

User Guide  
6615-2202



# GDW-11



**GDW-11 GSM/GPRS  
Modem**

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

[www.westermo.com](http://www.westermo.com)

## **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 waterproof.-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 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<br>EN 55024, Immunity IT equipment<br>EN 61000-6-3, Emission residential environments<br>FCC part 15 Class B<br>EN 50121-4, Railway signalling and telecommunications apparatus<br>IEC 62236-4, Railway signalling and telecommunications apparatus |
| Safety                               | EN 60950, IT equipment   |
| R&TTE<br>Article 3.1b<br>Article 3.2 | EN 301 489-1, EN 301 489-7<br>EN 301 489-1, EN 301 419-1<br>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



Westermo Teleindustri AB

T06-0174

## 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    | Installation manual |
|-----------------|------------|-----------|---------------------|
| DIN-rail        | GDW-11     | 3615-0001 | 6615-2202           |
| DIN-rail        | GDW-11 485 | 3615-0030 | 6615-2202           |

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

| No         | Short name   |
|------------|--|
| 89/336/EEG | Electromagnetic Compatibility (EMC)                  |
| 73/23/EEG  | Low Voltage Directive - LVD                          |
| 1999/5/EC  | RTTE Radio and Telecommunications Terminal Equipment |

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  | V1.2.1 (08/2002) |
| EN 61000-6-2 | Immunity for industrial environments   | 2 (2001)         |
| EN 55024     | Information technology equipment – Immunity  | 1 (1998)         |
| EN 61000-6-3 | Emission standard for residential, commercial and light-industrial environments  | 1 (2001)         |
| EN 60950-1   | Safety of information technology equipment   | 1 (2001)         |

The last two digits of the year in which the CE marking was affixed: 05

Herewith declares that product(s) listed above is in conformity with

| No          | Title                   | Issue |
|-------------|-------------------------|-------|
| FCC part 15 | Radio frequency devices |       |

Hans Levin  
Technical Manager  
14th December 2006

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

| <b>Electromagnetic Compatibility</b> |                |                                     |  |
|--------------------------------------|----------------|-------------------------------------|--|
| <b>Phenomena</b>                     | <b>Test</b>    | <b>Description</b>                  | <b>Test levels</b>   |
| 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<br>10 & 500 ms, 30% reduction<br>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<br>10 ms, 30% reduction<br>10 ms, 60% reduction<br>+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<br>2 kVrms 50 Hz 1 min (@ rated power <60 V)   |
| <b>Environmental</b>                 |                |                                     |  |
| 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<br>2 g, 8 – 500 Hz  |
| Shock                                | IEC 60068-2-27 | Operating                           | 15 g, 11 ms  |
| <b>Packaging</b>                     |                |                                     |  |
| 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.

