

# Manual

# GSM900 Module

for

# Reinhardt Weather Stations



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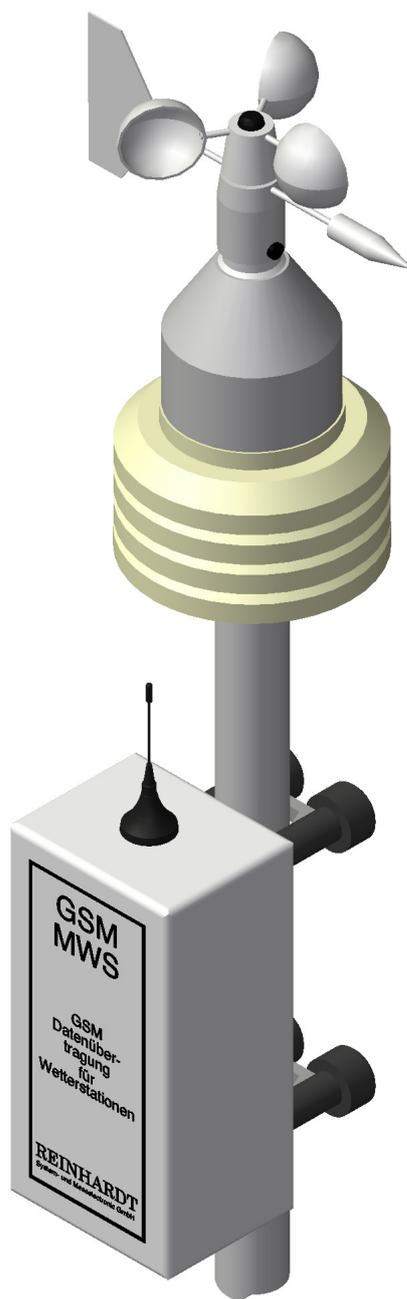
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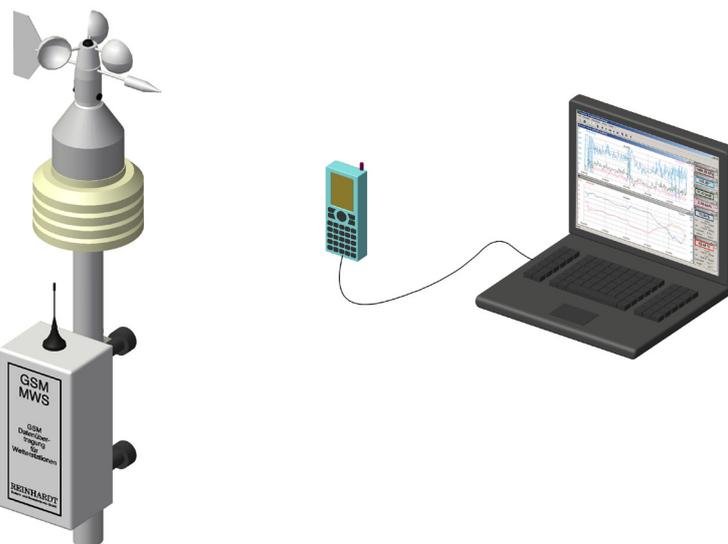
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## GSM-Modem-Module 900/1800 MHz for Reinhardt Weather Stations



## GSM-Modem-Module 900/1800 MHz for Reinhardt Weather Stations



## 1 For compliance

### 1.1 Usage

The GSM-Modem-Module 900/1800 MHz (short: GSM900) for all Reinhardt Weather Stations and sensors (MWS 9-5, MWS 5MV, MWS6, MWS4M, MWS 3, 485-sensors and sensors with datalogger) consists of a cellular phone with antenna, serial port and a controller board with an interface for connecting any REINHARDT weather station.

The GSM900 is designed for establishing a wireless connection from any PC or mobile phone to a REINHARDT weather station using the GSM-net.

**IMPORTANT: The SIM cards you use must support CSD transmission!!**

You can send a text-message to the GSM900 or directly ring up the GSM900, whereupon the GSM900 sends back a text-message within a few seconds to your mobile phone.

Another way to use the GSM900 is to establish a data-connection with a modem or cellular phone with serial or USB port. A computer connected to this port can now download the weather data of the connected weather station via the RS232-port or a USB-port (RS232 --> USB converter required).

Furthermore it is possible to generate alarm messages when measured values exceed or fall below a threshold value.

Even a subscription for regular text messages is possible.

In any case you should use a flatrate to avoid overflowing costs when forgot to disconnect from the GSM900.

Another way to avoid overflowing costs is to disconnect the PC module from the COM- or USB port to ensure that the contact to the GSM900 module is disconnected.

As an option there is a Control-Measuring Module available, which includes 4 measuring channels and 4 signal outputs.

Details about the Control-Measuring Module you'll find in chapter 4 - Control-Measuring Module.

## 1.2 Safety instructions



The instrument is manufactured in accordance with modern technical standards and can be operated without danger when used as directed.



Damage caused by non-observance of this operating manual can lead to forfeiture of warranty. REINHARDT System- und Messelectronic GmbH is not liable for subsequent damage.



REINHARDT System- und Messelectronic GmbH is not liable for damage of items or persons caused by improper handling or non-observance of the safety instructions! In such cases any guarantee claims shall become null and void.



Dear customer, the following safety and hazard notices not only protect your health, but also the appliance. Please read the following points carefully.



Do not leave the packaging material lying around. These parts are dangerous toys in the hands of children.

## 1.3 Mounting

Mounting of the GSM900 is performed by clamping it onto a 1" pipe near the weather station. **The distance between GSM900 and weather station must be at least 1 meter to avoid HF-critical disturbing influences to the weather station caused by the GSM900.**

Power supply is achieved by the cable with PSU. Connection between the weather station and GSM900 is achieved by a short 1:1 cable with two 7-pole plugs.

The GSM900 must be mounted with the antenna on top. Ensure that the cover is fixed properly and the sealing in the cover is intact! Otherways water may soak into the unit and destroy the components inside!



**Damage due to water inside the unit is not covered by warranty!**



This picture shows the basic mounting of the components.

The distance between the GSM900 and the station is too small in this example.

The distance between antenne and weather station should be at least 1m!

## 2 Commissioning

### 2.1 Hardware Installation

The GSM900 is connected to the standard ready made cable of the weather station (lefthand 7-pole connector) and powered by it.

The weather station is connected to the righthand 7-pole connector.



**CAUTION!** Do not mix up the both 7-pole connectors!!!

**Please do not use any tool to fasten the connectors in order to avoid the connectors working themselves loose due to too big force when fastening the connectors!!**

Connector of Control- Measuring Module (option)



Connector for power supply

Connector for weather station

## 2.2 Presetting

For operation a SIM card with activated CSD transmission (Circuit Switched Data) for the GSM900 and also for the cellular phone at the computer is an absolute necessity.

Infos about CSD transmission you'll find here:

[http://en.wikipedia.org/wiki/Circuit\\_Switched\\_Data](http://en.wikipedia.org/wiki/Circuit_Switched_Data)

Before inserting and using the SIM-card, you either need to remove the PIN-interrogation (**P**ersonal **I**dentification **N**umber) of your SIM-card with any mobile phone or tell the GSM900 the PIN and the PUK (**P**ersonal **U**nblocking **K**ey) as an option.

To perform this you connect the GSM900 via the enclosed power supply cable (left hand 7-pole connector) to a serial port (RS-232) of your computer (9-pole SUB-D connector).

**Do not connect the weather station yet!**

Then run any terminal software (hypertrm.exe or any other) with correct COM-port settings.

After powering the GSM900 in the terminal window, the following should appear:

```
REINHARDT System- und Messelectronic GmbH
GSM-MWS V.x.x / Vers.Date - Vers.Time
```

```
Init...done
```

If successful please type:

```
*ADMIN MOBILE PIN xxxx
```

(xxxx is your PIN here). The leading \* is just as important as the blanks between the single words. Please press the <ENTER> key to take over the command. With the same procedure you take over the PUK. Sending the PUK can be skipped.

```
*ADMIN MOBILE PUK xxxxxxxx
```

To check the inputs you type:

```
*ADMIN GET MOBILE
```

After pressing the <ENTER> key, the following list is displayed in the terminal window:

```
MOBILE
>PIN "xxxx"
>PUK "xxxxxxxx"
>TEL ""
>SMSC
>LIMIT 2000 (2000 left)
>BEARER V.32 (V32 curr.)
>Signal Quality 7,99
```

Signal Quality level, Biterrorrte (corresponds value of AT+CSQ)

```
0 = -113 dbm    0..7
1 = -111 dbm    99 = unknown
..
21= - 51 dbm
99 = unknown
```

# Manual GSM900 Module for Weather Stations

When the numbers set in inverted commas are the same as the desired numbers, the GSM900 is ready for the first action.

Finally you set the clock of your GSM900 with the command:

`!UhhmmssDDMMYY`

with hh = hour, mm = minute, ss = seconds, DD = day, MM = month and YY = year.

example:

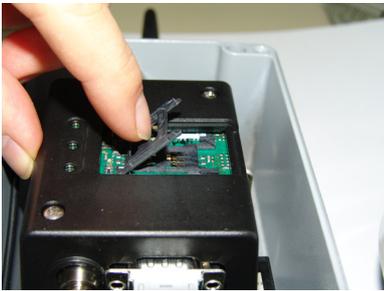
To set the clock to 17:10:00 on 18.01.2007 please type:

`!U171000180107`

Please note that the U must be a capital letter!

Once set the clock is running even when the GSM900 is powered off.

## 2.3 Insert the SIM-card

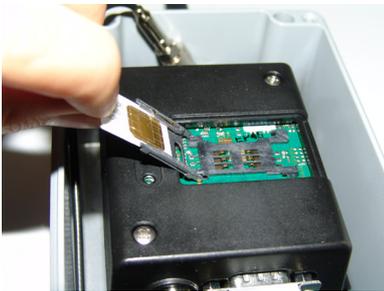


Power off the GSM900, loosen the four screws of the cover and remove it. Now you can see the cellular phone CT63 (black plastic case) and the controller board underneath.

Under the cover of the cellular phone the SIM card holder is placed.

Slide the cover in direction of arrow to remove the cover.

Now you can see the SIM card holder. Slide the upper part of the SIM card holder in direction of the LEDs and flip it open.



Now you insert the SIM card into the top of the SIM card holder like shown in the picture.

(As mentioned above, the SIM card must be activated for CSD transmission!)

See for example:

[http://en.wikipedia.org/wiki/Circuit\\_Switched\\_Data](http://en.wikipedia.org/wiki/Circuit_Switched_Data)



Shut the top of the SIM card holder, so that the SIM card fits into the SIM card holder and slide it away from the LEDs to lock it.

At last mount the cover and slide it against direction of arrow to lock it.



**Never apply too much force to the card holder and never use sharp tools!!**

Finally mount the cover with the four screws and take care that it seals reliably to avoid inrush of water.

If water soaks into the housing, the complete GSM900 module may be damaged unreparable!

## 3 Operating instructions

### 3.1 Basics for configuration of the GSM900

The GSM900 always contains 3 command ports:

- a) The serial port via cable which was already used to configure the PIN. This port is also used for transferring the weather data.
- b) Receiving or sending text messages (SMS - **Short Message Service**)
- c) The wireless serial data communication by the cellular phone.

The GSM900 can receive commands from each of these ports. The instruction set is fixed but single commands can vary depending on the selected port.



**In the native form the commands are used by SMS, when using GSM oder cable connection, the commands are used with a leading \*.**

In the following text the commands are always written in their native form. Due to that please refer to the *COMMAND REFERENCE* for differences when using GSM or cable connection. The GSM900 does not distinguish between capital and small letters!

Due to safety reasons the ports are differentiated!

Cable port: Via this port all data (administrative data and weather data) can be changed and downloaded without exception and without password.

Text messages (SMS) GSM connection: Here weather data can be downloaded within a subscription or as alarm messages, but no administrative data can be changed directly. Anyhow, to perform this an "administrative number" was established (mainly the number of a mobile phone), which allows an administrative access without password.

Principally you should store all telephone numbers in the international format.

This is not necessary within creating alarms or subscriptions, but it is necessary when authorization is required, for the GSM900 always "sees" the telephone numbers in the international format and refuses access when the number deviates.

#### 3.1.1 Priorities

When operating the GSM900 module, you have to pay attention to the different priorities of the different connections.

A connection via telephone call has got the highest priority. All other connections are not possible while a telephone connection is active.

A connection via text message has got a lower priority than a telephone call.

A HTTP connection has got the lowest priority.

## 3.2 Establishing the administrator

The administrator can lock and admit telephone numbers, delete alarms and subscriptions and receive system warnings.

To register a telephone number as administrative number you can

a) establish a cable connection and type via terminal program:

```
*ADMIN SET NUMBER <telephone number>
```

b) send a text message (SMS) to the GSM900 (to the telephone number of your SIM card) with the following content:

```
ADMIN <imei> SET NUMBER
```

c) establish a GSM connection to the GSM900 and type at the remote computer via terminal program :

```
*ADMIN <imei> SET NUMBER
```

<imei> is the IMEI (**I**nternational **M**obile **E**quipment **I**ntity) number (unique serial number with 15 characters) of your mobile phone which allows to identify each GSM or UMTS terminal equipment.

**Carefully keep this number and protect it against unauthorized use!**



Everybody who knows this number can make himself an administrator and modify and download all kind of data from the GSM900!!

To check by text message (SMS) if the number was entered correctly, you can display the current administrator telephone number with the command:

```
ADMIN GET NUMBER
```

This only works using SMS or GSM, if the number was already accepted correctly.

## 3.3 Configuring access limitations

As administrator you can refuse access to callers or groups of callers or allow access to certain callers.

Callers with permission besides the administrator can be added to the **INCLUDE** list (list of 10 telephone numbers). Use the following command to add a number to this list:

```
ADMIN SET INCLUDE <telephone number>
```

Also refer to the *COMMAND REFERENCE*. Here you can store 10 telephone numbers or parts of telephone numbers, i.e. +498196 (all participants of the local exchange 08196 in Germany (0049)). By default, however, callers not included in this list have also got access. You can hamstring this with the command:

```
ADMIN SET PERMIT 6 OFF
```

You also can block access for certain telephone numbers (or parts of telephone numbers) with:

```
ADMIN SET EXCLUDE <Rufnummer>
```

As above you can block access for a group of numbers when you insert only the leading digits of a group of telephone numbers.

Generally the **INCLUDE** list has got priority to the **EXCLUDE** list. This means that you can block a big group of telephone numbers, but allow access for one or two telephone numbers.

For example:

```
ADMIN SET EXCLUDE +49179
```

```
ADMIN SET INCLUDE +491794873XXX
```

All telephone numbers from Germany are blocked except the telephone number 01794873XXX.

## 3.4 Controlling the power supply

The GSM900 was developed for self-sufficient operation with solar and accumulator supply. Therefore, different possibilities to control the power supply and save energy are implemented. You can set one overvoltage and up to four undervoltage messages. The GSM900 is designed to operate at 12 VDV. This voltage value is preconfigured. Of course you can modify this voltage value by:

```
ADMIN SET LEVEL 1 <voltage value>
```

to

```
ADMIN SET LEVEL 5 <voltage value>
```

Level 1 means the lower limit. Voltage drop below this level switches off the GSM900.

By default this value is set to 8 VDC and should not be modified. Absolute minimum voltage value is 7.5 VDC. Lower than 7.5 VDC disables the entire system (GSM900 and connected weather station) to avoid damage of the accumulator due to massive discharge.

All other values only cause warnings and do not influence the proper operation of the GSM900.

