
Gmini-T

User Guide



© 2015



Web: www.intelec-systems.com

Copyright

Copyright © Intelec Systems cc, South Africa

November 2015.

Revision 1.1

All rights reserved. Neither part nor the whole of this publication may be adapted, reproduced, or stored in any material or electronic form without the prior written consent of the copyright holder.

Disclaimer

Information furnished in this manual is believed to be accurate and reliable; however no responsibility is assumed for its use, or any infringements of patents or other rights of third parties, which may result from its use.

This product or any variant of it is **not** intended for use in any **medical** / life-critical appliance, device or system in which the failure of the product might reasonably be expected to result in personal injury.

Intelec Systems cc will not accept any claim for damages howsoever arising as a result of use or failure of its products.

Product Warranty

Intelec Systems cc warrants its products from defect in material and workmanship from the confirmed date of purchase for a period of one year, provided that the said products have been operated within their specifications and that they have not been tampered with by unauthorized persons. Shipment costs will be borne by customers.

Intelec Systems holds the right and final decision to repair or replace any defective product. Proof of purchase must be supplied when requesting a repair.

Contents

1. Features and Specifications.....	1
2. Introduction	2
3. Wiring Instructions.....	3
4. Getting Started.....	5
5. Command list description	11
6. Contact Details	15
Appendix A Command list	16
Appendix B Troubleshooting	17

1. Features and Specifications

- GSM control of entire system from anywhere in the world using SMSs.
- All SMS commands in plain English.
- Alerting signals can be SMSed to a maximum of 5 cellular numbers.
- Up to 8 temperature probes.
- Probes operate from -55°C to +125°C.
- Probe accuracy $\pm 0.5^{\circ}\text{C}$ (over -10°C to +85°C range).
- Alarm filter-time from 1 to 60min.
- Alarm thresholds programmable for all 8 probes.
- Programmable individual temperature alarm messages.
- Access control function with up to 40 numbers.
- All access control programming done by SMS – no website access required.
- Locate function available for position-location parsed for Google maps.
- Input supply: 8 to 30V DC.
- 2 X 2A relays (N/O and N/C connections).
- Output relays have programmable output stable or pulsed states.
- Output relays have programmable pulse times.
- Dimensions: 100mm X 65mm X 28mm.

2. Introduction



The **Gmini-T** GSM temperature alarm is a low-cost GSM temperature wireless alarm device for monitoring 8 temperature probes. It can send SMSes when the temperature of a probe exceeds a programmable threshold. Each probe name can be custom programmed by an SMS. All alarm-channel threshold levels can be set. Further, the filter response times are also programmable. All the probes are connected to a 3-wire multi-drop bus, thus simplifying the wiring.

The **Gmini-T** also has 2 relays for controlling 2 outputs with up to 2A loads. The relay outputs can be switched on, off or pulsed by sending the unit an SMS. It is extremely simple to use and can be programmed from a mobile phone anywhere in the world. The controller command set is in plain English making it very simple to remember the commands. It can generate SMSes to a maximum of 5 mobile phones in the event of a channel temperature alarm. The SMS messages are fully programmable.

The **Gmini-T** can also be used as a missed-call access control system – it can open gates by ringing the unit without incurring costs. The unit only opens the gate if the caller ID is in the list of valid numbers. This feature is fully programmable by SMS ie no website access is required.

The **Gmini-T** has airtime query and airtime recharge functions built-in.

It also has a Locate function which sends an SMS to a mobile phoned parsed for Google maps. The link in the SMS only has to be clicked on to call up a Google map with the location pinned.

3. Wiring Instructions

The **IS-Gmini_T** controller unit has a 10-pin pluggable connector:

