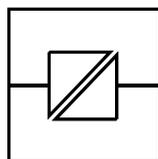


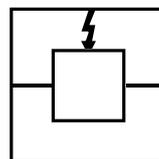
**GD-01
Quickguide**

INSTALLATION MANUAL

6196-2211



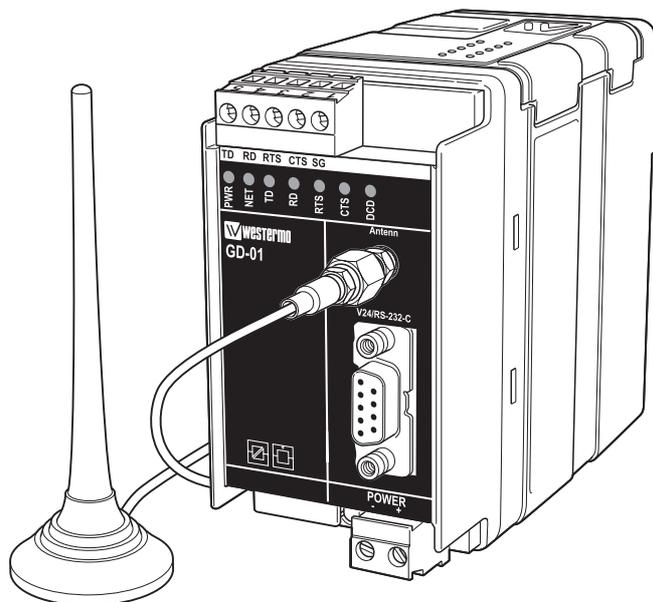
Galvanic
Isolation



Transient
Protection



CE
Approved



**GSM
Modem**



 **westermo**[®]
www.westermo.se

Introduction

Wireless data communication links over a GSM network can be used instead of normal wirebound communication in several industrial data communication applications. The benefits of wireless applications are many and one of the most obvious is the low cost of the installation. Other important benefits are for example all services provided by the GSM networks. The data transfer service is just one of many that could be used in a lot of different industrial data communication applications.

The Westermo GD-series of modems provides a reliable data communication link over GSM networks. The modems have been designed for use in industrial data communication applications and has several features that are normally not present on standard GSM modems. The GD-xx series of GSM modems is available in two versions: the GD-01 and the GD-02. The GD-01 is a DIN-rail mounted modem with RS-232 interface in either a 9-pin D-sub or in a 5-pin screw connector.

The GD-02 is also DIN rail mounted and has the same RS-232 interface as the GD-01 plus a RS-422/RS-485 interface in a 4-pin screw connector, 2 alarm inputs and one relay output. The GD-02 is in general more advanced than the GD-01. Besides the interface differences there are also a lot of “soft” features such as callback and password functionality.

The Westermo GD-series of modems can be used in data communication applications together with other GSM modems, traditional analogue PSTN modems (like the TD-33) or ISDN adapters (like the ID-90).

All configuration is made by AT-commands but in the GD-02 also dipswitches or remote configuration can be used to set up the modem.

See the technical specifications and the AT-command description for more details.

Note! To get the modem to work properly it is necessary to use a subscription (SIM-card) from a GSM network operator. To get all functions in the GD- modems to work it is important that the wanted services are enabled in the subscription. Please refer to the technical specification for a list of GSM services supported by the modem.

