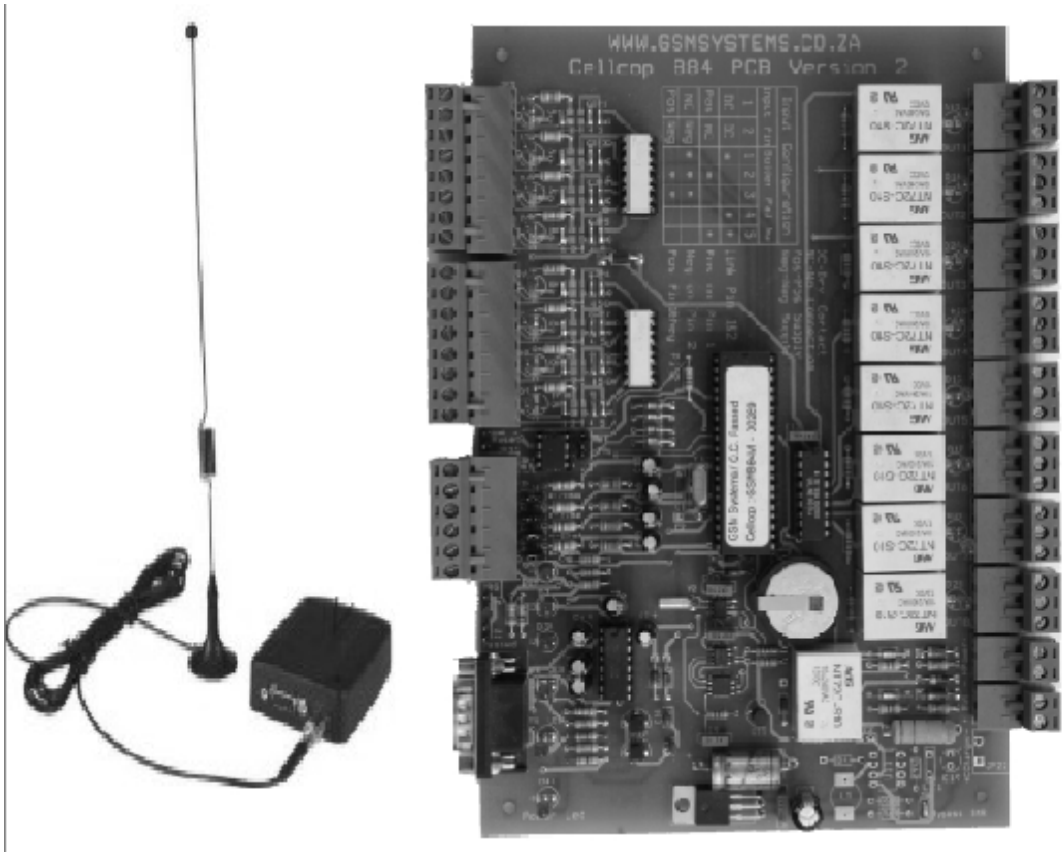
# Cellcop Communicator Modem Version

# Manual

**Feb 2008**



# ABOUT THE GSM COMMUNICATOR SYSTEM

The GSM communicator system is based on GSM SMS technology. It uses a GSM Modem for communication and is designed to provide you with flexibility and convenience. Read this manual carefully and have your installer instruct you on the system's operation and on which features have been implemented in your system. All users of this system should be instructed on its functions.

**Table of Contents**

## 1. Features

**Digital Inputs to communicate alarm conditions**

- Each input can be triggered to send an SMS to up to 16 Cellphone numbers
- The time delay before the SMS is send 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

**Outputs to control any electrical device**

- Outputs can be controlled by cellphone using SMS (Switching the output on, off or pulse)
- 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 inputs to monitor volume, temperature, etc. (Only on Cellcop884M)**

- Each analog can be triggered to send an SMS to up to 16 cellphone numbers
- The analog value where the SMS is send can be configured.
- Separate messages can be configured for High and Low level alarms.
- Messages to be send can be programmed by the user
- High or Low alarm messages can both be reported to predefined cellphone numbers.
- Reporting can be disabled for an analog
- The value of an analog can be requested from the unit by SMS

**Monitor AC power using the cell phone charger as input**

- AC power can be monitored by monitoring the cellphone charger state
- SMS can be send to up to 16 numbers when a power failure occur and when the power return

**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 a power failure occur and when the power returns

**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 is faulty.
- The battery is monitored by disconnecting it from the main supply and to measure the battery voltage while connected to a load.

**Timed events**

Timed events can be configured to control outputs, Switch Monitor modes, etc.

**Event logger**

The system can be setup to log events on the board.

**Run Meter on all inputs**
All inputs can be configured as run meters. Input 1 can control monitoring on other inputs. The run meter increment when the corresponding input is on.

**Monitor control using Input 1**
Input 1 can be used to control if an input or analog should be monitored.

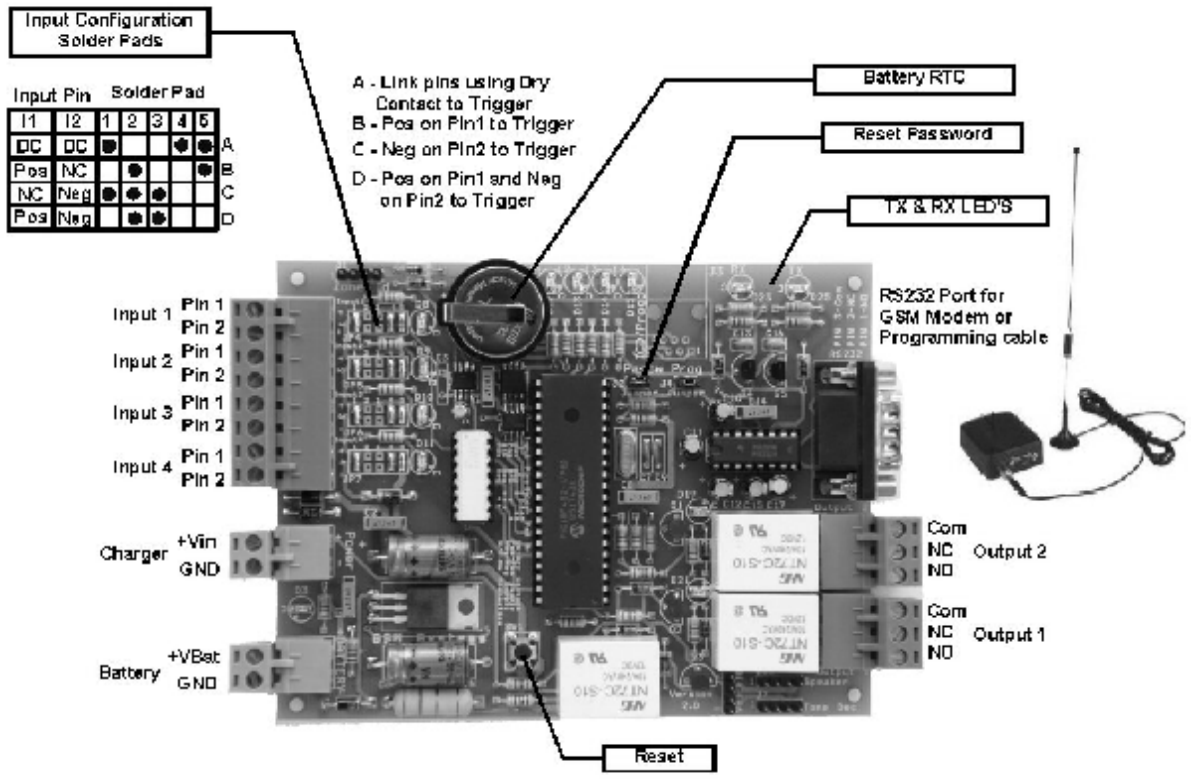
**Monitor modes**
Different monitor modes are implemented to enable different monitor setup.

**Local and remote configuration of the unit**

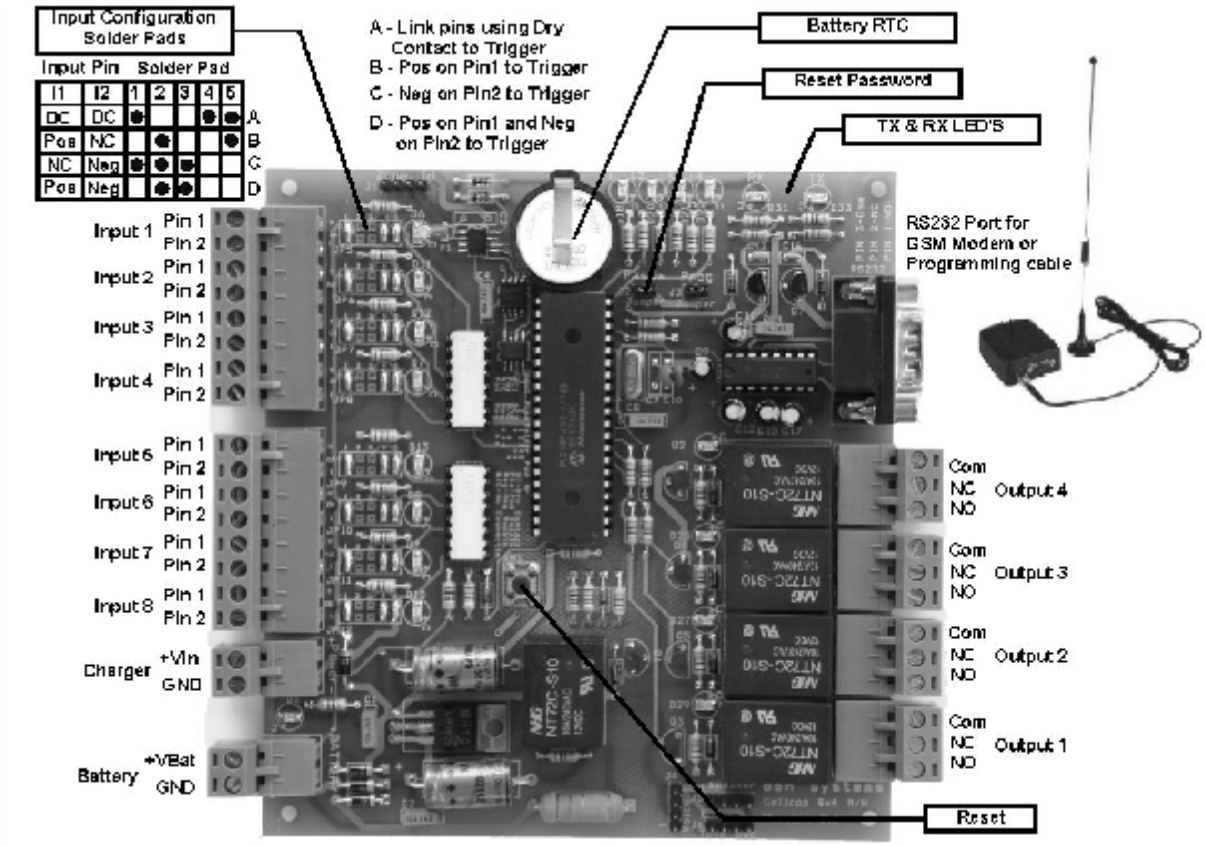
- The units parameters can be configured with the supplied configuration software
- Configuration can be done locally using a program cable or remotely using a modem

