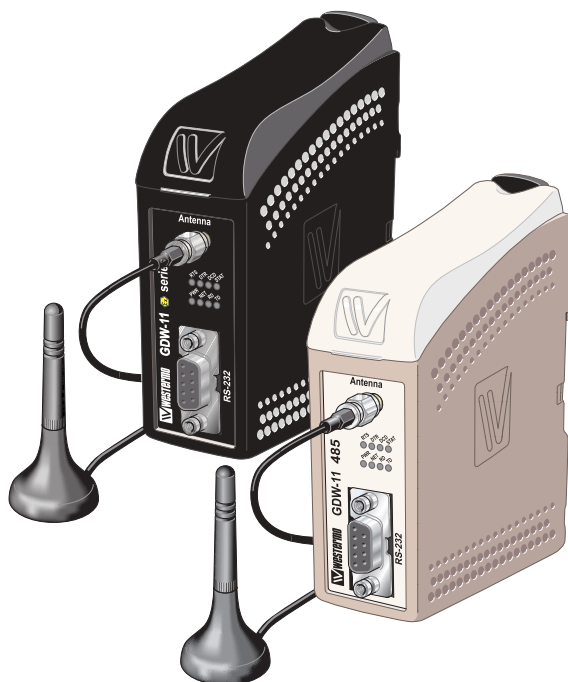




GDW-11



**GDW-11 GSM/GPRS
Modem**

**GDW-11 485 GSM/GPRS
Modem with RS-485**

Legal information

The contents of this document are provided "as is". Except as required by applicable law, no warranties of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, are made in relation to the accuracy and reliability or contents of this document. Westermo reserves the right to revise this document or withdraw it at any time without prior notice.

Under no circumstances shall Westermo be responsible for any loss of data or income or any special, incidental, and consequential or indirect damages howsoever caused.

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.

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 unit's 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 Article 3.2	EN 301 489-1, EN 301 489-7 EN 301 489-1, EN 301 419-1 EN 301 511
ATEX*	EN 60079-0, Explosive atmospheres – General requirements EN 60079-15, Explosive atmospheres – Construction, test and marking of type of protection "n" electrical apparatus

* Applicable for GDW-11 EX / GDW-11 485 EX only

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.



ATEX Information (Applicable for GDW-11 EX / GDW-11 485 EX only)

General

This unit is intended for use in Zone 2 hazardous location only.

Marking

 II 3 G

Ex nA IIC T4 Gc

SPECIAL CONDITION

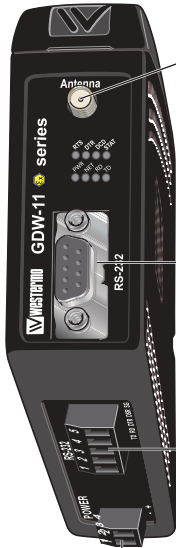
WARNING – DO NOT SEPARATE WHEN ENERGIZED

	Indicate that this unit complies with relevant European standards that are harmonised with the 94/9/EC Directive (ATEX).
II	Equipment group II. This unit can be installed in all places with an explosive gas atmosphere other than mines susceptible to firedamp
3	Equipment category 3. A category is the classification according to the required level of protection. This unit ensures the requisite level of protection during normal operation and is intended for use in areas in which explosive atmosphere caused by gases, vapours, mists, or dust mixtures are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only.
G	Indicates protection concerning explosive atmospheres caused by gases, vapours or mists (G).
Ex	Indicates that this unit is in conformity with relevant European Ex standard(s).
nA	Type of protection used. This unit is a non-sparking device "nA" which is constructed to minimize the risk of occurrence of arcs or sparks capable of creating an ignition hazard during conditions of normal operation.
IIC	Gas group, a typical gas is hydrogen.
T4	Temperature class T4 (T4 = 135°C). This unit is classified in accordance with its maximum surface temperature (external and internal).
Gc	Equipment protection level Gc (EPL Gc). Equipment for explosive gas atmospheres, having a "enhanced" level of protection, which is not a source of ignition in normal operation and which may have some additional protection to ensure that it remains inactive as an ignition source in the case of regular expected occurrences. EPL Gc are analogous to the ATEX Categories (Category 3 G = EPL Gc).
SPECIAL CONDITION	This unit has a special condition of use. The special condition for safe use contains safety related information that is necessary for the correct installation and safe use.

