Contents

1 DESCRIPTION ................................................................................................................ 4
  1.1 Summary .................................................................................................................. 4
  1.2 Safety instructions ................................................................................................. 4
  1.3 General note .......................................................................................................... 4

2 SOFTWARE .................................................................................................................... 5
  2.1 System requirements ............................................................................................ 5
  2.2 Software installation ............................................................................................. 5

3 MODULE ....................................................................................................................... 6
  3.1 Place the SIM card ............................................................................................... 6
  3.2 Connect the antenna .............................................................................................. 7
  3.3 Connect to power .................................................................................................... 7
  3.4 Connect to PC ......................................................................................................... 8
  3.5 LED description ..................................................................................................... 8
    3.5.1 Module status indication .................................................................................. 8
    3.5.2 IO indication ..................................................................................................... 8

4 CONFIGURATION ......................................................................................................... 9
  4.1 Connect to the GSM-PRO ...................................................................................... 9
  4.2 Synchronize .......................................................................................................... 10
    4.2.1 Upload changes to the module ...................................................................... 10
    4.2.2 Download settings from module ................................................................... 10
    4.2.3 Reset module to default .............................................................................. 10
    4.2.4 Synchronize date/time with PC ..................................................................... 10
    4.2.5 Restart device ............................................................................................... 11
    4.2.6 Connect to module ......................................................................................... 11
  4.3 Diagnostics .............................................................................................................. 12
    4.3.1 Signal quality ................................................................................................. 12
  4.4 Phonebook ............................................................................................................... 13
    4.4.1 Add contacts .................................................................................................. 13
    4.4.2 Delete contacts .............................................................................................. 14
    4.4.3 Import / Export phonebook .......................................................................... 15
  4.5 Settings .................................................................................................................... 16
    4.5.1 Main settings ................................................................................................ 16
    4.5.2 Periodical message ....................................................................................... 16
    4.5.3 Power cycle message .................................................................................... 16
    4.5.4 Power down message .................................................................................... 16
4.5.5 Active users .......................................................................................................................16
4.5.6 Import / Export settings .................................................................................................17

5  ADVANCED SETTINGS ........................................................................................................... 18
5.1 Update ........................................................................................................................................ 19
  5.1.1 Manual firmware updates ............................................................................................ 19
  5.1.2 OTA firmware update ................................................................................................ 19
  5.1.3 OTA configuration ......................................................................................................... 19
  5.1.4 Send update information ............................................................................................. 20
5.2 Network .................................................................................................................................... 20
  5.2.1 Allow data usage ........................................................................................................... 20
  5.2.2 Roaming ......................................................................................................................... 21
  5.2.3 APN settings .................................................................................................................. 21
  5.2.4 OTA Time synchronisation .......................................................................................... 21
  5.2.5 App .................................................................................................................................. 21
  5.2.6 Portal ...................................................................................................................................21
5.3 SMTP ....................................................................................................................................... 21
  5.3.1 SMTP settings ..................................................................................................................22
  5.3.2 SMTP test ..........................................................................................................................22
5.4 Log 22
  5.4.1 Event log .......................................................................................................................... 23
  5.4.2 AI log .................................................................................................................................. 23
  5.4.3 IO operating hours counter .......................................................................................... 24
    5.4.3.1 Request digital output counter ................................................................................. 24
    5.4.3.2 Request digital input counter .................................................................................. 24
    5.4.3.3 Reset digital output counter .................................................................................. 24
    5.4.3.4 Reset digital input counter .................................................................................... 24
  5.4.4 Monitor input changes during restart .......................................................................... 24
5.5 SIM 25
  5.5.1 Change SIM pin .............................................................................................................. 25
  5.5.2 Insert PUK code ............................................................................................................ 25
5.6 COM port .................................................................................................................................. 25

6  I/O CONFIGURATION AND MESSAGING ..............................................................................26
6.1 Digital Outputs .........................................................................................................................26
  6.1.1 Configuration ....................................................................................................................26
  6.1.2 Select users ..................................................................................................................... 27
  6.1.3 Messaging ........................................................................................................................ 27
    6.1.3.1 Number ID ..................................................................................................................27
    6.1.3.2 User defined instructions ..........................................................................................27
    6.1.3.3 Writing to multiple digital outputs ............................................................................ 27
    6.1.3.4 Writing to a single digital output ............................................................................... 27
  6.1.4 Using the one-shot function ............................................................................................ 28
  6.1.5 Reading from multiple digital outputs ............................................................................ 28
  6.1.6 Reading from a single digital output ............................................................................... 28
6.1.7 React on RING.................................................................28
6.1.8 Link DO to DI .................................................................28
6.1.9 Actvate when GSM connection is lost.................................28
6.1.10 Preserve status on startup ...............................................29
6.1.11 Wiring example...............................................................29
6.2 Universal Inputs.................................................................30
   6.2.1 Reading from multiple universal inputs .........................30
   6.2.2 Select receivers.............................................................30
   6.2.3 Confirmation sequence ................................................30
6.3 Analog inputs........................................................................31
   6.3.1 Configuration...............................................................31
   6.3.2 Reading from an analog input ......................................32
   6.3.3 Wiring example.............................................................32
6.4 Digital Inputs.........................................................................33
   6.4.1 Configuration...............................................................33
   6.4.2 Reading from a digital input ........................................33
   6.4.3 Connect to V out.............................................................34
   6.4.4 Wiring example.............................................................34
6.5 Read all IO statuses..............................................................35
6.6 Link multiple GSM-PRO's.....................................................35

7 OTHER MESSAGES.............................................................36
7.1 Module reset .................................................................36
7.2 Stop messaging ...............................................................36
7.3 Show all SMS commands ..................................................36

8 ADDITIONAL HARDWARE..................................................37
8.1 External antenna...............................................................37
8.2 Programming cable ..........................................................37

