Cellcop Communicator

CP72u-M

Feb 2015

User Manual

ABOUT THE CELLCOP COMMUNICATOR SYSTEM

The Cellcop GSM communicator system is based on SMS and GPRS technology. It uses standard cellphone technology for communication and has been designed to provide you with the greatest possible flexibility and convenience. Read this manual carefully and have your installer instruct you on your system's operation and on which features have been implemented in your system. All users of this system should be equally instructed in its use.

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1. Features

5 Inputs to communicate separate alarm conditions

- Each input can be triggered to send an SMS to up to 16 Cellphone numbers
- The time delay before the input is triggered can be set for each input
- Separate messages can be configured for On and Off states of the input signal
- Messages to be send can be programmed by the user
- On or Off states can both be reported to predefined cellphone numbers.
- Reporting can be disabled for an input
- The states of the inputs can be requested from the unit by SMS
- Monitoring of the inputs can be controlled using different modes
- Inputs can act as counters
- Inputs can act as Run Hour meters

2 Outputs to control any electrical device

- Outputs can be controlled by cellphone using SMS (Switching the output on, off or pulse)
- Output controls can be scheduled
- The duration of the pulse can be programmed for each output
- Outputs can be set to follow the state of an input
- Output can be set to switch on when the unit is dialed
- Status of an output can be requested from the unit by SMS
- Analog Limits can control the switching of outputs
- Own text can be used to control outputs

Monitor AC power using the charger input

- AC power can be monitored by using the charger input.
- SMS can be send to up to 16 numbers when an power failure occur and when the power return

Monitor the battery status

- The battery status can be monitored by the system.
- SMS can be send to up to 16 numbers when the battery go faulty.
- The battery is monitored by disconnecting it from the main supply and to measure the battery voltage while connected to a load.
- Add and delete numbers via SMS

Scheduled Commands

- The execution of commands can be scheduled

Monitor Mode

- Monitor mode is used to activate monitor functions
- Monitor Mode can be set by SMS or Monitor mode Inputs

Configuration tool to configure unit to user requirements

- All parameters can be set from configuration tool.
- Remote programming possible from the configuration tool
- Save and Load from files for backup

2. Getting Started

2.1 Description

The cellcop communicator can be used in various applications to monitor and control system alarms and parameters remotely using your cellphone. The unit can be configured to your requirements by using the configuration tool. The configuration tool allows the user to setup various options by setting the parameters and sending the setup to the cellcop. Using the configuration tool u can setup the Cellcop directly using a USB cable connected to the to the cellcop or remotely by connecting a GSM modem to the PC running the configuration tool and connect to the cellcop using a data call. The configuration can be backed up to file using the configuration tool for easy reuse in future or quickly setting up multiple boards with the same configuration.

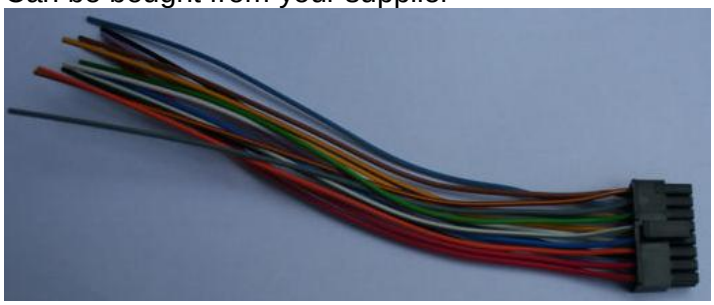
2.2 Typical hardware requirements

For a typical installation you will require the following:

- **CP52u-M Communicator board**

- **SIM card (Remember that the card must be a RICA card)**
  - The card must have been registered on RICA for use in South Africa (South Africa only)
  - In case of a pre-paid card it must have sufficient funds or SMS bundles loaded
  - The card must be packed switched data enabled in case of GPRS use
  - The card must be enabled for Circuit Switch data for remote programming via data call.

- **Power, Inputs and outputs harness connector**
  Can be bought from your supplier



- **GSM Antenna**
  Supplied by yourself or by your supplier

- **Power supply**
  Supplied by yourself or by GSM Systems
  Power supply 14.2V DC ± 5%

- **Relay board if unit will be used to switch external equipment**
  Can be bought from your supplier

1 relay add-on

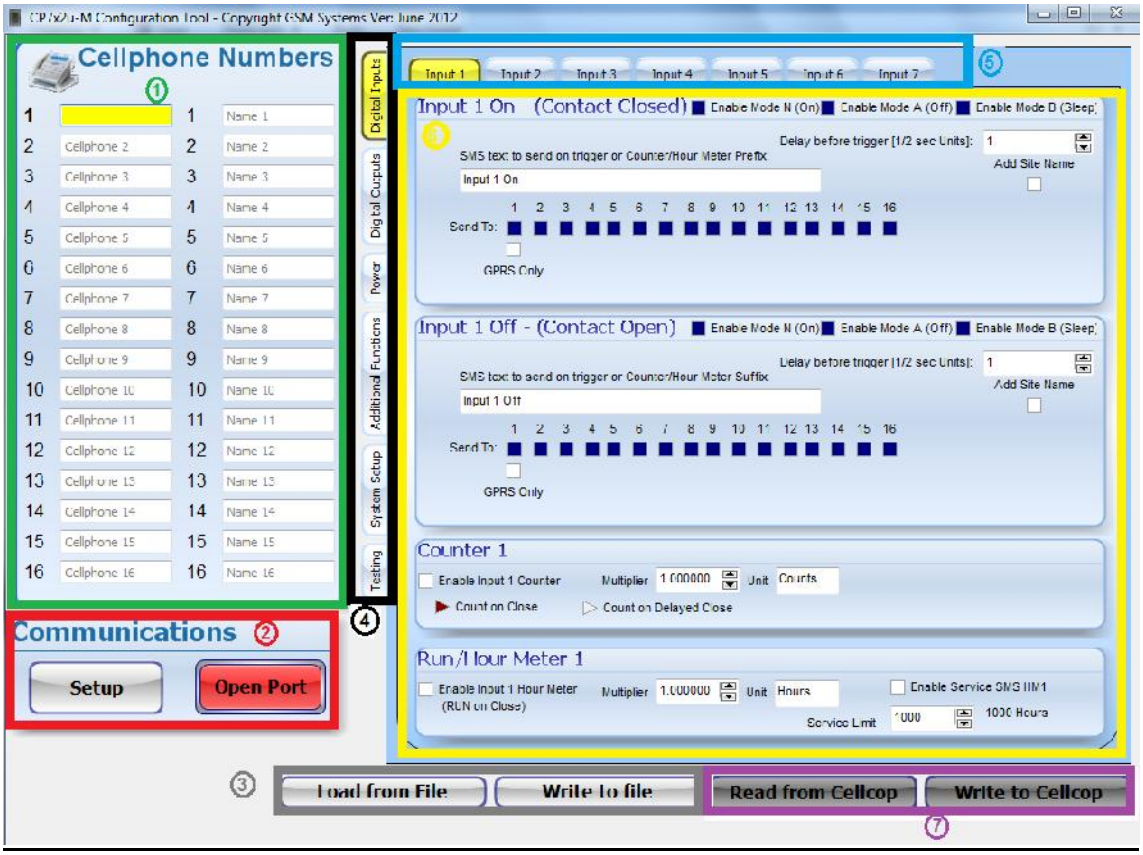
- **PC running configuration software and USB cable**
  Hardware can be bought from GSM Systems
  Software available on CD from GSM Systems or can be downloaded from
  http://www.drivehq.com/file/df.aspx/publish/cellcop/CellcopFiles/CP72u-M

2.3 The CP52u-M board layout

Harness and USB side zoomed view

SIM and antenna side zoomed view

2.4 The CP52u-M configuration software layout



(The color and number of the blocks drawn on the diagram represent the description below)

1. **Area to set up numbers to report to**
2. **Setting up communications to the communicator board and connecting to it**
3. **Loading and writing configuration files to and from hard disk**
4. **Main functionality selection tab**
5. **Secondary selection tab to select sub-sections for the main functionality tab**
6. **Configuration information for single entities as selected from main functionality tab and the secondary tab.**
7. **Reading current configuration and writing new configuration to the cellcop communicator**

2.5 Installing the configuration software

The configuration tool is a normal executable and can be copied to your own location from the supplied CD or from the internet (See link below). Run the Configuration Tool from the location where you copied it to.

The newest version can be downloaded from:

http://www.drivehq.com/file/df.aspx/publish/cellcop/CP52M

2.6 Connecting the CP52u-M board to a PC / Laptop via USB cable.

To set up the communicator with the functionality required from a PC or Laptop you have to connect the communicator board to the PC or Laptop with an USB cable. Then you have to use the configuration tool software package on your PC or Laptop to set up the board. A few things have to be set up and connected for this process. We will discuss setting up the USB driver on the PC or Laptop and copying the required configuration software onto the PC or Laptop for later use.

2.6.1 Installing the USB Driver

To use the USB programming option u need to install the USB driver. You can find the driver on the supplied CD or by downloading it from

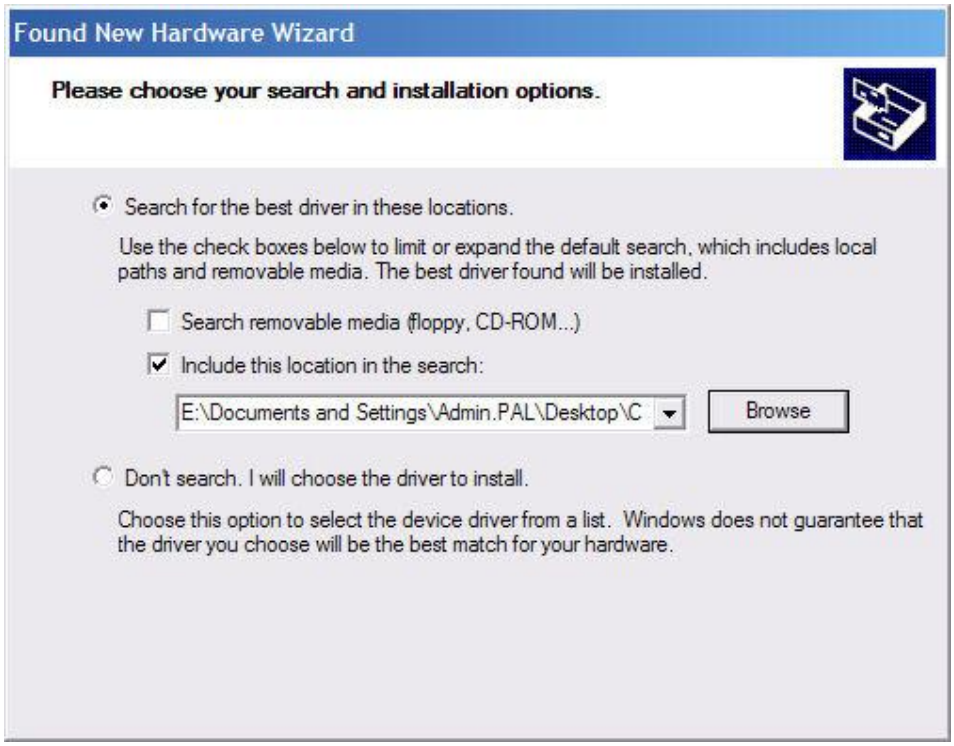
http://www.drivehq.com/file/df.aspx/publish/cellcop/CP52M

2.6.1.1 Driver Installation on Windows XP

When the USB cable is inserted for the first time a window will popup to begin the driver installation.

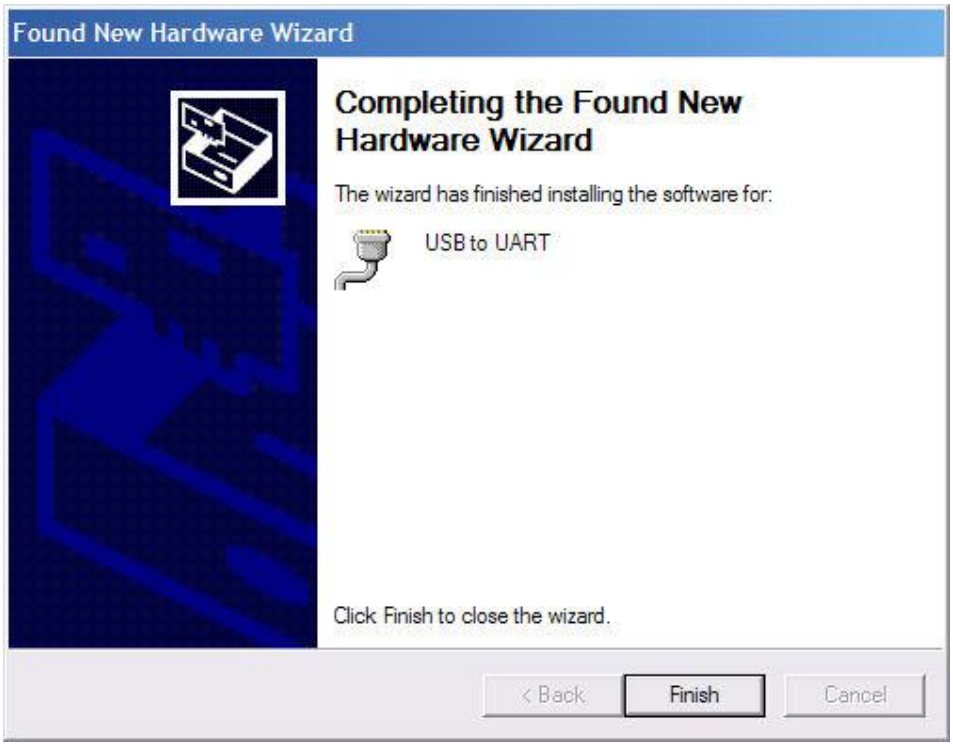
Select Install from specific location and click next.

Select the location where the driver is located. Driver directory on the supplied CD.



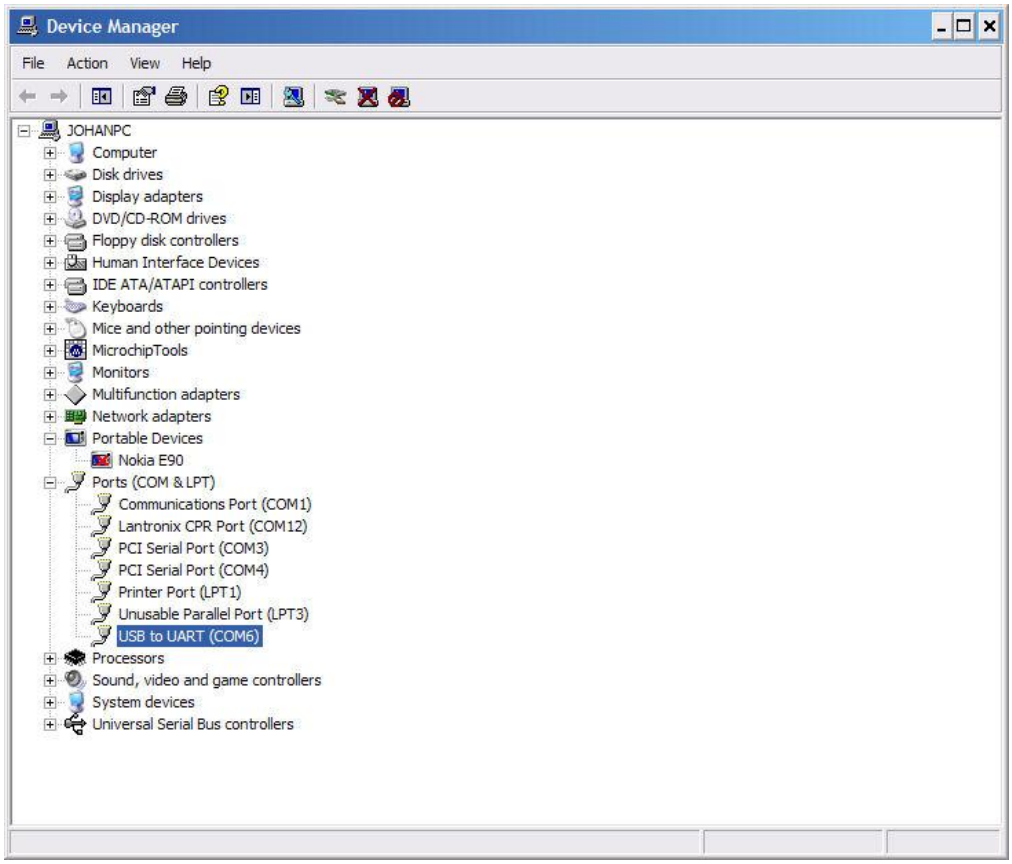
Click Next

Click Continue Anyway



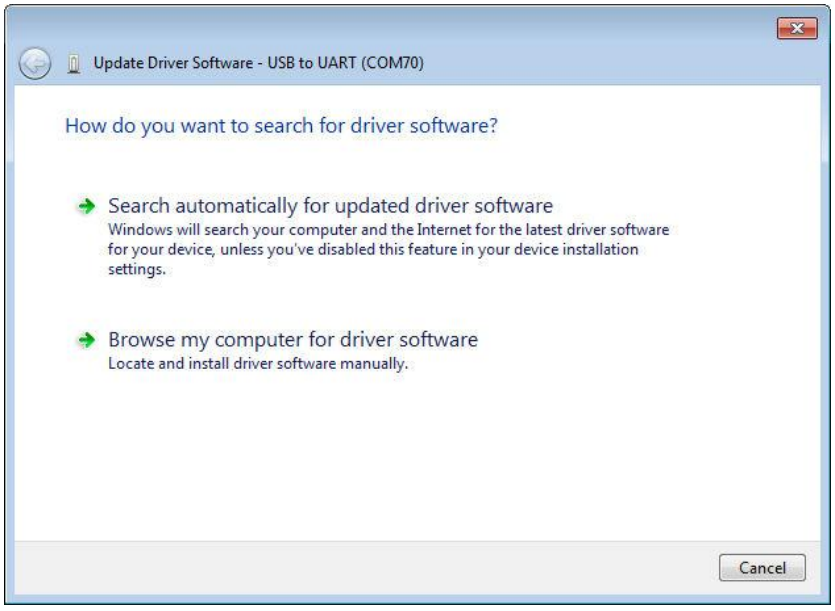
Click Finish. Driver is successfully installed. This will add a serial port to your existing ports. Use this serial port when configuring the unit.

To find out which port is the USB port, go to the device manager and click on ports. It's the port with USB to UART next to it. Use this port when configuring the unit.

