



Innovative Electronics for a changing world

ERM6 Server room monitor



Base unit



Serial cable



ERM6-GSM



PIR



Smoke sensor



heavy duty door switch



2 x 1.8m C13 power cables



Temperature, Humidity and water sensors



Mylar screened cable

ERM6-PC-GSM interface unit with USB to serial converter to receive SMS notifications directly to the monitoring software on PC for if Ethernet fails.



All components are available as separate items and should be ordered separately

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1. Introduction to ERM6 environmental room monitor
2. Sensors and connections
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4. Web pages and settings explanations
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9. Physical dimensions and extra pictures

1. INTRODUCTION

The ERM6 is a professional 19" rack mount remote environmental room monitoring system with **Ethernet** and GSM-**SMS** communication.

- Internal battery backup ✓
- Mains AC power and UPS AC power monitoring ✓
- Temperature sensor inputs x 2 ✓
- Humidity Sensor input ✓
- Smoke sensor input ✓
- Intrusion sensor input ✓
- Water/Flood sensor input ✓
- Ethernet Port with SNMP protocol ✓
- GSM-SMS Communication ✓
- Dry contact Relay outputs ✓
- Local LCD display ✓

Internal battery backup with integrated charger ensures communication at all times during Mains AC power failure with user defined battery low level SMS message and auto power shutdown to protect the battery.

External GSM-SMS module to connect to the ERM6 for sending alerts via SMS message.

The system monitors 2 temperatures, humidity, smoke, water presence and intrusion with external sensors.

The system measures the incoming voltage level on the 220VAC Mains power and indicate the physical voltage level on the LCD, Web pages and SNMP with a user configured low AC voltage level SMS.

The system monitors the UPS 220Vac input only as on or off.

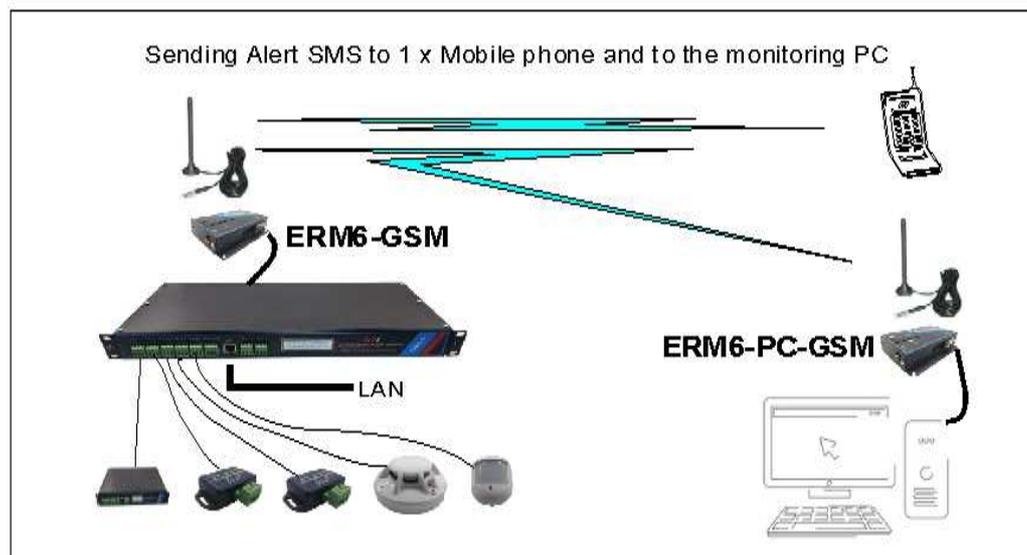
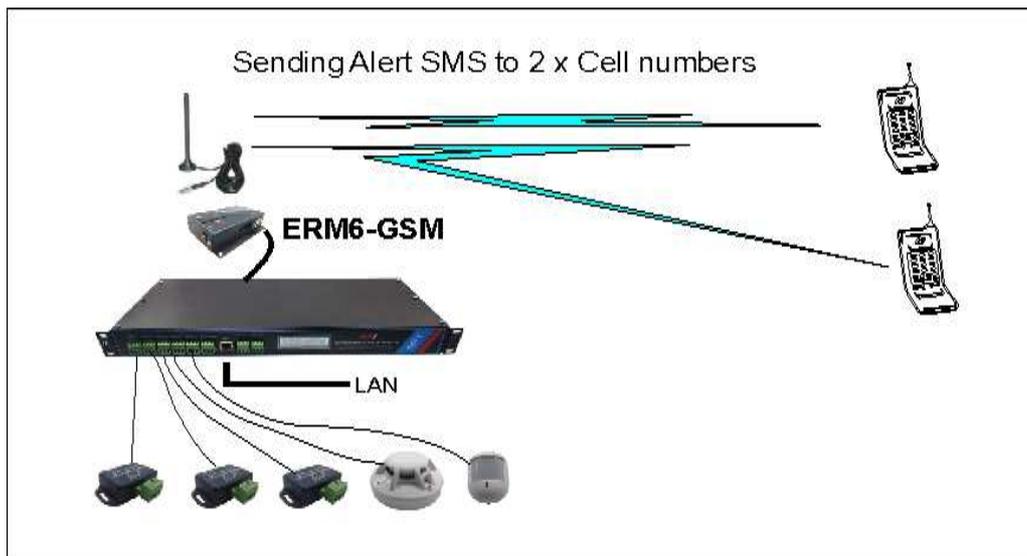
The ERM6 supports a ping function that can be activated / de-activated to ping an IP address on the network to determine if there is network connectivity to the monitoring software computer or not, should there be no network connectivity to the configured IP address the system will send a Ping time out SMS and include the status of the system.