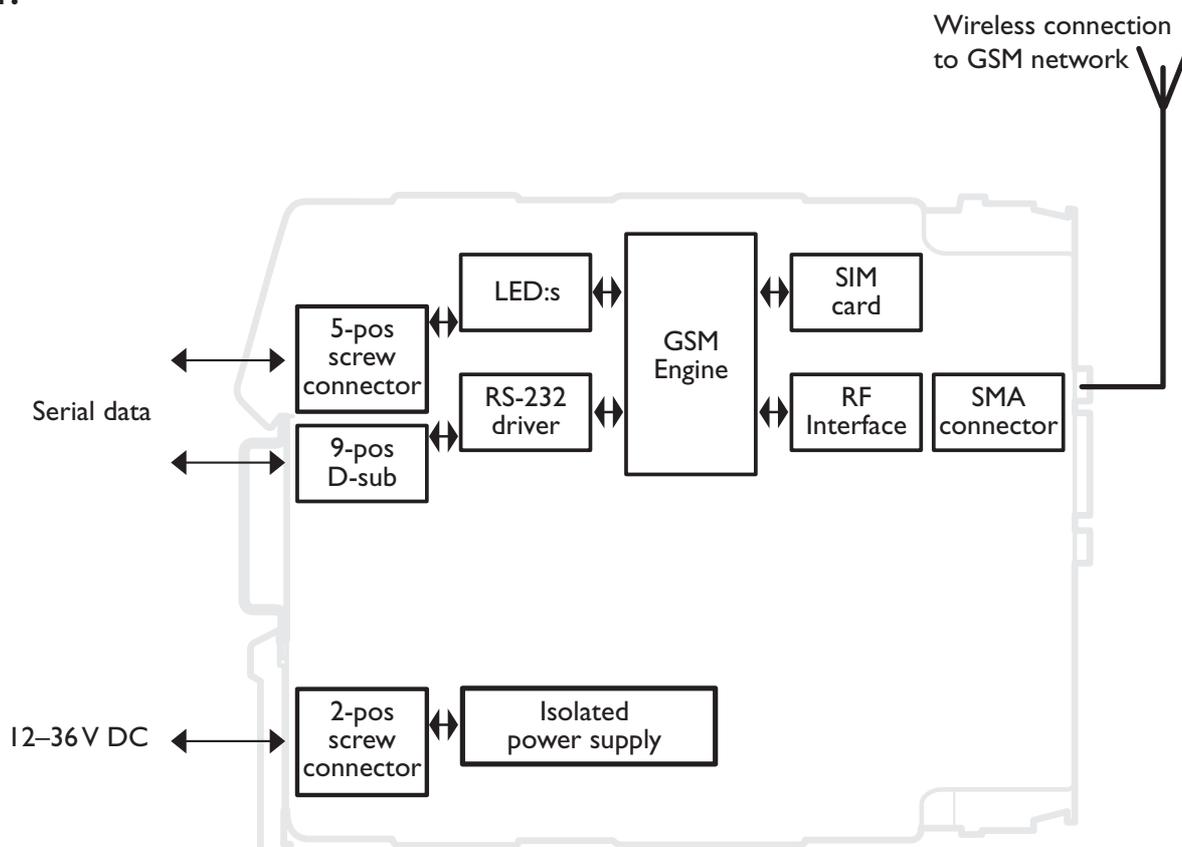
Functional description

The GD-series of modems are modem for wireless data transmissions over the public GSM network. The GSM-modem can be used to link PLC:s, data loggers, security and surveillance systems or for data acquisition.

The GSM services supported by the Westermo GD-modems are Circuit Switched Data, Fax, SMS and GPRS. A data communication link can be established to another GSM modem, to an analogue modem or to a digital ISDN adapter. The protocol used when connecting to an analogue modem is V.21, V.22, V.22bis, V.23, V32 or V.34. The protocol used when connecting to an ISDN adapter is V.110. A connection can be established either via AT-commands (ATD...) or via the RS-232 signal DTR. The DTR connection is made to a preconfigured number. The unit can send and receive FAX according to Fax Class 2 Group 3. SMS messages can be transmitted or received. A SMS send session can be initiated by either an AT command or by a positive transition of the DTR signal. Sending and receiving of packet data is possible with the GPRS service.

The GD-xx series of GSM modems is available in two versions: the GD-01 and the GD-02.

GD-01:



Safety



General:

Before using this unit, read the manual completely, and make sure that you understand it fully. Check that your application does not exceed the safe operating specifications for this unit.



Before installation, maintenance or modification work:

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap).

Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supply and all others electrical connections.



Installation:

This unit is constructed for professional system use. It should be located in a restricted access area, such as locked cabinet which can only be accessed by service personnel.

This unit is intended for permanent connection to the AC/DC power supply and should only be installed by qualified personnel.

The AC/DC power supply wiring must be sufficiently fused, and if necessary it must be possible to disconnect the unit manually from the voltage supply. Ensure compliance to national installation regulations.

This unit is a class II equipment, and does not rely on protective earthing.

This unit uses convection cooling. To avoid obstructions to the airflow around the unit, follow the spacing recommendations (see Installation).

