GenTemp™

GSM Temperature Alarm System

User Guide

Revision 1.0

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Introduction

GenTemp™ has been designed to provide reliable temperature monitoring and remote alarm notification directly to a mobile phone. The High and/or Low temperature set-points, Site description and probe description are user programmable. GenTemp™ has two digital outputs that can be activated my mobile phone. (Useful to switch fan or other device).

GenTemp™ can be programmed to send text alerts up to 5 mobile phones on global GSM or Next-G/3G mobile phone networks.

The system comes with a high gain antenna for better reception in low signal areas.

The current temperature can be obtained remotely at any time by sending a status request message from a mobile phone.

<u>System options include</u>

- Solar Power Supply
- Battery backup with trickle charger
- Alert messages sent direct to computer

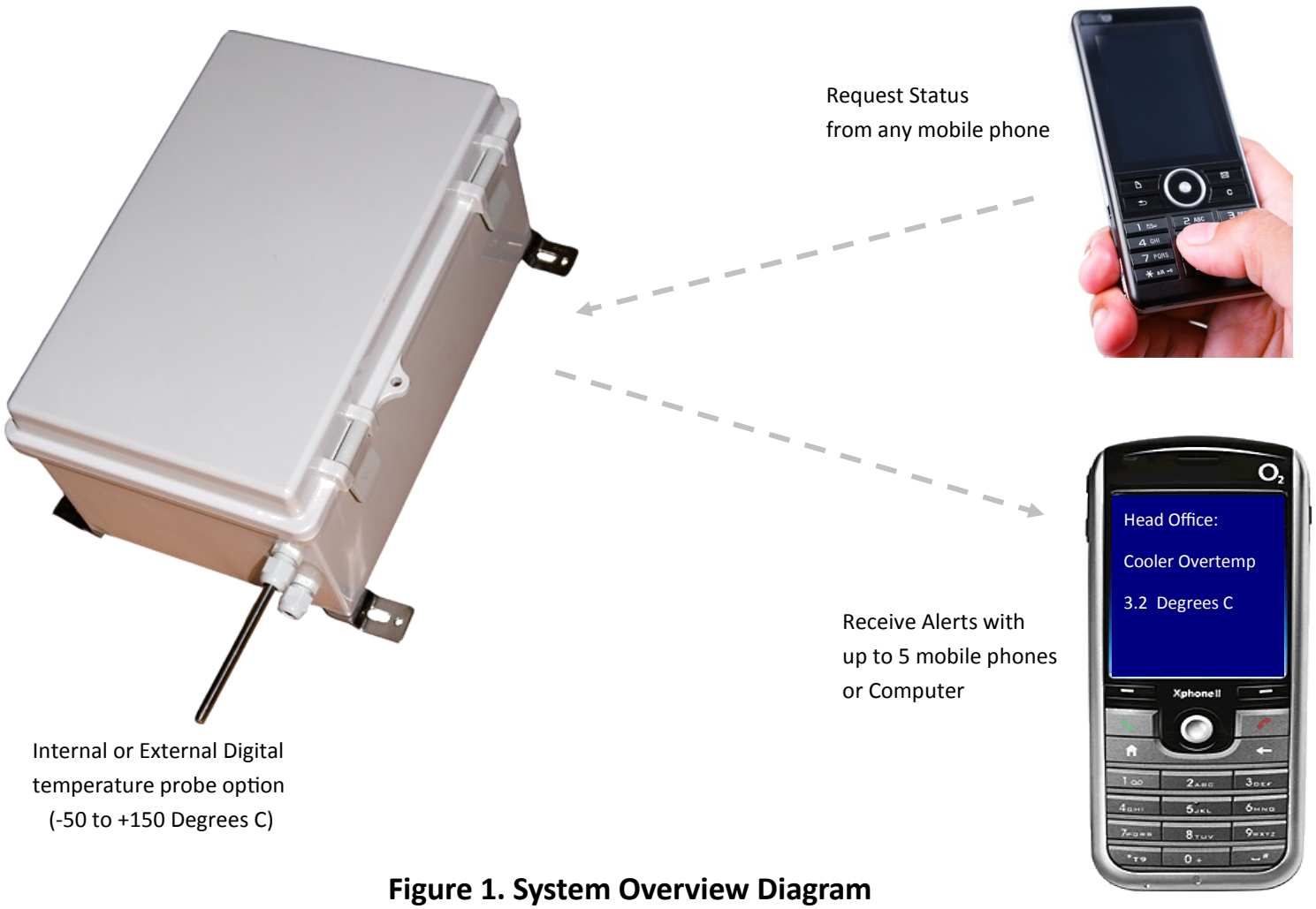


Figure 1. System Overview Diagram

How it works

Overview:

GenTemp™ is supplied with Windows© based software called “EzGSM”. The software enables up to 5 mobile phone numbers to be defined, a description for the site, a description for the item being monitored as well as HIGH and/or LOW temperature “trip-points” to be programmed into the unit.

The system requires a user-supplied SIM card. The SIM card is available from mobile phone vendors. It is recommended the SIM is not “Pre-Paid” as the GenTemp™ system has no way of determining when the card’s credit expires. The SIM card should also have the PIN number removed before using with GenTemp™. This can be done by the provider or by placing the SIM card into a mobile phone and disabling the SIM PIN feature using the phone’s setup function.

The standard GenTemp™ system requires 12V or 24V DC to operate. The system can be provided with optional Mains Plug-Pack, 230VAC supply or Solar power supply.

Probe Options:

The system can be supplied fitted with an internal or external digital temperature probe.