Local LCD display for easy on site indication of Ping reply time, alarms, Battery voltage and mains AC supply voltage.

The ERM6 features 2 potential free relay outputs, one momentarily and one Latch output, relay outputs can be controlled via web pages, SMS and SNMP set commands, this can be used to reset and control power to equipment.

The ERM6 GSM module will send any alerts via SMS message to one or two cell numbers as configured in the ERM6 web pages.

The ERM6-PC-GSM can be connected to the monitoring PC via a USB to serial converter to receive SMS messages directly to the monitoring PC if Ethernet fails, one of the cell numbers in the ERM6 web pages should be configured to the cell number installed in the ERM6-PC-GSM.



The ERM6 environmental room monitor can be connected to multiple sensors, only **smoke** and **intrusion** sensors can be in multiple as long as the alarm relay contacts from the connected sensors are connected in series so that any sensor triggered will break the closed circuit loop.



2. Sensors and connections – unit front



Temperature and Humidity sensors = Analogue sensors

Smoke, Water and Intrusion = Digital sensors

Connect all sensor modules to the correct inputs as indicated on the front of the ERM6

Connect the sensors with 2 pair (or 3 core) screened cable to the (+, - and S) terminals

(+) = +12V DC to each sensor (internal 250mA short circuit protection on each output)

(-) = GND (Negative) output to each sensors

(S) = Signal input from each sensor

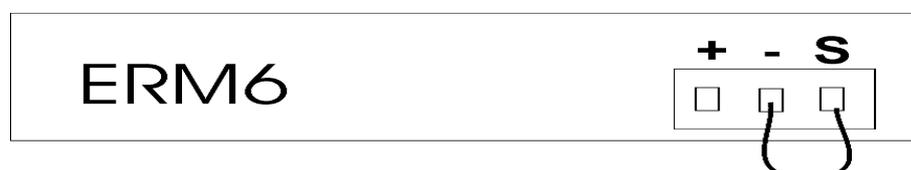
Connect + terminal on ERM6 to + on the sensor module (+12V)

Connect - terminal on ERM6 to - on the sensor module (Negative)

Connect S terminal on ERM6 to S on the sensor module (Signal)

Sensors not used:

Should any of the sensor inputs on the ERM6 not be used, please bridge out the **S** (signal) and – (negative) terminal with each other by means of a piece of electric wire, do not leave floating as false alarms can occur !



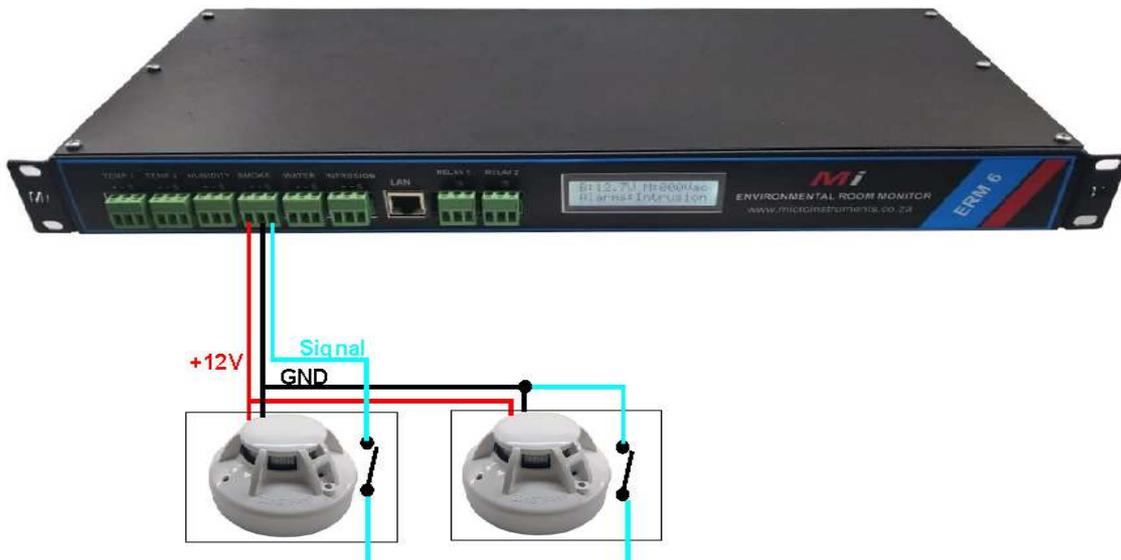
Temperature 1, Temperature 2 and Humidity sensor inputs is analogue and can each be connected to one of the related sensor modules only.