Approvals

Conformity with the Directive 99/5/EEC (Radio Equipment & Telecommunications Terminal Equipment) has been assessed by application of the standards

- EN60950 (user safety),
- EN 301 489-1 (Electromagnetic compatibility),
- EN 301 489-7 (Electromagnetic compatibility),
- EN 61000-6-2 (Electromagnetic compatibility, industrial immunity),
- EN 61000-6-3 (Electromagnetic compatibility, residential emission)
- EN 301 419-1 (Radio spectrum matters),
- EN 301 420 (Radio spectrum matters),

The GD-series of modems are fully compliant with ETSI GSM Phase 2+ standard.

Declaration of conformity

Westermo Teleindustri AB

Declaration of conformity

The Westermo Teleindustri AB company declares that the listed product conforms to the essential requirements of the R&TTE 1999/5/EC Directive, if used for its intended use.

Type of equipment: DIN-rail GSM modem
Model: GD-01
Article Number 3196-0001

Reference to 1999/5/EC Directive

User Safety (article 3.1a)

EMC (article 3.1b)

Efficient use of radio frequency spectrum (article 3.2)

Standards:

EN 60950: 2000

EN 301 489-1
EN 301 489-7

EN 301 419-1
EN 301 420



Hans Levin
Technical Manager
24th of September 2002

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Specifications

GSM services

Circuit Switched Data	Asynchronous transparent or non-transparent up to 14 400 bit/s MNP2 error correction and V.42 bis data compression
Fax	Fax group 3 (Class 1 and Class 2)
SMS	160 characters text or PDU Point to point (MT/MO) Cell broadcast
GPRS (optional)	GPRS Class 2, Class B Coding scheme: CSI to CS4

Connections

Power interface

Rated voltage	12–36 V DC
Rated current	@12 V DC: 200 mA / 40 mA
on line mode/	@24 V DC: 100 mA / 20 mA
idle mode	@36 V DC: 67 mA / 17 mA
Connection	Screw connector
Circuit type	Power network
Special factors	Reverse polarity protected

Communication and service interface, RS-232

Electrical specification	RS-232
Data rate	300–115 200 bit/s
Data format	7 or 8 databits, Odd, Even, None, Mark or Space parity
Connection	9-pin D-sub and 5-pin screw connector
Circuit type	SELV, max 15 m length, shielding not required

Communication interface, RS-422/RS-485 (only in GD-02)

Electrical specification	RS-422/485
Data rate	300–115 200 bit/s
Data format	7 or 8 databits, Odd, Even or None parity
Connection	5-position screw block
Circuit type	TNV-I, twisted pair, shielding not required
Special factors	Bus turning time < 1.5 bit time

Antenna interface

Frequency	EGSM900: 880 – 915 and 925 – 960 MHz GSM1800: 1 710 – 1 785 and 1 805 – 1 880 MHz
Connection	50 ohm impedance SMA male antenna connector
Special factors	If not the supplied antenna is used, check the “antenna information” section in this manual.
SIM interface	3 volts SIM cards supported

Insulation

Between circuits	Electrical strength
Power to all other	1,5 kV RMS @ 50Hz
Alarm to all other (only in GD-02)	0.5 kV RMS @ 50Hz

Climatic environment

Temperature, operating	0 to 55°C
Temperature, storage and transportation	-25 to 70°C
Relative humidity, operating	5 to 95% non-condensing
Relative humidity, storage and transportation	5 to 95% condensation allowed outside packaging

Mechanics

Dimension, mm	55 x 100 x 128 (WxHxD)
Weight	0,3 kg
Mounting	35 mm DIN-rail
Degree of protection	IP 20 (IEC 529)

Maintenance

No maintenance is required, as long as the unit is used within the specified conditions.

Installation

Mounting /Removal



Before mounting or removing the unit:

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap).

Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supply and all others electrical connections.

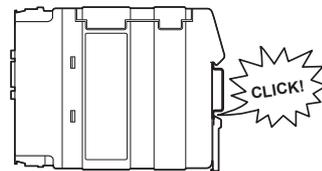
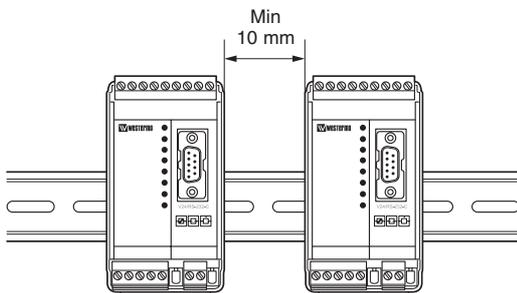
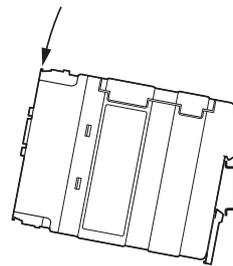
Mounting

This unit should be mounted on 35 mm DIN rail which is horizontally mounted on a wall or cabinet backplate.