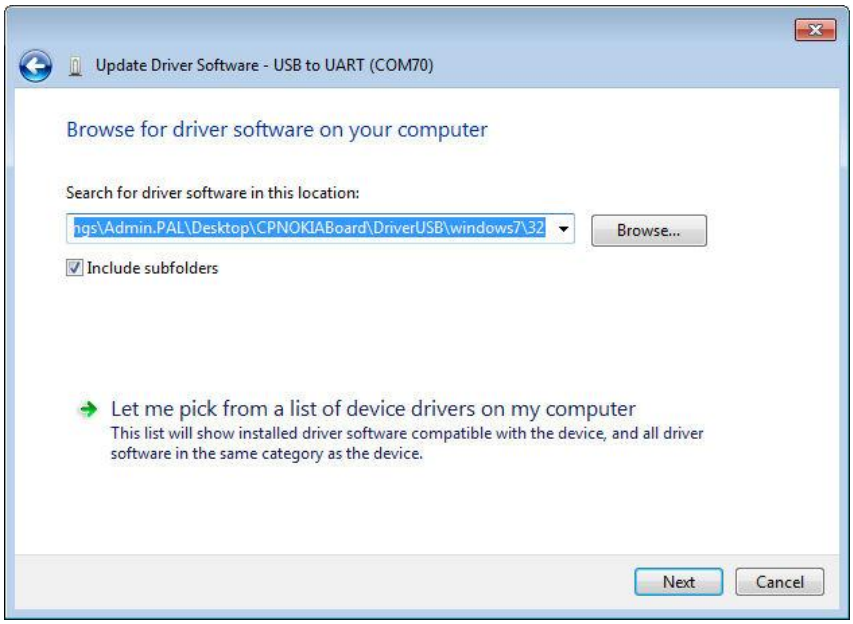


2.6.1.2 Windows 7 Driver Installation

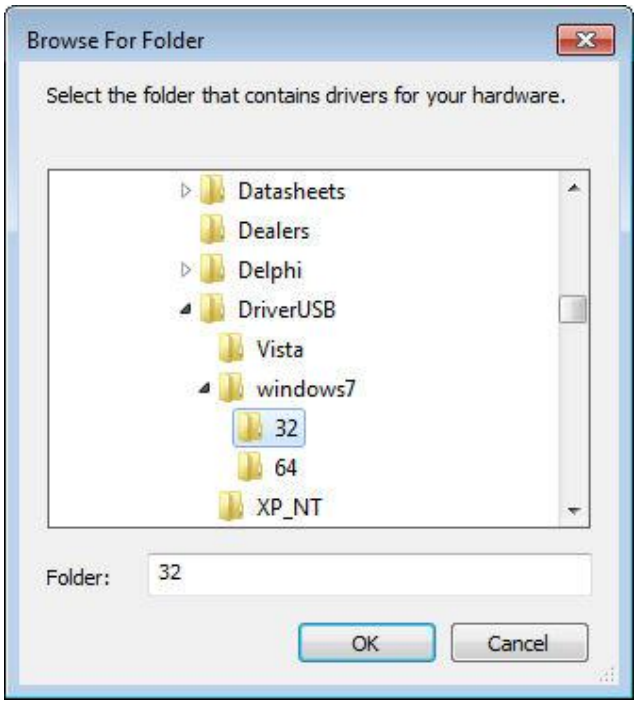
Windows 7 will install the wrong driver when inserted the first time. To install the correct driver go to the Device manager. A icon showing USB serial demo should be visible. Right click in this icon and select update Driver.

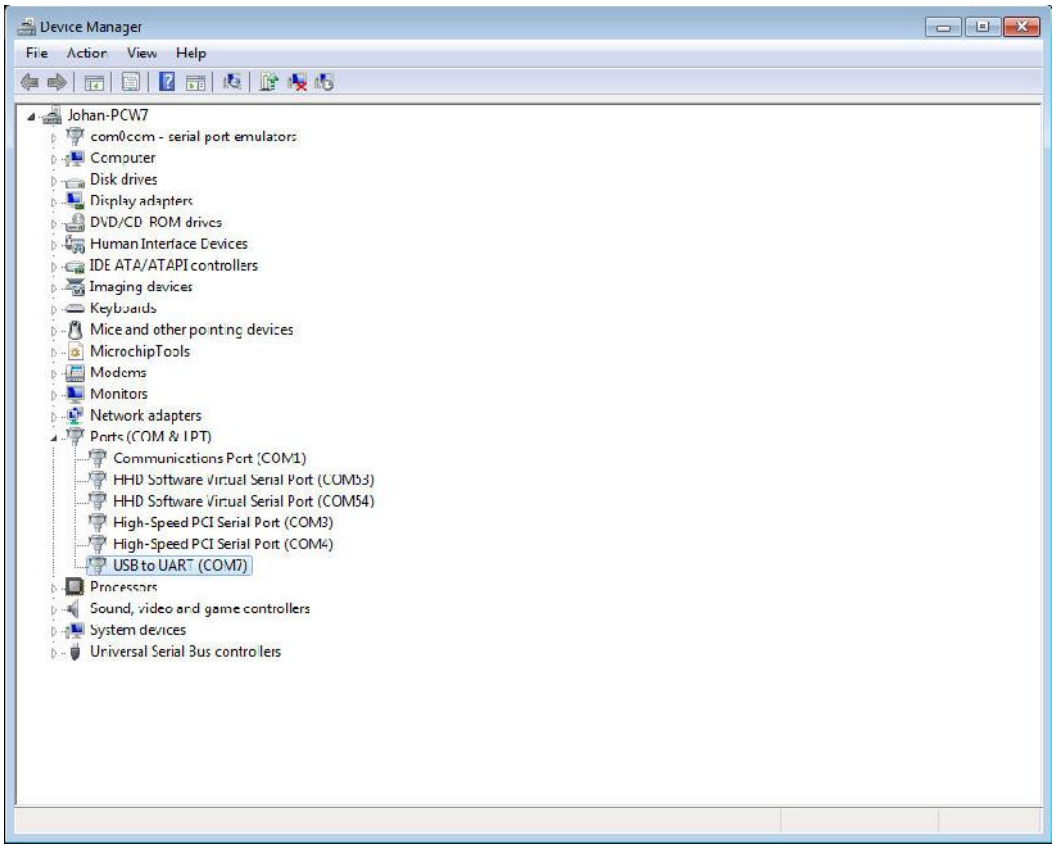


Select browse Computer for driver. Go to location where the driver is stored on your hard disk or on the supplied CD under the driver directory.



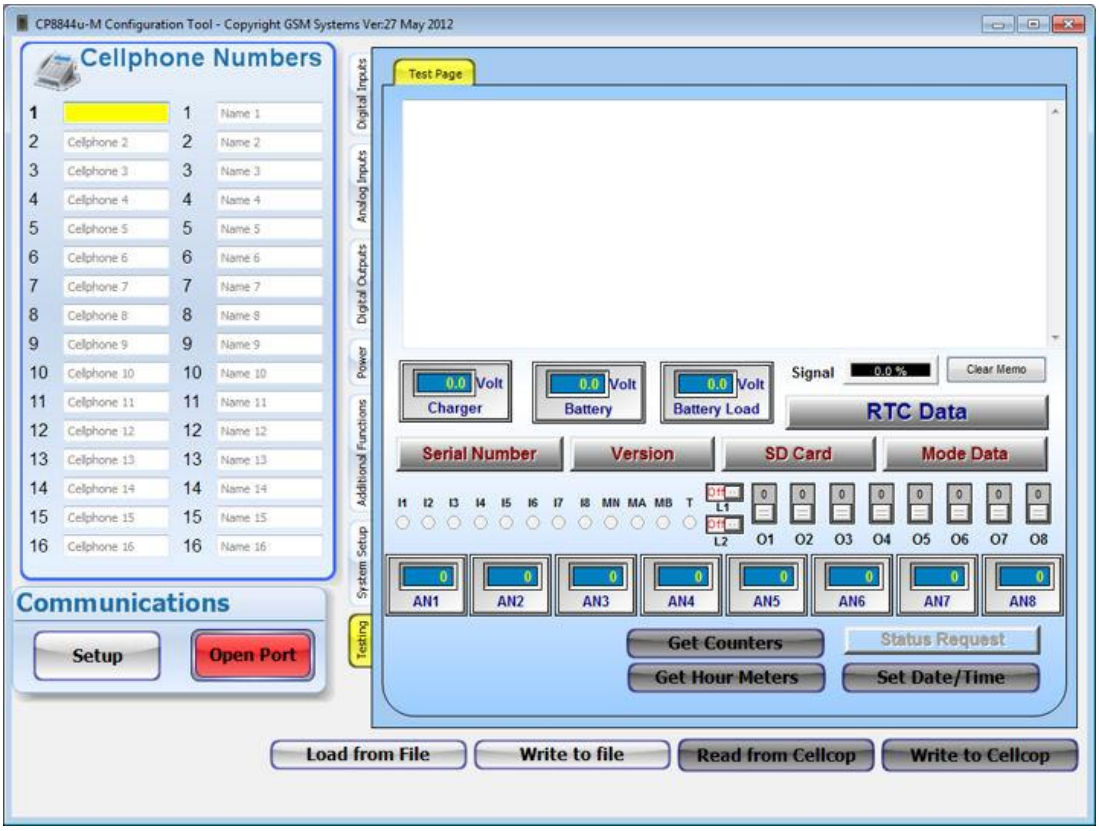
Select the directory for the driver of the version you have (32 or 64Bit)



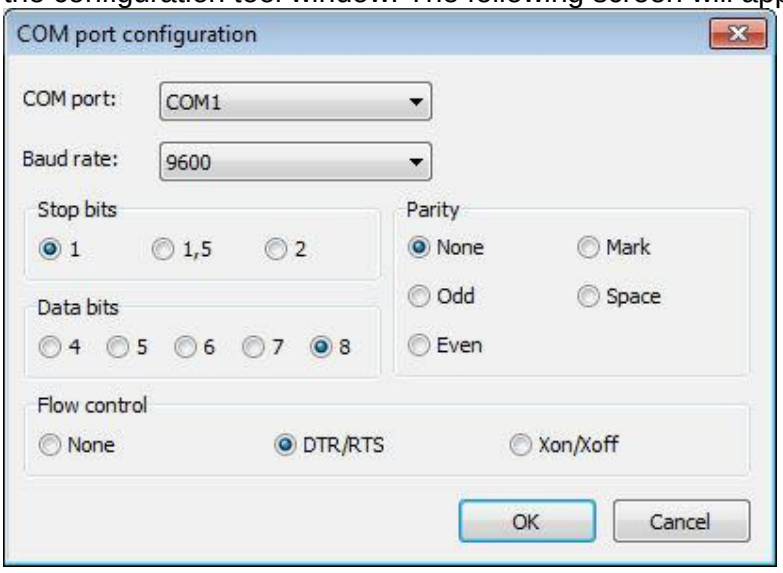


The driver should be installed. Note the port next to the USB to Uart line. This will be used when configuring the unit in the future.

2.6.2 Setting up the configuration software to connect to the communicator board.

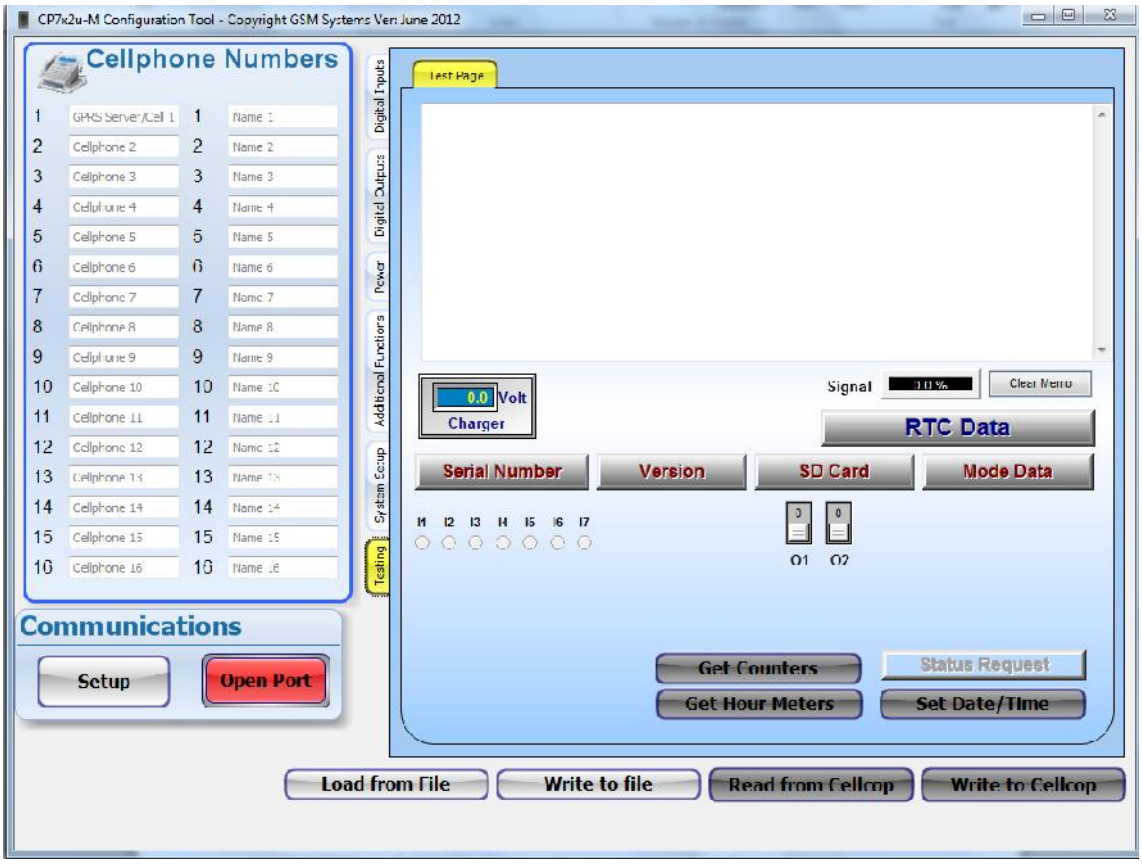


We need to set up the serial port that the CP72u-M communicator is connected to on the configuration tool software. Click “Setup” Button on the left bottom of the configuration tool window. The following screen will appear:



Change the port to the port where the communicator is connected. Don’t change anything else. Click OK when finished.

Click on the “Open Port” Button to enable the communications



Click the “Read from Cellcop” button to read the information from the GSM communicator. The progress bar will progress from 0 to 100 % as the information is read from the communicator. If the progress bar gets stuck at 5 % then you selected the wrong port or the configuration cable is not connected or the configuration cable is faulty.

Change the information and parameters to fit your setup

Click “Write to Cellcop” button to write your new configuration to the unit

The unit is now ready for normal operation.

2.7 Setting up the configuration software to connect to the communicator using a GSM Modem (Remote configuration)

Remote configuration using a GSM Modem use the same actions as the USB configuration but communications needs to be established with the remote unit first.

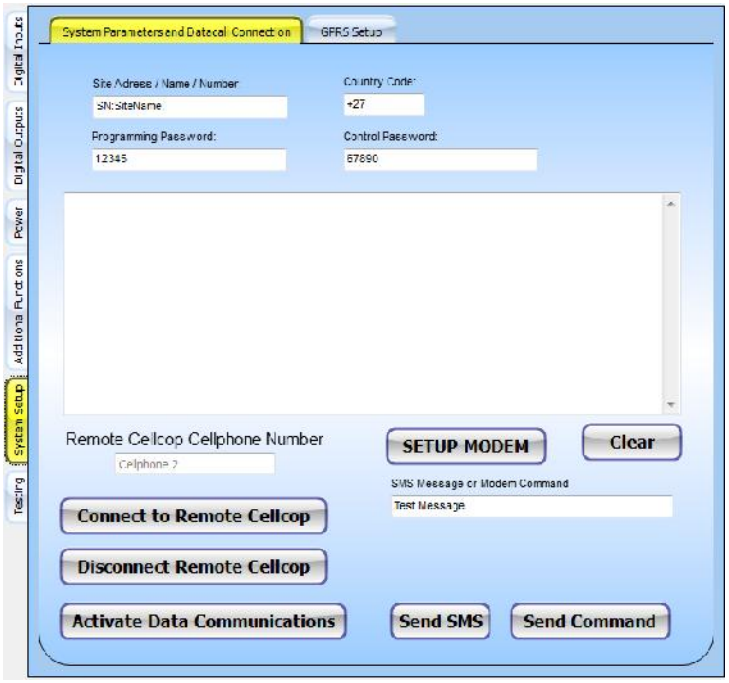
GSM Modem

NB: Please note that a remote connection can't be made to a board that is connected via USB to a PC. The USB connection takes privilege.

Connect a GSM modem to your computer. Note the Communication port for the GSM modem.

Select the communications port by clicking on the SETUP Button and follow instructions as described in 2.6.1 in this manual.

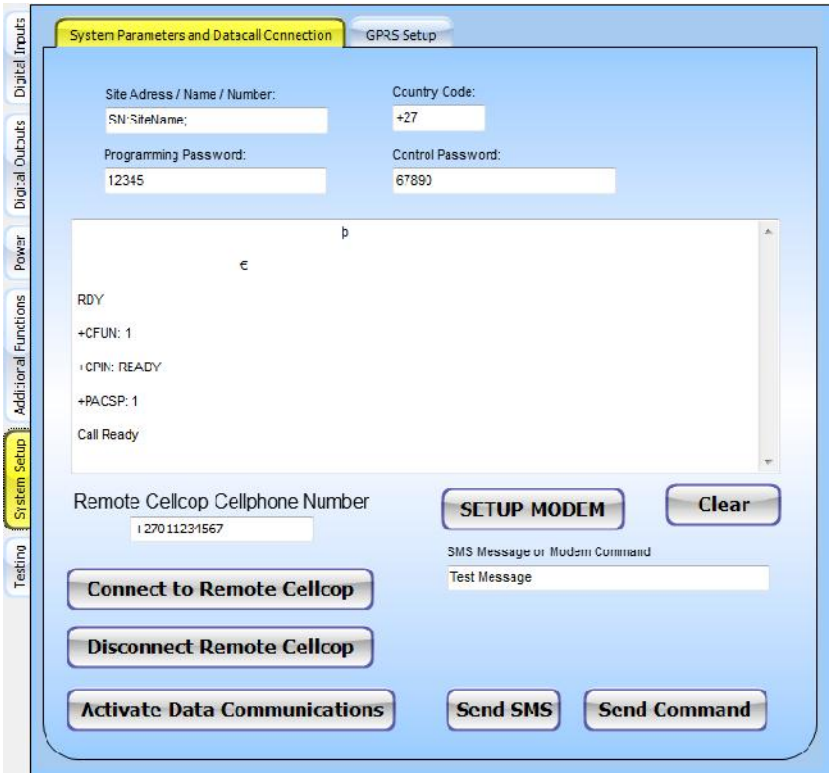
If the modem connection is open then click on the System Setup Tab, it is second from the bottom on the vertical tabs. You will have the following TAB open.



So let's open the connection.

Click on "Open Port" if successful the open port button will background color will become green and the button text will change to "Close Port".

You might see text in the middle screen come up like:



Enter the remote Cellcop's number and click on 'Connect to remote Cellcop". Wait until you see Connect 9600. If nothing happen make sure you have a GSM Modem connected to the PC and that it is switched on and the port is open. You are now connected and need to authorize the connection. Click on Activate data connection. Make sure your Programming password and the remote units programming password match. If they match you will get a message indicating communications is allowed. Now you can read and write configuration information to the communicator as well as download SD card logs (on the Additional Functions / SD Card Logger Screen). You can also SET the Date and time on the Testing Page (on the TAB below the current one).
Please note that you should click on "Disconnect remote Cellcop" button and then the "Close Port" Button when you completed your remote session with the communicator board so that the board can return to normal operation.

2.8 Backing up configuration detail to a file and loading it back again.

Backing up your configuration to a file is an essential way of making sure your future changes and installations of the same application become easier. To backup the configuration you first need to get the configuration into the configuration tool by reading from the Cellcop by clicking on the “Read from Cellcop” button or by changing the parameters directly on the tool. Then you click on the “write to file” button and supply the file name for the configuration backup. A nice method is to use the site name and date as part of you file name. That will make it identifiable in the future. This is just a guide you can setup your own name if you like.

To restore the configuration from a backed up file you must click on the “Load from file” button. Then you write to Cellcop to send the configuration to the Cellcop by clicking on the “Write to Cellcop” button.

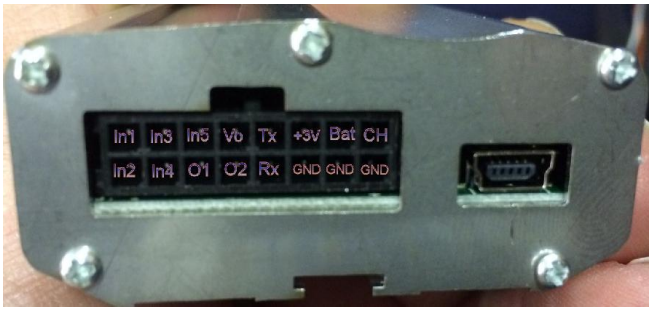
3. Configuring the communicator

The cellcop communicator is designed to be used in various industries and applications. The user can define configuration parameters to suit the requirements for the application that they need the Cellcop communicator for. The configuration tool is used to define the specific parameters and to load the configuration into the Cellcop. A copy of the parameters can also be saved to file for future use or as a backup. The following sections will explain the various features and layout of the Cellcop and how to configure each feature.

