ET-GSM REMOTE I/O

ET-GSM REMOTE I/O is the device that commands I/O devices through GSM Communications; it can enable/disable (ON/OFF) OUTPUT RELAY, check Input status, or alert user by sending SMS when Input status has been changed according to the specific condition. It is compatible with all facilitators in Thailand under the GSM Network that are 850MHz/900MHz/1800MHz and 1900MHZ; so, it is suitable to communicate, command, or check the operation of electrical appliances that are installed in distant places but it is still in the area that GSM Network can be accessed.

● Can setup a maximum of 8 numbers of both home phone and cell phone to receive a call or message. Other exceeding telephone numbers that have not been setup yet cannot command the device.

● Can setup a maximum of 8 numbers to send message to warn user when it found condition of warning; in this case, it must be the cell phone number that can receive SMS only.

● Can setup a maximum of 8 conditions of warning from 5 sources of INPUT. Moreover, it can setup condition of OUTPUT to auto run when it found condition of warning; in this case, user can set any OUTPUT to run or stop running or be unchanged when it found the specific condition of warning.

● Can command OUTPUTs and check operation of INPUTs by DTMF Code or short message (SMS) from the specific number.

OPERATION MODE

There are 3 operation modes for this ET-GSM REMOTE I/O; Normal Mode, Setup Mode and Restore Default Mode. It uses 4 DIP-SWITCH on the device to setup and choose the preferable operation of the device as follows;

SW1	SW2	SW3	SW4	Operation Mode
OFF	x	x	x	Normal Mode
ON	OFF	x	x	Setup Mode
ON	ON	x	x	Restore Default

Table shows how to choose operation mode by DIP-SWITCH (x=ignore).

● **SW1:** This switch is used to choose operation mode of the device. If this SW1 is set at OFF position, it is Normal Mode; but, if this SW1 is set at ON position, it is Setup Mode or Restore Default Mode. Normally, it always set this SW1 at OFF position.

● **SW2:** It is used together with SW1 to setup operation mode of the device to be Restore Default Mode; in this case, it has to set both values of SW1 and SW2 at ON position simultaneously. Remember, user has to sets position of both SW1 and SW2 completely before supplying power into the device only. If user changes the position of SW2 while the device is running, it has no any effect on the operation. When it runs in Normal Mode, it always sets this SW2 at OFF position.

● **SW3:** It is used to set audio notification through Connector Audio Out. If this SW3 is set at ON position, user can hear audio notification that reports the operation all time; but, if this SW3 is set at OFF position, there is no any audio notification, except there is incoming call and it directly commands the device through DTMF Code.

● **SW4:** It is reserved and unused. It always sets SW4 at OFF position.

NORMAL MODE

For this operation mode, it always sets this SW1 at OFF position. The operation of this mode accords with the conditions that are setup in Configuration; the device only receives a call and message from the specified numbers that is setup in Configuration. If there is any incoming call or message from other exceeding numbers that are not included in Configuration, the device ignores those commands. LED in this operation mode displays the operating state in the format of blinking light (ON/OFF) alternately at a speed of half a second (500mS).

- The device only receives a call and command by DTMF Code from the specific telephone number in Configuration.

- The device only receives message and decodes the received message from the specified telephone number in Configuration; moreover, it always auto deletes all received message after decoded completely. Remember, any message from another exceeding telephone numbers that is not included in the Configuration, it always auto deletes that message without decoding.

- When any INPUT is changed (DC1, DC2, DC3, DC4, or AC1), the device always checks the condition of warning (Alarm) and it auto sends the warning message to the specific telephone number. In this case, user needs to check if SIM CARD is ready to send warning message; for example, user needs to prepare all service fees because the device does not check any balance. If SIM CARD does not support any SMS, especially running out of money (in case of using prepaid SIM CARD), it cannot send any warning message and it is not resent.

- The device does not receive any command about setting value or editing Configuration in this operation mode, although it sends command or message from the specific telephone number. If user requires setting or editing any value in Configuration, it has to do in Setup Mode only.