## 2. Cellcop communicator models

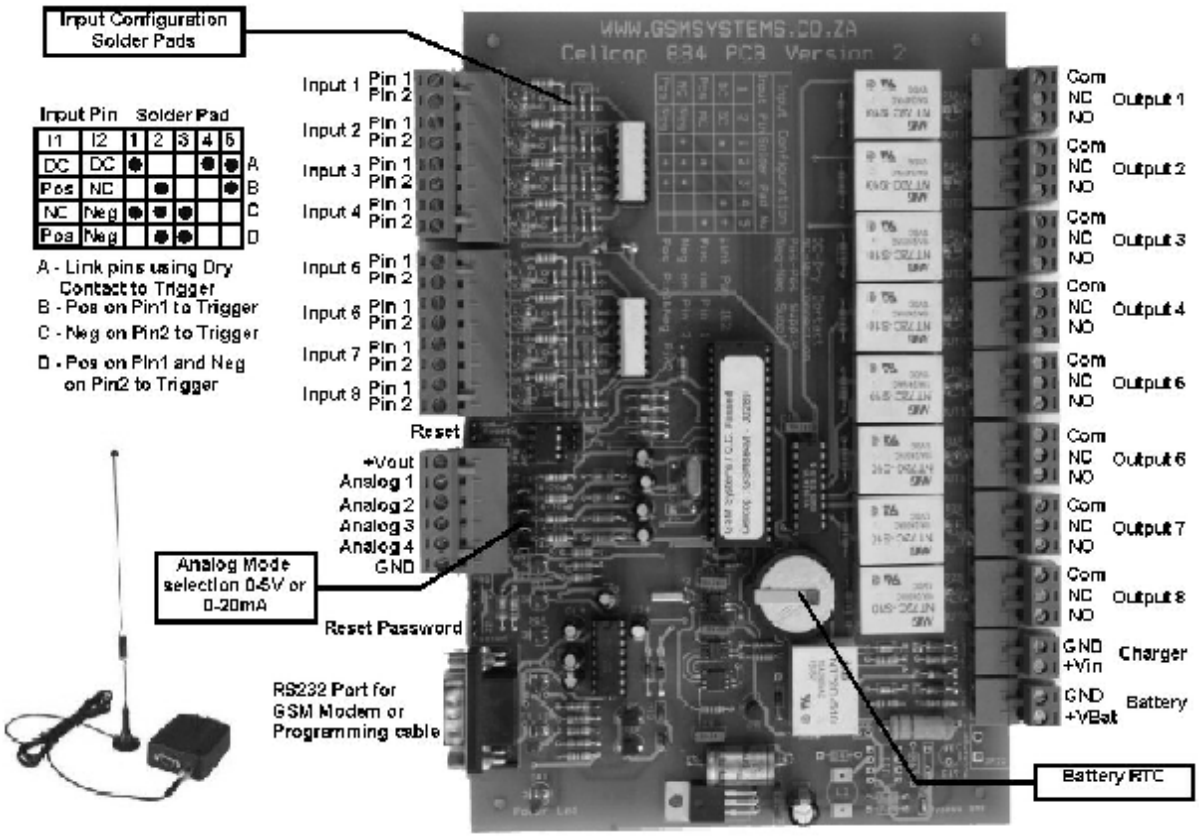
### 2.1 Cellcop 42M (4 inputs and 2 Outputs)



## 2.2 Cellcop84M (8 Inputs and 4 Outputs)




## 2.3 Cellcop 884M (8 inputs, 8 Outputs and 4 Analogs)



## 3. Operation of the GSM communicator

### 3.1 Setting up the Unit for operation

The following steps should be followed to use the GSM communicator

### 3.1.1 Wire up the inputs to sensors

The inputs can be wired up in various configurations.

The inputs can be setup to be used in various configurations by soldering the solder tags correctly.

Solder tag configuration:

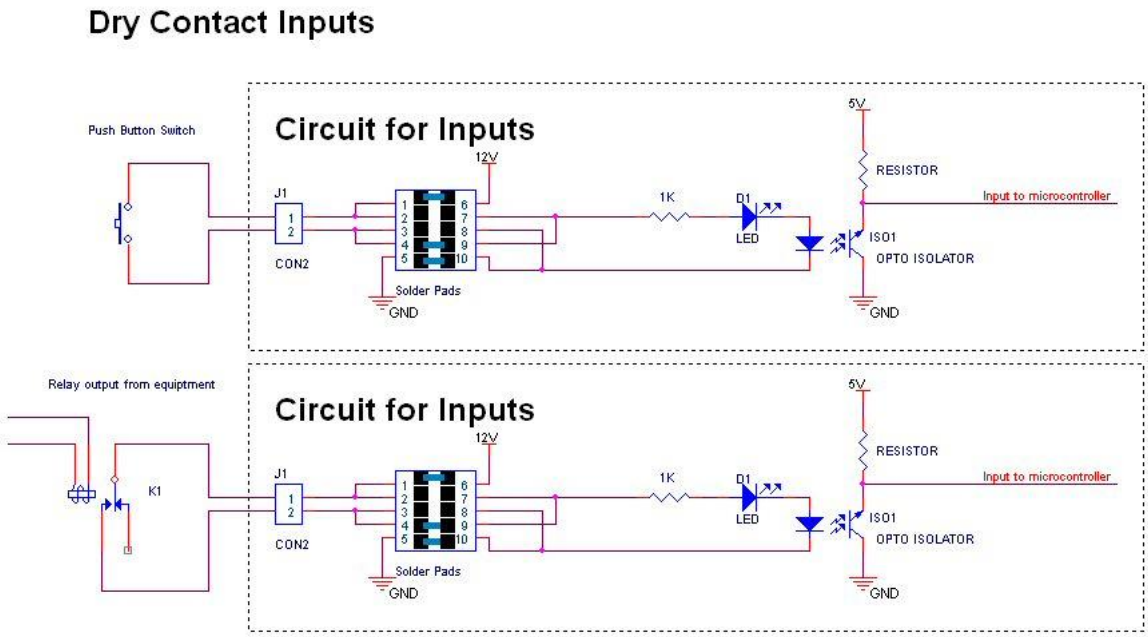
**Input configuration using the solder pads**

| Input Pins | | Solder pad Number | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 3 | 4 | 5 |
| DC1 | DC2 | * | | | * | * |
| Pos | N/C | | * | | | * |
| N/C | Neg | * | * | * | | |
| Pos | Neg | | * | * | | |

DC – Dry contact (Switch or relay)
Pos – Positive of the supply
Neg – Negative of the supply
N/C – No connection

**Configuration 1 (Dry Contact)**

Solder pads 1,4 and 5 must be soldered.

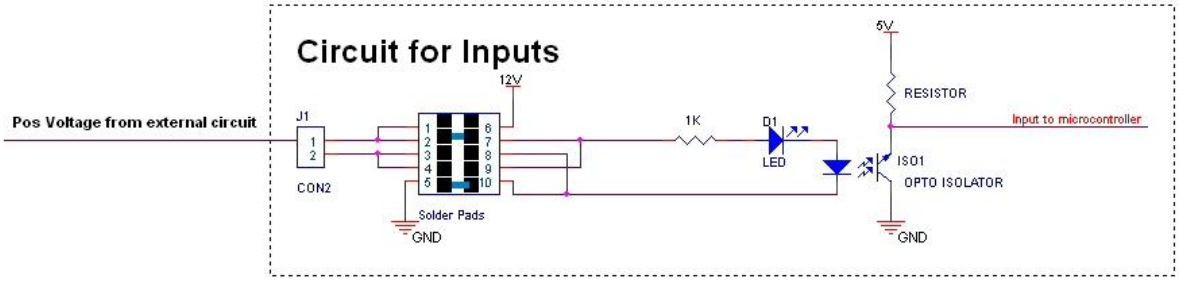



If the switches are closed the corresponding Input will go on and SMS will be send to the configured telephone numbers.

**Configuration 2 (Pos on pin 1 N/C on pin 2)**

Solder pads 2 and 5 must be soldered.

**Pos Supply on Input**




**Note: This circuit can only be used if the external equiptment and GSM Communicator use the same supply.**

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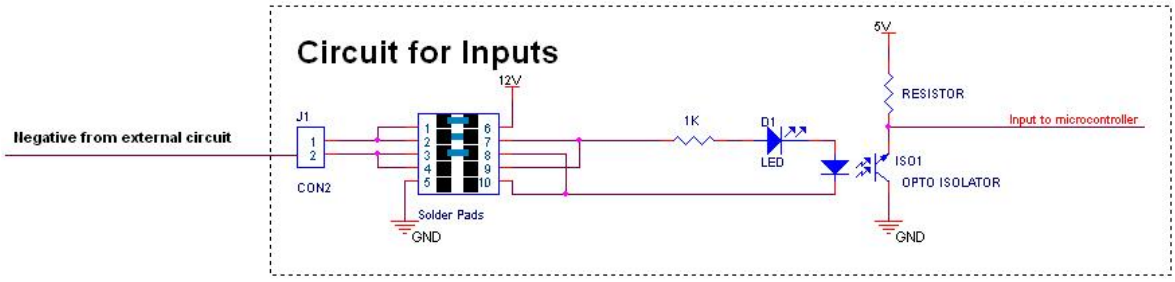
If a common supply is used then a positive from the alarm circuit can be used to trigger the unit.

**Configuration 3 (N/C on pin 1 Neg on pin 2)**

Solder pads 1,2 and 3 must be soldered.