Ratings and safety control drawing, GDW-11 EX

Power	(12 – 48) VDC; 350 mA
Ambient temperature	-25°C ≤ Ta ≤ +50°C
Maximum surface temperature	Temperature class T4 (max 135°C)
Ingress protection (IP)	IP21
Installation spacing	Minimum 25 mm above / below and minimum 10 mm left / right

Antenna



Position	Direction / description	Input / Output values
1	In/out / RF signal	Max RF power: 2 watt Data rate:
Shield	Signal ground	CSD: up to 14.4 kbit/s GPRS: up to 85.6 kbit/s

RS-232 (DB9, female)

Position	Direction / description	Input / Output values
1	Out / Data Carrier Detect (DCD)	U _{max} = ± 12 Vpk I _{max} = ± 60 mA Data rate: 300 bit/s to 115.2 kbit/s
2	Out / Received Data (RD)	
3	In / Transmitted Data (TD)	
4	In / Data Terminal Ready (DTR)	
5	- / Signal Ground (SG)	
6	Out / Data Set Ready (DSR)	
7	In / Request To Send (RTS)	
8	Out / Clear To Send (CTS)	
9	Out / Ring Indicator (RI)	

RS-232 (5-pin screw terminal)

Position	Direction / description	Input / Output values
1	In / Transmit Data (TD)	U _{max} = ± 12 Vpk I _{max} = ± 60 mA Data rate: 300 bit/s to 115.2 kbit/s
2	Out / Received Data (RD)	
3	In / Data Terminal Ready (DTR)	
4	Out / Data Set Ready (DSR)	
5	- / Signal Ground (SG)	

Position	Description	Input values
1	In / -VDC	U _{in} = (10 – 60) VDC Max I _{in} = 0.4A @ 10 VDC
2	In / +VDC	Max P _{In} = Max 4 W

Galvanically isolated via power transformer and optocoupler.
Capacitively isolated via 4700 pF capacitor rated 300 Vrms.

Ratings and safety control drawing, GDW-11 485 EX

Power	(12 – 48) VDC; 350 mA
Ambient temperature	$-25^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$
Maximum surface temperature	Temperature class T4 (max 135°C)
Ingress protection (IP)	IP21
Installation spacing	Minimum 25 mm above / below and minimum 10 mm left / right

Antenna



Position	Direction / description	Input / Output values
1	In/out / RF signal	Max RF power: 2 watt Data rate:
Shield	Signal ground	CSD: up to 14.4 kbit/s GPRS: up to 85.6 kbit/s

RS-232 (DB9, female)

Position	Direction / description	Input / Output values
1	Out / Data Carrier Detect (DCD)	$U_{\max} = \pm 12 \text{ Vpk}$ $I_{\max} = \pm 60 \text{ mA}$ Data rate: 300 bit/s to 115.2 kbit/s
2	Out / Received Data (RD)	
3	In / Transmitted Data (TD)	
4	In / Data Terminal Ready (DTR)	
5	– / Signal Ground (SG)	
6	Out / Data Set Ready (DSR)	
7	In / Request To Send (RTS)	
8	Out / Clear To Send (CTS)	
9	Out / Ring Indicator (RI)	

RS-422/485 (4-pin screw terminal)

Position	Direction / description	Input / Output values
1	In / R+ (RS-422/485 4-wire)	$U_{\max} = \pm 12 \text{ Vpk}$ $I_{\max} = \pm 60 \text{ mA}$ Data rate: 1200 bit/s to 115.2 kbit/s
2	In / R– (RS-422/485 4-wire)	
3	Out / T+ (RS-422/485 4-wire)	
	In/Out / T+ (RS-485 2-wire)	
4	Out / T– (RS-422/485 4-wire)	
	In/Out / T+ (RS-485 2-wire)	

Position	Description	Input values
1	In / –VDC	$U_{in} = (10 - 60) \text{ VDC}$ $\text{Max } I_{in} = 0.4 \text{ A @ } 10 \text{ VDC}$ $\text{Max } P_{in} = \text{Max } 4 \text{ W}$
2	In / +VDC	

Galvanically isolated via power transformer and optocoupler.
Capacitively isolated via 4700 pF capacitor rated 300 Vrms.

GDW-11 EX / GDW-11 485 EX

Special condition for safe use

Ambient temperature:

This unit is designed for use in extreme ambient temperature conditions according to the following:
 $-25^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$

Installation in an apparatus cabinet:

This unit requires installation in an Ex certified apparatus cabinet suitable for the area of use and providing a degree of protection of at least IP54.

Resistance to impact:

This unit requires installation in an apparatus cabinet where adequate resistance to impact is provided by the apparatus cabinet. See "Installation in an apparatus cabinet" above for requirements on the external apparatus cabinet.

Resistance to light:

This unit requires installation in an apparatus cabinet where it is protected from light (for example daylight or light from luminaires). See "Installation in an apparatus cabinet" above for requirements on the external apparatus cabinet.

Secureness of plugs:

When this unit is installed in an explosive atmospheres, all connectors must be mechanically secured to prevent loosening.