This unit use convention cooling. To avoid obstructions to the airflow around the unit, use the following spacing rules.

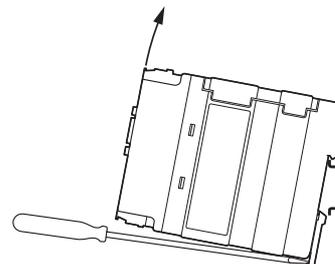
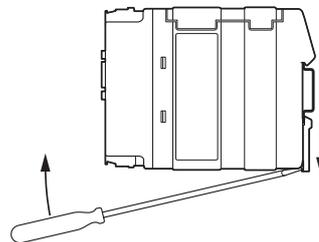
Recommended spacing 25 mm (1.0 inch) above/below and 10 mm (0.4 inches) left/right the unit.

Snap on mounting (figure)



Removal

Press down the black support at the back of the unit using a screwdriver (figure).



Connections

GD-01

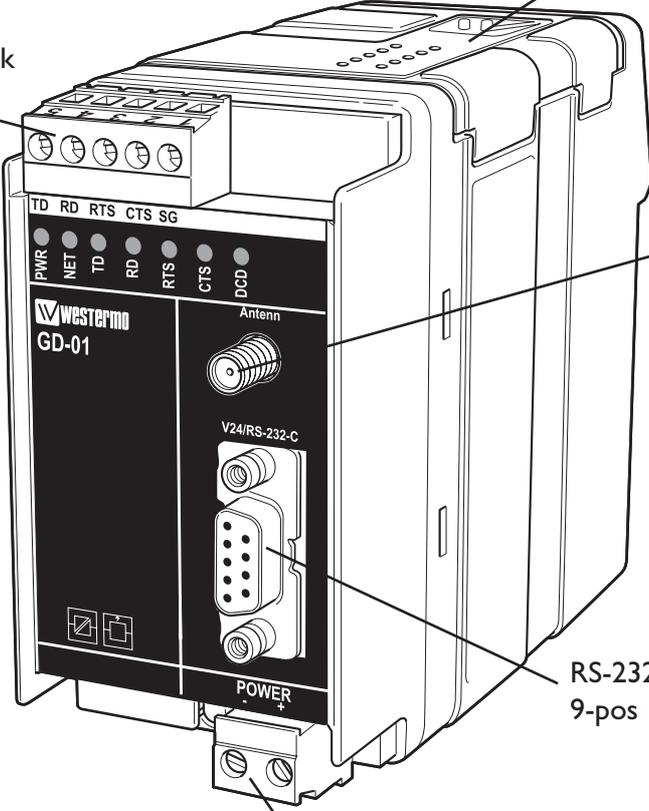
RS-232 interface,
5-position screw block

SIM interface

Antenna
interface

RS-232 interface,
9-pos D-sub

Power connection 12–36 V DC



Power interface

Connection	Description
2-pos screw block, +	Power 12–36 V DC
2-pos screw block, –	Power 12–30 V DC

RS-232 interface, screw connector

Connection in GD-01 5-pos screw connector	Connection in GD-02 9-pos screw connector	Direction	Description
1	5	–	Signal ground
2	6	Out	CTS
3	7	In	RTS
4	8	Out	RD
5	9	In	TD

RS-232 interface, 9-pin D-sub

Connection	Direction	Description
9-pos D-sub no. 1	Out	DCD
9-pos D-sub no. 2	Out	RD
9-pos D-sub no. 3	In	TD
9-pos D-sub no. 4	In	DTR
9-pos D-sub no. 5	–	Signal ground
9-pos D-sub no. 6	Out	DSR
9-pos D-sub no. 7	In	RTS
9-pos D-sub no. 8	Out	CTS
9-pos D-sub no. 9	Out	RI