SETUP MODE

For this operation mode, it always sets SW1 at ON position and SW2 at OFF position. The operation of this mode is similar to Normal Mode, but it only differs in their function because this operation mode is used to receive a call and message from every number; moreover, user can edit or setup any value in Configuration independently. LED in this operation mode displays the operating state in the format of blinking light (ON/OFF) alternately at a speed of 50/1000 seconds (500mS).

RESTORE DEFAULT MODE

For this operation mode, it always sets both SW1 and SW2 to be at ON position first and then supplies power to the device. After set the position of both SW1 and SW2 and supplied power to the device completely, user can hear 'beep' sound to notify user to know that it starts running; the timing of beep sound is "long-short-short-short-long-long-short", it means that the device start running in Restore Default Mode. In this case, user has to continuously repeat ON/OFF SW2 for 5 times to confirm; every time user does ON/OFF SW2, user can hear short beep sound one time to notify user to know the operating status. After user has repeated ON/OFF SW2 for 5 times completely, user can hear long beep sound one time; moreover, all Configurations are deleted completely and it will be Restore Default Mode.

- All numbers for receiving a call and message from 1 to 8 are cancelled in order to setup all new value.

- All numbers to alert user through message from 1 to 8 are cancelled in order to setup all new value.

- Condition of warning from 1 to 8 is cancelled in order to setup all new value.

- All messages in SIM CARD are deleted totally.

LED Status and Meanings of operation

● **VDD:** It shows status of Power Supply; it is lit up when it supplies power to the device.

● **RUN:** It shows operating status of the device. If it is running in Normal Mode, LED RUN is lit up and off every 500mS (500/1000 seconds: 0.5 seconds); but, if it is running in Setup Mode, LED RUN is lit up and off every 50mS (50/1000 seconds).

● **GSM:** It shows the operating status of GSM. It is lit up when the Module GSM is enabled and it turns off when the Module GSM is disabled.

● **NET:** It shows status of connection with network of Module GSM.

○ **OFF:** Module GSM is inactive.

○ **Alternate between ON for 64mS and OFF for 800mS:** It does not search any network.

○ **Alternate between ON for 64mS and OFF for 300mS:** The GPRS Communication is in progress.

○ **Alternate between ON for 64mS and OFF for 3000mS:** It is in the progress of searching network.

Table shows status of beep sound (Beep)

Timing of Beep sound (ON Beep)	Meanings of operation
750mS-100mS-100mS-100mS-750mS	Power-ON Beep
50mS-250mS-50mS-500mS	Receive a call
100mS-100mS-150mS-750mS	Receive a message
350mS	Command is correct
100mS-100mS-100mS-100mS	Command is error
100mS	Acknowledge, wait and operate
1000mS	Ready to run

**Table shows meanings of Beep sound.**

I/O System of ET-GSM REMOTE I/O

There are 9 Inputs/Outputs for ET-GSM REMOTE I/O that can be applied; in this case, there are 4 Outputs and 5 Inputs. Each set has Connector PLUG TYPE TERMINAL BLOCK to be connecting point, it consists of

- 4 Channel Output Relay (NO-NC-COM)
- 4 Channel Input DC (12VDC Input or Contact or PNP Sensor)
- 1 Channel Input AC (220VAC)

