	troubleshooting
report: checksum error	a) serial cable exceed 1.5 m b) defective upload file
no startup screen	check for firmware version 2.02 or higher request command: ATI
upload duration > 10 min.	change setup for ASCII transmission of terminal software (e.g. line and character speed)

10.4 LOGES ® Firmware Distribution

1. Please send any orders for upload files (available as 3.5 "disc) to the following address:

    ke Kommunikations-Elektronik GmbH
    Dept.: VM211
    Kabelkamp 20

    30179 Hanover/Germany

2. As an option the file is available at any time from the ke mailbox. Just dial ++49 (511) 3728124. The mailbox is accessible via ISDN or analog modems (up to V.34).

Please adjust your terminal software to the following data format parameters:

    8 data bits
    no parity
    1 stop bit

Select ANSI-BBS as terminal emulation. Due to the file size you should employ the Z-Modem protocol for the download.

3. Further information and support is available from the internet at

    http://www.ke-online.de\Support...\64k...\Firmware...

10 BOOT-LOADER

BOOT-
LOADER **10**

Operation Manual - ISDN Terminal Adapter V.24/V.28

ke

11 Setting of Parameters

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11 General Setting of Parameters

This chapter describes all testing facilities of the S_0 connector and the selection of the EAZ/MSN using the DIP switches.
Please refer to the table below for compatible mode operation using the 64k or EAZ/MSN selection via the DIP switches. After POWER UP the device starts an automatic self test presenting the result with the front panel LEDs.

11.1 EAZ Selection with DIP Switches

As the EAZ (terminal selection number) is a one-digit number from 0...9 it can be also selected without a terminal using the DIP switches S1.1...S1.4 that define the EAZ for incoming and outgoing calls. Please refer to the table below for switch allocation.

S1.1	S1.2	S1.3	S1.4	EAZ mask for incoming connections
OFF	OFF	OFF	OFF	Incoming calls with EAZ=0 (global call) are accepted.
ON	OFF	OFF	OFF	Incoming calls with EAZ=1 or EAZ=0 are accepted.
OFF	ON	OFF	OFF	Incoming calls with EAZ=2 or EAZ=0 are accepted.
ON	ON	OFF	OFF	Incoming calls with EAZ=3 or EAZ=0 are accepted.
OFF	OFF	ON	OFF	Incoming calls with EAZ=4 or EAZ=0 are accepted.
ON	OFF	ON	OFF	Incoming calls with EAZ=5 or EAZ=0 are accepted.
OFF	ON	ON	OFF	Incoming calls with EAZ=6 or EAZ=0 are accepted.
ON	ON	ON	OFF	Incoming calls with EAZ=7 or EAZ=0 are accepted.
OFF	OFF	OFF	ON	Incoming calls with EAZ=8 or EAZ=0 are accepted.
ON	OFF	OFF	ON	All incoming calls are accepted (night function).

11 EAZ MSN

11.2 D Channel Protocol and Line Type

At POWER ON the device detects the D channel protocol of the S_0 access automatically. If the automatical detection fails e.g. due to cabling errors at the S_0 bus or logical errors switch S1.5 defines the protocol for the D channel. To prevent any detection errors the S_0 access cable must be connected before POWER ON!

S1.5	prefered protocol
OFF	DSS1
ON	1TR6

DIP switch S1.6 defines the operation mode for setting of ISDN parameters. This feature is only relevant for the POWER ON test and not for other applications.

S1.6	operation mode (only for S_0 test)
OFF	dial line
ON	leased line

11.3 Downward Compatibility

For later applications implementing the software mode (AT commands) you should define using the DIP switches S1.7 and S1.8 if the terminal adapter reports have to be compatible to other modems. The position of the switches is transfered to register S47.

S1.7	S1.8	compatibility
OFF	OFF	terminal adapter 64k
ON	OFF	LGM 28.8D1
OFF	ON	LGM 14.4D1
ON	ON	LGM 9600H1

EAZ MSN 11

Now the basic setting 10 "ISDN parameters" must be selected using the DIP switches S3.2...S3.6 (modules) or S2.6...S2.10 (desktops).

S2.6	S2.7	S2.8	S2.9	S2.10	ISDN parameters
S3.2	S3.3	S3.4	S3.5	S3.6	
ON	OFF	OFF	ON	OFF	

After adjustment of the DIP switches (EAZ, operation mode, protocol and ISDN parameters) and if all connections are checked the operation voltage can be activated.

Now the setting of ISDN parameters starts. The EAZ/MSN and the D channel protocol are transfered to the S registers and the S_0 access is tested.

The interface line PM1 (and the LED PM1 of the modules) is active during this process to signal to the terminal equipment that the DCE (data communication equipment) is not ready for transmission temporarily. The test result is indicated by the front panel LED's of the devices.

LED	dial line (S1.6 OFF)	leased line (S1.6 ON)
PM1 ON	DCE not ready	DCE not ready
A/O ON	Layer 1 OK	Layer 1 OK
A/O flashes	Layer 1 ERROR	Layer 1 ERROR
M5 OFF	D channel protocol DSS1 detected	
M5 ON	D channel protocol 1TR6 detected	not relevant
M5 flashes	no protocol detected (ERROR)	

After an errorless test routine you should deactivate the operating voltage and set the DIP switches for your application.

Any operation is not possible if one of the LEDs A/O or M5 flashes. Please check for the following defects that might occur:

• S_0 access cable
•   connector socket wrongly wired
•   terminating resistors for S_0 bus operation
     not installed or wrong dimension

The setting of ISDN parameters has to be restarted after troubleshooting. The configuration of the LOGES ® LGM 64k for any application is only possible if no further faults are indicated.

11.4   EAZ Selection with AT Commands

During software operation of the LOGES ® LGM 64k the EAZ may be selected using AT commands (register S96).

The EAZ for incoming calls is defined in register S96. The possible range of values is from 0..9, the preset value is 0. Any alterations are performed using the ATS command.

11 EAZ MSN

Example: Setting of the EAZ to 2.

        Enter: ATS96=2(CR)

        Report: OK

11.5 MSN Selection with AT Commands

The MSN (multiple subscriber number) has max. 9 digits and is to select using the AT mode and the command AT%Z=(n).

Example: Setting of the MSN to 6747731.

        Enter: AT%Z=6747731(CR)

        Report: OK

11.6 MSN Selection with DIP Switches

This method is a special procedure. The digit defined using the DIP switches S1.1...S1.4 must correspond to the last digit of one of your MSN numbers. At an incoming call the LGM evaluates only the last digit. This procedure of MSN selection allows for adjustment of the ISDN board without a terminal.

Please refer to chapter 12.1 for the switches position concerning one-digit MSN.

12 Terminal Fax Features

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12 Extended Terminal Adapter Features

This chapter describes the implemented additional features of the terminal adapter.

12.1 Terminal Fax

The terminal fax feature allows for transfer of fax documents from a terminal equipment that operates with ASCII characters only. Here the terminal adapter provides fax modem and fax software features so that the DTE must not perform any fax specific controls. The complete ASCII character set can be transfered; any characters not coming from the ASCII character set are issued as IBM/PC compatible characters. The terminal fax feature allows for transfer of various text pages with max. 60 lines each. A line feed is generated either by the "LF" (line feed, ASCII value: 10_{dec}) or "CR" (carriage return, ASCII value: 13_{dec}) characters. A line feed is generated automatically if it is not received at least after 80 characters. A new page can be generated with the form feed character (form feed, ASCII value: 12_{dec}). A new side is generated automatically if a form feed character is not received after 60 text lines.

A fax is terminated with the "EOT" (end of transmission, ASCII value: 4_{dec}). The terminal adapter terminates a fax corresponding to the timeout period specified in register S69 if it does not receive any data from the terminal equipment.

Successful fax transmission is reported to the DTE with an "OK" or "ERROR" after on hook. Even if a transmission started with some errors the device receives all data before transfering an error report. For that reason the DTE does not receive any error reports during a transmission.

Functional Principles:

The LOGES ® 64k/M receives the data for a single fax side and stops the terminal equipment using data flow control procedures. Now the ASCII data is transfered internally to the fax format before transmission. Then the terminal adapter receives the data for the next fax page and so on until it receives an EOT character from the DTE or the timeout period defined in register S69 is exceeded. If the fax consists of more than one page the DTE must be capable for either hardware or software flow control.

12 Ext. Funct.

Transmission Procedure with the Terminal Fax Feature:

The dial parameter that initiates a terminal fax connection is defined in register S75. For our example we have chosen the parameter "#" (35_{dec}).