3.1 Hardware Connections overview

Front View

The bottom has the harness connector and USB port.



The top has the screw on port for the antenna and also the SIM card holder is on the top side of the communicator

Please note that the communicator must have a SIM card to connect to the network. For good reception it has to be fitted with a GSM antenna. It has to have a power supply to operate. If it is used as a logger it should have a Micro SD card. The LCD screen is optional.

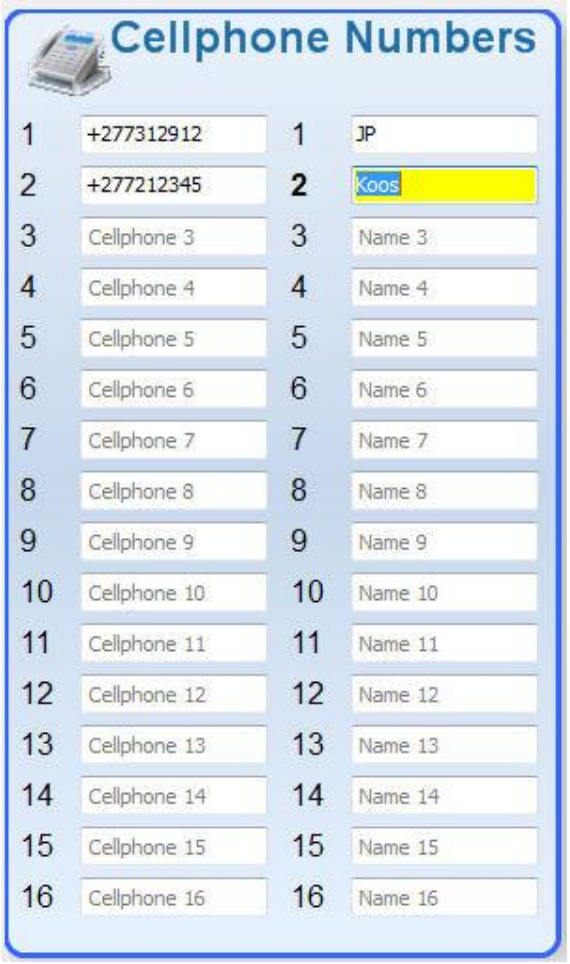
3.2 Cellphone Numbers and names

Alarms and status messages can be sent to specified cell numbers. These numbers must be set up on the communicator. Please note the position numbers where the cell numbers are entered. These positions are selected or de-selected in other configuration screens to select whether messages are sent or not sent to these numbers. You can enter up to 16 numbers.

If a GPRS server is used enter the server number into position number 1.

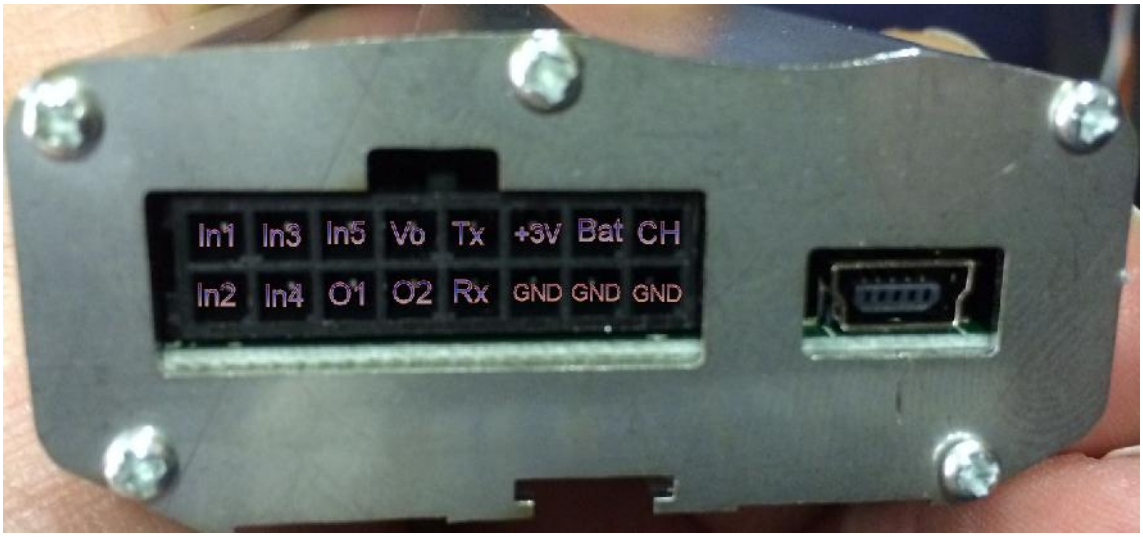
The number is entered on the left side and you can enter a description on the right.

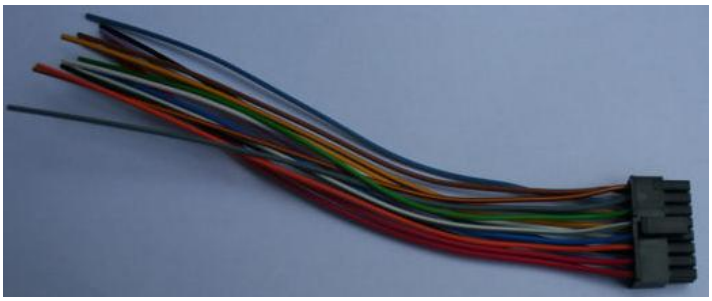
NB: Numbers must be entered in the international format. Replace 0 with country code. Example: 0825436789 must be +27825436789 on South African Networks.



3.3 Power Inputs and statuses

The Power Inputs has 5 Pins. This port is used to power the unit and to supply backup power. There is also 1 Vout pins to supply output power for sensors. The output voltage is a function of the input voltage. A maximum of 0.5 A can be drawn from these outputs. Find it at the right hand side bottom of the unit.





We can set up alarms on power failures and monitor charging and backup battery statuses. Select the Power tab on the vertical tabs.

In1	-	white/grey	In2	-	Brown
In3	-	Grey	In4	-	Blue/Grey
In5	-	Green	O1	-	Blue/Yellow
Vout	-	White/Red	Out2	-	Yellow
Tx	-	Blue	Rx	-	White
3V3	-	Red/Yellow	GND	-	Black
Bat	-	Orange	GND	-	Black
CHG	-	Red	GND	-	Black

You can enter the message to be sent on mains power on / off and / or battery status. The sent to: indicates the cell numbers that the message must be sent to. If all is selected as above screen shows it will still only send to numbers that are set up. So if position 3 to 16 has no cell numbers defined it will only send the message to cell numbers in position 1 and 2.

The delay, before the trigger, work in half second units. So if you want the message only to be send after the power has been off for 10 seconds you set the delay trigger to 20. This is helpful to filter out power dips and not real power outages.

You can set the alarm message only to be sent via GPRS only. This means that it is logged to a database on the internet and not sent to a cellphone via SMS.

You can also select if the event will be logged and if the event is logged if it is logged when the state change happens or after the timeout has run out after the state change.

You can select on which modes the event should be monitored. For power monitoring the default is on in all modes.

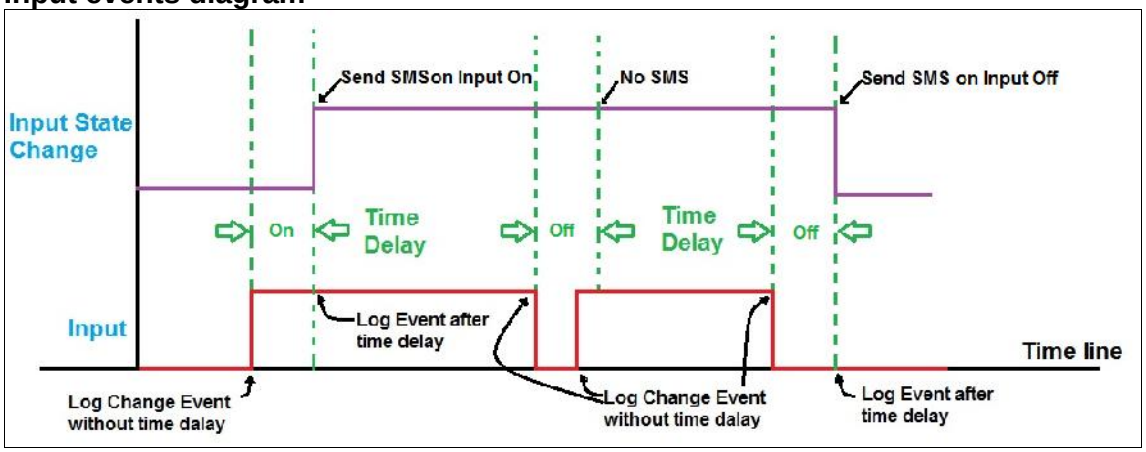
You can enter the level you want to use for testing if the battery has reached a low power level. Typically this will be set to 10V on a 12 V battery.

The add site name option allows you to concatenate the site name of the site sending the message to the back of the SMS message been send.

3.4 Digital Inputs

Digital Inputs is used to report alarms on an On / Off state. The Input is On when the input is connected to ground and off when it is disconnected. The unit can be configured to report both the On and the Off or only a single state. A delay timer can be setup to delay the state change from On to Off and from Off to On. Inputs can also be used as counters and hour meters.

Input events diagram

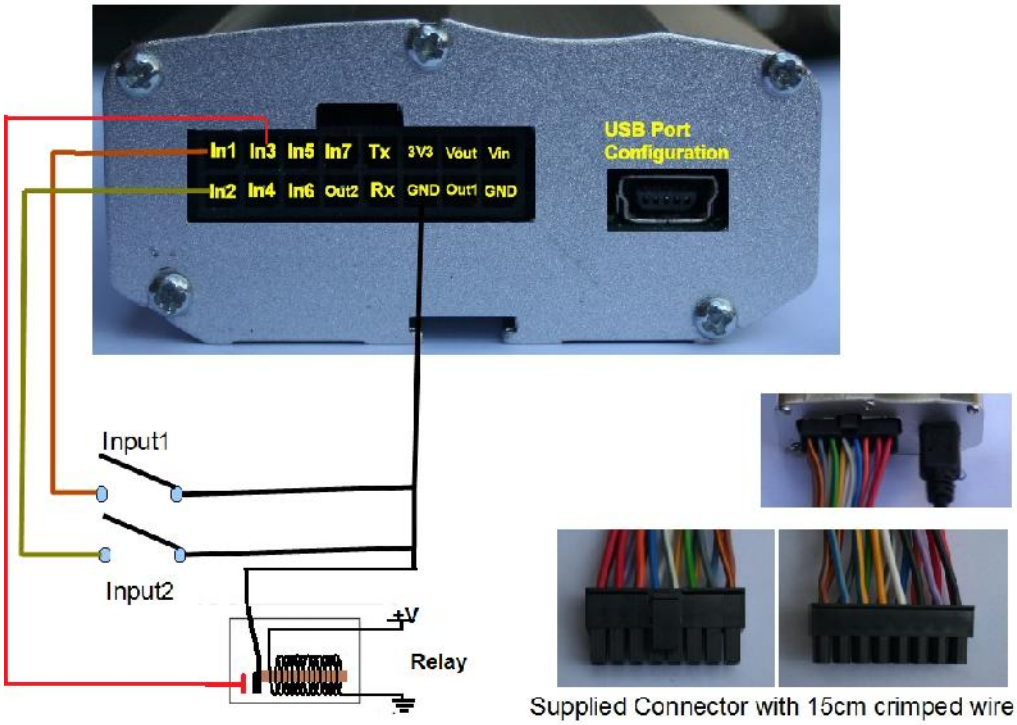


The diagram above shows the difference between change events and delayed change events on the inputs. The input state change signal shows the effect after the delay, on On and Off events, has run out. So you can see that the short off period on the Input is ignored by the state changes as it were not long enough for the input state change to be affected. An example of using this functionality is for instance on power monitoring where we only want to report on constant power loss and not power dips. So the power off input must be off for longer than the off timer defined, before the input state change will reflect it, and for instance send an alarm SMS on the power lost input. SMS messages is sent on state changes if activated to send SMS messages in the configuration

The digital inputs are number In1 to In7 and any of the two available grounds (Black) can be used

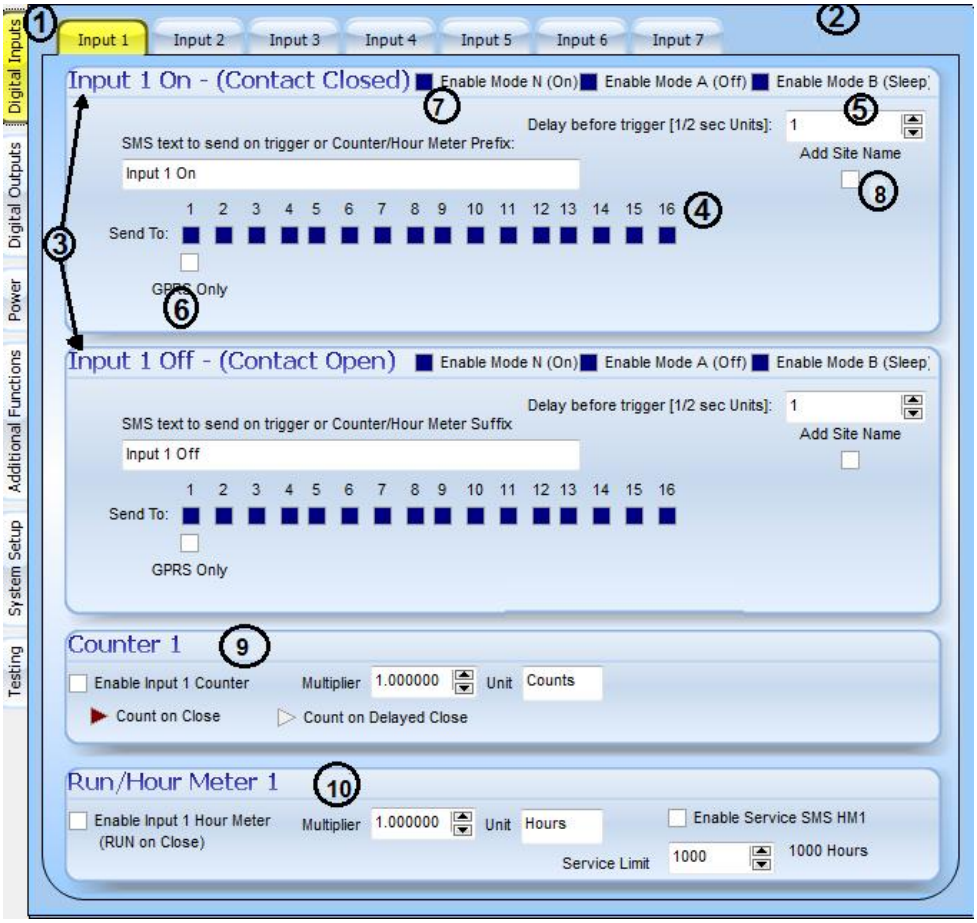
The inputs are designed to monitor a contact or a GND signal. The input is activated when a GND signal is presented at the input. The input is deactivated when the GND signal is removed from the input.

A typical connection diagram showing connections of a switch on digital input 1 and 2 and a relay switch on digital input 3



We can set up alarms on input changes and monitor these changes and statuses. Select the “Digital Inputs” tab on the vertical tabs.

Configuring Inputs using the configuration tool:



1. To setup parameters on digital inputs select the “Digital Inputs” tab on the vertical tabs.

2. There are 7 digital inputs available and each can be configured separately.

3. Simply select the input on the top horizontal tabs that you want to configure. You can enter the message to be sent on the On or Off state of the digital input. The sent to: indicates the cell numbers that the message must be sent to.

4. If all is selected as above screen shows it will still only send to numbers that are set up. So if position 3 to 16 has no cell numbers defined it will only send the message to cell numbers in position one and 2.

5. The delay, before the trigger, work in half second units. So if you want the message only to be send after the change has been effect for 10 seconds you set the delay trigger to 20. This is helpful to filter out bounce effects on the inputs.

6. You can set the alarm or message only to be sent via GPRS only. This means that it is logged to a database on the internet and not sent to a cellphone via SMS.

7. You can select on which modes the input should be monitored. For instance

a house alarm may be off in Mode A and thus no monitoring of these inputs will happen in Mode A if not ticked.

8. The add site name option allows you to concatenate the site name of the site sending the message to the back of the SMS message been send.

9. All inputs can have a counter associated with it. Simply enable the counter by ticking its box. Set the multiplier and Units that you want to use for the counter and select if it must count on the input change to ON or on Input delayed state change to on. For instance connecting to a Kw/h meter that gives a pulse for every 0.001 Kw/h used we will set the multiplier to 0.001 and the unit to Kw/h. Then after 100 pulses have been counted we will know that 1 Kw/h has been used.

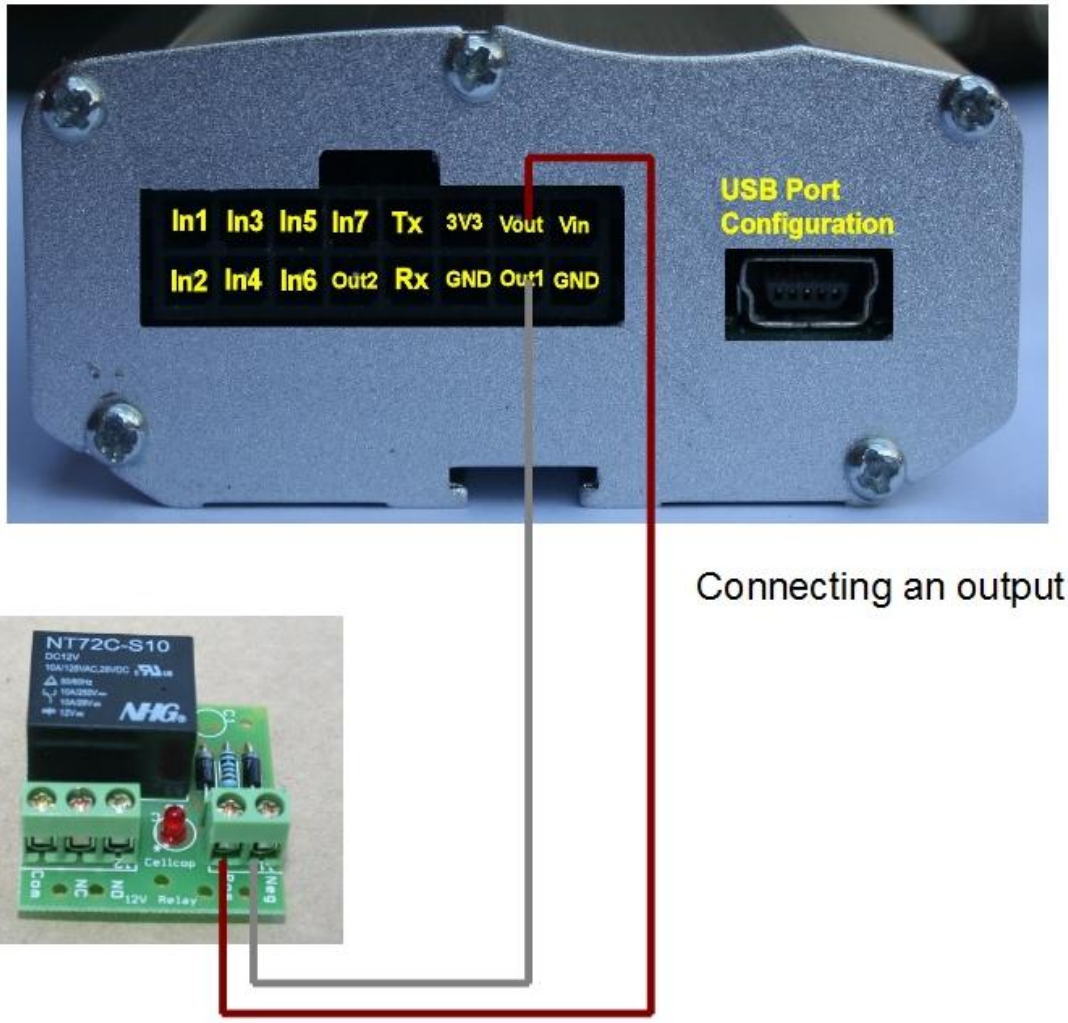
10. Every input can also have a run meter associated with it. Simply enable the run meter by ticking its box. Set the multiplier and units that you want to use for the run meter. For instance monitoring a pump, pumping water at a rate of 300 cubic liters of water a hour, we will set the multiplier to 300 and set the unit to cubic Liter. By selecting the “ENABLE SERVICE M HM1” option the communicator will send a service message every time the service limit value is reached. This means that if you for instance monitor a Generator that should have a service every 250 hours you can set the value to 250 and check the “ENABLE SERVICE M HM1” option. When 250 hours is reached the communicator will send a service notification SMS. When the service has been done the service personnel can update the value to 500 Hours. So when the Generator has done another 250 hours and reached the total running hours of 500 it will send the next service notification SMS. The process then simply repeats itself.