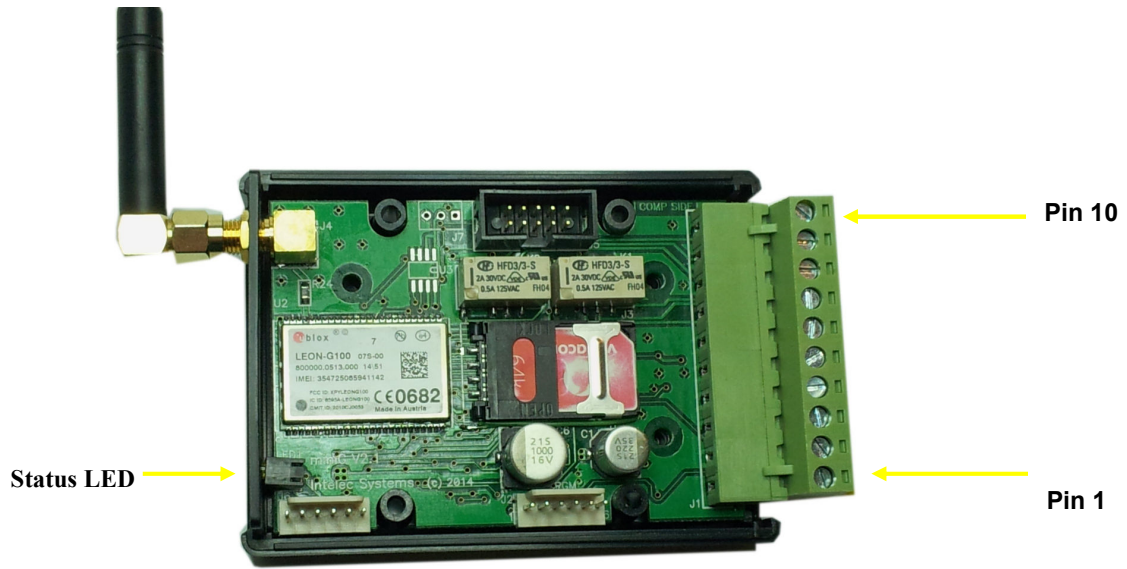
Pin Number	Name	Characteristic
1	Vin	8V- 30V
2	0V / T – Gnd (Black)	0V
3	T – Data (yellow)	
4	T – Vtemp (Red)	
5	Relay 1 (N/O)	2A @ 30VDC *
6	Relay 1 (COM)	2A @ 30VDC *
7	Relay 1 (N/C)	2A @ 30VDC *
8	Relay 2 (N/O)	2A @ 30VDC *
9	Relay 2 (COM)	2A @ 30VDC *
10	Relay 2 (N/C)	2A @ 30VDC *

* **Note** that the relay contacts can only switch 62.5VA (284mA) @ 220VAC.

Temperature probe connections:

The temperature probes have 3 wires. They should be connected according to the table below. Multiple probes are connected in parallel.

Probe Wire Name	Probe Wire Colour	Gmini-T pin connections
Gnd	Black or Green	2
Data	Yellow	3
Vtemp	Red	4



4. Getting Started

The initial setup and maintenance of your **Gmini-T** unit is managed entirely by SMS. Each **Gmini-T** unit has a SIM card with a unique telephone number. In order to setup and maintain your **Gmini-T**, you will need to use the telephone number in conjunction with a number of commands. Please read the user guide in full before attempting to configure your **Gmini-T**.

If you start with a brand new pre-paid SIM card, you will have to pre-load the airtime from a phone for the first time or via internet banking. Note that once the pre-paid amount is paid, it takes a few minutes before the system is activated. The SIM card may now be inserted into the **Gmini-T** system. Once this has been performed, any later airtime “recharging” may be done from a mobile phone or internet banking.

On power-up of the **Gmini-T** controller, the unit’s status LED (light emitting diode) will go on momentarily (0.5s). After the unit has been registered on the network, the LED flashes once every 2.5 seconds. If the LED doesn’t flash, please see **Troubleshooting Appendix B**.

Note that the SIM card should **not** have a PIN code.

Note that the antenna should be further than 3cm from any metal and the unit should not be enclosed in a metal case unless an external whip antenna is used (outside the metal box.) See application note.

Note that if heavy-current loads need to be controlled, an **external** high-power relay should be switched by the internal relay outputs. It is also preferable to use an external relay for switching 220VAC. See application note.

Note that the commands are separated by a semi-colon or comma and **MUST end with a semi-colon or comma!**

Here is a “quickstart” series of commands to get going:

Send an SMS with the following information:

General Commands:

a) Password;Signal;

eg: 000000;Signal;

to get the signal strength.