The internal probe version has the probe protruding from the bottom of the enclosure and is typically used for applications that monitor room temperature such as computer server room. The entire unit is located in the room being monitored.

The external probe version is normally used where the probe must be located in a confined space or compartment (such as a fridge or freezer unit). In this case the GenTemp™ Unit is mounted outside the compartment and the external probe (supplied with 5m cable) is fitted inside the compartment being monitored.

Figure 2. External Probe Option

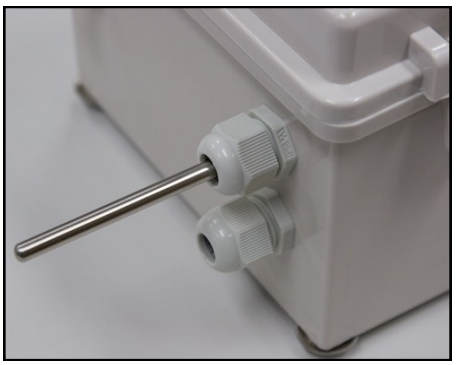


Figure 3. Internal Probe Option

Alert Messages

GenTemp™ can send several text messages to the mobile phone numbers setup using the EzGSM software.

When the system is powered up, it will send a “Power Up” system message to notify that the system has been switched on.

If the 230VAC mains supply or Mains plug-pack option is fitted, the system will send a “Mains Loss” alert if the mains power supply is lost at any time. A “Mains Restore” message will be sent when power is restored after a mains loss occurs.

The system also monitors the Battery voltage (if solar power supply or battery backup is fitted). In event the battery voltage drops below 10.5V a “Low Battery” alert message will be sent. Once the battery level is restored (rises above 11.5V) a “Battery Restore” message will be sent.

The temperature alert warnings will be sent when the temperature rises above the HIGH trip-point set up using EzGSM software (if High alarm enabled) and/or the temperature falls below the LOW trip-point (if enables). Once the temperature is restored for either alarm case, a “Temperature OK” message will be sent.

Sending commands to GenTemp™ from mobile phone

The current temperature and Battery voltage can be obtained at any time using any mobile phone. The user sends a user defined password followed by the word “status” to the Gen-Temp™ unit. The unit will then send back the current Temperature and Battery voltage to the mobile phone that sent the request.