Conductor temperature:

When this unit is installed in locations with high ambient temperature, special precautions shall be taken upon the choice of external conductors and the temperature rating of the conductor(s).

Directive 94/9/EC alongside with other directives:

Directive 2004/108/EC (EMC) applies, to assure a safe performance of this unit under the scope of Directive 94/9/EC, refer to the electromagnetic immunity level specified under "Type tests and environmental conditions" in this manual.

Standards and date of compliance

EN 60079-0 and EN 60079-15
2011-06-30

Declaration of Conformity



Westermo Teleindustri AB

Declaration of conformity

The manufacturer Westermo Teleindustri AB
SE-640 40 Stora Sundby, Sweden

Herewith declares that the product(s)

Type of product	Model	Art no
GSM modem	GDW-11, GDW-11 EX, GDW-11 485, GDW-11 485 EX	3615-0001, -5001, -0030, -5030

is in conformity with the following EC directive(s).

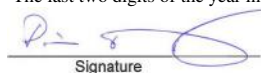
No	Short name
2004/108/EC	Electromagnetic Compatibility (EMC)
1995/5/EC	Radio and Telecommunications Terminal Equipment (R&TTE)
94/9/EC ¹	Equipment Explosive Atmospheres (ATEX)

References of standards applied for this EC declaration of conformity.

No	Title	Issue
EN 301 419-1	Digital cellular telecommunications system (Phase 2); Attachment requirements for global system for mobile communications (GSM); Part 1: Mobile stations in the GSM 900 and DCS 1800 bands;Access	V4.1.1 (04/2000)
EN 301 511	Global system for mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under Article 3(2) of the R&TTE Directive (1999/5/EC)	V9.0.2 (03/2003)
EN 301 489-7	Electromagnetic compatibility and radio spectrum matters (ERM); Electromagnetic compatibility (EMC) standard for radio equipment and services	V1.3.1 (11/2005)
EN 61000-6-2	Electromagnetic compatibility – Immunity industrial environments	2005
EN 61000-6-3	Electromagnetic compatibility – Emission residential environments	2007
EN 55024	Information technology equipment - Immunity	1998 + A1:2001 + A2:2003
EN 60950-1	Information technology equipment – Safety	2006 + A11:2009
EN 60079-0	Explosive atmospheres, Equipment – General requirements	2009
EN 60079-15	Electrical apparatus for explosive gas atmospheres – Construction, test and marking of type of protection “n” electrical apparatus	2005

The last two digits of the year in which the CE marking was affixed:

11



Signature

Pierre Öberg
Technical Manager
30 June 2011

¹ Applicable for GDW-11 EX and GDW-11 485 EX only.

Postadress/Postal address
S-640 40 Stora Sundby
Sweden

Tel.
016-428000
Int+46 16428000

Telefax
016-428001
Int+46 16428001

Postgiro
52 72 79-4

Bankgiro
5671-5550

Org.nr/
Corp. identity number
556361-2604

Registered office
Eskilstuna

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)
		Any port to any port and enclosure	0,5 kVrms 50 Hz 1 min (GDW-11 EX)
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, GDW-11	UL 94	PC / ABS	Flammability class V-1
Enclosure, EX-versions		Cabelec 6141	
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.

The GDW-11 485 also has an RS-422/485 interface in screw terminal block.

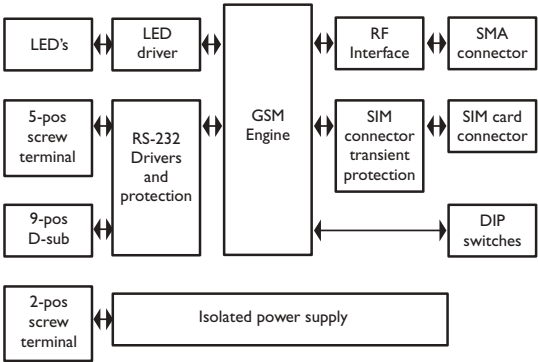
Features:

- ⌘ 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
- ⌘ Serial interface 2/4 wire half / full duplex RS-422/RS-485 interface (GDW-11 485 only)
- ⌘ DTR-dialing
- ⌘ DTR-SMS
- ⌘ Isolated 12 – 48 VDC power supply
- ⌘ Din-rail mountable
- ⌘ LED indicators
- ⌘ Windows configuration tool.