The dial up starts with the dialstring "ATD # calling number" and causes the reports listed below:

for successful dial up: FCON

if any failures occur: ABORT
                               NO DIALTONE
                               BUSY
                               NO CARRIER
                               NO ANSWER

The terminal adapter does not start automatical redialing after failures. The DTE has to evaluate all reports and to react correspondingly.
An FCON report is issued whenever a connection to a fax device is established. Now the DTE is ready to transfer ASCII characters to the terminal adapter. The DTE is able to stop a transmission directly with an EOT character after all characters have been tranfered. Otherwise the DTE waits for the LOGES ® 64k/M to send a status report. This is performed automatically if the terminal adapter does not receive any characters from the DTE for 4 secs. (register S69). The status report informs about the transmission procedure (OK or ERROR).
During fax transmission the first line of the first side contains date and time as the second line issues the text "terminal fax from:" and the text from calling number memory Z15.

Datum: 29.07.96 13. 18. 21 Uhr
Terminal-Fax von: 9999/KENNUNG
Dieses ist ein 2 zeiliger
Test. Terminal - Fax

Fig. 1: Terminal Fax Example

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Summary of S Registers and Control Codes:

Register S69 transmit timeout: default: 4 s
Register S75 terminal fax dial parameter: default: "!"

end of transmission	EOT	4_{dec}
form feed	FF	12_{dec}
carriage return	CR	13_{dec}
line feed	LF	10_{dec}

Attention:
The terminal fax feature is being ignored if the dial parameters for terminal fax (S75) and analog dialing (S95) are selected identically!

12 Ext.
Funct.

12.2   Charges Aquisition

As an additional feature the terminal adapters allow for charges aquisition using the calling number storage (short dial register). Data evaluation and recording is performed implementing a computer. As the LOGES ® 64k cannot be polled constantly the terminal adapter records the data of max. 100 outgoing connections in a ring buffer. A computer software polls the ring buffer periodically and writes all connection data to a special file. After this process the internal memory of the LOGES ® 64k can be erased. The charges aquisition feature allows for constant generating of records concernig outgoing connections, time and charges. Any further devices connected to the S_0 bus cannot be polled for these information as the charges aquisition feature operates only with its individual terminal adapter.

AT Commands for Charges Aquisition Control

AT&Z=T	activate calling number memory
AT&Z=V	activate charges memory
AT&Z?	read out charges memory (ring buffer)
AT&ZCLEAR	erase all entries of short dial register and charges memory

The switching between calling number memory and charges memory and vice versa causes an additional prompt to prevent any inadvertent switching.

Example:

> AT&Z=V

> **Attention:** Number storage is erased (J/N)

After typing an "J" all entries are erased immediately. The switching command is processed and saved immediately.

The command AT&ZCLEAR erases the memory without any prompting.

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Clock Setting for Charges Aquisition

The LOGES ® 64k comes with an integrated clock that operates only during operation times. The clock can be set as described below:

1. The clock is synchronized automatically to the time coming from the ISDN network at any outgoing dial up.
2. The clock may be set manually with an AT command (to be software selected from the internal computer clock).

The ISDN network supplies time information only for outgoing dial ups. For this reason time information is not charge free.
The clock was implemented to supply time information for incoming connections as well. This allows for checking of provider accounts concerning charges.

The commands listed here are employed for operation of the internal clock:

AT!TIME?   display time
AT!TIME=HH:MM   set time

Function of the Ring Buffer

The ring buffer has a special allocation scheme and stores up to 100 entries. Any older entries are overwritten. The entries are displayed acc.to time and date i.e. the oldest entry is presented first. If the listing has less than 100 entries only the existing records are transfered to the DTE.

12 Ext. Funct.

Records Structure of the Ring Buffer

The data of the ring buffer have the following structure:

date	time	analog/digital	phone nr.	number of	connection
		A/D	14 char.	charges	time

The fields of the records have a constant length and are separated by 5 SPACE characters.

field lengths:

field	length
date	6
time	5
A/D	1
phone number	14
number of charges	5
connection time	6

Example of a records display:

```
at&Z?
05.08.      14:22  D    202              ?????      00011s
05.08.      14:23  A    6747775          00001      00014s
05.08.      14:25  D    05113728124      00001      00075s
05.08.      14:27  A    05113728125      00001      00060s
number of records:4
OK
```

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12.3   PPP/SLIP Transmission Protocols

These protocols come from the TCP/IP field (internet, LAN) and provide a method of transport for data blocks via point-to-point connections.
Data transmission with TCP/IP protocols is normally synchronous. Data packets are transfered with start and stop bits and are received as data packets at the remote side.
Data transfer between DTE and the terminal adapter is performed implementing the V.24 interface. During this procedure the data block allocation is being lost. The terminal adapter packs DTE data to random "new" data blocks which he transfers to the opposite station. The receiving side does not get the same data blocks transfered by the partner's computer application. As this might cause problems PPP and SLIP protocols are normally combined with the tranparent HDLC protocol (AT\N9).

12.3.1 PPP Protocol Support

The PPP (point-to-point) protocol is a modern protocol described by an RFC (Request for Comments). A further RFC (RFC 1662) describes the synchronous and asynchronous HDLC for PPP. The LOGES LGM 64k/M supports the standard for asynchronous transmission of HDLC frames with identical block generation. This allows for the device to transfer unaltered HDLC blocks without any problems. The LOGES does not need any protocol support if both partners operate via an asynchronous interface. Normally the PPP protocol is employed with the transparent HDLC protocol (AT\N9).

ATPPP=0   PPP support deactivated

ATPPP=1   PPP support activated

12.3.2 SLIP Protocol Support

The SLIP is a not standardized method of data block transport via point-to-point connections (RFC 1053). SLIP allows for transfer of unaltered data blocks via the serial interface. So a LOGES LGM 64k/M is capable of transfering data to an ISDN PC board that is set to HDLC transmission. The SLIP protocol manages the transfer of unaltered data blocks.

ATSLIP=0   SLIP support deactivated

ATSLIP=1   SLIP support activated

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Appendix A/Switches Tables

The terminal adapters of the 64k product line feature 20 DIP switches. The desktops LOGES ® 64k and LOGES ® 64k/M and the LGH 64k for top rail installation have two blocks with 10 switches each (S1.1...S1.10 and S2.1...S2.10).

The terminal adapters LGM 64k and LGM 64k/M come with three blocks of switches (S1.1...S1.10 and S2.1...S2.4 at the top of the device and S3.1...S3.6 at the side of the module housing).

The description of the switches tables operates with double head lines. The upper line presents the DIP switches of the desktops. The second line (with grey shading) presents the DIP switches of the modules.

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode LGM 1200H1
S3.2	S3.3	S3.4	S3.5	S3.6	
ON	OFF	ON	OFF	ON	

Tab.: Example switches table

The position of the DIP switches is described in chapter 2.
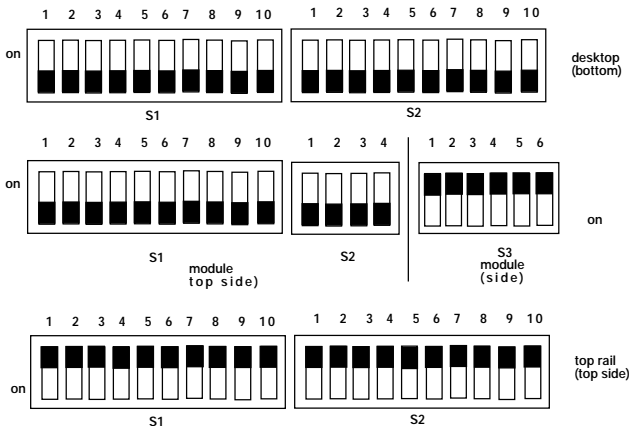
Fig.: Position of the DIP switches

APPENDIX

A.1 LGM 1200H1 Operation

S1.1	S1.2	S1.3	transmission rate *
S1.1	S1.2	S1.3	
OFF	OFF	OFF	1200 bit/s hx, V.23, asyn.
ON	OFF	OFF	1200 bit/s hx, V.23 with clock + SYNC change
OFF	ON	OFF	1200 bit/s hx, no SYNC change
ON	ON	OFF	idle
OFF	OFF	ON	idle
ON	OFF	ON	300 bit/s dx, V.21 constant carrier
OFF	ON	ON	300 bit/s, S2 (RTS) controlled
ON	ON	ON	300 bit/s, S2-M2 (RTS-CTS) simulation

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	S1.9	protocol for automatic dialing
S1.7	S1.8	S1.9	
OFF	OFF	OFF	asynchr. start - stop
ON	OFF	OFF	sync. bitoriented ASCII
OFF	ON	ON	sync. byteoriented ASCII
ON	ON	OFF	sync. bitortiented EBCDIC
OFF	OFF	ON	sync. byteoriented EBCDIC
ON	OFF	ON	sync. bitoriented ASCII/NRZI
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI
ON	ON	ON	idle

APPENDIX

S1.10	channel allocation (only for V.21)
S1.10	
OFF	transmit channel allocation B, receive channel allocation A
ON	transmit channel allocation A, receive channel allocation B

S2.1	hx: carrier delay	S2.1	at V.21: channel alloc.
S2.1		S2.1	(ignored at ISDN op.)
OFF	~ 22 ms	OFF	autom.
ON	V.23 ~30 ms; V.21 ~200 ms	ON	acc. to S1.10

S2.2	equalizer (ignored at ISDN op.)
S2.2	
OFF	on
ON	off

S2.3	S2.4	only for dx operation (ignored at ISDN op.)
S2.3	S2.4	
OFF	OFF	no deactivation
ON	OFF	no deactivation
OFF	ON	after 250 ms
ON	ON	after 10 s

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: LGM 1200H1
S3.2	S3.3	S3.4	S3.5	S3.6	
ON	OFF	ON	OFF	ON	

* During ISDN operation the modulation procedures are emulated using bit rate adaption acc. to V.110.
During analog operation the operation mode V.21 (300 bps) is supported.