Note: it should NOT be 99 (no signal.) The ideal is 31 (but between 20 and 31 is okay.) If the signal is less than 15, you should see **Appendix B**.

b) Password;RechargeAirtime;Network;VoucherNum;

Network = [Vodacom]; [MTN]; [CellC]; [Virgin]; [Telkom]

eg: 000000;RechargeAirtime;Vodacom;9867340954;

to recharge the airtime on the Vodacom network.

c) Password;GetAirtime;Network;

Network = [Vodacom]; [MTN]; [CellC]; [Virgin]; [Telkom]

eg: 000000;GetAirtime;Vodacom;

to get the remaining airtime on the Vodacom network.

d) Password;EditPassword;NewPassword;

NewPassword = [6-digit ‘Password’] **(initially set to ‘000000’)**

eg: 000000;EditPassword;123456;

to set new password to ‘123456’

e) Password;OpenDoor;

eg: 000000;OpenDoor;

to force a “Door Open” command by sms.

Temperature Functions:

a) Password;RegisterProbes;

eg: 000000;RegisterProbes;
to register the connected probes.

b) Password;GetTemp;

eg: 000000;GetTemp;
to get the current temperature readings of all the connected probes.

c) Password;SetAlarmTemp;ChanNum;Temp;

eg: 000000;SetAlarmTemp;0;-10;
to set the channel 0 alarm threshold to -10°C.

d) Password;GetAlarmTemp;

eg: 000000;GetAlarmTemp;
to get the channel alarm threshold parameters of all the probes.

e) Password;SetAlertMessage;ChanNum;Message;

eg: 000000;SetAlertMessage;0;Fridge;
to set the SMS alert message of channel 0 to "Fridge."

f) Password;GetAlertMessage;ChanNum;

eg: 000000;GetAlertMessage;0;
to get the SMS alert message of channel 0.

g) Password;SetFilterTime;Time;

eg: 000000;SetFilterTime;5;
to set the alarm filter time to 5mins (temperature state must be stable for 5 mins before an alert is sent.).

h) Password;GetFilterTime;

eg: 000000;GetFilterTime;
to get the alarm filter time.

Access control functions:**a) Password;AddNumber;Cellnumber;**

This command allows a new number to be added to the access control function list. The access control function switches relay 1 when a recognized number dials in.

eg: 000000;AddNumber;27828058585;

to add number +27828058585 to the access control list. .

NOTE: *Omit leading zero.*

b) Password;DeleteNumber;CellNumber;

eg: 000000;DeleteNumber;27828058585;

to delete the access control number '27828058585'.

NOTE: *use ALL instead of the number to delete the entire access control list*

c) Password;GetBlockNumber;BlockNumber;

eg: 000000;GetBlockNumber;0;

to view the first 10 numbers of the access control list.

eg: 000000;GetBlockNumber;1;

to view the next 10 numbers of the access control list, etc.

Alert Functions:**a) Password;SetSMSnumbers;location;number;**

eg: 000000;SetSMSnumbers;0;0825556666;

to set alert SMS number 0 to 0825556666.

b) Password;GetSMSnumbers;location;

eg: 000000;GetSMSnumbers;0;

to get the parameters of the alert SMS number at location 0.

c) Password;SetSMSEvents;Event;location;

eg: 000000;SetSMSEvents;OverTemp;0;

to set alerts to send SMS to mobile at location 0 ie. 0825556666.

eg: 000000;SetSMSEvents;OverTemp;ALL;

to set alerts to send SMS to ALL mobile locations

d) Password;GetSMSEvents;

eg. 00000;GetSMSEvents;

to get all the event settings.

Relay Functions (output):**a) Password;Switch;RelayNum;State;**

eg: 000000;Switch;1;ON;

to switch relays 1 ON.

eg: 000000;Switch;2;OFF;

to switch relays 2 OFF.

eg: 000000;Switch;1;Pulse;

to switch pulse relays 1 for the preset time..

b) Password;Status;

eg: 000000;Status;

to get the internal relay states

c) **Password;SetRelayTimes;RelayNum;Time;**

eg: 000000;SetRelayTimes;1;10;

to set the relay 1 pulse times (and access control pulse time) to 10secs.

d) **Password;GetRelayTimes;**

eg: 000000;GetRelayTimes1;

to get the relay pulse times.

Location Function:

a) **Password;Locate;**

eg. 00000;Locate;

to get the geographical position. Click the link in the received SMS.

