GDW-11

6615-2200

WESTERMO

User Guide
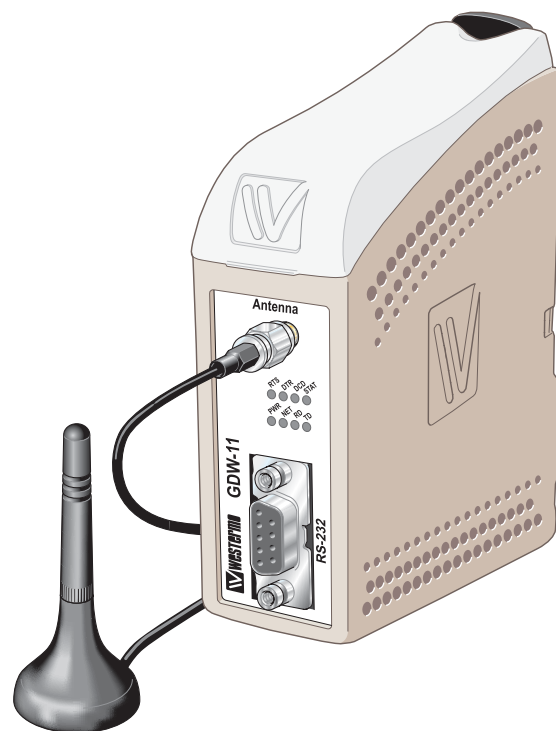
*GSM/GPRS
Modem*

Legal information

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More information about Westermo can be found at the following Internet address:

http://www.westermo.com

Safety

⚠ **Before using this unit:**

Read this manual completely and gather all information on the unit. Make sure that you understand it fully. Check that your application does not exceed the safe operating specifications for this unit.

Hazardous voltages may occur within this unit when connected to a power supply.

Prevent access to hazardous voltages by disconnecting the unit from its power supply.

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

⚠ **Before installation:**

This unit should only be installed by qualified personnel.

This unit should be built-in to an apparatus cabinet, or similar, where access is restricted to service personnel only.

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

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

Care recommendations

Follow the care recommendations below to maintain full operation of unit and to fulfil the warranty obligations.

This unit must not be operated with covers or lids removed.
Do not attempt to disassemble the unit. There are no user serviceable parts inside.
Do not drop, knock or shake the unit, rough handling beyond the specification may cause damage to internal circuit boards.
Do not use harsh chemicals, cleaning solvents or strong detergents to clean the unit.
Do not paint the unit. Paint can clog the unit and prevent proper operation.
Do not expose the unit to any kind of liquids (rain, beverages, etc). The unit is not water-proof. Keep the unit within the specified humidity levels.
Do not use or store the unit in dusty, dirty areas, connectors as well as other mechanical part may be damaged.
If the unit is not working properly, contact the place of purchase, nearest Westermo distributor office or Westermo Tech support.

GSM specific safety

Please read and follow the guidelines listed below. The precautions must be observed during all phases of the operation. Breaking these rules may be dangerous, illegal or affect performance of the unit and/or invalidate the unit's approval and/or warranty.

General

Remember to follow any special regulations and warnings in force in any area and never use the unit whenever it's forbidden to use it. Do not use the unit when it may cause interference or danger. A wireless device exposed to interference above specified limits could result in deteriorated performance.

Hospitals or other Medical environment

Do not use the unit in a medical environment such as health care facilities. Follow any regulations or rules that instruct you to not use the unit.

Pacemakers

The Health Industry Manufacturers Association recommends that a minimum separation of six (6") inches be maintained between cellular wireless equipment and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by and recommendations of Wireless Technology Research.

Persons with pacemakers:

⋮ Should ALWAYS keep the the unit and its antenna more than six inches from their pacemaker when the unit is turned ON.

⋮ If you have any reason to suspect that interference is taking place, turn your wireless equipment OFF immediately.

Hearing Aids

Some digital wireless equipment may interfere with some hearing aids. In the event of such interference, you may want to consult your service provider [or call the customer service line to discuss alternatives.]

Other Medical Devices

If you use any other personal medical device, consult the manufacturer of your device to determine if they are adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information.

Turn the wireless equipment OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

Aircraft

Do not use the unit in an aircraft. The use of a wireless unit in an aircraft may be dangerous to the operation of the aircraft, disrupt the wireless network, and may be illegal.

Failure to observe these instructions may lead to suspension or denial of cellular services to the offender, legal action, or both.

Vehicle

If the unit is incorrectly installed in a vehicular environment, the operation of the unit could interfere with the vehicle electronics. Faulty installation and/or operation can constitute a safety hazard.

For Vehicles equipped with an airbag

An air bag inflates with great force. DO NOT place objects, including either installed or portable wireless equipment, in the area over the air bag or in the air bag deployment area. If in-vehicle wireless equipment is improperly installed and the air bag inflates, serious injury could result.

Blasting areas

Do not use the unit where blasting is in progress or in "blasting areas".
Observe restrictions and follow any regulation or rules.

Explosive atmospheres

Do not use the unit in any area with a potentially explosive atmosphere.
Potentially explosive areas are often, but not always, clearly marked.
They include fuelling areas such as petrol stations, below decks on boats, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles, such as grain, dust, or metal powder.

RF energy

The GDW-11 is a low power radio transmitter and receiver. When it is ON, it receives and also sends out radio frequency (RF) signals.
Most modern electronic equipment is shielded from RF signals. However, certain electronic equipment may not be shielded against the RF signals from the wireless unit. All radio-transmitting devices send signals, which may cause interference in different electronic devices. To avoid interference, place the units antenna a sufficiently long distance from other electronics.

Critical applications

Cellular units operate using radio signals and cellular networks cannot be guaranteed to connect in all conditions. Therefore you should never rely solely on a wireless device for essential communications, for example medical emergencies.

Backup copies

Remember to make backup copies of all important data, for example PIN/PUK codes, contents of SIM card etc.

Antenna care

Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications, or attachments could damage the unit and may violate current regulations.

Do not touch the antenna unnecessarily when the unit is in use. Contact with the antenna affects call quality and may cause the unit to operate at a higher power level than otherwise needed.