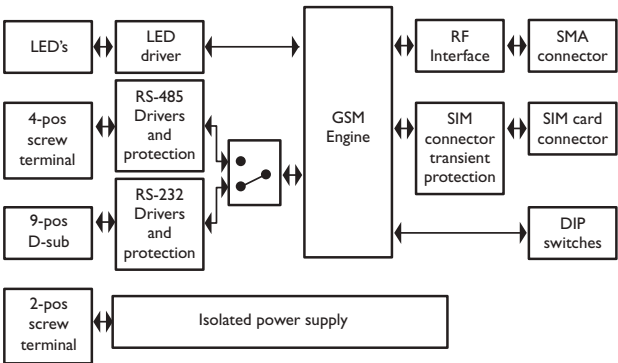
The GDW-11 can be used in data communication applications together with other GSM modems, traditional analogue PSTN modems or ISDN adapters. Packet switched data can be transferred via the GPRS service.

Functional description

GDW-11 / GDW-11 EX



GDW-11 485 / GDW-11 485 EX



Interface specifications

Power	
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 I^2t	0.05A ² s
Startup current*	0.75A peak
Polarity	Reverse polarity protected
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm ² (AWG 24-12)
Isolation to	All other ports 3 kV _{rms} 50 Hz 1 min
Shielded cable	Not required

*External supply current capability for proper startup

RS-232	
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
Protocol	Transparent
Retiming	Yes
Transmission range	15 m
Isolation to	Power port 3 kV _{rms} 50 Hz 1 min
Connection	9-pin D-sub female (DCE) and 5 pos Detachable screw terminal (DCE)
Connector size	Detachable screw terminal 0.2 – 2.5 mm ² (AWG 24 – 12)
Shielded cable	Not required*
Conductive housing	Isolated to all other circuits

* 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.

RS-422/485	
Electrical specification	EIA/TIA-485 ITUV.11 2-wire or 4-wire twisted pair
Data rate	1 200 bit/s – 115.2 kbit/s
Data format	7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits. 9-11 bit words
Protocol	Transparent
Retiming	Yes
Turn around time	<10 ms (half duplex)
Transmission range	≤ 1200 m, depending on data rate and cable type (EIA RS-485)
Settings	120 Ω termination and failsafe biasing 680 Ω
Protection	Installation Fault Tolerant (up to ±60 V)
Isolation to	Power port 3 kV _{rms} 50 Hz 1 min
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm ² (AWG 24 – 12)
Shielded cable	Not required*
Miscellaneous	Do not connect RS-232 and RS-422/485 simultaneously

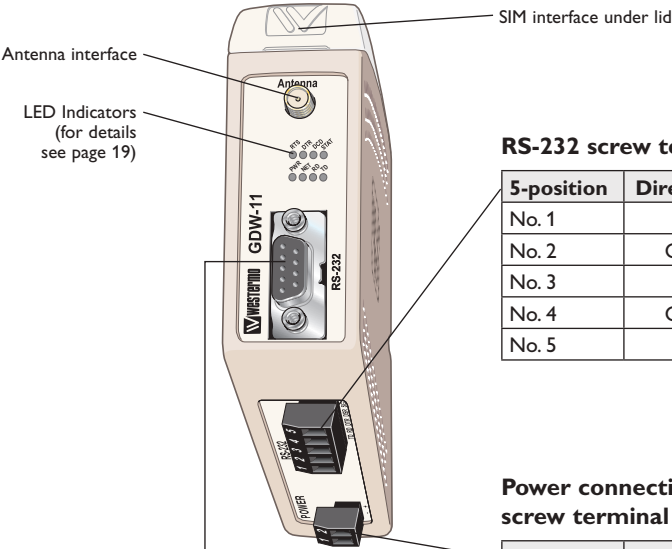
* Railway installation close to the rails.

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.

Antenna	
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 port 3 kV _{rms} 50 Hz 1 min

SIM	
Electrical specification	3 volts SIM supported
Isolation to	Power port 3 kV _{rms} 50 Hz 1 min

Connections GDW-11



RS-232 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

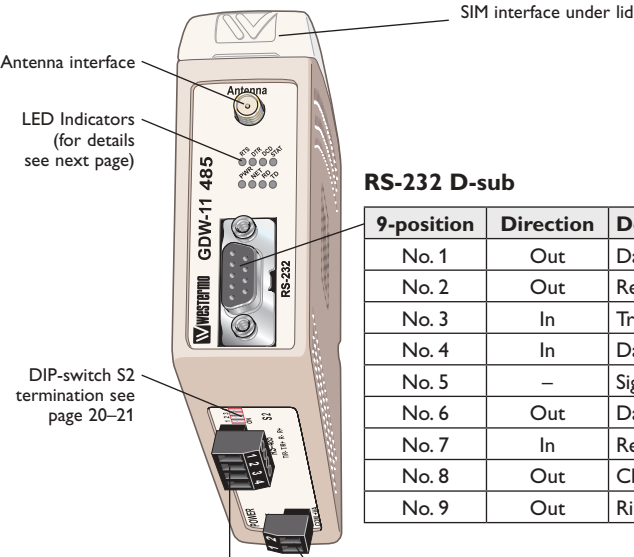
Power connection screw terminal

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

RS-232 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)