A.2   LGM 2400D2 Operation

S1.1	transmission procedure
S1.1	
OFF	asynchronous
ON	synchronous

S1.2	S1.3	format V.25bis sync.	S1.2	S1.3	data format. asyn.
S1.2	S1.3		S1.2	S1.3	
OFF	OFF	bitoriented ASCII	OFF	OFF	10 bit/character
ON	OFF	byteoriented ASCII	ON	OFF	9 bit/character
OFF	ON	bitoriented EBCDIC	OFF	ON	8 bit/character
ON	ON	byteoriented EDCDIC	ON	ON	11 bit/character

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	clock source at synchr. operation
S1.7	S1.8	
OFF	OFF	transm. clock int. (T2, 114)
ON	OFF	transm. clock from receive clock (T4, 114)
OFF	ON	transm. clock ext. (T1, 113), (ignored at ISDN op.)
ON	ON	idle

S1.9	S1.10	transmission rate *
S1.9	S1.10	
OFF	OFF	via interface line S4/114
ON	OFF	2400 bit/s, permanently set
OFF	ON	1200 bit/s, permanently set
ON	ON	idle

S2.1	channel without answer tone	S2.2	idle
S2.1		S2.2	
OFF	calling mode		
ON	answer mode		

S2.3	V.25bis	S2.4	S2/CTS control
S2.3	comm. echo	S2.4	
OFF	no echo	OFF	perm. ON
ON	echo	ON	from DTE

S2.5	idle
S3.1	
OFF	
ON	

S2.6	bitrate tolerance "overspeed"
S3.2	
OFF	+1%/-2.5%
ON	+2.3%/2.5%

S2.7	guardtone (ignored at ISDN op.)
S3.3	
OFF	off
ON	1800 Hz

S2.8	carrier at const. connection
S3.4	
OFF	constant
ON	controlled

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: LGM 2400D2
S3.2	S3.3	S3.4	S3.5	S3.6	
X	X	X	ON	ON	

X = see above for meaning

* During ISDN operation the modulation procedures are emulated using bit rate adaption acc. to V.110. The hx operation is simulated acc. to ITU-T recommendation V.13.

A.3 LGM 2400H1 Operation

S1.1	modulation alternative (ignored at ISDN op.)
S1.1	
OFF	alternative A
ON	alternative B

S1.2	scrambler (ignored at ISDN op.)
S1.2	
OFF	without scrambler
ON	with scrambler

S1.3	transmission procedure
S1.3	
OFF	synchronous
ON	asynchronous

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	S1.9	protocol for automatic dialing
S1.7	S1.8	S1.9	
OFF	OFF	OFF	sync. byteoriented ASCII
ON	OFF	OFF	sync. bitoriented ASCII
OFF	ON	ON	sync. byteoriented ASCII
ON	ON	OFF	sync. bitortiented EBCDIC
OFF	OFF	ON	async, ASCII 8 data bits
ON	OFF	ON	sync. bitoriented ASCII/NRZI
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI
ON	ON	ON	idle

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S1.10	idle
S1.10	

S2.1	(ignored at ISDN op.)	S2.2	carrier delay time
S2.1		S2.2	
OFF		OFF	S2-M2 = 20 ms
ON		ON	S2-M2 = 70 ms

S2.3	receive level (ignored at ISDN op.)	S2.4	test operation
S2.3		S2.4	
OFF	-43 dBm	OFF	data operation
ON	-33 dBm	ON	test pattern generation

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: LGM 2400H1
S3.2	S3.3	S3.4	S3.5	S3.6	
OFF	ON	ON	OFF	ON	

The hx operation mode V.26bis is emulated using bit rate adaption acc. V.110 by the LOGES ® 64k. The hx control is simulated acc. to ITU-T V.13. For this reason both DTEs must be equipped with a LOGES ® 64k.

Attention:
During analog operation the terminal adapters do not support the operation mode acc. to V.26bis.

A.4 LGM 4800H2 Operation

S1.1	transmission rate *
S1.1	
OFF	4800 bit/s
ON	2400 bit/s

S1.2	echo protection (ignored at ISDN op.)
S1.2	
OFF	synchronous
ON	asynchronous

S1.3	transmission mode
S1.3	
OFF	synchronous
ON	asynchronous

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	S1.9	protocol for automatic dialing
S1.7	S1.8	S1.9	
OFF	OFF	OFF	sync. byteoriented ASCII (BSC)
ON	OFF	OFF	sync. bitoriented ASCII (HDLC)
OFF	ON	ON	sync. byteoriented EBCDIC (BSC)
ON	ON	OFF	sync. bitortiented EBCDIC (HDLC)
OFF	OFF	ON	async, ASCII 8 data bits
ON	OFF	ON	sync. bitoriented ASCII/NRZI (HDLC)
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI (HDLC)
ON	ON	ON	idle

S1.10	M5/DCD processing (ignored at ISDN op.)
S1.10	
OFF	M5= ON 50 ms after carrier
ON	M5= ON after complete training

S2.1	equalizer	S2.2	carrier delay
S2.1	(ignored at ISDN op.)	S2.2	
OFF		OFF	S2-M2 ~20 ms
ON		ON	S2-M2 ~70 ms

S2.3	receive level	S2.4	test operation
S2.3	(ignored at ISDN op.)	S2.4	
OFF	-43 dBm	OFF	data operation
ON	-33 dBm	ON	test pattern generation

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: LGM 4800H2
S3.2	S3.3	S3.4	S3.5	S3.6	
ON	ON	ON	OFF	ON	

* The hx operation mode V.26bis is emulated using bit rate adaption acc. V.110 by the LOGES ® 64k. The hx control is simulated acc. to ITU-T V.13. For this reason both DTEs must be equipped with a LOGES ® 64k.

Attention:
The modulation acc.to V.27ter is not supported during analog operation.

A.5 V.29 Operation

S1.1	transmission rate *
S1.1	
OFF	9600 bit/s
ON	7200 bit/s

S1.2	echo protection (ignored at ISDN op.)
S1.2	
OFF	synchronous
ON	asynchronous

S1.3	transmission mode
S1.3	
OFF	synchronous
ON	asynchronous

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	S1.9	protocol for automatic dialing
S1.7	S1.8	S1.9	
OFF	OFF	OFF	sync. byteoriented ASCII (BSC)
ON	OFF	OFF	sync. bitoriented ASCII (HDLC)
OFF	ON	ON	sync. byteoriented EBCDIC (BSC)
ON	ON	OFF	sync. bitortiented EBCDIC (HDLC)
OFF	OFF	ON	async, ASCII 8 data bits
ON	OFF	ON	sync. bitoriented ASCII/NRZI (HDLC)
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI (HDLC)
ON	ON	ON	idle

S1.10	M5/DCD processing (ignored at ISDN op.)
S1.10	
OFF	M5= ON 50 ms after carrier
ON	M5= ON after complete training

S2.1	equalizer	S2.2	carrier delay
S2.1	(ignored at ISDN op.)	S2.2	
OFF		OFF	S2-M2 ~20 ms
ON		ON	S2-M2 ~70 ms

S2.3	receive level	S2.4	test operation
S2.3	(ignored at ISDN op.)	S2.4	
OFF	-43 dBm	OFF	data operation
ON	-33 dBm	ON	test pattern generation

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: V.29
S3.2	S3.3	S3.4	S3.5	S3.6	
OFF	OFF	ON	OFF	ON	

* The hx operation mode V.26bis is emulated using bit rate adaption acc. V.110 by the LOGES ® 64k. The hx control is simulated acc. to ITU-T V.13. For this reason both DTEs must be equipped with a LOGES ® 64k.

Attention:
The modulation acc.to V.29 is not supported during analog operation.