Maintenance

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

Agency approvals and standards compliance

Type	Approval / Compliance
EMC	EN 61000-6-2, Immunity industrial environments
	EN 55024, Immunity IT equipment
	EN 61000-6-3, Emission residential environments
	FCC part 15 Class B
	EN 50121-4, Railway signalling and telecommunications apparatus
	IEC 62236-4, Railway signalling and telecommunications apparatus
Safety	EN 60950, IT equipment
R&TTE Article 3.1b	EN 301 489-1,
	EN 301 489-7
Article 3.2	EN 301 489-1,
	EN 301 419-1
	EN 301 511

FCC Part 15.105 Notice: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Declaration of Conformity

Type tests and environmental conditions

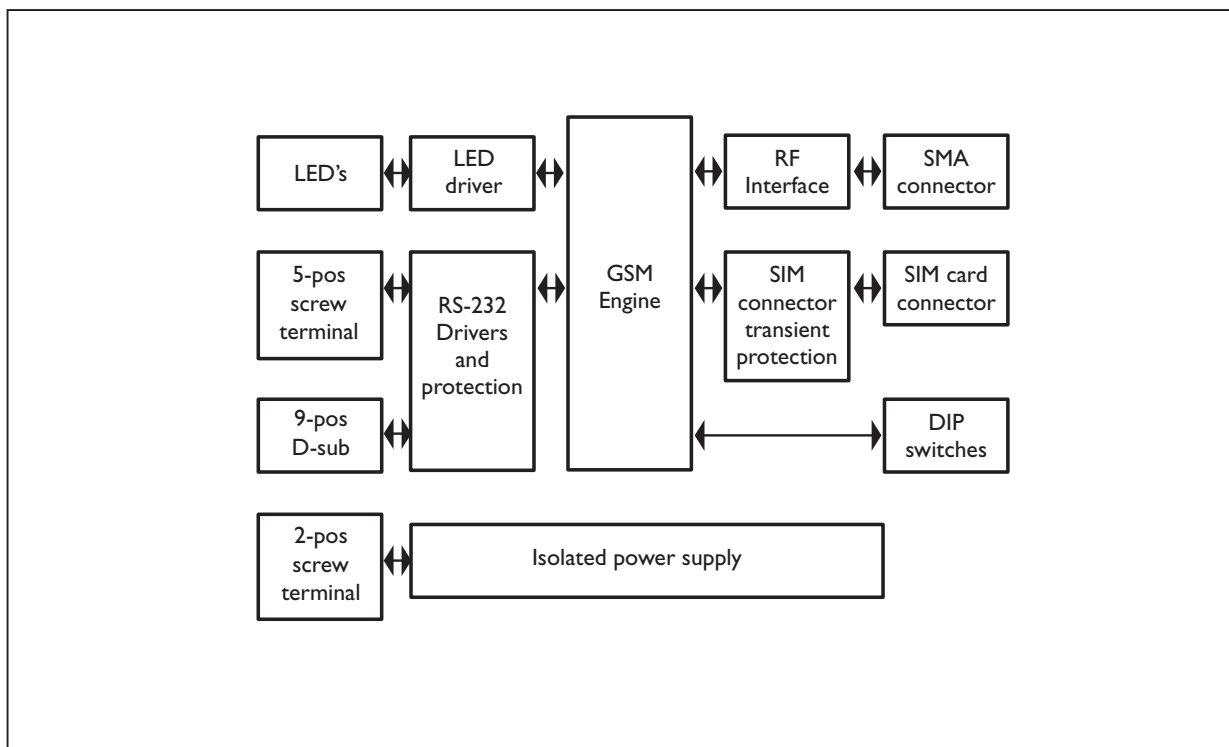| Electromagnetic Compatibility			
Phenomena	**Test**	**Description**	**Test levels**
ESD	EN 61000-4-2	Enclosure contact	± 6 kV
		Enclosure air	± 8 kV
RF field AM modulated	IEC 61000-4-3	Enclosure	20 V/m 80% AM (1 kHz), 80 – 2000 MHz
RF field 900 MHz	ENV 50204	Enclosure	20 V/m pulse modulated 200 Hz, 900 ± 5 MHz
Fast transient	EN 61000-4-4	Signal ports	± 2 kV
		Power ports	± 2 kV
Surge	EN 61000-4-5	Signal ports unbalanced	± 2 kV line to earth, ± 2 kV line to line
		Signal ports balanced	± 2 kV line to earth, ± 1 kV line to line
		Power ports	± 2 kV line to earth, ± 2 kV line to line
RF conducted	EN 61000-4-6	Signal ports	10 V 80% AM (1 kHz), 0.15 – 230 MHz
		Power ports	10 V 80% AM (1 kHz), 0.15 – 230 MHz
Power frequency magnetic field	EN 61000-4-8	Enclosure	100 A/m, 50 Hz, 16.7 Hz & 0 Hz
Pulse magnetic field	EN 61000-4-9	Enclosure	1000 A/m, 6.4 / 16 ms 5 pos/5neg pulse in XYZ direction
Voltage dips and interruption	EN 61000-4-11	AC power ports	10 & 5 000 ms, interruption 10 & 500 ms, 30% reduction 100 & 1 000 ms, 60% reduction
Mains freq. 50 Hz	EN 61000-4-16	Signal ports	100 V 50 Hz line to earth
Mains freq. 50 Hz	SS 436 15 03	Signal ports	250 V 50 Hz line to line
Voltage dips and interruption	EN 61000-4-29	DC power ports	10 & 100 ms, interruption 10 ms, 30% reduction 10 ms, 60% reduction +20% above & −20% below rated voltage
Radiated emission	EN 55022	Enclosure	Class B
	FCC part 15		Class B
Conducted emission	EN 55022	AC power ports	Class B
	FCC part 15	AC power ports	Class B
	EN 55022	DC power ports	Class B
Dielectric strength	EN 60950	Signal port to other isolated ports	2 kVrms 50 Hz 1 min
		Power port to other isolated ports	3 kVrms 50 Hz 1 min 2 kVrms 50 Hz 1 min (@ rated power <60 V)
Environmental			
Temperature		Operating	−25 to +50°C
		Storage & Transport	−30 to +85°C
Humidity		Operating	5 to 95% relative humidity
		Storage & Transport	5 to 95% relative humidity
Altitude		Operating	2 000 m / 70 kPa
Service life		Operating	10 year
Vibration	IEC 60068-2-6	Operating	7.5 mm, 5 – 8 Hz 2 g, 8 – 500 Hz
Shock	IEC 60068-2-27	Operating	15 g, 11 ms
Packaging			
Enclosure	UL 94	PC / ABS	Flammability class V-1
Dimension W x H x D			35 x 121 x 119 mm
Weight			0.2 kg
Degree of protection	IEC 529	Enclosure	IP 21
Cooling			Convection
Mounting			Horizontal on 35 mm DIN-rail