OUTPUT RELAY

ET-GSM REMOTE I/O has 4 of 5A Contact Relay Output; each Relay has Connector 3 PIN PLUG TYPE TERMINAL BLOCK to be connecting point for Output. The Contact consists of NO (Normal Open), NC (Normal Close) and COM (Common); in this case, user can suitably choose any Contact Relay according to the requirement; it may use NO(Normal Open) with COM (Common), or NC (Normal Close) with COM (Common). The Contact Relay can enable/disable (ON/OFF) Power Supply to control the operation of electrical appliances that is either Direct Current (DC) or Alternating Current (AC). The Contact Relay can receive the maximum of 5A Current. If using with Direct Current (DC), it can resist a maximum of 24VDC (at the maximum of 5A Current); or, if using with Alternating Current (AC), it can resist a maximum of 220VDC (at the maximum of 5A Current).
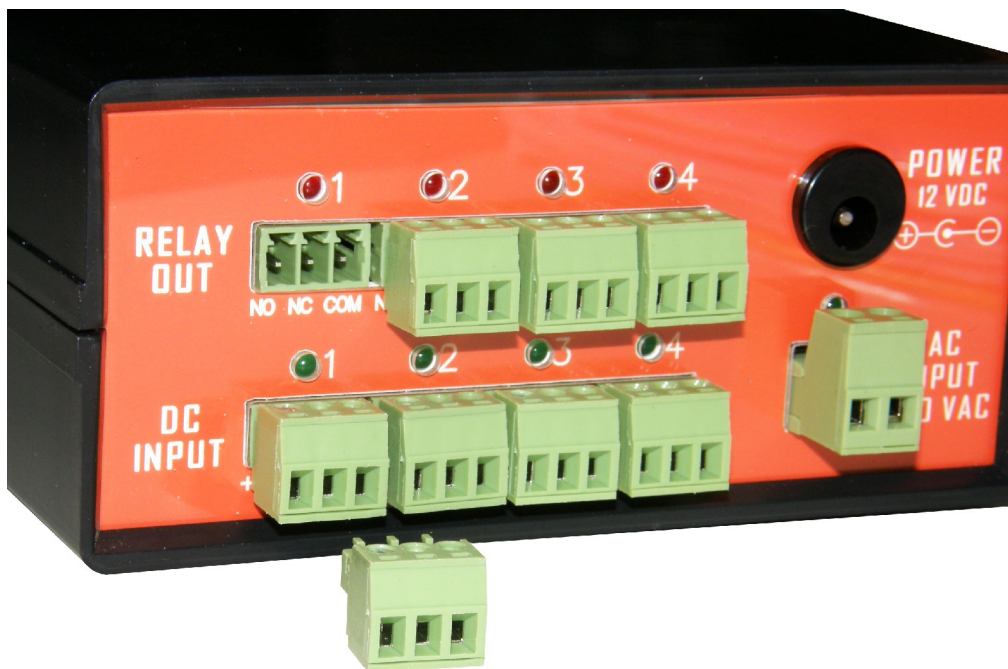

- **COM(COMMON):** This Pin is used together with NO or NC. While connecting, it always uses this Pin COMMON to be connecting point for Pin NO or NC.

O   Interface COM(COMMON) with NO (Normal Open) to be Switch that operates together with the operation of Relay. If Relay runs, the device that is controlled by Contact Relay also runs; or, if Relay stops, the device that is controlled by Contact Relay also stops.

O   Interface COM(COMMON) with NC (Normal Close) to be Switch and its operation contrasts with Relay. If Relay runs, the device that is controlled by Contact Relay stops; but, if Relay stops, the device that is controlled by Contact Relay runs.

- **NO(Normal Open):** It is Contact Relay as Normal Open. When Relay does not run, this Contact is opened; but, when Relay runs, this Contact is closed. While connecting, it uses Connector NO with Connector COMMAND as a Switch to enable/disable (ON/OFF) signal or power supply to control the operation of electrical appliances. This Contact is suitable for the application that requires controlling the operation of electrical appliance while using together with the Relay.
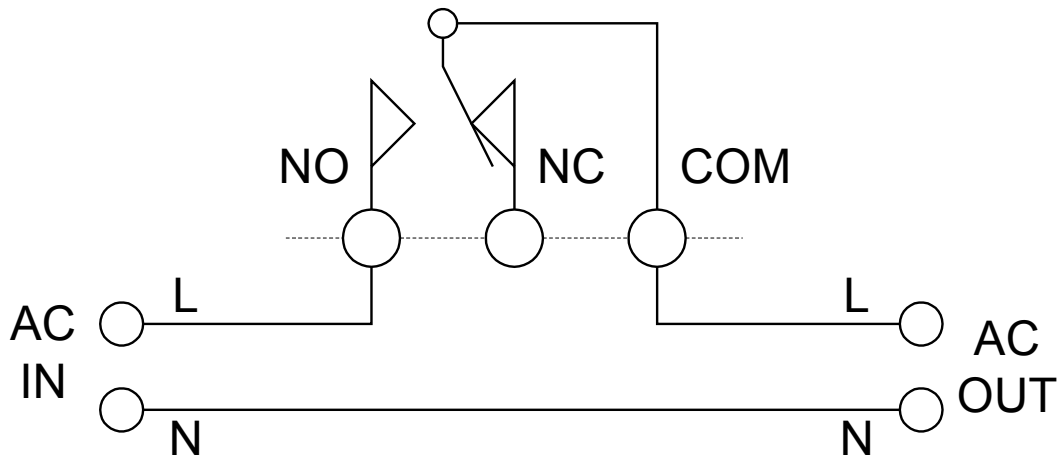
Picture illustrates an example of interfacing Relay in the format of Normal Open(NO) to enable/disable (ON/OFF) 220VAC electrical appliance.