**Pos Supply on Input**




**Note: This circuit can only be used if the external equiptment and GSM Communicator use the same supply.**

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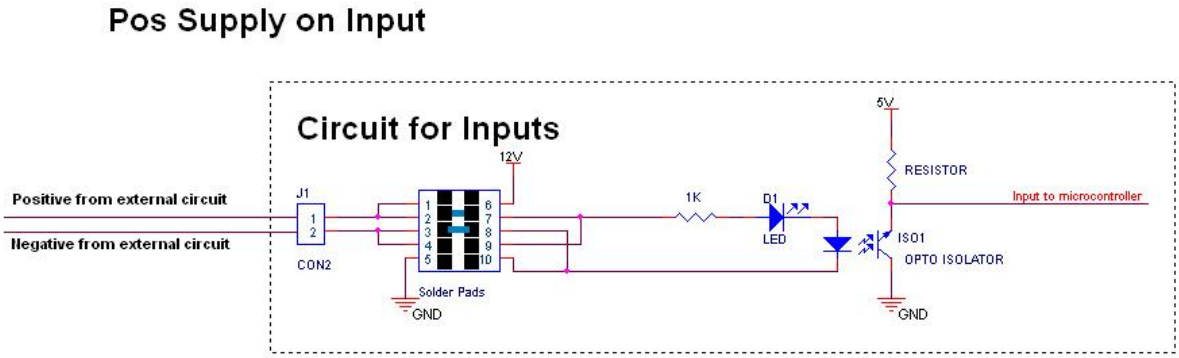
If a common supply is used then a negative from the alarm circuit can be used to trigger the unit.

**Configuration 4 (Pos on pin 1 Neg on pin 2)**

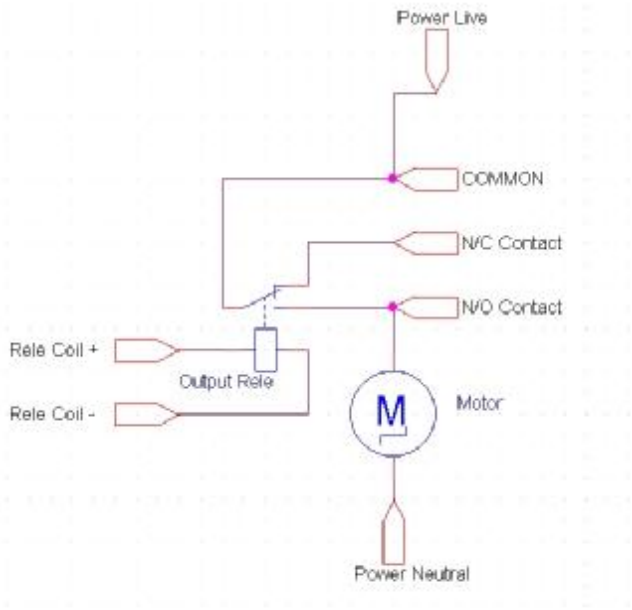
Solder pads 1,2 and 3 must be soldered.




No common supply. Positive and negative is supplied from external alarm circuitry.

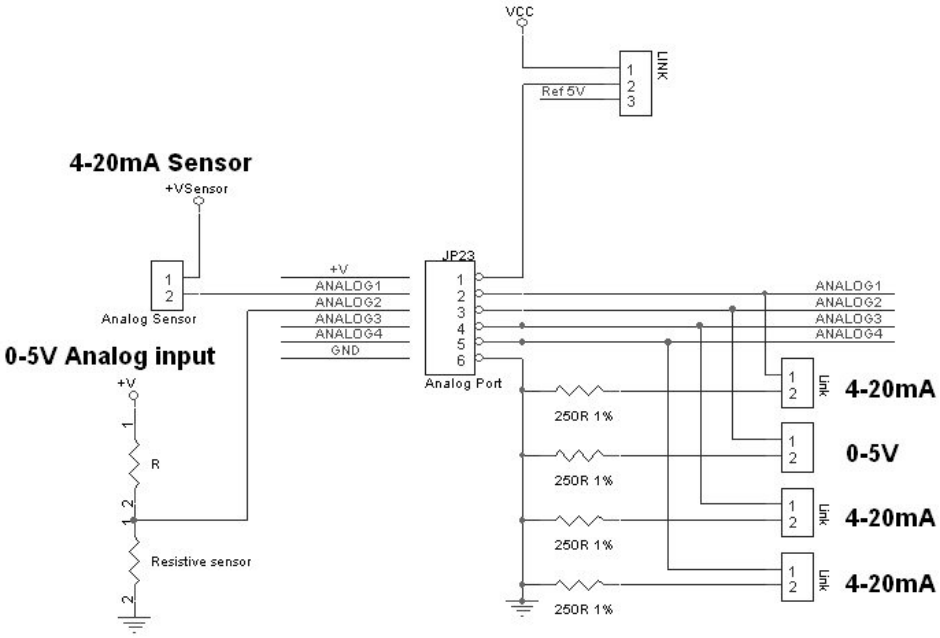
## 3.1.2 Wire outputs to devices to be controlled

The outputs are isolated rele outputs and are able to switch 240 VAC 10 A. The relay output are available on the terminals.



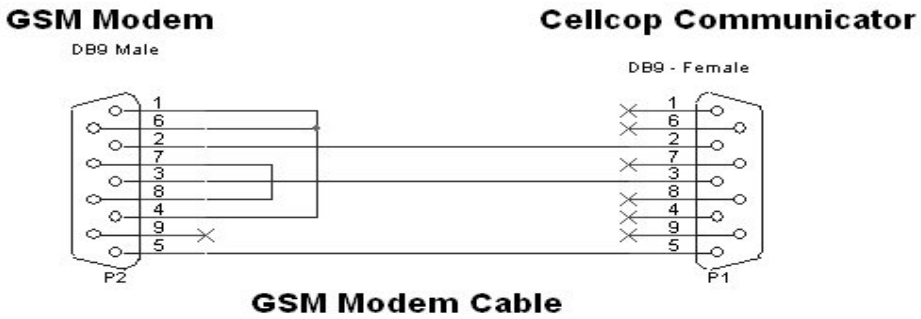

Output used to switch on a motor using less than 240VAC and 10A current

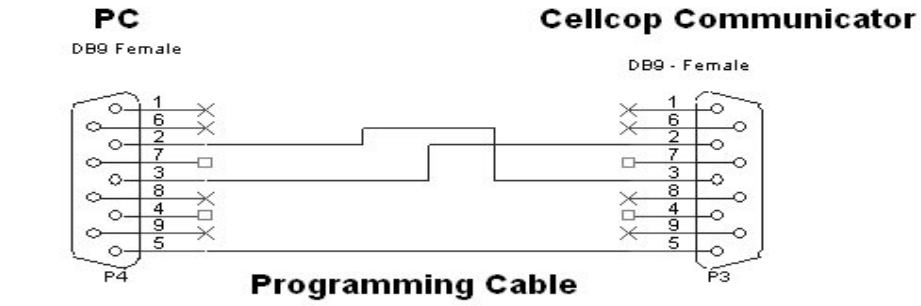
### 3.1.3 Wire Analogs for monitoring




The analog input can be either 0-20mA or 0-5V. If the link is connected the 0-20mA option is selected. The 250 ohm resistor will convert the 0-20mA to a voltage of 0-5V. The communicator use a 10 bit A/D converter and the value of 0-5V will correspond to a value of 0-1023 in the communicator.

### 3.1.4 Connecting the modem / PC



### 3.1.5 Connecting the power supply

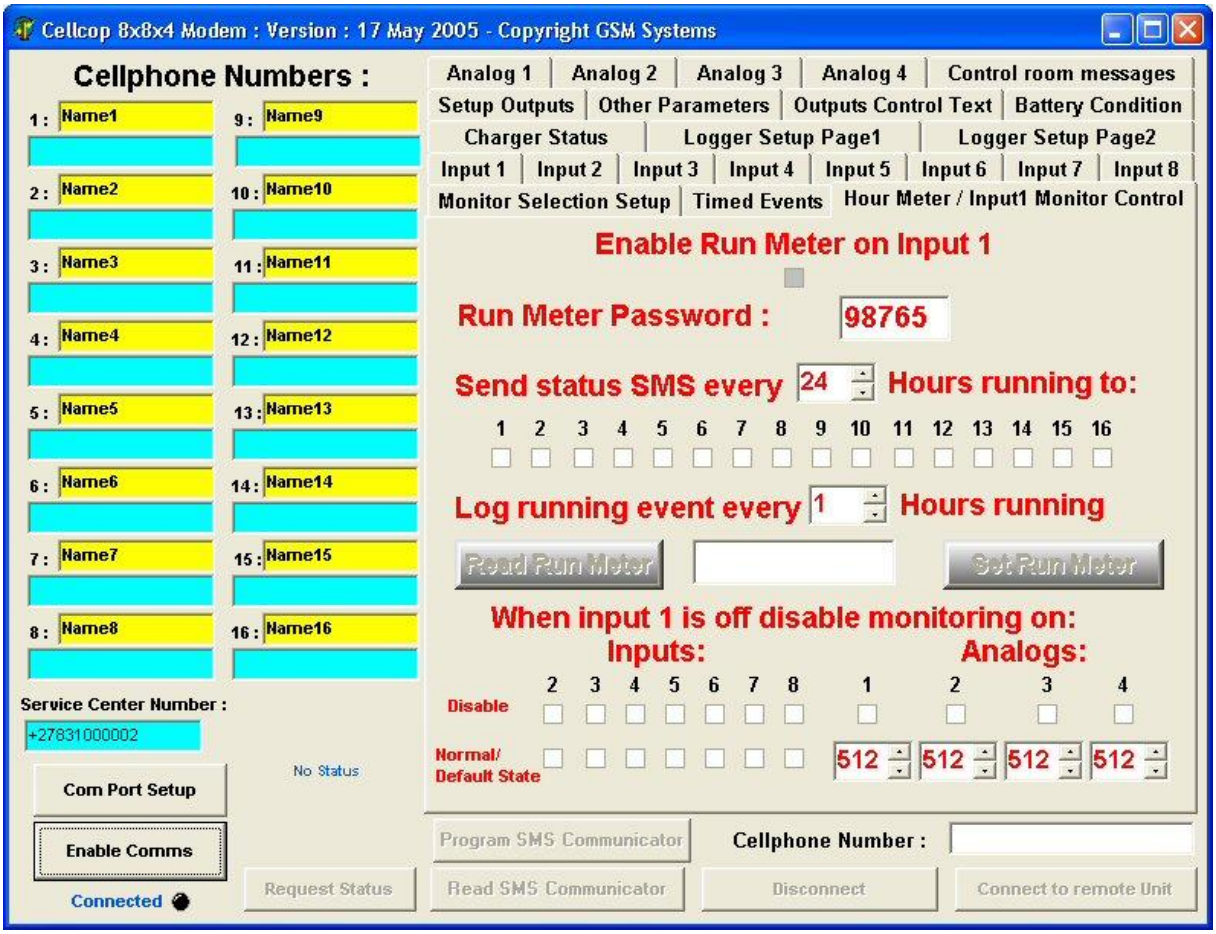
A 13.8 V 1A power supply should be connected to the Charger input while a 12V lead acid battery should be connected to the battery input.