9 ADDITIONAL SOFTWARE..................................................38
9.1 GSM-PRO App .................................................................38
9.2 GSM-PRO Portal..............................................................38

10 TROUBLESHOOTING......................................................40
10.1 Cannot connect to the PC, no module found .......................40
10.2 No connection to GSM network ........................................40
10.3 The module doesn’t send any messages ..............................40
10.4 The module doesn’t start..................................................40
10.5 Diagnosis........................................................................41
   10.5.1 USB........................................................................41
   10.5.2 OTA........................................................................41
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5.2.1</td>
<td>Port forwarding</td>
<td>41</td>
</tr>
<tr>
<td>11</td>
<td>APPENDIX: SMS COMMANDS</td>
<td>42</td>
</tr>
<tr>
<td>12</td>
<td>APPENDIX: DIAGNOSTIC COMMANDS</td>
<td>44</td>
</tr>
<tr>
<td>13</td>
<td>APPENDIX: SIGNAL STRENGTHS</td>
<td>45</td>
</tr>
<tr>
<td>14</td>
<td>APPENDIX: TECHNICAL SPECIFICATIONS</td>
<td>46</td>
</tr>
</tbody>
</table>
1 DESCRIPTION

1.1 Summary

The GSM-PRO is a compact remote control and messaging system. All IOs are monitored by SMS and email and controlled by SMS communication through the GSM network.

The module can be configured with the GSM-PRO PC-software. Each IO can be modified by user-defined parameter names and messages. A selected group of users can be chosen from the phonebook to control the module, or only receive messages.

GSM-PRO features:

- 4 Digital Outputs (DO), relay CO contact 250V/5A
- 8 Universal Inputs (UI) which can be set by software as:
  - Analog Input (AI), 0..10V
  - Digital Input (DI)

On each defined input status change (rising or falling flank for digital inputs or reached level for analog inputs) the module sends a pre- or user-defined message to the selected group of users. The outputs can be set when a selected user sends a pre- or user-defined SMS to the GSM-PRO.

The GSM-PRO sends a periodical message on user defined times. On power loss the module holds enough power to send SMS messages to all selected GSM users (NO email). It also sends messages when coming back from a power reset.

1.2 Safety instructions

- This device is NOT suitable for monitoring sensible or time critical processes. Power interruption or GSM network failures do not guarantee flawless monitoring.
- Keep ESD precautions in mind when opening the module.
- This module can require a GSM data connection. For information about costs ask your GSM service provider.

1.3 General note

This manual applies to firmware and interface version 2.0.0 or higher. Some functions are not available in older versions.

NOTE:
Firmware version 1.6.2 or lower is not compatible with interface version 2.0.0 or higher.
Firmware version 2.0.0 or higher is not compatible with interface version 1.5.2 or lower.

Please contact Conta-Clip when an older revision is needed.
2 SOFTWARE

Download the latest GSM-PRO interface software at:

On start up the interface software checks if there is a new interface available and, when a module is connected, a new firmware version is available. To manually check for updates click: Help -> check for updates.
NOTE: checking for updates requires an internet connection.

2.1 System requirements

The following requirements are needed to run and use the software properly:
- Windows XP sp3, Vista, 7, 8
- Minimal 1024 x 768 pixels screen resolution
- 100MB Hard disc capacity available
- 256MB RAM
- USB port

2.2 Software installation

As the program needs to install hardware drivers make sure you have administrator rights.

Run the GSM-PRO_setup.exe to install the application. The setup wizard will guide you through the rest of the setup process.

When starting the interface for the first time it will prompt if you want to keep informed on updates by email. This function can be repeated in the advanced settings update tab (see 5.1).

After starting the interface set the language by: Edit -> Language. The chosen language is saved and recalled at start up.
3 MODULE

3.1 Place the SIM card

NOTE: Keep ESD precautions in mind when opening the module.

Place a SIM card into the SIM card holder to access the GSM network:

- Lift the lid with a small flat screwdriver.

- Place a SIM card into the SIM card holder (image may vary).

- Replace the lid.
3.2 Connect the antenna

Connect the antenna on the antenna connector on top of the module.

3.3 Connect to power

Connect the 24V and 0V to a 24VDC power supply (10..30VDC).
3.4 Connect to PC

Connect a USB cable (artnr. 16103.2, sold separately, please contact Conta-Clip for further information) to the mini USB socket on the module, and the other end to a USB port on a PC.

NOTE: Make sure to install the interface software and drivers before connecting the module to a PC.

3.5 LED description

3.5.1 Module status indication

After connecting the power it takes about 10 seconds before the first Led activates.

The Led ‘Run’ indicates module activity:
- Flash = starting-up (takes about 90 seconds)
- ON = ready for use (blinks every 10 seconds)
- OFF = no power

The Led ‘Com’ indicates network activity:
- green ON = connected to GSM network
- green Flash = roaming GSM network
- green OFF = not connected to GSM network

The Led ‘Busy’ indicates module activity:
- ON = module currently busy

After data transfers between the PC and the module, the module performs a reset. During this time all UI Led’s light up and all other Led’s are off.

3.5.2 IO indication

- For each Digital Output a Led lights up when the relay is activated.
- The Universal Input Led’s light up when:
  - When set as digital input : the input is active (1)
  - When set as analog input : a top or bottom threshold is exceeded
4 CONFIGURATION

4.1 Connect to the GSM-PRO

Connect 24VDC to the module and connect a USB cable between the GSM-PRO and a PC USB port. Wait for the module to start up and run the GSM-PRO interface software. NOTE: module start up takes about 90 seconds, after connecting to power it takes about 10 seconds before the first LED activates.

On start up the configuration software searches all available COM ports for an available GSM-PRO. When found, the software downloads the diagnostic data and prompts to download the settings from the device. If chosen yes, the user interface will be automatically updated.