The two auxiliary outputs can be controlled by mobile phone by sending a command to switch either output ON or OFF. This is typically useful for activating a cooling fan or other device in event of over or under temperature situation.

Installation

Locating the unit:

The GenTemp™ Unit should be located close to the point being monitored. If the internal temperature probe option is fitted then the entire unit is self-contained and should be placed within the room being monitored. If the External temperature probe option is being used then the unit would typically be mounted nearby and the probe (supplied with 5m cable) should be located inside the area being monitored (normally a fridge or cooler).

Power Supply:

GenTemp™ requires an operating voltage of 12V or 24V DC with current capacity up to 1.5Amps peak. The system can be powered by 230 VAC/12V Plug-pack, 230VAC fixed-wired supply or backup battery that is connected to a charging unit or Solar panel rated at 10W or higher.
All these options are available from Orbit Communications Pty Ltd.

Antenna:

The antenna supplied with GenTemp™ has approximately 5dBi gain. This enables the system to be operated in areas where signal strength may be weaker and provides more reliable connection in higher signal areas. The antenna has 1.5m cable to enable it to be located on top of the unit of close to the unit. The Antenna has a magnetic base for attaching to a metallic surface or Velcro patch can be attached to the underside of the magnetic base to enable it to be attached to almost any surface. The antenna should be mounted vertically.

GSM Dialler

GenTemp™ contains a GSM dialler unit that will operate on worldwide GSM and Next-G/3G mobile phone networks. All that is needed to use the GenTemp™ unit is an active SIM card. These cards are normally provided through mobile phone vendors. *Note: It is recommended NOT to use a pre-paid SIM card as the system has know means to identify when the card requires topping up.*

GenTemp™ has the facility to enable a PIN number to be entered for the SIM card but the SIM card must already be set up with the PIN number before installing in the GenTemp™ unit. Typically it is convenient to ensure the PIN number function for the SIM card is disabled. (This can be done by vendor of the SIM or using a standard mobile phone to remove the PIN requirement before installing.

Figure 6. Insert SIM Card into Dialler

Figure 7. Push in until SIM locks in place

Figure 8. RED Status LED

To install the SIM card into the GSM Dialler

1. Switch off the power (Switch on control board should be DOWN)
2. Insert SIM into slot as shown in Fig(6), press SIM fully into slot until it locks into placed as shown in Fig(7). (Gold contacts on SIM are DOWN, Notch on card is on left side as shown).
3. To remove SIM, Press SIM using small flat object and release, the SIM should spring outward.
4. Switch on the power (Switch on control board should be UP)

The RED Status LED on the dialler indicates when the dialler is connected to a mobile network. Blink rate 1 second ON and OFF = no connection, 3 seconds ON and 1 second OFF = connected.

Setting up GenTemp™

The GenTemp™ system is supplied with Windows® software called “EzGSM”. This software is used to set up the system.

Using EzGSM setup software

EzGSM must first be installed onto a desktop or laptop computer. The software is used to program the settings into the GenTemp™ unit. Once GenTemp has been set up, the cable can be removed and the system will operate as programmed. The settings will remain in the Gentemp™ unit even after power down and can only be modified using EzGSM software.

Serial Port

GenTemp™ connects to the computer using an RS232 serial link. If the computer has a DB9 serial port (as shown below) then a straight-through RS232 cable can be used to directly connect the computer to the GenTemp™ unit. If the computer does not have a DB9 connector then a USB to RS232 convertor can be used to enable the GenTemp™ unit to connect to the computer via the USB port instead. The USB to DB9 serial port adaptor is shown below. These can be obtained from most electrical outlets such as Dick Smith Electronics, Tandy, JB-HiFi.