- **NC(Normal Close):** It is Contact Relay as Normal Close. When Relay does not run, this Contact is closed (Short); but, when Relay runs, this Contact is opened. While connecting, it uses Connector NC with Connector COMMAND as a Switch to enable/disable (ON/OFF) signal or power supply to control the operation of electrical appliances. This Contact is suitable for the application that requires controlling the operation that contrasts with the operation of Relay.
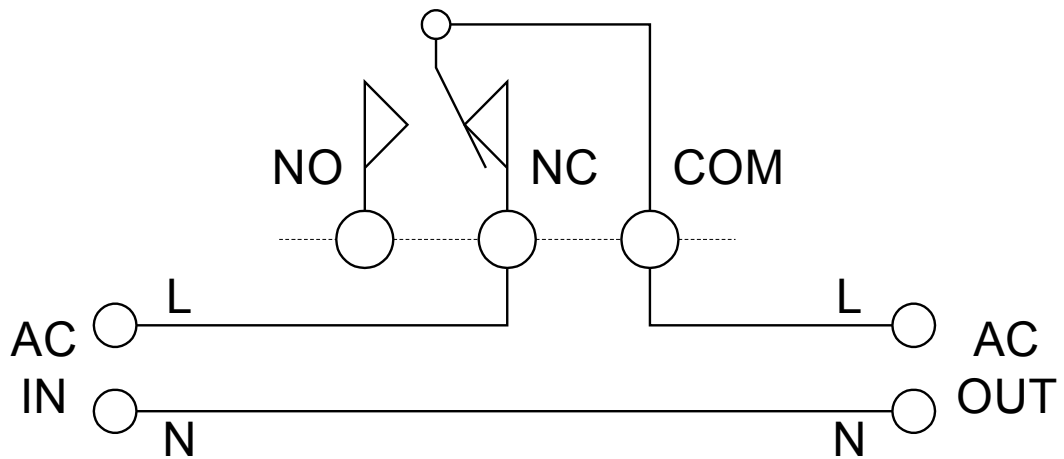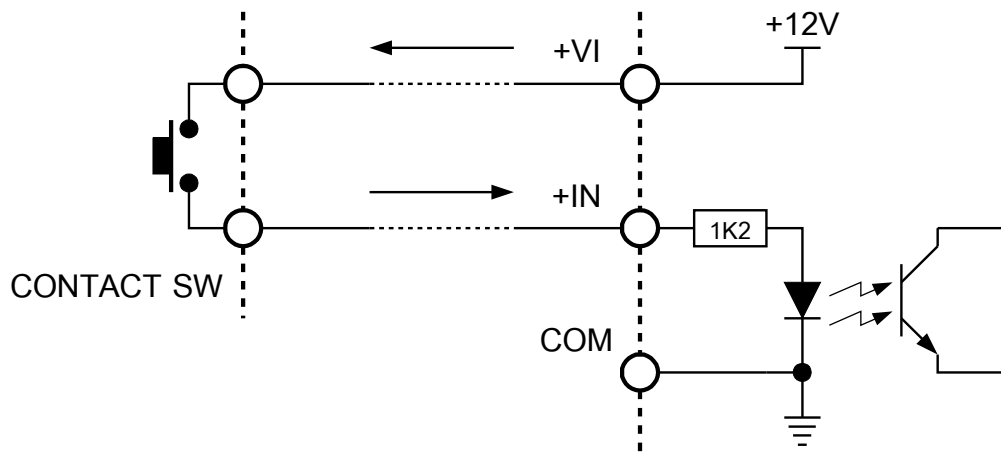

Picture illustrate an example of interfacing Relay in the format of Normal Close(NC) to enable/disable (ON/OFF) 220VAC electrical appliance.