To view the current voltage limitations you type:

```
ADMIN GET LEVEL
```

When setting a voltage level, take care to choose the lowest limit for LEVEL1 and the highest value for LEVEL5.

When you operate at 13.8 V and want to get a text message when the voltage drops below 12 VDC, you must first set the voltage level by:

```
ADMIN SET LEVEL 4 12.0
```

To enable sending a text message, you type the following:

```
ADMIN SET WARN 4 ON
```

To list the configuration of the warning messages you type:

```
ADMIN GET WARN
```

Now the entry "ON" must appear after the number 4. Generally you should not set the limitations too close to the regular voltage value. To avoid getting a text message every time the voltage swings a little bit, a hysteresis of 1 VDC was implemented.

In the example above the voltage must rise above 13 VDC to receive a LEVEL4 text message after the 12 V warning message.

At LEVEL 3 to LEVEL1 the graduation of the voltage does not matter, for after each warning text message the voltage must exceed the next higher level to enable the warning text messages.

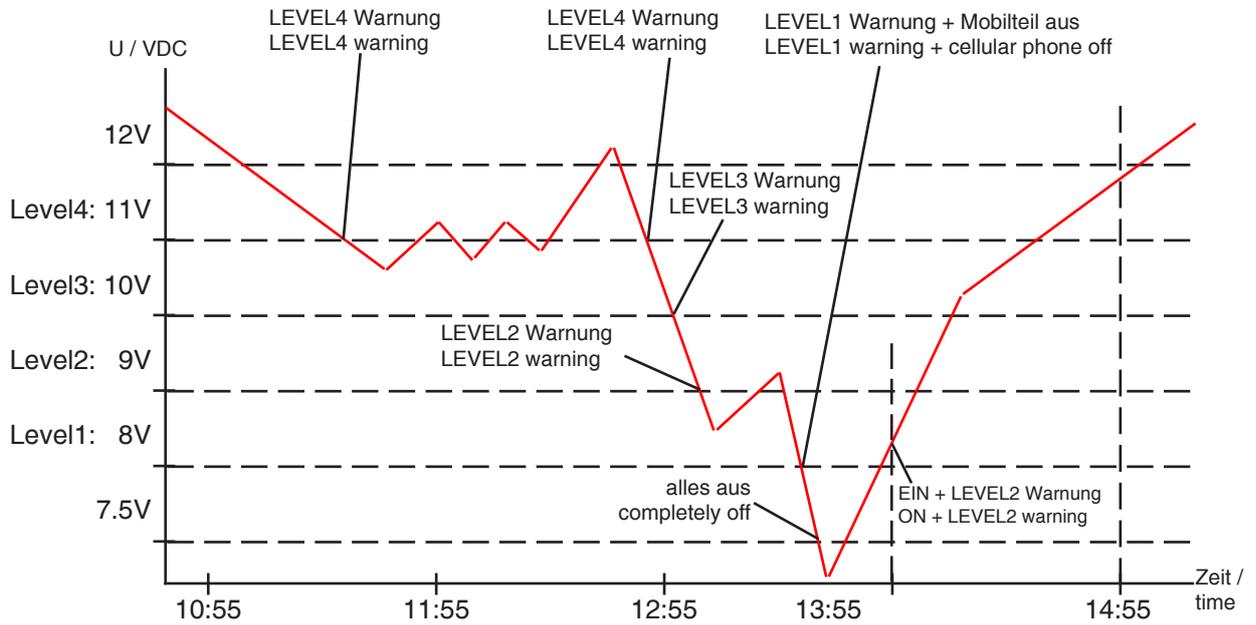
By the way, in these text messages the current supply voltage is also displayed.

You can request the current supply voltage with the command:

```
LEVEL
```

See the diagram on the next page for explanation of the warning text messages!

## 3.4.1 Graphical explanation of power supply control



## 3.5 Precautions to save power

Apart from the continuous operation (70 mA at 12 VDC without weather station) there are different modes available to save energy, if the GSM900 need not be accessible at any time.

To set a desired mode to save energy you use the command:

```
ADMIN SET POWER x
```

The following modes are available:

```
ADMIN SET POWER 0
```

means continuous operation mode without precautions for saving energy.

Advantage of this mode is the permanent availability of weather data.

If you prefer the use of subscriptions and alert rules and not always want to retrieve weather data, you can use the command:

```
ADMIN SET POWER 1
```

In this case the GSM900 switches on for 10 minutes per hour (5 minutes before and after every full hour). This saves about 0.6 W power input.

However, an alert rule or a warning text message may switch on the cellular phone unplanned. In this case the system is accessible for another 10 minutes!

There is another advantage of this mode: The data logger of the weather station is filled continuously without gaps for the weather station is always active in this mode.

To save more power, you set the next mode by:

```
ADMIN SET POWER 2
```

This switches to a minimum operation which disables the GSM900 and the weather station completely. The whole system is active only 5 minutes before and 5 minutes after every full hour.

This mode allows that subscriptions can be sent and the weather station has enough time to power up completely.

Alerts and warnings are processed, but only within the 10 minutes when the system is active!

You can query the current mode by:

```
ADMIN GET POWER
```

Additionally you can shut down the whole system manually by:

```
ADMIN OFF
```

The whole system (GSM900 and weather station) will power up again 5 minutes before the next full hour. What happens after power up depends on the configured power save mode.

## 3.6 Manual download of weather data

With the command:

```
KEN <sensor id>,<sensor id>,<..>
```

you can request the current weather data. <sensor id> means that the 2 letters stand for a certain sensor (i.e. TE for temperature, WR for wind direction, ...).

For example:

```
KEN te,Dr,fE
```

sends the values for temperature, air pressure and humidity. If the number of characters of the requested text message exceeds the possible number, another text message is created and sent immediately after the first text message.

You find the <sensor ids> in the manual of the respective weather station.

For further information please refer to the **COMMAND REFERENCE** (chapter 4.2)!

## 3.7 Subscription of weather data

The command:

```
ABO <DayHour>,<DayHour> <sensor id>,<sensor id>,<..>
```

creates a subscription to your telephone number with current weather data at every selected full hour. You can also select days and hours, when you want to receive a text message including the chosen weather data.

Example:

```
ABO Mo10,di15 te,Dr,fE
```

creates a subscription with data of temperature, air pressure and humidity for every Monday at 10:00 a.m. and every Tuesday at 3:00 p.m..

If the number of characters of the requested text message exceeds the possible number, another text message is created and sent immediately after the first text message.

Since firmwareversion 1.2 there are some new commands for creating ABOs:

With an additional + (=8:00 a.m. to 6:00 p.m.or weekdays) or an additional \* (=24h or daily) setting of ABO rules is much easier now.

Examples:

```
Mo*,Tu*,We+,Th8,9
```

(Monday, Tuesday hourly, Wednesday hourly from 8:00a.m. to 6:00 p.m.as well as Thursday at 8:00 a.m. and 9:00 a.m.);

```
*+,Fr19,20
```

(daily each hour from 8:00a.m. to 6:00 p.m and Friday additional at 7:00 p.m. and 8:00 p.m.);

```
++Sa9,10
```

(Monday..Friday hourly from 8:00a.m. to 6:00 p.m and on Saturday at 9:00 a.m and 10:00 a.m.);

```
+*,Su12,20
```

(Monday to Friday hourly and Sunday at noon and 8:00 p.m.);

```
**
```

(hourly the whole week)

You find the <sensor ids> in the respective manual of the weather station.

For further information please refer to the **COMMAND REFERENCE** (chapter 4.2)!

## 3.8 Create alerts

You can create alert rules with the command:

```
ALARM <Hour> <Term>
```

Every data string of the weather station is checked if the conditions in the rule are true. You can choose different hours when checking is to be performed to avoid that

- a) too many text messages are sent and
- b) unnecessary text messages are sent ( i.e. in the middle of the night,..)

Example:

for checking if temperature is below 0°C at 10 a.m., 11 a.m., noon, 1 p.m. and 2 p.m.:

```
ALARM 10,11,12,13,14,15 te<0
```

You can link up to 3 terms with **and** (&) resp. **or** (+) i.e.:

```
ALARM 12,13,14,15,16,17,18 te<0&wg>10+re>0
```

checks temperature **and** if windspeed is above 10km/h **or** precipitation above 1 l/m<sup>2</sup>.

In the text message there are the current values and also the alarm conditions (in brackets).

You find the <sensor ids> in the respective manual of the weather station.

For further information please refer to the **COMMAND REFERENCE** (chapter 4.2)!

## 3.9 Text message with raw weather data

(Since firmware version 1.2)

With the command

```
TRACK <Day><Time>,<Day><Time> <Parameter>
```

you can store up to 10 numbers receiving a text with raw weather data.

Input of time is the same as in ABO.

Parameter @:

Name or number of station (only with RS485). Is set to 1, when missing (=MWS). (0 = GSM)

Parameter ?:

Multiple of storage interval of weather station. Is set to 1 when missing.

The weather station sends a synchronisation sign each time it writes into the logger so the GSM900 recognizes storing of weather data and storage interval. In this case each time the station stores into the logger a text message would be sent.

With ? = 3 data would be sent each 15 Minutes at a 5 minutes storage interval. endet werden.

With

```
TRACK REMOVE
```

sending of raw weather data can be cancelled. (Like ABO or ALARM)

## 3.10 Transmission via HTTP

(Since firmware V1.4)

For sending data via HTTP you need a mobile phone including internet profiles (i.e. CT63, ..)! With the older MC35i sending data via HTTP is not possible, all older functions are still working what means that the firmware is downwardly compatible.

The most important function is establishing a GPRS connection to an accesspoint (ADMIN MOBILE GPRS ADDRESS), and the adding of sensor values to an URL (ADMIN MOBILE HTTP ADDRESS) . A GET function is used to transmit data added to an URL. After the address has been opened successfully, the connection is closed, this means, no data are read but only the header will be transmitted.

i.e.:

`http://www.myserver.de/mws/input.php?STA=1&STN=MWS&TE=23.33&DR=1013.12&CHK=227`

All additional values created by the GSM900 are transmitted in 3 characters prefix, the sensor values with 2 characters prefix as used. For each station the following prefixes are issued:

STA (=Station address [ADMIN STATION x IDENT <adr>])  
STN (=Station name [ADMIN STATION x NAME <name>])  
CHK (=Checksum [STA xor (prekoma sensor1 & 255) xor (...)]

Special issues at sensor date and sensor time:

TIM (= Time of station [-:], not in CHK!!)  
DAT (=date of station [-.], not in CHK!!)

The selection of sensors is done by ADMIN SET HTTP, the identical to KEN or ABO, i.e. ADMIN SET HTTP \*\* ?5 te,dr,fe

HTTP output can be activated or deactivated with ADMIN SET PERMIT 12 ON/OFF.

When it is activated, in addition all warnings normally only sent to the administrator will be sent to the URL. The format looks like follows:

i.e.:

`http://www.myserver.de/mws/input.php?STA=1&WRN=4&LVL=10.5&LMT=11.0`

STA (=station address [ADMIN STATION x IDENT <adr>])  
WRN (= Warnindex [ADMIN GET WARN])  
LVL (= Voltage level, only when WRN < 5)  
LMT (= Limit, having been exeeded or dropping below)

A little overview about Accesspoint Nams (APN) you'll find in the technical appendix under 5.7 (APN list)

An accesspoint list zou |ll find here: [APN-List](#)

## 3.11 Transmission via SMTP

(Since firmware V1.6)

Similar to transfer via HTTP a CT63 mobile phone needs to be installed (since 09/10) and the GPRS connection must be established via accesspoint (APN).

ADMIN MOBILE GPRS ADDRESS "<accesspointname>“,

ADMIN MOBILE GPRS NAME "<username>“ and

ADMIN MOBILE GPRS PASSWD "<password>“ will perform this.

Username and password only will be needed when the provider demands this.

Furtermore an email server which provides transmitting emails via SMTP is needed.

This is established with

ADMIN MOBILE SMTP ADDRESS "<server name:port#>“.

Username and password can be saved with

ADMIN MOBILE SMTP NAME "<log\_in name>“, or

ADMIN MOBILE SMTP PASSWD "<password>“.

With ADMIN MOBILE SMTP EMAIL "<own email address>“ the sender email address is set.

TIP:

Most times the email must contain a part of the username or the user needs to be stored in plain text for the email is sent at all, i.e.

„Hans Muster <muster.hans@example.com>“

Data can be retrieved via

ADMIN GET MOBILE SMTP, the password, however, is covered ().

Example: Establishing of O2 (postpaid) as GPRS-APN (see also 4.7 APN list):

ADMIN MOBILE GPRS ADDRESS "internet“

Delete previous username and password: For O2 does not demands authentication, only inverted commas need to be inserted:

ADMIN MOBILE GPRS NAME ""

ADMIN MOBILE GPRS PASSWD ""

For example we now can use O2 als email sender, but any other email provider with SMTP/Pop3 access is possible (i.e. Hotmail, Web.de, GMX, and so on).

ADMIN MOBILE SMTP ADDRESS "mail.o2online.de:25“

With ":25“ the port is set. At O2 this is the standard SMTP port.

At AOL this would be port 587, for example:

ADMIN MOBILE SMTP ADDRESS "smtp.de.aol.com:587“

Then email account, username (and password, if needed) of email account holder are set.

```
ADMIN MOBILE SMTP EMAIL „Hans Muster <hans.muster@o2online.de>“  
ADMIN MOBILE SMTP NAME „hans.muster@o2online.de“  
ADMIN MOBILE SMTP PASSWD ""
```

These data you should have got when you established the account. In principle these data don't differ from retrieving / writing email via PC software like OUTLOOK or any others.

Now an ABO can be established, which points to an external (someone else's) email account.

```
ABO user@web.de +8,Sa10,So10 te,dr,fe
```

Herewith each working day at 8 o'clock, on Saturday and on Sunday at 10 o'clock an email to user@web.de with data of temperature, air pressure and humidity will be sent.

The sender is the previously set „Hans Muster <hans.muster@o2online.de>“.

It would be useful to create an email account with a name like "weather-station", for the email recipient then already may recognize from the sender name, what the received email may contains.

A little overview about Accesspoint Nams (APN) you'll find in the technical appendix under 4.7 (APN list)

Extract from [The Mobile Broadband User blog](#), [APN-List](#)

## 3.12 Setting time limit for connection

(Since firmwareversion 1.2)

With the command

`*CONNECT LIMIT x`

you can set the maximum connection time to x minutes (default: x = 1440).

If this time is elapsed the connection is closed automatically.

With the command

`*CONNECT OFF`

the connection is immediately closed and an eventually data logger request to the weather station is interrupted.

(Since firmwareversion 1.3)

The command

`*CONNECT DATA`

shows details of connection:

`CONNECT DATA`

`>NUMBER +49xxxxxx`

`>LIMIT xx minutes left`

## 3.13 Manually operation via terminal software

You can read weather data via GSM900 module either with the delivered Reinhardt software "weather32" or manually with a terminal software (i.e. hyperterminal).

In any case you need a modem, better a cellular phone with USB-port for connection to a computer.

The Reinhardt USB-PC module needs following settings:

115200 baud, 8 databits, no parity, 1 stopbit, no protocol. When connecting to a computer, a virtual COM-port is created for calling the GSM900 module.

Operation with Reinhardt software is described in the manual of the Reinhardt software [Weather32](#).

When connecting via terminal software you perform this with AT commands.

For calling the GSM900 module, you type the command ATD <number of the GSM900>.

Establishing the connection may need more than 30 seconds!

When the connection is established, you'll receive a CONNECT message and the transmission rate via GSM.