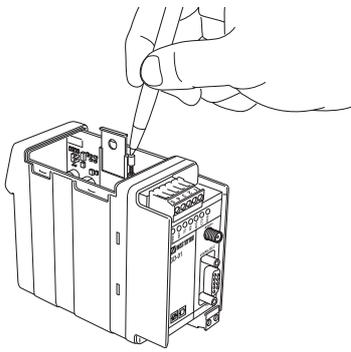
Antenna interface

Connection	Direction	Description
SMA male connector	–	2W @ 900 MHz, 1W @ 1 800 MHz

SIM card interface

Connection	Direction	Description
SIM card	–	Supported SIM card voltage: 3 volt

It is necessary to have a GSM subscription from a network operator. They will provide you with a SIM card that should be mounted in the SIM card holder. The SIM card holder is located under the top lid of the modem.



Press the button to eject the holder. Mount the SIM card in the holder and make sure it is correctly installed before it is pushed back into the modem.

LED indications

PWR	LED on LED off	Correct internal power No internal power
NET	LED off LED on LED flashing slowly LED flashing rapidly	Device switched off - Not ready Device switched on Connecting to network Device switched on Idle mode (registered on network) Device switched on Transmission mode
TD	LED blinking LED off	LED showing data received from the local RS-232/V24 port No data received on the local RS-232/V24 port
RD	LED blinking LED off	LED showing data transmitted on the local RS-232/V24 port No data transmitted on the local RS-232/V24 port
RTS	LED on LED off	RS-232/V.24 RTS signal is active RS-232/V.24 RTS signal is inactive
CTS	LED on LED off	RS-232/V.24 CTS signal is active RS-232/V.24 CTS signal is inactive
DCD	LED on LED off	RS-232/V.24 DCD signal is active RS-232/V.24 DCD signal is inactive

Quick Start guide

The serial interface is default configured to:

- 9600 bit/s, 8 databits, no parity and 1 stop bit. (refer to AT+IPR and AT+ICF commands)
- RTS / CTS flowcontrol enabled (please refer to AT+IFC command)
- DTR signal must be active from the DTE (please refer to AT&Dn command)

Follow the steps below to get the unit up and running as quick as possible:

- Insert a valid SIM-card with correct services enabled (e.g. incoming and outgoing DATA service)
- Make sure that the antenna is connected and placed in the best position possible.
- Power on the unit and make sure that the PIN code of the SIM-card is disabled either with the help of a mobile phone or with the command AT+CLCK. If the PIN code should be enabled make sure to enter the correct PIN code with the command AT+CPIN.
- Check on the front of the GD that the NET LED is flashing , this means that the unit has a connection to the GSM network and that it is registered.
- Check with a terminal program the received signal quality (please refer to AT+CSQ command) The value of the first parameter reported from the +CSQ command should be between 10 and 31, the value of the second parameter should always be 0.
- Make sure that the DTE equipment is connected and configured with the same serial settings as the GD unit.
- Configure the GD unit with appropriate commands as needed in the specific application. Please refer to the application examples in the end of the full manual on the CD.

Configuration

The GD-01 can be configured via AT-commands on the service interface.

Short form list of AT commands

S-registers	Description	Direct Save	+CSAS	&W	&F	Default value
S0	Ring signals before auto answer	-	-	x	x	0

General commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CGMI	Manufacturer identification	-	-	-	-	-
+CGMM	Request model identification	-	-	-	-	-
+CGMR	Request revision identification	-	-	-	-	-
+CGSN	Product Serial Number	-	-	-	-	-
+CSCS	Select TE character set	-	-	x	x	"PPCP437"
+WPCS	Phonebook Character Set	-	-	x	x	"TRANSPARENT"
+CIMI	Request IMSI	-	-	-	-	-
+CCID	Card Identification	-	-	-	-	-
+GCAP	Capabilities list	-	-	-	-	-
+CPOF	Power off	-	-	-	-	-
+CFUN	Set phone functionality	-	-	-	-	-
+CPAS	Phone activity status	-	-	-	-	-
+CMEE	Report Mobile Equipment errors	-	-	x	x	0
+CKPD	Keypad control	-	-	-	-	-
+CCLK	Clock Management	-	-	-	-	-
+CALA	Alarm Management	-	-	-	-	-