Smoke and Intrusion inputs can be connected to multiple sensors – example

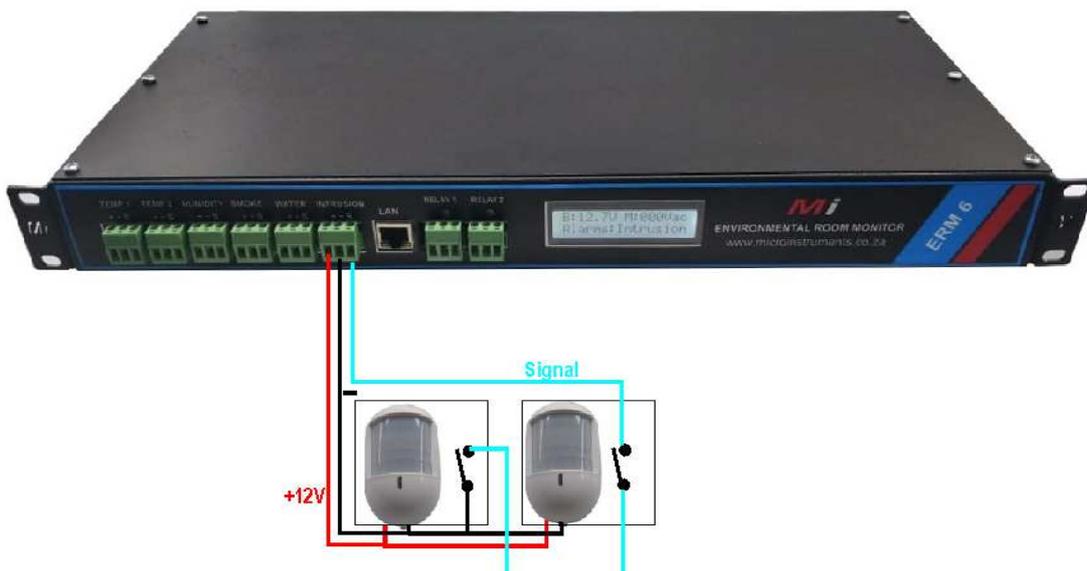
Powered Smoke and Intrusion sensors:

Multiple smoke and Intrusion sensors (PIR) can be connected to the smoke and Intrusion inputs. Smoke and Intrusion inputs should be normally closed inputs between terminal – and terminal S. The + and – terminals from ERM6 should be wired to each sensor to power the sensors and the relay contacts (common and normally closed) from each sensor should be series connected. Series connected relay outputs from sensors ensure that any sensor in the line can trip to break the series signal loop to GND (Negative) which will cause an alert.

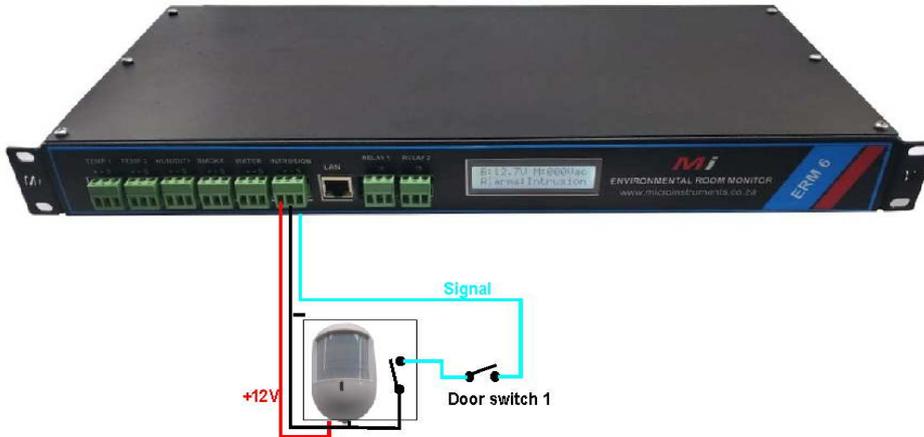
Powered smoke sensors:



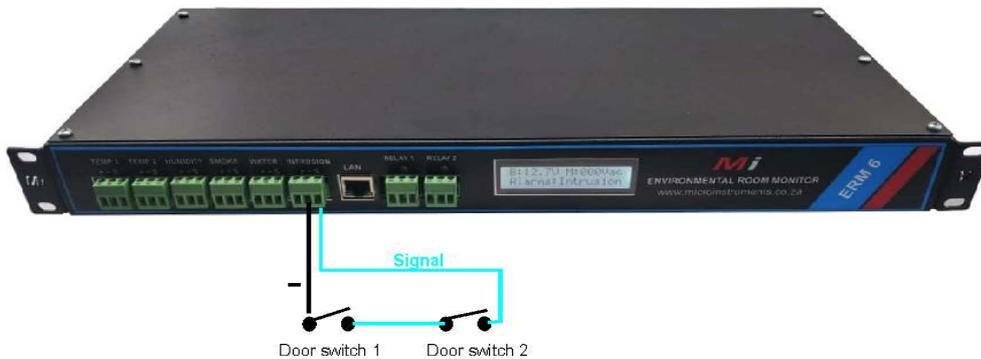
Powered intrusion sensors:



Mixed powered and non-powered sensors on Intrusion input:



Non Powered Sensors on intrusion input:



3. Connections- Unit Rear



Mains 220V: C14 male connector for 220VAC Mains input – the unit measures the incoming AC voltage from here and the internal charger is powered from this input.

Reset switch – keep pressed and then flick the power switch while holding the reset switch until the LCD display indicate “Reset Complete”- factory settings restored to defaults – IP: 192.168.1.2.

Power switch: switch the system on / off, the system will **only switch on** if AC input power is present at first, so the system cannot be switched on by accident without AC power and drain the battery, when the system is switched on and the AC fails the system will run on the internal battery backup until the battery falls to 11.5Vdc and then shut down to protect the battery.

RS232-GSM: Rs232 data port for serial cable to ERM6-GSM module

UPS 220V: C14 male connector for 220VAC input from UPS – This 220Vac input is monitored for if the 220Vac is present from the UPS or not.

4. Web pages and Settings

Home Page:

**Server Room Monitor**[Home Page](#)[Status](#)[Relay Control](#)[Set Temp/Humidity Alarms](#)[Network Configuration and GSM Setup](#)[SNMP Configuration](#)

ERM 6

Stack Version: v5.36
Build Date: Nov 05 2019 serial # Mi-0001

Relay's 1 and 4**Module Heartbeat****Intrusion Alarm:**
OFF**220V Mains:**
ON**220V UPS:**
ON**Battery Voltage:** 13.9V

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Home page

The current stack version , software build date and serial number of the ERM6 is displayed

Status of relay 1 and 2 is indicated by green radio buttons if active

Module heartbeat is updated in one second intervals to indicate CPU running

Intrusion alarm , 220Vac Mains supply and the UPS 220Vac supply status is indicated

The home page also displays the internal battery voltage

STATUS PAGE



Server Room Monitor

Home Page	<h2>STATUS</h2> <p>build date of the HEX file programmed and serial number:.</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;">Nov 01 2019 serial # Mi-0001</div> <p>Temperature sensor 1:.</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;">00.0</div> <p>Temperature sensor 2:.</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;">00.0</div> <p>Humidity %.</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;">00.0 %</div> <p>Smoke sensor Alarm.</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;">YES!</div> <p>Water Sensor Alarm:.</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;">YES!</div> <p>Intrusion Alarm:.</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;">YES!</div> <p>Current LCD Display image:.</p> <p>B: = Internal Battery Voltage M: = Mains AC Input voltage</p> <div style="border: 1px solid gray; padding: 2px; text-align: center;"> B:13.8V M:239Vac Alarms:Intrusion </div>
Status	
Relay Control	
Network Configuration and GSM Setup	
SNMP Configuration	

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The status page indicate the current Temperature in degrees celcius of each of the two temperature sensors, the Relative Humidity and the status of alarm inputs, Smoke, Water and Intrusion.

The LCD image of the ERM6 is copied to status page and will update when the user refresh the status page manually.

Internal Battery voltage is indicated by eg: **B:13.9V** (indicating the current battery voltage)

Mains incomming voltage is displayed by **M:239Vac** - the system measures the voltage level present on the Mains 220Vac input to indicate low or faulty AC voltage levels supplied by the electrical utility which in turn can cause problems with UPS systems etc.The AC voltage level is available in the web pages and in SNMP.

All statuses for alarm inputs is displayed on this page.

SMS alarms will automatically be send if any alarm(Temp,Humidity,Smoke,Water,Intrusion) level is exceeded or breached.