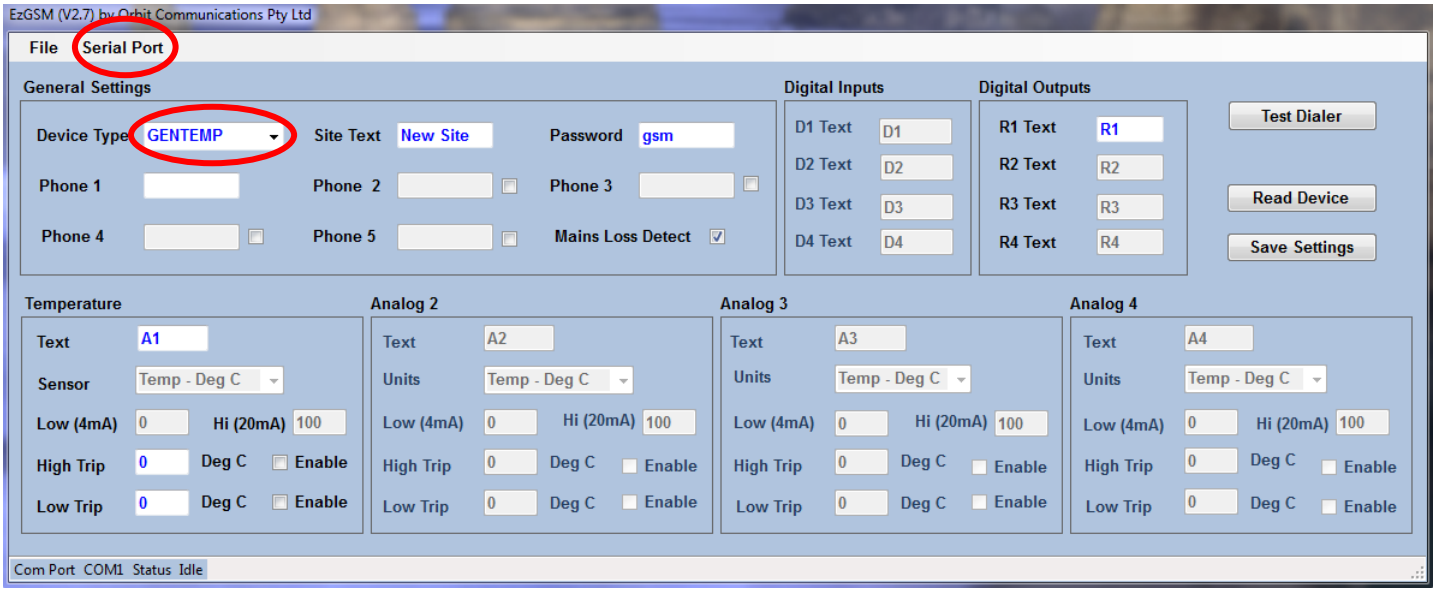
DB9 Connector

USB to DB9 Adaptor

Running the software:

Install EzGSM onto the computer by running the setup file provided on CD ROM that came with the GenTemp™ unit. Once EzGSM software is installed, an icon will be placed on the desktop of the computer. Run the software using the desktop icon.