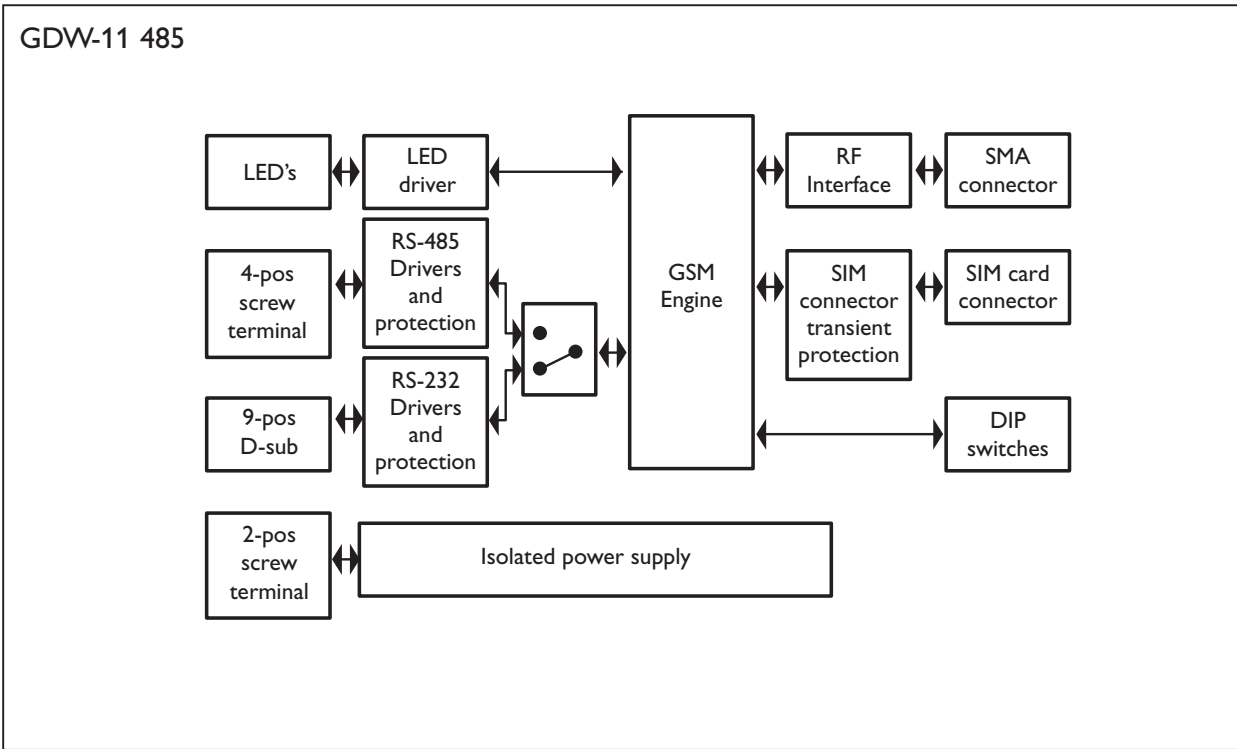
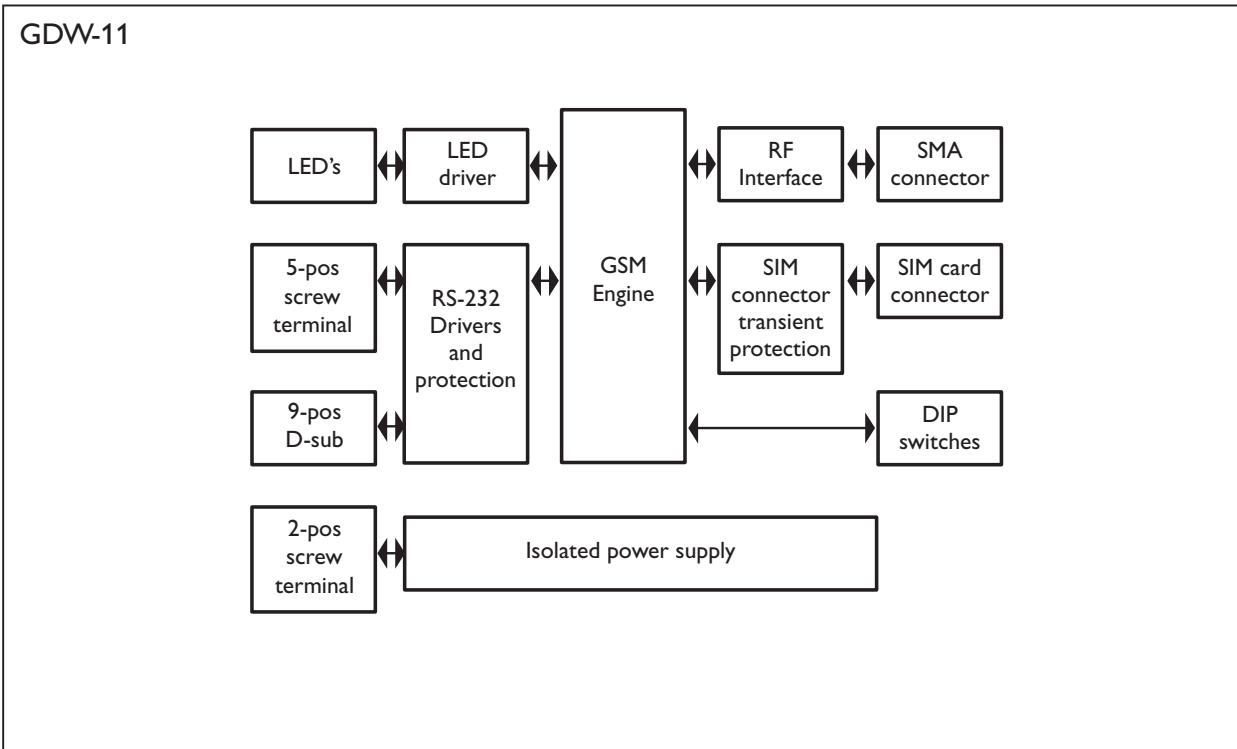
The GDW-11 485 also has an RS-422/485 interface in screw terminal block.