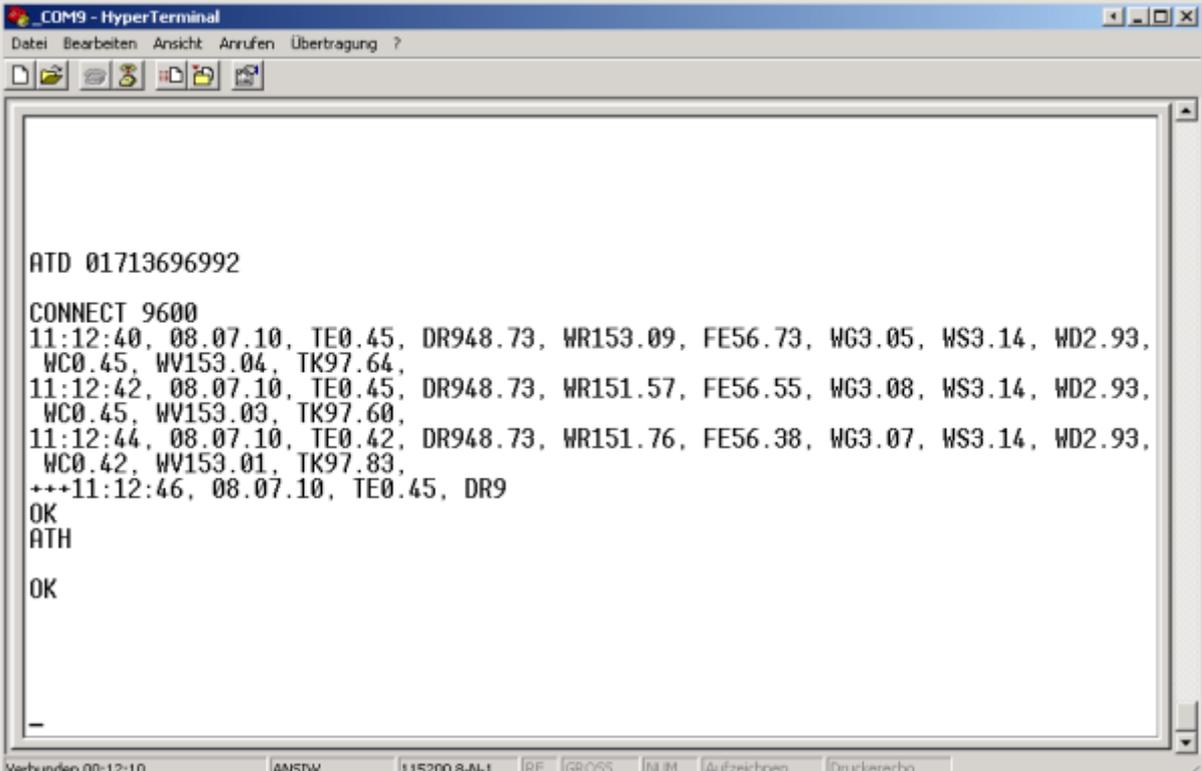
Now all 2 seconds a dataset will be received and you can control the weather station with the commands described in the manual for the respective weather station (i.e. [MWS 9-5](#)).

For disconnecting from the GSM900 module you first type 3 plus signs to reach the USB-PC module and then type the disconnect command ATH. When disconnection was successful you'll get an OK.

Don't forget to disconnect. Otherways you'll get very high telephone costs!

Refer to command CONNECT (limit) or chapter 3.12.

An example for connection with hyperterminal you'll find below::



```
_COM9 - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?
[Icons]

ATD 01713696992

CONNECT 9600
11:12:40, 08.07.10, TE0.45, DR948.73, WR153.09, FE56.73, WG3.05, WS3.14, WD2.93,
WC0.45, WV153.04, TK97.64,
11:12:42, 08.07.10, TE0.45, DR948.73, WR151.57, FE56.55, WG3.08, WS3.14, WD2.93,
WC0.45, WV153.03, TK97.60,
11:12:44, 08.07.10, TE0.42, DR948.73, WR151.76, FE56.38, WG3.07, WS3.14, WD2.93,
WC0.42, WV153.01, TK97.83,
+++11:12:46, 08.07.10, TE0.45, DR9
OK
ATH
OK

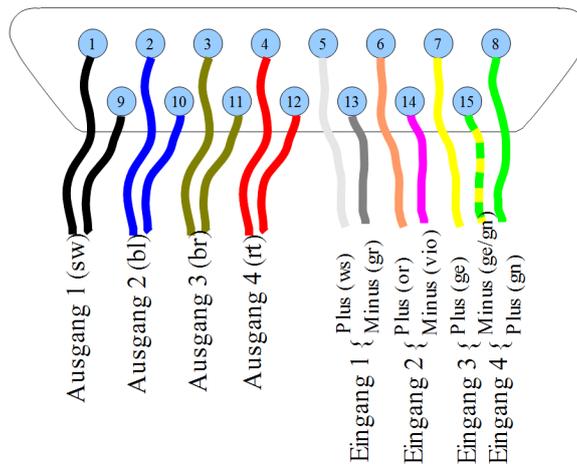
Verbunden 00:12:10  ANSW  115200 8-N-1  RF  GROSS  NUM  Aufzeichnen  Druckerecho
```

## 4 Control-Measuring Module

The Control-Measuring Module consists of an additional board within the GSM900 housing, containing 8 photo-MOS relays connected to a 15-pole connector (D-SUB). 4 relays are configured as outputs 4 are configured as inputs.

The connector of the Control-Measuring Module is protected by a protective cap which absolutely necessarily must be placed on the connector when the GSM900 is used without the cable of the Control-Measuring Module. When connecting the cable remove the protective cap and keep it safe.

Layout of connector:



The input recognizes a high, when the signal level between plus and minus is higher than 3VDC and maximum 48VDC. Input current is app. 1ma up to 30mA at 48VDC. Short voltage peaks higher than 48VDC are cut by suppressor diodes.

The sensors of the GSM900 Module:

(STATION 0)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
Date	Time	Supply voltage	CMM output 1	CMM output 2	CMM output 3	CMM output 4	reserved	reserved	reserved	reserved	reserved	reserved	CMM input 1	CMM input 2	CMM input 3	CMM input 4	reserved	Signal quality															

The outputs may be switched manually with the command:

```
DATA <Ausgang> <on/off>,<Ausgang> <on/off>, <...>
```

which also returns the conditions of all inputs and outputs.

For switching outputs automatically depending on increasing or decreasing fixed values of sensors you can set a term for each output, which causes switching the output in case of matching condition. (Also see ALERTS)

To perform this, you need to deliver the term of condition to the GSM900 sensors in administrator level:

```
ADMIN STATION 0 SENSOR x TERM <hour>,<...> <term1><logical link>  
<Term2><logical link><Term3>
```

Explanation:

With station 0 you'll get access to the 32 sensors of the GSM900 itself, which contain the inputs and outputs. Sensors 1, 2 and 3 are predefined by date, clock and supply voltage.

From sensor 4 you'll find the outputs (output 1 is sensor 4, output 2 is sensor 5, ...).

From sensor 14 you'll find the inputs (input 1 is sensor 14, input 2 is sensor 15, ...).

So in the example above i.e. x = 4 for output 1.

With <hour> the period of time for which the automatic detection should be active can be selected. Like in the ALERTs you may add different hours separated by comma, or symbols \* (for whole day) and + (for 8:00 a.m. to 6:59 p.m.).

Important: A BLANK must be set between the hours and the terms, but you **must not** set BLANKs between the hours itself!

For <term> the sensor's identifier, the condition operator and the limit value has to be inserted. Condition operators may be < (smaller), <= (smaller or equal), = (equal), >= (bigger or equal), > (bigger) or <> (different).

The limit value is any number, with or without decimal point. If you set numbers with decimal point the separator must be a ".", i.e. 10.3.

The limit value also may be a range, then the lower and the upper value must be set in brackets, separated by comma. In this case only = (equal) or <> (different) are allowed!

As <logical link> only & (and) or + (or) are allowed.

An overview about the default assignments and sensor's identifiers you'll find in the technical appendix.

Examples:

**ADMIN STATION 0 SENSOR 5 TERM 12,13 so>300**

checks from noon to 13:59 p.m., if the solar radiation increases 300 W/m<sup>2</sup> and switches output 2 if this condition gets true. If this value (300 W/m<sup>2</sup>) is decreased, output 2 switches off.

**ADMIN STATION 0 SENSOR 4 TERM \* te<0**

checks permanently and switches on output 1, if temperature goes below 0°C. Above 0°C output 1 switches off.

**ADMIN STATION 0 SENSOR 6 TERM \*?15 te<0.5**

checks permanently and switches on output 3, if temperatur decreases 0,5°C. After switching on checking is stopped for 15 minutes to avoid that the output switches too often when the value stays near 0,5°C (like a threshold).

**ADMIN STATION 0 SENSOR 4 TERM \*!8“3 te<10 & wg>10**

checks permanently and switches on output 1 if the temperature is below 10°C and the windspeed is above 10 km/h for at least 8 data strings. Output 1 will be switched off if either the temperature is above 10°C for 3 data strings or the windspeed gets lower than 10 km/h for 3 data strings. This is to avoid that short peaks lead to switching of an output.

**ADMIN STATION 0 SENSOR 7 TERM \*!3 wg>10 & wr<>(10,350)**

checks permanently and switches on output 4 if the windspeed is higher than 10 km/h for 3 data strings and the wind comes from north direction (between 350° and 10°). Output 1 switches off immediately if this condition is not true anymore.

For getting access to the inputs and outputs of the Control-Measuring Module in front of the sensor's identifier the identifier of the station must be set (GSM900 = 0, Weather station = 1).

**ADMIN STATION 0 SENSOR 7 TERM \*!3 @0 E1=0 & @1 wg>10**

checks permanently and switches on output 4 if for 3 data strings the wind speed is higher than 10 km/h AND input 1 is low (< 3VDV). If this condition becomes flase, output 4 switches off immediately.

The outputs may be cascaded but a circle dependency must be avoided in any case:

**ADMIN STATION 0 SENSOR 4 TERM \*!3 wg>10 & wr<>(10,350)**

**ADMIN STATION 0 SENSOR 5 TERM \*!3 @0 A1=0 & @1 te<15**

checks permanently and switches on output 1 when for 3 data strings the wind speed is higher than 10 km/h and the wind direction is from north (+/- 10°). Output 2 is switched on when in addition the temperature decreases 15°C (for 3 data strings).

When output 1 swiches off also output 2 is switched off.

To change an existing automatic switch the command ADMIN STATION 0 SENSOR x TERM... only has to be input again.

Automatic switching can be disabled completely with the command:

**ADMIN STATION 0 SENSOR x TERM OFF**

The outputs can be switched only manually in this case, if allowed by ADMIN SET PERMIT

To check the conditions you entered you can read any output like an input with:

**ADMIN GET STATION 0 SENSOR x**

In addition to the identifier, the name, the unit and the current value the parameters TIME (=period of time of activity), INHIBIT (=idle time in minutes after switching on), DELAY\_ON (=switch on delay in counted data strings), DELAY\_OFF (=switch off delay in counted data strings), and the TERM by itself are displayed:

```
STATION 0 SENSOR 4
>IDENT A1
>NAME output1
>UNIT
>DATA 1.00
->TIME 0-23,
->INHIBIT 0 (0 left)
->DELAY-ON 1 (1 left)
->DELAY-OFF 1 (1 left)
->TERM [E1=0.00] & [WG>10.00]
```



**CAUTION: The reaction of the Control-Measuring Module is not performed in real time. A delay of several seconds may occur!**

Further information for programming the Control-Measuring Module you'll find under:  
**ADMIN STATION <Station> SENSOR <Sensor> TERM <Term>**

## 5 Technical appendix

### 5.1 Command overview

ABO	Creates one of 10 hourly weather subscription text messages
KEN or IDENT	Text message dispatching of current weather data
ALARM	Creates one of 10 alert text messages with up to 3 alert conditions
TRACK	Stores up to 10 numbers for sending raw weather data
DATA	Controlling the S/M board, Display of in / outputs (Option)
LEVEL	Displays the current voltage of the power supply
UPDATE	(Not available at the moment)
CONNECT	
├─DATA	Shows connection data (number, minutes left for connection)
├─LIMIT	Sets maximum time for active connection until automatic disconnect
└─OFF	Immediately disconnects active connection and cancels logger request to weather station
ADMIN	
├─MOBILE	
├─PIN	Records the PIN
├─PUK	Records the PUK (Private user key)
├─TEL	Records additional telephone key
├─SMSC	States the number of the SMS exchange center
├─LIMIT	Limits the maximum number of text messages per week
├─BEARER	Switches between analog (standard) and ISDN connection
├─GPRS	
├─ADDRESS	Refers the necessary access point for GPRS connection to GSM900 module
├─NAME	Specifies the user name for GPRS connection ("" when no user name is required)
└─PASSWD	Specifies the password for GPRS connection ("" when no password is required)
├─HTTP	
├─ADDRESS	Refers the recipient address (URL) of the HTTP site for data transmission
├─NAME	Specifies the user name for GPRS connection ("" when no user name is required)
└─PASSWD	Specifies the password for GPRS connection ("" when no password is required)
├─SMTP	
├─ADDRESS	Email (-address) of an account at a provider
├─NAME	Specifies the user name for SMTP connection ("" when no user name is required)
├─EMAIL	Specifies the own email address (sender)
└─PASSWD	Specifies the password for SMTP connection ("" when no password is required)
├─STATION	
├─IDENT	States the address of the station
├─BAUD	Sets the BAUD-rate of the station (must be the same as of weather station)
├─NAME	States the name of weather station (prefixed to the sensors)
├─SENSOR	
├─KEN or IDENT	States the sensor identifier of the weather station's sensor
├─NAME	States the complete sensor name
├─UNIT	States the sensor's unit
└─TERM	For controlling the Control- Measure Module
├─ON	Switches the weather station on
└─OFF	Switches the weather station off
└─.....	

# Manual GSM900 Module for Weather Stations

ADMIN	
┌ SET	
└ NUMBER	Register administrator telephone number
└ POWER	Set Powersave-Mode
└ WARN	States warnings to the administrator
└ PERMIT	States restrictions
└ INCLUDE	Record one of 10 telephone numbers having access to the system
└ EXCLUDE	Record one of 10 telephone numbers refused having access to the system
└ LEVEL	States voltage thresholds for power supply controls
└ KEN or IDENT	States default sensors for unknown callers
└ HTTP	Timing for data transfer via HTTP
└ ┌ -ERR	Settings for troubleshooting (not recommended for the user!)
┌ GET	
└ NUMBER	Request of administrator telephone number
└ POWER	Request power save mode
└ WARN	Displays configuration of administrator warnings
└ PERMIT	Display authoring- and message restrictions
└ ABO	Display all 10 subscriptions
└ ALARM	Display all 10 alert numbers
└ INCLUDE	Display all 10 allowed telephone numbers
└ EXCLUDE	Display all 10 refused telephone numbers
└ MOBILE	Display the cellular phone parameters (PIN, PUK...)
└ LEVEL	Request of the voltage limits
└ KEN or LEVEL	Display the standard sensors
└ STATION	Display of the station's parameters (name, BAUD-rate..)
└ ┌ _SENSOR	Display of the sensor parameters (sensor ident, name, unit)
└ LOG	Shows the last 12 actions
└ ERR	Shows an error listing
└ MOBILE	
└ ┌ GPRS	Shows the GPRS settings
└ ┌ HTTP	Shows the HTTP settings
└ ┌ SMTP	Shows the SMTP settings
┌ REMOVE	
└ ABO	Delete one or all subscription positions / numbers
└ ALARM	Delete one or all alert positions / numbers
└ TRACK	Delete one or all recipients getting a text message / email including raw weather data
└ INCLUDE	Delete one or all access positions / numbers
└ EXCLUDE	Delete one or all exclusion positions / numbers
└ CONNECT OFF	Immediately disconnects active connection and cancels logger request to weather station
└ OFF	Swich off the entire system (GSM900 & weather station)
└ SEND	Sends a text message to all alarm numbers and subscribers
└ ┌ ABO	Sends a text message to all subscribers
└ ┌ ALARM	Sends a text message to all alarm numbers

## 5.1.1 Commands for troubleshooting

**ADMIN SET ERR 14 ON**  
**OFF**

Forces initialisation of the mobile phone when the HTTP transmission fails 6 times.