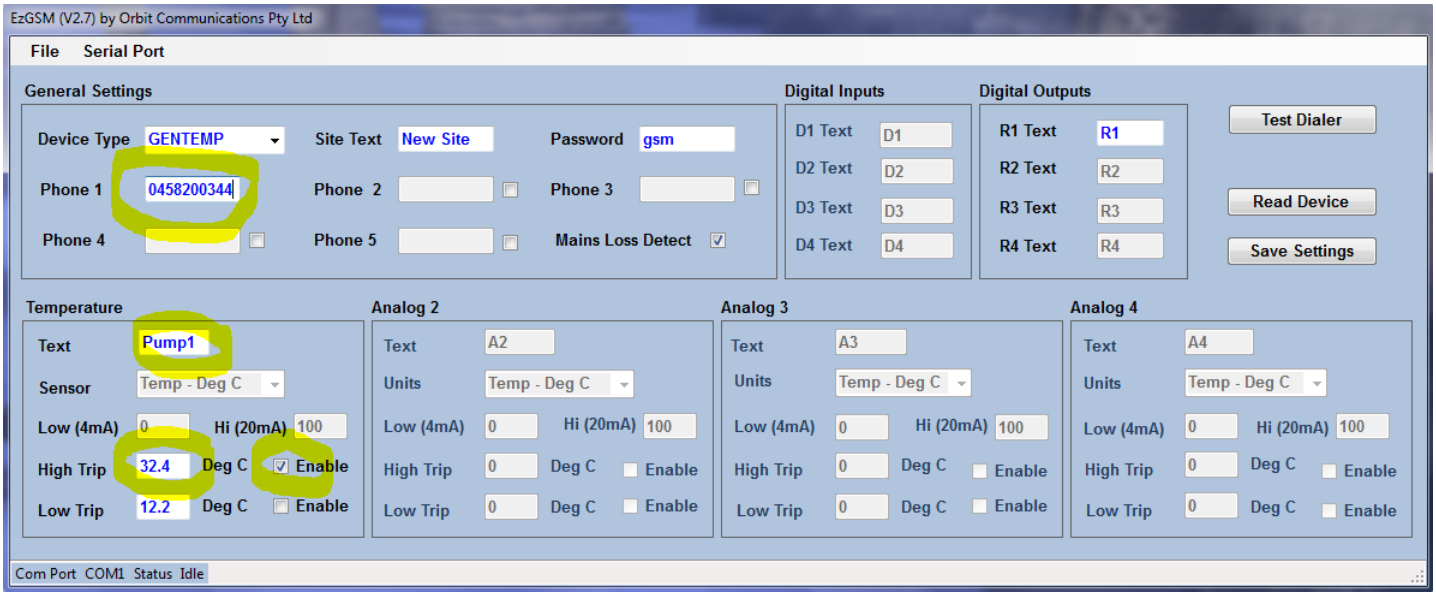
Note: The first time EzGSM is run, the program may prompt for a serial port. Enter the number of the serial port that is to be used to program GenTemp™. The appropriate serial port may be selected also by clicking “Serial Port” from the main menu and selecting from list of installed ports.



Select “GenTemp” as the Device Type using the pull-down list.

The description of the site (Site Text) is set as “New Site” by default. This can be changed to any meaningful text that describes or helps identify the site where the GenTemp™ unit is to be installed. This text is sent with every message to identify which site the message has been sent from.

Enter a password up to 5 characters long in the “Password” box. This is the word that MUST be sent before each command. It can be set to blank and therefore no password needs to be sent with commands to the unit but it is recommended a password be used for security purposes.



Enter at least 1 mobile phone number that alert messages can be sent to. GenTemp can sent alert messages up to 5 phone numbers. The small tick box next to each number must be ticked to enable another number to be added.

Enter a description of the object being monitored (“Pump1” in above example).

The High and Low temperature alarm limits can be programmed individually. One or both types of alarms and values for alarm can be set as desired. The “Enable” box must be ticked for an alarm to be active.

Click “Save Settings” button to store the values into the GenTemp™ unit.

Click the “Test Dialler” button to send a test message to the phone number entered. Typical delivery time on Next-G/3G network is around 5 seconds. This may vary between various network providers and network usage at the time.

The GenTemp™ unit is not programmed and ready for use. Whenever the program rises above the level set for a HIGH Trip, a High Temperature alert message will be sent and visa-versa when the level drops below the LOW Trip value (if wither or both are Enabled).

Text Message commands

The format for commands sent to the GenTemp device...

[Password] [Single Space] [Command]

The password is selected using EzGSM software provided. Note: The text is NOT case sensitive but there must be only a SINGLE SPACE between password and command.

Example: Send a command to switch ON R1 Output. Assume the password was set to **site3**

Create a text message on the mobile phone using the phone number set using the supplied configuration software and then enter the following text as the message and Send...