A.6   LOGEM ® 914/LGM 14.4D1 Synchronous/V.25bis

S1.1	S1.2	S1.3	transmission rate (bit/s)
S1.1	S1.2	S1.3	acc. to corr. analog modulation [1]
OFF	OFF	OFF	14400 bit/s/auto (V.32bis, V.32, V22bis, V.22)
ON	OFF	OFF	14400 bit/s/V.32bis
OFF	ON	OFF	12000 bit/s/V.32bis
ON	ON	OFF	9600 bit/s/V.32
OFF	OFF	ON	7200 bit/s/V.32
ON	OFF	ON	4800 bit/s/V.32
OFF	ON	ON	2400 bit/s/V.22bis
ON	ON	ON	1200 bit/s/V.22

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	S1.9	protocol for automatic dialing
S1.7	S1.8	S1.9	
OFF	OFF	OFF	sync. byteoriented ASCII
ON	OFF	OFF	sync. bitoriented ASCII
OFF	ON	ON	sync. byteoriented EBCDIC
ON	ON	OFF	sync. bitortiented EBCDIC
OFF	OFF	ON	async, ASCII 8 data bits
ON	OFF	ON	sync. bitoriented ASCII/NRZI
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI
ON	ON	ON	AS400 operation

during leased line operation (digital 64S):			
S1.7	S1.8	S1.9	leased line operation mode
S1.7	S1.8	S1.9	
OFF	OFF	OFF	leased line via S_0 line interface
ON	OFF	OFF	idle
OFF	ON	OFF	idle

S1.10	channel allocation for leased line operation
S1.10	
OFF	answer
ON	originate

S2.1	S2.2	clock variant
S2.1	S2.2	
OFF	OFF	transmit clock internally T2/T4
ON	OFF	transmit clock receiver T2=T4
OFF	ON	transmit clock externally T1/T4 (ignored at ISDN op.) [2]
ON	ON	---

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: synchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGEM ® 914
ON	ON	OFF	OFF	ON	LGM 14.4D1

1) During employment of the 64k the data transmission rates are emulated acc. to V.110. The terminal adapter 64k/M employs the correspondent V recommendations during analog dial up.
2) External clock is only supported during analog dial up by the LOGES ® 64k/M.

A.7 LOGEM ® 914/LGM 14.4D1 Asynchronous (software mode/AT and V.25bis)

S1.1	S1.2	S1.3	transmission rate (bit/s)
S1.1	S1.2	S1.3	acc. to corr. analog modulation [1]
OFF	OFF	OFF	14400 bit/s/auto (V.32bis, V.32, V22bis, V.22)
ON	OFF	OFF	14400 bit/s/V.32bis
OFF	ON	OFF	12000 bit/s/V.32bis
ON	ON	OFF	9600 bit/s/V.32
OFF	OFF	ON	7200 bit/s/V.32
ON	OFF	ON	4800 bit/s/V.32
OFF	ON	ON	2400 bit/s/V.22bis
ON	ON	ON	1200 bit/s/V.22

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	ON	OFF	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	OFF	ON	
ON	OFF	ON	
OFF	ON	ON	leased line, switching channel alloc. A (originator)
ON	ON	ON	leased line, switching channel alloc. B (answer)

S1.7	S1.8	S1.9	error correction procedure/data format
S1.7	S1.8	S1.9	
OFF	OFF	OFF	autoreliable mode
ON	OFF	OFF	reliable mode (not for V.23)
OFF	ON	OFF	reliable mode V.42bis (no V.21 and V.23 operation)
ON	ON	OFF	reliable mode MNP 5 (no V.23 operation)
OFF	OFF	ON	normal mode
ON	OFF	ON	direct mode 9 bit/character
OFF	ON	ON	direct mode 10 bit/character
ON	ON	ON	direct mode 11 bit/character

S1.10	data flow control (not during direct mode)
S1.10	
OFF	hardware, RTS/CTS (S2/M2)
ON	software, XON/XOFF

S2.1	S.2.2	DTE rate for normal and reliable mode
S2.1	S2.2	
OFF	OFF	autobaud for AT commands (default: 9600 bps)
OFF	ON	9600 bit/s
OFF	ON	19200 bit/s
ON	ON	38400 bit/s

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: asynchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGEM ® 914
ON	OFF	OFF	OFF	ON	LGM 14.4D1

1) During employment of the 64k the data transmission rates are emulated acc. to V.110. The terminal adapter 64k/M employs the correspondent V recommendations during analog dial up.

A.8   LOGEM ® 928/LGM 28.8D1 Synchronous V.25bis

S1.1	S1.2	S1.3	transmission rate (bit/s)
S1.1	S1.2	S1.3	acc. to corr. analog modulation [1]
OFF	OFF	OFF	28800 bit/s/auto (V.34bis,V32bis, V. 32, V22bis, V. 22)
ON	OFF	OFF	28800 bit/s/V.34
OFF	ON	OFF	26400 bit/s/V.34
ON	ON	OFF	24000 bit/s/V.34
OFF	OFF	ON	21600 bit/s/V.34
ON	OFF	ON	19200 bit/s/V.34
OFF	ON	ON	16800 bit/s/V.34
ON	ON	ON	14400 bit/s/V.34

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	S1.9	protocol for automatic dialing
S1.7	S1.8	S1.9	
OFF	OFF	OFF	sync. byteoriented ASCII
ON	OFF	OFF	sync. bitoriented ASCII
OFF	ON	ON	sync. byteoriented EBCDIC
ON	ON	OFF	sync. bitortiented EBCDIC
OFF	OFF	ON	async, ASCII 8 data bits
ON	OFF	ON	sync. bitoriented ASCII/NRZI
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI
ON	ON	ON	AS400 operation

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during leased line operation (digital 64S):			
S1.7	S1.8	S1.9	leased line operation mode
S1.7	S1.8	S1.9	
OFF	OFF	OFF	leased line via S_0 line interface
ON	OFF	OFF	idle
OFF	ON	OFF	idle

S1.10	channel allocation for leased line operation
S1.10	
OFF	answer
ON	originate

S2.1	S2.2	clock variant
S2.1	S2.2	
OFF	OFF	transmit clock internally T2/T4
ON	OFF	transmit clock receiver T2=T4
OFF	ON	transmit clock externally T1/T4 (ignored at ISDN op.) [2]
ON	ON	---

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: synchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGEM ® 928
OFF	ON	OFF	OFF	ON	LGM 28.8D1

1) During employment of the 64k the data transmission rates are emulated acc. to V.110. The terminal adapter 64k/M employs the correspondent V. recommendations during analog dial up.
2) External clock is only supported during analog dial up by the LOGES ® 64k/M.

A.9 LOGEM ® 928/LGM 28.8D1 Asynchronous (Software mode/AT and V.25bis)

S1.1	S1.2	S1.3	transmission rate (bit/s)
S1.1	S1.2	S1.3	acc. to corr. analog modulation [1]
OFF	OFF	OFF	28800 bit/s/auto (V.34bis,V32bis, V.32, V22bis, V.22)
ON	OFF	OFF	28800 bit/s/V.34
OFF	ON	OFF	26400 bit/s/V.34
ON	ON	OFF	24000 bit/s/V.34
OFF	OFF	ON	21600 bit/s/V.34
ON	OFF	ON	19200 bit/s/V.34
OFF	ON	ON	16800 bit/s/V.34
ON	ON	ON	14400 bit/s/V.34

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	ON	OFF	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	OFF	ON	---
ON	OFF	ON	---
OFF	ON	ON	leased line, switching channel alloc. A (originator)
ON	ON	ON	leased line, switching channel alloc. B (answer)

S1.7	S1.8	S1.9	error correction procedure/data format
S1.7	S1.8	S1.9	
OFF	OFF	OFF	autoreliable mode
ON	OFF	OFF	reliable mode (not for V.23)
OFF	ON	OFF	reliable mode V.42bis (no V.21 and V.23 operation)
ON	ON	OFF	reliable mode MNP5 (no V.23 operation)
OFF	OFF	ON	normal mode
ON	OFF	ON	direct mode 9 bit/character
OFF	ON	ON	direct mode 10 bit/character
ON	ON	ON	direct mode 11 bit/character

S1.10	data flow control (not during direct mode)
S1.10	
OFF	hardware, RTS/CTS (S2/M2)
ON	software, XON/XOFF

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S2.1	S.2.2	DTE rate for normal and reliable mode
S2.1	S2.2	
OFF	OFF	autobaud for AT commands (default: 38400 bps) [2]
OFF	ON	38400 bit/s
OFF	ON	57600 bit/s
ON	ON	115200 bit/s

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation (only for direct mode)
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: asynchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGEM ® 928
OFF	OFF	OFF	OFF	ON	LGM 28.8D1

1) During employment of the 64k the data transmission rates are emulated acc. to V.110. The terminal adapter 64k/M employs the correspondent V. recommendations during analog dial up.

2) The automatical detection of the LGM 64k and LGM 64k/M operates up to 57600 bit/s.