Description

The GDW-11 provides a reliable data communication link over GSM/GPRS networks. The unit has been designed for use in industrial data communication applications and has several features that are not normally present on standard GSM modems. The GDW-11 is a DIN-rail mounted modem with RS-232 interface in a 9-pin D-sub.and an alternative RS-422/485 interface in5 pos screw terminal block. The generic IO can be configured for a number of operating modes such as SMS sending, transparent transfer of digital IO between two modems, dialling predefined numbers.

Features:

- Dual band GSM 900/1800 MHz
- GPRS class 10
- Integrated TCP/IP stack
- All configurations are done by industry standard AT-commands
- Serial interface RS-232 in D-sub
- DTR-dialing
- DTR-SMS
- Isolated 12 – 48 VDC power supply
- Din-rail mountable
- LED indicators
- Windows configuration tool.

The GDW-11 can be used in data communication applications together with other GSM modems, traditional analogue PSTN modems or ISDN adapters. Packet switched data can be transferred via the GPRS service.

Functional description

```
┌──────┐   ┌──────┐        ┌──────┐        ┌──────┐   ┌──────┐
│ LED's│◄─►│ LED  │◄─►│     │◄─►│  RF  │◄─►│ SMA  │
│      │   │driver│        │     │   │Interface│ │connector│
└──────┘   └──────┘        │     │        └──────┘   └──────┘
                          │ GSM │
┌──────┐   ┌──────┐        │Engine│       ┌──────┐   ┌──────┐
│5-pos │   │RS-232│◄─►│     │◄─►│ SIM  │◄─►│SIM card│
│screw │   │Drivers│       │     │   │connector│ │connector│
│terminal│  │ and │        │     │   │transient│ └──────┘
└──────┘   │protection│     │     │   │protection│
┌──────┐   │      │        │     │   └──────┘
│9-pos │◄─►│      │        │     │◄───────────► ┌──────┐
│D-sub │   │      │        │     │              │ DIP  │
└──────┘   └──────┘        └──────┘              │switches│
                                                └──────┘
┌──────┐   ┌────────────────────────────────┐
│2-pos │◄─►│     Isolated power supply        │
│screw │   │                                │
│terminal│  └────────────────────────────────┘
└──────┘
```

Remote configuration

The GDW-11 can be configured from a remote modem. To configure a GDW-11 any GSM , ISDN or PSTN modem can be used.

The modem used to configure is referred as "local modem".

Please make sure that the remote GDW-11 powered up and have registered on the network .

- Connect the local modem to it's media (ISDN, PSTN or GSM)
- Connect the PC's com-port to the DTE interface of the local modem.
- Connect the power supply.
- Start a terminal emulation program (i.e. Windows Hyper-Terminal).
- Configure the local modem protocol:
    1. If local modem is a GDW-11 a normal GSM data connection should be used.
    2. If local connection is ISDN, configure with the B channel protocol V110 9600 bit/s.
    3. If local connection uses some analogue modem, the modem has to be configured for V32 modulation line speed 9600 bit/s.
- Set up a connection to the remote IDW-90 to be configured by using the normal dial command: ATD<No><CR>. When connected send the remote escape sequence <++++>. The called remote GDW-11 shall acknowledges by requesting the remote password. Please enter the correct password (default: no password, just return). Now you can configure the remote GDW-11/12 using AT-commands. Password for remote configuration is defined with AT*WRAP – Remote access password.
- Configure the parameter on the remote GDW-11/12 from your terminal program and save the settings with AT&W.
- Hang up the connection using the ATH command.

Interface specifications

Power interface	
Rated voltage	12 to 48 VDC
Operating voltage	10 to 60 VDC
Rated current	350 mA @ 12 VDC
	150 mA @ 24 VDC
	75 mA @ 48 VDC
Rated frequency	DC
Inrush current I²t	0.05A²s
Startup current*	0.75A peak
Polarity	Reverse polarity protected
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm² (AWG 24-12)
Isolation to	All other interfaces

* External supply current capability for proper startup

RS-232 interface	
Electrical specification	RS-232 V.24
Data rate	300 bit/s – 115.2 kbit/s
Data format	7 or 8 data bits, Odd, even or no parity, 1 or 2 stop bits
Connection	9-pin D-sub female DCE, 5 pos screw terminal
Transmission range	15 m
Isolation to	Power interface

Antenna interface	
Frequency bands	GSM900 TX 880 – 915 and RX 925 – 960 MHz
	GSM1800 TX 1710 – 1785 and RX 1805 – 1880 MHz
Data rate	CSD: up to 14.4 kbit/s, GPRS: up to 85.6 kbit/s
Connection	SMA female, Impedance: 50 ohm
Isolation to	Power interface

SIM interface	
Electrical specification	3 volts SIM supported
Isolation to	Power interface

Installation

Mounting / Removal

Before mounting or removing the unit:

⚠️ **Warning! Do not open connected unit**

Hazardous voltages may occur within this unit when connected to a power supply.

Warning!

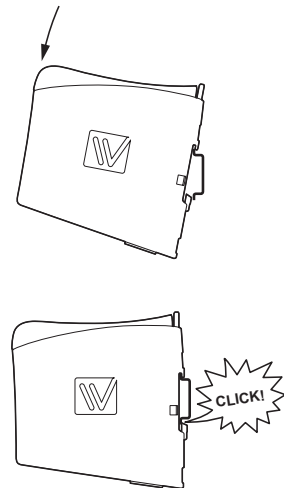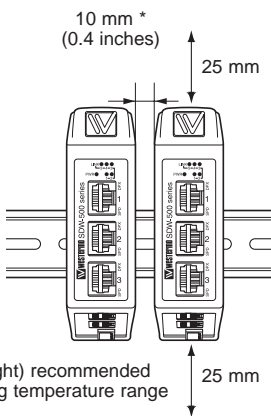Prevent access to hazardous voltages by disconnecting the unit from its power supply.

