Gmini 100

User Guide

INTELEC SYSTEMS
Intelligent Electronic Systems

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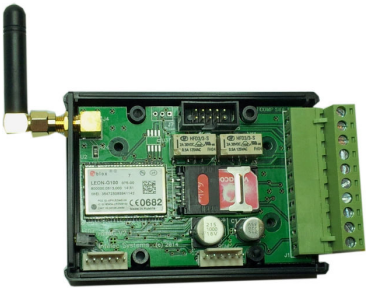

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1. Features and Specifications

- GSM control of entire system from anywhere in the world using SMSs.
- All SMS commands in plain English.
- Access control function with up to 50 numbers.
- All access control programming done by SMS – no website access required.
- Alerting signals can be SMSed to a maximum of 5 cellular numbers.
- Programmable alert messages for active-high and / or active-low input states.
- 4 Alarm modes for use as an alarm system or to activate an external alarm.
- Locate function available for position-location parsed for Google maps.
- Input supply: 8 to 30V DC.
- 2 X inputs (trigger levels: 3V to 30V)
- 2 X 2A @ 30VDC (220VAC @ 62.5VA) relays (N/O and N/C connections)
- Output relays have programmable output stable or pulsed states.
- Output relays have programmable pulse times.
- Programmable input trigger filter-times.
- Dimensions: 100mm X 65mm X 28mm.

2. Introduction

The **Gmini 100** GSM controller is a low-cost general-purpose GSM wireless device for monitoring 2 inputs and controlling 2 outputs for up to 2A loads. 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 one or both of the inputs being triggered. The SMS messages are fully programmable. The relay outputs can be switched on, off or pulsed by sending the unit an SMS.

Further, the unit has an access control feature to open gates by ringing the unit without incurring costs. The unit drops the call and then 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 100** can be used for many functions eg to monitor the AC power and report a power failure event via SMS; it can be connected to an alarm to send a message when the alarm goes off, or even be used as a 2 input-alarm system with alarm-active LED and siren.

The **Gmini 100** has airtime query and airtime recharge functions built-in.

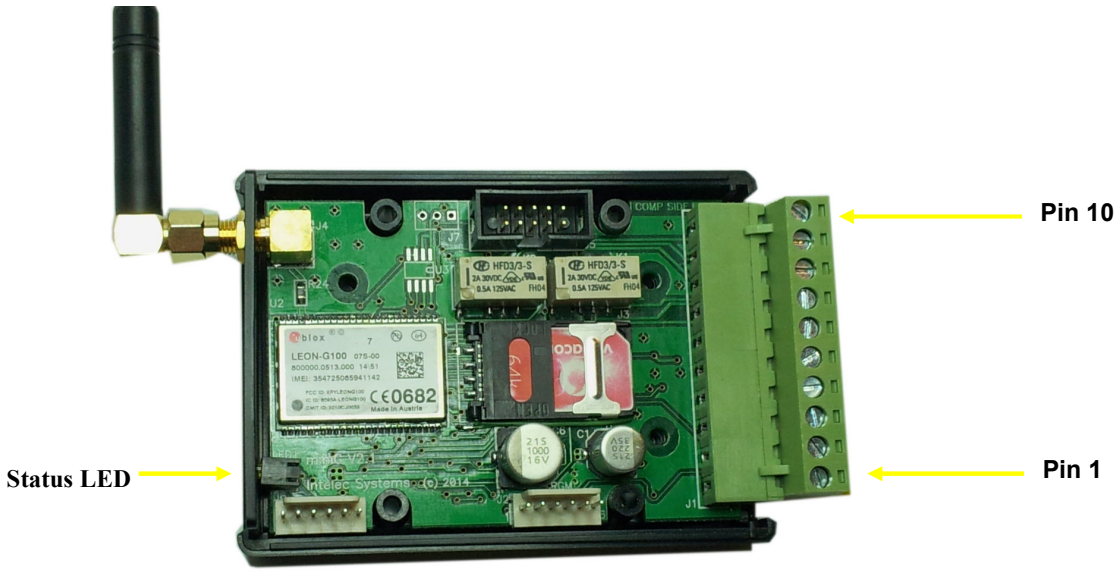
It also has a Locate function which sends an SMS to a mobile phoned parsed for Google maps. The link in the SMS only has to be clicked on to call up a Google map with the location pinned.

3. Wiring Instructions

The **IS-Gmini 100** controller unit has a 10-pin pluggable connector:

Pin Number	Name	Characteristic
1	Vin	8V- 30V
2	0V	0V
3	Input 1	3V – 30V
4	Input 2	3V – 30V
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.



4. Getting Started

The initial setup and maintenance of your **Gmini 100** controller is managed entirely by SMS. Each **Gmini 100** unit has a SIM card with a unique telephone number. In order to setup and maintain your **Gmini 100**, 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 100**.