### 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



## Interface specifications

| <b>Power</b>          |  |
|-----------------------|--|
| Rated voltage         | 12 to 48 VDC   |
| Operating voltage     | 10 to 60 VDC   |
| Rated current         | 350 mA @ 12 VDC<br>150 mA @ 24 VDC<br>75 mA @ 48 VDC |
| Rated frequency       | DC   |
| Inrush current $I^2t$ | 0.05A <sup>2</sup> s                                 |
| Startup current*      | 0.75A peak   |
| Polarity              | Reverse polarity protected                           |
| Connection            | Detachable screw terminal                            |
| Connector size        | 0.2 – 2.5 mm <sup>2</sup> (AWG 24-12)                |
| Isolation to          | All other ports 3 kV <sub>rms</sub> 50 Hz 1 min      |
| Shielded cable        | Not required   |

\*External supply current capability for proper startup

| <b>RS-232</b>            |  |
|--------------------------|--|
| 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 <sub>rms</sub> 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 <sup>2</sup> (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 ITU V.11<br>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.<br>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 <sub>rms</sub> 50 Hz 1 min                                      |
| Connection               | Detachable screw terminal   |
| Connector size           | 0.2 – 2.5 mm <sup>2</sup> (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.

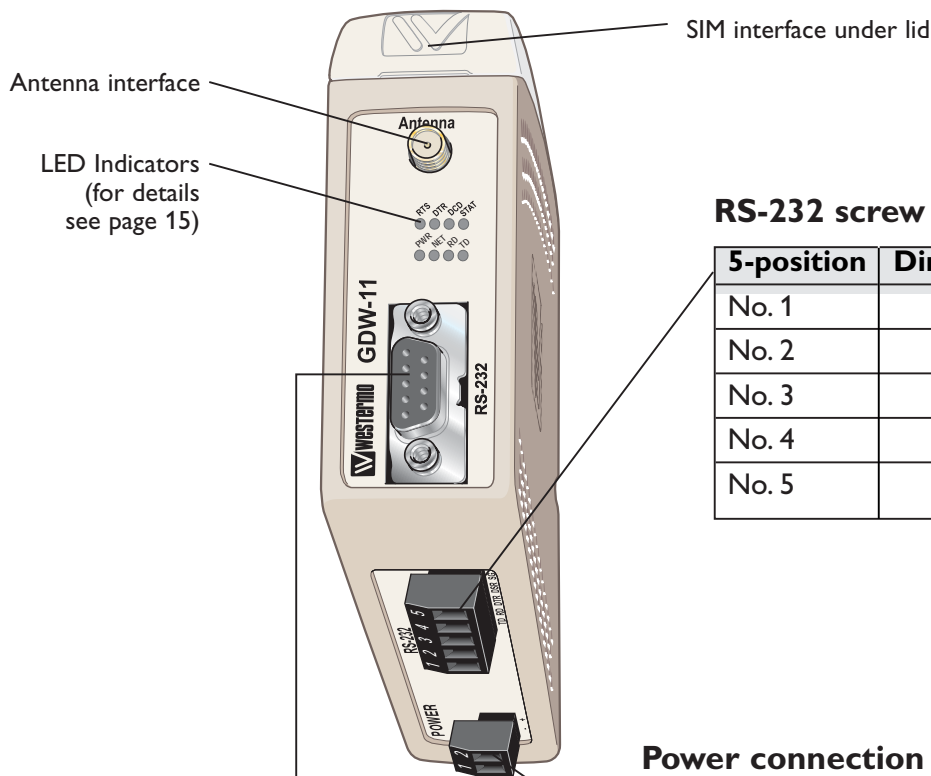
## Antenna

|                 |   |
|-----------------|---|
| Frequency bands | GSM900 TX 880 – 915 and RX 925 – 960 MHz<br>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 <sub>rms</sub> 50 Hz 1 min  |