Call control commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
D	Dial command	-	-	-	-	-
H	Hang-Up command	-	-	-	-	-
A	Answer a call	-	-	-	-	-
+CEER	Extended error report	-	-	-	-	-
+VTD	DTMF signals tone duration	-	-	-	-	-
+VTS	Send DTMF signals	-	-	-	-	-
%Dn	Automatic dialing with DTR	-	-	x	x	0
+CICB	Incoming Call Bearer	-	-	x	x	2
+CSNS	Single Numbering Scheme	-	-	x	x	0

Network service commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CSQ	Signal Quality	-	-	-	-	-
+COPS	Operator selection	x	-	x	x	0,2
+CREG	Network registration	-	-	x	x	0
+WOPN	Read operator name	-	-	-	-	-
+CPOL	Preferred operator list	-	-	-	-	-

Security commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CPIN	Enter PIN	-	-	-	-	-
+CPIN2	Enter PIN2	-	-	-	-	-
+CPINC	PIN remaining attempt number	-	-	-	-	-
+CLCK	Facility lock	-	-	-	-	-
+CPWD	Change password	-	-	-	-	-

Phonebook commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CPBS	Select phonebook memory storage	-	-	-	-	-
+CPBR	Read phonebook entries	-	-	-	-	-
+CPBF	Find phonebook entries	-	-	-	-	-
+CPBW	Write phonebook entry	-	-	-	-	-
+CPBP	Phonebook phone search	-	-	-	-	-
+CPBN	Move action in phonebook	-	-	-	-	-
+CNUM	Subscriber number	-	-	-	-	-
+WAIP	Avoid phonebook init	-	-	x	x	0
+WDPCP	Delete Calls Phonebook	-	-	-	-	-
+CSVM	Set Voice Mail Number	x	-	-	x	0

Short Messages commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CSMS	Select message service	x	-	-	-	0
+CNMA	New Message Acknowledgement	-	-	-	-	-
+CPMS	Preferred Message Storage	-	-	-	-	-
+CMGF	Preferred Message Format	-	-	x	x	1
+CSAS	Save Settings	-	-	-	-	-
+CRES	Restore settings	-	-	-	-	-
+CSDH	Show text mode parameters	-	-	x	x	0
+CNMI	New message indication	-	x	-	x	0,1,0,0,0
+CMGR	Read message	-	-	-	-	-
+CMGL	List message	-	-	-	-	-
+CMGS	Send message	-	-	-	-	-
+CMGW	Write Message to Memory	-	-	-	-	-
+CMSS	Send Message From Storage +CMSS	-	-	-	-	-
+CSMP	Set Text Mode Parameters	-	x	-	x	1,167,0,0
+CMGD	Delete message	-	-	-	-	-
+CSCA	Service center address	-	x	-	-	SIM dependant
+CSCB	Select Cell Broadcast Message Types	-	-	-	-	-
+WCBM	Cell Broadcast Message Identifiers	-	-	-	-	-
+WMSC	Message status modification	-	-	-	-	-
+WMGO	Message overwriting	-	-	-	-	-
+WUSS	Unchange SMS Status	-	x	-	x	0

Supplementary Services commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CCFC	Call forwarding	-	-	-	-	-
+CLCK	Call barring	-	-	-	-	-
+CPWD	Modify SS password	-	-	-	-	-
+CCWA	Call waiting	-	-	x	x	0
+CLIR	Calling line identification restriction	-	-	-	-	-
+CLIP	Calling line identification presentation	-	-	x	x	0
+COLP	Connected line identification presentation	-	-	x	x	0
+CAOC	Advice of charge	-	-	-	-	-
+CACM	Accumulated call meter	-	-	-	-	-
+CAMM	Accumulated call meter maximum	-	-	-	-	-
+CPUC	Price per unit and currency table	-	-	-	-	-
+CHLD	Call related supplementary services	-	-	-	-	-
+CLCC	List current calls	-	-	-	-	-
+CSSN	Supplementary service notifications	-	-	x	x	0,0
+CUSD	Unstructured supplementary service data	x	-	-	x	0
+CCUG	Closed user group	x	-	-	-	0,0,0