If no module was found on start-up, click the connect button in the upper right corner to search for the module:

![Interface Software](image)

If the module is found the text ‘connected’ at the bottom left side will appear.
4.2 Synchronize

Press the synchronize button to edit the module:

![Synchronize interface]

4.2.1 Upload changes to the module

Upload current configuration software settings to the module.
NOTE: uploading settings to the module overwrites all settings within the module. Therefore it is highly recommended to download the settings from the module first, before uploading any new changes.

4.2.2 Download settings from module

Download all settings from the module into the interface.

4.2.3 Reset module to default

Restore all settings in the module back to factory default.

4.2.4 Synchronize date/time with PC

The date and time of the module are synchronized with your PC system time.
4.2.5 Restart device

Due to the internal capacity it’s not possible to quickly reset the device by powering off. Click this button to reset the device by software.

4.2.6 Connect to module

Find a module and connect to it by USB.
4.3 Diagnostics

After connecting to the module the diagnostics tab is filled. This page shows:
- Registered GSM network or connection errors
- Signal strength in percentage and signal quality
- Module timestamp
- Module firmware version
- IMEI number
- Error messages:
  - SIM PIN code required
  - SIM PUK code required
  - No SIM card
  - Date / Time not set
  - No user selected
  - No network registration

Refresh the diagnostics tab by clicking the ‘diagnostic check’ button.

To request the diagnostics by SMS send: `status`.

Press the ‘check data connection’ button to test if a GPRS (internet) connection can be established by the module. Check chapter 5.2. for further instructions on setting up an internet connection.

4.3.1 Signal quality

The signal quality information is defined by the Dutch Telecom Agency according to GSM network regulations. The full list is shown in the appendix.

To request the signal strength /and quality by SMS send: `csq`.
4.4 Phonebook

The interface software has a phonebook to list all your contacts for further usage. All actions in the phonebook will auto save on completion.

4.4.1 Add contacts

To add a contact to the phonebook click on the next empty row and fill in the name and phone number or email address.

NOTE: The phone number must be preceded by the international access code
E.g.:
- UK +44
- Germany +49
- France +33
- Netherlands +31
- Italy +39
- Spain +34
- Poland +48
- Portugal +351
4.4.2 Delete contacts

To delete a contact select one or multiple rows to delete and click the delete button.
4.4.3 Import / Export phonebook

The phonebook can be exported for usage on another PC that has the interface software installed. To export the phonebook click the ‘phonebook’ button and ‘export phonebook’. Windows prompts ‘save as’. Save the file with a given name on a preferred destination to the PC.

To import the phonebook click the ‘phonebook’ button and ‘import phonebook’. Windows prompts to point the location of an exported *.cpf file.
4.5 Settings

4.5.1 Main settings

The main functions of the module are configured in the ‘settings’ tab:

- Module name
- SIM pin number, this is the pin number to access the SIM card. By most providers it is default set to 0000.

4.5.2 Periodical message

The GSM-PRO can send a periodical message on a user defined time:

- Daily, set the time
- Weekly, set the day and time
- Monthly, set the day of the month and time

This message can be supplemented with the actual status of all IOs.

4.5.3 Power cycle message

The GSM-PRO can send a message on every module start up, so the users are aware of a power recovery.

4.5.4 Power down message

On power loss the module holds enough capacity to send SMS messages to the first 5 selected GSM users.

The GSM-PRO detects a power down when the power < 8V and returns when the power > 10V.

NOTE: The module tries to send the message to all defined users in the settings tab with the guarantee of the first 5 selected users.

4.5.5 Active users

The active users are those who have full access to the module and receive the auto messages. The sequence of messaging is determined by the order of selected users (nr 1 to 10).

If a user only needs to access the module but doesn’t want to receive any messages uncheck the checkbox behind the user.

Click the button ‘Copy users to UIs’ to copy the selected users from the settings tab to all UI tabs.
4.5.6 Import / Export settings

Export the settings to preserve them for later usage after closing the user interface. To export all settings click the ‘settings’ button and ‘export settings’. Windows prompts ‘save as’. Save the file with a given name on a preferred destination to the PC.

To import the settings click the ‘settings’ button and ‘import settings’. Windows prompts to point the location of an exported *.ccf file.

To print all settings click print settings and select an available printer.
5 ADVANCED SETTINGS

Access the ‘advanced settings’ by clicking Edit->advanced settings or tapping F2. The following functions can be configured:

- updates
- network connection
- email
- logging
- SIM card
- COM port

After completing the set-up the configuration needs to be uploaded to the module. See chapter 4.2.1 for further details.
5.1 Update

The GSM-PRO can perform firmware updates remotely (OTA) or when connected by USB to a PC. Over The Air (OTA) covers remote actions where the data is transmitted over GPRS.

![OTA firmware update](image)

NOTE: To perform an OTA action the module has to be registered to a GSM data connection and data usage has to be allowed (see section network settings)

5.1.1 Manual firmware updates


After downloading, unzip the complete folder to a location on your PC. Click the firmware update button and the software prompts to the location of the firmware. Locate the unzipped folder and select the GSM-PRO.jar file.

During the firmware update all UI LEDs on the module light up. The firmware update takes about 2 minutes. After the update the module restarts itself.

NOTE: do NOT disconnect the module or turn off the power supply during this operation.

5.1.2 OTA firmware update

To remotely update the firmware send: `fotap`. The GSM-PRO downloads the online firmware, installs it and restarts. When a firmware update is succeeded the module sends a confirmation to the sender.

To check the modules current firmware version send: `fwv`. The module answers `<module name> firmware version: <version number>`.

To check if there is a newer firmware version available send: `cupd`. The module answers `<module name> (No) update found. Online <firmware version> local: <firmware version>`.