Warning!

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

Mounting

This unit should be mounted on 35 mm DIN-rail, which is horizontally mounted inside an apparatus cabinet, or similar.

Snap on mounting, see figure.

10 mm *
(0.4 inches)

25 mm

* Spacing (left/right) recommended
 for full operating temperature range

25 mm

This unit uses convection cooling. To avoid obstructing the airflow around the unit, use the following spacing rules. Minimum spacing 25 mm (1.0 inch) above / below and 10 mm (0.4 inches) left /right the unit. Spacing is recommended for the use of unit in full operating temperature range and service life.
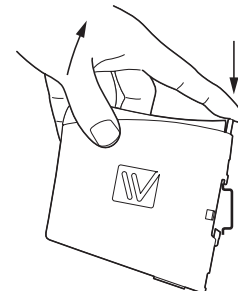
Removal

Press down the black support at the top of the unit. See figure.

Connections

SIM interface under lid

Antenna interface

LED Indicators
(for details
see next page)
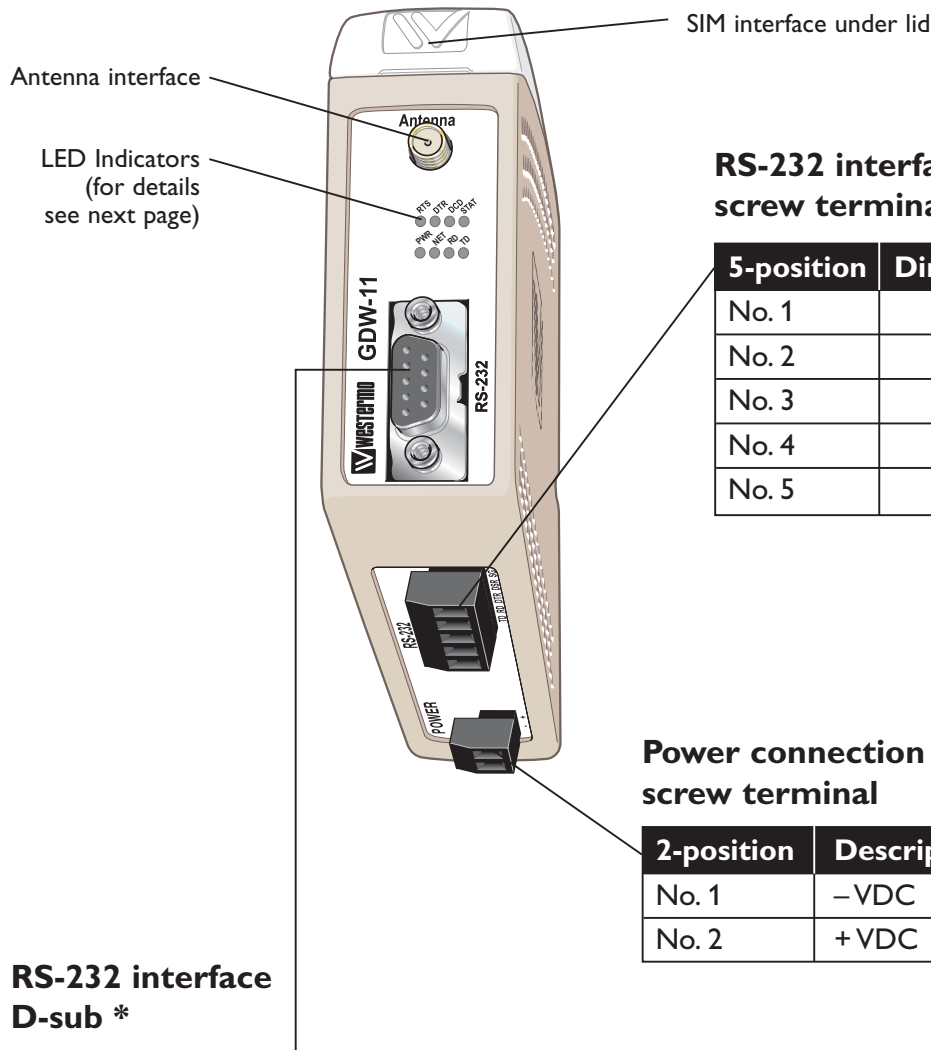
**RS-232 interface
screw terminal ***

5-position	Direction	Description
No. 1	In	TD
No. 2	Out	RD
No. 3	In	DTR
No. 4	Out	DSR
No. 5	–	SG

**Power connection
screw terminal**

2-position	Description
No. 1	– VDC
No. 2	+ VDC

**RS-232 interface
D-sub ***

9-position	Direction	Description
No. 1	Out	Data Carrier Detect (DCD)
No. 2	Out	Receive Data (RD)
No. 3	In	Transmit Data (TD)
No. 4	In	Data Terminal Ready (DTR)
No. 5	–	Signal ground (SG)
No. 6	Out	Data Set Ready (DSR)
No. 7	In	Request To Send (RTS)
No. 8	Out	Clear To Send (CTS)
No. 9	Out	Ring Indicator (RI)

## NOTE

* **Railway installation close to the rails.**
  For a cable located inside 3 m boundary and connected to this port, the use of shielded cable is recommended, this is to minimise the risk of interference. The cable shield should be properly connected (360°) to an earthing point within 1 m from this port. This earthing point should have a low impedance connection to the conductive enclosure of the apparatus cabinet, or similar, where the unit is built-in. This conductive enclosure should be connected to the earthing system of an installation and may be directly connected to the protective earth.