**ADMIN SET ERR 15 ON**  
**OFF**

Forces a complete reset at midnight. The weather station is also reset in this case.

**CAUTION:** After performing these settings you must unplug the power supply of the GSM900 for app. 5 seconds and then reconnect it, to activate the new settings

## 5.2 Command reference

**KEN** <sensor id>,<sensor id>,<sensor id>,<...>

requests the current weather data if this function has been released (see ADMIN SET PERMIT), where <sensor id> *is the sensor identifier (2 letters)* of the respective sensor.

You will find the standard allocation of the sensors under 4.3 *STANDARD ALLOCATION OF THE SENSORS*.

Example for a sensor request (you can use capital or small letters):

KEN te,Dr,fE

The text message you receive looks as follows:

ABO

Station 1

Temperature: 22.30 °C

Pressure: 1013.24 hPa

Humidity: 55.78 %

Cable connection and GSM connection:

\***KEN** <telephone number> <sensor id>,<sensor id>,<ensor id>,<...>

sends a text message to the specified telephone number.



**Important: Do not forget the blank between the telephone number and the first sensor identifier!!**

---

**ABO** <Weekday><Hour>,<.><.>,<.><.> <sensor id>,<sensor id>,<sensor id>,<...>

creates a subscription which sends a text message on the specified weekdays at every specified full hour, if this function has been released (see ADMIN SET PERMIT),

You will find the standard allocation of the sensors under 4.3 *STANDARD ALLOCATION OF THE SENSORS*.



**The blank between <Hour> and <sensor id> is important whereas there must not be a blank between <Weekday> and <Hour>!!!**

To abbreviate the command length, the hours of one weekday can be pooled as follows:

ABO Mo8,20,di10,14 te,dr,fe

This causes a text message on Monday at 8 a.m. and 8 p.m. and on Tuesday at 10 a.m. and 2 p.m. including Temperature, Pressure and Humidity.

Further there are \* and + as wildcards. \* means daily, + from Monday to Friday. Example:

ABO \*9,11,18,+7,20,so15 wg,wr

You get a daily text message at 9 a.m., 11 a.m. and 6 p.m., from Monday to Friday at 7 a.m. and 8 p.m. and on Sunday at 3 p.m. including Windspeed and Winddirection.



**For every telephone number you can create a subscription; additional subscription commands change the subscription.**

You get a message if your subscription was created successfully or not, if this function has been released (see ADMIN SET PERMIT),

Cable connection:

\***ABO** <recipient> <Weekday><Hour>,<.><.> <sensor id>,<sensor id>,<...>

subscribes to the specified *recipient* (telephone number or email address).

**The blank between telephone number and weekday is important.**

You'll get a message or email if your subscription was created successfully or not, if this function has been released (see ADMIN SET PERMIT),

GSM-Connection:

\***ABO** <Weekday><Hour>,<.><.>,<.><.> <sensor id>,<sensor id>,<sensor id>,<...>

subscribes the telephone number of the current connection.

---

### **ABO REMOVE**

deletes an existing subscription. After using this command no text messages to the specified telephone number is transmitted.

You'll get a message if your subscription was deleted successfully or not, if this function has been released (see ADMIN SET PERMIT),

#### Cable connection:

**\*ABO REMOVE** <recipient>

deletes the subscription of the specified telephone number or email address.

You'll get a message to the specified telephone number or email address if your subscription was deleted successfully or not, if this function has been released (see ADMIN SET PERMIT),

#### GSM-Connection:

**\*ABO REMOVE**

deletes the subscription of the current connection.

---

**ALARM** <Hour>,<Hour>,<..> <Term1><Link><Term2><Link><Term3>

creates an alert rule with up to 3 terms which is activated at the specified hours. A text message is sent if all conditions specified by the terms are true, if this function has been released (see ADMIN SET PERMIT).

<Term> is a sensor id, an operator and a threshold value, where valid operators are < (less than), <= (less or equal), = (equal), >= (greater or equal), > (greater than) or <> (unequal).



**The threshold value is a value with or without decimal places (if you set a decimal place the separator must be a dot ".")!!**

The threshold value can also be a range. In this case you must set brackets, a lower value and, separated by comma, an upper value. The valid operators here are only = (equal) and <> (unequal)! Only & (and) or + (or) are allowed as junctions.

You find the standard allocation of the sensors under 4.3 *STANDARD ALLOCATION OF THE SENSORS*.



**The blank between <Hour> and <Term> is important whereas there must not be a blank between the <Hours>!!**

To abbreviate the command length there is wildcard \*, which chooses 24 hours, and +, which chooses the hours from 8 a.m. to 6 p.m..

Example:

```
ALARM 8,9,10,11,12 te<12.5 & re>0
```

checks from 8 a.m. including 12:59, if the temperature is lower than 12.5 °C AND the amount of rain is greater than 0. In this case a alert text message with the current weather data and the alert rules will be sent:

```
ALARM
```

```
Station 1
```

```
Temperature: 12.3°C (<12.5) &
```

```
Precipitation: 0.5 l/m2 (>0)
```

```
ALARM * te=(10,25) + wg>10
```

checks 24 hours a day if the temperature is between 10 °C and 25 °C. If this is true, an alert text message is sent as well as when the windspeed is greater than 10 km/h.

To avoid getting repetetive text messages due to durable true alert conditions, after an alert text message was sent, the alert rule is only released by default after one hour has passed.

If you want to shorten or lengthen this idle time, you can insert the desired idle time in minutes (5 to 255) directly after the hour separated by an ? (question mark).

Example:

```
ALARM +,19?15 wg > 10 & wr<>(135,235)
```

checks daily from 8 a.m. to 19:59 (+ means hour 8 a.m. to hour 6 p.m. and explicit hour 7 p.m.) if the windspeed is greater than 10 km/h and the winddirection is NOT from south directions (south east to south west). For example an alert text message is sent, if the wind comes from North with 12 km/h. After this alert text message a renewed alert text message is onlysent after 15 minutes have passed!

With the parameter ! you can set a delay, in which the alert condition must be valid continuous. The delay is dependent on the data strings sent by the weather station, i.e. each 2 seconds at MWS 5M or each second at MWS 3. An alert rule like

## ALARM +!5 te>30

would check from 8.00 a.m. to 6.59 p.m., if the temperature increases 30°C. If this condition is valid for 5 consecutive data sets (= 10 seconds at MWS 5M), a SMS is sent (with idle time of 60 minutes).

It is important, that this parameter directly follows the time(s) (without blank) like the idle time (parameter ?). The order of parameters (if issued) doesn't matter.

Possible values for the delay time are 1 (=default) to 32.000. A special case is the value 0, which only uses the values written into the station's data logger. This is usefull with sensors resetted by the weather station depending on the storage interval, i.e. windpeak or wind average.

The value of the idle time (parameter ?) can have values from 5 to 32000 minutes (default = 60). The old synthax may be used as well, for the delay is set to 1 and the idle time is set to 60 if not used.

With

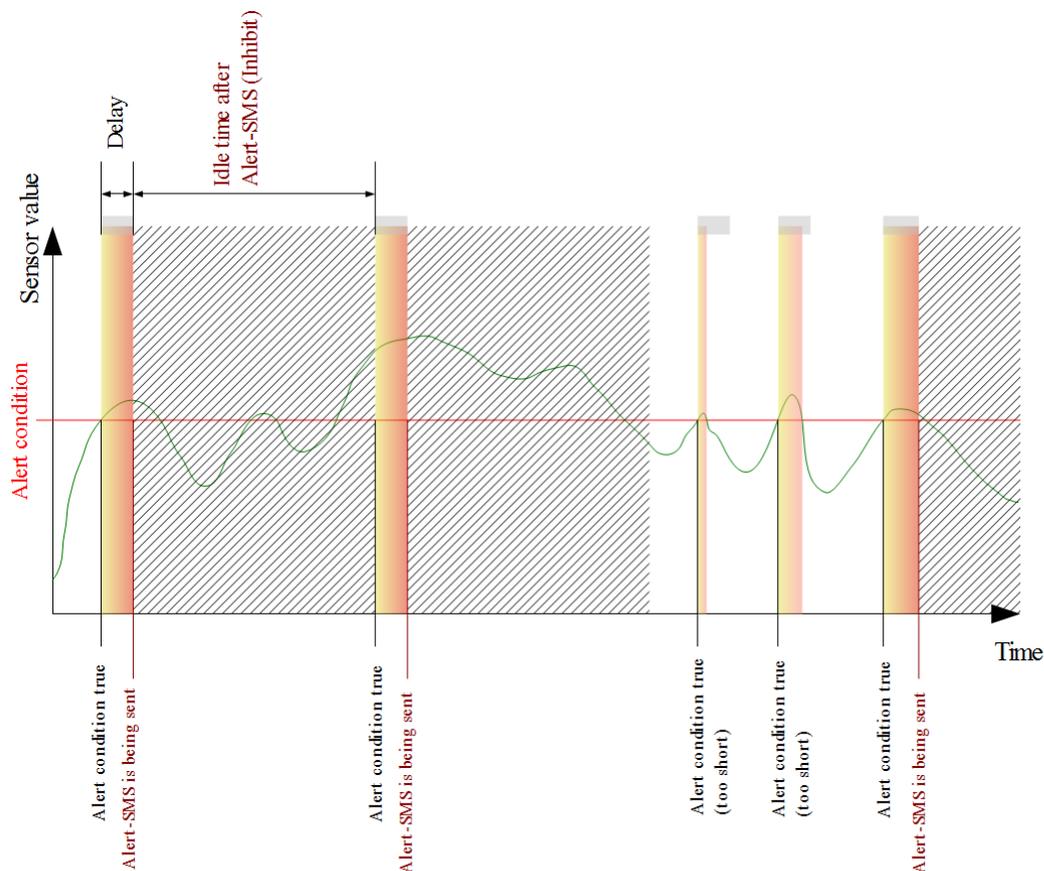
## ALARM 10,11,12 wg>10.5

a SMS is sent, as soon as the windspeed increases 10,5 km/h within 10 a.m. to 0.59 p.m. with an idle time of 60 minutes.

The following diagram shows the coherences between the parameters delay (!) and idle time (?), i.e. with **ALARM 6,7,8,9!30?10 Sensor>=Alert condition**

-> delay = 30 daten strings (= 1 minute at MWS5M)

-> idle time = 10 minutes





**For every telephone number only one alert rule can be created. Entering alarm conditions again will only change the rule.**

You get a message if your alert rule was created successfully or not, if this function has been released (see ADMIN SET PERMIT),

Cable connection:

```
*ALARM <recipient> <Hour>,<..> <Term1><Link><Term2>  
<Link><Term3>
```

creates an alert rule for the specified telephone number or email address.



**The blank between recipient and Hour is important!**

You'll get a message to the specified telephone number or email address, if your alert rule was created successfully or not, if this function has been released (see ADMIN SET PERMIT),

GSM-Connection:

```
*ALARM <Hour>,<Hour>,<..> <Term1><Link><Term2><Link><Term3>
```

creates an alert rule for the current telephone number.

---

## ALARM REMOVE

deletes an existing alert rule. After performing this, no alert text message is sent to the specified telephone number.

You'll get a message to the specified telephone number, if your alert rule was deleted successfully or not, if this function has been released (see ADMIN SET PERMIT),

Cable connection:

```
*ALARM REMOVE <recipient>
```

deletes an existing alert rule for the specified telephone number or email address.

After performing this, no more alert message is sent to the specified telephone number or email address.

You'll get a message to the specified telephone number or email address, if your alert rule was deleted successfully or not, if this function has been released (see ADMIN SET PERMIT),

GSM-connection:

```
*ALARM REMOVE
```

deletes the existing alert rule for the current telephone number.

**TRACK <Day><Time>,<Day><Time>,.... @<station> ?<multiplier>**

You can store up to 10 numbers receiving a text message containing raw weather data.

Raw data are equal to data string of weather station, i.e:

13:05:50, 10.09.10, TE25.02, DR949.09, FE25.23, WG4.31, WS4.77, WD4.15, {13}{10}

Input of day / time is the same as in ABO.

Parameter @station:

Name or number of station (only with RS485). Is set to 1, when missing (=MWS). (0 = GSM)

Parameter ?multiplier:

Multiple of storage interval of weather station. Is set to 1 when missing.

The weather station sends a synchronisation sign each time it writes into the logger so the GSM900 recognizes storing of weather data and storage interval. In this case each time the station stores into the logger a text message would be sent.

With ? = 3 data would be sent each 15 Minutes at a 5 minutes storage interval.endet werden.

Example:

**TRACK Mo12,13,14,15,Sa\*,So\* ?6**

creates a text message with raw data from Saturday 0:00 to Sunday 23:59 and Monday from 12:00 to 15:59.

With

**TRACK REMOVE**

sending of raw weather data can be cancelled. (Like ABO or ALARM)

Cable-connection:

**\*TRACK <recipient><Day><Time>,<Day><Time>,.... @<station> ? <multiplier>**

GSM-connection:

**\*TRACK <Day><Time>,<Day><Time>,.... @<station> ? <multiplier>**

---

## **DATA [<output> <on/off>,<output> <on/off>, ...]**

is used for showing or switching the input and outputs of the Control-Measuring Module.

To switch on or switch off one or more outputs, you need to add the name of the respective output(s) (i.e. A1) behind the command and separated by a BLANK either add "on" or a "1" for switching on or add "off" or "0" for switching off the respective output.

Further outputs must be separated by comma or BLANK.

To switch the outputs manually this feature must be enabled (see ADMIN SET PERMIT).

The command DATA always shows the current condition of the inputs and the outputs, whether used with or without parameters.

i.e.

**DATA A1 on A2 off A3 1,A4 0**

gives the following output:

```
DATA
GSM-MWS
>Ausgang1: 1.00
>Ausgang2: 0.00
>Ausgang3: 1.00
>Ausgang4: 0.00
>Eingang1: 0.00
>Eingang2: 0.00
>Eingang3: 0.00
>Eingang4: 0.00
```

where 1.00 means, that the output relais is switched on or a voltage above 3 VDC is at the input. When the value is 0.00 the respective output relais is switched off or the voltage at the respective input is below 2,5 VDC.

A following command:

## **DATA**

would lead to the same output, if the inputs haven't changed in the meantime.

**CAUTION:**

You may overwrite an automatic switching set by ADMIN STATION 0 SENSOR x TERM ... with the DATA command. Anyway, this you shouldn't perform if possible, or only be done in idle times of the automatic switchings for within the next seconds the automatic will switch back to the previous constellation.

Cable and GSM connection:

**\*DATA [<output> <on/off>,<output> <on/off>, ...]**

---

## **LEVEL**

shows the current value of the power supply voltage.

Cable and GSM connection:

**\*LEVEL**

---

## **CONNECT DATA**

Shows details of connection:

```
CONNECT DATA
>NUMBER +49xxxxxx
>LIMIT xx minutes left
```

Cable and GSM connection:

**\*CONNECT DATA**

---

## **CONNECT LIMIT x**

You can set the maximum connection time to x minutes (default: x = 1440).  
If this time is elapsed the connection is closed automatically.