For examples of applications please see point 5 in the manual

3.5 Digital outputs

Outputs are used to control things remotely. The outputs on cellcop is designed to switch a 12 V DC relay. On the communicator we have 3 commands per output. The output can be switched On, Off or Pulsed (On for a defined period of time). Various options (SMS, Scheduler, etc.) to trigger these commands on outputs exist.

Connecting a relay board to the outputs



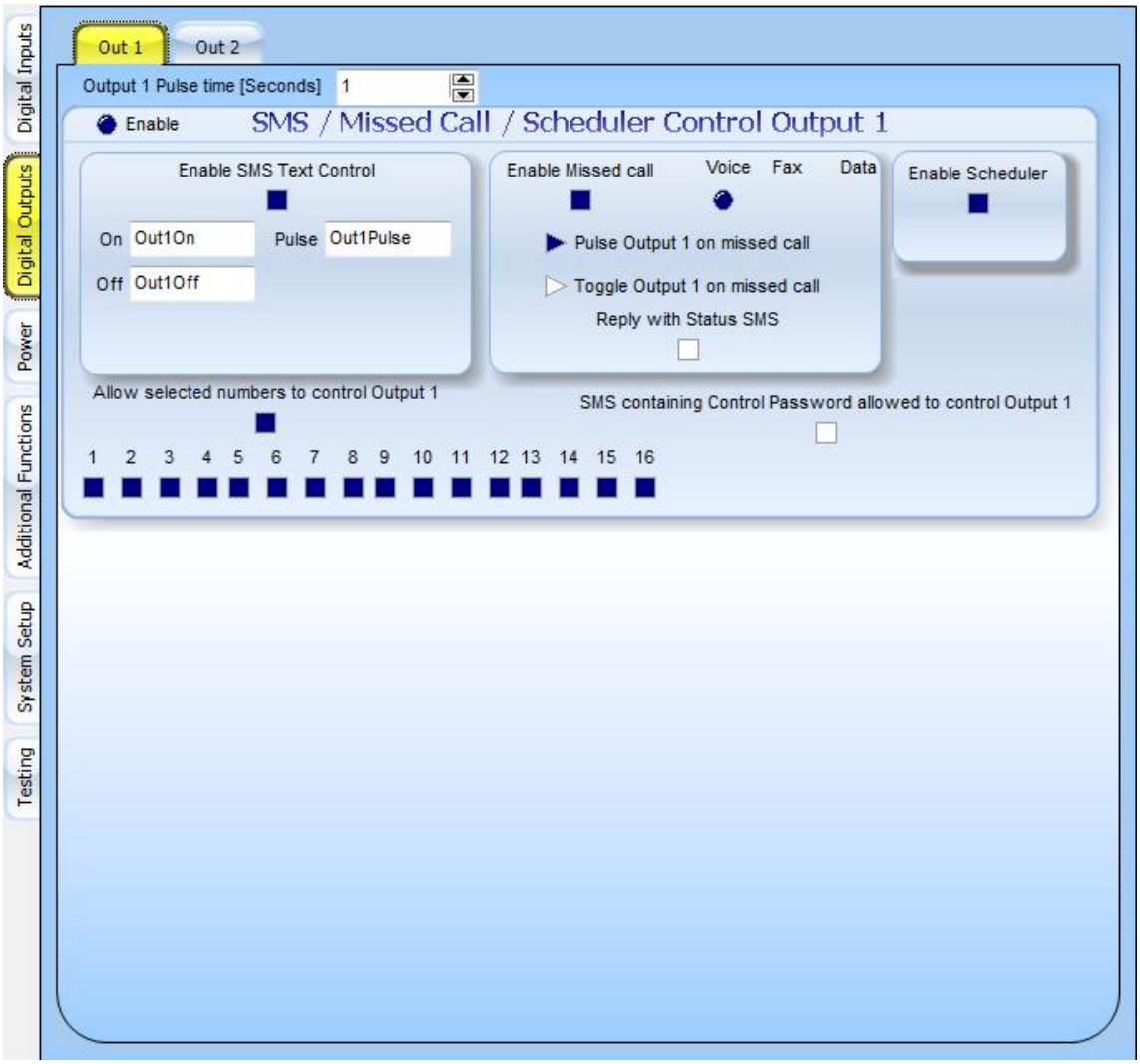
The outputs are designed to switch a 12 DC relay. The output terminals use 2 pins. Pin 1 is a permanent 12V output, while pin 2 is a switched negative.

Output relay board:

1 relay add-on

SMS and Scheduler control
Output state will be controlled by SMS and the scheduler. To switch on an output you must SMS the unit with the text programmed for that function. In the example outputs 1 will switch on when *Out1On# is sent via SMS to the unit from a authorized cellphone

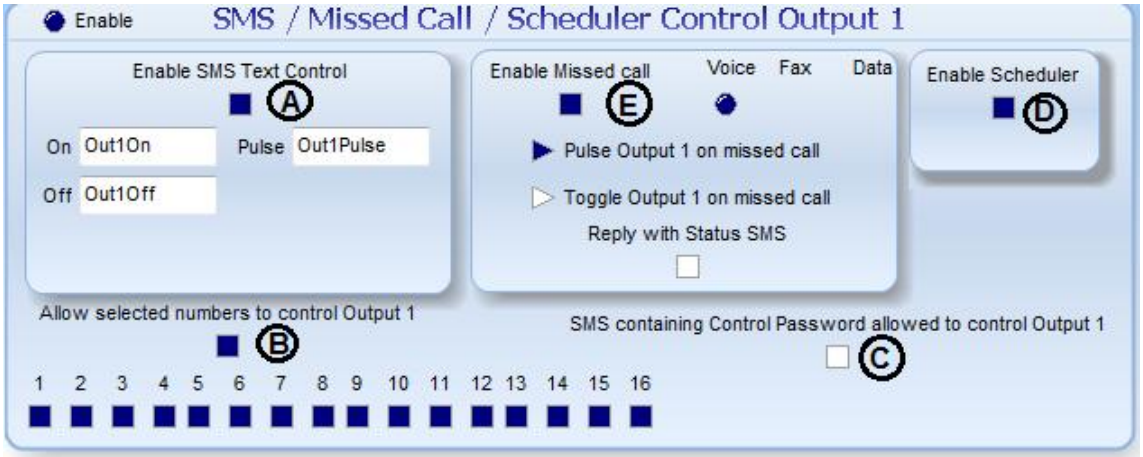
Configuring digital outputs.
Select the Digital Outputs TAB and then the TAB off the output you want to configure.



Any pulse command that is executed will pulse for the duration as entered in the output 1 Pulse time [Seconds] field right at the top of the TAB.

SMS and Scheduler control.

Output state will be controlled by SMS and the scheduler. To switch on an output you must SMS the unit with the text programmed for that function. In the example outputs 1 will switch on when *Out1On# is sent via SMS to the unit from an authorized cellphone or a message containing the programming password (cpw*12345#) as well.



A. To switch on an output you must SMS the unit with the text programmed for that function. In the example output 1 will switch ON when *Out1On#, OFF when *Out1Off# and will pulse for 20 seconds when *Out1Pulse# is sent via SMS to the unit from an authorized cellphone. The controlling text can be changed for the configuration to make more sense to the user like: "*Pump On#", *Alarm Off#", *Pulse output#", etc. The length of the pulse is also configurable in seconds in the output 1 Pulse time [Seconds] field on the top of the window.

B. The: allow selected numbers must be selected to enable any cellphones selected to control the output. In the example all numbers have control rights.

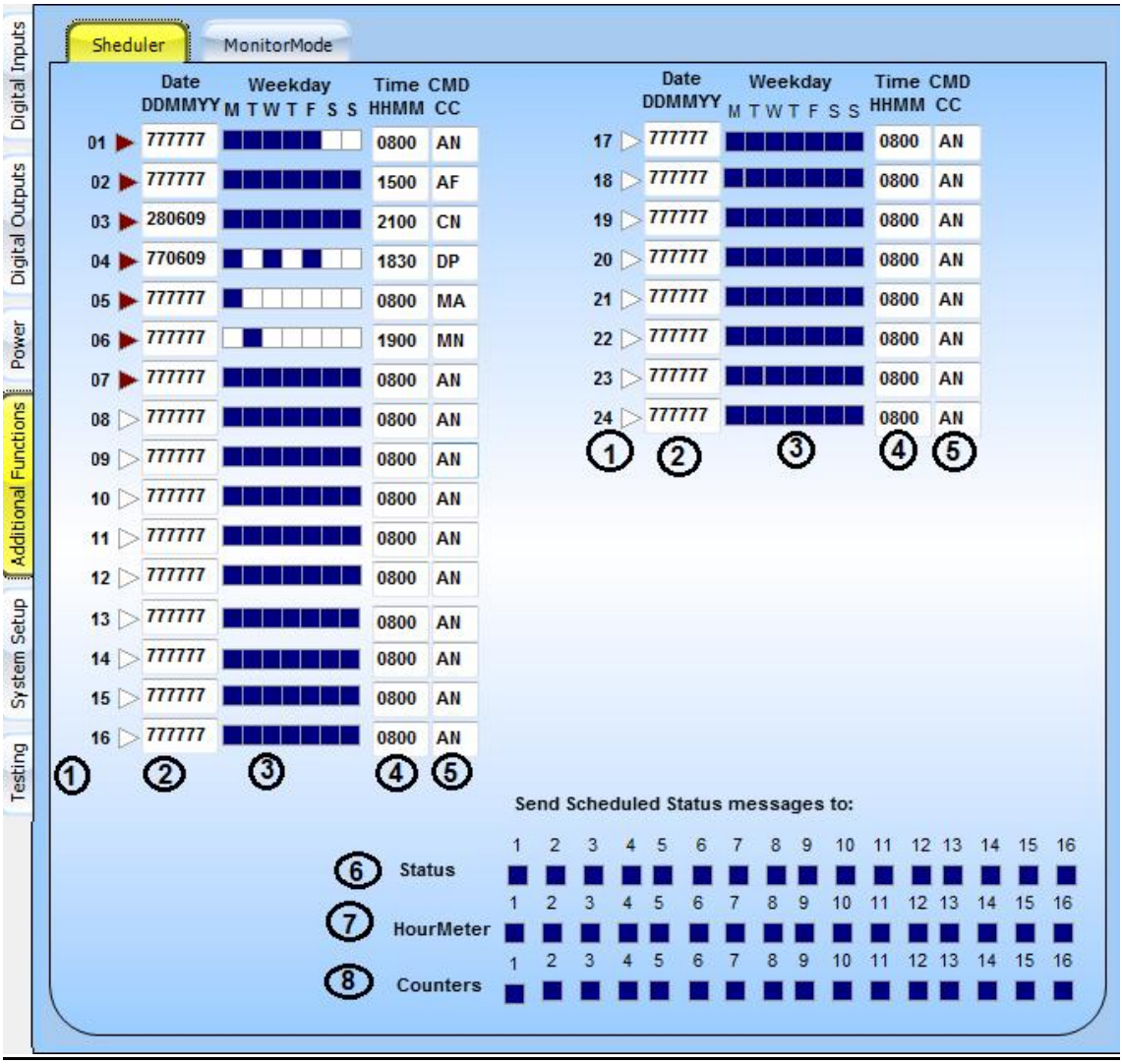
C. If SMS containing Control Password is allowed on output 1 is checked then any cellphone can control the output as long as the password is added to the SMS message been send to the controller. Example of SMS text: cpw*12345# *out1On#

D. Enable scheduler option lets you enable the output for control by scheduled commands.

E. Enable missed call allows you to control the output with a missed voice call. Select whether the missed call will pulse the output or toggle the output If you want a status message back once the output has switched, select the Reply with Status SMS check box.

3.6 Scheduler

Select “Additional Functions” TAB and then the “Scheduler” TAB in the configuration tool to get to the scheduler configuration page. Scheduled commands can be used to schedule a command, Mode change, SMS status, Enable logger, etc. based on a date/time. “77” in any date or time field ignore that field in matching. Setting the date and time to “77” will execute the command every minute for the days of the week that is enabled.



1. You can specify up to 24 scheduled commands. Select the triangle next to the number to activate that schedule.

2. The date to enter is in DDMMYY format and the scheduler will check to see if the entered date match todays date to determine if it should execute the programmed command. Placing a “77” in either the “DD”,” MM” or “YY” fields will exclude that field from being checked. It is important that the weekdays should be enabled for the date configured.

3. Weekdays can be selected to execute the command on.

4. The time that the command must be executed can be specified as HHMM

5. The command can be selected from a drop down list. Right click in the CC field for the following selectable list of available commands.

AN - Output 1 On	HN - Output 8 On
AF - Output 1 Off	HF - Output 8 Off
AP - Output 1 Pulse	HP - Output 8 Pulse
BN - Output 2 On	MN - Normal Mode
BF - Output 2 Off	MA - Mode A
BP - Output 2 Pulse	MB - Mode B
CN - Output 3 On	SM - Send Status Message
CF - Output 3 Off	LE - SD Logger Enable
CP - Output 3 Pulse	LD - SD Logger Disable
DN - Output 4 On	SH - SMS Hourmeters 1-4
DF - Output 4 Off	Sh - SMS Hourmeters 5-8
DP - Output 4 Pulse	SC - SMS Counters 1-4
EN - Output 5 On	Sc - SMS Counters 5-8
EF - Output 5 Off	LS - Log Data to SD Card
EP - Output 5 Pulse	LG - Log Data to Server via GPRS
FN - Output 6 On	ME - EnableModem and SMS Number 16
FF - Output 6 Off	MD - Disable Modem
FP - Output 6 Pulse	
GN - Output 7 On	
GF - Output 7 Off	
GP - Output 7 Pulse	

Send Scheduled Status messages to:

6. Status: Select the cellphones to send the status messages to.

7. Hour Meter: Select the cellphones to send the hour meter messages to.

8. Counters: Select the cellphones to send the counter messages to.

In the settings as shown above the following will happen:
1: Every Monday to Friday at 08:00 output 1 will be switched ON.
2: Every day at 15:00 output 1 will be switched OFF.
3: On the date 28/06/09 at 21:00 Output 3 will be switched ON.
4: Every Monday, Wednesday and Friday of June 2009 at 18:30 Output 4 will be pulsed. The pulse period will depend on the pulse time specified in the Output 4 configuration page.
5: Every Monday at 08:00 the unit will switch monitoring mode to Mode A.
6: Every Tuesday at 19:00 the unit will switch monitoring mode to Mode N.
7: Every day at 08:00 output 1 will be switched ON.

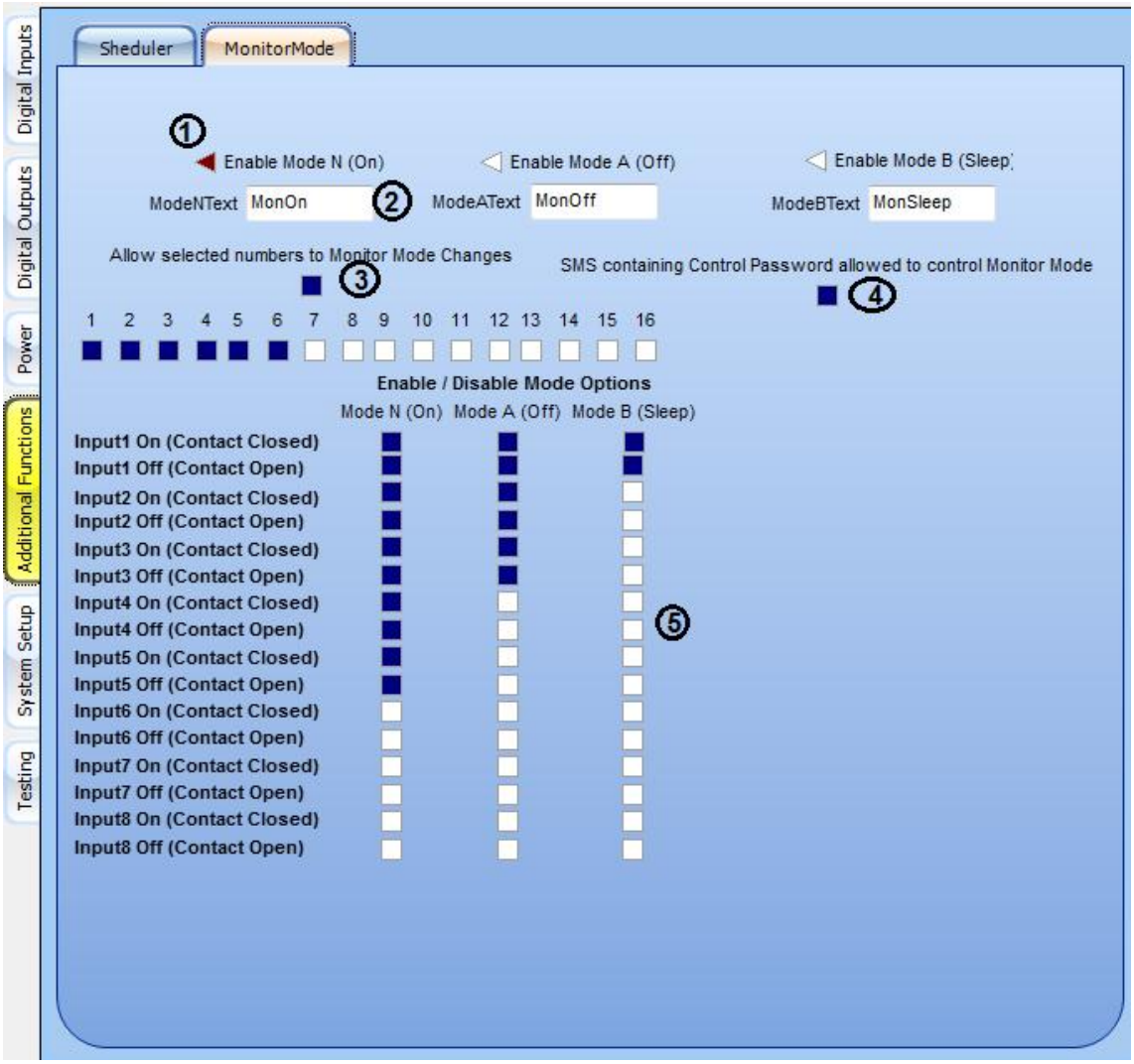
8: Every Monday at 0800 copy Cellphone 16 to 1
9: Every Tuesday at 0800 copy Cellphone 15to 1

3.7 Monitor mode

The cellcop communicator has a feature to define monitoring of digital and analog inputs based on 3 groups. This is called the monitor mode function. The user can define what is monitored when the unit is switched to a specific monitor mode (N, A or B). Monitor mode can be switched using SMS.

The monitor mode can be used to control what is monitored in a specific mode. As an example you can define Mode N to monitor all inputs, Mode A be to monitor only certain inputs and Mode B to monitor nothing. Then by switching the monitoring mode using the mode switch command u can control the monitoring

Setup the monitor mode using the configuration software. To configure the monitor modes select “Additional functions” tab on the vertical tab menu and then “Monitor Mode” on the horizontal tab menu.