A.10 LOGEM ® 928/LGM 28.8D1 Highspeed Synchronous V.25bis

| S1.1 | S1.2 | S1.3 | transmission rate (bit/s) |
S1.1	S1.2	S1.3	acc. to corr. analog modulation [1]
OFF	OFF	OFF	33600 bit/s/auto. detect. V.34, V.34bis
ON	OFF	OFF	33600 bit/s/V.34bis
OFF	ON	OFF	31200 bit/s/V.34bis
ON	ON	OFF	28800 bit/s/V.34
OFF	OFF	ON	26400 bit/s/V.34
ON	OFF	ON	24000 bit/s/V.34
OFF	ON	ON	21600 bit/s/V.34
ON	ON	ON	19200 bit/s/V.34

| S1.4 | S1.5 | S1.6 | operation mode |
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

| S1.7 | S1.8 | S1.9 | protocol for automatic dialing |
S1.7	S1.8	S1.9	
OFF	OFF	OFF	sync. byteoriented ASCII
ON	OFF	OFF	sync. bitoriented ASCII
OFF	ON	ON	sync. byteoriented EBCDIC
ON	ON	OFF	sync. bitortiented EBCDIC
OFF	OFF	ON	async, ASCII 8 data bits
ON	OFF	ON	sync. bitoriented ASCII/NRZI
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI
ON	ON	ON	AS400 operation

| S1.7 | S1.8 | S1.9 | leased line operation mode (digital 64 S) |
S1.7	S1.8	S1.9	
OFF	OFF	OFF	leased line via S_0 line interface
ON	OFF	OFF	idle
OFF	ON	OFF	idle

S1.10	channel allocation for leased line operation
S1.10	
OFF	answer
ON	originate

S2.1	S2.2	clock variant
S2.1	S2.2	
OFF	OFF	transmit clock internally T2/T4
ON	OFF	transmit clock receiver T2=T4
OFF	ON	transmit clock externally T1/T4 (ignored at ISDN op.) [2]
ON	ON	---

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: synchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGEM ® 928
ON	OFF	ON	ON	OFF	LGM 28.8D1

1) During employment of the 64k the data transmission rates are emulated acc. to V.110. The terminal adapter 64k/M employs the correspondent V. recommendations during analog dial up.

2) External clock is only supported during analog dial up by the LOGES ® 64k/M.

APPENDIX

A.11   LOGEM ® 928/LGM 28.8D1 Highspeed Asynchronous AT/V.25bis

S1.1	S1.2	S1.3	transmission rate (bit/s)
S1.1	S1.2	S1.3	acc. to corr. analog modulation [1)]
OFF	OFF	OFF	automode V.34bis, V.34
ON	OFF	OFF	33600 bit/s/V.34bis
OFF	ON	OFF	31200 bit/s/V.34bis
ON	ON	OFF	28800 bit/s/V.34
OFF	OFF	ON	26400 bit/s/V.34
ON	OFF	ON	24000 bit/s/V.34
OFF	ON	ON	21600 bit/s/V.34
ON	ON	ON	19200 bit/s/V.34

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	ON	OFF	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	OFF	ON	
ON	OFF	ON	
OFF	ON	ON	leased line, switching channel alloc. A (originator)
ON	ON	ON	leased line, switching channel alloc. B (answer)

S1.7	S1.8	S1.9	error correction procedure/data format
S1.7	S1.8	S1.9	
OFF	OFF	OFF	autoreliable mode
ON	OFF	OFF	reliable mode (not for V.23)
OFF	ON	OFF	reliable mode V42bis (no V.21 and V.23 operation)
ON	ON	OFF	reliable mode (no V.23 operation)
OFF	OFF	ON	normal mode
ON	OFF	ON	direct mode 9 bit/character
OFF	ON	ON	direct mode 10 bit/character
ON	ON	ON	direct mode 11 bit/character

S1.10	data flow control (not during direct mode)
S1.10	
OFF	hardware, RTS/CTS (S2/M2)
ON	software, XON/XOFF

S2.1	S.2.2	DTE rate for normal and reliable mode
S2.1	S2.2	
OFF	OFF	autobaud for AT commands (default: 38400 bps) [2]
OFF	ON	38400 bit/s
OFF	ON	57600 bit/s
ON	ON	115200 bit/s

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation (only for direct mode)
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: asynchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGEM ® 928
OFF	OFF	OFF	OFF	ON	LGM 28.8D1

1) During employment of the 64k the data transmission rates are emulated acc. to V.110. The terminal adapter 64k/M employs the correspondent V. recommendations during analog dial up.

2) The automatical detection of the LGM 64k and LGM 64k/M operates up to 57600 bit/s.

A.12 LOGES ® 64k Synchronous/V.25bis

S1.1	S1.2	S1.3	protocol	transmission rate
OFF	OFF	OFF	auto	64000 bit/s
ON	OFF	OFF	transparent	64000 bit/s
OFF	ON	OFF	V.110	56000 bit/s
ON	ON	OFF	V.110	48000 bit/s
OFF	OFF	ON	V.110	38400 bit/s
ON	OFF	ON	V.110	19200 bit/s
OFF	ON	ON	V.110	9600 bit/s
ON	ON	ON	V.110	4800 bit/s

S1.4	S1.5	S1.6	operation mode
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	leased line (M1 + direct switching)
ON	ON	OFF	direct call (outg. dir. dialing via interface S1/DTR)
OFF	OFF	ON	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	OFF	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	ON	ON	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
ON	ON	ON	S1.1 operation, leased line via S1/DTR

S1.7	S1.8	S1.9	protocol for automatic dialing
OFF	OFF	OFF	sync. byteoriented ASCII
ON	OFF	OFF	sync. bitoriented ASCII
OFF	ON	ON	sync. byteoriented EBCDIC
ON	ON	OFF	sync. bitortiented EBCDIC
OFF	OFF	ON	async, ASCII 8 data bits
ON	OFF	ON	sync. bitoriented ASCII/NRZI
OFF	ON	ON	sync. bitoriented EBCDIC/NRZI
ON	ON	ON	AS400 operation

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during leased line operation (digital 64S):			
S1.7	S1.8	S1.9	leased line operation mode
S1.7	S1.8	S1.9	
OFF	OFF	OFF	leased line via S_0 line interface
ON	OFF	OFF	idle
OFF	ON	OFF	idle

S1.10	channel allocation for leased line operation
S1.10	
OFF	answer
ON	originate

S2.1	S2.2	clock variant
S2.1	S2.2	
OFF	OFF	transmit clock internally T2/T4
ON	OFF	transmit clock receiver T2=T4
OFF	ON	transmit clock externally T1/T4 (ignored at ISDN op.) [2]
ON	ON	---

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation (up to 56000 bit/s)
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: synchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGES ® 64k
ON	ON	ON	ON	OFF	

A.13   LOGES ® 64k Asynchronous Software Mode/AT and V.25bis

S1.1	S1.2	S1.3	transmission rate (bit/s)
S1.1	S1.2	S1.3	
OFF	OFF	OFF	automatical
ON	OFF	OFF	38400 bit/s
OFF	ON	OFF	19200 bit/s
ON	ON	OFF	9600 bit/s
OFF	OFF	ON	4800 bit/s
ON	OFF	ON	2400 bit/s
OFF	ON	ON	1200 bit/s
ON	ON	ON	300 bit/s

S1.4	S1.5	S1.6	operation mode
S1.4	S1.5	S1.6	
OFF	OFF	OFF	S1.2 operation (outg. autom. dialing, inc. autom. switching with answer tone)
ON	OFF	OFF	S1.2 operation (outg. manual dialing, inc. autom. switching with answer tone)
OFF	ON	OFF	S1.2 operation (outg. autom. dialing. inc. manual switching with answer tone)
ON	ON	OFF	S1.2 operation (outg. manual dialing, inc. manual switching with answer tone)
OFF	OFF	ON	leased line, switching channel alloc. A (originator)
ON	OFF	ON	leased line, switching channel alloc. B (answer)
OFF	ON	ON	
ON	ON	ON	

S1.7	S1.8	S1.9	error correction procedure/data format	
S1.7	S1.8	S1.9		
OFF	OFF	OFF	reliable mode V.42	(S1.1...S1.3=OFF)
ON	OFF	OFF	reliable mode MNP4	(S1.1...S1.3=OFF)
OFF	ON	OFF	X.75 transparent	(S1.1...S1.3=OFF)
ON	ON	OFF	X.75 T.70NL	(S1.1...S1.3=OFF)
OFF	OFF	ON	autoreliable mode	(S1.1...S1.3=OFF)
ON	OFF	ON	HDLC	(S1.1...S1.3=OFF)
OFF	ON	ON	normal mode	
ON	ON	ON	direct mode 10 bit/character (reg.S60/S61)	

S1.10	data flow control (not during direct mode)
S1.10	
OFF	hardware, RTS/CTS (S2/M2)
ON	software, XON/XOFF

ke

S2.1	S.2.2	DTE rate for normal and reliable mode
S2.1	S2.2	
OFF	OFF	autobaud for AT commands (default: 38400 bps) [1]
OFF	ON	38400 bit/s
OFF	ON	57600 bit/s
ON	ON	115200 bit/s

S2.3	rate change (ignored at ISDN op.)
S2.3	
OFF	off
ON	on

S2.4	hx simulation (only for direct mode)
S3.1	
OFF	off
ON	on

S2.5	idle
S3.1	
OFF	
ON	

S2.6	S2.7	S2.8	S2.9	S2.10	operation mode: asynchronous
S3.2	S3.3	S3.4	S3.5	S3.6	LOGES ® 64k
OFF	ON	ON	ON	OFF	

1) The automatical detection of the LGM 64k and LGM 64k/M operates up to 57600 bit/s.