PASSWORD:

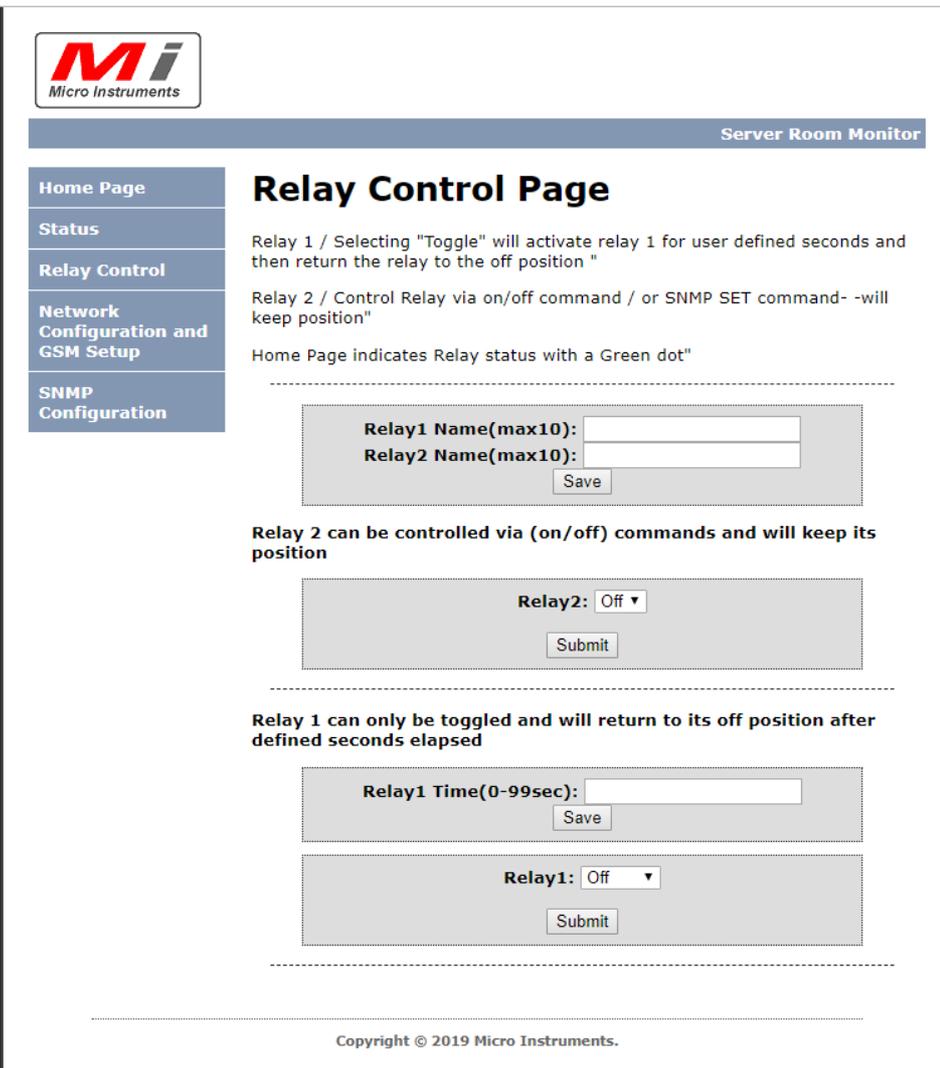
The screenshot shows the ERM6 web interface. On the left is a sidebar menu with the following items: Home Page, Status, Relay Control, Network Configuration and GSM Setup, and SNMP Configuration. The main content area is partially obscured by a 'Sign in' dialog box. The dialog box contains the following text: 'Sign in', 'http://192.168.5.50', 'Your connection to this site is not private', 'Username', 'Password', 'Sign in', and 'Cancel'. Below the dialog box, the main content area displays 'Nov 01 2019 serial # Mi-0001', 'Temperature sensor 1:', and 'Temperature sensor 2:'. The 'Temperature sensor 1:' label is followed by a value of '00.0'.

Relay Control page , Network configuration page, Temperature and Humidity alarm levels page and SNMP configuration page will require a password, Default username and password is **admin** and **admin**

Password can be changed to a user defined password under the Network Configuration page.

There is no backdoor implemented on passwords and the user should master reset the system once password is forgotten.

RELAY CONTROL PAGE:



The screenshot shows the 'Relay Control Page' of the 'Server Room Monitor'. On the left is a navigation menu with options: Home Page, Status, Relay Control, Network Configuration and GSM Setup, and SNMP Configuration. The main content area has a title 'Relay Control Page' and two sections of instructions. The first section describes Relay 1 control, followed by a form with input fields for 'Relay1 Name(max10):' and 'Relay2 Name(max10):', and a 'Save' button. The second section describes Relay 2 control, followed by a form with a 'Relay2: Off' dropdown menu and a 'Submit' button. The third section describes Relay 1 toggle control, followed by a form with an input field for 'Relay1 Time(0-99sec):' and a 'Save' button, and another form with a 'Relay1: Off' dropdown menu and a 'Submit' button. At the bottom, there is a copyright notice: 'Copyright © 2019 Micro Instruments.'