“Site3 R1ON”

GenTemp™ will send an acknowledgement message back to the mobile phone to indicate the required action has been performed.

Available Commands

Command	Description
R1ON	Sets R1 Output ON
R1OFF	Sets R1 Output OFF
R2ON	Sets R2 Output ON
R2OFF	Sets R2 Output OFF
STATUS	Returns Temperature, Battery Voltage and IO state

Most mobile phones have a facility to save text “Templates”. This provides a convenient method of sending the commands without needing to re-type them each time. First set up an entry into the mobiles Phone Book that has the phone number of the GenTemp device then create a template for each of the commands shown in the table above. To send a command you then select to send a message to the GenTemp (select from the phone book) and then “insert” the appropriate text template and finally “Send”.

Text Alert messages

The following messages are sent from GenTemp™

Message	Description
Over Temp	Enabled High Trip temperature exceeded
Under Temp	Temperature dropped below alarm level
Temp Restore	Temperature within normal limits
Mains Loss	Detected loss of mains power
Mains Restore	Mains power has been restored
Low Battery	Backup Battery below 10.5V
Battery OK	Backup Battery OK
Power Up	System has been powered up
Status	Returns Temp, Battery and IO Status

Example of sent text alert

“New Site: Pump1 Over Temperature 28.6 Degrees C”