Cable and GSM connection:

**\*CONNECT LIMIT x**

---

## **CONNECT OFF**

The connection is immediately closed and an eventually data logger request to the weather station is interrupted.

Cable and GSM connection:

**\*CONNECT OFF**

---

---

## ADMIN

All ADMIN-commands are specified for mobile or modem operation transmitted from the administrator telephone number! In all other cases the IMEI must be added after the ADMIN command!

Example:

```
ADMIN 123451234512345 GET MOBILE
```

For that please also see **3.2 Establishing the Administrator**.

---

### ADMIN MOBILE PIN <PIN>

sets the PIN which the GSM900 answers with on PIN request of the SIM card. It must be the same as the PIN of your SIM card, if the PIN request of your SIM card was not disabled! Without PIN the GSM900 only works in cable connection modes. The GSM is disabled because it cannot be started. So no text messages or GSM connections are available!

Cable and GSM connection:

```
*ADMIN MOBILE PIN <PIN>
```

---

### ADMIN MOBILE PUK <PUK>

sets the PUK which the GSM900 answers with on PUK request of the SIM card. This comes into effect when the PIN was inserted wrongly for three times. For this, the PUK must be the same as the PUK of your SIM card or left blank, if the GSM900 should not answer to PUK request! If this happens, you must remove the SIM card from the cellular phone of the GSM900 and insert the PUK with any other mobile phone. If the GSM900 was started three times with the wrong PIN and three times with the wrong PUK, you must remove the SIM card from the cellular phone of the GSM900 and insert the PUK2 with any other mobile phone.

Cable and GSM connection:

```
*ADMIN MOBILE PUK <PUK>
```

---

### ADMIN MOBILE TEL <telephone number>

sets the telephone number which the GSM900 answers with on an activated telephone code request. This only is used with a modem other than the GSM900's MC35i (Siemens).

Cable and GSM connection:

```
*ADMIN MOBILE TEL <telephone number>
```

---

## **ADMIN MOBILE SMSC** <telephone number>

sets the number of the SMS exchange which is responsible for text messages. You get this number from your provider.

Normally the SMSC need not be specified, because this number is stored on the SIM card. Specify this number only when there are difficulties sending text messages.

Cable and GSM connection:

\***ADMIN MOBILE SMSC** <telephone number>

---

## **ADMIN MOBILE LIMIT** <number>

sets the maximum number of text messages to be sent per week. So you can restrict the number of text messages arising by subscriptions, alerts, downloading current weather data and requests. **Regardless of this, warnings to the administrator are sent if released (see ADMIN SET WARN).**



If the function is released you get a warning message to the administrator telephone number, if the maximum number of text messages was sent.

So if you allow warnings to be sent and for example have a SMS flatrate with 100 text messages, you should limit the maximum number of text messages to 90 as a precaution so that 10 free SMS are left for warnings.

Cable and GSM connection:

\***ADMIN MOBILE LIMIT** <number>

---

## **ADMIN MOBILE BEARER V.32**

Allows analog data services (standard = analog/RLP with 9600 baud))

## **ADMIN MOBILE BEARER V.110**

Allows digital dataservices (i.e. ISDN). When using a mobile phone, you need to set it into digital mode with the command AT+CBST=71 before dialing the number of the GSM900 (mode V.110 with 9600 baud).

With the Reinhardt software you perform this in the menu **Settings of weather data** under **Connection parameters** and **Settings**. (Also see manual of weather32 software).

Cable and GSM connection:

\***ADMIN MOBILE BEARER V.32**

\***ADMIN MOBILE BEARER V.110**

---

## **ADMIN MOBILE GPRS ADDRESS "<access-point-address>"**

Refers the necessary access point for GPRS connection to GSM. This address is supplied by the provider for internet access via a mobile phone.

**IMPORTANT:** set address with inverted commas ("address"),  
i.e. ADMIN MOBILE GPRS ADDRESS "gprs.provider.de"

### Cable and GSM connection:

**\*ADMIN MOBILE GPRS ADDRESS "<access-point-address>"**

---

## **ADMIN MOBILE GPRS NAME "<user-name>"**

When a user name is needed for GPRS log in, you must specify it in here.

**IMPORTANT:** set name with inverted commas ("name")

If no authentication is needed for accessing GPRS, GPRS NAME and GPRS PASSWD must be set with 2 inverted commas ("").

### Cable and GSM connection:

**\*ADMIN MOBILE GPRS NAME "<user-name>"**

---

## **ADMIN MOBILE GPRS PASSWD "<user-password>"**

When a password and user name is need for log in to GPRS, the password must be defined.

**IMPORTANT:** set password with inverted commas ("password")

If no authentication is needed for accessing GPRS, GPRS NAME and GPRS PASSWD must be set with 2 inverted commas ("").

### Cable and GSM connection:

**\*ADMIN MOBILE GPRS PASSWD "<user-password>"**

---

## **ADMIN MOBILE HTTP ADDRESS "<url>"**

Refers the recipient address (=URL) of the HTTP site. The sensors are added to this address and transferred to the site via GET method.

**IMPORTANT:** set address with inverted commas ("address")

i.e. ADMIN MOBILE HTTP ADDRESS "http://www.myserver.de/weather/input.php"

**IMPORTANT: The address must start with http:// !**

Cable and GSM connection:

**\*ADMIN MOBILE HTTP ADDRESS "<url>"**

---

## **ADMIN MOBILE HTTP NAME "<user-name>"**

When a user name is needed for GPRS log in, you must specify it in here.

**IMPORTANT:** set name with inverted commas ("name")

If no authentication is needed for accessing GPRS, HTTP NAME and HTTP PASSWD must be set with 2 inverted commas ("").

Cable and GSM connection:

**\*ADMIN MOBILE HTTP NAME "<user-name>"**

---

## **ADMIN MOBILE HTTP PASSWD "<user-password>"**

When a password and user name is need for log in to GPRS, the password must be defined.

**IMPORTANT:** set password with inverted commas ("password")

If no authentication is needed for accessing GPRS, HTTP NAME and HTTP PASSWD must be set with 2 inverted commas ("").

Cable and GSM connection:

**\*ADMIN MOBILE HTTP PASSWD "<user-password>"**

---

## **ADMIN MOBILE SMTP ADDRESS "<outgoing mail server:port#>"**

Refers the name and port of outgoing mail server. Over this SMTP server the mail are being sent.  
IMPORTANT: set server name and port with inverted commas ("server name:port#")  
i.e. ADMIN MOBILE SMTP ADDRESS "mail.o2online.de:25"

Cable and GSM connection:

**\*ADMIN MOBILE SMTP ADDRESS "<outgoing mail server:port#>"**

---

## **ADMIN MOBILE SMTP NAME "<Log\_in name>"**

Here you set the username for log in into your email account.  
IMPORTANT: set name with inverted commas ("name")  
If no authentication is needed, SMTP NAME and SMTP PASSWD must be set with 2 inverted commas only ("").

Cable and GSM connection:

**\*ADMIN MOBILE SMTP NAME "<Log\_in name>"**

---

## **ADMIN MOBILE SMTP EMAIL "<own email-address>"**

Here you set your own email address (sender).  
IMPORTANT: set email address with inverted commas ("email address")  
If no authentication is needed, SMTP NAME and SMTP PASSWD must be set with 2 inverted commas only ("").

Cable and GSM connection:

**\*ADMIN MOBILE SMTP EMAIL "<own email-address>"**

---

## **ADMIN MOBILE SMTP PASSWD "<log\_in password>"**

Here you set the password for log in into your email account.  
IMPORTANT: set password with inverted commas ("password")  
If no authentication is needed, SMTP NAME and SMTP PASSWD must be set with 2 inverted commas only ("").

Cable and GSM connection:

**\*ADMIN MOBILE SMTP PASSWD "<log\_in password>"**

---

---

This page is left free for further expansions!

## **ADMIN STATION** <Station> **IDENT** <Address>

sets the GSM900's address for RS485 bus. This must be set to the address of the desired station. This address only influences the HTTP mode. Here the address ist set in front of the sensors (=STA), also see 3.10 Transmission via HTTP.

<Station> in the range from 1 .. 4,

<Address> in the range from 1 .. 254.

Cable and GSM connection:

**\*ADMIN STATION** <Station> **IDENT** <Address>

---

## **ADMIN STATION** <Station> **BAUD** <Baudrate-Index>

sets the BAUD-rate of station x. This must be the same as the station's BAUD-rate, where <Station> = 0 (zero) is reserved for the GSM900 and determines with which BAUD-rate data are sent via the cable connection. Please note that the BAUD-rate of the GSM900 must be the same or higher than the weather station's BAUD-rate!

<Station> in the range from 0 .. 4.

<Baudrate-Index> (0..7) determines the BAUD-rate:

0 = 300 Baud	3 = 2400 Baud	6 = 19200 Baud
1 = 600 Baud	4 = 4800 Baud	7 = 38400 Baud
2 = 1200 Baud	5 = 9600 Baud (= Standard)	

Cable and GSM connection:

**\*ADMIN STATION** <Station> **BAUD** <Baudrate-Index>

---

## **ADMIN STATION** <Station> **NAME** <characters>

sets the station's name which appears in the headline of the text message above the sensors with its values.

<Station> in the range from 1 .. 4

<characters> are 19 arbitrary characters (Numbers, small or capital letters and special characters). Please note that the GSM character set does not include all characters (see table **GSM-Alphabet**) on the last page of this manual.

Use short names to ensure good readability of the text message!

Cable and GSM connection:

**\*ADMIN STATION** <Station> **NAME** <characters>

---



**ADMIN STATION** <Station> **SENSOR** <sensor> **KEN** <characters>

sets the sensor identifier of the <sensor> sensor of the chosen weather station. The GSM900 checks every data string of the weather station for this sensor identifier to read the appropriate sensor-value. For this the respective sensor ids of the weather station and of the GSM900 must match! <Station> must be in the range from 0 .. 4, where 0 (zero) is reserved for the GSM900.

<sensor> must be in the range from 1 ... 32.

<characters> are 2 capital letters.

To record a new sensor e.g. for the soil temperature whose sensor identifier you have already intergrated in the weather station (or already was contained in the weather station's data string), you type:

ADMIN STATION 1 SENSOR 8 KEN ST



Please note that in this case the sensor id must comprise 2 capital letters!

You find the standard allocation of the sensors under 4.3 *STANDARD ALLOCATION OF THE SENSORS*.

You find the procedure to implement a new sensor to the weather station in the respective manual of your weather station.

Cable and GSM connection:

\***ADMIN STATION** <Station> **SENSOR** <sensor> **KEN** <characters>

---

**ADMIN STATION** <Station> **SENSOR** <sensor> **NAME** <characters>

sets the sensor's name appearing instead of the sensor id in the text message.

If you do not enter any character, the sensor id is written. You find the standard allocation of the sensors in the appendix. To record e.g. sensor 8 ("BT" was set as sensor id - see above) as "soil temperature" (see above), you type:

ADMIN STATION 1 SENSOR 8 NAME Soil temperature.

<Station> must be in the range of 0 .. 5, where 0 (zero) is reserved for the GSM900.

<sensor> must be in the range from 1 ... 32.

<characters> are 19 arbitrary characters (Numbers, small or capital letters and special characters).



Please note that the GSM character set does not include all characters (see table **GSM-Alphabet**) on the last page of this manual.

Use short names to ensure good readability of the text message!

Cable and GSM connection:

\***ADMIN STATION** <Station> **SENSOR** <sensor> **NAME** <characters>

---

**ADMIN STATION** <Station> **SENSOR** <Sensor> **UNIT** <characters>

sets the unit of the <sensor> sensor of the chosen weather station. The GSM900 adds a unit behind every measured value. If you do not want to have a unit, you insert a blank.

<Station> must be in the range of 0 .. 5, where 0 (zero) is reserved for the GSM900.

<sensor> must be in the range from 1 ... 32.

<characters> are 7 arbitrary characters (Numbers, small or capital letters and special characters). Please note that some special characters may be not included in the GSM character set or not being converted like ° (degree).

To specify a unit for the soil temperature sensor in the above example you type:

ADMIN STATION 1 SENSOR 8 UNIT °C



**Please note that the units are only characters and are not converted into values!**

You find the standard allocation of the sensors under 4.3 *STANDARD ALLOCATION OF THE SENSORS*.

Cable and GSM connection:

**\*ADMIN STATION** <Station> **SENSOR** <Sensor> **UNIT** <Zeichen>

---

**ADMIN STATION x ON**

Switches on weather station x (x = 1..4 -> value without means)

Cable and GSM connection:

**\*ADMIN STATION x ON**

---

**ADMIN STATION x OFF**

Switches off weather station x (x = 1..4 -> value without means)

Cable and GSM connection:

**\*ADMIN STATION x OFF**

---

**ADMIN STATION** <Station> **SENSOR** <Sensor> **TERM** <Term>

The function of the Control-Measuring Module has been extended, similar to the alert function, to avoid that sensor values don't influence the control outputs immediately but after a settable delay. This delay, in which the control condition must be valid constantly, is also set by the parameter !. This delay also is dependent on the data strings sent by the weather station, like used in the alert conditions. (i.e. MWS 5M a data string each two seconds)

A term like:

**ADMIN STATION 0 SENSOR 4 TERM +!5 te>30**

would lead to monitoring the temperature from 8:00 a.m. to 6:59 p.m. if values are above 30°C. If this is the case for more than 5 successive data strings (=10 seconds with MWS 5M) output 1 will be switched on. If the temperature decreases 30,01°C in this period of time, output 1 will be switched off within one second.

Important: In the example above output 1 would be switched off only at 8:00 a.m. next day when the temperature at 6:59 p.m. still is higher than 30°C, for with the + the time limit 8:00 a.m. to 6:59 p.m. has been set and beyond this period of time no automatic switching is performed!

Off course you may switch off output 1 manually with the command **DATA A1 OFF** at any time

Like in the alert function you can set an idle time after switching on. Here the default idle time is 0 while in alert functions the default idle time is 60 minutes.

In this idle time only manually can be switched off, i.e. with **DATA A1 OFF**. Only after expiry of the idle time automatic switching will be performed again.

The idle time is set with the parameter ? in minutes. (also see ALARM)

i.e.

**ADMIN STATION 0 SENSOR 5 TERM 12,13?15 so>300**

would drive an awning at output 2 (from noon to 1:59 p.m.), if the solar radiation is higher than 300 W/m<sup>2</sup>. After switching on the output at least stays on (provided that no manually switch off is performed). Only after expiry of the idle time checking of the solar radiation will be performed again.

A further parameter is not found in the Alert function: " (QUOTATION MARK ) a switch off delay may be set. This is performed in the same manner as the switch on delay (parameter !).