LED Indicators

LED	Status	Description
PWR	ON	In service
	OFF	Out of service
NET	ON	Modem switched ON, Not registered on network
	OFF	Modem switched OFF
	Slow Flash	Modem switched ON, registered on the network
	Quick Flash	Modem switched ON, registered on the network, communication in progress
TD	ON	Data received on the RS-232 or RS-485 port
	OFF	No data received on the RS-232 or RS-485 port
RD	ON	Data transmitted on the RS-232 or RS-485 port
	OFF	No data transmitted on the RS-232 or RS-485 port
RTS	ON	RTS signal active on the RS-232 port
	OFF	RTS signal inactive on the RS-232 port
DTR	ON	DTR signal active on the RS-232 port
	OFF	DTR signal inactive on the RS-232 port
DCD	ON	DCD signal active on the RS-232 port
	OFF	DCD signal inactive on the RS-232 port
Status	OFF	RSSI (Received Signal Strength Indicator)* $0 \le RSSI \le 9$ (–113 dBm to –95 dBm)
	Flash 25% ON	$10 \le RSSI \le 14$ (–93 dBm to –85 dBm)
	Flash 50% ON	$15 \le RSSI \le 19$ (–83 dBm to –75 dBm)
	Flash 75% ON	$20 \le RSSI \le 24$ (–73 dBm to –65 dBm)
	ON	$25 \le RSSI \le 31$ (–63 dBm to –51 dBm)
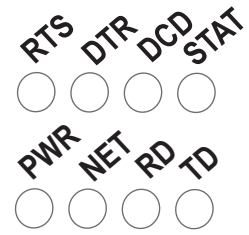
* Function needs to be activated with S1:2

DIP-switch settings

DIP-switches under the lid on top of the unit
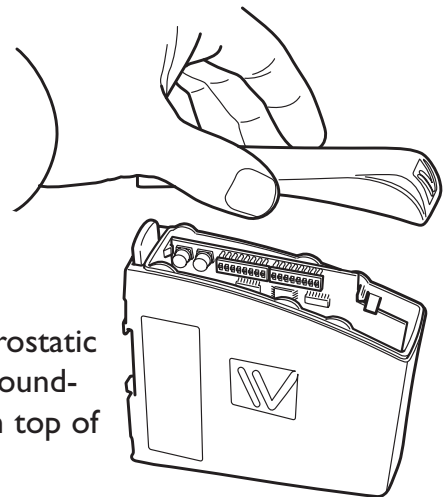
Before DIP-switch settings:

⚠️ **Warning! Do not open connected unit**

Hazardous voltages may occur within this unit when connected to a power supply.

Warning!

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap), before the lid on top of the unit is removed.

NOTE DIP-switch alterations are only effective after a power on or after a software reset command (ATZ).
A setting configured by any other method during normal operation, overrides the DIP-switch setting. However, at power up, the DIP-switch settings have precedence over the setting configured by any other method.

S1
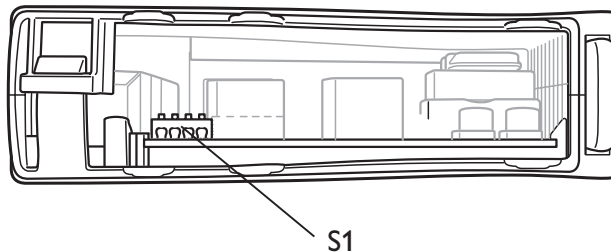
Status LED indication		Factory default setting	
S1 ON 1 2 3 4	Status LED not used LED is OFF	S1 ON 1 2 3 4	Used stored setting
S1 ON 1 2 3 4	Status LED indicates signal strength, see description of LED indicators (page 14)		

Windows configuration tool "GDW-Tool"

The GDW-Tool is a PC – application program with a graphical interface for easy configuration of the complex functions found in the GDW-11.
Please refer to external document "GDW-Tool" for a complete description of the functionality of the Windows program.

Start up guide

Follow the steps below to get the unit up and running in a simple application

Default settings of the serial interface are:

- AT+IPR=115200   115200 bit/s
- AT+ICF=3,4   8 databits, no parity and 1 stop bit.
- AT+IFC=2,2   RTS/CTS flow control enabled
- AT&D2   DTR is set to call control.

Start up steps:

- Insert a valid SIM-card with the appropriate services enabled (e.g CSD data services. GPRS etc)
- Make sure the antenna is connected and placed in the best possible position.
- Power ON the unit and make sure that the PIN code control of the SIM-card is disabled. This can be done either with the help of a mobile phone or with the command AT+CLCK. If the PIN code should be enabled in the application, make sure that the correct PIN code is sent to the modem with the command AT+CPIN
- Check on the front of the unit that the NET LED is flashing, this means that the unit has a connection to the GSM network and that it has registered on the network.
- Check the received signal quality with the command AT+CSQ. The result value of the first parameter should be between 10 and 31, the value of the second parameter should always be 0.

Configuration

The GDW-11 can be configured both from the local DTE interface and remotely over the GSM network. Independently if the local or remote interface is used the configuration can be made with AT-commands on the serial interface,or with a PC-based application configuration tool. Basic configurations can also be made or with DIP switches locally.

AT-Commands

The most commonly used commands are listed below.
Please refer to the document "GDW-11 AT-Command Guide" for a complete list of all the available AT-commands and a detailed description of the serial AT-command interface.

+CLCK – Facility lock (PIN code control)

This command is used to control (lock or unlock) or show status of an ME or a network facility.
A common ME function related to this command is to enable or disable the PIN code on the SIM.
Refer to the complete AT-Command guide for more information.

Syntax:
AT+CLCK = <fac>, <mode>, <password>

Parameters:

<fac>
"SC"   PIN code control.
             More values for <fac> exists, see +CPWD.

<mode>
0   Disable the facility.
1   Enable the facility.
2   Query status.

Example:
AT+CLCK = "SC", 0, 1234   ;disables the PIN code.

+CPIN – Enter PIN code

This command is used to enter passwords required by the unit. The most common password used in a ME is the PIN code. Please refer to the complete AT-command manual for more information.

Syntax:
AT+CPIN = <pincode>

Parameters:
<pincode>
4 to 8 digits.

Example:
AT+CPIN = 1234   *;enter the PIN code.*

+CPWD – Change password

Description:

This command is used by the application to change a password (PIN, call barring, NCK, etc.). The facility values <fac>) are the same as for the +CLCK command with a "P2" facility to manage SIM PIN2. For the network lock ("PN"), unlocking is forbidden after 10 failed attempts to disable (unlock) the network lock with an incorrect password.