Appendix B/Basic Factory Defaults

B.1   Basic Setting 0

In delivery state the terminal adapters are adjusted to basic setting 0. All DIP switches are in position "OFF".

Here the terminal adapter operates with automatical detection of the transmission rate (ATF255), automatical protocol detection /AT\N3) and automatical detection of the DTE rate. Data flow control is set to RTS/CTS (AT\Q2). Command echo and report codes are activated. The current setting is displayed with the command AT\S.

```
at\s
Konfiguration:
 F Betriebsart .......... Auto   %C Kompress.-Mode . 1   &M Sync.Betrieb ................. 0
 L Lautstaerke ............. 1   %E Retrain ................. 1   &R M2-Option ..................... 1
 M Lautsprecher .......... 1   %G Steuerkontakt ...... 2   &S M1-Option ..................... 1
 Q Meldungen .............. 0   %I Info-Okt. Abgehend 2   &T Testeinstellungen ........... 5
 V Text/Numerisch ........ 1   %K Info-Okt. Ank. ....... 2   &X Taktvariante ................... 0
 X Meldungsart ............ 4   %M Passwort-Modus . 0   &Y Start-Profil ..................... 0
\A MNP-Blocklaenge ... 1   %R Rate-Change ........ 0   Autobaud .............................. 1
\C MNP-Handshake ..... 0   %W Analog/Digital-W. 42   DEE-Baudrate .............. 57600
\G Modem-Flusskontr. . 0   %X Rufnummernausg. 0   Fernkonfig ........................... 0
\K Break-Handling ........ 3   &C M5-Option ............. 2   AT/V.25bis-Befehle ............... 0
\L Block/Stream-Mode  0   &D S1-Option ............. 1   Testtaste .............. Datentaste
\N ECC-Modus ............ 3   &H Simuliert Hx .......... 0   Rufannahme. ....................... 1
\Q DEE-Flusskontrolle . 2   &I CONNECT-Meldung 0   Auto-Protokoll .............. 1TR6
\X XON/XOFF-Weiterg. . 0   &L Standleitung .......... 0   EAZ ...................................... 1

OK
```

In delivery state password protection is deactivated.

B.2 Basic Setting 8 (User Setting 2)

The basic setting 8 is selected with the DIP switches S2.9 (module: S3.5) in position "ON" and with all other switches in position "OFF". This process is activated during POWER ON (ref. to "Loading of Basic Settings") at the hardware side or software selected with the command AT&F8 using a terminal software.

The basic setting 8 can be overwritten with AT&W2. This allows for generating an individual default setting that can be loaded with the DIP switches.

In delivery state the terminal adapter is adjusted for operation without an active interface line "DTR". As an addition remote configuration is activated (S45=1). The transmission rate (ATF255) and the transmission protocol (AT\N3) are detected automatically. The auto answer mode is active.

Konfiguration:

F Betriebsart .... Auto	%C Kompress.-Mode . 1	&M Sync.Betrieb 0
L Lautstaerke 1	%E Retrain 1	&R M2-Option 1
M Lautsprecher 1	%G Steuerkontakt 2	&S M1-Option 1
Q Meldungen 0	%I Info-Okt. Abg. 2	&T Testeinstellungen 5
V Text/Numerisch 1	%K Info-Okt. Ank. 2	&X Taktvariante 0
X Meldungsart 4	%M Passw.-Modus 0	&Y Start-Profil 0
\A MNP-Blocklaenge ... 1	%R Rate-Change 0	Autobaud 1
\C MNP-Handshake 0	%W Analog/Digital-W.42	DEE-Baudrate 57600
\G Modem-Flussk. 0	%X Rufnummernausg 0	Fernkonfig 1
\K Break-Handling 3	&C M5-Option 2	AT/V.25bis-Befehle 0
\L Block/Stream-Mode 0	&D S1-Option 0	Testtaste .... Datentaste
\N ECC-Modus 3	&H Simuliert Hx 0	Rufannahme 1
\Q DEE-Flusskontrolle .. 2	&I CONNECT-Meldung 0	Auto-Protokoll 1TR6
\X XON/XOFF-Weiterg. . 0	&L Standleitung 0	EAZ..................... 0

OK

at&v
Version 4.00 D   Option: Modem-Chip
F255 E1 L1 M1 Q0 X4 V1 P \Q2 \G0 \A1 \C0 \L0 \M1 \N3 \X0 \K3 \B3 %C1
%E1 %G2 %I2&Y0 %K2 %M0 %R0 %S0 %X0 %Y0 &L0 &I0 &X0 &G0 &M0
&C2 &D0 &H0 &R1 &S1 &T5

S00=001 S01=000 S02=043 S03=013 S04=010 S05=008 S07=100 S08=002
S10=050 S12=045 S20=255 S26=004 S28=000 S37=000 S39=017 S40=019
S45=001 S47=003 S50=255 S51=255 S54=001 S60=000 S61=000 S80=000
S81=002 S90=005 S91=000 S93=000 S95=042 S96=000 S99=002 S100=042
S101=000 S102=000
EAZ: 0

OK

B.3 Loading of Basic Setting 0 or 8

The loading of the basic settings, e.g. if you are not certain about the terminal adapter setting, is possible during POWER ON. Any stored configurations in the EEPROM are erased in this case with exception of passwords and short dial numbers.

Procedure:

1. Deactivate the operation voltage of the terminal adapter.

2. Select a basic setting with the DIP switches.

3. Press and hold the "Da/Ta" button.

4. Activate the operation voltage with pressed button.

5. Wait for the LED A/O (ANS, LB) to light up. If you release the button now the new setting is stored and the terminal adapter is operational. The EEPROM configurations are not overwritten.

6. If you press the button until the LED A/O (ANS, LB) flashes the new configuration is copied to the EEPROM as well. Recent settings are overwritten.
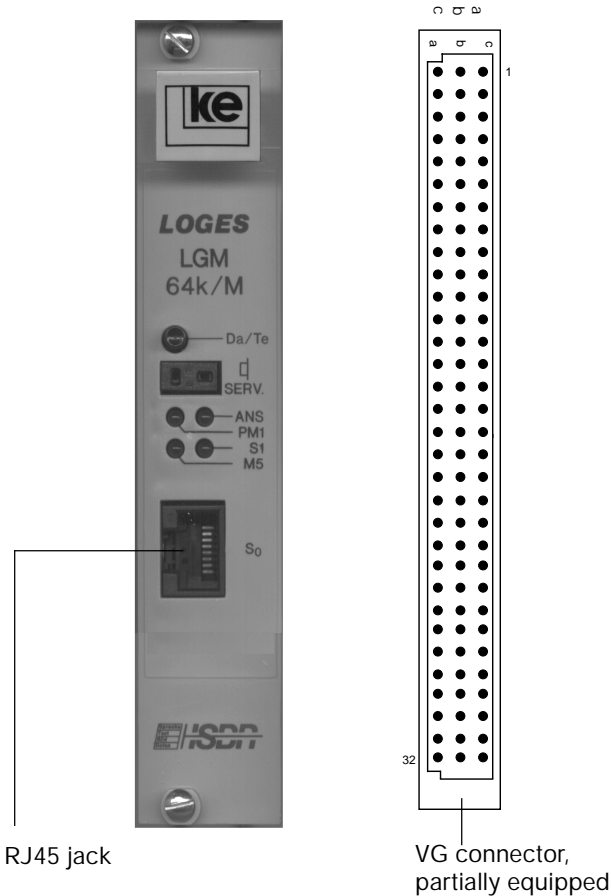
Attention:
This procedure is only applicable for loading of the basic setting 0 and 8.