1. After reading back configuration data from the cellcop the red triangle shows in what mode the board is currently operating.

2. The ModeNText, ModeAText and ModeBText can be specified to be used by SMS commands. So in the example above sending the following will change the current mode accordingly. You can configure your own text.

- *MonOn# – Set to mode N
- *MonOff# – Set to mode A
- *MonSleep# - Set to mode B

3. You can configure what cellphones are allowed to change the mode by SMS. In the example above cellphones 1 – 6 can change the modes.

4. If the “SMS containing Control Password allowed to change monitor mode” is selected you can change the monitor mode from any cellphone as long as the Control Password is also sent. (cpw*12345#)

5. You can select the input states that are monitored in every monitor mode. Above we are monitoring Inputs 1 – 5 the ON and OFF state in Mode N, Input 1- 3 The ON and OFF state in monitor Mode A and only Input 1 the ON and OFF state in monitor Mode B. These setting are exactly the same as the settings on the Inputs, Analogs and power pages and give a convenient overview of monitor mode.

Switch Mode using Scheduled Commands

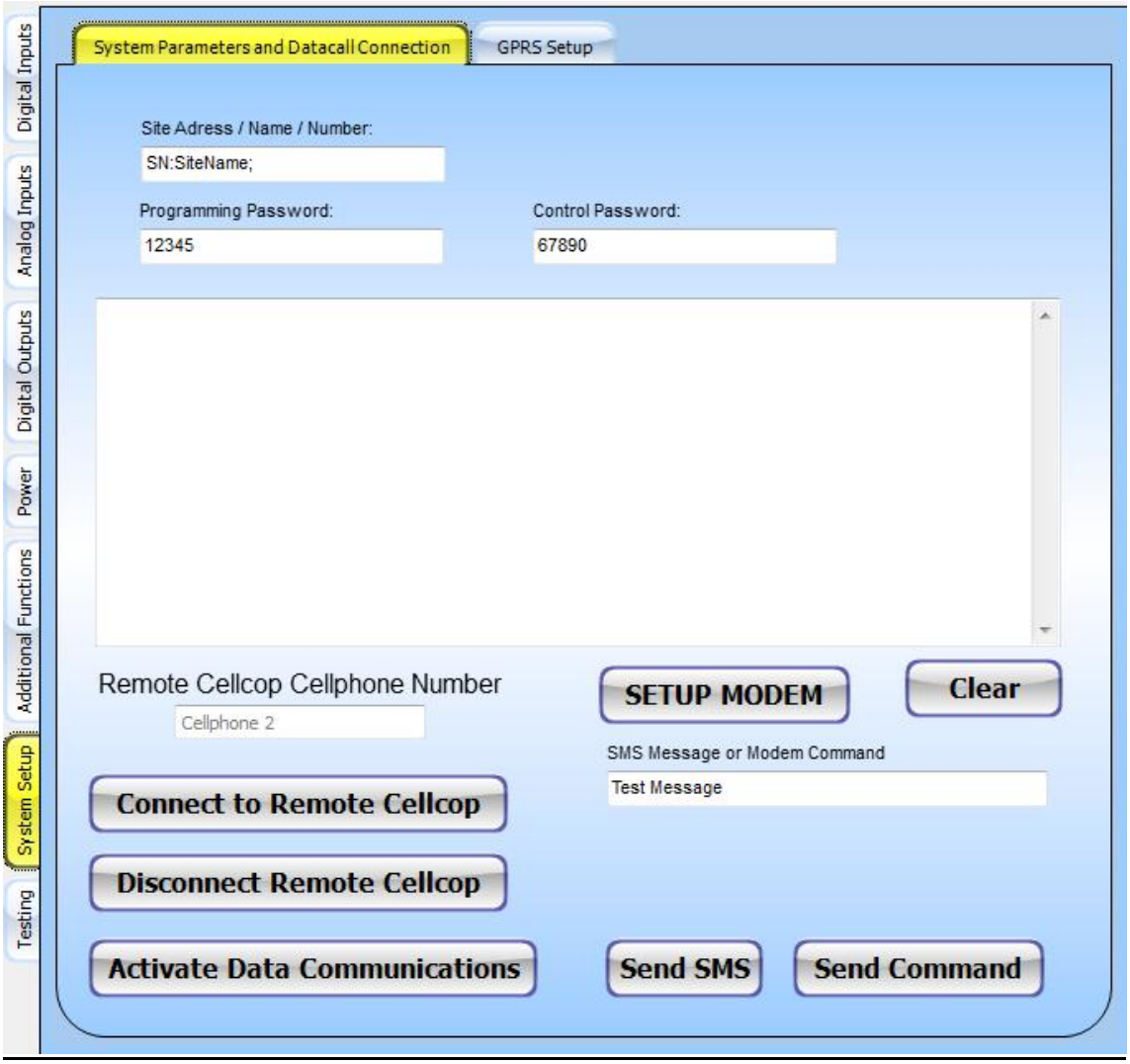
See “Scheduled Commands Page”

3.8 System parameters and data call connection

To configure the System parameters and data call connection select “Additional functions” tab on the vertical tab menu and then “System parameters and data call connection” on the horizontal tab menu.

Enter a Site Name here. This site name can be send with messages if so required. Also enter a Programming and Control Password for use when you set parameters or do commands from a cellphone that is not registered with rights on this unit. Use ppw*12345# for programming password and cpw*67890# for command password.

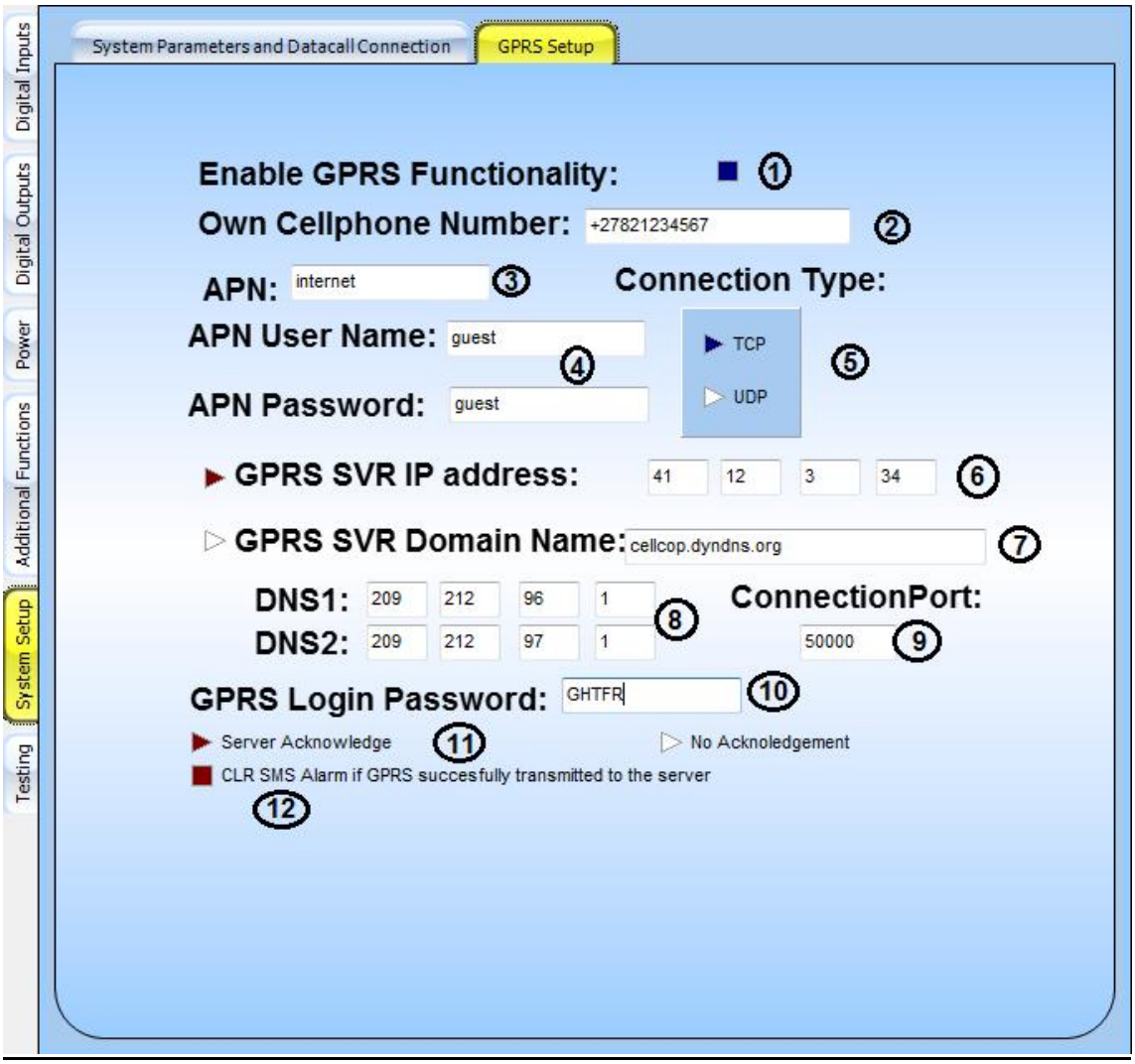
For more detail on data call connection please see section 2.7 (Setting up the configuration software to connect to the communicator using a GSM Modem (Remote configuration)) in this manual



3.9 GPRS setup

Note that if GPRS is used on the board then server based software is needed for the board to connect to on the internet. This software is called Cellcop Messaging System and is available from your supplier at a cost. Please contact your supplier for more information regarding the server side software

To configure the GPRS select “System Setup” tab on the vertical tab menu and then “GPRS Setup” on the horizontal tab menu.



1. To use the GPRS functionality, enable it by selecting the check box.

2. Enter the cell number of the SIM used in the device as its used to identify the unit in the field to the server side software that you are connecting to.

3. Enter the APN for the network being used.

4. Enter the user name and password for the APN connection.

5. Select if the connection will be TCP or UDP(Available on request). We usually use TCP.

6. Select if you will use an IP address or Domain Name to connect to.

7. You can connect to a server by using the Domain Name. You will need to run dynamic DNS functionality at the server side to resolve your dynamic IP address to a constant Domain name hosted at a dynamic domain name service provider.

8. You need to enter Dynamic Name Servers (DNS) IP addresses that can resolve your Dynamic Domain name to the current IP address.

9. The connection port is the port that the server side software has allocated for this unit to connect on.

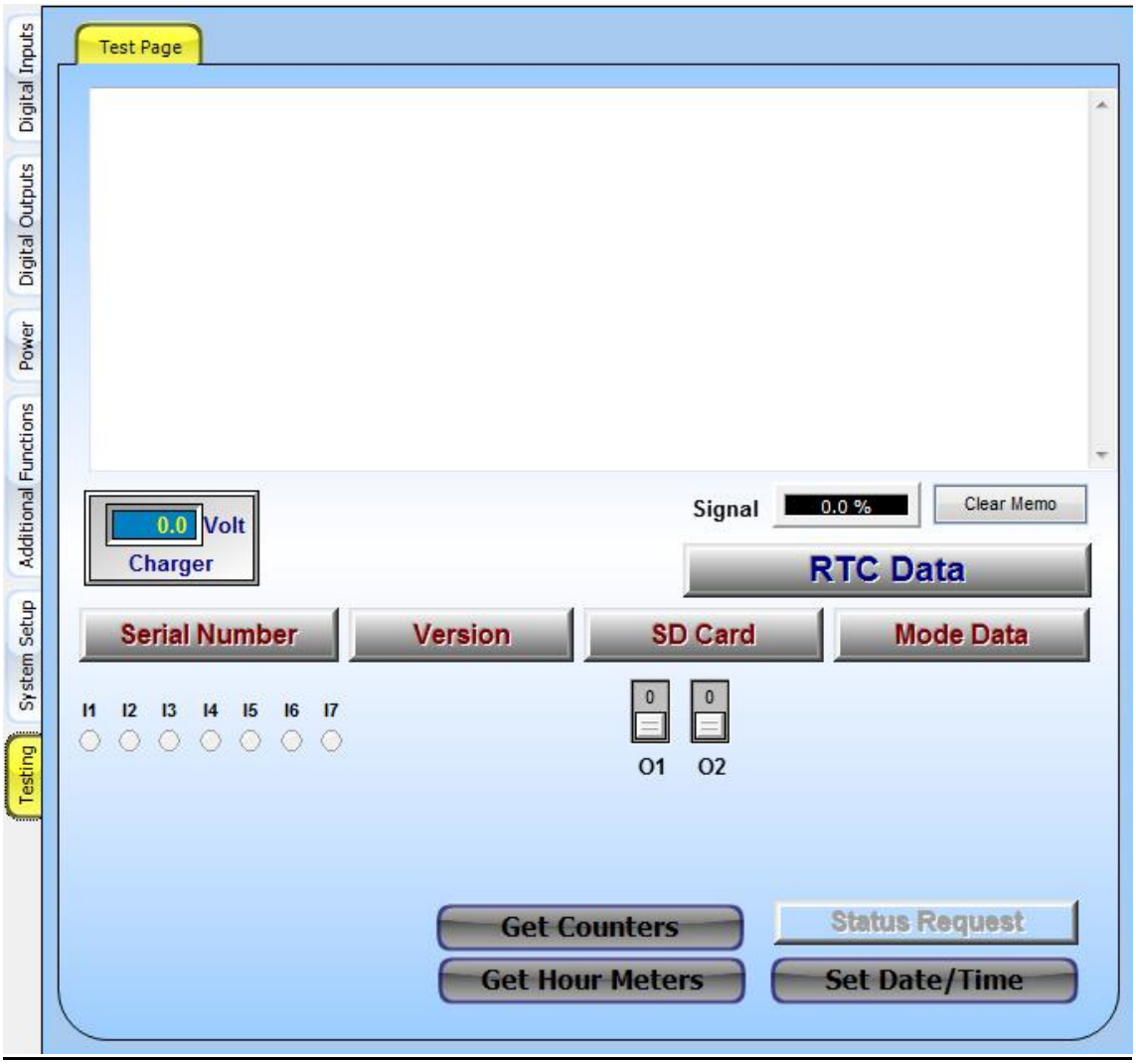
10. The GPRS password is the password used by the server side software to authenticate the connection being made with the current unit cell phone number.

11. Server Acknowledge must be switched on if you want the server side software to acknowledge when data is received from the unit.

12. CLR SMS Alarm will only send alarms to server via GPRS if the message is send successfully via GPRS. If not it will also send the alarm via SMS.

3.10 Setting RTC and testing board

Use this page to set the real time clock (RTC) by clicking the Set Date / Time button. The RTC will be set to the Date and time of the PC. Use RTC Data button to read the current RTC setting. Use Get voltages to read the current voltages. Get signal to read the current signal strength. All the replies will be displayed in the memo box.



3.11 USB Port

The USB port is used to connect the unit to a PC or Laptop for configuration. The unit will be powered from the USB port.

Note that the USB driver has to have been installed previously on the PC to connect the Configuration Tool software to the unit. The port made available for the USB interface will also be needed to make the connection.

Please see section 2.6.2 (Setting up the configuration software to connect to the communicator board) in this manual for more information.

3.12 Antenna

Screws onto the antenna plug.

3.13 SIM Card

Out

In

4 Controlling the GSM Communicator using a Cellphone

The GSM communicator can be controlled or programmed by sending a SMS to the GSM communicator.

We divide it in to control commands and programming (Configuration) commands.

If control rights are enabled, then only cellphones with control rights can send a command SMS to the communicator. A custom text can be programmed to be used to switch outputs.

4.1 SMS Control Commands to communicator

If control rights are enabled, then only those cellphones with control rights can send a command SMS to the communicator.

If “SMS with a control password is selected” then by adding the command password to the start of the SMS message allows you to send control commands from cellphones not defined in the communicator cellphone list.

A custom text can be programmed on the communicator so that if the custom text is send via SMS to the communicator you can use it to switch outputs.

4.1.1 Custom commands

Can be issued and must start with a * and end with a #.
Example:
cpw*12345# *out1on# *out2pulse# *monon#

4.1.2 Status request commands

4.1.2.1 Main status request

*mainstatus#

4.1.2.2 Hour meter status request

*hmstatus#

4.1.2.3 Counter Status Request

*cntstatus#

Status messages can contain measurement and status information depending on how it was configured.

The following properties exist and should be checked within each message. Not all will be inserted in every message. Process the message and update only properties received.

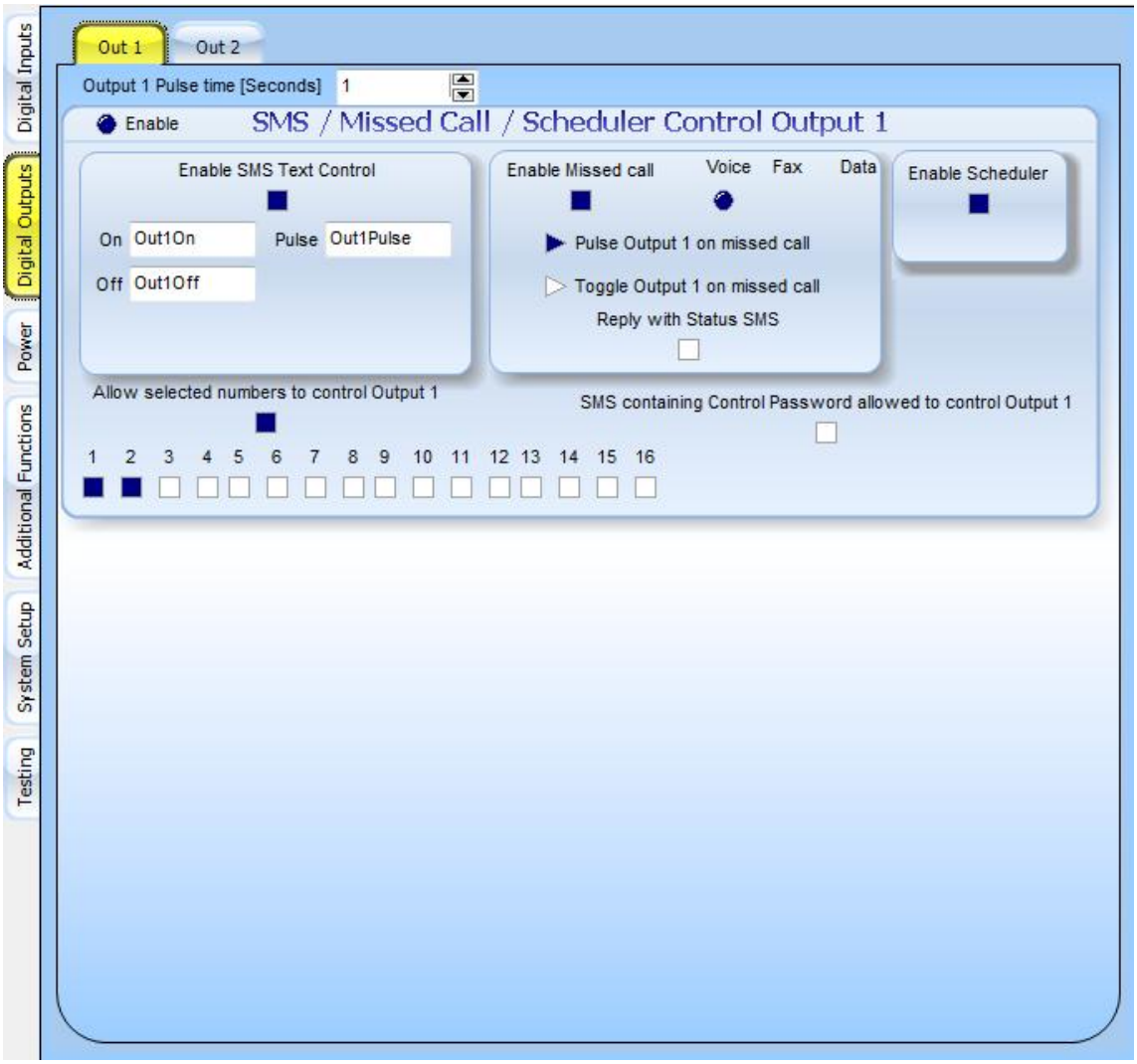
4.1.2.4 Properties

I:1234567; Inputs
I<x>:z; x = 1-7, z = 1 or 0;
Mon:Mode; - Text property (Mode is text describing the mode)
Ch:12.5V; Charger Voltage
Bat:12.2V; Battery Voltage
O:123--67P; Outputs , Numbers = on, - = Off, P = Pulse
O<x>:z; x = 1-8, z = 1 or 0;
Sig:Value%;
Maintenance Required

H<x>:<Value><Unit>; - Hour Meters, x= 1 to 7
C<x>: <Value><Unit>; - Counters , x= 1 to 7
RT:DD/MM/YY HH:MM:SS; - Real time clock
Maintenance: Required; - Maintenance Status Text field can be any text

Example: “PumpOn” text send to the communicator will switch on Output 1 and “PumpOff” text send to the communicator will switch off Output 1.