### 3.1.6 Programming the GSM Communicator

**Cable programming:**

1. Connect the Cellcop unit to the PC using the RS232 cable
2. Power-up the Cellcop 8x8x4M using a 12 V DC supply.
3. Run the supplied programming software

The following window will appear :




Select the serial port that the Cellcop8x4N is connected to using the Com Port Setup
Click on the Enable Comms button to enable the communications
Click the read SMS communicator button to read the information from the GSM communicator
Change the information and parameters to fit your setup

- Service Center Number
- Cellphone Numbers and names
- Input Parameters
- Output Parameters
- Analog Parameters
- Logger Parameters
- AC Power monitor parameters
- Etc.

4. Click “Program SMS Communicator button” to program your setup into the unit
5. Switch of the power
6. The unit is now ready for installation

**Remote Programming:**

1. Connect a Cell Modem to the PC using a serial cable.
2. Start the programming software
3. Select the correct serial port where the Cell Modem is connected.
4. Enable communications
5. Enter the number for the unit that must be programmed
6. Press the “Connect to remote site” button
7. When connect LED is green program same as cable programming.

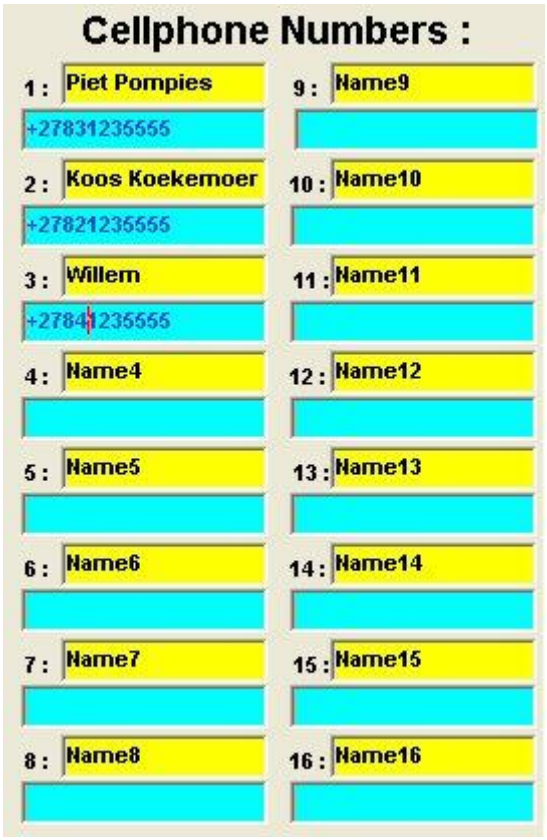
**Note:** The password that is programmed on the board must be used or it will not accept programming messages. The password can be changed using cable programming. If the Reset password link is closed before the board is powered then the password will be reset to 12345.

## 4. Programming Parameters

### 4.1 Service Center Number :

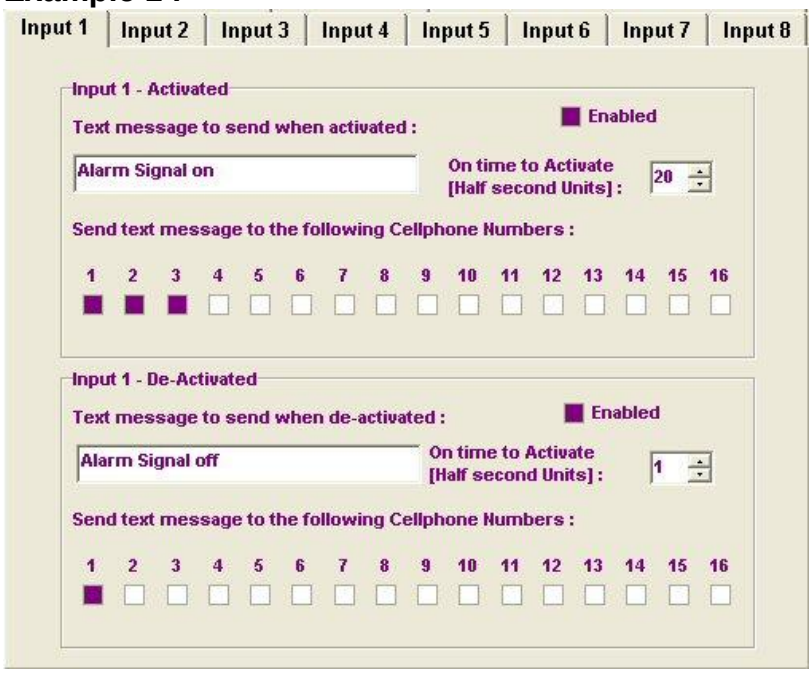

**MTN :** +27831000002 Pay as you go : +27831000113
**Vodacom :** +27829119 or +27829129

### 4.2 Cellphone Numbers and names:



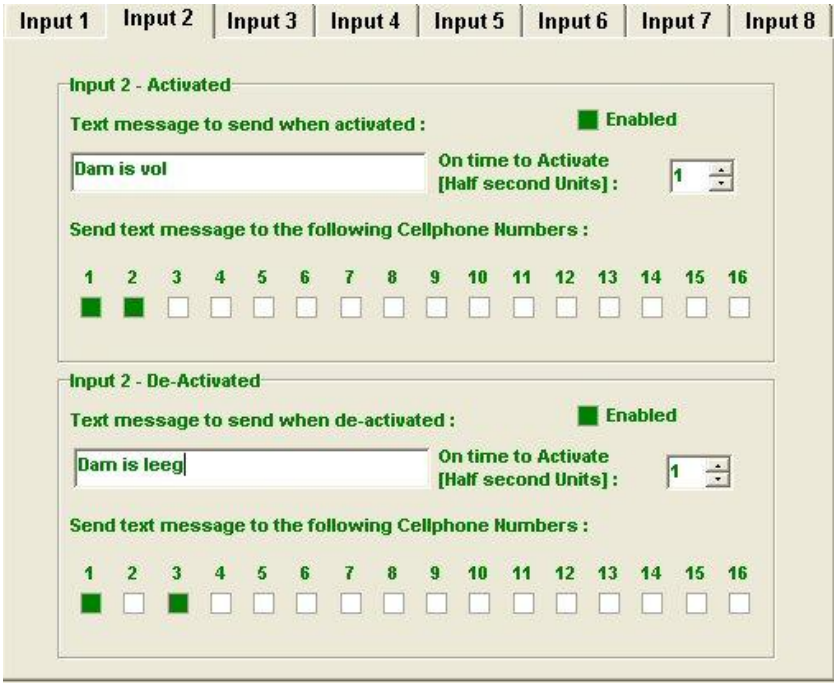
## 4.3 Input parameters:

**Example 1 :**



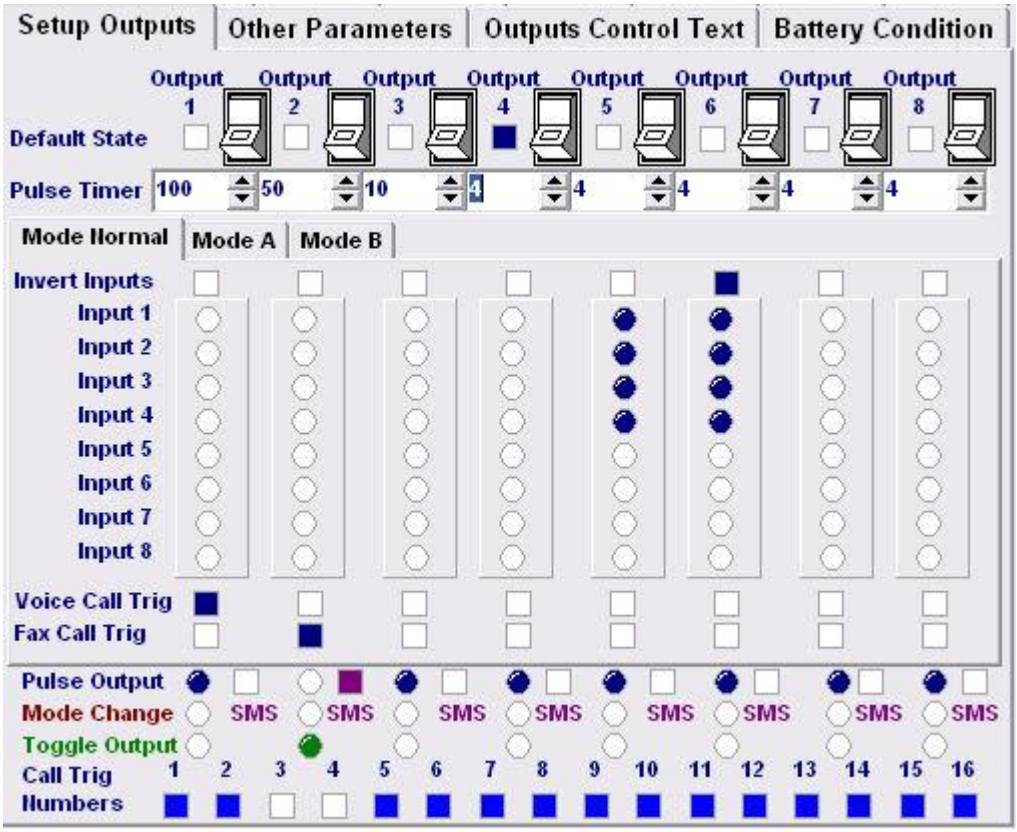

Input 1 is setup to send a SMS containing text “Alarm Signal on” to Cell phone number 1,2 and 3 only if the input 1 was on for 10 seconds. A SMS containing text “Alarm Signal off” will be send when Input 1 go Off to Cellphone number 1.