## SIM

|                          |  |
|--------------------------|--|
| Electrical specification | 3 volts SIM supported                      |
| Isolation to             | Power port 3 kV <sub>rms</sub> 50 Hz 1 min |

## Connections



### 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          |

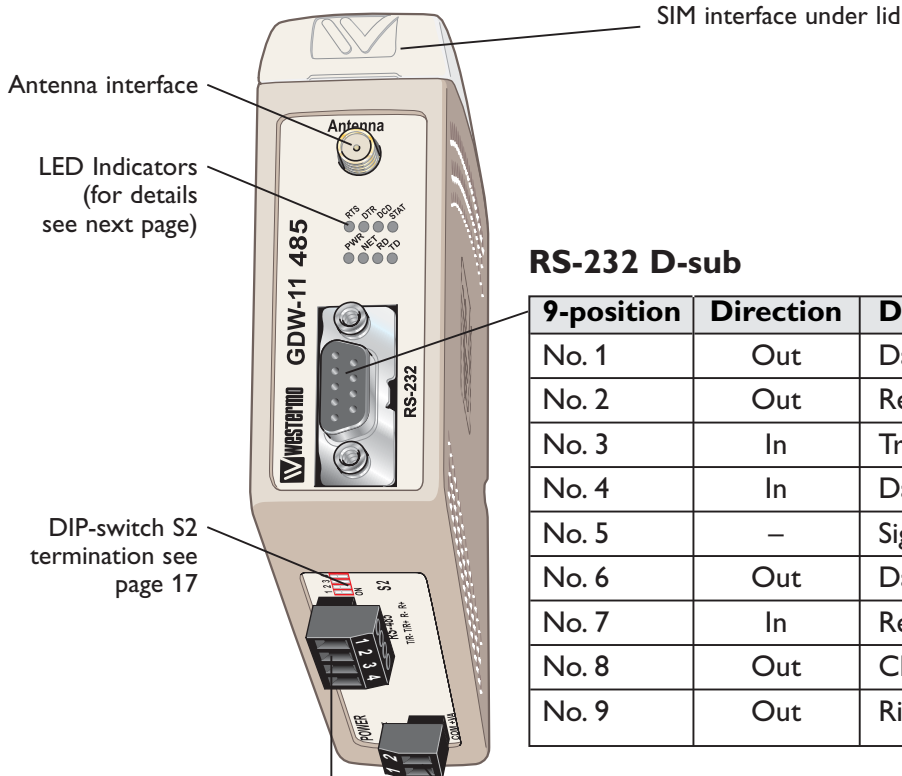
### Power connection screw terminal

| 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



## 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        |

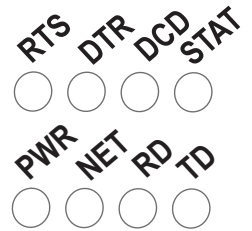
## RS-422/485

| 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)*<br>$0 \leq \text{RSSI} \leq 9$ (-113 dBm to -95 dBm) |
|        | Flash 25%<br>ON | $10 \leq \text{RSSI} \leq 14$ (-93 dBm to -85 dBm)  |
|        | Flash 50%<br>ON | $15 \leq \text{RSSI} \leq 19$ (-83 dBm to -75 dBm)  |
|        | Flash 75%<br>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!