.



Only Cellphone numbers in position 1 and 2 will be able to switch output1

Adding the password to the SMS from another cellphone will not work as its disabled in the configuration show above

Giving the unit a missed call from cellphone 1 or 2 will pulse output 1 for 1 second.

NB: Outputs can only be controlled with SMS if Output follow is not enabled.

4.2 SMS Programming Commands to communicator

Must contain the programming password.
ppw*67890# <Programming commands>

Programming commands samples

4.2.1 Set Real Time Clock (RTC)

setrtc*HHMMSSDDMMYYW# - Set RTC

4.2.2 Set hour meter value

sethm<x>*Value # - Set Hour meter. X = 1 to 7

4.2.3 Set counter value

setcnt<x>*Value # - Set Counter value. X = 1 to 7

4.2.4 Set Hour meter Limit for maintenance

setmainhm<x>*Value#

4.2.5 Schedule commands

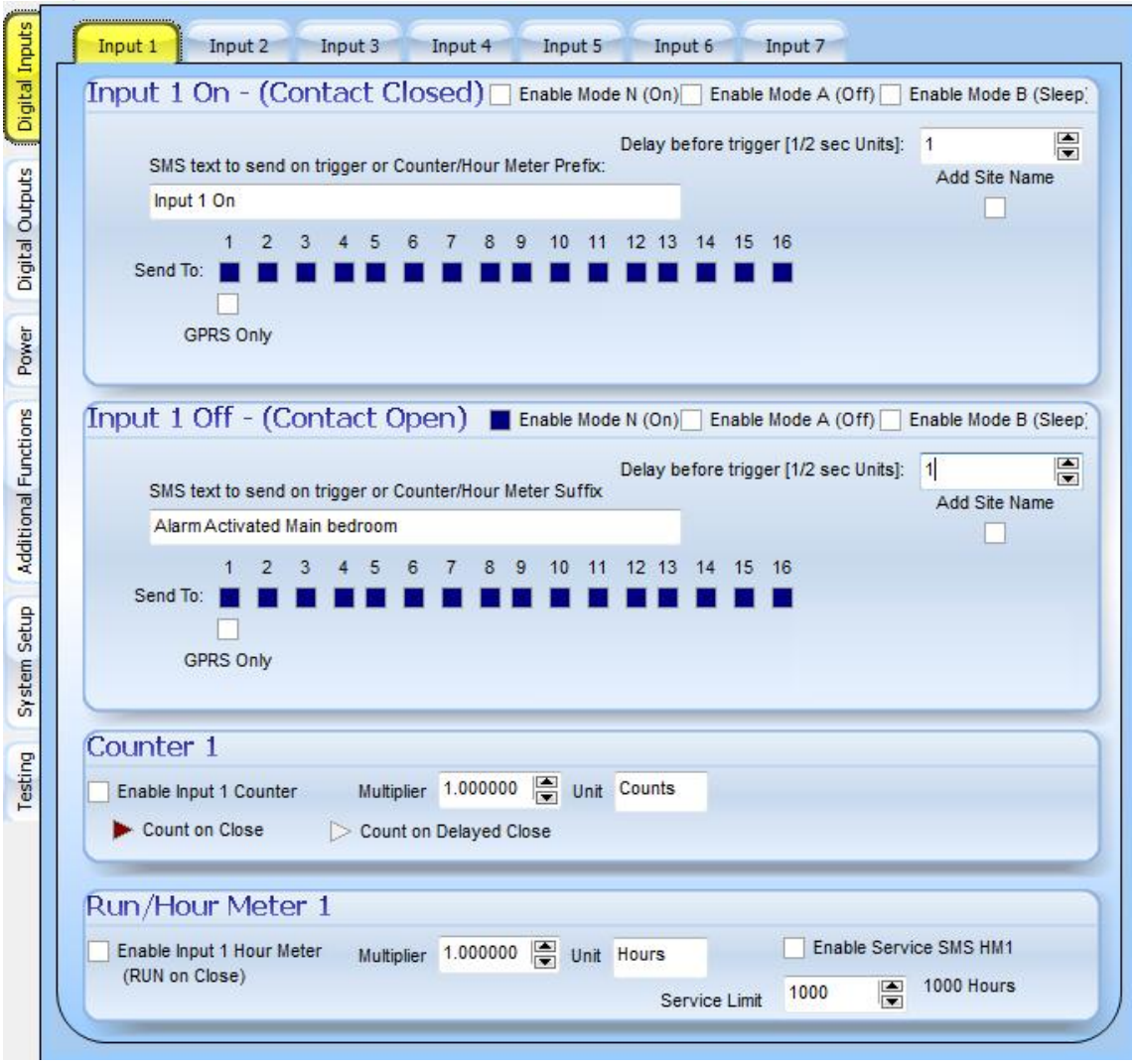
Shed<x>*<y>DDMMYYHHMMCCWW# x=0 1 to 24, y= 1 or 0
Shed<x>*y# - Switch of/On Logging.

5 Applications

5.1 Alarm System

The CP72u-M has 7 Digital inputs. Inputs are used to monitor a digital state like On and Off or Open and Closed. It can also be used to communicate an Event like Panic triggered or Burglary alarm. By configuring the parameters you can control how the unit utilizes the input. The CP72u-M used a negative trigger to activate and input. A dry contact or switch to GND can be used to activate and deactivate a state of an input. Inputs can also be used as Hour meters and Counters. The following examples show some uses of inputs:

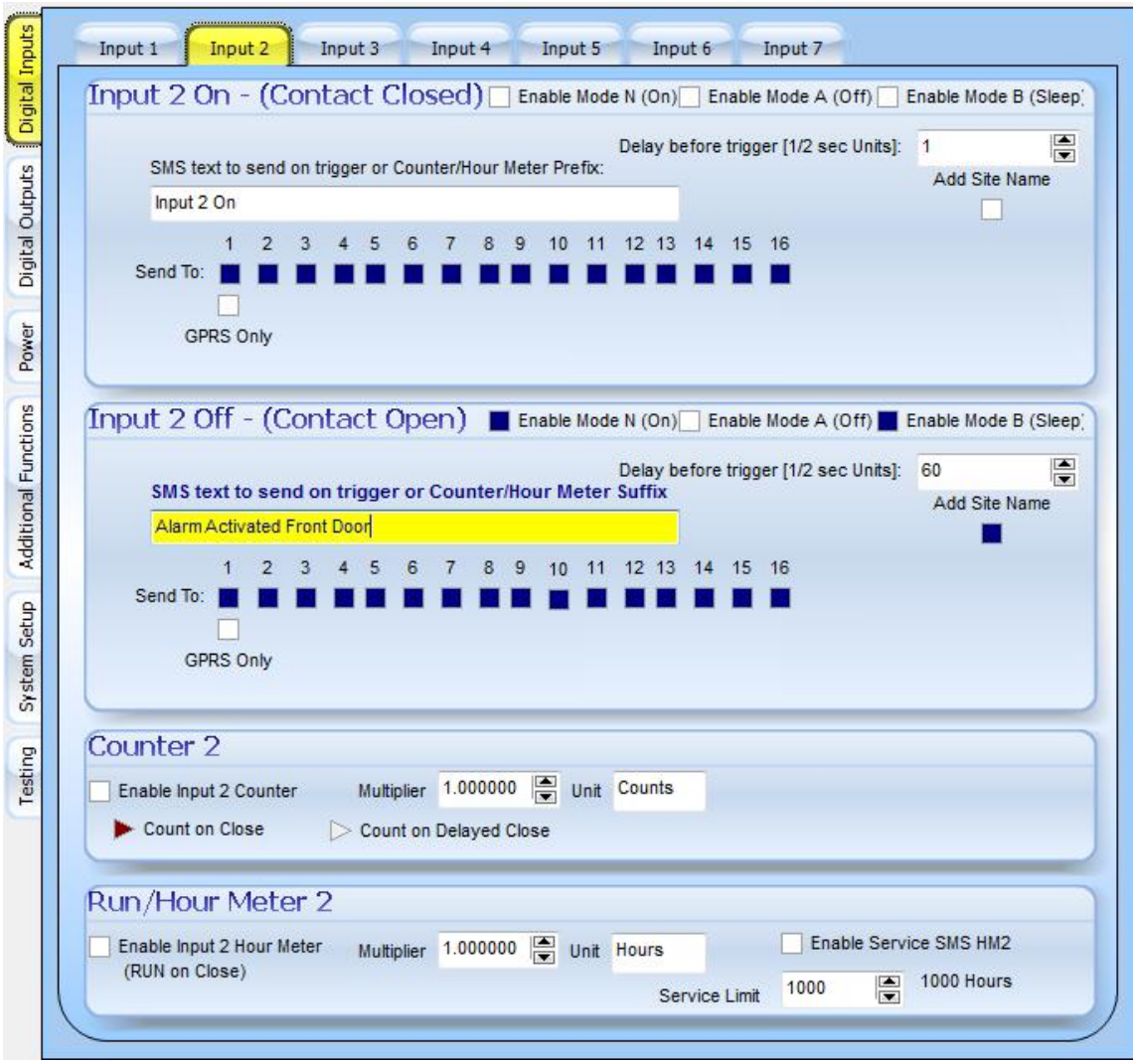
Example 1:
This will typically be for a PIR in the main bedroom wired for a Normally Closed (NC) configuration



Input 1 is setup to send a SMS containing text “Alarm Activated Main Bedroom” to Cell phone number 1 to 16 only if the input 1 was off for half a second and the current Mode is N (normal).

No message will be sent on input one on.

Example 2:
This will typically be for a magnetic switch on a door in the house wired for a Normally Closed (NC) configuration

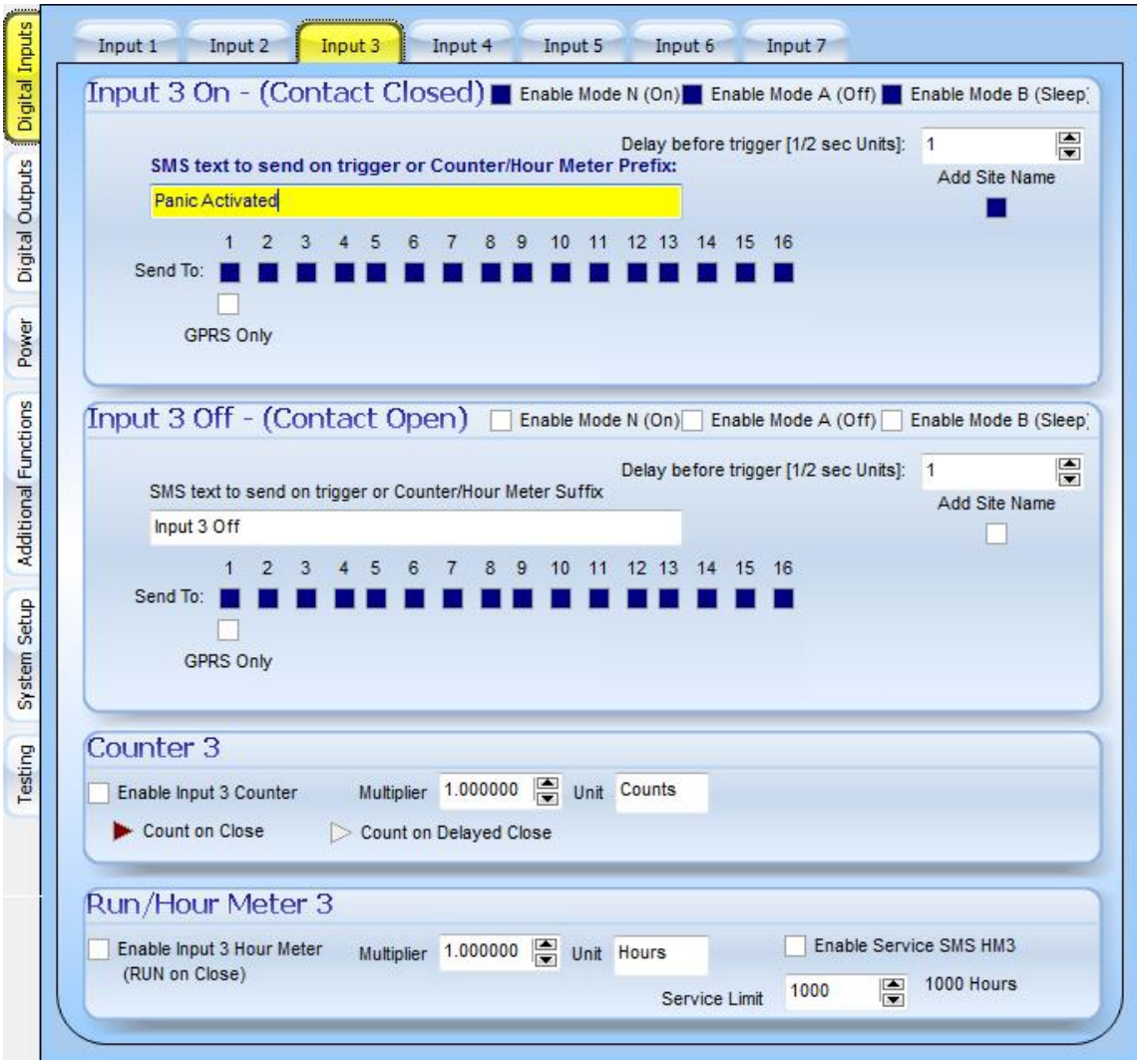


The SMS message “Alarm Activated Front Door” will be send if the door is opened for longer than 30 seconds so that the person entering has time to deactivate the alarm on entry.

Door will be monitored in Mode N (Normal) alarm on as well as in Mode B (Sleep). So at night the PIR will be ignored in Mode B but the doors will still be monitored in Mode B. Only in Mode A as with the current operation all the sensors on the alarm will be off.

The Site name will be sent with the SMS message.

Example 3:
This will typically be for a panic button in the house wired for a Normally Open (NO) configuration



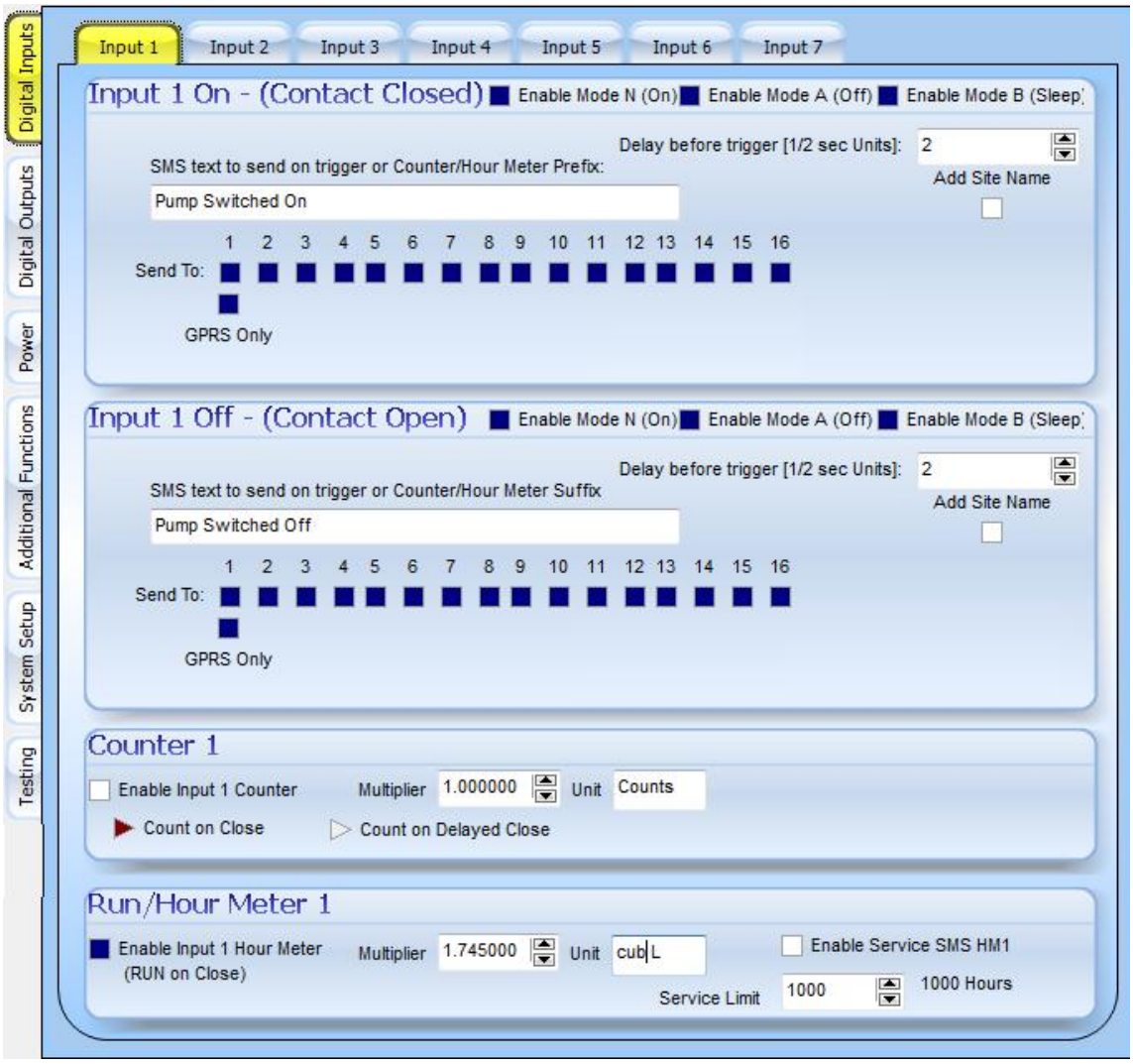
The SMS message “Panic Activated” will be send if the panic button is pressed.

Panic button will be monitored in all modes so the alarm can be off (mode A), the panic will still activate.

The Site name will be sent with the SMS message.

5.2 Water Pumped. (Run Meter)

Example 1:
Here we use an input to indicate that a pump pumping water is running or not. The pump is calibrated and we know that it pumps 1.745 cubic liters of water per hour.



So as per the example above we entered the multiplier of 1.745, the unit as cubic liters and enabled the run Meter on input one by selecting the check box.