**Example 2 :**



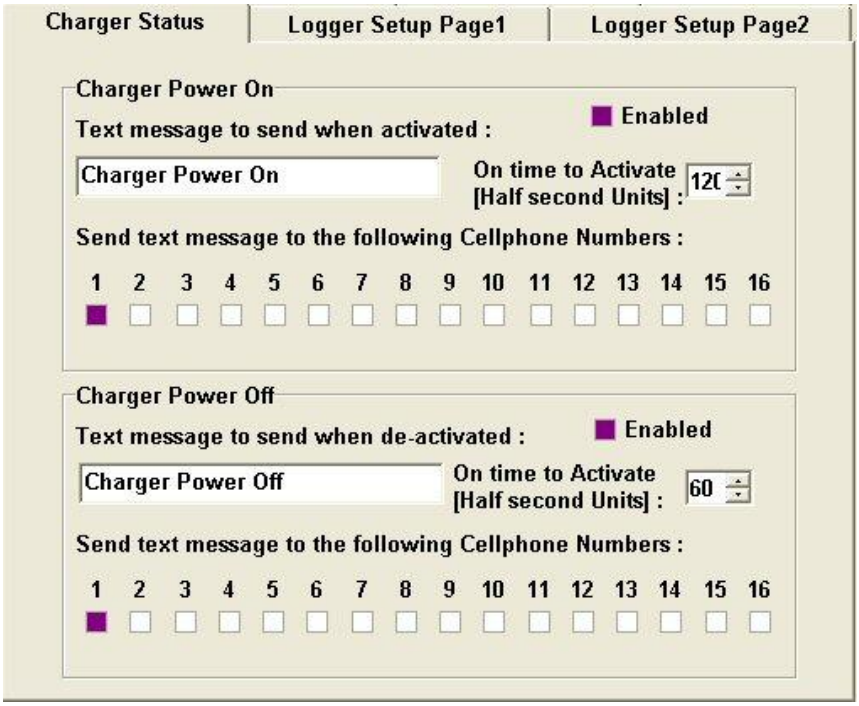

Input 2 will send an SMS to Cell numbers 1 and 2 when Input 2 go on containing the text “Dam is vol” and it will send an SMS to Cell numbers 1 and 3 when Input2 go off containing the text “Dam is leeg”

## 4.4 Output Parameters:



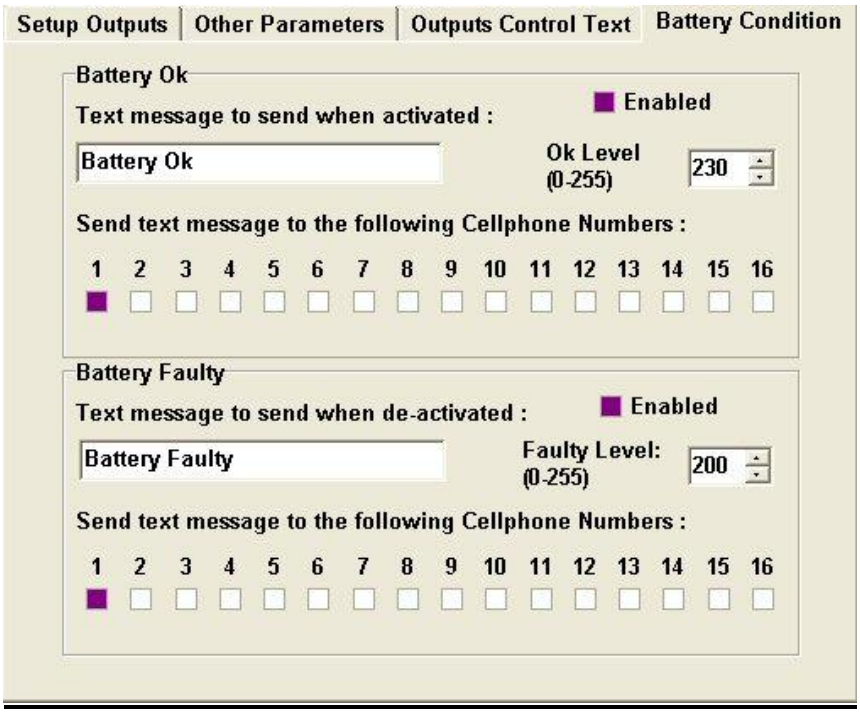

Then buttons on the top of the page is test buttons to switch the outputs while the cellcop board is connected to the configuration software. The default state is the state that the unit will start up after power up. In this example all outputs except output 4 will startup in the off state. The pulse timer is the time that the output is switched on after a pulse command is issued. The pulse command can be issued using SMS, a missed call or by the timed events. The value entered is in half second units and the maximum is 60000. There are 3 pages for Mode Normal, A and B. The output follow inputs and the missed call triggers can be configured for each mode. Depending on the mode the outputs will be triggered according to the setup. The invert inputs will determine if the outputs are triggered when inputs go on or when they go off. In this example output 5 will be triggered when inputs 1-4 goes on while Output 6 will be triggered when inputs 1-4 go off. A missed call to the unit can be used to trigger an output pulse, Switch the current mode or to toggle an output. In this example output 1 will perform a pulse command when a voice call is received from a cell phone configured in cell phone positions 1,2 and 5-16. The missed call function uses the caller ID for the identification of the cell phone number so make sure the calling phones “send caller ID” is enabled. Output 2 will be toggle when a fax call is received from a cell phone number programmed in positions 1,2 and 5-16. It will then send a status SMS back.

## 4.5 AC Power monitor parameters battery charger:




The communicator will send an SMS to cellphone number 1 containing “Charger Power On” when the charger is go on after 60 seconds and it will send an SMS to cellphone number 1 “Charger Power Off” when the charger is switched off for 30 seconds.

## 4.6 Status of the battery:




The battery status will be tested once every 24 hours when the power is on and continuously when the power is off. If the battery voltage is above the predefined voltage it will send a message “Battery Ok” to the predefined cellphone numbers. If the battery voltage is below the predefined voltage it will send “Battery Faulty” to the predefined cellphone numbers. The current status of the battery is determined at start-up and only changes in state will be reported. This mean that you will not get an SMS every 24 hours telling you the state of the battery but only when the state changes. To calculate the Count to be programmed use the following equation.

Program Count = (V/15) *255 where V is the voltage where you want the alarm.

To calculate V from the count use

V = (Count /255) * 15

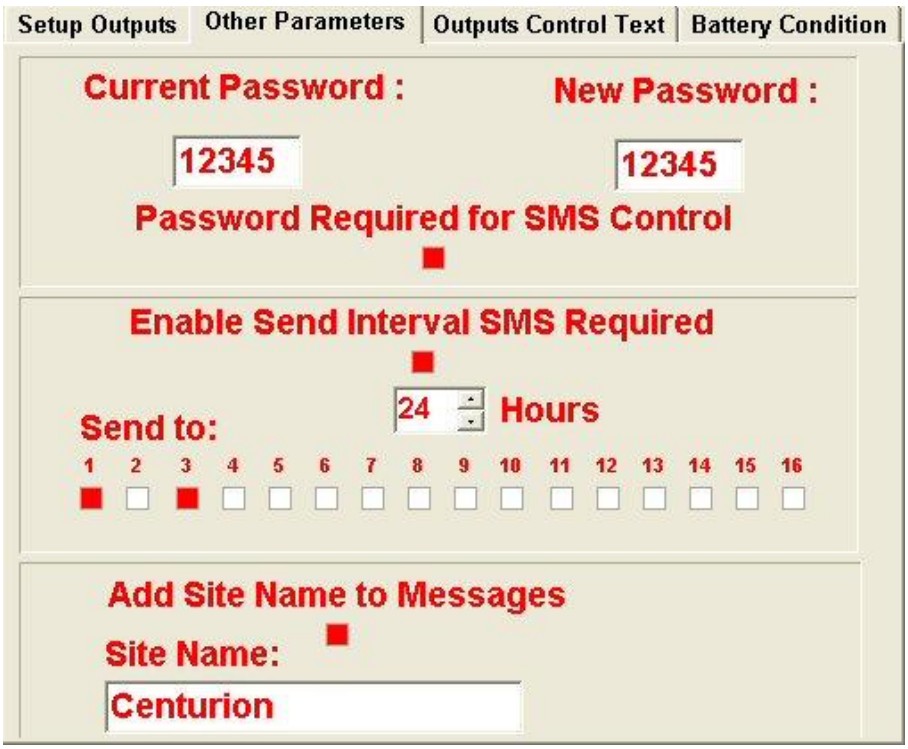
Examples:

V = (200/255)*15 = 11.7V

V = (230/255)*15 = 13.5V

Count = 13/15 *255 = 221

## 4.7 Other parameters

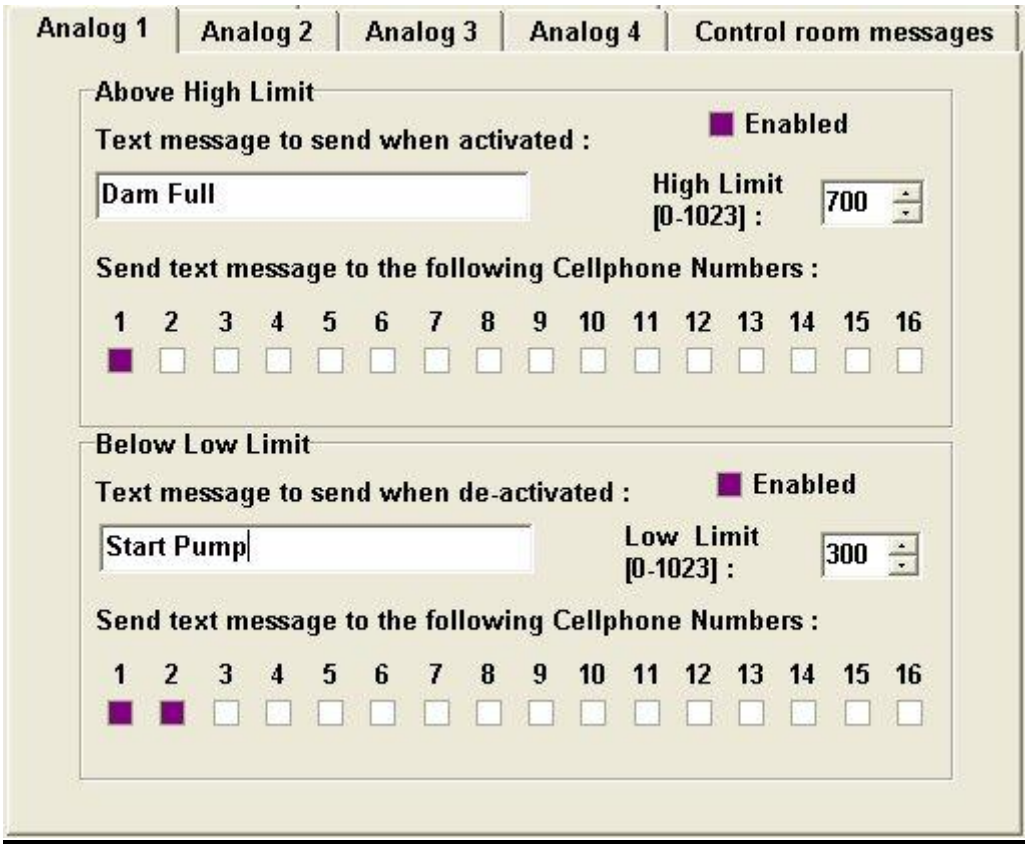



The password that is necessary to send commands to the board. To change the password put the current password in on current password field and the new password in the New Password field. If you don't have the right password you can't program the unit remotely or send SMS command to the unit when password required tick box is on.