User defined names can be entered for Relay 1 and Relay 2 to help the system administrator remember what is connected to the relays's

Relay 2 can be controlled to the on or off position from here and will keep the position-can also be controlled via SMS and the web pages.

The reset relay time (momentarely operation time) for Relay 1 should be entered in seconds

Selecting "Toggle" for Relay1 and submit the system will energize Relay 1 for the amount of user defined seconds as defined by the user, the relay will then after the time had elapsed return to the normal off position- the relay can also be triggered to reset via SMS and the web pages.

Temperature & Humidity Alarm setup



Server Room Monitor

Home Page

Status

Relay Control

Set
Temp/Humidity
AlarmsNetwork
Configuration and
GSM SetupSNMP
Configuration

Temperature & Humidity

Set alarm level for Temp1,Temp2 and Humidity

Temp1: Degrees Celcius
Temp2: Degrees Celcius
Humidity: % Humidity

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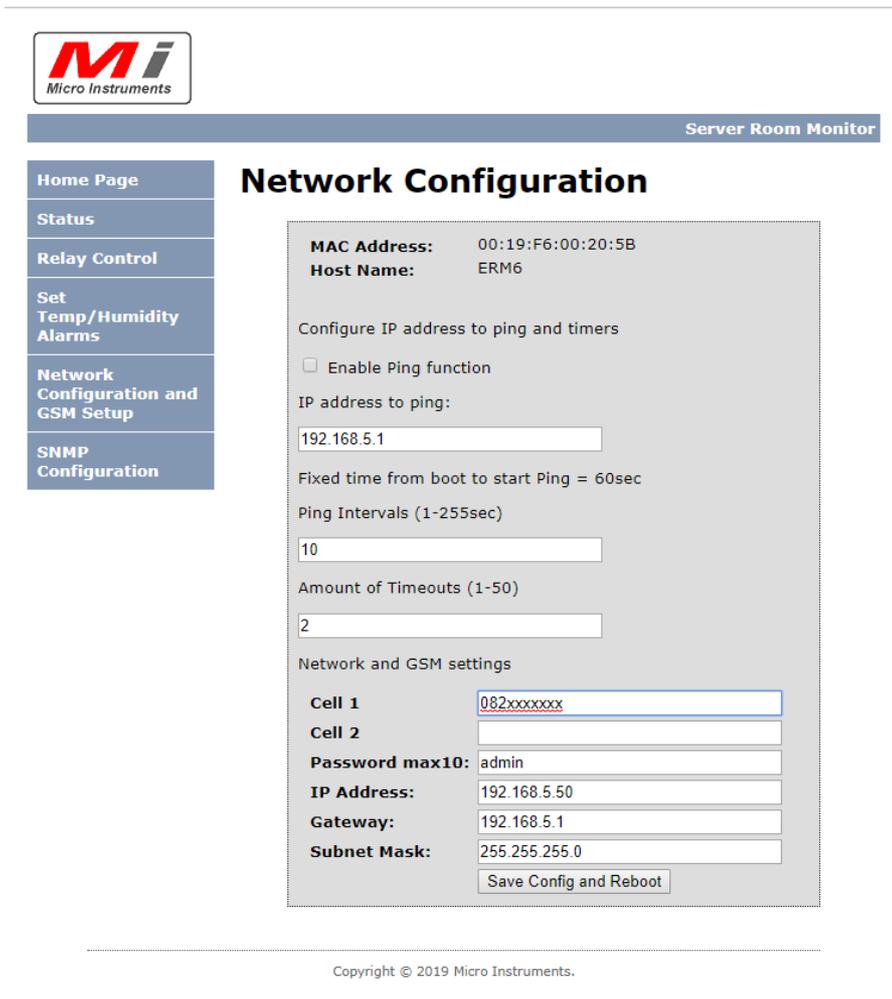
Enter Temperature sensor 1 (Temp1) alarm value in degrees Celcius – system will alert once this value is exceeded.

Enter Temperature sensor 2 (Temp2) alarm value in degrees Celcius – system will alert once this value is exceeded.

Enter Humidity sensor alarm value in percentage relative humidity

SMS alarms will automatically be send to the numbers programmed in the system should any one of the alarm values be exceeded or the internal battery falls below the set value.