5. Command list description

Command format: Password;Command;[Parameters];[Parameters];

Please note that there should be no spaces around the semicolons. Also all the parameters are case-insensitive. The password is a 6 digit number. The very last parameter or command **MUST BE terminated with a semicolon!**

Commands:

- i) **Password;AddNumber;CellNumber;**
[CellNumber=12digits] eg. 27828048483
[with country code] [omit leading zero]

This command allows a new number to be added to the access control function. The access control function switches relay 1 when a recognized number dials in.

- ii) **Password;DeleteNumber;CellNumber;**
[Cellnumber] or
[ALL]

This command deletes a number from the access control function.

- iii) **Password;GetBlockNumber;BlockNumber;**
[Block Number = 0..4] [10 numbers per block]

This command displays the valid numbers in blocks of 10 numbers for the access control function. The end of the user list is denoted by the char "E".

- iv) **Password;SetRelayTimes;RelayNum;Time;**
[RelayNum] = [1] or [2]
[Time = 1..250secs]
[default = 2 secs]

This command sets the relay activation time to be set for pulsed mode.

- v) **Password;GetRelayTimes;**

This command gets the relay activation times for pulsed mode.

- vi) **Password;SetSMSnumbers;location;number;**
[location=(0..4)]
[number = [up to 20 digit mobile number] eg. 0828048483]

This command sets the mobile numbers where alert messages are sent.

- vii) **Password;GetSMSnumbers;location;**
[location=(0..4)]

This command gets the mobile numbers from the alert locations.

- viii) **Password;DeleteSMSNumber;location;**
[location=(0..4)]

This command deletes a particular SMS alert number.

- ix) **Password;SetSMSEvents;Event;location;**
[Event] = [OverTemp]
[location] -> SMS Cell# [0..4]; [All]; [OFF]

This command sets the SMS alert events ie to which mobile number(s) alerts should be sent (if at all.)

- x) **Password;GetSMSEvents;**

This command gets the SMS alert event locations.

- xi) **Password;EditPassword;NewPass;**

[NewPass is the new password value (6 digits)]
[Default password = '000000']

This command changes the password to a new 6 digit value.

- xii) **Password;VersionNums;**

This command gets the hardware, the software version numbers and unit serial number.

- xiii) **Password;Signal;**

This command gets the unit's GSM signal strength.

Result => (0 to 31)
0 = weak signal;
31 = strong signal
99 = no signal

- xiv) **Password;RechargeAirtime;Network;VoucherNum;**
[Network] = [Vodacom] ; [MTN] ; [CellC] ; [Virgin] ; [Telkom]

This command recharges the airtime from a voucher. The particular network is also entered as a parameter. **Note that this command should only be used once the number has been activated on the network. See "Getting started" section above for details.**

- xv) **Password;GetAirtime;Network;**

This command gets the remaining airtime

- xvi) **Password;OpenDoor;**

This command forces a "Door Open" command by sms on relay 1.

xvii) Password;RegisterProbes;

This command registers all the connected probes.

xviii) Password;GetTemp;

This command gets the current temperature readings of all the connected probes.

xix) Password;SetAlarmTemp;ChanNum;Temp;

[ChanNum] = [0..7]

[Temp] = [-55..125]

This command sets the channel alarm threshold temperature.

xx) Password;GetAlarmTemp;

This command gets the channel alarm threshold parameters of all the probes.

xxi) Password;SetAlertMessage;ChanNum;Message;

[ChanNum] = [0..7]

[Message] = [up to 15 characters of text]

This command sets the SMS temperature alert device name.

xxii) Password;GetAlertMessage;ChanNum;

[ChanNum] = [0..7]

This command gets the SMS temperature alert device name.

xxiii) Password;SetFilterTime;Time;

[Time] = [0..60] mins

This command sets the alarm filter time (temperature state must be stable for this period before an alert is sent.)

xxiv) Password;GetFilterTime;

This command gets the alarm filter time.

xxv) Password;DeleteAllSMS;

This function deletes all SMSes.

xxvi) Password;Switch;RelayNum;State;

[Relay Number] = [1] or [2]

[State] = [On] or [Off] or [Pulse]

This function switches relays 1 or 2 into the on, off or pulsed states.

xxvii) Password;Status;

This function gets the internal relay states.

xxviii) Password;Locate;

This function gets the location co-ordinates using a proprietry cell-tower locate algorithm. The results are SMSed back as a Google map link which when selected, pulls up a map.