Syntax:

AT+CPWD= <fac>, <oldpwd>, <newpwd>

Parameters:

<fac>

"PS"	SIM lock facility with a 8 digits password.
"SC"	PIN enabled (<mode> = 1) / disabled (<mode> = 0).
"AO"	BAOC (Barr All Outgoing Calls).
"OI"	BOIC (Barr Outgoing International Calls).
"OX"	BOIC-exHC (Barr Outgoing. International Calls except to Home Country).
"AI"	BAIC (Barr All Incoming Calls).
"IR"	BIC-Roam (Barr Incoming When Roaming outside Home Country).
"AB"	All Barring services.
"AG"	All outGoing barring services.
"AC"	All inComing barring services.
"PN"	Network lock with a 8 digits password (NCK).
"PU"	Network Subset lock with a 8 digits password (NSCK).
"PP"	Service Provider lock with a 8 digits password (SPCK).
"PC"	Corporate lock with a 8 digits password (CCK).
"P2"	SIM PIN2.

<oldpwd>, <newpwd>

4 or up to 8 or 16 digits according to the facility.

Command example	Possible responses	Note
AT+CPWD=?	+CPWD: ("PS",8),("SC",8), ("AO",4),("OI",4),("OX",4), ("AI",4),("IR,4),("AB",4), ("AG",4),("AC",4),("P2",8), ("FD",8),("PN",8),("PU",8), ("PP",8), ("PC",8) OK	Possible values, CHV1/CHV2 must be on 8 digits maximum (4mn), For call barring, on 4 digits maximum
AT+CPWD="SC",1234,5555	OK	Change PIN, PIN was correct
AT+CPWD="SC",1234,5555	+CME ERROR: 16	Change PIN, PIN was wrong
AT+CPIN=5555	OK	Enter PIN, PIN was correct
AT+CPWD="PN",12345678, 00000000	OK	Change NCK, NCK changed for net lock

+CSQ – Received signal strength

This command is used to check the Received Signal Strength Indication (RSSI) and the Bit Error Rate (BER). The command can be used with or without a SIM card inserted.

Syntax:

AT+CSQ.

Response syntax:

+CSQ: <RSSI>, <BER>

Parameters:

<RSSI>

0	–113 dBm or less.
1	–111 dBm.
2 to 30	–109 to –53 dBm.
31	–51 dBm or greater.
99	Not known.

<BER>

0	BER < 0.2%
1	0.2% < BER < 0.4%
2	0.4% < BER < 0.8%
3	0.8% < BER < 1.6%
4	1.6% < BER < 3.2%
5	3.2% < BER < 6.4%
6	6.4% < BER < 12.8%
7	BER > 12.8%
99	Not known.

Example:

AT+CSQ   *;Checks the received signal level and quality of the wireless link.*

&D – DTR control

This command controls the Data Terrminal Ready (DTR) signal in the RS-232 interface.

Syntax:

AT&Dn

<n>

0	The DTR signal is ignored.
1	Modem switches from data to command mode when DTR swtches from ON to OFF.
2	An active call is released when DTR switches from ON to OFF.

Example:

AT&D0   *;The unit will ignore the state of DTR signal.*

E – Character echo

This command is used to control whether the unit echoes characters received on the local serial interface, or not. The unit only echoes characters when in command mode and if echo is on.

Syntax:

ATEn

Parameters:

<n>

0	Echo off.
1	Echo on.

Example:

ATE0   *;Disables echo of characters in command mode.*

+ICF – Serial character format

Configures the local serial port character format.

Syntax:

AT+ICF = <format>, <parity>

Parameters:

<format>

	Data bits	Parity bit	Stop bit(s)
0	–	–	–
1	8	0	2
2	8	1	1
3	8	0	1
4	7	0	1
5	7	1	1
6	7	0	1

<parity>

0	Odd.
1	Even.
2	Mark.
3	Space.
4	None.

Example:

AT+ICF= 3,4   *;sets 8 databits, no parity and 1 stop bit.*

+IFC – Serial flow control

Configures the local serial port flow control.

Syntax:

AT+IFC = <DCE to DTE>, <DTE to DCE>

Example:

AT+IFC= 2,2   ;sets RTS CTS flow control in both directions.

Parameters:

<DCE to DTE>

0	None.
2	RTS.

<DTE to DCE>

0	None.
2	CTS.

+IPR – Fixed serial speed

This command specifies the data rate on the local serial port.

Syntax:

AT+IPR = <serial baudrate>

Example:

AT+IPR=9600

Q – Result code suppression

Description:

This command determines whether the mobile equipment sends result codes or not.

Syntax:

ATQ<n>

Parameters:

<n>

0:	DCE transmits result codes.
1:	Result codes are suppressed and not transmitted.

Command example	Possible responses	Note
ATQ0	OK	DCE transmits result codes
ATQ1		Result codes are suppressed and not transmitted

S-registers

S0 – Automatic answer

Description:

This S0 parameter determines and controls the product automatic answering mode.

Syntax:

ATS0=<value>

Command example	Possible responses	Note
ATS0=2	OK	Automatic answer after 2 rings
ATS0?	002 OK	Current value is presented with 3 characters padded with zeros
ATS0=0	OK	No automatic answer

All others S-parameters (S6,S7,S8 ...) are not implemented.

V – DCE response format

Description:

This command determines whether the DCE response format uses or not the header characters <CR><LF>, and the result codes are provided as numeric or verbose.

Syntax:

ATV<n>

Parameters:

<n>

0	(Information responses):	<text><CR><LF>
0	(Result codes):	<numeric code><CR>
1	(Information responses):	<CR><LF><text><CR><LF>
1	(Result codes):	<CR><LF><verbose code><CR><LF>

Command example	Possible responses	Note
ATV0	0	DCE transmits limited headers and trailers and numeric result codes
ATV1	OK	DCE transmits full headers and trailers and verbose response text

*WPIN – Auto PIN Code

Description:

This command configures the modem to automatically control the SIM PIN code. The command can be used when it's impossible to disable SIM PIN code check in the SIM card or when the PIN check needs to be enabled for any other reason. Since the PIN code is stored in flash memory, the modem will send the PIN code to the SIM automatically when it is requested.

Syntax:

AT*WPIN=<mode>, <PIN_code>

Parameters:

<mode>

0:	Disable automatic PIN code control.
1:	Enable automatic PIN code control.

<PIN_code>

The SIM PIN code. A string of 4 numerical digits.