NETWORK Configuration and GSM setup:



Micro Instruments

Server Room Monitor

Home Page

Status

Relay Control

Set Temp/Humidity Alarms

Network Configuration and GSM Setup

SNMP Configuration

Network Configuration

MAC Address: 00:19:F6:00:20:5B
Host Name: ERM6

Configure IP address to ping and timers

Enable Ping function

IP address to ping:
192.168.5.1

Fixed time from boot to start Ping = 60sec

Ping Intervals (1-255sec)
10

Amount of Timeouts (1-50)
2

Network and GSM settings

Cell 1 082xxxxxx

Cell 2

Password max10: admin

IP Address: 192.168.5.50

Gateway: 192.168.5.1

Subnet Mask: 255.255.255.0

Save Config and Reboot

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The systems hard coded **MAC address** will be displayed and the **Hostname**

Enable Ping Function: if this checkbox selected the system will automatically after 60sec from reboot start to ping the user entry IP address.(If no ping reply is received within the ping interval and amount of timeouts window the system will automatically generate a “**PING TIME OUT**” warning SMS to the numbers programmed.This SMS will also include the status on the Mains 220Vac input and the current voltage present, UPS 220Vac output , internal battery voltage and the status of Relay 2.

The Ping function can help to determine if the ERM6 have a Live Ethernet connection so that it can be monitored on the host pc running the monitoring software.

The Ping Reply time will be indicated on the LCD screen after each successful ping command.

Ping Intervals: User entry here specifies the amount of seconds to pause before the next Ping command is send to the specified IP address.

Amount of timeouts: User entry here specifies the amount of Ping intervals to pass with a NO ping reply before generating the auto Ping timeout SMS.

Should the Ping command fail “**Ping timed out**” will be displayed and a Ping time out SMS will be send to the Cell numbers listed in the web page, The ping failed SMS includes the 220VAC input with the current voltage as well as the UPS 220VAC Status and the internal battery DC Voltage.

SNMP



Server Room Monitor

- Home Page
- Status
- Relay Control
- Network Configuration and GSM Setup
- SNMP Configuration**

SNMP Community Configuration

Read/Write Community String configuration for SNMPv2c Agent.

Configure multiple community names if you want the SNMP agent to respond to the NMS/SNMP manager with different read and write community names. If less than three communities are needed, leave extra fields blank to disable them.

Read Comm1 :	<input type="text" value="public"/>
Read Comm2 :	<input type="text" value="read"/>
Read Comm3 :	<input type="text"/>
Write Comm1:	<input type="text" value="private"/>
Write Comm2:	<input type="text" value="write"/>
Write Comm3:	<input type="text" value="public"/>
<input type="button" value="Save Config"/>	

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SNMP read and write communities can be altered here but usually can be left unaltered for our monitoring software.

iReasoning SNMP walk screenshot

Operations:

Name/OID	Value	Type	IP:Port
.1.3.6.1.2.1.1.1.0	ERM6	OctetString	192.168.5.5...
.1.3.6.1.2.1.1.2.0	.1.3.6.1.4.1.45501	OID	192.168.5.5...
.1.3.6.1.2.1.1.3.0	14 seconds (1449)	TimeTicks	192.168.5.5...
.1.3.6.1.2.1.1.4.0	admin	OctetString	192.168.5.5...
.1.3.6.1.2.1.1.5.0	Micro Instruments	OctetString	192.168.5.5...
.1.3.6.1.2.1.1.6.0	Remote	OctetString	192.168.5.5...
.1.3.6.1.2.1.1.7.0	17	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.1.1.0	SNMPv1/2Agent	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.1.2.0	V1	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.1.3.0	September 19	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.1.0	0	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.1.1	1	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.2.0	0	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.2.1	0	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.3.0	0.0.0.0	IpAddress	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.3.1	0.0.0.0	IpAddress	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.4.0		OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.2.1.1.4.1		OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.1.0	0	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.2.0	1	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.3.0	1	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.4.0	13.8	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.5.0	244	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.6.0	0	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.7.0	1	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.8.0	00.0	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.9.0	0	Integer	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.10.0	B:13.8V M:244VacAlarms: Water	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.11.0	00.0	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.12.0	00.0	OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.13.0		OctetString	192.168.5.5...
.1.3.6.1.4.1.45501.1.3.14.0		OctetString	192.168.5.5...

6. More on the GSM module for ERM6

All commands are lower and upper case sensitive

Request SMS functions from any cell number + ERM6 web page programmed cell numbers:

Any mobile phone can send the following sms requests to the number of the SIM card inserted in the ERM6 GSM module and don't have to be one of the programmed numbers to get a reply SMS:

Help can be send to request a reply sms with all commands accepted by the GSM system

Sig can be send to request a signal strenght and bit rate error **reply** sms from the ERM6-GSM, the sms originator can now see if the GSM signal strenght is addequite in the current Antenna position or on the specific operator SIM card used.