Connections GDW-11 485



RS-232 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)

Power connection screw terminal

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

RS-422/485

Position	Direction*	Description		Product marking
No. 1	In	R+ (A') Receive	RS-422/485 4-wire	R+
No. 2	In	R– (B') Receive	RS-422/485 4-wire	R–
No. 3	Out	T+ (A) Transmit	RS-422/485 4-wire	T/R+
	In/Out	T+ (A/A') Transmit/Receive	RS-485 2-wire	
No. 4	Out	T– (B) Transmit	RS-422/485 4-wire	T/R–
	In/Out	T+ (A/A') Transmit/Receive	RS-485 2-wire	

* Direction relative to this unit

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)* $0 \leq \text{RSSI} \leq 9$ (–113 dBm to –95 dBm)
	Flash 25% ON	$10 \leq \text{RSSI} \leq 14$ (–93 dBm to –85 dBm)
	Flash 50% ON	$15 \leq \text{RSSI} \leq 19$ (–83 dBm to –75 dBm)
	Flash 75% ON	$20 \leq \text{RSSI} \leq 24$ (–73 dBm to –65 dBm)
	ON	$25 \leq \text{RSSI} \leq 31$ (–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

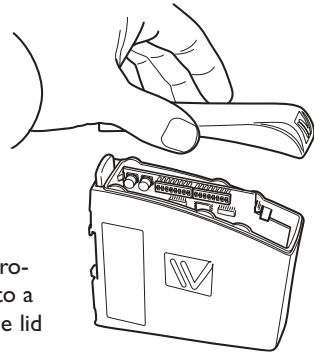
Hazardous voltages may occur within this unit when connected to a power supply.

Warning!

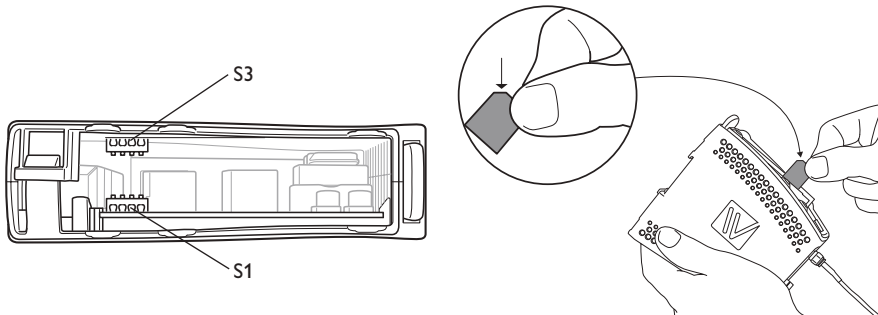
Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap), before the lid on top of the unit is removed.



To activate DIP-switches Advanced mode needs to be enabled.



NOTE DIP-switch alterations are only effective after a power on or after a software reset command (AT+CFUN=1). 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



Status LED not used
LED is OFF



Status LED indicates signal strength, see description of LED indicators (page 15)

S1 Power on parameter setting



Use saved parameter settings



Set factory default at next power on (AT&F)