INPUT DC and CONTACT

ET-GSM REMOTE I/O has 4 INPUTs to interface with Contact or DC Voltage; each set of INPUT DC has Connector 3 PIN PLUG TYPE TERMINAL BLOCK to be connecting point for INPUT. Moreover, there is LED to display operating status of INPUT. Connector of each Circuit INPUT consists of +VI(+12V), +IN(INPUT), and COM(COMMON or GND); there are several methods to interface INPUT such as Contact and INPUT DC or Source Current Sensor (PNP Sensor Type).

- CONTACT INPU uses Connector +VI and +IN to interface with Contact and the system externally supplies +12VDC to Pin +VI. If it is interfaced through Contact that is close, the current flows through the Contact, comes back to Connector +VI, and INPUT runs. But, if the Contact is Open, it separates the circuit and INPUT stops. It can interface Cable more than 50 meters well.
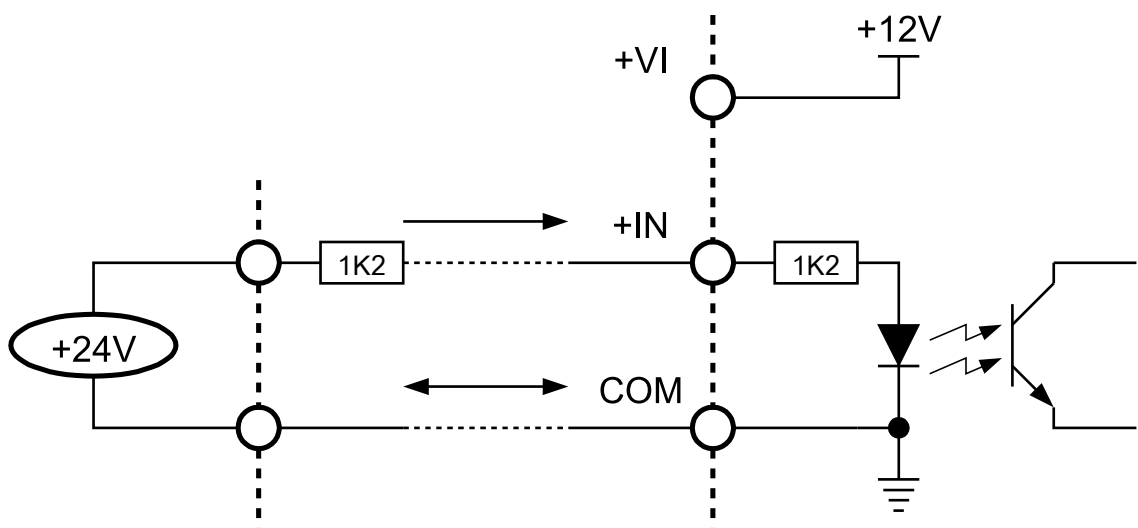

Picture illustrates an example of interfacing INPUT with Contact Switch (Contact SW).