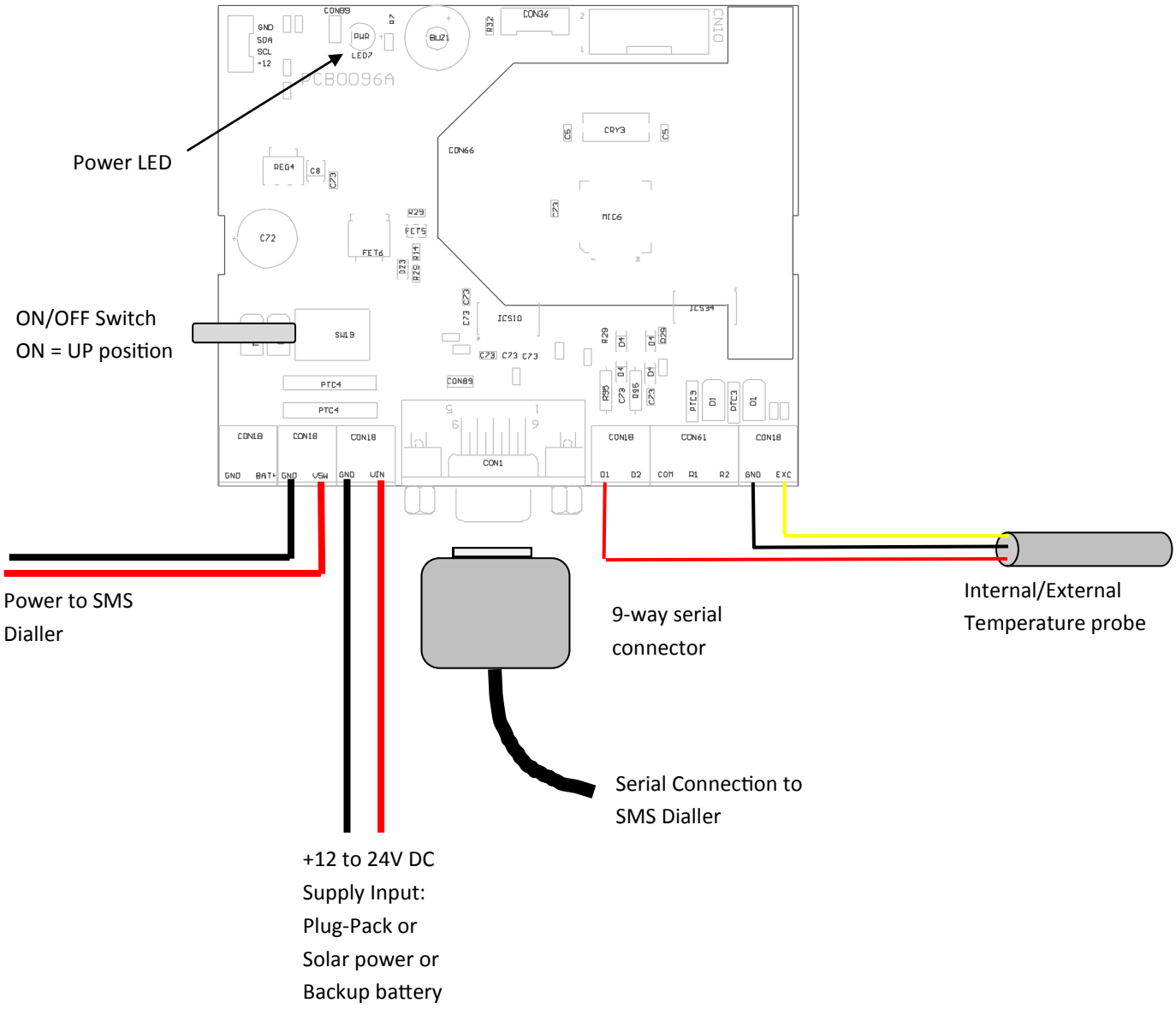
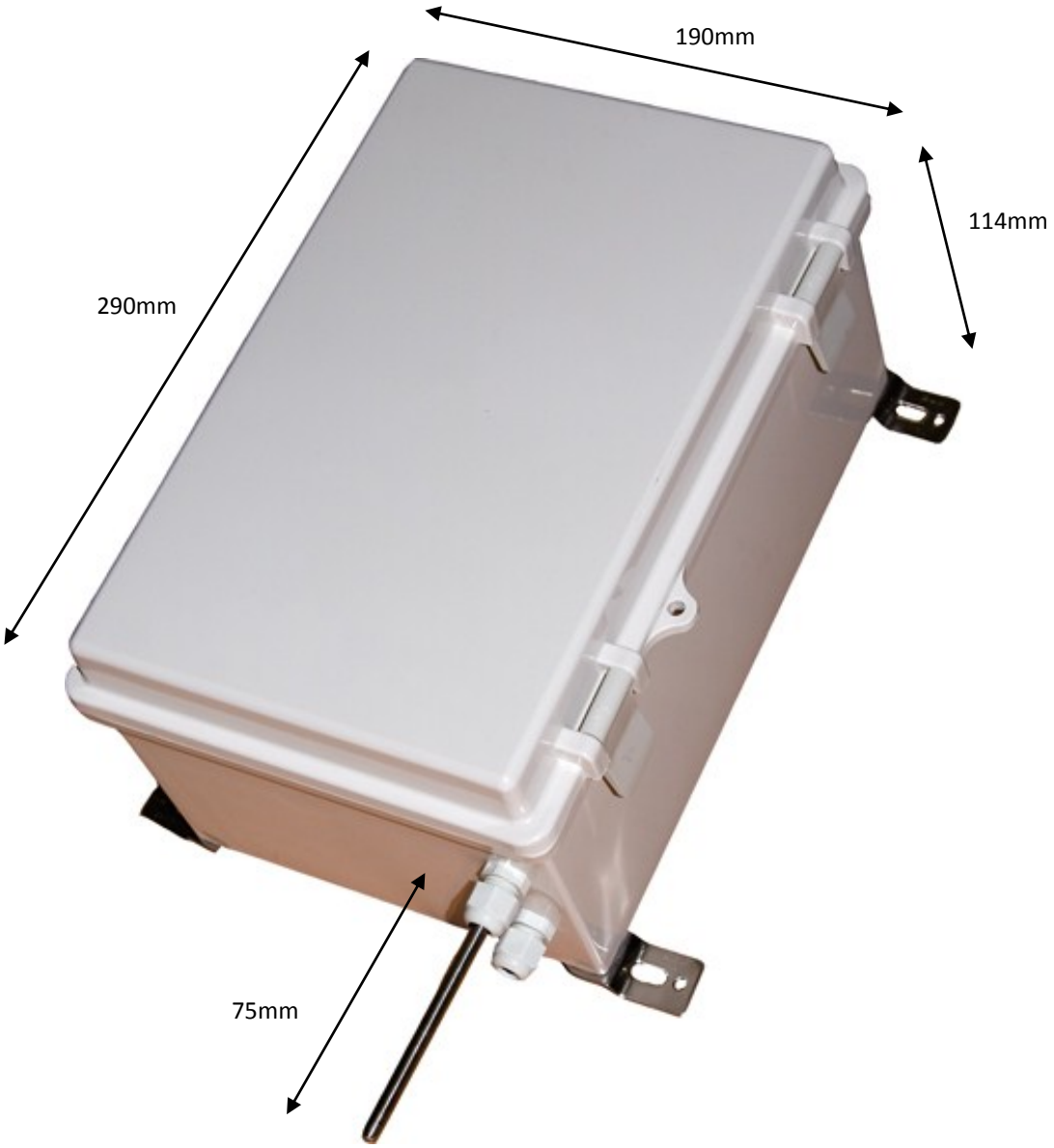