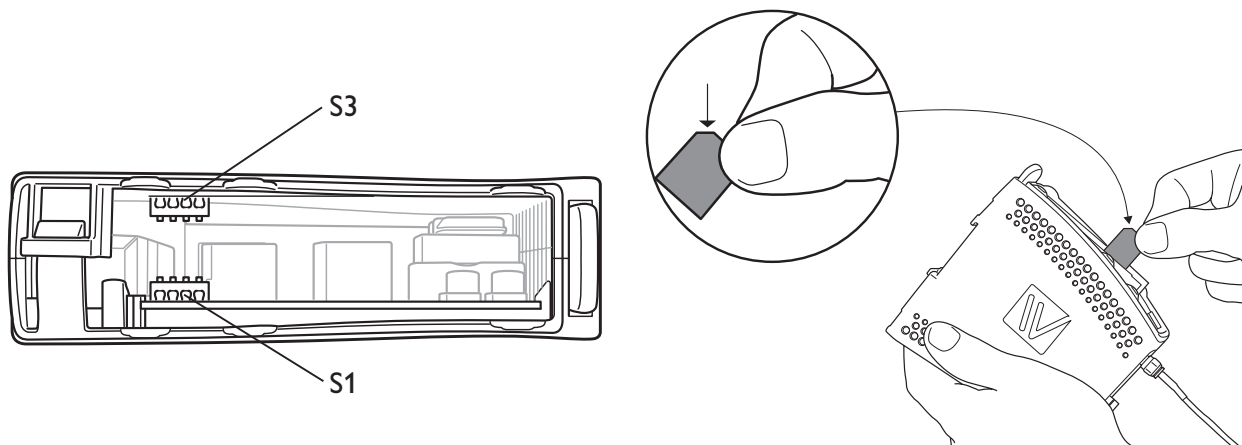
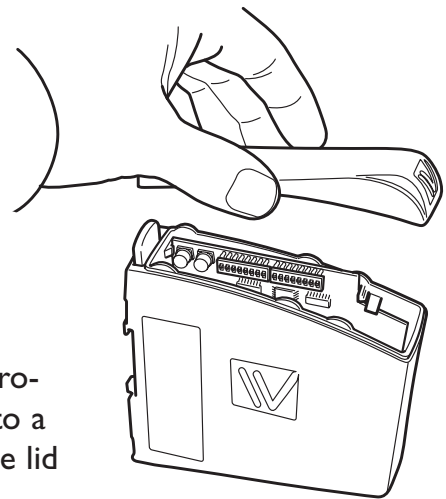
Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap), before the lid on top of the unit is removed.



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



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



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

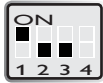
### S3 Selection of data rate, only in GDW-11 485