The interval SMS send an SMS to the selected cellphone number on the interval specified to the numbers specified. The interval SMS is the status message containing all status information.

Add the site name to the SMS messages send. If the box is ticked then the site name specified here will be added to all messages.

## 4.8 Setup Analogs




The communicator will send and SMS “Dam Full” to the configured number when the analog value is above 700. It will also send an SMS “Start Pump” to the configured numbers when Analog 1 is below 300. The unit uses a 10 bit Analog to digital converter and 0 – 5V or 0 – 25mA correspond to a value of 0 – 1023.

To calculate the limit value use the following equation:

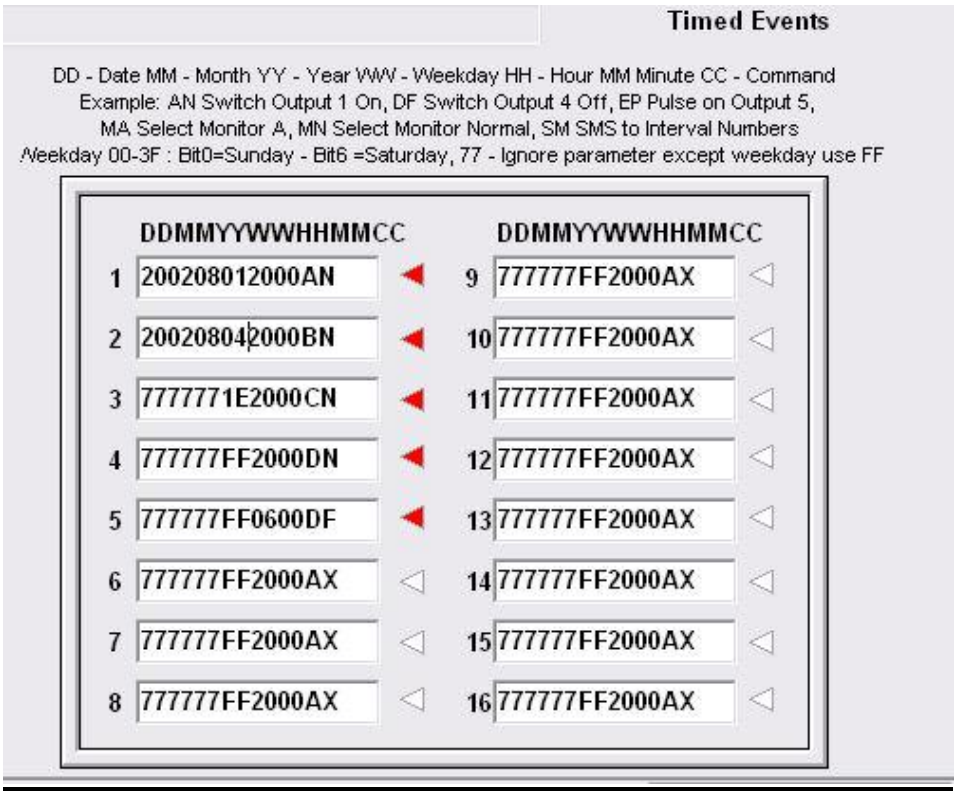
Limit value = V/5 * 1023

Example for a limit of 3 V:

Limit value = 3/5 * 1023 = 613

The analog alarm will reset and be ready to send another SMS when the Limit goes 5 units below or above the set value.

## 4.9 Setup timed events




The tick is used to enable the timed event.
The format of the timed event is: DDMMYYWWHHMMCC where
**DD** is Date: 01-31 or 77 to ignore day
**MM** is Month: 01-12 or 77 to ignore month
**YY** is Year: 00-99 or 77 to ignore year
**WW** is Days of the week: 01-3F or FF to ignore Weekday
01 - Sunday 02 - Monday 04 - Tuesday 08 - Wednesday
10 - Thursday 20 - Friday 40 – Saturday
**HH** is Hour: 00-23 or 77 to ignore month MM is Minutes: 01-59 or 77 to ignore month
**CC** is Command to execute
Commands available for timed events are:

**Outputs**
AN Switch Output 1 On
DF Switch Output 4 Off
EP Pulse on Output 5

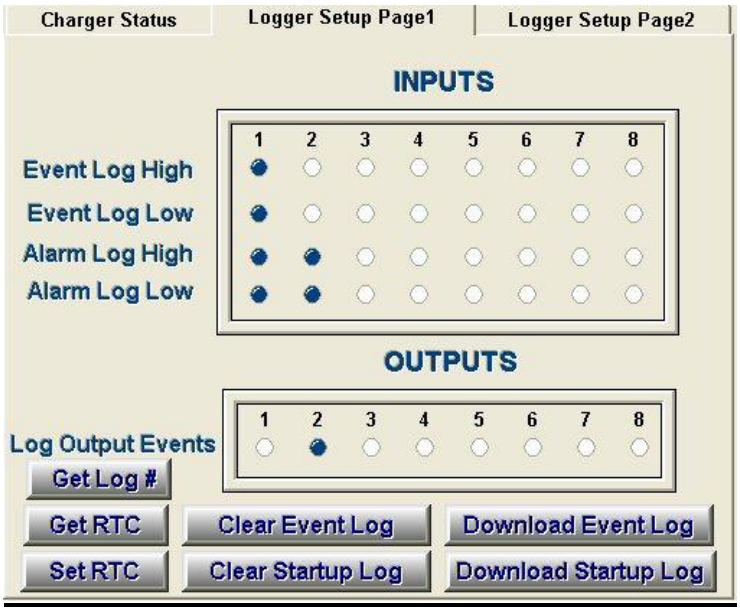
**Monitor mode**
MA - Select Monitor A
MN - Select Monitor Normal
MB - Select Monitor B

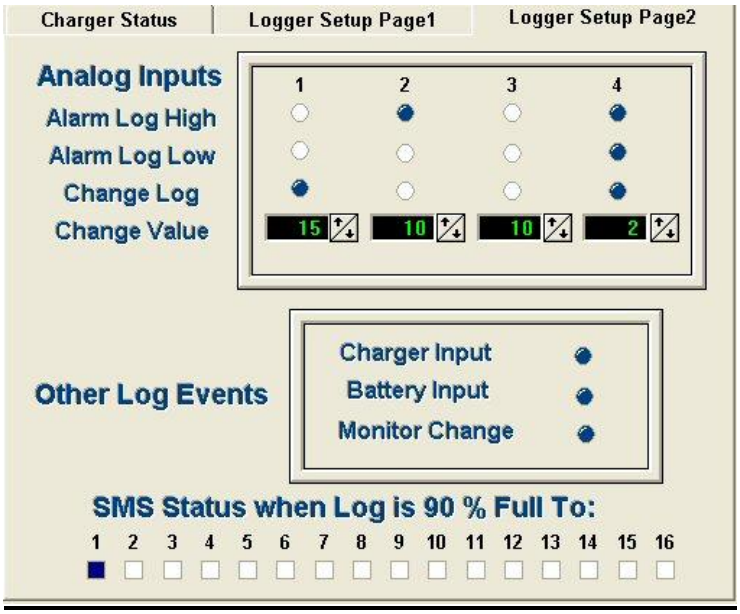
**Send SMS to interval numbers**
SM - SMS to Interval Numbers

**Copy cellphone number position x to y**
ab- Copy Cell Number 1 to Cell Number 2,
pa- Copy Cell Number 16 to Cell Number 1

In this example Events 1-5 are enabled. Event 1 is programmed to send On command to output 1 Sunday 20 February 2008 20H00. Event 2 is programmed to Switch output 2 on, Tuesday 20 February 2008 20H00. Event 3 is programmed to switch output 3 On from Monday to Friday at 20h00. Event 4 is programmed to switch output 4 On every day at 20h00. Event 5 is programmed to switch output 4 Off every day at 06h00.