S1 Selection of DTE interface, only in GDW-11 485 / GDW-11 485 EX



RS-232 interface



RS-422/485 interface
4-wire full duplex



RS-485 interface
2-wire half duplex

S2 DIP-switch

RS-422/485 termination, only in GDW-11 485 / GDW-11 485 EX



No termination



Termination of R in 4-wire connection



Termination of both T and R in 2-wire
connection



Termination of both T and R in 4-wire
connection

S3 Selection of data rate, only in GDW-11 485 / GDW-11 485 EX



1200 bit/s



19.2 kbit/s



2400 bit/s



38.4 kbit/s



4800 bit/s



57.6 kbit/s



9600 bit/s



115.2 kbit/s

Factory settings GDW-11 / GDW-11 EX

S1



Factory settings GDW-11 485 / GDW-11 485 EX

S1



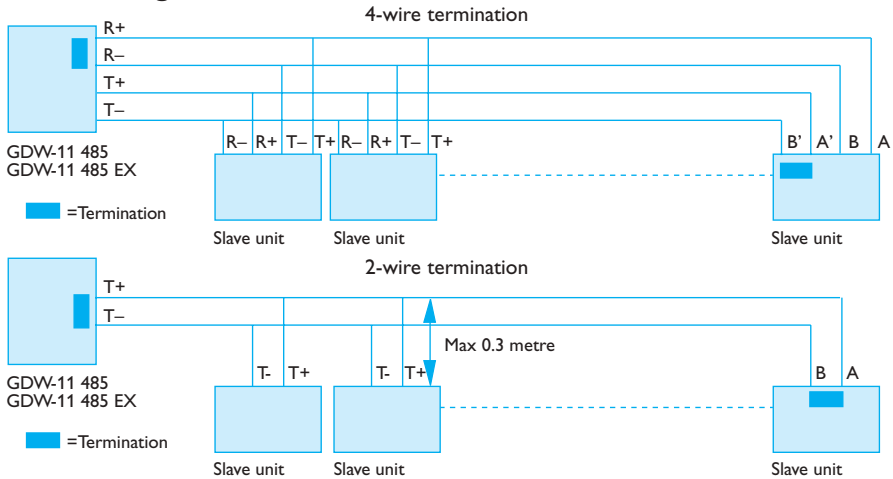
S2



S3



RS-422/485 general advice



Termination recommendations

The RS-422/485 line must be terminated. In the GDW-11 485 / GDW-11 485 EX, the termination is combined with fail-safe functionality. The termination is used to prevent undefined states when the bus is in tri-state condition.

- ⌘ Using 2-wire RS-485 both ends should be terminated.
- ⌘ Using 4-wire RS-485 both pairs shall be terminated at both ends.
- ⌘ Using 4-wire RS-422 it's only necessary to terminate the receivers.

RS-422/485 connection pins can be differently named. For some equipment brands the T+ corresponds to A, but other brands might use some other naming convention. If a unit does not work it can help to swap A and B.

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.

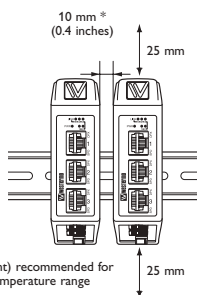
Warning!

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

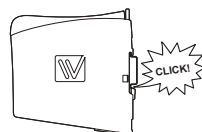
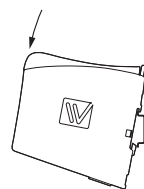
Mounting

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.



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



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.



SIM card

The SIM card is accessible under the lid on top of the unit. The SIM card is needed for full operation of the unit.



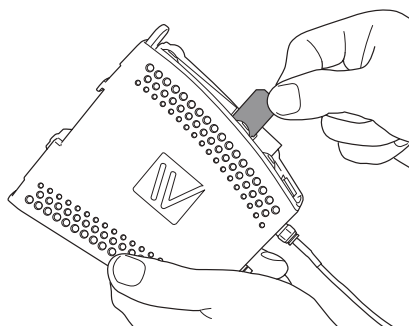
Warning!

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.



Warning! Do not open connected equipment.

Hazardous voltage may occur within this unit when connected to power supply. Prevent access to hazardous voltages by disconnecting the unit from power supply and all other electrical connections.



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 unit.

Antenna care and placement



Warning! Please ensure that power is disconnected from the unit before connecting the antenna.

Since the GDW-11 is installed in a fixed location, special care must be taken when planning the installation, especially when placing the antenna. The standard antenna shipped with the product is an efficient dual-band antenna designed for the GSM900 and the GSM1800 bands used in the European and most-Asian countries.

Depending on the installation location and surrounding materials, the signal strength reaching the GDW-11 may not be sufficient. The best way to find the optimal position of the antenna is to use the Westermo GD-Tool to measure the “received signal strength”.

The antenna must only be connected locally and not connected to a cable distribution system going outside the building.

Windows configuration tool GD-Tool

The GD-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 GD-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=9600 | 9.6 kbit/s |
| ⌘ AT+ICF=3,4 | 8 databits, no parity and 1 stop bit. |
| ⌘ AT+IFC=0,0 | RTS/CTS flow control disabled |
| ⌘ AT&D0 | DTR signal is ignored. |

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 from the local DTE interface. When the local interface is used the configuration can be made with AT-commands on the serial interface, or with a PC-based application configuration tool. Factory default settings can also be obtained by using a DIP switch locally.



Standard mode is used for basic GSM modem functionality

Advanced mode adds extended command set and functions. See AT+WOPEN.

Commands that require advanced mode are marked

AT-Commands

The most commonly used commands are listed below.

Please refer to the document “GDW 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)

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.

+CPIN – Enter PIN code

Syntax:

AT+CPIN = <pincode>

Parameters:

<pincode>

4 to 8 digits.

+CPWD – Change 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.

+CSQ – Received signal strength

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.

&D – DTR control

TSyntax:

AT&Dn

<n>

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

E – Character echo

Syntax:

ATEn

Parameters:

<n>

0	Echo off.
1	Echo on.

+ICF – Serial 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.