Cable and GSM connection:

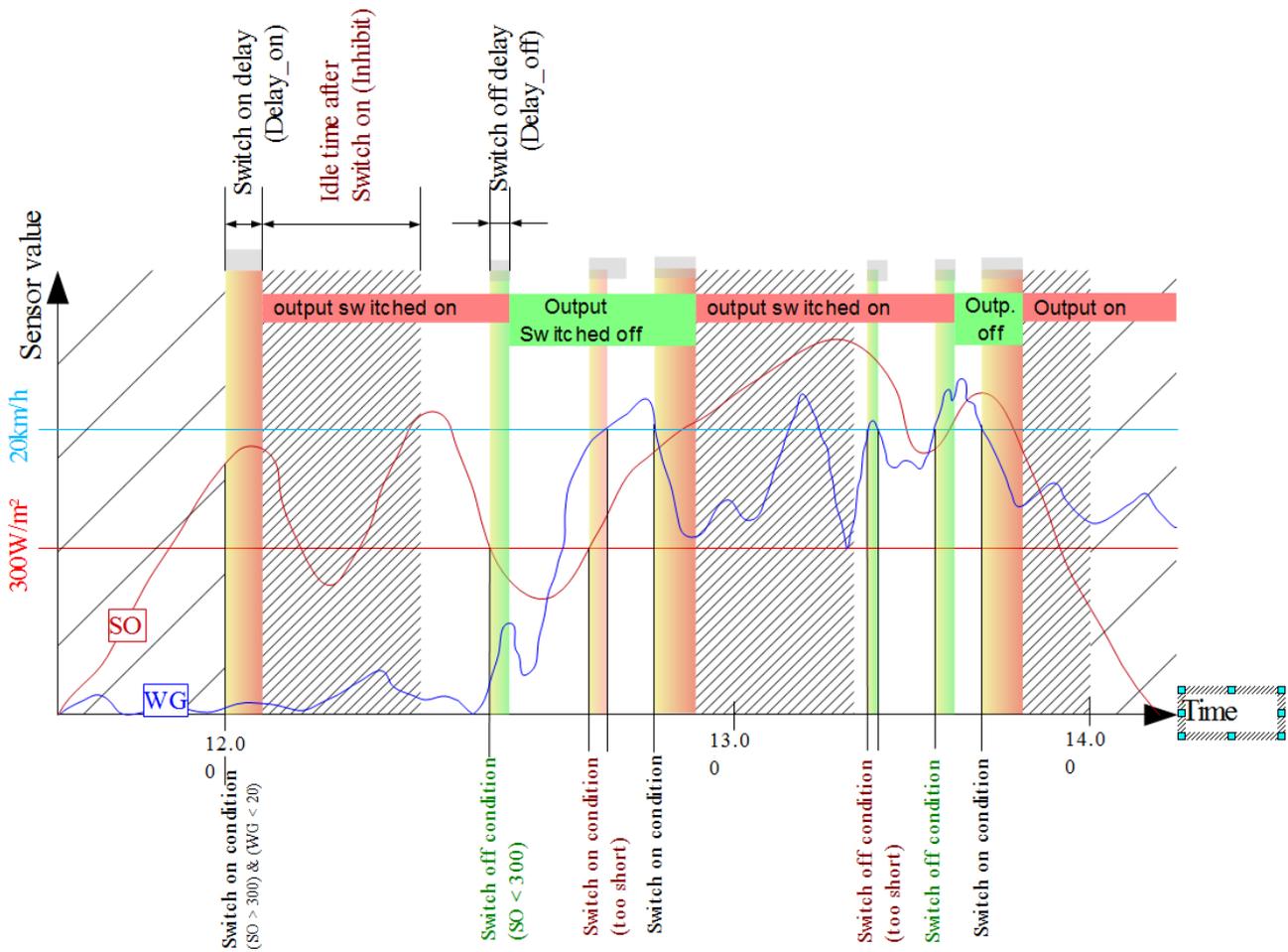
\***ADMIN STATION** <Station> **SENSOR** <Sensor> **TERM** <Term>

# Manual GSM900 Module for Weather Stations

A complete example with all parameters

**ADMIN STATION 0 SENSOR 5 TERM 12,13?15!10"5 so>300 & wg<20**

drive the awning at output 2 from noon to 1:59 p.m. when solar radiatin exceeds 300 W/m<sup>2</sup> and wind speed is below 20 km/h.



## **ADMIN SET NUMBER**

ADMIN <imei> SET NUMBER

sets the current telephone number from which you send this command to the administrator telephone number. If the current telephone number is not already the administrator, then the 15 characters long IMEI number must be added as well. e.g.:

ADMIN 123451234512345 SET NUMBER

You have got the IMEI with the GSM900; it is also placed on bottom of the cellular phone inside the GSM900 case.

(Also see **3.2 Establishing the Administrator.**)

Cable and GSM connection:

### **\*ADMIN SET NUMBER**

\*ADMIN <imei> SET NUMBER

---

## **ADMIN SET POWER <Powersave-value>**

sets the power save modes of GSM900 and weather station.

<Powersave-value> must be in the range from 0 .. 2.

0 = Always on (= Standard)

1 = Cellular phone on for 10 minutes (5 min. before to 5 min. after every full hour).

2 = GSM900 and weather station on for 10 minutes (5 min. before to 5 min. after every full hour).

In mode <Powersave-value> = 0 you can always communicate with the GSM900. This means that subscriptions and alerts are handled. Current weather data can be requested permanently if this feature is released with ADMIN SET PERMIT.

In mode <Powersave-value> = 1 subscriptions and alerts are handled. Current weather data can only be requested 5 minutes before to 5 minutes after every full hour, except that an alert text message was sent out of this period of time. In this case current data can also be requested up to 10 minutes after the sending of the alert text message.

This mode saves about 0.6 W of power (about 50 mA at 12 VDC for 50 minutes --> 0.5 W/h)

In mode <Powersave-value> = 2 the entire system (GSM900 and weather station) is switched off for 50 minutes per hour and only activated 5 minutes before to 5 minutes after every full hour to handle subscriptions. Alert messages are only sent within these 10 minutes active time.

Cable and GSM connection:

**\*ADMIN SET POWER <Powersave-Wert>**

---

**ADMIN SET WARN <number> ON**  
**ADMIN SET WARN <number> OFF**

enables / disables the sending of warning text messages for the specified warning.

<number> has got the following meanings:

- 1 = message before the cellular phone disables due to under voltage (LEVEL1)
- 2 = message when voltage drops below voltage LEVEL2
- 3 = message when voltage drops below voltage LEVEL3
- 4 = message when voltage drops below voltage LEVEL4
- 5 = message when voltage increases voltage LEVEL5
- 6 = message when the maximum number of text messages has been sent  
(see. ADMIN MOBILE LIMIT)
- 7 = message when the weather station has not sent data for more than 10 minutes

The voltage levels can be set with ADMIN SET LEVEL or requested by ADMIN GET LEVEL .  
You can request the current supply voltage by LEVEL. All warning messages are active by default.  
If you do not want to get a warning message when the weather station is inactive for more than 10 minutes, you perform this by:

**ADMIN SET WARN 7 OFF**

To get the status of the warning message settings you type:

**ADMIN GET WARN**

Cable and GSM connection:

**\*ADMIN SET WARN <number> ON**  
**\*ADMIN SET WARN <number> OFF**

---

**ADMIN SET PERMIT <number> ON**

**ADMIN SET PERMIT <number> OFF**

allows setting up subscriptions and alert messages as well as request of current values.

<number> has got the following meanings:

1 = allows request of current data (KEN or IDENT)

If <number> = 1 is disabled, nobody (not even the administrator) can request current data by KEN.

2 = allows setting up and handling of subscriptions (ABO)

If <number> = 2 is disabled, no subscriptions can be set up. Previous subscriptions cannot be handled.

3 = allows setting up and handling of alert rules (ALARM)

If <number> = 3 is disabled, no alert rules can be set up. Previous alert rules cannot be handled.

See also the command ALARM.

4 = allows create TRACK

If <number> = 4 is disabled, no text messages with raw data will be sent.

5 = allows connecting to the GSM net

If <number> = 5 is disabled, no GSM connection can be established, this means, immediately after ringing, the connection is cancelled.

6 = allows "knocking at", for sending current data to the caller

If <number> = 6 is disabled, no current data can be sent by short (up to 3 times) ringing.

7 = allows answering to unknown callers

If <number> = 7 is disabled, handling of unknown callers / text messages can be refused. Unknown means the caller is either not administrator or not stored in the INCLUDE table.

(see also "ADMIN SET INCLUDE"). 7 = allows answering to unknown callers

8 = allows sending of messages in case of setting up / deleting a subscription

9 = allows sending of messages in case of setting up / deleting an alert message

After setting off <number> = 8 for subscribers, or <number> = 9 for alerts no more status messages are sent. This means that setting up a subscription or an alert rule is not confirmed any more!

However, if these are enabled a message for success, failure or refusal of setting up or deleting is sent. (<number2> = off or <number3> 0 off).

10 = allows sending of status messages regarding TRACK

11 = allows changing of digital outputs (SM-option) via DATA

12 = allows transmission of weather data and warnings via HTTP

See also the command ABO.

By default all permissions are enabled. You can request the status of permissions with:

ADMIN GET PERMIT

Cable and GSM connection:

**\*ADMIN SET PERMIT <number> ON**

**\*ADMIN SET PERMIT <numbe> OFF**

## **ADMIN SET INCLUDE** <telephone number>

adds a telephone number to the table of known callers. This table consists of up to 10 telephone numbers. Please note the conventions for telephone numbers. They should always be inserted in international format (+49., +44., +42..) for the GSM may not find the the telephone number otherwise. You also can add parts of telephone numbers (minimum 4 characters) to permit more numbers (a group of numbers) with a table number:

If you refuse handling of unknown callers with:

**ADMIN SET PERMIT 5 OFF**

only commands from callers out of the table (and the administrator telephone number) are handled. You can list the table of the known callers with **ADMIN GET INCLUDE**. You need not include the administrator telephone number, for this number always has automatical permission. The **INCLUDE** numbers are always prior to the **EXCLUDE** numbers.

You can permit all German mobile numbers with leading 0177 by:

**ADMIN SET INCLUDE +49177**

On the other hand you can exclude all German mobile numbers with leading 0177 except the numbers beginning with 0177357 by:

**ADMIN SET EXCLUDE +49177**

**ADMIN SET INCLUDE +49177357**

You can delete numbers out of the table with **ADMIN REMOVE INCLUDE**.

### Cable and GSM connection:

**\*ADMIN SET INCLUDE** <telephone number>

---

## **ADMIN SET EXCLUDE** <telephone number>

add a telephone number to the table of refused callers. This table consists of up to 10 telephone numbers. Please note the conventions for telephone numbers. They should always be inserted in international format (+49., +44., +42..) for the GSM may not find the telephone number otherwise. The priority of the **EXCLUDE** numbers is lower than of the **INCLUDE** numbers or of the administrator telephone number. So you cannot refuse yourself if you are administrator.

You can list the table of **EXCLUDE** numbers with: **ADMIN GET EXCLUDE**.

Like with **ADMIN SET INCLUDE** you can exclude parts of numbers (groups of telephone numbers). Example:

**ADMIN SET EXCLUDE +49179**

excludes all German telephone numbers beginning with 0179. So you can refuse text message requests from different mobile nets which are often more expensive than net internal text messages. Delete telephone numbers from the table you perform with:

**ADMIN REMOVE EXCLUDE**

### Cable and GSM connection:

**\*ADMIN SET EXCLUDE** <telephone number>

---

**ADMIN SET LEVEL** <number> <voltage>

chooses the voltage thresholds for the warning text messages

This table consists of 5 voltage values each selected by <number>. The respective voltage values must be in increasing order (LEVEL1 is the lowest voltage value, LEVEL5 the highest).

When shipped the levels are set as follows:

LEVEL 1:( MOBILE ) 8.0  
LEVEL 2:( WARN #3 ) 9.0  
LEVEL 3:( WARN #2 ) 10.0  
LEVEL 4:( WARN #1 ) 11.0  
LEVEL 5:( LIMIT ) 20.0

The values between Level 4 + 5 are the standard area of operation!

The levels cause warning text messages when voltage drops below a level or exceeds a level (only LEVEL5), if this function is released with ADMIN SET WARN.

When voltage drops below LEVEL1, the cellular phone of the GSM900 is switched off. No more current values can be downloaded in this case. Every hour or in case of alert the system checks, if the voltage is sufficient for the cellular phone. When it is, the system enables the cellular phone. All other voltage values only cause warning text messages and have no effect on operation of the system.

For <voltage> any floating point numbers between 7.5 up to 30.0 can be inserted (decimal separator must be a . (dot)). Please keep the increasing order of the voltage values!

You can request the list of voltage levels with:

ADMIN GET LEVEL

Cable and GSM connection:

**\*ADMIN SET LEVEL** <number> <voltage>

---

**ADMIN SET KEN** <sensor id>,<sensor id>,<sensor id>,<...>

determines the default sensors, which a caller gets by "knocking at", if this function is released. See (ADMIN SET PERMIT). "Knocking at" means, that the caller rings up to 3 times and then hangs up. If the caller hangs up before it rings 4 times, the GSM900 checks if the caller is in the subscription list. If he is, he gets a text message with the values of the sensors stored in the subscription list. If he is not, the values of these sensors are sent, which you choose here with <sensor id>.

You find the standard allocation of the sensors under 4.3 *STANDARD ALLOCATION OF THE SENSORS*.

Cable and GSM connection:

**\*ADMIN SET KEN** <sensor id>,<sensor id>,<sensor id>,<...>

---

**ADMIN SET HTTP** <weekday><time>,<weekday><time>... ?<Sending intervall> <sensors>

Sets the stages and sensors for GPRS transmission. Weekdays and sensors are used like in ABO function. Also the respective abbreviation are valid, i.e.:

\*\* (=continuous, each day of the week from 0 o'clock a.m. to 11 o'clock p.m.)

+\*(=Mo-Fr continuous)

Sa\*,Su\* (=only at the weekend)

This setting is used to avoid unnecessary data are sent when the server is not reachable at certain (predefined) times.

The sending interval is set in minutes. Reasonably intervals are in the range of 1 and 10000 (valid range is from 1..65535). When a 0 (Zero) is transmitted, each time the weather station stores into its data logger, a transmission is generated. If you want to use the data logger, this setting is reliable, for then the data in the logger and the transmitted data are synchronous.

Setting of the sensors is identical as in the ABO function.

You can use sensor identifiers (i.e. te, fe, dr,...) or use the full sensors name (i.e. Temperature).

i.e. ADMIN SET HTTP \*\* ?1 te,dr,fe

transmits temperature, pressure and humidity each minute.

i.e. ADMIN SET HTTP \*\* ?0 @GSM-MWS ve @STATION1 te,dr,fe

each time when STATION1 stores into its data logger, first of all the value of GSM900 modules supply voltage is transmitted, then the values of temperatur, pressure and humidity of STATION1 are transmitted.

## Cable and GSM connection:

**\*ADMIN SET HTTP** <weekday><time>,<weekday><time>... ?<Sending intervall> <sensors>

---

---

## **ADMIN GET NUMBER**

shows the administrator telephone number set with ADMIN SET NUMBER.

Cable and GSM connection:

**\*ADMIN GET NUMBER**

---

## **ADMIN GET POWER**

shows the value of the power save mode set with ADMIN SET POWER.

Cable and GSM connection:

**\*ADMIN GET POWER**

---

## **ADMIN GET WARN**

shows the list of warning messages enabled by ADMIN SET WARN <number> ON or disabled by ADMIN SET WARN <number> OFF

Cable and GSM connection:

**\*ADMIN GET WARN**

---

## **ADMIN GET PERMIT**

shows the list of authorisations enabled by ADMIN SET PERMIT <number> ON or disabled by ADMIN SET PERMIT <number> OFF.

Cable and GSM connection:

**\*ADMIN GET PERMIT**

---

## **ADMIN GET ABO <list number (1..10)>**

lists all 10 subscribers if used without list number. If not all positions are occupied by subscribers, "--" is displayed, otherwise the subscriber's telephone number in international format. The minimum number of text messages per week for this subscriber in brackets is listed after the telephone number. Minimum for the following reason: the number of text messages depends on the length of the sensor's names, the units and the values, which cannot be calculated in advance. Nonetheless this value can show you quite well how sparingly a subscriber uses his text messages.