## 4.10 Setup Logger

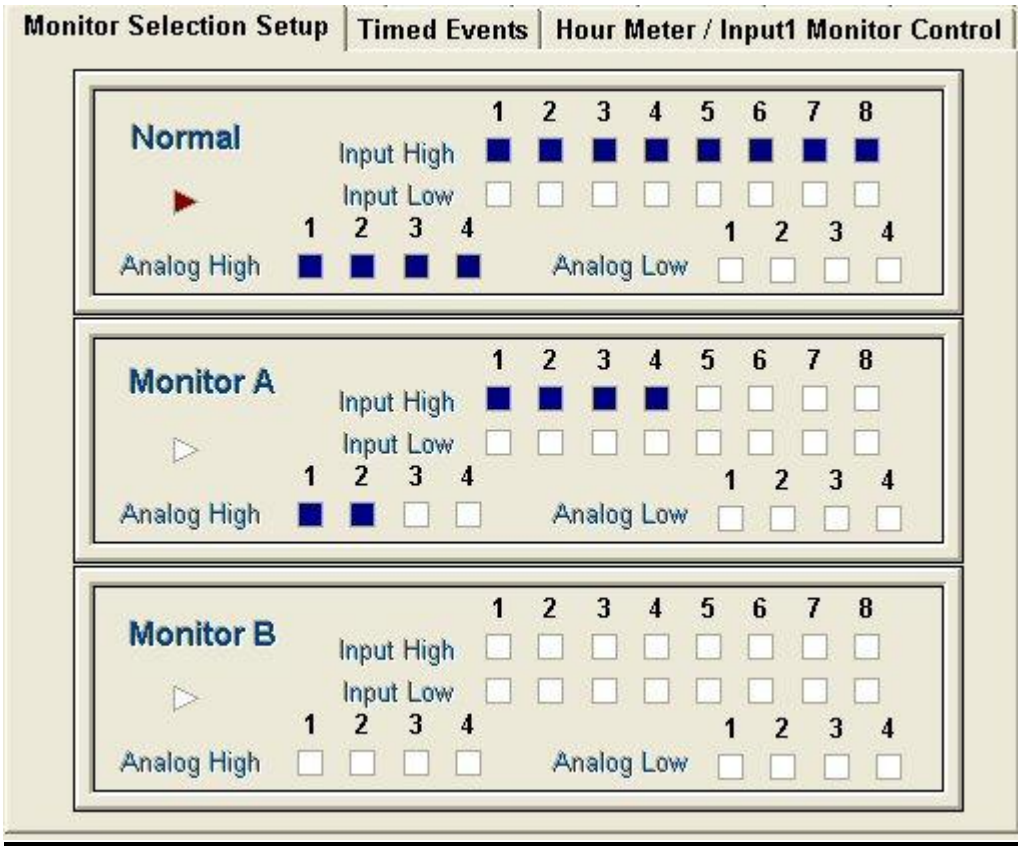



Use these 2 pages to setup the logger parameters. Logging on the different events can be enabled or disabled separately. The system can alert you when the log is 90 % full. The Real time clock (RTC) can be set by clicking on the “Set RTC” button. The system Date and time will be programmed into the unit. The logs can be cleared by clicking on the Clear log buttons. The logs can be downloaded by clicking on the download event log buttons. The system will store the downloaded log into the comma delimited file specified.

**Log the following events for the example screens**
Input 1 High, Low, High alarm and Low alarm events.
Input 2 High alarm and Low alarm event
Output 2 events
Analog 1 change event when the analog value changes 15 units.
Analog 2 High Alarm events
All analog 4 events
Charger, battery and monitor change events

## 4.11 Setup Monitor Selection




Setup the inputs and analogs to be monitored in the different modes. The example screens show the following configurations:

Normal configuration is selected

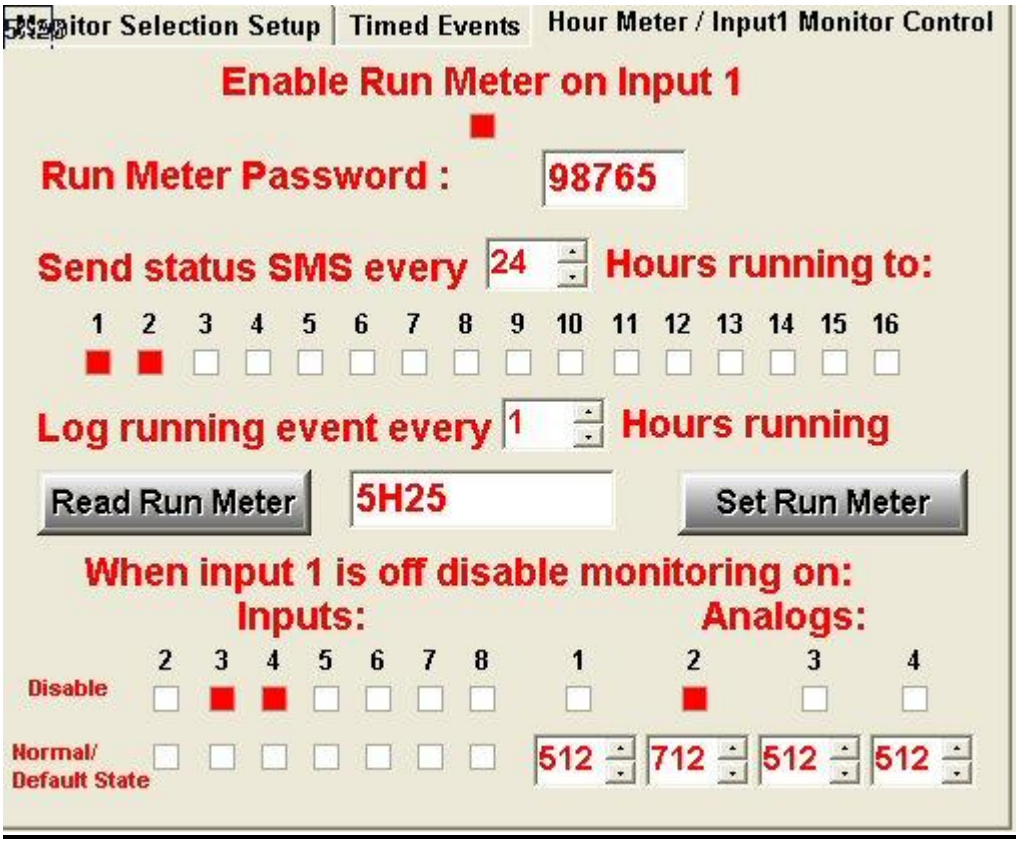
**Normal**
Monitor all Inputs High events

**Monitor A**
Monitor Inputs 1-4 High events and Analog 1 and 2 High limits.

**Monitor B**
Disable monitoring on all inputs and analogs.

See SMS command to change the monitor mode using SMS.

## 4.12 Setup Run Meter and Input 1 monitor control




Tick enable run meter to enable the run meter on Input1. Set the run meter password to enable the setting of the run meter using SMS. Send an SMS every x hours running to the configured cellphone numbers. Log running event every y hours running. Set or read the run meter values. Use Input 1 to disable monitoring when input 1 is off ticking the corresponding event to disable. Normal/default state is the state or value to use as default when input 1 is switched on.

**Example screen:**

Enable the run meter

Run meter password is 98765

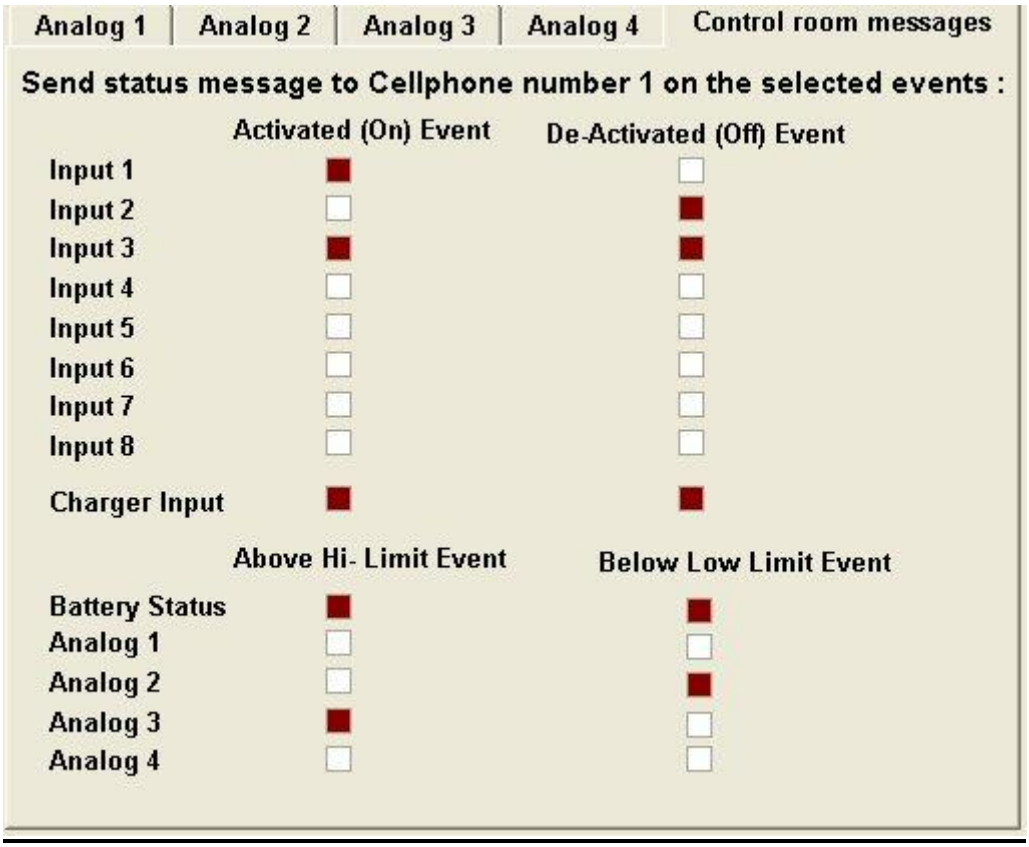
Send status message every 24 hours running to cell numbers 1 and 2

Log running event every hour running

The current hour meter value is 5H25

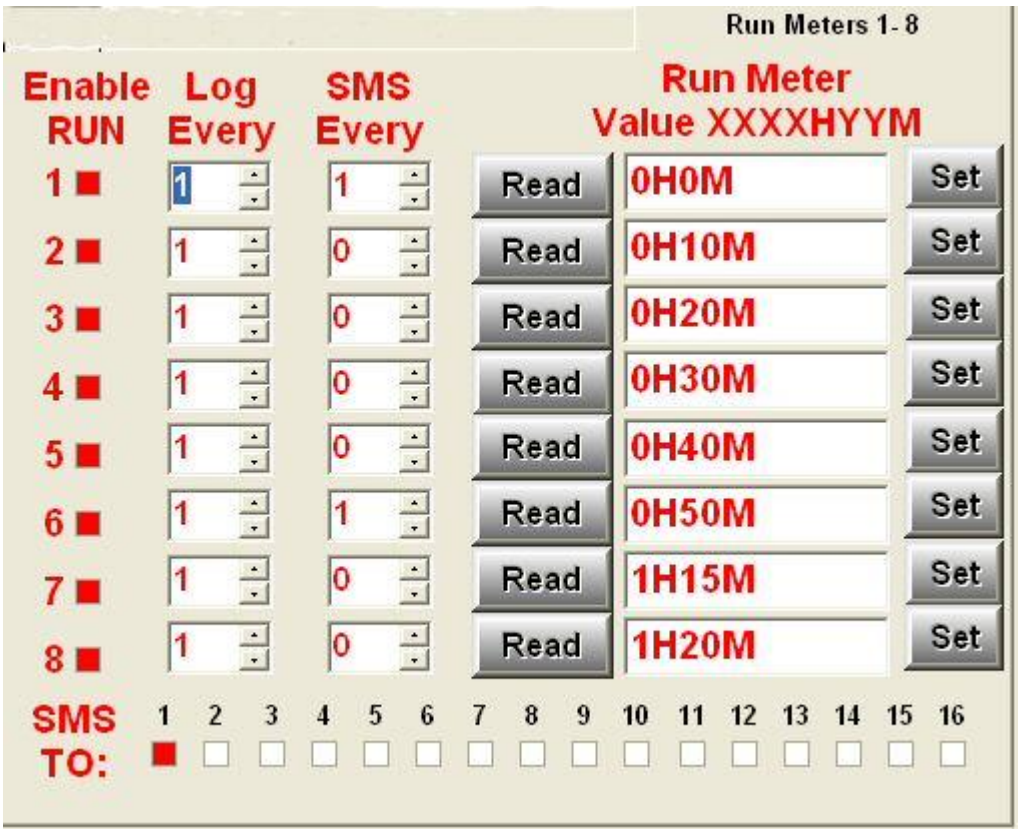
Disable inputs 3 and 4 as well as analog 2 when input 1 is off. The default state for input 3 and 4 is off and the default value for analog 2 is 712 when input 1 is enabled.