Operation Manual - ISDN Terminal Adapter V.24/V.28

Appendix C/Interfaces of the Terminal Adapters

**C.1   Front Panel and Reverse Side of the Modules
          LGM 64k/LGM 64k/M**

RJ45 jack   VG connector,
                                             partially equipped

Additional Information:
**The RJ45 jack is switched in parallel to the corresponding contacts
of the VG connector. The V.24 interface of the rackmounted versions
operates with active low TTL levels.**

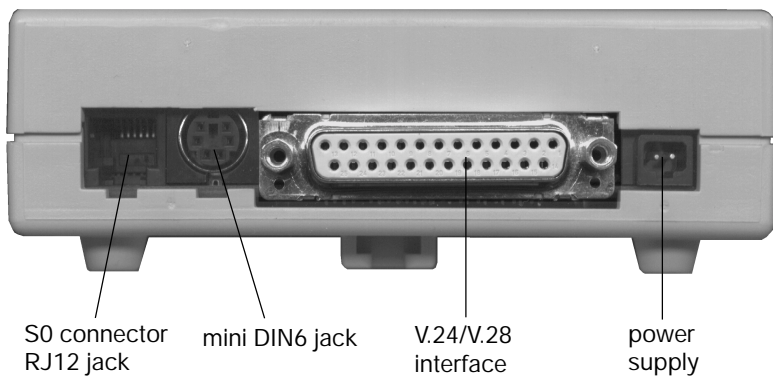APPENDIX

C.2   Pin Allocation of the VG Connector

Pin	a	b	c
1			
2			
3	Tx 1 (+)		Tx 2 (-)
4			
5			
6			
7	Rx 2 (+)		Rx 1 (-)
8			
9			
10	HD2	S1.1	
11	T2(XCK)	S1.2	D1 (TxD)
12	HD1	S1.3	D2 (RxD)
13	T4 (RCK)	S1.4	S2 (RTS)
14	PS3	S1.5	M2 (CTS)
15		S1.6	M1 (DSR)
16	S1 (DTR)	S1.7	GND
17		ext. data button	
18	PS2	S1.8	M5(DCD)
19	M3 (RI)	S1.9	
20	S4 (SEL)	S1.10	
21	T1 (TCK)	S2.1	
22	PM1	S2.2	M5(SPD)
23		S2.3	
24		S2.4	
25		voice signal for loudspeaker amp.	
26			
27			
28			
29	+5V	+5V	+5V
30	+5V	+5V	+5V
31	GND	GND	GND
32	GND	GND	GND

C.3   Pin Allocation of the RJ45 Jack at the Front Panel

pin	allocation
1	idle
2	idle
3	TX+
4	RX+
5	RX-
6	TX-
7	idle
8	idle

APPENDIX
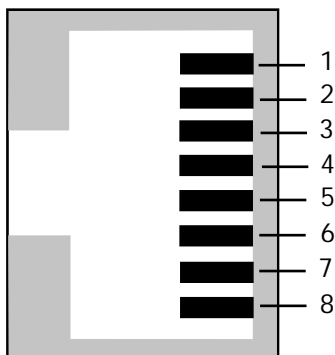
C.4 Interfaces of the LOGES ® 64k/LOGES ® 64k/M

S0 connector
RJ12 jack   mini DIN6 jack   V.24/V.28
interface   power
supply

C.5 Pin Allocation of the RJ12 Jack
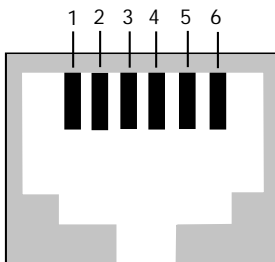
pin	allocation
1	idle
2	TX+
3	RX+
4	RX+
5	TX-
6	idle

C.5 S_0 Standard Connection RJ12 - RJ45 for LOGES ® 64k and LOGES ® 64k/M
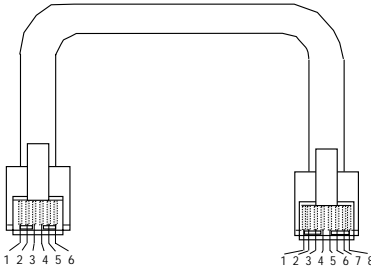
allocation table	
RJ12	RJ45
pin	pin
	1
1	2
2	3
3	4
4	5
5	6
6	7
	8

C.6   Interfaces of the LOGES 64k

Allocation of the RJ45 jack
(S_0 connector)
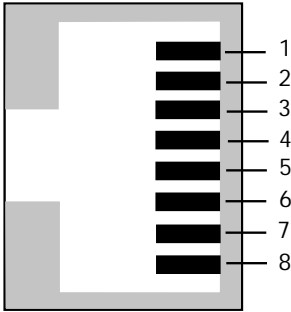
pin	allocation
1	idle
2	idle
3	TX+
4	RX+
5	RX-
6	TX-
7	idle
8	idle

power
supply

S_0 connector
RJ45 jack
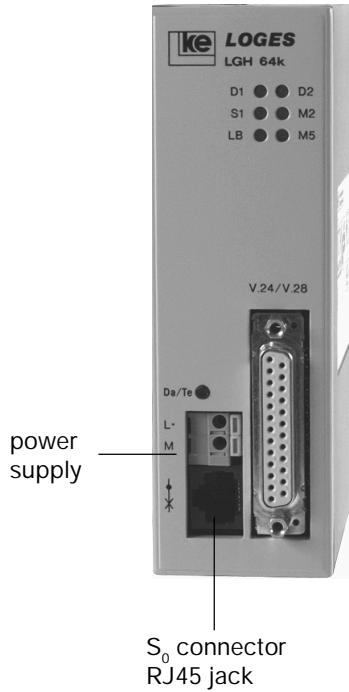
power supply connector:
L+:   +24 V DC
M: GND

C.7 V.24 Interface Allocation

interface type			connector or pin allocation			description
DIN	ITU-T	Name	25 pol. Bu.	9 pol. Bu.	VG-Leiste	
E1	101	GND	1	U a)		protective ground
E2	102	GND	7	5	16c	signal ground
D1	103	TxD	2	3	11c	transmit data
D2	104	RxD	3	2	12c	receive data
S1.1	108/1	DTR	20	4	16a	transmission route on
S1.2	108/2	DTR	20	4	16a	DTE ready
S2	105	RTS	4	7	13c	transmit section ON
S4	111	SEL	23	-	20a	high DTE rate ON
M1	107	DSR	6	6	15c	modem ready
M2	106	CTS	5	8	14c	ready for transmission
M3	125	RI	22	9	19a	incoming call
M4	112	SPD	12	-	22c	high transmission rate
M5	109	DCD	8	1	18c	receive signal level
T1	113	TxC	24	-	21a	modem transmit clock
T2	114	TxC	15	-	11a	modem transmit clock
T4	115	RxC	17	-	13a	modem receive clock
PM1	142	TM	25	-	22a	test status
PS2	140	RL	21	-	18a	activate remote test loop
PS3	141	LL	18	-	14a	activate localtest loop
		+8V	9	-		aux.voltage +
		-8V	10	-		aux.voltage -
		+5V			30 a, b, c	operating voltage
		GND			32 a, b, c	ground

a) U=housing/ground

C.8   Standard Connection for Asynchronous Transmission

DTE conn. 25pol.			terminal adapter	
			LOGES 64k LGH 64k	LGM 64k
1*	E1	protective ground	1	
7	E2	ground	7	16c
2	D1	transmit data	2	11c
3	D2	receive data	3	12c
4	S2	transmit section ON	4	13c
5	M2	ready for transmission	5	14c
20	S1.1	transmission route ON	20	16a
20	S1.2	DTE ready	20	16a
6	M1	modem ready	6	15c
8	M5	transmit signal level	8	18c
22	M3	incoming call	22	19a
21*	PS2	activate remote test loop	21	18a
12*	M4	high transmission rate	12	22c
23*	S4	high transmission rate ON	23	20a
25*	PM1	test status	25	22a
18*	PS3	activate local test loop	18	14a

* These pin assignments are not mandatory.

Attention:
The V.24 interface of the modules LGM 64k and LGM 64k/M operates with TTL levels. An interface adaptation is necessary for operation with V.24/V.28 terminal equipment.

C.9 Standard Connection for Synchronous Transmission

DTE conn. 25pol.			terminal adapter	
			LOGES 64k LGH 64k	LGM 64k
1	E1	protective ground	1	
7	E2	ground	7	16c
2	D1	transmit data	2	11c
3	D2	receive data	3	12c
4	S2	transmit section ON	4	13c
5	M2	ready for transmission	5	14c
20	S1.1	transmissionroute ON	20	16a
20	S1.2	DTE ready	20	16a
6	M1	modem ready	6	15c
8	M5	receive signallevel	8	18c
22	M3	incomingcall	22	19a
21	PS2	activate remote test loop	21	18a
18	PS3	activate local tes tloop	18	14a
17	T4	receive clock	17	13a
15	T2	transmit clock	15	11a
24	T1	transmit clock	24	24a
12	M4	high transmission rate	12	22c
23	S4	high transmission rate ON	23	20a
25	PM1	test status	25	22a

Attention:
The V.24 interface of the modules LGM 64k and LGM 64k/M operates with TTL levels. An interface adaptation is necessary for operation with V.24/V.28 terminal equipment.