Stat can be send to request a status sms-returning Mains voltage, UPS output voltage status, Relay 2 status and the internal battery voltage

Command SMS functions only from programmed cell numbers within the ERM6 web pages :

The commands below all have a reply SMS back from the system to indicate that the message have been received

Rr1 can be send to reset Relay 1 for the user defined time specified in the web pages

R2on can be send to switch Relay 2 to the ON position

R2off can be send to switch Relay 2 to the OFF position

All alarms(Water, Smoke, Intrusion) and sensor alarms(Temp1, Temp2 and Humidity) sms notifications will always be send out to **one** or **two** cell numbers as programmed in the main ERM6 unit web pages.

Ping time out sms notifications will also be send to **one** or **both** numbers as programmed in the ERM6 web pages.

When the user "**reboot**" the ERM6 environmental room monitor system from within the Network settings page, the system will automatically reboot the GSM module also and the GSM will need another 15 seconds to establish its connection to the cell provider tower again.

7. SNMP OID Table

- 1.3.6.1.4.1.45501.1.3.1.0 = Relay 2 Statuses
- 1.3.6.1.4.1.45501.1.3.2.0 = Mains AC voltage status
- 1.3.6.1.4.1.45501.1.3.3.0 = UPS AC voltage status
- 1.3.6.1.4.1.45501.1.3.4.0 = Internal Battery voltage
- 1.3.6.1.4.1.45501.1.3.5.0 = Mains AC input voltage level
- 1.3.6.1.4.1.45501.1.3.6.0 = Smoke sensor
- 1.3.6.1.4.1.45501.1.3.7.0 = Water sensor
- 1.3.6.1.4.1.45501.1.3.8.0 = Humidity sensor
- 1.3.6.1.4.1.45501.1.3.9.0 = Intrusion Alarm status
- 1.3.6.1.4.1.45501.1.3.10.0 = **Reserved
- 1.3.6.1.4.1.45501.1.3.11.0 = Temperature sensor 1
- 1.3.6.1.4.1.45501.1.3.12.0 = Temperature sensor 2
- 1.3.6.1.4.1.45501.1.3.13.0 = **Reserved
- 1.3.6.1.4.1.45501.1.3.14.0 = **Reserved

Micro Instruments registered PEN number: 45501

As registered with [Internet Assigned Number Authority \(IANA\)](#)

8. GSM Module for PC – **ERM6-PC-GSM** (optional extra unit)

The monitoring software supplied by Micro Instruments can interface to the ERM6 system with Ethernet with SNMP as well as SMS communication. To enable SMS communication to the monitoring software the optional extra **ERM6-PC-GSM** should be purchased and installed to the monitoring PC.

The GSM module comes with a USB to Serial converter cable to connect to a USB port on the host monitoring PC.

In the event of a loss of Ethernet connectivity from the ERM6 server room monitor to the host monitoring PC, should any alarm occur the system can send the SMS message to the monitoring PC to update the alarm status on the pc monitoring software – the software will indicate if the last information was received via Ethernet or SMS and a log file is available.

The ERM6 accommodate 2 cell numbers that can be configured in the web pages, one number must be the number of the ERM6-PC-GSM if used and the other can be a cell number to a mobile phone.



1 x ERM6-PC-GSM



1 x GSM band Antenna – magnetic Base



1 x USB to Serial converter cable



1 x 220Vac to 12Vdc power adaptor

9. Technical specifications

Power inputs:

Mains 220Vac power input consumption max: 15 Watt max

UPS 220Vac power input consumption max: 0.5 Watt max

Sensor inputs:

All sensor power outputs 250mA over current protected

Analogue : Temperature 1 and 2 : Range -10 to + 125 degree Celcius / **Accuracy** +- 2 degrees Celcius

Analogue : Humidity: Relative Humidity sensor 0-100% - **Accuracy:** +- 3%

Digital : Smoke Sensor: Photoelectric type smoke sensor

Digital : Water sensor: Amplified sensor with 2 x Tinned copper wire sensor wires.

Digital : Intrusion sensor: Set of heavy duty door magnetic reed switch , Passive Infra red detector for movement

LAN:

10Mb/s Ethernet port with SNMP enabled and embedded web pages

Relay outputs:

220Vac 10Amp potential free relay contacts

LCD Screen:

2 line x 16 character LCD screen with backlight

Internal Battery charger:

Constant Voltage , constant current lead acid battery charger with 1 Amp current limit

Internal Battery Type:

12V @ 2.4 A/h sealed lead acid battery – approximately life span 2 to 3 years.

Unit backup time with fully charged battery approximately 8 hours minimum.

Internal Fan:

1 x 40mm x 40mm 12Vdc Fan

10. Physical dimensions:



ERM6

19" Rack mount enclosure

Length : 480mm

Height : 47mm

Width : 200mm

Weight : 3.310 Kg



ERM6-GSM

Length: 122mm

Height: 30mm

Width: 72mm

Weight: 0.3Kg