Cable and GSM connection:

**\*ADMIN GET ABO <list number (1..10)>**

---

## **ADMIN GET ALARM <list number (1..10)>**

lists all 10 alert positions if used without list number. If not all positions are occupied by alerts, "--" will be displayed, otherwise the subscriber's telephone number in international format. The maximum number of text messages per week in case of permanent alert situations in brackets is listed after the telephone number.

Cable and GSM connection:

**\*ADMIN GET ALARM <list number (1..10)>**

---

## **ADMIN GET INCLUDE**

lists all 10 telephone numbers from the INCLUDE list. If a position is not occupied by a telephone number, "--" is displayed, otherwise the included telephone number in international format or in the format stored by ADMIN SET INCLUDE.

Cable and GSM connection:

**\*ADMIN GET INCLUDE**

---

## **ADMIN GET EXCLUDE**

lists all 10 telephone numbers from the EXCLUDE list. If a position is not occupied by a telephone number, "--" is displayed, otherwise the included telephone number in international format or in the format stored by ADMIN SET EXCLUDE.

Cable and GSM connection:

**\*ADMIN GET EXCLUDE**

---

## **ADMIN GET MOBILE**

lists the following values regarding the mobile telephone:

- >PIN ""
- >PUK ""
- >TEL ""
- >SMSC
- >LIMIT 2000

These values at a time have been set by the respective commands:

ADMIN MOBILE PIN, ADMIN MOBILE PUK, ADMIN MOBILE TEL, ADMIN MOBILE SMSC and ADMIN MOBILE LIMIT.

Cable and GSM connection:

**\*ADMIN GET MOBILE**

---

## **ADMIN GET MOBILE GPRS**

Shows the GPRS settings:

MOBILE GPRS  
>ADDRESS ""  
>NAME ""  
>PASSWD ""

Cable and GSM connection:

**\*ADMIN GET MOBILE GPRS**

---

## **ADMIN GET MOBILE HTTP**

Shows the HTTP settings:

MOBILE HTTP  
>ADDRESS ""  
>NAME ""  
>PASSWD ""

Cable and GSM connection:

**\*ADMIN GET MOBILE HTTP**

---

## **ADMIN GET MOBILE SMTP**

Shows the SMTP settings

### **MOBILE SMTP**

```
>ADDRESS "<outgoing mail server:port#>"  
>NAME ""  
>PASSWD ""  
>EMAIL ""
```

Cable and GSM connection:

## **\*ADMIN GET MOBILE SMTP**

---

## **ADMIN GET LEVEL**

lists all stored voltage thresholds (LEVEL) stored by ADMIN SET LEVEL.

Cable and GSM connection:

## **\*ADMIN GET LEVEL**

---

## **ADMIN GET KEN / ADMIN GET IDENT**

shows the default sensors a unregistered caller get in a SMS via "call waiting" if this feature is activated.

### **ADMIN IDENT**

```
>SENSORS  
->GSM-MWS (0):  
->Reinhardt MWS (1): TE,DR,FE,  
-> (2):  
-> (3):  
-> (4):
```

These sensors i.e. have been set by **ADMIN SET IDENT te,dr,fe**

---

## **ADMIN GET STATION <station>**

lists the values of the weather station with the number <station> where <station> is a number from 0..5. <station> = 0 is reserved for the GSM900.

>IDENT 1

>BAUD 5

>NAME Station

These values were set with the respective commands by ADMIN STATION <x> NAME, ADMIN STATION <x> BAUD und ADMIN STATION <x> IDENT.

Cable and GSM connection:

**\*ADMIN STATION <station>**

---

## **ADMIN GET STATION <station> SENSOR <sensor>**

lists the values of the weather station with the number <station> where <station> is a number from 0..5. <station> = 0 is reserved for the GSM900.

<sensor> is a number between 1 and 32.

>IDENT TE

>NAME Temperatur

>UNIT °C

These values were set with the respective commands by ADMIN STATION <x> SENSOR <y> UNIT, ADMIN STATION <x> SENSOR <y> NAME, ADMIN STATION <x> SENSOR <y> IDENT.

Cable and GSM connection:

**\*ADMIN GET STATION <station> SENSOR <sensor>**

---

## **ADMIN GET LOG**

Shows the log of the last 12 activities

Cable and GSM connection:

**\*ADMIN GET LOG**

---

## **ADMIN GET ERR**

Shows the log of the last 12 errors

Cable and GSM connection:

**\*ADMIN GET ERR**

---

## **ADMIN GET TRACK <list number (1..10)>**

Shows the 10 memory cells for tracking when used without list number

Cable and GSM connection:

**\*ADMIN GET TRACK <list number (1..10)>**

---

## **ADMIN GET HTTP**

shows the sensors, i.e. set by

**ADMIN SET HTTP \*\* ?1 te,dr,wr,fe,re,wg,wd,wv,tk**

HTTP

>TIME

->MO:0-23,

->TU:0-23,

->WE:0-23,

->TH:0-23,

->FR:0-23,

->SA:0-23,

->SU:0-23,

>INTERVAL 1

>SENSORS

->GSM-MWS (0):

->Reinhardt MWS (1): TE,DR,WR,FE,RE,WG,WD,WV,TK,

-> (2):

-> (3):

-> (4):

Cable and GSM connection:

**\*ADMIN GET HTTP**

---

---

This page is left free for further expansions

## **ADMIN REMOVE ABO <number>**

removes the subscription on position <number>. Instead of the position of the subscription you can also insert a telephone number. The GSM900 then searches the subscription positions for this telephone number and removes the respective subscription if the search was successful.

The wildcard for removing all subscriptions is \*.

### Cable and GSM connection:

**\*ADMIN REMOVE ABO <number>**

---

## **ADMIN REMOVE ALARM <number>**

removes the alert rule on position <number>. Instead of the number of position you also can insert a telephone number. The GSM900 then searches the alert rule positions for this telephone number and removes the respective alert rule if the search was successful.

The wildcard for removing all alert rules is \*.

### Cable and GSM connection:

**\*ADMIN REMOVE ALARM <number>**

---

## **ADMIN REMOVE TRACK**

Removes numbers (like ADMIN REMOVE ABO)

### Cable and GSM connection:

**\*ADMIN REMOVE TRACK**

---

## **ADMIN REMOVE INCLUDE** <number>

removes the included telephone number on position <number> of the INCLUDE list. The telephone number in this position then has no more access if the handling of unknown telephone numbers has been disabled by ADMIN SET PERMIT, except that this number is included by another group of numbers in this list. Instead of the number of position you also can insert a telephone number. The GSM900 then searches the positions of the INCLUDE list for this telephone number and removes the telephone number if the search was successful.

The wildcard for removing all INCLUDE numbers is \*.

### Cable and GSM connection:

\***ADMIN REMOVE INCLUDE** <number>

---

## **ADMIN REMOVE EXCLUDE** <number>

removes the excluded telephone number on position <number> of the EXCLUDE list. The telephone number stored in this position again has access to the GSM900. Instead of the number of position you also can insert a telephone number. The GSM900 then searches the positions of the EXCLUDE list for this telephone number and removes the telephone number if the search was successful.

The wildcard for removing all EXCLUDE numbers is \*.

### Cable and GSM connection:

\***ADMIN REMOVE EXCLUDE** <number>

---

---

## **ADMIN CONNECT OFF**

Like CONNECT OFF, but this command can be sent via text message or COM-connection

Cable and GSM connection:

**\*ADMIN CONNECT OFF**

---

## **ADMIN OFF**

switches off the entire system (GSM900 and weather station). According to plan the system switches on again 5 minutes before the next full hour.

What happens then depends on the selected power save mode. Either the entire system disables again, only the cellular phone disables or the entire system stays active.

See also ADMIN SET POWER.

Cable and GSM connection:

**\*ADMIN OFF**

---

## **ADMIN SEND ABO x cccc**

Sends a text message with content cccc to subscriber x (x = 1..10 or x = \* for all subscribers)

Cable and GSM connection:

**\*ADMIN SEND ABO x cccc**

---

## **ADMIN SEND ALARM x cccc**

Sends a text message with content cccc to alert number x (x = 1..10 or x = \* for all alert numbers)

Cable and GSM connection:

**\*ADMIN SEND ALARM x cccc**

---

---

## 5.2.1 New commands since firmware V1.3:

TRACK<Day><Hour>,<.><.> <Identifier>,<Identifier>,<...> @>station> ?<multiplier>

TRACK REMOVE

ADMIN GET TRACK

shows the 10 memory cells for Tracking

ADMIN REMOVE TRACK

removes numbers (like ADMIN REMOVE ABO)

ADMIN GET LOG

shows the log of the last 12 activities

ADMIN STATION x OFF

switches off weather station x (x = 1..4 -> value without means)

ADMIN STATION x ON

switches on weather station x (x = 1..4 -> value without means)

ADMIN STATION x SEND cccc

sends the string cccc to weather station x (x = 1..4)

ADMIN SEND \* cccc

sends a text message with content cccc to all subscribers and alert numbers

ADMIN SEND ABO x cccc

sends a text message with content cccc to subscriber x (x = 1..10 or x = \* for all subscribers)

ADMIN SEND ALARM x cccc

sends a text message with content cccc to alert number x (x = 1..10 or x = \* for all alert numbers)

ADMIN CONNECT OFF

like CONNECT OFF, but this command can be sent via text message or COM-connection

ADMIN MOBILE BEARER V.32

(standard, allows analog calls)

ADMIN MOBILE BEARER V.110

(allows ISDN-calls)

## 5.2.2 New commands since firmware V1.4:

### **Generally change:**

GPRS integration, sending of current data to a server address.  
Selection of data (choosing sensors) is performed as usual.

```
ADMIN GET MOBILE GPRS
MOBILE GPRS
>ADDRESS ""
>NAME ""
>PASSWD ""
```

```
ADMIN GET MOBILE HTTP
MOBILE HTTP
>ADDRESS ""
>NAME ""
>PASSWD ""
```

ADMIN MOBILE GPRS ADDRESS „<access-point-address>“  
Refers the necessary access point for GPRS connection to GSM.

ADMIN MOBILE GPRS NAME „<user-name>“  
When a user name is needed for GPRS log in, you must specify it in here.

ADMIN MOBILE GPRS PASSWD „<user-password>“  
When a password and user name is need for log in to GPRS, the password must be defined.

ADMIN MOBILE HTTP ADDRESS "<url>“  
Refers the recipient address (=URL) of the HTTP site. The sensors are added to this address and transferred to the site via GET method.

ADMIN MOBILE HTTP NAME „<user-name>“  
When a user name is needed for GPRS log in, you must specify it in here.

ADMIN MOBILE HTTP PASSWD „<user-password>“  
When a password and user name is need for log in to GPRS, the password must be defined.

ADMIN SET HTTP <weekday(s)><time(s)> ?<Sending intervall> <sensors>  
Sets the stages and sensors for GPRS transmission.

ADMIN SET HTTP \*\* ?0 @GSM-MWS ve @STATION1 te,dr,fe  
each time when STATION1 stores into its data logger, first of all the value of GSM900 modules supply voltage is transmitted, then the values of temperatur, pressure and humidity of STATION1 are transmitted.

ADMIN SET PERMIT 12 ON /OFF  
Allows or refuses HTTP transmission.

## 5.2.3 New commands since firmware V1.6:

### **Generally change:**

Implementation of transmission of ABO-, alert- and track-messages via email.  
For this the space for numbers was expanded from 20 to 64 characters.

**CAUTION: When updating from lower versions the numbers memory will be overwritten, that means that all records and settings will get lost!!**

See also 3.11 Transmission via SMTP

ADMIN MOBILE SMTP ADDRESS "<Servername:port#>"

Sets the name and the port number of the outgoing mail server

ADMIN MOBILE SMTP NAME "<log\_in name>"

Sets the SMTP user name

ADMIN MOBILE SMTP EMAIL "<own email-address>"

Sets the sender email address

ADMIN MOBILE SMTP PASSWD "<log\_in password>"

Sets the SMTP password.

## 5.2.4 New commands since firmware V1.7:

With the parameter ! a delay, within the alert condition has to be valid constantly, can be set now. The delay is dependent on the number of data strings sent by the station. The MWS 5MV, for example, sends a data string each two seconds, the MWS 3 sends a data string each second.

Example:

**ALARM +!5 te>30**

Combination of parameters delay and idle time at alerts.

Example:

**ALARM 6,7,8,9!30?10 Sensor>=Alarm condition**

Within ADMIN GET ABO, ADMIN GET ALARM and ADMIN GET TRACK the input of the number of the list was added (1..10), which shows details to the respective number.

Example:

**ADMIN GET ALARM 1**

**ADMIN GET ABO 1**

Output of standard sensors, which are sent to a not registered caller by "call waiting" via SMS, if this feature is activated.

**ADMIN GET KEN / ADMIN GET IDENT**

Output of sensors / parameters, i.e. set by ADMIN SET HTTP \*\* ?1 te,dr,wr,fe,re,wg,wd,wv,tk.

**ADMIN GET HTTP**

Following a detailed description of the new ADMIN GET commands in V1.7:

## Manual GSM900 Module for Weather Stations

The commands ADMIN GET ABO, ADMIN GET ALARM and ADMIN GET TRACK now allow the input of the list number (1..10), which shows the details to the respective list number.

The command

```
ADMIN GET ALARM 1
```

now shows the following:

```
ALARM 1
>NUMBER 0179xxxxxxx
>TIME 9,10
>INHIBIT 60 (0 left)
>DELAY 30 (30 left)
>TERM [WG>6.00]
```

assuming an alert rule like **ALARM 9,10!30 wg > 6** from a mobile with the number 0179xxxxxxx, while the command

```
ADMIN GET ABO 1
```

leads to the following output:

```
ABO 1
>NUMBER 0179xxxxxxx
>TIME
->MO:12,
->TU:12,
->WE:12,
->TH:12,
->FR:12,
->SA:12,
->SU:12,
>SENSORS
->GSM-MWS (0):
->Reinhardt MWS (1): TE,DR,FE,
-> (2):
-> (3):
-> (4):
```

This abo would have been created from a mobile with the number 0179xxxxxxx with the command **ABO \*12 te,dr,fe**.

In this context two further commands have been implemented:

## **ADMIN GET KEN / ADMIN GET IDENT**

shows the default sensors a unregistered caller get in a SMS via "call waiting" if this feature is activated.

```
ADMIN IDENT
>SENSORS
->GSM-MWS (0):
->Reinhardt MWS (1): TE,DR,FE,
-> (2):
-> (3):
-> (4):
```

These sensors i.e. have been set by **ADMIN SET IDENT te,dr,fe**

## **ADMIN GET HTTP**

shows the sensors, i.e. set by

**ADMIN SET HTTP \*\* ?1 te,dr,wr,fe,re,wg,wd,wv,tk**

```
HTTP
>TIME
->MO:0-23,
->TU:0-23,
->WE:0-23,
->TH:0-23,
->FR:0-23,
->SA:0-23,
->SU:0-23,
>INTERVAL 1
>SENSORS
->GSM-MWS (0):
->Reinhardt MWS (1): TE,DR,WR,FE,RE,WG,WD,WV,TK,
-> (2):
-> (3):
-> (4):
```

## 5.2.5 New commands since firmware V1.8:

The function of the Control-Measuring Module has been extended, similar to the alert function, to avoid that sensor values don't influence the control outputs immediately but after a settable delay. This delay, in which the control condition must be valid constantly, is also set by the parameter !. This delay also is dependent on the data strings sent by the weather station, like used in the alert conditions.

Example:

**ADMIN STATION 0 SENSOR 4 TERM +!5 te>30**

Setting the idle time per parameter is possible now.

Example:

**ADMIN STATION 0 SENSOR 5 TERM 12,13?15 so>300**

Setting of a switch-off delay is now possible.