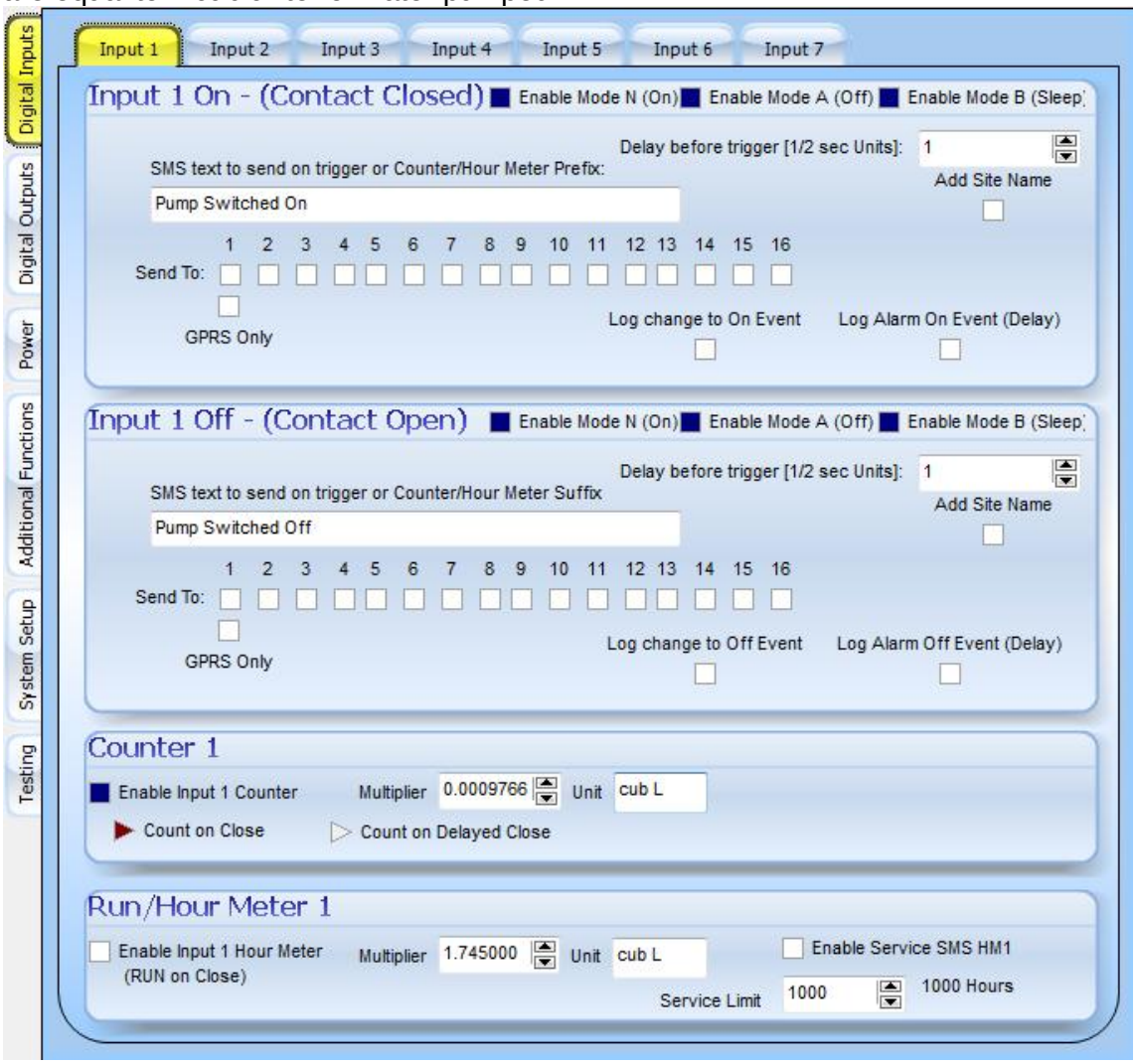
We did not enable a service limit SMS.

No SMS message will be sent on input one on or off, instead the message and Run meter values will be sent via GPRS to a server on the internet where it will be logged to a database.

The messages will be send and monitored on all modes.

5.3 Water Pumped. (Pulse Counter)

Example 1:
Here we use an input to indicate that a pump pumping water is running or not. The input is connected to a flow meter on the pump and it sends pulses thru as the water is being pumped. The flow meter is calibrated and we know that every 1024 pulses are equal to 1 cubic liter of water pumped.



So the unit will count a pulse every time the input is activated and the multiplier is 1/1024 cubic liter or 0.0009765625

The unit is cubic liter

No message will be sent on input one on or off as no cell numbers is selected. Values are also not logged or send to a server via GPRS.

5.4 Generator Monitor.

Example 1:
In this example we will monitor a diesel power generator that is used for backup power to the mains supply. The generator is controlled by a PLC and some interfaces are available from the PLC thru relay contacts.

The PLC provides interfaces for:

- Mains Power On / Off
- Generator Start / Stop
- Generator Over Heat
- Generator Low oil Pressure

We can also interface with a Kw/h meter to monitor how much power is used from mains power. The Kw/h meter provides a pulse output that gives 1 pulse for every 0.001 Kw/h used.

The generator should get a preventive maintenance service every 250 hours of operation.

We would like to set the generator PLC into manual mode / automatic mode remotely via SMS. (This is an input available on the PLC)

We would like to reset the PLC remotely via SMS command. (This is an input available on the PLC)

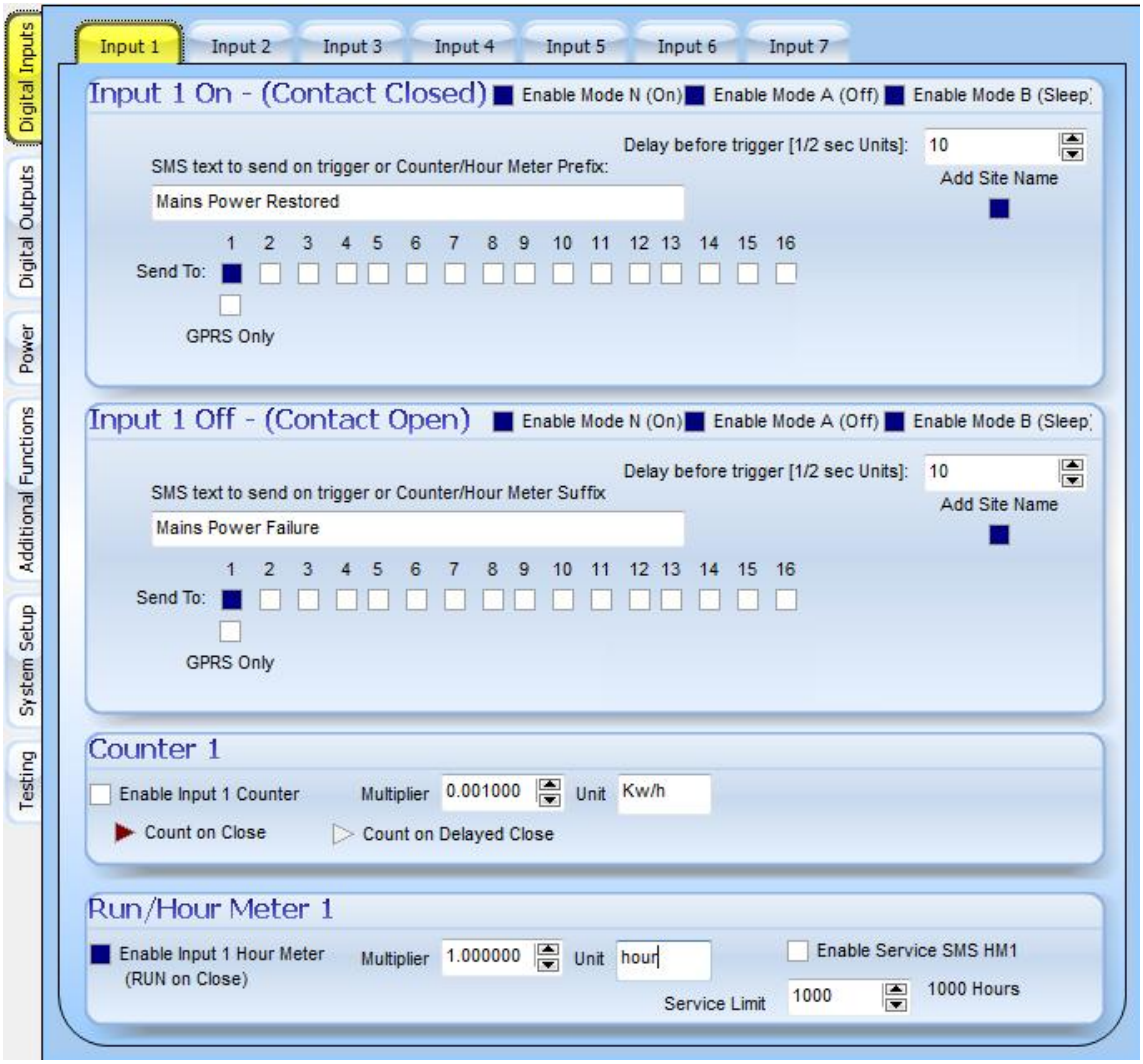
The following screens will show how we configure the unit to get the functionality as required above.

We load the following cell numbers for the person responsible for the generator (Gen Supervisor) and the service person that does a service on the generator every 250 hours. (Gen Service)

So in digital input 1 we monitor the Mains power on and off. We will send the mains power restored / failure messages as shown underneath to the Gen Supervisor if the condition prevails for 5 seconds (Delay trigger of 10). The delay trigger is used to filter out any power dips and only report real failures.

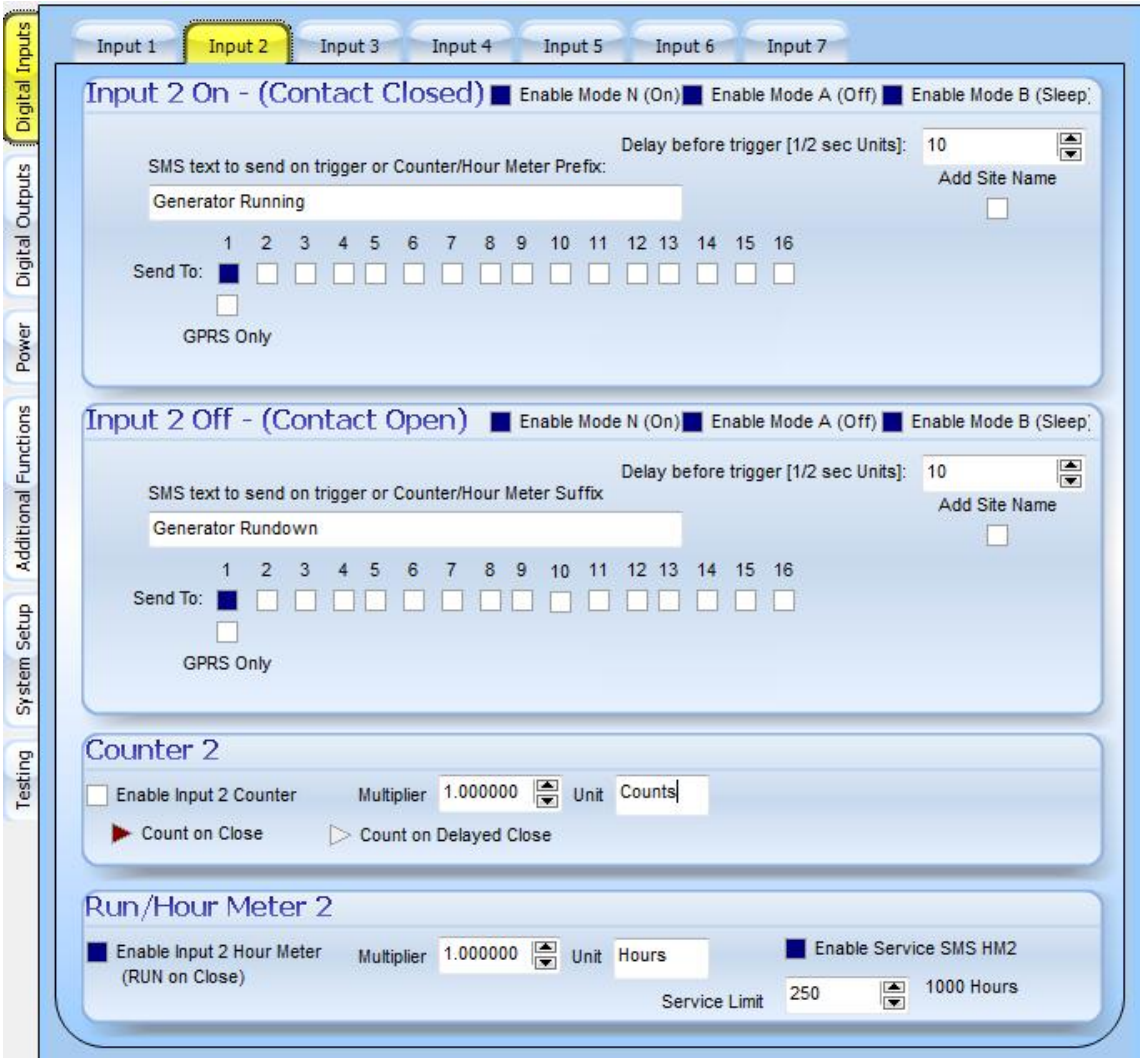
Messages will also get the site name attached to the back of the message.

The run meter information can be used to see how long we were running on mains and how long we run on generator power.



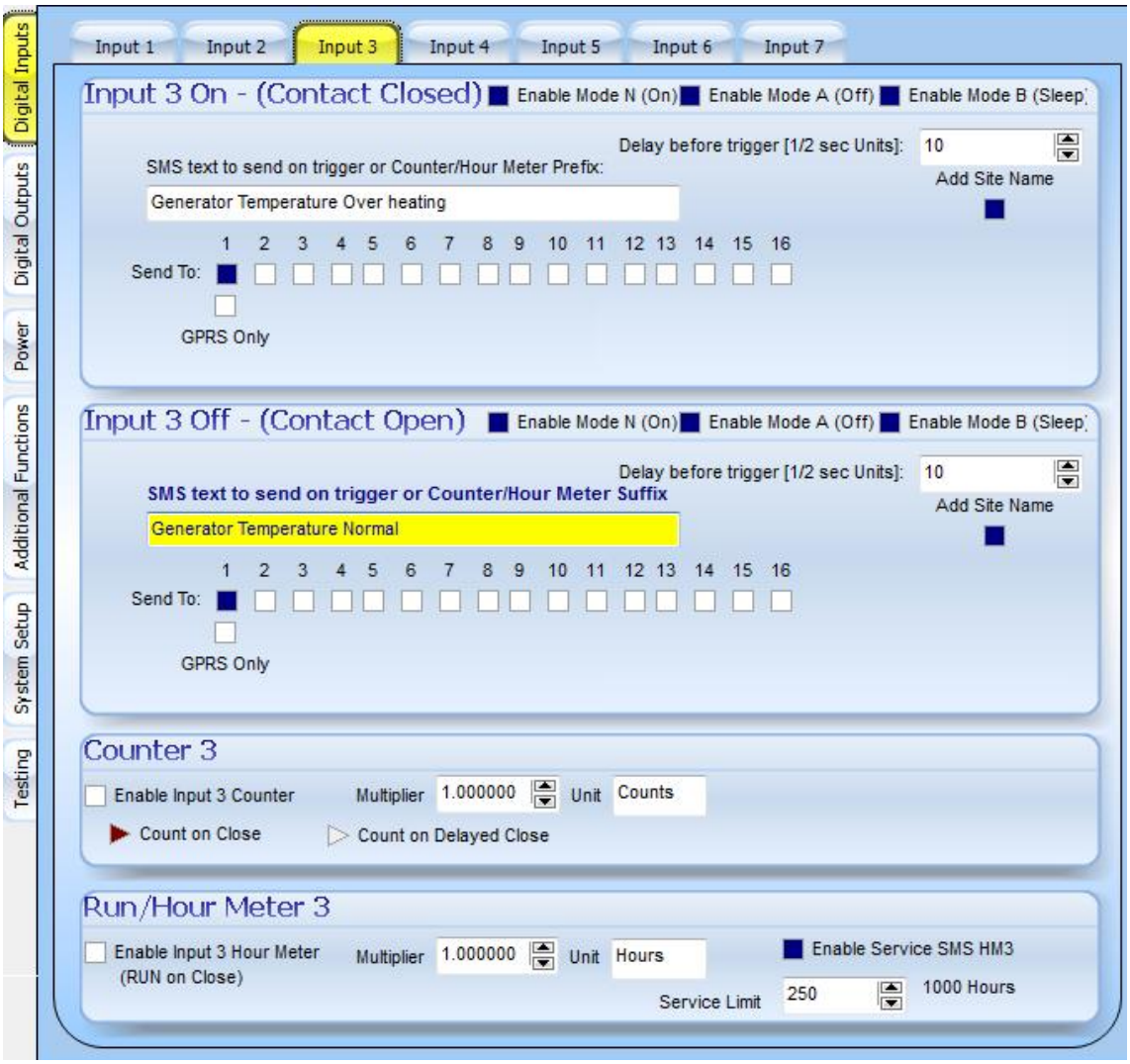
So in digital input 2 we monitor the Generator Start / Stop. We will send the generator running / rundown messages as shown underneath to the Gen Supervisor if the condition prevails for 5 seconds (Delay trigger of 10). The delay trigger is used to filter out any start failures and only report real events.

The run meter information can be used to see how long we were running on generator and if service intervals have been reached. A Service SMS will be send to the Gen Supervisor and the Gen Service person after every 250 hours is reached.



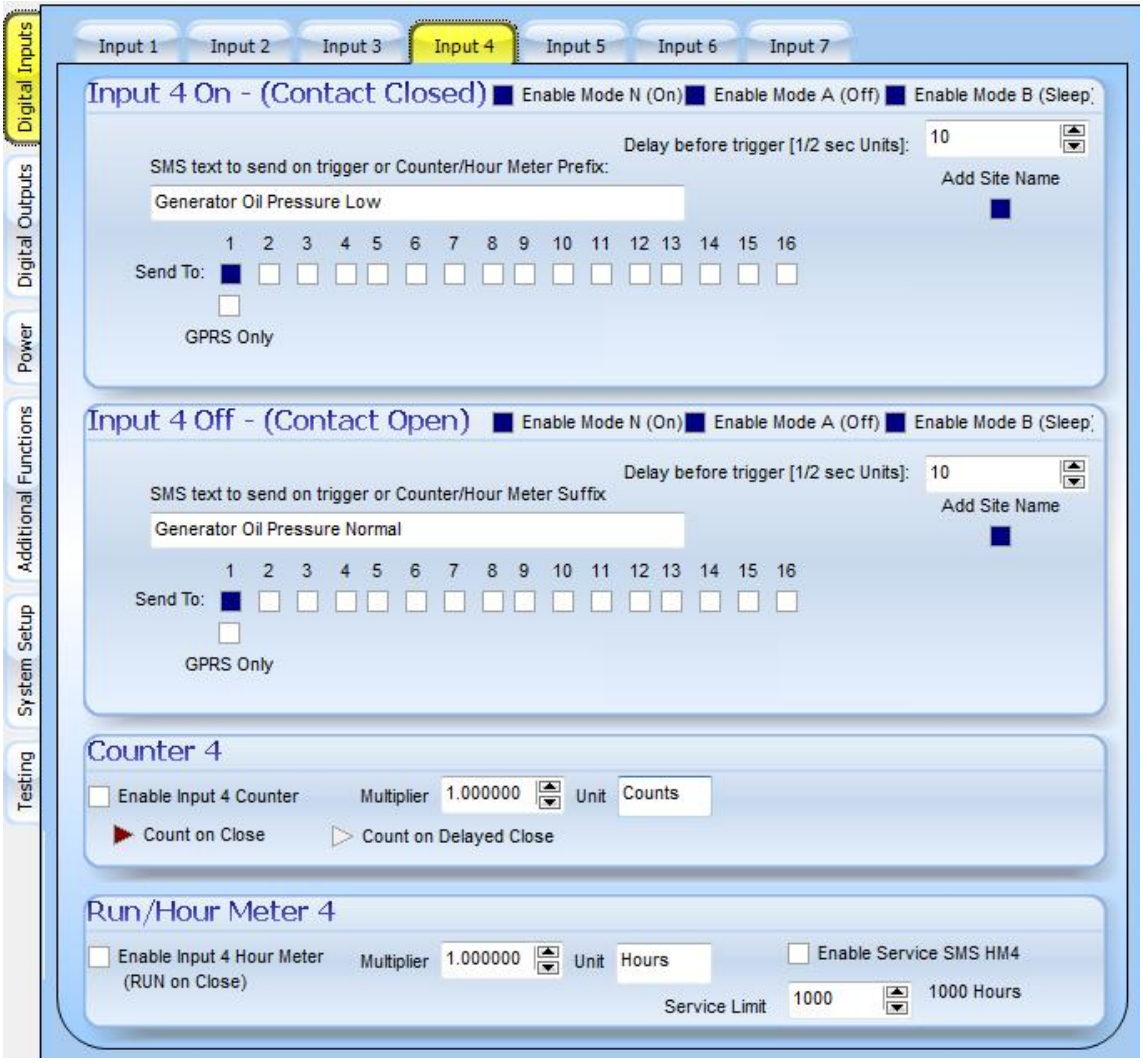
So in digital input 3 we monitor the generator over heating alarm. We will send the Generator Temperature Over heating / Normal messages as shown underneath to the Gen Supervisor if the condition prevails for 5 seconds (Delay trigger of 10). The delay trigger is used to filter out any power dips and only report real failures.