## 4.13 Setup Control room messages



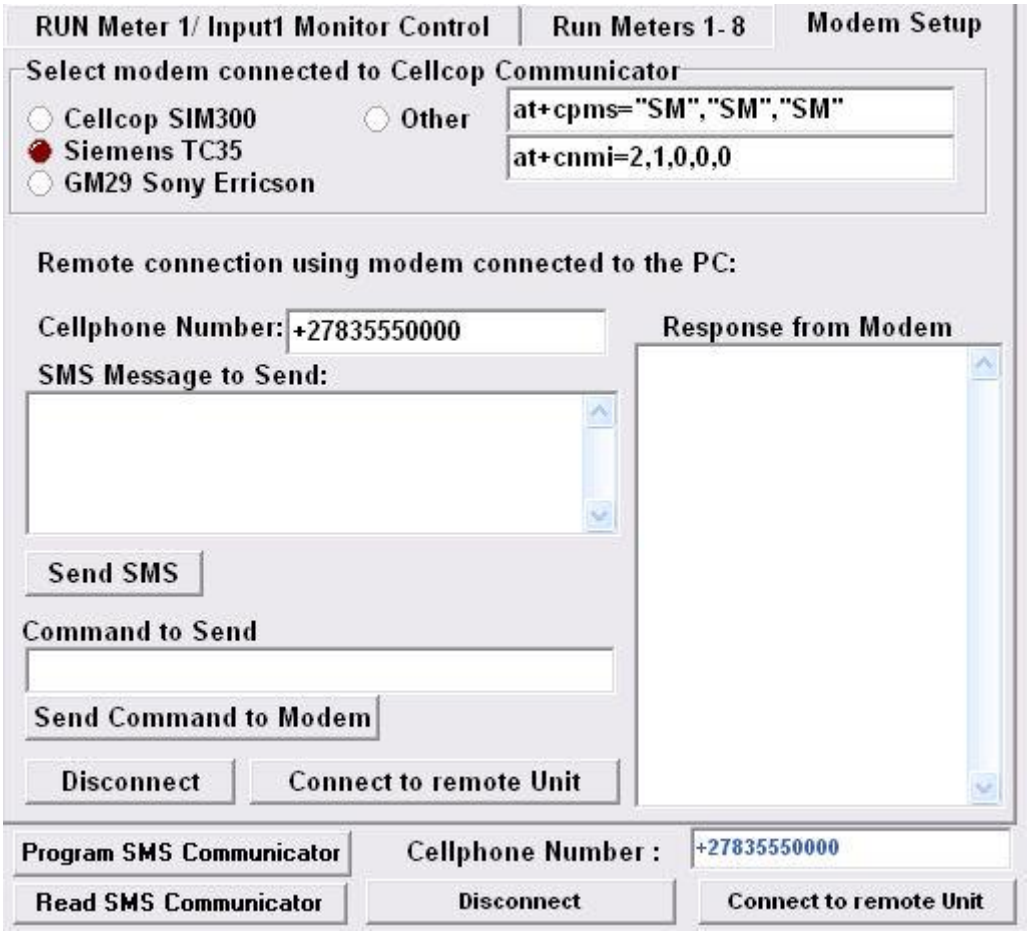

Send status messages to cellphone 1 when the configured events are triggered. The Run meter status message will be send if enabled and the corresponding input is triggered. If run meter 3 is enabled the Run meter status will be send when input 3 is triggered.

## 4.14 Setup Run Meters 1-8




The first column control if a run meter is enabled or not. The second column set the time in hours between run log points. If set to 1 it will log a point for every hour running. Running meter increment when the corresponding input is on. The third column set the time in hours between run hour SMS's. The Run Hour SMS containing the current run meter values for all run meters that is enabled will be SMSed to the selected numbers. The last column is used to read and set the run meter values.

## 4.15 Setup Modem and Remote Connection




**Select the modem connected to the cellcop unit by ticking the appropriate option.**

**1. Cellcop SIM300**
**2. Siemens TC 35**
**3. GM29 Sony Erricson**
**4. Other**

**With other you can insert the appropriate setup command for your GSM modem.**

For remote connection to your cellcop board connect the modem to your PC. Run the configuration software and setup the appropriate port. Insert the cellphone number of your remote cellcop unit and use “Connect to remote Unit”. When the remote site is connected use the configuration software as if you were connected directly to the cellcop board.

## 5 Controlling the GSM Communicator using a Cellphone (SMS commands)

### 5.1 Output Commands

**Control a single output**

<Passwd5><Space>ANS

Character 1: A-H : Output1 – Output 8
Character 2: N - On
F - Off
P – Pulse
Character 3: S – Send Status SMS back
Any other character don't send SMS back

**Control all outputs**

<Passwd5><Space>OUTABCDefghS

Characters 1 – 8 : if Capital switch output on and if non-capital switch output off
Character 9: S – Send Status SMS back
Any other character don't send SMS back

Example:
12345 OUTABCDEFGhS
Swith Outputs 1-7 On an 8 Off and send Status SMS back.

### 5.2 Request Status Command

<Passwd5><Space>STA – Normal Status request

<Passwd5><Space>STB – Run Meter Status request

<Passwd5><Space>STZ – Normal + Run meter Status request (2 SMS)

NB: Must have a cellphone number in position 9 to use STB and STZ

### 5.3 Select Monitor Mode

<Passwd5><Space>MAS

Character 2: N – Select Normal Mode
A – Select A Mode
B – Select B Mode
Character 3: S – Send Status SMS back
Any other character don't send SMS back

## 5.4 Set the Real Time Clock using SMS

<Passwd5><Space>RTCDDMMYYWHHMMSSS
DD – Day
MM – Month
YY – Year
W – Weekday (0-6 : Sunday – Saturday)
HH – Hour
MM – Minutes
SS - Seconds
Character 17: S – Send Status SMS back
Any other character don't send SMS back

Example:

12345 0610683131200S – 6 Oktober 2068 Wednesday 13:12:00 and send Status SMS back

## 5.5 Program Timed Events using SMS

<Passwd5><Space>PECDDMMYYWHHMMCCS

Character 3 – Select Time event number : A-P : Event Number 1 - 16
DD – Day
MM – Month
YY – Year
W – Weekday (0-6 : Sunday – Saturday)
HH – Hour
MM – Minutes
CC – Comands
Character 17: S – Send Status SMS back
Any other character don't send SMS back

77 - Ignore Date Time parameter

Commands available:
AN Switch Output 1 On, DF Switch Output 4 Off, EP Pulse on Output 5,
MA Select Monitor A, MN Select Monitor Normal,
SM SMS to Interval Numbers
ab- Copy Cell Number 1 to Cell Number 2, pa- Copy Cell Number 16 to Cell Number 1

Example:
PEC77777772012BNS – Ignore Date parameters every day 20:12 switch output B on and send status SMS back
PEC10100472012paS – Ignore Week day and on 10 October 2004 20:12 copy Cell 16 to 1 and send status SMS back

## 5.6 Program Cellphone Number using SMS

<Passwd5><Space>TNAS<Cellphone Number>

Character 3 : A-P : Cellphone Number 1 – 16
Character 4 : S – Send Status SMS back
Any other character don't send SMS back
<Cellphone Number> - Cellphone number to program

Example:

12345 TNCS+278312345678 – Program Cell number +278312345678 into position 3 and send Status SMS back

## 5.7 Program Monitor Modes using SMS

<Passwd5><Space>SMNABCDEFGHABCDEFGHABCDEFGHS

Character 3 : N – Select Normal Mode
A – Select A Mode
B – Select B Mode

Character 4-11 : if Capital enable inputs High and Non Capital Disable inputs High
Character 12-19 : if Capital enable inputs Low and Non Capital Disable inputs Low
Character 20-23 : if Capital enable inputs Analog High and Non Capital Disable Analog High
Character 24-27 : if Capital enable Analog Low and Non Capital Disable Analog Low
Character 28 : S – Send Status SMS back
Any other character don't send SMS back

Example:

12345 SMBabcdEFGHABCDefghABcdabCDS – for Mode B set the following Monitor Inputs 4-8 High and Inputs 1-4 Low and Analog 1-2 High and Analog 3-4 Low and send Status SMS Back

## 5.8 Set RUN METER to a Value

<Passwd5> <Space> RUNM <RUNWPasswd5> **XXXXX**H**YY**M**S**

Where W is
M – Run Meter 1
2 – Run Meter 2
3 – Run Meter 3
4 – Run Meter 4
5 – Run Meter 5
6 – Run Meter 6
7 – Run Meter 7
8 – Run Meter 8

Example:

**12345** RUNX**98765**33333H59MS

M Run meter 1. Program password: 12345, Run meter password: 98765, Set Hours to 33333 and minutes to 59, if last character S - Send SMS to confirm programming

XXXXX must be 5 digits

YY must be 2 Digits

## 6. Specification

| | |
|---|---|
| 1. Modem used | Sony Erricson GM29 |
| 2. Power supply | 13.8V DC ± 5% |
| 3. Max. voltage for outputs | 240 V AC |
| 4. Max. current for Outputs | 10 A |

**IMPORTANT NOTICE**

**The Cellcop communicator system cannot prevent emergencies. It is only intended to alert you and - if programmed - your neighbors and monitoring station of an emergency situation. GSM communicators 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 communicator 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.**