● INPUT that supplies DC Voltage (+12V) uses Connector +IN and COM, it can be used with +12VDC Input Voltage. If using with higher voltage, it has to add more Resistors to limit current for the circuit; in this case, it has to interface Serial Resistor with Input (+IN) to limit the current first and then interface with the circuit later. It has to calculate the current that will be supplied to Input about 10mA.
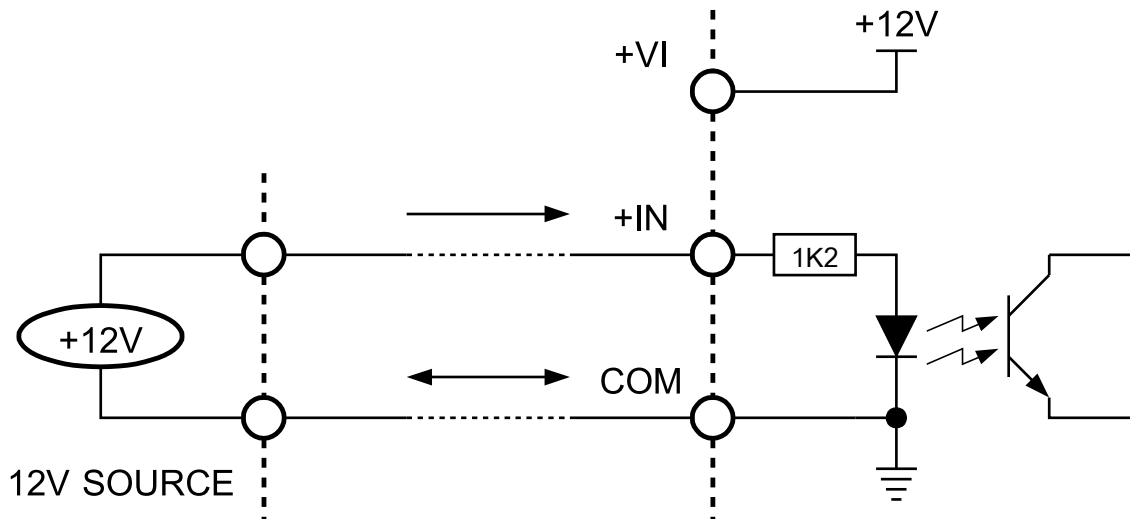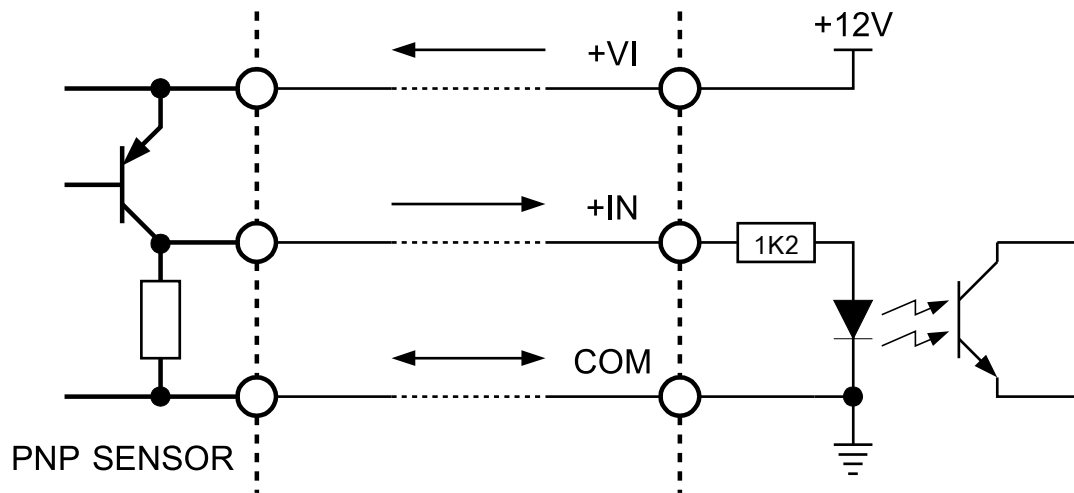

Picture illustrates an example of interfacing INPUT with 12V Input Source.

Picture illustrates an example of interfacing INPUT with 24V Input Source.

• Source Current Sensor Input or PNP Sensor Type interfaces with INPUT by using 3 Cables that are +VI, +IN, and COM(GND).

Picture illustrates an example of interfacing INPUT with PNP Sensor.

INPUT 220VAC

ET-GSM REMOTE I/O has 1-CH INPUT to detect 220VAC Power Supply and it can directly use this Input with 220VAC by using Connector 2 PIN PLUG TYPE TERMINAL. Moreover, there is LED to display the operating status of INPUT; this LED is lit up (ON) when INPUT is running or it is interfacing INPUT with 220VAC.