5.1.3 OTA configuration

The configuration with the user interface can be performed remotely. Send: `rotac` to start this procedure. When the command is received the module uploads the current configuration to the
Conta-Clip server and answers: ‘module IMEI nr: <IMEI nr> <module name> configuration file uploaded.’

Fill the unique module International Mobile Equipment Identity (IMEI) into the user interface and press ‘download configuration’. The user interface will be automatically updated with the settings of the (remote) module.

After making the required changes to the configuration, press ‘upload configuration’ to upload the new configuration onto the Conta-Clip server. Configuration files are kept on the server for 5 days.

Finally send: cotac, cotac, cotac, cotac to inform the module that the new configuration is online. It will download the configuration and resets, this will take about one minute. Finally the module answers: ‘<module name> configuration file updated’.

The configuration file can also be requested by sending: ccf, ccf, ccf, ccf directly followed by a valid email address (e.g. ccf, name@conta-clip.de). When ready, the module answers with a confirmation message and the configuration file is received by the email address. Download and import the file into the interface, for further information see chapter 4.5.6.

NOTE: to up- and download the configuration the PC has to be connected to the internet.

5.1.4 Send update information

Send us your contact details to stay informed on any updates regarding this product. Your details will be used for this purpose only.

5.2 Network

5.2.1 Allow data usage

Mark this checkbox if a data connection is required. 
NOTE: Activating mobile internet can cause unexpected costs. Contact your provider for an appropriate subscription or prepaid card.

If the internet connection is required but not allowed after configuration send an SMS: APN, <APN name>, <APN username>, <APN password>

The module establishes an internet connection upon next restart. The module can now be upgraded or configured over the air.
If the internet connection has to maintain after restart, this can be configured remotely.

5.2.2 Roaming

If roaming is disabled the module blocks SMS and data connections when registered to a foreign GSM network.
NOTE: contact your GSM service provider for roaming rates to avoid unexpected high billing.

5.2.3 APN settings

To register to a GPRS connection, enter the APN (Access Point Name) settings of your GSM service provider. If these settings are unknown to you, request them at your provider.

Before uploading them into the module the APN settings can be tested by pressing the ‘test’ button. This tests the APN settings entered into the fields in the interface.

Remotely check the GSM data connection by sending: **cdc**. The module answers with the status of the connection.

5.2.4 OTA Time synchronisation

The module can check online if date/time is not correct, if needed the module performs a synchronisation.
When selected this action is performed approximately every 24 hours after powering up.

To synchronize date/time by SMS send: **time**. The module takes the provider message timestamp to synchronise
The module answers: `<module name> set time to <timestamp>`.

NOTE: after synchronizing date/time the module automatically restarts.

5.2.5 App

Mark the checkbox to synchronize your GSM-PRO’s events and IO status so it can be read and controlled by an Apple iOS or Android App.

5.2.6 Portal

Mark the checkbox and fill your PC’s remote IP and port to allow the GSM-PRO to access the Portal software.
See the GSM-PRO Portal manual for further instructions.

5.3 SMTP

Enter the SMTP (Simple Mail Transfer Protocol) settings for outgoing email. The SMTP is used to send email via outgoing mail server. Insert these values only if you want the module to send emails.
5.3.1 SMTP settings

Conta-Clip offers free usage of the SMTP server for outgoing mail of the GSM-PRO. If you want to use the Conta-Clip SMTP server enter ‘Conta-Clip’ as the server name. NOTE: Conta-Clip does not guarantee any uptime of this service.

If you prefer to use your own SMTP server, enter your SMTP settings. Contact your hosting service for further details.

Make sure to insert a valid sender, this is an email address on the SMTP server. When this is not correct some servers might not accept self-addressed email or the email might not get past spam filters.

NOTE: SSL connected SMTP servers e.g. Hotmail / Gmail are not supported by the GSM-PRO.

5.3.2 SMTP test

Before uploading into the module, the SMTP settings can be tested by entering an existing email address and then pressing the ‘test’ button. This tests the APN settings entered into the fields in the interface.

NOTE: A GSM data connection is required to test the SMTP server.

5.4 Log

The GSM-PRO can keep log files with a maximum size of 720 events. When a log is 90% full the module sends a warning message to the active users. When the log is 100% full the module sends another warning message and then it stops logging until downloaded or erased.

A full log can also be sent automatically to one selected email address. After this action the log file is automatically erased and the module continues logging.

Each log can be viewed and erased while connected to the PC by clicking the button or remote by sending a command.
5.4.1 Event log

When this log is enabled the GSM-PRO logs the following events:

- Reached threshold limits on the AI inputs
- Rising and falling flank on the digital inputs (DI)
- Received messages
- Sent messages
- Data transmissions
- OTA updates

When connected, view this log by clicking ‘view event log’. View remote by sending: `evlog` directly followed by a valid email address (e.g. `evlog name@conta-clip.de`). When ready, the module answers with a confirmation message and the event log is received at the email address.

When connected erase the event log by clicking ‘erase event log’. Erase remote by sending: `evclr`.

The module answers with a confirmation message.

NOTE: on heavy usage the event log is filled rapidly. It is highly recommended to choose the auto send option when enabled.

5.4.2 AI log

Choose the interval for the AI log:

- 10 min (5 days)
- 15 min (7.5 days)
- 20 min (10 days)
- 30 min (15 days)
- 45 min (22.5 days)
- 60 min (30 days)

The log duration in days is based on logging 1 AI.

When connected, view this log by clicking ‘view AI log’. View remote by sending: `ailog` directly followed by a valid email address (e.g. `ailog name@conta-clip.de`). When ready the module answers with a confirmation message and the AI log is received by the email address.
When connected, erase the event log by clicking ‘erase Al log’. Erase remote by sending: \texttt{aiclr}. The module answers with a confirmation message.

5.4.3 IO operating hours counter

The IO operating hours counter sums the total time the IO is in HI state. The counter can be turned on/off each individual digital in- and output. The counted value can be added to the periodical message and ‘RALL’(see chapter 6.5).