Data commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CBST	Bearer type selection	–	–	x	x	0,0,1
+FCLASS	Select mode	–	–	–	–	–
+CR	Service reporting control	–	–	x	x	0
+CRC	Cellular result codes	–	–	x	x	0
+ILRR	DTE–DCE local rate reporting	–	–	x	x	0
+CRLP	Radio link protocol parameters	–	–	x	x	61,61,48,6,1
+DOPT	Others radio link parameters	–	–	x	x	1,1
%C	Select data compression	–	–	x	x	2
+DS	V42 bis data compression	–	–	x	x	3,0,4096,20
+DR	V42 bis data compression report	–	–	x	x	0
\N	Select data error correcting mode	–	–	x	x	0

Fax class 1 commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+FTM	Transmit speed	–	–	–	–	–
+FRM	Receive speed	–	–	–	–	–
+FTH	HDLC transmit speed	–	–	–	–	–
+FRH	HDLC receive speed	–	–	–	–	–
+FTS	Stop transmission and wait	–	–	–	–	–
+FRS	Receive silence	–	–	–	–	–

Fax class 2 commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+FDT	Transmit Data	–	–	–	–	–
+FDR	Receive Data	–	–	–	–	–
+FET	Transmit page punctuation	–	–	–	–	–
+FPTS	Page transfer status parameters	–	–	–	–	–
+FK	Terminate Session	–	–	–	–	–
+FBOR	Page transfer bit order	–	–	x	x	0
+FBUF	Buffer size report	–	–	–	–	–
+FCQ	Copy quality checking	–	–	x	x	0
+FCR	Capability to receive	–	–	x	x	1
+FDIS	Current sessions parameters	–	–	x	x	0,5,0,0,2,0,0,0,0
+FDCC	DCE capabilities parameters	–	–	x	x	0,5,0,0,2,0,0,0,0
+FLID	Local ID string	–	–	–	–	–
+FPHCTO	Page transfer timeout parameter	–	–	x	x	30

V24-V25 commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+IPR	Fixed DTE rate	–	–	x	–	9600
+ICF	DTE–DCE character framing	–	–	x	–	3,4
+IFC	DTE–DCE local flow control	–	–	x	–	2,2
&C	Set DCD signal	–	–	x	–	1
&D	Set DTR signal	–	–	x	–	1
&S	Set DSR signal	–	–	x	–	1
O	Back to online mode	–	–	–	–	–
Q	Result code suppression	–	–	x	x	0
V	DCE response format	–	–	x	x	1
Z	Default configuration	–	–	–	–	–
&W	Save configuration	–	–	–	–	–
&T	Auto–tests	–	–	–	–	–
E	Echo	–	–	x	–	1
&F	Restore factory settings	–	–	–	–	–
&V	Display configuration	–	–	–	–	–
I	Request identification information	–	–	–	–	–
+WMUX	Data / Commands Multiplexing	–	–	x	x	0