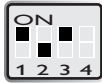
1200 bit/s



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

S1



### Factory settings GDW-11

S1



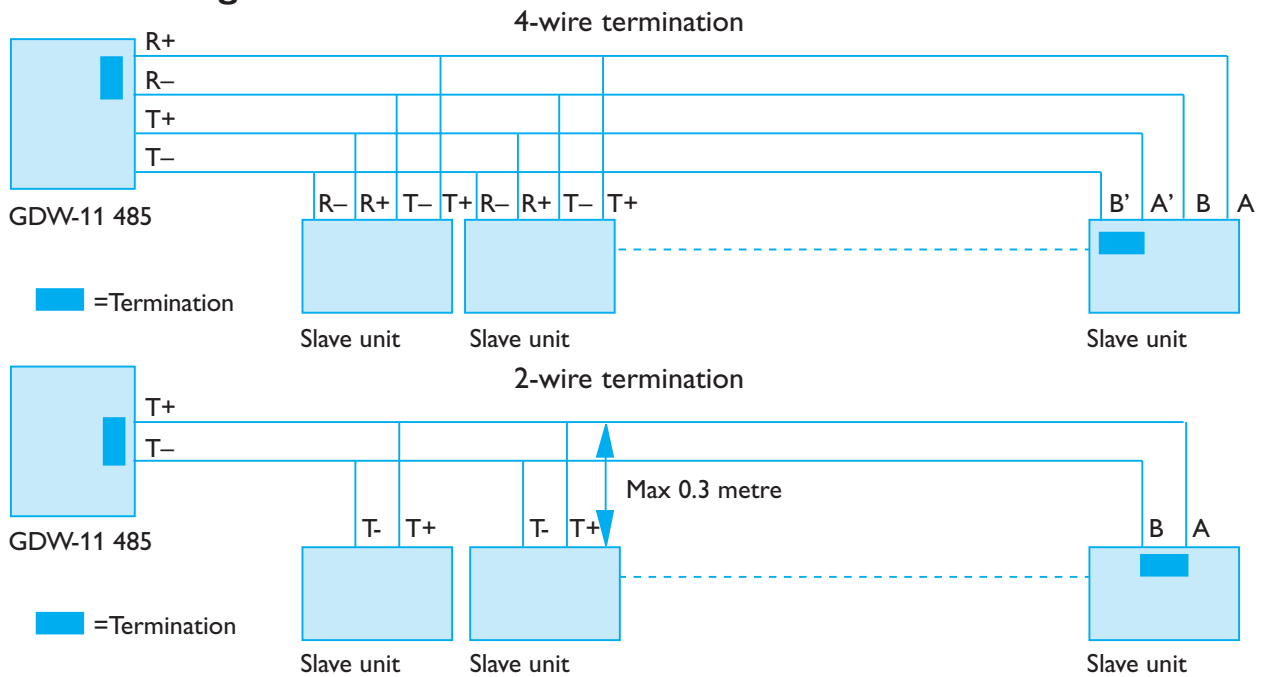
S2



S3



## RS-422/485 general advice



### Termination recommendations

The RS-422/485 line must be terminated. In the GDW-11 485, 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.

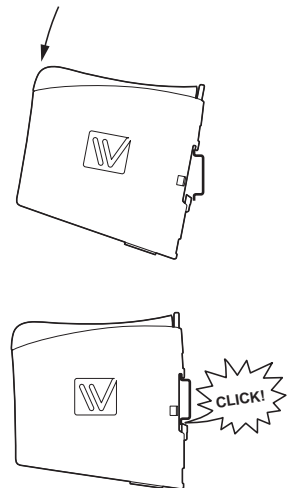
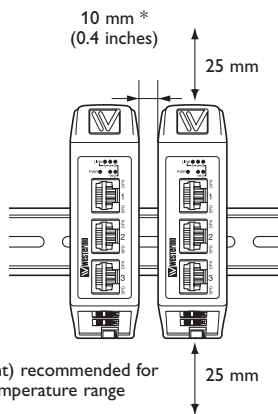
**Warning!**

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.

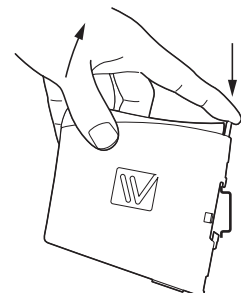
Snap on mounting, see figure.



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.



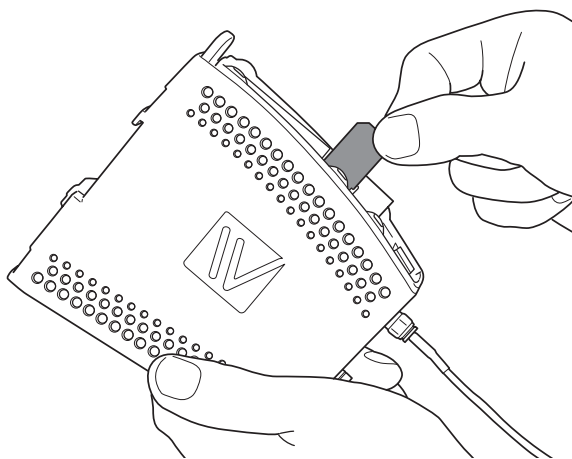
### Warning!

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>**

|   | <b>Data bits</b> | <b>Parity bit</b> | <b>Stop bit(s)</b> |
|---|------------------|-------------------|--------------------|
| 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;+WRST=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&W         | Store default settings          |