Counters are limited to 17500 hours.

NOTE: make sure to keep all IO’s in LO state when configuring the counters due to faults in starting time.

5.4.3.1 Request digital output counter

To retrieve the counter value of an individual digital output, send: \texttt{timedon}, where n is the number of the requested digital output. The module answers: ‘Don ON for x,xx hours’.

To retrieve the counter values of all digital outputs send: \texttt{timedo0}. The module answers: ‘Do1 was ON for x,xx hours, Do2 was ON for x,xx hours ... Do4 was ON for x,xx hours’.

5.4.3.2 Request digital input counter

To retrieve the counter value of an individual digital input, send: \texttt{timedi}, where n is the number of the requested digital input. The module answers: ‘Di\textsubscript{n} ON for x,xx hours’.

To retrieve the counter value of all digital inputs send: \texttt{timedi0}. The module answers: ‘Di1 was ON for x,xx hours, Di2 was ON for x,xx hours ... Di8 was ON for x,xx hours’.

5.4.3.3 Reset digital output counter

To reset the counter value of an individual digital output, send: \texttt{clrtimedon}, where n is the number of the requested digital output. The module answers: ‘erasing counter Do\textsubscript{n}’.

To reset the counter values of all digital outputs, send: \texttt{clrtimedo0}. The module answers: ‘erasing counter Do1, erasing counter Do2... erasing counter Do4’.

5.4.3.4 Reset digital input counter

To reset the counter value of an individual digital input, send: \texttt{clrtimedi}, where n is the number of the requested digital input. The module answers: ‘erasing counter Di\textsubscript{n}’.

To reset the counter values of all digital inputs, send: \texttt{clrtimedi0}. The module answers: ‘erasing counter Di1, erasing counter Di2... erasing counter Di4’.

5.4.4 Monitor input changes during restart

The module detects changes on the inputs while restarting. The status when is saved on restart / power-down and will be compared on next start-up. Any changes detected are send to the configured users.
5.5 SIM

5.5.1 Change SIM pin

Change the SIM pin code by inserting the current pin code and the new one. Click ‘change SIM pin’ to change.

5.5.2 Insert PUK code

When a wrong PIN number is given 3 times the SIM card is locked and requests the PUK code. The diagnostics page shows this in the error messages. Insert the correct PUK and PIN code and click ‘insert PUK code’.

5.6 COM port

The COM port tab shows on which COM port a GSM-PRO module is found.
6 I/O CONFIGURATION AND MESSAGING

The module responds to read and write commands. Commands are preceded by an ‘r’ for read and ‘w’ for write actions.
All SMS commands are NOT case sensitive.

6.1 Digital Outputs

6.1.1 Configuration

The GSM-PRO has 4 CO outputs. The following items can be configured with the software:

- Name, this name must be unique and cannot be used with any other input or output. Default set as DO1 to DO4.
- After setting a digital output the module sends a confirmation message followed by the actual output state. This message is sent only to the sender of the message.
- Send only the user defined text, this sends only the text defined in the message box, no module name, IO name and timestamp. See section 6.6.
- Define your own instructions to control the output.
- Activate or toggle the output when starting a phone call with the module.
- Link DO to DI
- Activate when GSM connection lost, deactivate when GSM connection returns.
- Preserve or deactivate the status on restart or power cycle.
6.1.2 Select users

The recipients have access to the associated digital output.
NOTE: Selected DO users do not have any rights to send other commands to the module other than addressed to the defined output.

6.1.3 Messaging

It is possible to send self made instructions or use the pre-defined instructions per output or as a group as described in the next chapters.
With these instructions an output can be activated, deactivated and activated for a given period of time (one-shot).

6.1.3.1 Number ID

The number ID for setting a digital output can be disabled per output. When disabled the output responds on both SMS and incoming calls (see 6.1.3.6) from everyone.
NOTE: keep safety precautions in mind when disabling this function together with the ring function due to unwanted incoming calls.

6.1.3.2 User defined instructions

Use a self made instruction to control an output. E.g. you may want to use the instruction *pump on* to activate output 1, and *pump off* to deactivate.

In this way the multiple outputs can also be controlled by configuring the same instruction for another output.

It is also possible to combine functions with one instruction. E.g. activate an output, deactivate another, activate the one-shot on a third and so on.

6.1.3.3 Writing to multiple digital outputs

To set all Digital outputs send the default message: *wmdo*xxxx
Each x represents the state of its positions output: 0=off, 1=on, 2=don’t change and 3=toggle.
E.g. when you send *wmdo*0123:
- DO1 sets to 0
- DO2 sets to 1
- DO3 is not changed
- DO4 toggles its state (0 to 1 or 1 to 0)

The module sends a confirmation message with the output states only to the sender: ‘status DO1=x, DO2=x, DO3=x, DO4=x’

NOTE: see user defined functions to define own instructions.

6.1.3.4 Writing to a single digital output

To set an individual digital output (DO) send the following default message: *wdo*nx, where n= the output number and x= the state.
E.g. when you send *wdo31*, DO3 is set to 1.

When a user defined name is given to an output, it can be addressed by putting the name between asterisks. E.g. if an output is called ‘light’, you can set it by sending *w*light*3*, this output will be toggled.
If set, the module sends a confirmation message: ‘status DO\text{n}=x’, or when a user defined name is given: ‘status name=x’

If an output state is already in the state, the text: ‘status not changed’ is added to the answer.

NOTE: see user defined functions to define own instructions.

6.1.4 Using the one-shot function

The digital outputs can be set for a given time from 1 to 36000 seconds. When this command is received, the DO sets to 1 and after the number of seconds the DO falls back to 0. The one shot function is called by selecting a single DO followed by a ‘t’ for time and the time in seconds. E.g. when you send \texttt{wdo1t10} DO1 is set for 10 seconds.