Command example	Possible responses	Note
AT*WPIN=1,"1234"	OK	Enable the autopin mode with the PIN code: 1234
AT*WPIN?	*WPIN: 1,"1234"	Current value
AT*WPIN =?	*WPIN: (mode, "PIN code")	Test command

See also the +CPIN and +CLCK command for more information.

+WRST – Reset command

Description:

This command resets the modem after the time specified by the **<delay>** parameter.

Syntax.

AT+WRST =<Mode>,<Delay>

Response syntax:

+WRST: <Mode>,<Delay>,<RemainTime>

Parameters:

<val1>

0:	timer reset is disabled
1:	timer reset is enabled

<Delay>

sets the time before reset

Range **"000:01"– "168:59"** (format hhh:mm)

<RemainTime>

time before next reset

Range **"000:01"–"168:59"** (format hhh:mm)

Command example	Possible responses	Note
AT+WRST=?	OK	
AT+WRST=0	OK	Disable timer
AT+WRST=1,"001:03" at 1 hour 3 minutes	OK	Enable timer and set delay
AT+WRST?	+WRST: 1,"001:03","001:01" OK	Timer activated to reset after 1 hour and 3 minutes. At this point, 1 hour and 1 minute remain before next reset.

⠿ GDW-11 connected to GDW-11 with DTR signal call

Configure the units

AT+CPIN=xxxx	If PIN code required
AT&F	Set the unit to factory default
AT&W	Store default settings

Set up the connection – The dialling modem

AT+CPBS="SM"	Select phonebook as memory storage (this is default)
AT+CPBW=1,"nnn"	Store the number of the remote modem in the dialling GDW-11
AT&S0	Set DSR signal always high (if this signal is used to trig the DTR)
AT%D1 (ON).	Activates automatic DTR dialling if DTR switches from low (OFF) to high
Switch DTR from OFF to ON	The modem will now dial the phone number stored in the first location of the AND phonebook.

Set up the connection – The answering modem

ATA	Enter the answer command when RING comes from the network or set up ATS0=1 to auto answer on 1 RING signal (or more than 1).

NOTE: If no valid DTR signal can be provided by external application, the modems DSR signal can be used to trig the transmission. Connect the DSR signal via a relay, or other potential free contact, to the DTR signal. A 10 kohm pull down resistor should also be connected between the DTR and a signal that is always low e.g. the DCD can be used if the modem is used only for SMS sending:
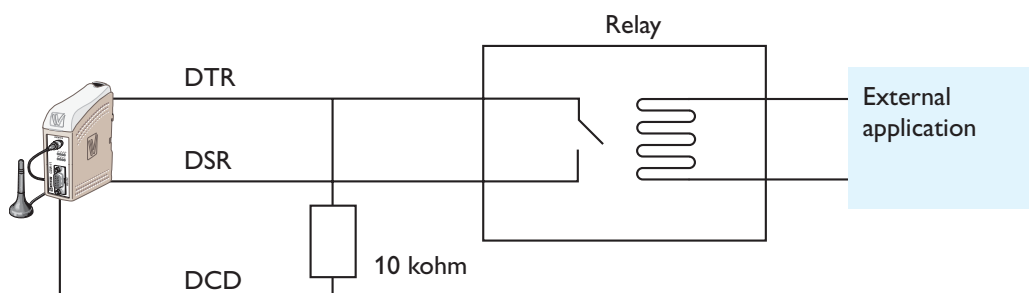
⠿ GDW-11 connected via CSD-V32 to analogue modem
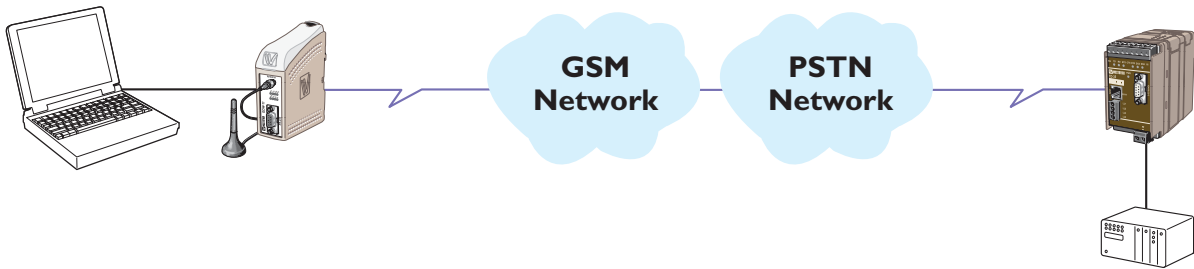
Configure the GDW-11

AT+CPIN=xxxx	If PIN code required
AT&F	Set the unit to factory default
AT+CBST=7,0,1	Set the bearer to V.32 protocol at 9600 bit/s
AT&W	Store default settings

Configure the TD-35

AT&F	Set the unit to factory default
AT&W	Store default settings
SW2: 2,3,5,6 ON	Set dip switch 2 to configure the serial speed and format to 9600 bit/s 8 databits, None parity, 1 stopbit
SW4: 4 ON	Set dip switch 4 to configure the analogue line protocol

Set up the connection – The dialling modem (GDW-11)

|	
ATDxxxx	Enter the dial command to dial the number to the remote modem

Set up the connection – The answering modem (TD-35)

ATA	Enter the answer command when RING comes from the network or set up ATS0=1 to answer on 1 RING signal (or more than 1).