Messages will also get the site name attached to the back of the message.

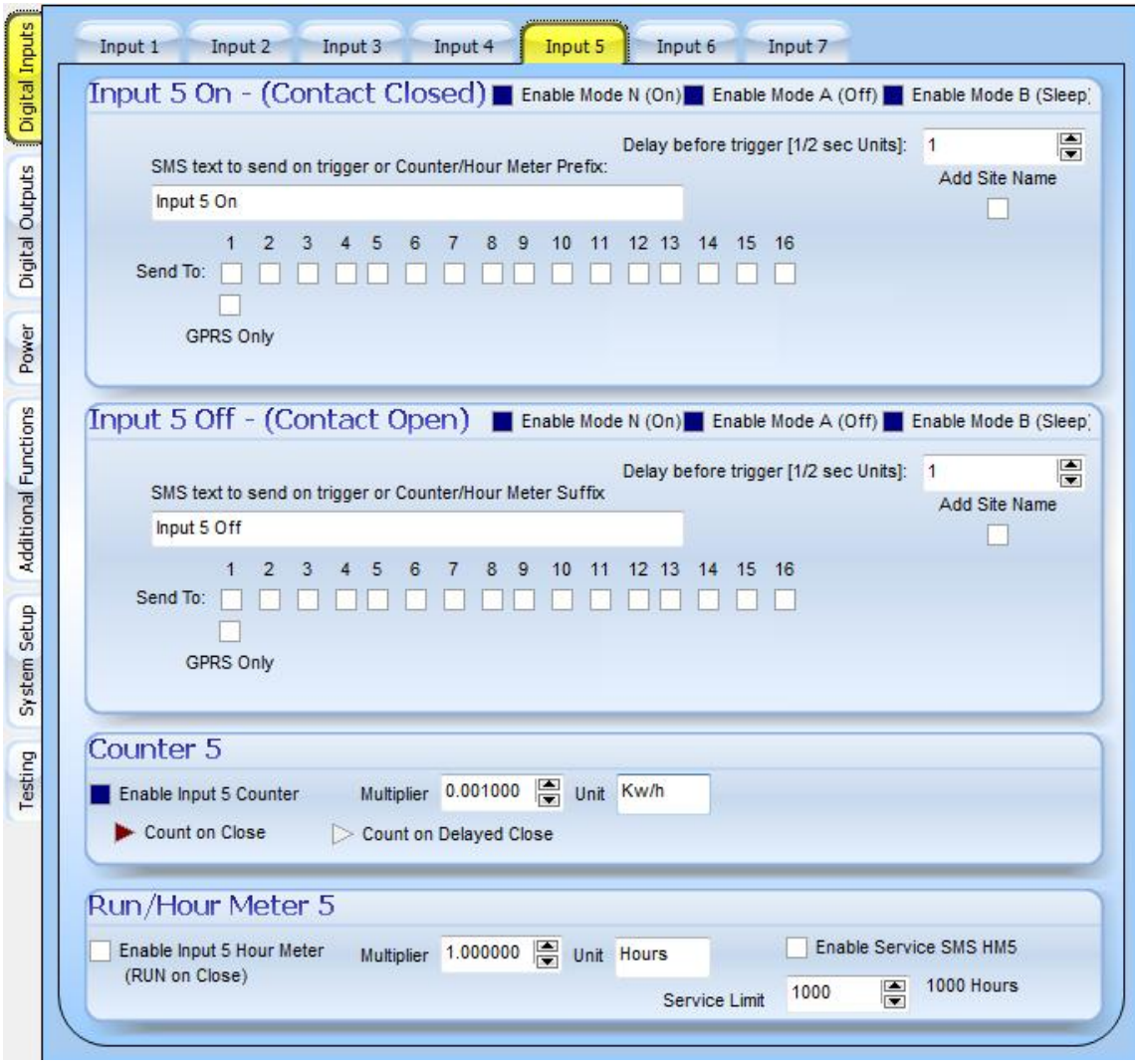


So in digital input 4 we monitor the generator oil pressure alarm. We will send the Generator Oil Pressure Low / Normal messages as shown underneath to the Gen Supervisor if the condition prevails for 5 seconds (Delay trigger of 10). The delay trigger is used to filter out any power dips and only report real failures.

Messages will also get the site name attached to the back of the message.



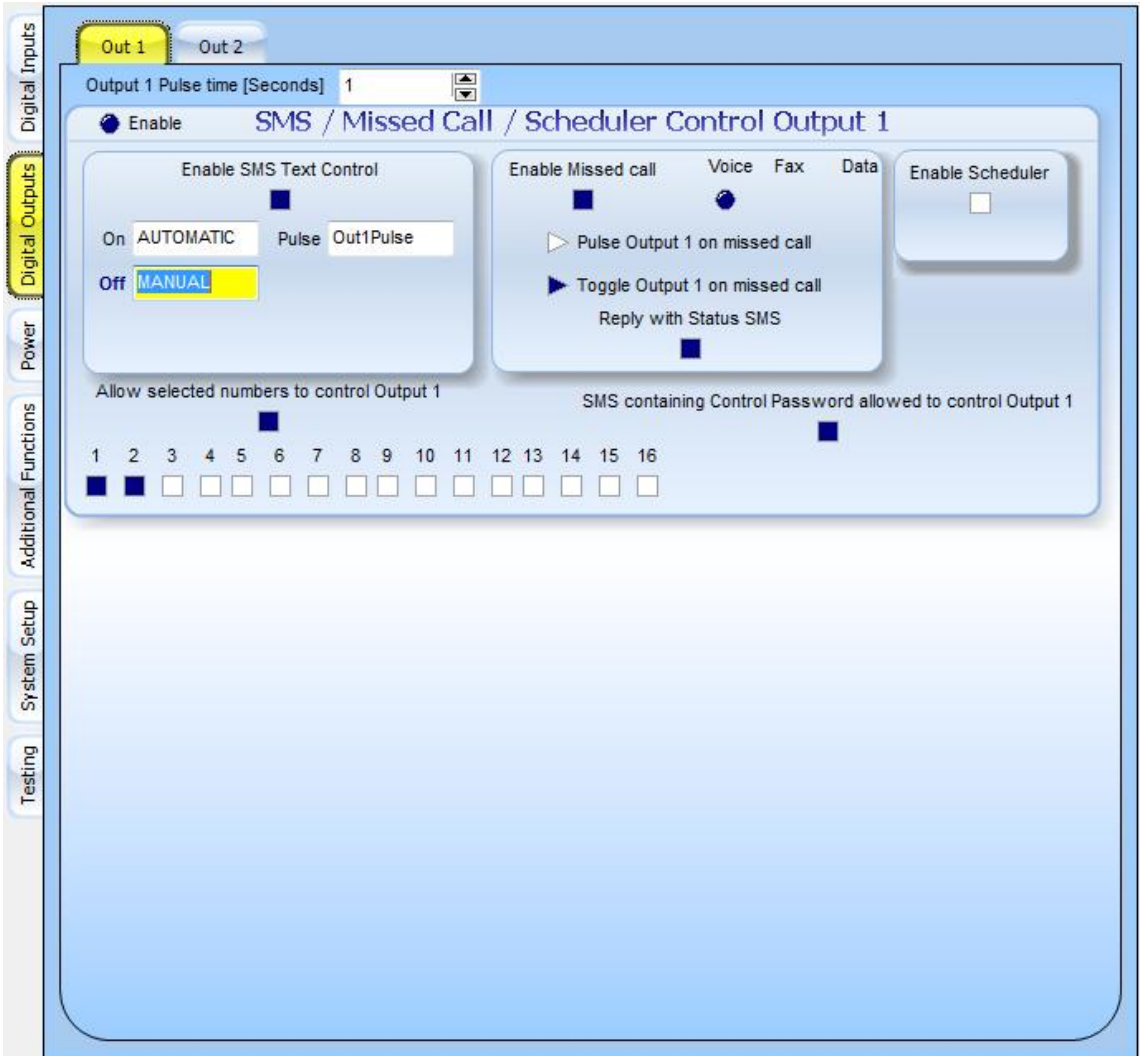
So in digital input 5 we will count pulses as given by the Kw/h meter so we can see how much mains power we are using. So we enable the counter and set the multiplier to 0.001 as 100 counts = 1 Kw/h



We will setup output 1 to set the PLC in Automatic mode when the text “AUTOMATIC” is send to it and to run in Manual mode when the text “Manual” is sent to it.

The Generator Supervisor and the Generator Service registered phone numbers is allowed to send commands to control output 1

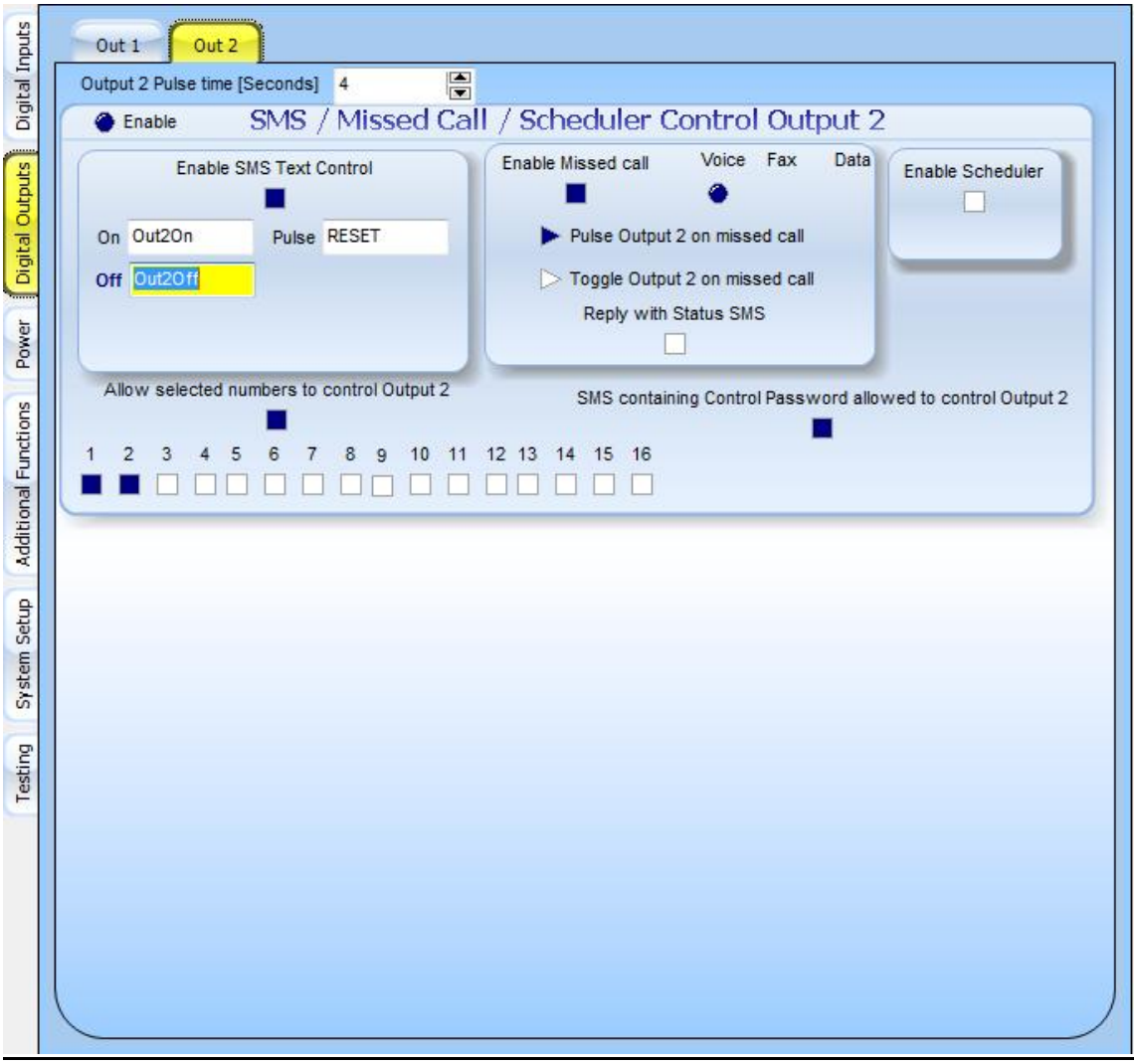
SMS commands send with a password can be send from other cellphones than the two enabled phones.



We will setup output 2 to reset the PLC by sending a pulse out on output 2 for 4 seconds when the text “RESET” is send to it.

The Generator Supervisor and the Generator Service registered phone numbers is allowed to send commands to control output 2

SMS commands send with a password can be send from other cellphones than the two enabled phones.

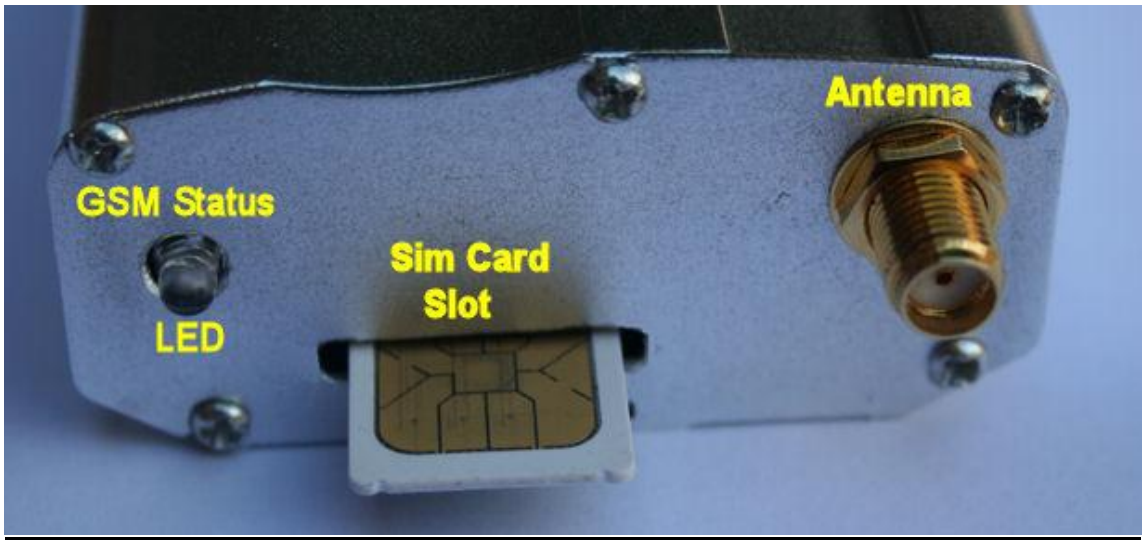


6. Troubleshooting

Symptom: Communicator does not send messages.

Possible remedies:

1. Check if there is power on the board. Mains or battery should be available and LED light should come on.



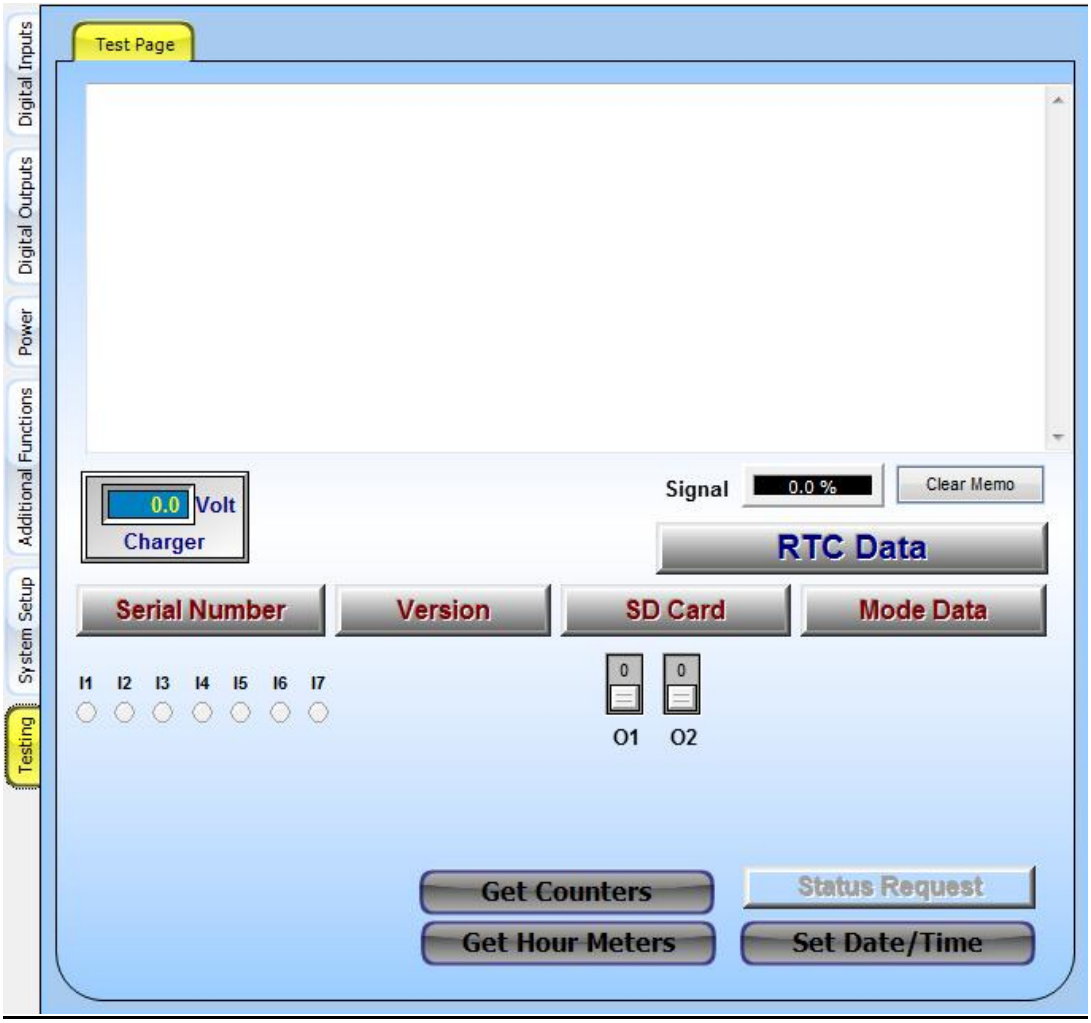
The LED light is on the left as indicated in the photo above

2. Check if the LED is flashing once every 3 seconds. This means the SIM is connected to the network and messages can be sent. Possible problems is that the SIM does not have money available on the account or that the card has not been RICA'ed

3. If The LED is flashing once every 1 second it means that the SIM is not registered on the network. This can be an old SIM that has been deleted of the network or it does not have enough signal strength to connect to the network.

4. If there is power and the SIM is registered on the network with enough money on the account to send messages them make sure the configuration is set up correctly to the right cellphone numbers ant that the input triggers actually occur.

5. The test page on the configuration software can help a lot as it shows charger voltage and signal strength. You can also see the state of the digital inputs and switch the outputs.



IMPORTANT NOTICE

A security system cannot prevent emergencies. It is only intended to alert you and - if programmed - your neighbors and monitoring station of an emergency situation. Security systems are generally very reliable but they may not work under all conditions and they are not a substitute for prudent security practices or life and property insurance. Your security system should be installed and serviced by qualified security professionals who should instruct you on the level of protection that has been provided and on system operations.