The one-shot function sends two answers, one at the start and one at the end of the sequence.

NOTE: see user defined functions to define own instructions.

6.1.5 Reading from multiple digital outputs

To retrieve the status of all digital outputs send: \texttt{rmdo}.

The module answers: ‘status DO1=x, DO2=x, DO3=x, DO4=x’

6.1.6 Reading from a single digital output

To retrieve the status of an individual digital output, send: \texttt{rdo n}, where \texttt{n} is the number of the requested digital output. The module answers: ‘status DO\text{n}=x’

When a user defined name is given to a digital output it can be addressed by putting the name between asterisks. E.g. if an output is called ‘light’, you read the status by sending \texttt{r*light*}. The module answers: ‘status light=x’

6.1.7 React on RING

This function enables toggling one or more DOs on a RING (phone call) command. When one of the selected users in the settings tab dials the number of the module it toggles all selected DOs and breaks the connection. The caller receives a SMS message with the status of the DOs.

When the output timer value is set greater than 0 the output status is set to 1 for the amount of seconds set. If the output status is already 1 this is kept for the amount of seconds and then set to 0.

Set the output timer value to 0 to disable the timer function.

6.1.8 Link DO to DI

DO1 can be linked to DI1, DO2 to DI2 and so on. When a status change on a DI is detected the corresponding DO will adopt this status.

The status of the DO can always be overruled by an SMS message setting the output(s)(see above). If an output has already the same state as the linked input the output will not change.

NOTE: This function can conflict with the SMS and RING instructions.

6.1.9 Activate when GSM connection is lost

Select to activate an output when the GSM connection is lost. The output deactivates as soon as the GSM connection is re-established.
NOTE: This function can conflict with the SMS and RING instructions.

6.1.10 Preserve status on startup

Choose if the status per output is preserved on restart or power cycle. If deselected the output is deactivated.

6.1.11 Wiring example

In the following example Do1 is connected as normally open and Do4 is connected as normally closed.

[Diagram of wiring example]

Connect only to a single polarity supply!

The following examples are not allowed:
6.2 Universal Inputs

The GSM-PRO has 8 universal inputs which can individual be configured as:
- Analog input AI (0..10V)
- Digital input DI (default)

The selected button represents the chosen function and is set after uploading.

6.2.1 Reading from multiple universal inputs

To read all universal inputs send the default message: `rmui`

The module sends a status message with the input states: ‘read UI1=xxxx, UI2=xxxx, .... UI8=xxxx’. UI is replaced by the configured input type: AI or DI.

6.2.2 Select receivers

The recipients receive the messages of the selected UI. The sequence of messaging is determined by the order of selected users (nr 1 to 10).

NOTE: Selected UI users do not have any rights to send commands to the module.

6.2.3 Confirmation sequence

When the confirmation is enabled, the module sends the message to the selected users one by one with an adjustable interval delay.

E.g. the sequence starts, the first phone number is addressed. When the delay time has expired, the next phone number in the list is addressed, and so on until the last phone number in the list is addressed.

This can be repeated for selected number of times before the module stops the sequence.

The user who receives the message is able to stop the confirmation sequence by sending a chosen text (can be left blank) to the module before the delay has expired. The module answers: ‘Confirmation ended <timestamp>’

NOTE: When a new status is reached on the UI, a new sequence is started and the old sequence is stopped automatically.
When there are one or more email addresses in the user list, the email is sent only once to all email addresses at the beginning of the sequence.

6.3 Analog inputs

Each analog input (AI) represents a scaled value from 0 to 10V. Within this scale threshold values can be monitored.

6.3.1 Configuration

Configure the following items:

- Name; this name must be unique and cannot be used with any other input or output. Default set as AI1 to AI8.
- The unit for the input feedback. E.g. litres (Ltr) or kilograms (kg).
- Log this AI at a pre-set interval, see chapter 5.4 for interval settings.
- The min. value represents the scaled value for 0V
- The max. value represents the scaled value for 10V
- Lower limit threshold
- Upper limit threshold
- Minimal change (hysteresis)
- Send only the user defined text, this sends only the text defined in the message box, no module name, IO name and timestamp.
- The Analog Inputs can generate messages including value and unit when:
  - The upper limit + hysteresis is reached
  - The lower limit – hysteresis is reached
  - The status recovers between the upper and lower limit +/- hysteresis
NOTE: The min./max. and threshold/hysteresis values are limited to 5 digits with a maximum of 2 decimals.

A delay in seconds can be set which a changed Al has to exceed before it is accepted, during the delay the UI led blinks. If the status of the delay is changed back again to the previous state before the delay is expired the change is discarded.
Set the delay to 0 to disable detection delay.

6.3.2 Reading from an analog input

To retrieve the status of an analog input, send: \texttt{ruin}, where \( n \) is the number of the requested input. The module answers: ‘status Aln=xxxx’

When a user defined name is given to an input it can be addressed by putting the name between asterisks. E.g. if an output is called ‘watertank’, you read the status by sending \texttt{ruin**watertank**}. The module answers: ‘status watertank=xxxx’

6.3.3 Wiring example

In the following example Ai1 and Ai8 are connected to an analog source.
6.4 Digital Inputs

6.4.1 Configuration

Configure the following items:

- **Name**: this name must be unique and cannot be used with any other input or output. Default set as DI1 to DI8.

- The Digital Inputs can generate messages when:
  - A rising flank is detected: the status changes from 0 to 1
  - A falling flank is detected: the status changes from 1 to 0

A delay in seconds can be set which a changed DI has to exceed before it is accepted, during the delay the UI led blinks. If the status of the delay is changed again before the delay is expired the change is discarded.

Set the delay to 0 to disable detection delay.