APPENDIX

C.10 ASCII Table

Code	Mnem	Dec	Hex	Code	Dec	Hex	Code	Dec	Hex	Code	Dec	Hex
	NULL	00	00	SP	32	20	@	64	40	`	96	60
CTRL A	SOH	01	01	!	33	21	A	65	41	a	97	61
CTRL B	STX	02	02	"	34	22	B	66	42	b	98	62
CTRL C	ETX	03	03	#	35	23	C	67	43	c	99	63
CTRL D	EOT	04	04	$	36	24	D	68	44	d	100	64
CTRL E	ENQ	05	05	%	37	25	E	69	45	e	101	65
CTRL F	ACK	06	06	&	38	26	F	70	46	f	102	66
CTRL G	BEL	07	07	´	39	27	G	71	47	g	103	67
CTRL H	BS	08	08	(	40	28	H	72	48	h	104	68
CTRL I	HT	09	09	)	41	29	I	73	49	i	105	69
CTRL J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
CTRL K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
CTRL L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
CTRL M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
CTRL N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
CTRL O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
CTRL P	DLE	16	10	0	48	30	P	80	50	p	112	70
CTRL Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
CTRL R	DC2	18	12	2	50	32	R	82	52	r	114	72
CTRL S	DC3	19	13	3	51	33	S	83	53	s	115	73
CTRL T	DC4	20	14	4	52	34	T	84	54	t	116	74
CTRL U	NAK	21	15	5	53	35	U	85	55	u	117	75
CTRL V	SYN	22	16	6	54	36	V	86	56	v	118	76
CTRL W	ETB	23	17	7	55	37	W	87	57	w	119	77
CTRL X	CAN	24	18	8	56	38	X	88	58	x	120	78
CTRL Y	EM	25	19	9	57	39	Y	89	59	y	121	79
CTRL Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
	ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
	US	31	1F	?	63	3F	_	95	5F	DEL	127	7F

Appendix D/Technical Data

	desktops		modules		top rail
	LOGES ® 64k	LOGES ® 64k/M	LOGES ® LGM 64k	LOGES ® LGM 64k/M	LOGES ® LGH 64k
dimensions (h x w x d) in mm	40x114x180		130x26x190		135x43x124
Environmental conditions for operation/storage					
temperature	0...40 °C / -25...+55 °C				
rel. humidity	85 % / < 98 %				
climatic model acc. to DIN 500 19 (non condensing)	R 12 / R 52				
power supply	power supply adapter Inp. 230 V/50Hz/7VA Outp. 7V AC/50Hz/4.2 VA		+5 V ± 5%		+24 V ±20%
			appr. 100 mA	appr. 300 mA	appr. 40 mA
Electrical parameters for line switching					
S_0 interface	ITU-T I.430, I.431				
voltage resistance for S_0 bus/V.24 interface	1 KV acc. to ETS 300047- 1... 3				
interference measuring at S_0 connector	acc. EN 50082-1				
interference level	acc. to EN 55022, class B				
DTE interface					
mechanical	25pole sub D jack, acc. to ISO 2110		96pole jack, DIN 41612, partially equipped, type R, class 2		25pole sub D jack, acc. to ISO 2110
electrical	ITU-T V.28		CMOS/TTL levels /act.low)		ITU-T V.28
transmission rate in bit/s	asynchronous 300...115200 bit/s synchronous 600...64000 bit/s				
Protocols					
D channel	DSS1, 1TR6				
B channel	ITU-T V.110, X.75 transparent, T.70NL, BTX X.30				

Appendix E/Glossary

1TR6: D channel protocol for national (german) ISDN. This control channel is employed for subscriber dialing and data transfer.

2B+D: Abbreviation for the channels available with an ISDN basic access (2 B channels and 1 D channel).

a/b terminal adapter: A unit that connects conventional analog devices to the ISDN. The terminal adapter transfers analog to digital signals and controls the D channel protocols.

ACK: The control character ACK (acknowledgement) is employed during data transmission to request for new data (software handshake).

ANIS subscriber: A subscriber connected to an ISDN exchange.

Call transfer: The ISDN subscriber can deviate his calls to another phone number.

ANSI: American **N**ational **S**tandards **I**nstitute.

APE: Abbreviation for decentral peripheal unit. Subscribers connected to non ISDN local exchanges can be connected to an ISDN exchange using an APE.

ASCII: American **S**tandard **C**ode for **I**nformation **I**nterchange. ASCII files contain only letters and numbers from the alphabet but no other additional characters.

Asynchronous data transmission: Data transmission without data clock. Start and end of data words have to be marked with start and stop bits.

Autoreliable mode: A data transmission can be realized with or without data protection.

Base connector: Connection to the ISDN network with two channels for one phone number. Max. 8 devices for transmission of speech, text, data and videos may be connected. Two devices can be utilized simultaneously.

Base connector concentrator: Decentral digital connection module of an exchange.

APPENDIX

Gross transmission rate: Gross line transmission rate for information and synchronization data.

BZT: German federal authority for licensing of telecommunication devices.

CAPI: Common ISDN-API interface. This standard was defined by software and hardware manufacturers to connect software and hardware components.

CCITT: Comité Consultativ International Télégraphique et Téléphonique. International institution. CCITT recommendations have normative character for manufacturers of telecommunication equipment (ref. to ITU-T).

Datel services: Datel services (in germany: data telecommunication services) Datex-J, Datex-P, etc..

Data flow control: Data flow control is employed to avoid data loss during transmission. Data loss may occur if the internal modem data buffers overflow. If this occurs the modem has to prevent the DTE from transmitting further data.
Flow control is possible as:
a) hardware flow control that utilizes the signals S2 and M2 (RTS and CTS) of the V.24 interface.
b) software flow control using the characters XON and XOFF within the data stream for control. The connection is not transparent.

Data compression: Data from the sending modem is being compressed in real time acc. to defined algorithms and then transmitted. The receiving modem decompresses the data and transfers it to the terminal equipment. Data compression can only be used with activated data protection protocols.

Data protection protocol: The data protection protocol is employed to correct transmission errors. The modems come with integrated protection protocols thus allowing the terminal equipment to transmit and receive information data only. At an active data protection protocol the transmit data is transformed to blocks that are labeled with a checksum before the transmission starts. At the receiving side the checksum is calculated for each received block and compared with the received checksum. If no errors occur the block is positively acknowledged. A retransmission of the block is requested if errors occur during transmission.

APPENDIX

DBU: Dial backup unit.

DTE: Data terminal equipment.

DCE: Data communication equipment.

Dial Backup: Switching of a secondary path using switched lines (dial backup) is activated whenever the leased line connection is broken. In those cases the modem establishes a switched line connection to the remote end. The device switches back automatically to leased line operation if the connection is operational again.

Direct call: This option allows for setting of interface line S1/DTR by the DTE without a dial command and dialing the first number stored with AT&Z0 from the number storage.

Direct mode: Direct mode allows for transparent data transmission. The transmission rate between DTE and modem is equal to the transmission rate between the two modems. Data coming from the DTE is directly transfered to the modem modulator, i.e. data is being processed without any data buffering procedures. Data flow control is not necessary for this method. The dial up can only be stopped by deactivating the S1/DTR line as the modem does not detect the escape sequence "+++".

D channel: The D channel transmits control data from ISDN accesses.

EAZ: The terminal selection number is only available for national (german) ISDN operation and extends the subscriber address (calling number). This allows for external dial up of selected terminal equipment.

EEPROM: **E**lectrically **E**raseable **P**rogrammable **R**ead **O**nly **M**emory. Stores user configurations and phone numbers selected using the necessary command.

ETSI: The **E**uropean **T**elecommunications **S**tandards **I**nstitute is a normative european institute. ETSI recommendations are accepted automatically as european standard for all EC (European Community) member states.

ISDN: **I**ntegrated **S**ervices **D**igital **N**etwork.

ISDN base access: The base access features two digital information channels B1and B2 and a digital control channel (64 kbit/s).

ISDN primary multiplex access: Features 30 digital information channels and a digital control channel with 16 kbit/s.

ISDN exchange: A digital (ISDN) exchange that allows for connecting of analog subscribers as well.

ITU: The **I**nternational **T**elecommunications **U**nion is an international institution that replaces the CCITT.

Local exchange: Subscriber access area exchange for direct subscriber connection.

MNP 1...4: Data protection protocols (Microcom Networking Protocol).

MNP 5: Data compression procedure.

Modem: Blending of **mo**dulator/**dem**odulator. A modem transfers digital signals to voice frequency signals for transmission on the telephone network.

Normal mode: The modem buffers data coming from the DTE. The transmission rate between DTE and modem may differ from the transmission rate between the two modems. To prevent data loss the flow control has to be activated. The modem processor controls the transfer of data from the data buffer. Normal mode operates without data protection protocols.

RAM: Random **A**ccess **M**emory. Read/write memory. The modem stores its current configuration in the RAM. The memory content is lost after deactivation of the operation voltage.

Reliable mode: In comparison to normal mode the modems operate with activated data protection protocols (MNP, V.42). The dial up in reliable mode is stopped if the remote modem does not support any protection protocols.

Remote switching: Switching of a telecommunication access outside the local exchange.

S_0 interface: Standard subscriber interface of the ISDN base access.

S_{0FV}: Interface of an ISDN base access for leased lines.

S_{2M}: Primary multiplex access. Designed for larger applications with max. 30 D channels.

TAE: Telecommunications access socket.

Terminal equipment: Any telecommunications equipment e.g. telephones, modems or fax machines are terminal equipments.

Speedbuffering: Multimode modems that support different modulation modes guarantee for constant interface rates towards the DTE (ref. to normal mode).

V.42: Data protection protocol.

V.42bis: Data compression procedure.

APPENDIX

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APPENDIX

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Operation Manual - ISDN Terminal Adapter V.24/V.28