⁙ GDW-11 connected via CSD-V.110 to ISDN adapter
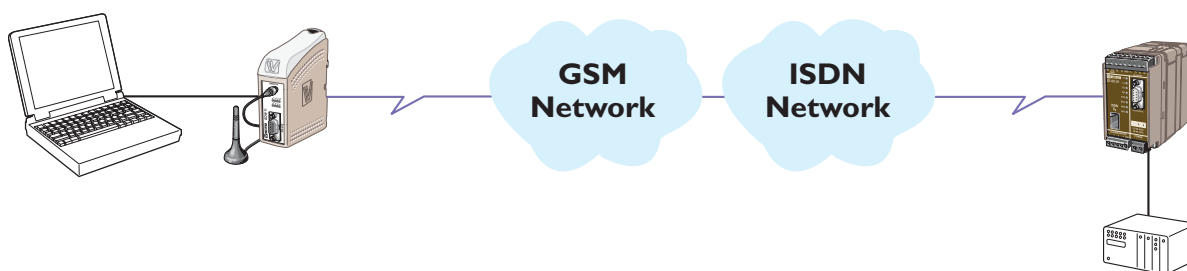
Configure the GDW-11

AT+CPIN=xxxx	If PIN code required
AT&F	Set the unit to factory default
AT+CBST=71,0,1	Set the bearer to V.110 protocol at 9600 bit/s
AT&W	Store default settings

Configure the ID-90

AT&F	Set the unit to factory default
AT**PROT=0	Set the B-channel protocol to V.110
AT**BRN=4	Set line baudrate for V.110 to 9600 bit/s
AT**V110LLC=1	Set low layer compatibility to send detailed information about V.110 protocol to the called party.
AT%B4	Set local serial baudrate to 9600 bit/s
AT&W	Store default settings

Set up the connection – The dialling modem (GDW-11)

ATDxxxx	Enter the dial command to dial the number to the remote modem

Set up the connection – The answering modem (ID-90)

ATA	Enter the answer command when RING comes from the network or set up ATS0=1 to answer on 1 RING signal (or more than 1).

Note: When using an ISDN adapter it's sometimes necessary to set up the MSN (multiple subscriber number) in the ISDN unit. The command AT**MSN=nn is used to set the msn.
Please refer to the installation manual of the ID-90 for more information.

## ⸬ GDW-11 sending text message with SMS by activating DTR signal
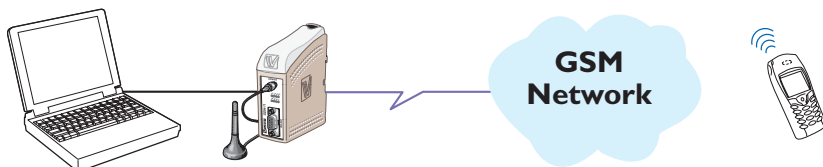
Configure the GDW-11

AT+CPIN=xxxx	If PIN code required
AT&F	Set the unit to factory default
AT&W	Store default settings

Send message – The sending modem

AT+CMGW="0762342489"<CR> Alarm text message <ctrl+Z>	Store the destination phone number and the text message in the SIM card
+CMGW: 1	Its important that location 1 is used (the modem should respond with +CMGW: 1). If index is more than 1, delete previously stored message in location 1 with AT+CMGD=1,0 and then try again.
AT&S0	Set DSR signal always high (if this signal is used to trig the DTR)
AT%D2	Activates automatic DTR SMS transmission if DTR switches from OFF to ON.
AT&W	If settings are needed after power reset its important to save the configuration with this command.
Switch DTR from OFF to ON	Sends the short message in the first location of the SIM memory.

NOTE: If no valid DTR signal can be provided by external application, the modems DSR signal can be used to trig the transmission. Connect the DSR signal via a relay, or other potential free contact, to the DTR signal. A 10 kohm pull down resistor should also be connected between the DTR and a signal that is always low e.g. the DCD can be used if the modem is used only for SMS sending:
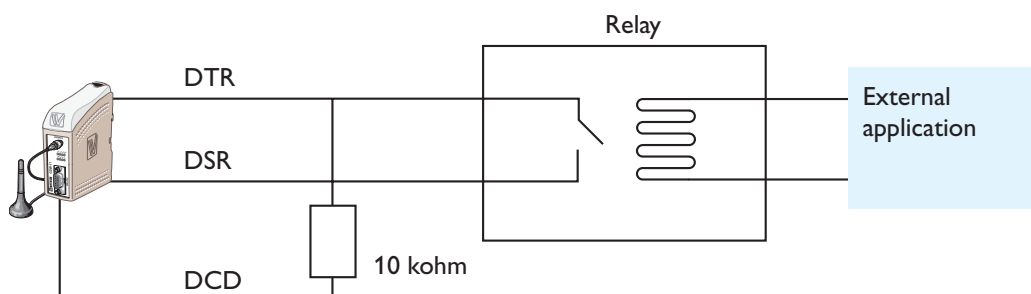
⠿ GDW-11 communicates via GPRS and a PC to public server on Internet

Configure the GDW-11 with a terminal

AT+CPIN=xxxx	If PIN code required
AT&F	Set the unit to factory default
AT+CGATT=1	Make an attach (register) to the GPRS network
AT+CGDCONT=1,"IP","xxx"	Define the PDP context with APN="xxx"
AT&W	Store settings

Connect the GDW-11 to the PC and configure a standard "remote dial-up" connection in the Windows environment. If the network operator requires username and password, these must also be correctly filled in.

Set up the connection – The dialling modem (GDW-11)

Select "dial"	Select "dial on the PC" connected to the GDW-11.
Wait	Wait until the link is fully connected and verified.

GDW-11 communicates via GPRS to another GDW-11 with TCP socket connection. This example uses SIM cards with fixed IP addresses.

Configure the GDW-11 with a terminal (both units)

AT+CPIN=xxxx	If PIN code required
AT&F	Set the unit to factory default
AT+CGATT=1	Make an attach (register) to the GPRS network
AT&W	Store settings

Connect to the ISP using GPRS (both units)

AT*WGPRSAPN ="APN_Server"	Set the APN server address
AT*WGPRSUN ="username"	Set the APN username
AT*WGPRSPW ="password"	Set the APN password

Set up the TCP server

AT*WTCPSERV ="255.255.255.255"	No filter of the incoming TCP client IP address
AT*WTCPPORT =9000	Set up the TCP port (it must be the same in both units)
AT*WTCPMODE=1	Set this modem to server

Set up the TCP client

AT*WTCPSERV ="123.456.789.123"	Set up the servers IP address
AT*WTCPPORT =9000	Set up the TCP port (it must be the same in both units)
AT*WTCPMODE=0	Set this modem to client

Activate the auto connect mode (both units)

AT*WTCPCONNECT=1	Activate the GPRS context
AT*WSAVE	Store TCP settings

At the TCP server

Power off / on	Auto connect at power on
Ok	Response from the modem
Data	Data flow is bidirectional (only after the client has connected)

At the TCP client

Power off / on	Auto connect at power on
Ok	Response from the modem
Data	Data flow is bidirectional (only after the client is connected)

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Subsidiaries