6.4.2 Reading from a digital input

To retrieve the status of a digital input, send: `ruin`, where n is the number of the requested input. The module answers: ‘status DIn=x’

When a user defined name is given to an input it can be addressed by putting the name between asterisks. E.g. if an input is called ‘door’, you read the status by sending `ru*door*`. The module answers: ‘status door=x’
6.4.3 Connect to V out

The module contains a source which can be used to connect the digital inputs. When using the power down function it’s highly recommended to use this source over the input voltage to connect the digital inputs. Otherwise the change of the digital inputs could be detected before the power down, causing the module to send digital input change messages and not having enough capacity to also send the power down message.

NOTE: the V+ is a source with 20mA which is designed for signalling. This connection is not suitable as power supply.

6.4.4 Wiring example

In the following example all Di’s are connected to be pulled-up with +V.
6.5 Read all IO statuses

To retrieve the status of all IOs send: `rall`. The module answers:

`<Module name> IO status:
DO1=x (to) DO4=x
UI1=xxx (to) UI8=xxx`

Where UI is replaced by the chosen input type: AI or DI.

To send the full IO status to an email address send: `rall<email>`.

6.6 Link multiple GSM-PRO’s

It’s possible to link multiple GSM-PRO units by SMS. By selecting the ‘send only user defined text’ in the IO configuration it’s possible to send the pre-defined messages to other modules.

For example: digital input 8 sends WDO21 on a rising flank to a second unit. This unit receives the message, sets digital output 2 and sends a message WDO31 to a third unit, and so on. On the falling flank the first unit sends WDO20 to deactivate the digital output on the second unit and so on. It is also possible to send an SMS to itself and activate digital outputs on reaction to digital inputs.

NOTE: The digital outputs cannot parse any messages. They only respond to their sender.
7 OTHER MESSAGES

7.1 Module reset

Reset with the following command: \texttt{wreset}. This performs a full module reset. The module answers with the power cycle message if set.

7.2 Stop messaging

The command: \texttt{mesoff} will stop the module from sending any more messages. The module answers: ‘messaging turned off’.

To turn back on the messaging send: \texttt{meson}. The module answers: ‘messaging turned on’.

7.3 Show all SMS commands

Send \texttt{help} to receive a list with all commands. See chapter 10 for an overview.
8 ADDITIONAL HARDWARE

The hardware described below is sold separately. Please contact CONTA-CLIP for more information.

8.1 External antenna

If mounted in a closed (metal) cabinet the GSM reception can be very poor. Therefore an external antenna is offered which can be placed outside the cabinet. (Art.nr. 16061.2)

8.2 Programming cable

To connect the module to a PC for configuration, a USB to mini USB cable is used. (Art.nr. 16103.2). This cable may be connected only during the configuration of the module.
9 ADDITIONAL SOFTWARE

9.1 GSM-PRO App

The GSM-PRO App can be downloaded from the Google Play store for Android and from the Apple Store for Apple iOS.

With the app you can view the IO status and events or set an output by simple tapping your smartphones touch screen. No longer need to remember any SMS codes.

Please contact CONTA-CLIP for more information.

9.2 GSM-PRO Portal

The GSM-PRO Portal is a desktop monitoring and control software for multiple GSM-PRO modules. It can be downloaded from:

Please read the Portal manual or contact CONTA-CLIP for more information.
10 TROUBLESHOOTING

10.1 Cannot connect to the PC, no module found

- Disconnect the module from power / PC wait 10 seconds and re-connect.
- Reboot the PC after driver installation.
- In your system device manager Ports (COM & LPT) check if the driver of the Silicon Labs CP210x is installed and the version is higher or equal to 6.3.0.0.
- Try a different USB port, remove any hubs or extension cables.

10.2 No connection to GSM network

- Make sure the SIM card is placed correctly.
- Check the diagnostics tab for error messages, PUK or PIN required.
- Check the signal strength.

10.3 The module doesn’t send any messages

- Is the used IO proper set.
- Make sure the SIM card is placed correct.
- Does the prepaid card holds enough credit.
- Check your email spam/unwanted box.

10.4 The module doesn’t start

- Disconnect from power, wait 5 minutes and reconnect to power.
- Place a jumper on the upper pins of J2 (left side of SIM card) and repeat above step. The module starts up factory default state. Configuration may need to be recovered.
10.5 Diagnosis

For additional troubleshooting, the activities in the module can be monitored with the diagnosis window. To open this press help->diagnosis.

See the appendix for instructions to request data from the module. Enter the instruction to the “send” box and hit enter. The response is shown in the window.

10.5.1 USB

If the module is connected by USB to the PC the text will appear in the window. If the interface did not find a module on startup make sure the module is connected and press the connect button. After establishing the connection check the USB checkbox.

Wait for activities to appear or send an instruction for any response.

10.5.2 OTA

It is possible to do a remote diagnose on the module. An internet connection for the module and a portforwarding (see chapter portforwarding) for the used PC is required. Enter the internal IP address of the PC, the submitted port and mark the OTA option. The PC is now waiting for the GSM-PRO.

Next send the SMS: DEBUG<IP>:<port>
Replace the IP with the external IP from your router and the port with the forwarded one. Within 2 minutes the module should connect to the PC, this is visible in the diagnose window.

10.5.2.1 Port forwarding

If your PC is located behind an router, you need to open a port on the router and forward this port to the fixed LAN IP of the PC so that you can connect to the program correctly from the Internet. This function is available on most routers in the market and is often known as “Port Forwarding”.

The OTA diagnosis needs a port that is suitable for TCP connections. For further information on Port Forwarding please contact your system administrator or read your router manual.

NOTE: when the OTA diagnosis is started for the first time, Windows might prompt if the program is allowed to listen to the internet beyond the firewall. Click “allow access”.