+IFC – Serial flow control

Syntax:

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

Parameters:

<DCE to DTE>

0	None.
2	RTS.

<DTE to DCE>

0	None.
2	CTS.

+IPR – Fixed serial speed

Syntax:

AT+IPR = <serial baudrate>

Q – Result code suppression

Syntax:

ATQ<n>

Parameters:

<n>

0: DCE transmits result codes.

1: Result codes are suppressed and not transmitted.

S-registers

S0 – Automatic answer

Syntax:

ATS0=<value>

V – DCE response format

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>



+WOPEN – Open AT control command

The modem is by default configured with enhanced mode disabled (AT+WOPEN=0). The advanced mode is needed to get all functionality to work as stated in Datasheets and User Guide for GDW-11.

When advanced mode is enabled AT&F will do the following:

S0=2;+VWRST=1,"024:00"

After disabling advanced mode some unwanted result codes may appear. To get rid of these extra result codes the following AT commands must be used:

AT+CREG=0

AT+CGREG=0

AT+WIND=0

AT+CGEREP=0

Syntax:

AT+WOPEN=<Mode>

Response syntax:

+WOPEN: <Mode>[,<IntVersion>[<ExtVersion>]]

Parameters:

<Mode>

- 0: Stop the Open-AT embedded application. If the product was running, it resets.
- 1: Start the Open-AT embedded application. If the product was stopped, it resets.
- 2: Get the Open AT library versions.
- 3: Erase the objects flash of the Open-AT embedded application.
- 4: Erase the Open-AT embedded application.
- 5: Suspend (in WAVECOM software kernel) the Open AT embedded application tasks.

NOTE:

Mode = 3 and 4 are only available if Open-AT embedded application is stopped (AT+WOPEN=0).

Open AT embedded applications can be resumed with AT+WOPENRES command or the INTERRUPT feature (see +WCFM command).

<IntVersion>

ASCII string giving the internal Open AT library version.

<ExtVersion>

ASCII string giving the external Open AT library version.

***WPIN – Auto PIN Code**

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.

+WRST – Reset command

Syntax.

AT+WRST =<Mode>,<Delay>

Response syntax:

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

Parameters:

<Mode>

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)

Application examples

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&V	Store default settings

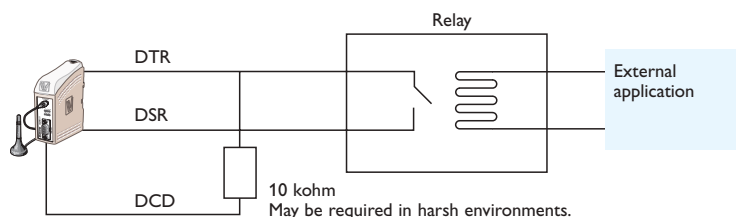
Set up the connection – The dialling modem

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	Activates automatic DTR dialling if DTR switches from low (OFF) to high (ON).
AT&W	Save settings
Switch DTR from OFF to ON	The modem will now dial the phone number stored in the first location of the phonebook.

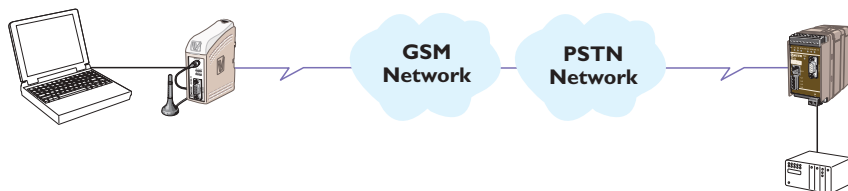
Set up the connection – The answering modem

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-36

AT&F	Set the unit to factory default
AT&W	Store default settings
SW1: 2,3,5,6 ON	Set dip switch 1 to configure the serial speed and format to 9600 bit/s 8 databits, None parity, 1 stopbit
SW4: 5 ON	Set dip switch 4 to configure the analogue line protocol To make switch setting active the power must be cycled OFF -> ON

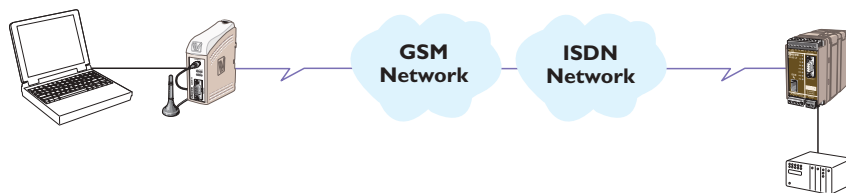
Set up the connection – The dialling modem

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

Set up the connection – The answering modem

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	Save settings

Configure the IDW-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	Save settings

Set up the connection – The dialling modem

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

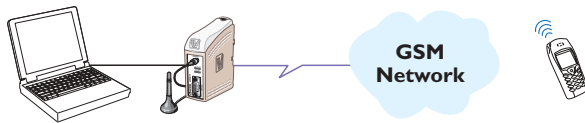
Set up the connection – The answering modem

ATA	Enter the answer command when RING comes from the network or set up ATSO=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 IDW-90 for more information.