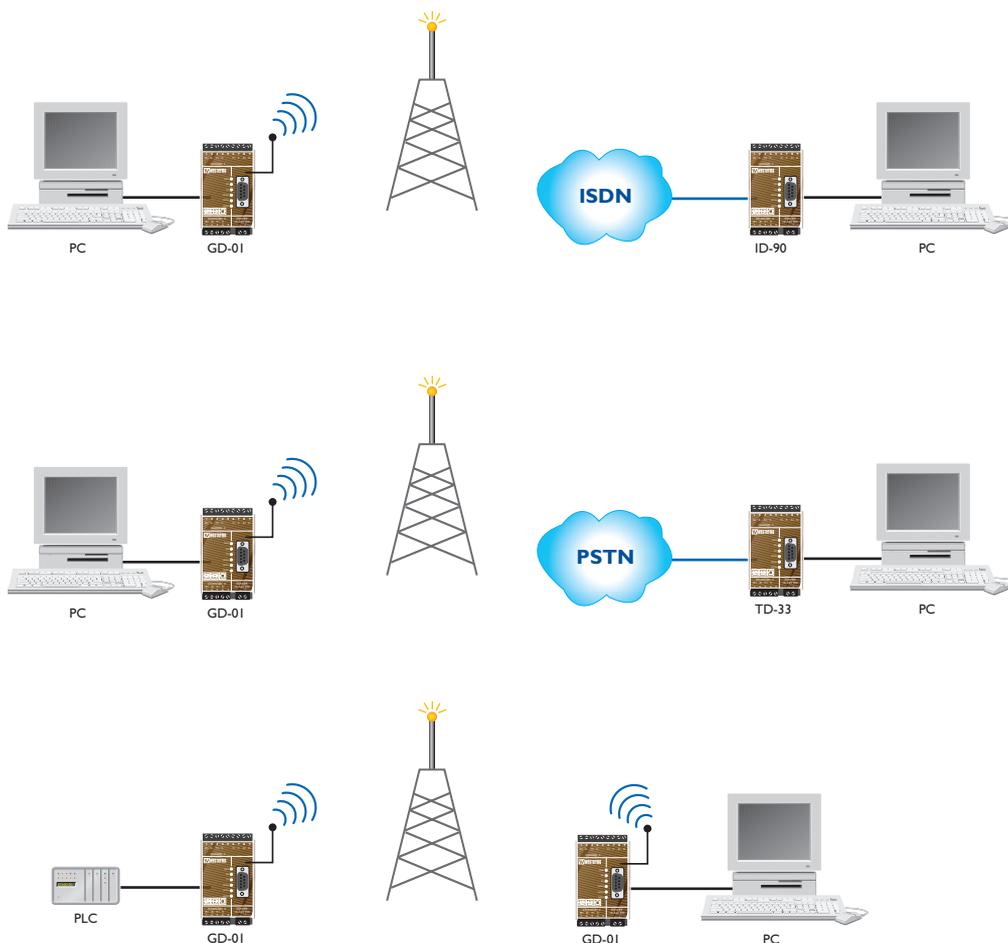
Specific AT commands

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CCED	Cell environment description	–	–	–	–	–
+CCED	Automatic RxLev indication	–	–	–	–	–
+WIND	General Indications	x	–	–	x	0
+CMER	Mobile Equipment event reporting	–	–	x	x	0
+WLPR	Read Language Preference	–	–	–	–	–
+WLPW	Write Language Preference	–	–	–	–	–
+WAC	Abort command	–	–	–	–	–
+WDWL	Downloading	–	–	–	–	–
+WDR	Data Rate	x	–	–	–	2
+WHWV	Hardware Version	–	–	–	–	–
+WDOP	Date of Production	–	–	–	–	–
+WSTR	Status Request	–	–	–	–	–
+WSCAN	Scan	–	–	–	–	–
+WRIM	Ring Indicator Mode	–	–	–	–	–
+W32K	32kHz Power down Mode	–	–	–	–	–
+WSSW	Internal Software version	–	–	–	–	–
+WCCS	Custom Character Set	–	–	–	–	–
+WLCK	Lock	–	–	–	–	–
+CPHS	CPHS command	x	–	–	x	0
+WMIR	Customer storage mirror	–	–	–	–	–
+WMBN	CPHS Mail Box Number	–	–	–	–	–
+WRST	Reset	–	–	–	–	–
+WLOC	Local Information	–	–	–	–	–
+WATH	Hang–up	–	–	–	–	–

AT commands for GPRS

Command	Description	Direct Save	+CSAS	&W	&F	Default value
+CGDCONT	Define PDP Context	-	-	-	-	-
+CGQREQ	Requested Quality of Service Profile	-	-	-	-	-
+CGQMIN	(Minimum acceptable) Quality of Service Profile	-	-	-	-	-
+CGATT	GPRS attach or detach	-	-	-	-	-
+CGACT	PDP context activate or deactivate	-	-	-	-	-
+CGDATA	Enter data state	-	-	-	-	-
+CGCLASS	GPRS mobile station class	-	-	-	-	-
+CGSMS	Select service for MO SMS messages	-	-	-	-	-
+CGEREP	GPRS event reporting	-	-	-	-	-
+CGREG	GPRS network registration status	-	-	-	-	-
D	Request GPRS IP service	-	-	-	-	-
+CGAUTO	Automatic response to a network request for PDP context activation	-	-	-	-	-
+CGANS	Manual response to a network request for PDP context activation	-	-	-	-	-
+CGPADDR	Show PDP address	-	-	-	-	-
+CGCOUNTERS	PDP Counters Infos	-	-	-	-	-
+WGPRS	GPRS PARAMETERS CUSTOM:	-	-	-	-	-
+WGAUTH	Set authentication parameters	-	-	-	-	-
+WGIPCPINF	Get IPCP informations	-	-	-	-	-

Application examples



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