---

GSM-PRO
**11 APPENDIX: SMS COMMANDS**

RALL  => read all IOs
RMDO  => read multiple (all) digital outputs
RDOn  => read digital output number n
RMUI  => read multiple (all) universal inputs
RUIn  => read universal input number n
WMDOxxxx => write multiple digital outputs to status x
WDOnx => write digital output number n to status x
WDOnTxxxx => write digital output number n to status 1 for xxxx seconds
WRESET => device reset
CCF m => mail configuration file to email address m
EVLOG m => mail event log to email address m
EVCLR => clear event log
AILOG m => mail AI log to email address m
AICLR => clear analog inputs log
FOTAP => firmware over the air provisioning
ROTAC => request over the air configuration
COTAC => check over the air configuration
CDC => check data connection
FWV => request firmware version
MESON => turn on messaging
MESOFF => turn off messaging
HELP => view all SMS commands
CUPD => check for firmware update
TIME => synchronize date/time by SMS
TIMEDIn => request digital input hour counter n, use ‘0’ for all di’s
TIMEDOn => request digital output hour counter n, use ‘0’ for all do’s
CLRTIMEDIn => reset digital input hour counter n, use ‘0’ for all di’s
CLRTIMEDOn  => reset digital output hour counter n, use ‘0’ for all do’s
CSQ       => check signal quality and strength
IMEI      => request IMEI number
STARTAPP  => configure APP usage
APN,<servername>,<user>,<pass> => setup one time data usage
PORTAL<ip>:<port>  => configure portal usage
STATUS    => request diagnostics
DEBUG<ip>:<port>  => activate remote debugger
12 APPENDIX: DIAGNOSTIC COMMANDS

HELLO => alive call, module answer with world
RST => device reset
MPWR => device power (V)
UIn => request ui number n, use ‘0’ for all ui’s
Donx => set do number n to status x, use ‘0’ for all do’s
## Appendix Signal strengths

<table>
<thead>
<tr>
<th>% (percentual)</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,0%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>3,2%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>6,5%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>9,7%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>12,9%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>16,1%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>19,4%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>22,6%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>25,8%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>29,0%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>32,3%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>35,5%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>38,7%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>41,9%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>45,2%</td>
<td>Too low for connectivity</td>
</tr>
<tr>
<td>48,4%</td>
<td>Marginal reception</td>
</tr>
<tr>
<td>51,6%</td>
<td>Marginal reception</td>
</tr>
<tr>
<td>54,8%</td>
<td>Marginal reception</td>
</tr>
<tr>
<td>58,1%</td>
<td>Marginal reception</td>
</tr>
<tr>
<td>61,3%</td>
<td>Marginal reception</td>
</tr>
<tr>
<td>64,5%</td>
<td>Reasonable reception</td>
</tr>
<tr>
<td>67,7%</td>
<td>Reasonable reception</td>
</tr>
<tr>
<td>71,0%</td>
<td>Reasonable reception</td>
</tr>
<tr>
<td>74,2%</td>
<td>Reasonable reception</td>
</tr>
<tr>
<td>77,4%</td>
<td>Reasonable reception</td>
</tr>
<tr>
<td>80,6%</td>
<td>Good reception</td>
</tr>
<tr>
<td>83,9%</td>
<td>Good reception</td>
</tr>
<tr>
<td>87,1%</td>
<td>Good reception</td>
</tr>
<tr>
<td>90,3%</td>
<td>Good reception</td>
</tr>
<tr>
<td>93,5%</td>
<td>Good reception</td>
</tr>
<tr>
<td>96,8%</td>
<td>Too high! Please attune your signal strength</td>
</tr>
<tr>
<td>100,0%</td>
<td>Too high! Please attune your signal strength</td>
</tr>
</tbody>
</table>
### 14 APPENDIX: TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>Order Information</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>type</strong></td>
<td>GSM-PRO</td>
</tr>
<tr>
<td><strong>Cat. no.</strong></td>
<td>16099.2</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>275gr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Input / Output Data</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8 multifunctional analog / dig. inputs</strong></td>
<td></td>
</tr>
<tr>
<td><strong>resolution / accuracy (0.10V)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>input resistance (0.10V)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>input current digital inputs (typ.)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>UI minimal pulse length</strong></td>
<td></td>
</tr>
<tr>
<td><strong>input threshold digital Inputs</strong></td>
<td></td>
</tr>
<tr>
<td><strong>4 relay outputs</strong></td>
<td></td>
</tr>
<tr>
<td><strong>rated / inrush current (Ohmic load)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>life span @ Ohmic load</strong></td>
<td></td>
</tr>
<tr>
<td><strong>max. switching frequency</strong></td>
<td></td>
</tr>
<tr>
<td><strong>contact material / test voltage</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>GSM Data</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Transmit power</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Antenna</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>General Data</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>module power supply</strong></td>
<td></td>
</tr>
<tr>
<td><strong>module current (max)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Reference out</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Power Backup</strong></td>
<td></td>
</tr>
<tr>
<td><strong>operating / storage temperature</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Max. relative humidity</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CE marking</strong></td>
<td></td>
</tr>
<tr>
<td><strong>conductor cross section / strip length</strong></td>
<td></td>
</tr>
<tr>
<td><strong>mounting / installation position</strong></td>
<td></td>
</tr>
<tr>
<td><strong>module LxWxH (TS 35 / direct)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>insulating material / flammability class</strong></td>
<td></td>
</tr>
<tr>
<td><strong>protection degree (DIN 40050)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>installation guidelines</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Accessories</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GSM antenna</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Cat. no.</strong></td>
<td>16010.2</td>
</tr>
<tr>
<td><strong>GSM external antenna</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Cat. no.</strong></td>
<td>16061.2</td>
</tr>
<tr>
<td><strong>USB programming cable</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Cat. no.</strong></td>
<td>16103.2</td>
</tr>
</tbody>
</table>

---

Errors, modifications and omissions excepted.