Example:

**ADMIN STATION 0 SENSOR 5 TERM 12,13?15!10"5 so>300 & wg<20**

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## 5.3 STANDARD ALLOCATION OF THE SENSORS (STATION 0) - GSM900 Module

Sensor	sensor id	Sensor name	Sensor unit
Sensor 1	"~."	"Datum"	
Sensor 2	"~:"	"Zeit"	
Sensor 3	"VE"	"Eingangsspannung"	"V"
Sensor 4	"A1"	"Ausgang 1"	
Sensor 5	"A2"	"Ausgang 2"	
Sensor 6	"A3"	"Ausgang 3"	
Sensor 7	"A4"	"Ausgang 4"	
Sensor 8		Reserved	
Sensor 9		Reserved	
Sensor 10		Reserved	
Sensor 11		Reserved	
Sensor 12		Reserved	
Sensor 13		Reserved	
Sensor 14	"E1"	"Eingang 4"	
Sensor 15	"E2"	"Eingang 4"	
Sensor 16	"E3"	"Eingang 4"	
Sensor 17	"E4"	"Eingang 4"	
Sensor 18		Reserved	
Sensor 19		Reserved	
Sensor 20		Reserved	
Sensor 21		Reserved	
Sensor 22		Reserved	
Sensor 23		Reserved	
Sensor 24		Reserved	
Sensor 25		Reserved	
Sensor 26		Reserved	
Sensor 27		Reserved	
Sensor 28		Reserved	
Sensor 29		Reserved	
Sensor 30		Reserved	
Sensor 31		Reserved	
Sensor 32	"SQ"	"Signal Qualität"	

Please note that the sensor names are in German by default.  
For changing the names see **ADMIN STATION SENSOR NAME**.

## 5.3.1 STANDARD ALLOCATION OF THE SENSORS (STATION 1..4) - Weather stations & Sensors

Sensor	sensor id	Sensor name	Sensor unit
Sensor 1	"~."	"Datum"	
Sensor 2	"~:"	"Zeit"	
Sensor 3	"TE"	"Temperatur"	"°C"
Sensor 4	"SI"	"Sonne Intern"	"W/m <sup>2</sup> "
Sensor 5	"DR"	"Luftdruck"	"hPa"
Sensor 6	"ZA"	"Zusatz-Sensor A"	
Sensor 7	"SO"	"Globalstrahlung"	"W/m <sup>2</sup> "
Sensor 8	"ZB"	"Zusatz-Sensor B"	
Sensor 9	"WR"	"Windrichtung"	"°"
Sensor 10	"ZC"	"Zusatz-Sensor C"	
Sensor 11	"FE"	"Luftfeuchte"	"%"
Sensor 12	"RE"	"Regenmenge"	"l/m <sup>2</sup> "
Sensor 13	"RD"	"Regen-Intensität"	"l/m <sup>2</sup> "
Sensor 14	"WG"	"Windgeschwindigkeit"	"km/h"
Sensor 15	"WS"	"Windspitze"	"km/h"
Sensor 16	"WD"	"Winddurchschnitt"	"km/h"
Sensor 17	"GE"	"Gewitter"	"Pulse"
Sensor 18	"WC"	"Windchill"	"°C"
Sensor 19	"WV"	"Windricht.vorherr."	"°"
Sensor 20	"GH"	"Ortshöhe"	"m"
Sensor 21	"GX"	"GPS Latitude"	
Sensor 22	"GY"	"GPS Longitude"	
Sensor 23	"GV"	"GPS Geschwindigkeit"	"km/h"
Sensor 24	"TK"	"Temperaturkoeff."	
Sensor 25	"TR"	"Temperaturreferenz"	
Sensor 26	"VI"	"Betriebsspg."	
Sensor 27	"UH"	"Heizspg."	
Sensor 28	"EF"	"Error-Flags"	
Sensor 29	"PA"	"Digitaler Eingang"	
Sensor 30	"GS"	"GPS Satelliten"	
Sensor 31	"~~"		
Sensor 32	"VE"	"Eingangsspannung"	"V"

This page is left free for further expansions

## 5.4 STANDARD ALLOCATION OF THE VOLTAGE THRESHOLDS

System off voltage		7,5V
Modem off voltage	(= Warning Level 1)	8,0V
Voltage underflow warning	(= Warning Level 2)	9,0V
Voltage underflow warning	(= Warning Level 3)	10,0V
Voltage underflow warning	(= Warning Level 4)	11,0V (Hysteresis +1V)
Voltage overflow warning	(= Warning Level 5)	20,0V (Hysteresis -1V)

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## 5.5 GSM Alphabet

0x00	0 COMMERCIAL AT	@
0x01	1 POUND SIGN	£
0x02	2 DOLLAR SIGN	\$
0x03	3 YEN SIGN	¥
0x04	4 LATIN SMALL LETTER E WITH GRAVE	è
0x05	5 LATIN SMALL LETTER E WITH ACUTE	é
0x06	6 LATIN SMALL LETTER U WITH GRAVE	ù
0x07	7 LATIN SMALL LETTER I WITH GRAVE	ì
0x08	8 LATIN SMALL LETTER O WITH GRAVE	ò
0x09	9 LATIN CAPITAL LETTER C WITH CEDILLA	Ç
0x0A	10 LINE FEED	
0x0B	11 LATIN CAPITAL LETTER O WITH STROKE	Ø
0x0C	12 LATIN SMALL LETTER O WITH STROKE	ø
0x0D	13 CARRIAGE RETURN	
0x0E	14 LATIN CAPITAL LETTER A WITH RING ABOVE	Å
0x0F	15 LATIN SMALL LETTER A WITH RING ABOVE	å
0x10	16 GREEK CAPITAL LETTER DELTA	
0x11	17 LOW LINE	—
0x12	18 GREEK CAPITAL LETTER PHI	
0x13	19 GREEK CAPITAL LETTER GAMMA	
0x14	20 GREEK CAPITAL LETTER LAMBDA	
0x15	21 GREEK CAPITAL LETTER OMEGA	
0x16	22 GREEK CAPITAL LETTER PI	
0x17	23 GREEK CAPITAL LETTER PSI	
0x18	24 GREEK CAPITAL LETTER SIGMA	
0x19	25 GREEK CAPITAL LETTER THETA	
0x1A	26 GREEK CAPITAL LETTER XI	
0x1B	27 ESCAPE TO EXTENSION TABLE	
0x1B	0A 27 10 FORM FEED	
0x1B	14 27 20 CIRCUMFLEX ACCENT	^
0x1B	28 27 40 LEFT CURLY BRACKET	{
0x1B	29 27 41 RIGHT CURLY BRACKET	}
0x1B	2F 27 47 REVERSE SOLIDUS (BACKSLASH)	\
0x1B	3C 27 60 LEFT SQUARE BRACKET	[
0x1B	3D 27 61 TILDE	~
0x1B	3E 27 62 RIGHT SQUARE BRACKET	]
0x1B	40 27 64 VERTICAL BAR	
0x1B	65 27 101 EURO SIGN	•
0x1C	28 LATIN CAPITAL LETTER AE	Æ
0x1D	29 LATIN SMALL LETTER AE	æ
0x1E	30 LATIN SMALL LETTER SHARP S (German)	ß
0x1F	31 LATIN CAPITAL LETTER E WITH ACUTE	É
0x20	32 SPACE	
0x21	33 EXCLAMATION MARK	!
0x22	34 QUOTATION MARK	”
0x23	35 NUMBER SIGN	#
0x24	36 CURRENCY SIGN	¤
0x25	37 PERCENT SIGN	%
0x26	38 AMPERSAND	&
0x27	39 APOSTROPHE	‘
0x28	40 LEFT PARENTHESIS	(
0x29	41 RIGHT PARENTHESIS	)

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0x2A	42 ASTERISK	*
0x2B	43 PLUS SIGN	+
0x2C	44 COMMA	,
0x2D	45 HYPHEN-MINUS	-
0x2E	46 FULL STOP	.
0x2F	47 SOLIDUS (SLASH)	/
0x30	48 DIGIT ZERO	0
0x31	49 DIGIT ONE	1
0x32	50 DIGIT TWO	2
0x33	51 DIGIT THREE	3
0x34	52 DIGIT FOUR	4
0x35	53 DIGIT FIVE	5
0x36	54 DIGIT SIX	6
0x37	55 DIGIT SEVEN	7
0x38	56 DIGIT EIGHT	8
0x39	57 DIGIT NINE	9
0x3A	58 COLON	:
0x3B	59 SEMICOLON	;
0x3C	60 LESS-THAN SIGN	<
0x3D	61 EQUALS SIGN	=
0x3E	62 GREATER-THAN SIGN	>
0x3F	63 QUESTION MARK	?
0x40	64 INVERTED EXCLAMATION MARK	!
0x41	65 LATIN CAPITAL LETTER A	A
0x42	66 LATIN CAPITAL LETTER B	B
0x43	67 LATIN CAPITAL LETTER C	C
0x44	68 LATIN CAPITAL LETTER D	D
0x45	69 LATIN CAPITAL LETTER E	E
0x46	70 LATIN CAPITAL LETTER F	F
0x47	71 LATIN CAPITAL LETTER G	G
0x48	72 LATIN CAPITAL LETTER H	H
0x49	73 LATIN CAPITAL LETTER I	I
0x4A	74 LATIN CAPITAL LETTER J	J
0x4B	75 LATIN CAPITAL LETTER K	K
0x4C	76 LATIN CAPITAL LETTER L	L
0x4D	77 LATIN CAPITAL LETTER M	M
0x4E	78 LATIN CAPITAL LETTER N	N
0x4F	79 LATIN CAPITAL LETTER O	O
0x50	80 LATIN CAPITAL LETTER P	P
0x51	81 LATIN CAPITAL LETTER Q	Q
0x52	82 LATIN CAPITAL LETTER R	R
0x53	83 LATIN CAPITAL LETTER S	S
0x54	84 LATIN CAPITAL LETTER T	T
0x55	85 LATIN CAPITAL LETTER U	U
0x56	86 LATIN CAPITAL LETTER V	V
0x57	87 LATIN CAPITAL LETTER W	W
0x58	88 LATIN CAPITAL LETTER X	X
0x59	89 LATIN CAPITAL LETTER Y	Y
0x5A	90 LATIN CAPITAL LETTER Z	Z
0x5B	91 LATIN CAPITAL LETTER A WITH DIAERESIS	Ä
0x5C	92 LATIN CAPITAL LETTER O WITH DIAERESIS	Ö
0x5D	93 LATIN CAPITAL LETTER N WITH TILDE	Ñ
0x5E	94 LATIN CAPITAL LETTER U WITH DIAERESIS	Ü
0x5F	95 SECTION SIGN	§

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0x60	96 INVERTED QUESTION MARK	¿
0x61	97 LATIN SMALL LETTER A	á
0x62	98 LATIN SMALL LETTER B	á
0x63	99 LATIN SMALL LETTER C	á
0x64	100 LATIN SMALL LETTER D	á
0x65	101 LATIN SMALL LETTER E	á
0x66	102 LATIN SMALL LETTER F	á
0x67	103 LATIN SMALL LETTER G	á
0x68	104 LATIN SMALL LETTER H	á
0x69	105 LATIN SMALL LETTER I	á
0x6A	106 LATIN SMALL LETTER J	á
0x6B	107 LATIN SMALL LETTER K	á
0x6C	108 LATIN SMALL LETTER L	á
0x6D	109 LATIN SMALL LETTER M	á
0x6E	110 LATIN SMALL LETTER N	á
0x6F	111 LATIN SMALL LETTER O	á
0x70	112 LATIN SMALL LETTER P	á
0x71	113 LATIN SMALL LETTER Q	á
0x72	114 LATIN SMALL LETTER R	á
0x73	115 LATIN SMALL LETTER S	á
0x74	116 LATIN SMALL LETTER T	á
0x75	117 LATIN SMALL LETTER U	á
0x76	118 LATIN SMALL LETTER V	á
0x77	119 LATIN SMALL LETTER W	á
0x78	120 LATIN SMALL LETTER X	á
0x79	121 LATIN SMALL LETTER Y	á
0x7A	122 LATIN SMALL LETTER Z	á
0x7B	123 LATIN SMALL LETTER A WITH DIAERESIS	ä
0x7C	124 LATIN SMALL LETTER O WITH DIAERESIS	ö
0x7D	125 LATIN SMALL LETTER N WITH TILDE	ñ
0x7E	126 LATIN SMALL LETTER U WITH DIAERESIS	ü
0x7F	127 LATIN SMALL LETTER A WITH GRAVE	à

° is changed to ´

² is changed to 2

## 5.6 Current consumption of GSM900

Example: Current consumption of GSM900 with weather station MWS 5MV

CAUTION! Under 8.5V no GPRS available!!!

Operating voltage: 8.50V

GSM-Operation:

App. 190mA

when searching the network / sending SMS temporarily (app. 5-10s): 220mA

GPRS-Operation:

App. 200mA (at a transmission interval of 1 minute)

when transmitting: 400mA (app. 2s)

Operating voltage: 10.00V

GSM-Operation:

App. 180mA

when searching the network / sending SMS temporarily (app. 5-10s): 215mA

GPRS-Operation:

App. 200mA (at a transmission interval of 1 minute)

when transmitting: 375mA (app. 2s)

Operating voltage 12.00V

Initializing (+ logging into the network, app. 2s) max 240mA

GSM-Operation:

App. 170mA

when searching the network / sending SMS temporarily (app. 5-10s): 200mA

GPRS-Operation:

App. 185mA (at a transmission interval of 1 minute)

when transmitting: 315mA (app. 2s)

Operating voltage: 15.00V

GSM-Operation:

App. 155mA

when searching the network / sending SMS temporarily (app. 5-10s): 180mA

GPRS-Operation:

App. 165mA (at a transmission interval of 1 minute)

when transmitting: 270mA (app. 2s)

Operating voltage: 18.00V

GSM-Operation:

App. 150mA

when searching the network / sending SMS temporarily (app. 5-10s): 170mA

GPRS-Operation:

App. 150mA (at a transmission interval of 1 minute)

when transmitting: 230mA (app. 2s)

# Manual GSM900 Module for Weather Stations

## 5.7 APN list

APNs (Extract from [APN-List](#)):

### Austria

<i>Operator</i>	<i>Service</i>	<i>APN</i>	<i>Username</i>	<i>Password</i>
Drei		drei.at	[blank]	[blank]
Max Online Metro		gprsmetro	GPRS	[blank]
T-Mobile A <small>(Max Online)</small>		gprsinternet	GPRS	[blank]
T-Mobile A <small>(Max Business)</small>		business.gprsinternet	GPRS	[blank]
Mobilkom A1		A1.net	gprs@a1plus.at	[blank]
OneNet		web.one.at	[user specific]	[user specific]
tele.ring		web	web@telering.at	web

### Germany

<i>Operator</i>	<i>Service</i>	<i>APN</i>	<i>Username</i>	<i>Password</i>
E-Plus		internet.eplus.de	eplus	gprs
O2	(GPRS)	internet	[blank]	[blank]
	postpaid	internet	[blank]	[blank]
	prepaid	pinternet.interkom.de	[blank]	[blank]
	(3G)	surfo2	[blank]	[blank]
T-Mobile		internet.t-d1.de	td1	gprs
Vodafone		web.vodafone.de	[any]	[any]
	prepaid	event.vodafone.de	[blank]	[blank]

### Switzerland

<i>Operator</i>	<i>Service</i>	<i>APN</i>	<i>Username</i>	<i>Password</i>
Orange CH		internet	[blank]	[blank]
Sunrise		internet	internet	internet
Swisscom		gprs.swisscom.ch	[blank]	[blank]

*I&OE / Specifications subject to change without prior notice !*  
11/17