GDW-11 sending text message with SMS by activating DTR signal



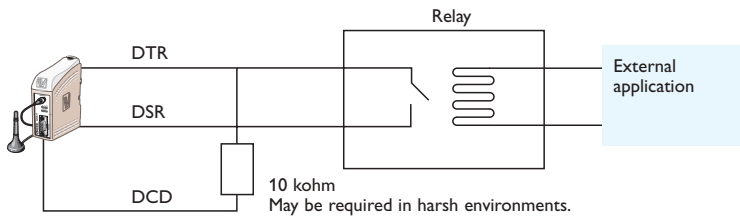
Configure the GDW-11

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

Send message

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

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	Save 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

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+WOPEN=1	Enable Advanced mode. Modem will restart
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*WGPRAPN="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&W	Store TCP settings

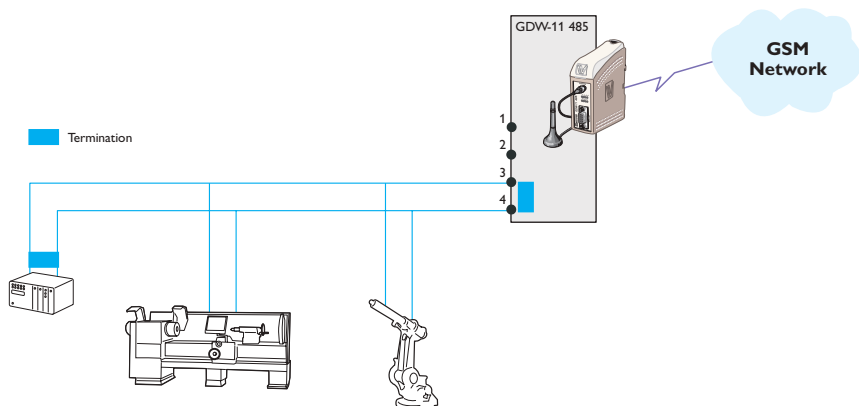
At the TCP server

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)

GDW-11 485, two wire half duplex



In this application the GDW-11 485 is set to communicate with a number of units with RS-485 interface. The communication is 2 wire half duplex at 38 400 bit/s.

Configure the GDW-11 485

AT+CPIN=xxxx	If PIN code required
AT&F	Set the unit to factory default
AT&V	Store default settings
S1:4 ON	Select 2-wire RS-485 half duplex
S2:1,2 ON	Termination / Failsafe active
S3:1,3 ON	38.4 kbit/s

To make switch setting active the power must be cycled from OFF to ON.



Westermo Teleindustri AB • SE-640 40 Stora Sundby, Sweden

Phone +46 16 42 80 00 Fax +46 16 42 80 01

E-mail: info@westermo.com

Westermo Web site: www.westermo.com

Sales Units

Sweden

Westermo Data Communications AB

Svalgången 1

SE-724 81 Västerås

Phone: +46 (0)21 548 08 00 • Fax: +46 (0)21 35 18 50

E-Mail: info.sverige@westermo.se

United Kingdom

Westermo Data Communications Ltd

Talisman Business Centre • Duncan Road

Park Gate, Southampton • SO31 7GA

Phone: +44(0)1489 580-585 • Fax: +44(0)1489 580586

E-Mail: sales@westermo.co.uk

Germany

Westermo Data Communications GmbH

Goethestraße 67, 68753 Waghäusel

Tel.: +49(0)7254-95400-0 • Fax: +49(0)7254-95400-9

E-Mail: info@westermo.de

France

Westermo Data Communications S.A.R.L.

9 Chemin de Chilly 91160 CHAMPLAN

Tél : +33 1 69 10 21 00 • Fax : +33 1 69 10 21 01

E-mail : infos@westermo.fr

Singapore

Westermo Data Communications Pte Ltd

2 Soon Wing Road #08-05

Soon Wing Industrial Building

Singapore 347893

Phone +65 6743 9801 • Fax +65 6745 0670

E-Mail: sales@westermo.com.sg

North America

Westermo Data Communications

939 N. Plum Grove Road, Suite F

Schaumburg

Chicago

Phone: +1 847 619 6068

Fax: +1 847 619 66 74

E-mail: info@westermo.com

Taiwan

Westermo Data Communications Co

F2, No. 188, Pao-Chiao Rd.

Shing-Tien City

Taipei 23145

Phone: +886 2 8911 1710

E-mail: info@westermo.com

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