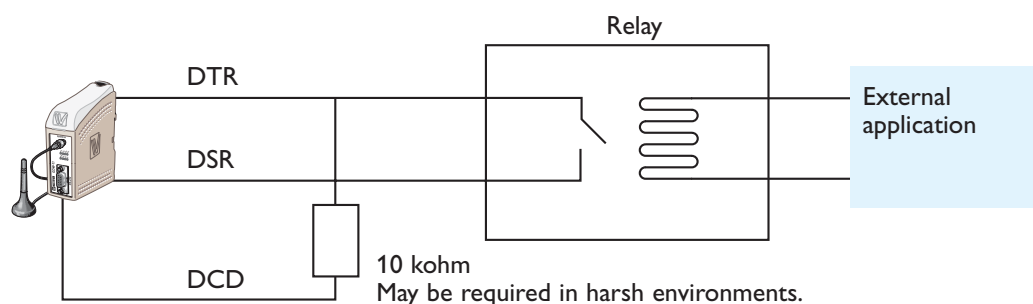
### Set up the connection – The dialling modem

|                           |   |
|---------------------------|---|
| 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                     | 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. |

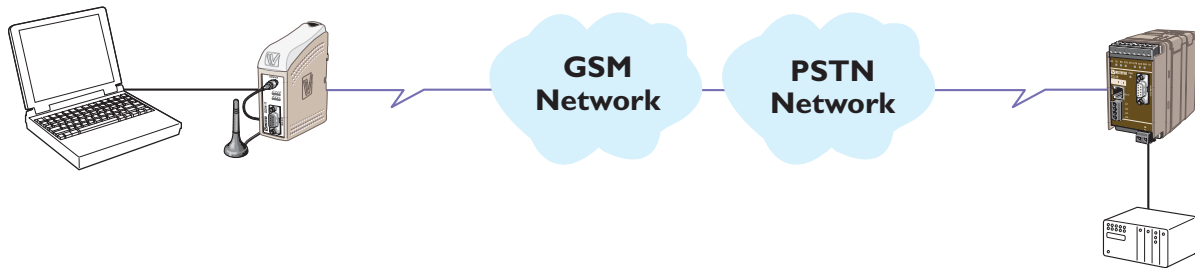
### Set up the connection – The answering modem

|     |  |
|-----|--|
| ATA | Enter the answer command when RING comes from the network or set up ATSO=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<br>To make switch setting active the power must be cycled OFF -> ON. |

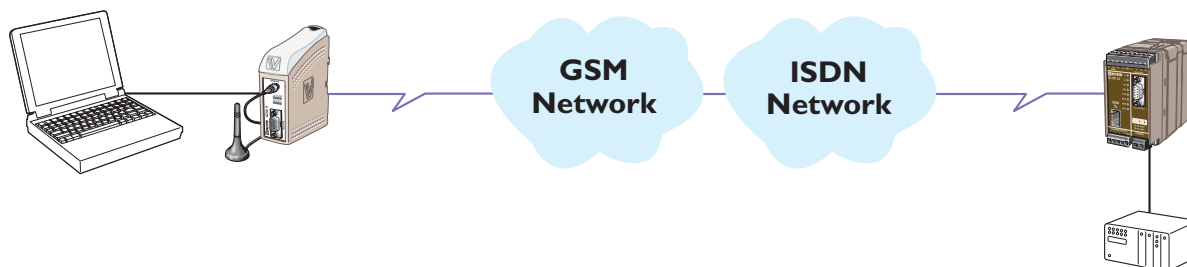
#### Set up the connection – The dialling modem

|         |   |
|---------|---|
| 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 |
|---------|---|

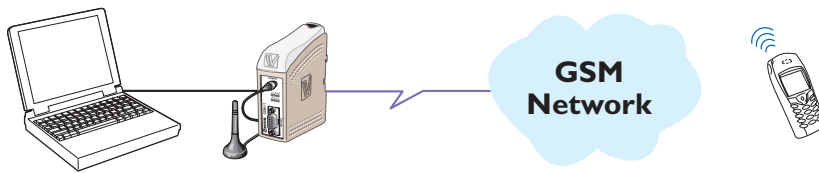
#### Set up the connection – The answering modem