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 100** 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 100** 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.

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 (input):

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;location;

eg: 000000;SetSMSEvents;0;

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

eg: 000000;SetSMSEvents;ALL;

to set alerts to send SMS to ALL mobile at locations

d) Password;GetSMSEvents;

eg. 00000;GetSMSEvents;

to get the event settings.

e) Password;SetInputMessage;InputNumber;Level;Message;

eg. 00000;SetInputMessage;1;Hi;Pump Fail;

to set the input 1 event high-state message to "Pump Fail"

eg. 00000;SetInputMessage;1;Low;Pump OK;

to set the input 1 event low-state message to "Pump OK"

f) Password;GetInputMessage;InputNumber;Level;

eg. 00000;GetInputMessage;1;Hi;

to get the input 1 event high-state message.

g) Password;SetInputEvents;InputNumber;Level;State;

eg. 00000;SetInputEvents;1;Hi;On;

to set the input 1 event high-state alert to On state.

The **defaults** are all **on**.

h) Password;GetInputEvents;

eg. 00000;GetInputEvents;1;

to get the input event states for all inputs.

i) Password;SetInputFilter;InputNum;Time;

eg. 00000;SetInputFilter;1;2;

to set the input 1 filter time to 2 secs.

j) Password;GetInputFilter;

eg. 00000;GetInputFilter;

to get the input filter times.

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.

Alarm Functions:

a) Password;SetAlarmMode;Mode;

***eg*:** 000000;SetAlarmMode;Ring;

to switch the unit into an alarm system which can use the missed call feature (as well as the AlarmOn/AlarmOff command) to activate and de-activate the alarm. Relay 1 is used to drive an "armed" status LED and Relay 2 is used to drive a siren.

***eg*:** 000000;SetAlarmMode;Ext1R;

to switch the unit into an alarm mode which can be used to activate and de-activate an external alarm with a single arm-disarm input. Relay 1 ON is armed and Relay 1 OFF is disarmed.

***eg*:** 000000;SetAlarmMode;Ext2R;

to switch the unit into an alarm mode which can be used to activate and de-activate an external alarm with a separate arm and disarm input. This mode uses relay1 for ARM and relay2 for DISARM.

b) Password;GetAlarmMode;

***eg*:** 000000;GetAlarmMode;

to get the current alarm mode setting.

c) Password;AlarmOn;

***eg*:** 000000;AlarmOn;

to switch the alarm on (activate input 1 and input 2.)

d) Password;AlarmOff;

***eg*:** 000000;AlarmOff;

to switch the alarm off (de-activate input 1 and input 2.)

*** Note**: The AlarmMode should be switched off to activate the normal access control, relay and input functions.

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;location;
[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;SetInputMessage;InputNumber;Level;Message;
[InputNumber] = [1] or [2]
[Level] = [Hi] or [Low]
[Message = 25 chars]

This function sets up the input alert messages for inputs 1 and 2. It can set the message for a high-level input and a message for the low-level states. Default messages are already set up.

xviii) Password;GetInputMessage;InputNumber;Level;
[InputNumber] = [1] or [2]
[Level] = [Hi] or [Low]

This function gets the input alert messages for inputs 1 and 2.

xix) Password;SetInputEvents;InputNumber;Level;State;
[InputNumber] = [1] or [2]
[Level] = [Hi] or [Low]
[State] = [On] or [Off]

This function sets up the input alert events. Each level event for each channel can be switched on or off. The **defaults** are all **on**.

xx) Password;GetInputEvents;

This function gets all the input events.

xxi) Password;DeleteAllSMS;

This function deletes all SMSes.

xxii) 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.

xxiii) Password;Status;

This function gets the internal relay states.

xxiv) Password;AlarmOn;

This function is used to activate an external alarm system when in **EXT1R** or **EXT2R** mode. In alarm mode **EXT1R**, it switches relay 2 ON. In alarm mode **EXT2R**, it pulses relay 1. In **LOCAL** or **RING** modes (Gmini as fully-fledged alarm system), it activates the inputs so that they can trigger the alarm.

xxv) Password;AlarmOff;

This function is used to de-activate an alarm system when in **EXT1R** or **EXT2R** mode. In alarm mode **EXT1R** it switches relay 2 OFF. In alarm mode **EXT2R**, it pulses relay 2. In **LOCAL** or **RING** modes (Gmini as fully-fledged alarm system), it de-activates the inputs so that they can't trigger the alarm.

xxvi) Password;SetAlarmMode;Mode;