Figure 9. Internal wiring diagram for GenTemp™

Mechanical Details



Ordering Information

Part Code	Description
GEN0001	Internal probe, backup battery with charger
GEN0002	External probe, backup battery with charger
GEN0007	Internal probe, solar power supply
GEN0008	External probe, solar power supply
GEN0005	Internal probe, 12/24V DC
GEN0006	External probe, 12/24V DC
GSM0025	Kit for receiving messages direct to computer

Safety Precautions

The following safety precautions must be observed whenever the Orbit wireless device system is in operation or in service. Failure to comply with these precautions violates the safety standards of the design, manufacture and intended use of the product

- The system is not to be used:

  In hospitals or places where medical equipment may be in use.

  In an aircraft (whether on the ground or in the air)

  Refuelling points

  Explosive areas

- Restricted use of the Orbit wireless device

  Near any chemical plant

  Near any Fuel depot

The Orbit wireless device system receives and transmits radio frequency energy while switched on, therefore interference can occur if the Orbit wireless device is located near TVs, radios, PCs or any inadequately shielded equipment.

WEEE directive 2002/96/EC, disposal of old electronic equipment

This product shall not be treated as household waste. It must be placed at an appropriate collection point for the recycling of electrical and electronic equipment. By ensuring the correct disposal of this equipment, it will help the environment and human's health. The recycling will help to conserve the natural resources.

Important

Due to the nature of wireless systems, transmission and reception of data can never be guaranteed. Data may be corrupted (i.e. Have errors) or be totally lost at certain times due to the environment, other machinery or malfunction of electronic components. Although significant loss of data are rare when wireless devices such as the Orbit wireless device system are used in a normal manner, Orbit's wireless device system should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death or loss of property. Orbit Communications Pty Ltd accepts no responsibility for damages of any kind resulting from errors in data transmitted or received using Orbit's Orbit wireless device systems, or for the failure of the Orbit wireless device system to transmit or receive such data.

Do not operate the Orbit wireless device system in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference, in such areas, Orbit's wireless device system must be powered OFF.

Do not operate Orbit wireless device system in any aircraft, whether the aircraft is on the ground or in flight. In an aircraft the Orbit wireless device system must be powered OFF.

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Products may not be returned to Orbit Communications without prior authorization. To obtain a Returned Product Authorization (RPA), contact Orbit Communications by phone, fax or email. An RPA number will be issued after our staff determines the nature of the problem. Please write the RPA number on the outside of the shipping container. Any non-warranty products returned for repair should be accompanied by a purchase order to cover the cost of the repairs.