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

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



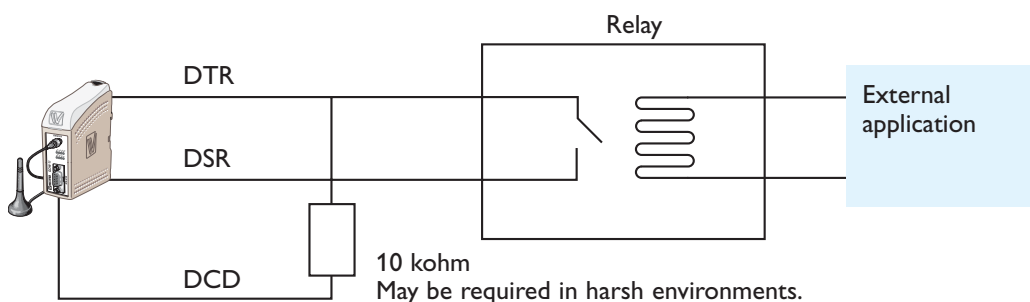
### Configure the GDW-11

|   |  |
|---|--|
| AT+CPIN=xxxx  | If PIN code required   |
| AT&F  | Set the unit to factory default  |
| AT+CMGW="0762342489"<CR><br>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        |

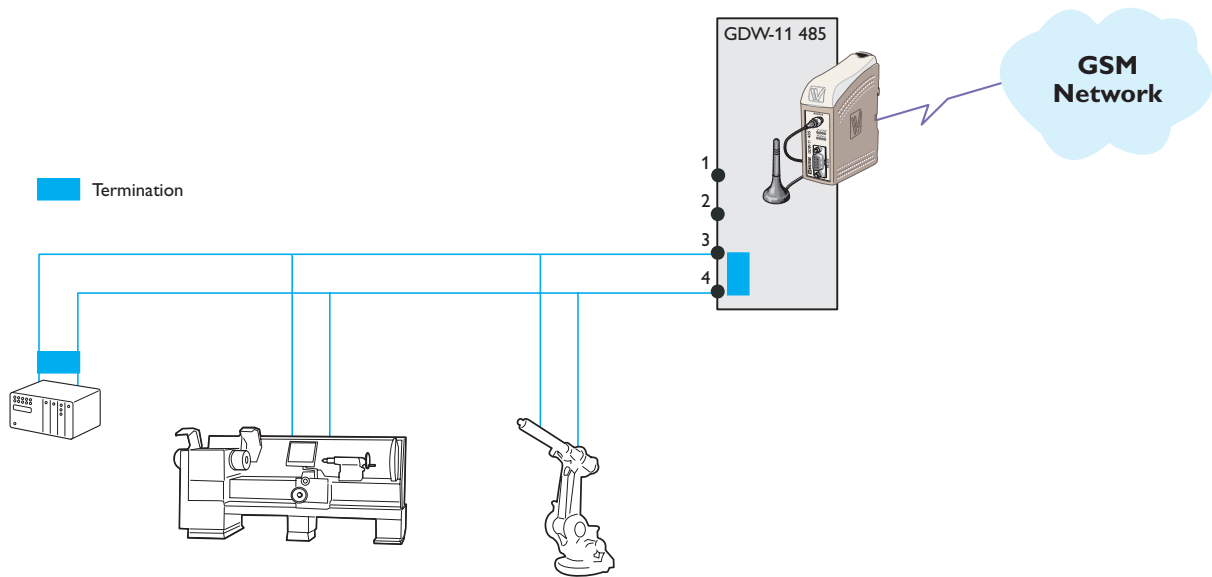
### At the TCP server

|                |  |
|----------------|--|
| 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&W         | 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.se](mailto:info@westermo.se)

**Westermo Web site: [www.westermo.com](http://www.westermo.com)**

---

### Subsidiaries

---

#### Westermo Data Communications AB

SE-640 40 Stora Sundby  
Phone: +46 (0)16 42 80 00  
Fax: +46 (0)16 42 80 01  
[info@westermo.se](mailto:info@westermo.se)

#### Westermo OnTime AS

Gladsvei 20 0489 Oslo, Norway  
Phone +47 22 09 03 03 • Fax +47 22 09 03 10  
E-mail: [contact@ontimenet.com](mailto:contact@ontimenet.com)

#### 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](mailto:sales@westermo.co.uk)

#### 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](mailto:info@westermo.de)

#### 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](mailto:infos@westermo.fr)

*Westermo Teleindustri AB have distributors in several countries, contact us for further information.*