Note that the full system instruction set can be seen in appendix A

6. Contact Details

South Africa:

Intelec Systems cc

Cape Town, South Africa

Contact: Alon Bas
Phone: +27-21-686 8484
Fax: +27-86-642 4907
Mobile: +27-82-804 8484
Email: alon@intelec-systems.com
Web: www.intelec-systems.com

Appendix A Command list

Firmware

SMS Function Command List:

- i) Password;AddNumber;CellNumber;
[CellNumber=12digits] eg. 27828048483
[with country code] [omit leading zero]
- ii) Password;DeleteNumber;CellNumber; **[Cellnumber] or [ALL]**
- iii) Password;GetBlockNumber;BlockNumber; **[Block Number = 0..4]**
[10 X nums per block]
- iv) Password;SetRelayTimes;RelayNum;Time; **[RelayNum] = [1] or [2]**
[Time = 1..250secs]
[default = 2 secs]
- v) Password;GetRelayTimes;
- vi) Password;SetSMSNumbers;location;number;
[location=(0..4)] [Num=15digits] eg. 0828048483
- vii) Password;GetSMSNumbers;location;
- viii) Password;DeleteSMSNumber;Location;
- ix) Password;SetSMSEvents;Event;Location;
[Event] = [OverTemp] [Location] -> SMS Cell# [0..4]; [All]; [OFF]
- x) Password;GetSMSEvents;
- xi) Password;EditPassword;NewPass; **[Initially set to: '000000']**
- xii) Password;VersionNums;
- xiii) Password;Signal; **[0...31 = low .. high; 99 = No signal]**
- xiv) Password;RechargeAirtime;Network;VoucherNum;
[Network] = [Vodacom] ; [MTN] ; [CellC] ; [Virgin] ; [Telkom]
- xv) Password;GetAirtime;Network;
- xvi) Password;OpenDoor;
- xvii) Password;RegisterProbes;
- xviii) Password;GetTemp;
- xix) Password;SetAlarmTemp;ChanNum;Temp;
[ChanNum] = [0..7] [Temp] = [-55..125]
- xx) Password;GetAlarmTemp;
- xxi) Password;SetAlertMessage;ChanNum;Message;
[ChanNum] = [0..7] [Message] = [up to 15 characters of text]
- xxii) Password;GetAlertMessage;ChanNum;
[ChanNum] = [0..7]
- xxiii) Password;SetFilterTime;Time;
[Time] = [0..60] mins
- xxiv) Password;GetFilterTime;
- xxv) Password;DeleteAllSMS;
- xxvi) Password;Switch;RelayNum;State;
[Relay Number] = [1] or [2]
[State] = [On] or [Off] or [Pulse]
- xxvii) Password;Status; [gets relay state]
- xxviii) Password;Locate;

Appendix B Troubleshooting

Problem	Solution
LED doesn't flash on once for 0.5s on power-up.	<p>Check power is present.</p> <p>Check the power supply polarity.</p>
<p>After power-up the LED flashes on once for 0.5s, but after a further 30sec, the LED goes off and stays off.</p> <p>Note that when the unit is registered on the GSM network, the LED flashes on every 2.5s.</p>	<p>Check SIM card installed.</p> <p>Ensure SIM card still valid.</p> <p>Ensure SIM card doesn't have a PIN.</p> <p>Check SIM card on a cell phone first to make sure there is a reasonable signal.</p> <p>Ensure that the unit and antenna are not enclosed in a metal box.</p> <p>Ensure that the antenna is not placed near metal (> 3cm away.)</p>
System works, but low signal strength.	<p>If signal low (<15), make sure antenna not placed near metal (> 3cm away.)</p> <p>Change position of unit / antenna.</p> <p>Change antenna to whip type.</p> <p>Change service provider.</p>
System doesn't send return SMSes or trigger responses.	<p>Ensure SIM has airtime.</p> <p>Ensure the SetSMSnumbers and SetSMSEvents commands are correctly set up.</p>
When attempting to perform a RegisterProbes command, "No devices detected!" is returned.	<p>Connect the probes and check that the wiring is correct before issuing the command.</p>