[Mode] = [OFF]	**[Alarm mode off]**
[Mode] = [LOCAL]	**[Use Gmini as alarm system]**
[Mode] = [RING]	**[Use Gmini as alarm system with missed call]**
[Mode] = [EXT1R]	**[Used to activate 1-input activation external alarm with relay 1]**
[Mode] = [EXT2R]	**[Used to activate 2-input activation external alarm with relay 1 (ON) and relay 2 (OFF)]**

This function sets the alarm mode:

LOCAL and **RING** modes set the **Gmini** up as a fully-fledged alarm system with 2 inputs and Relay1 showing "alarm active" status by driving an LED and Relay2 driving a siren. The siren will be blipped once to indicate when the alarm is activated and twice when the alarm is de-activated. The pulse-time of Relay2 (for the siren) should be set by the **SetRelayTimes** command. **RING** mode is different to **LOCAL** mode in that the alarm system can be switched on and off using the missed-call feature as well as the AlarmOn and AlarmOff commands. Use the **AddNumber** command to add valid missed-call devices.

The **EXT1R** and **EXT2R** functions are used to drive and monitor an external alarm system. The **EXT1R** mode switches Relay1 on and off to activate and de-activate an external alarm. **EXT2R** mode switches Relay1 to switch the external alarm on and Relay2 to switch the external alarm off.

Set the mode to **OFF** to re-enable the normal access control, relay and input functions.

xxvii) Password;GetAlarmMode;

This function gets the alarm mode.

xxviii) Password;SetInputFilter;InputNum;Time;

[InputNum] = [1] or [2]
[Time = 0..3600secs]
[default = 0]

This function sets the filter reaction time for the inputs. The input will only send an alert when the input signal is in a state for a minimum time period (**Time** parameter.) This parameter can be set from 0 to 3600 seconds. Note that the 0 parameter is set to 200ms.

xxix) Password;GetInputFilter;

This function gets the input filter parameters.

xxx) 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:

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Cape Town, South Africa

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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;Location;
[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;SetInputMessage;InputNumber;Level;Message;
[InputNumber] = [1] or [2]
[Level] = [Hi] or [Low]
[Message = 25 chars]

xviii) Password;GetInputMessage;InputNumber;Level;

xix) Password;SetInputEvents;InputNumber;Level;State;
[InputNumber] = [1] or [2]
[Level] = [Hi] or [Low]
[State] = [On] or [Off]

xx) Password;GetInputEvents;

xxi) Password;DeleteAllSMS;

xxii) Password;Switch;RelayNum;State;
[Relay Number] = [1] or [2]
[State] = [On] or [Off] or [Pulse]

xxiii) Password;Status; [gets relay state]

xxiv) Password;AlarmOn; [switches relay 2 ON in **EXT1R** mode]
[pulses relay 1 ON in **EXT2R** mode]
[activates the Gmini when in **LOCAL** or **RING** modes]

xxv) Password;AlarmOff; [switches relay 2 OFF in **EXT1R** mode]
[pulses relay 2 ON in mode **EXT2R** mode]
[de-ctivates the Gmini when in **LOCAL** or **RING** modes]

xxvi) Password;SetAlarmMode;Mode;
[Mode] = [OFF] [Alarm mode off]
[Mode] = [LOCAL] [Use Gmini as alarm system]

[Mode] = [RING]	**[Use Gmini as alarm system with missed call (de)activation]**
[Mode] = [EXT1R]	**[Used to activate 1-input activation external alarm with relay 1]**
[Mode] = [EXT2R]	**[Used to activate 2-input activation external alarm with relay 1 (ON) and relay 2 (OFF)]**

xxvii) Password;GetAlarmMode;Mode; [gets the alarm mode]

xxviii) Password;SetInputFilter;InputNum;Time; **[InputNum] = [1] or [2]**
[Time = 0..3600secs]
[default = 0]

xxix) Password;GetInputFilter;

xxx) Password;Locate;

Appendix B Troubleshooting

Problem	Solution
LED doesn't flash on once for 0.5s on power-up.	Check power is present. Check the power supply polarity.
After power-up the LED flashes on once for 0.5s, but after a further 30sec, the LED goes off and stays off. Note that when the unit is registered on the GSM network, the LED flashes on every 2.5s.	Check SIM card installed. Ensure SIM card still valid. Ensure SIM card doesn't have a PIN. Check SIM card on a cell phone first to make sure there is a reasonable signal. Ensure that the unit and antenna are not enclosed in a metal box. Ensure that the antenna is not placed near metal (> 3cm away.)
System works, but low signal strength.	If signal low (<15), make sure antenna not placed near metal (> 3cm away.) Change position of unit / antenna. Change antenna to whip type. Change service provider.
System doesn't send return SMSes or trigger responses.	Ensure SIM has airtime. Ensure the SetSMSnumbers and SetSMSEvents commands are correctly set up.