When user requires applying this INPUT 220VAC to alert trouble because of blackout and it uses the same source of Power Supply for INPUT 220VAC, it has to use UPS (Un-interruptible Power Supply) to be Power Supply for the device because the device can keep running at least 1 minute after blackout as shown in the example below;
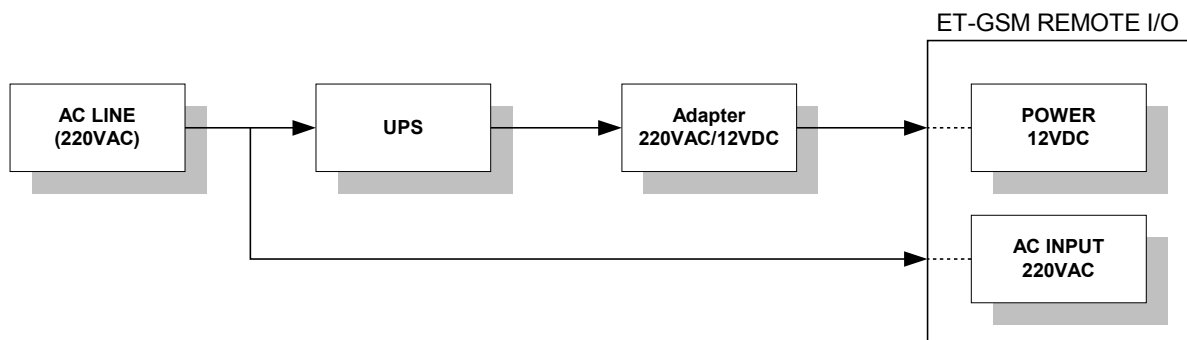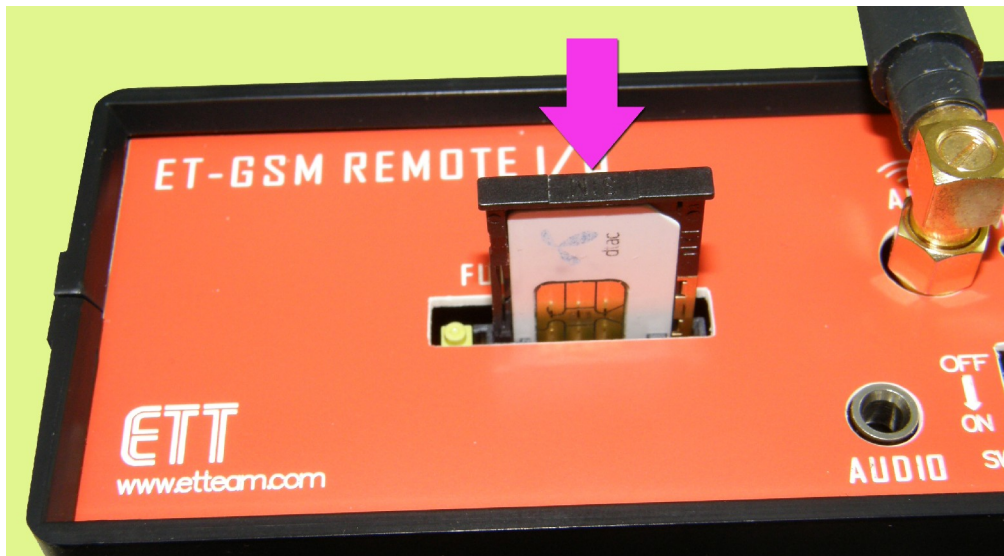

Diagram shows how to apply ET-GSM REMOTE I/O to alert trouble when 220VAC is turn off (blackout).

How to insert SIM CARD into device

Picture shows how to insert SIM CARD.

How to setup Configuration

User can setup Configuration for the device while it is in Setup Mode only; in this case, it has to set the position of SW1 at ON and it sets the position of SW2 at OFF.

There are 2 ways to setup Configuration of the device. Firstly, it setup value by short message (SMS); and secondly, it setup value by DTMF Code. There are 3 groups of Configuration and there are 8 values for each group.

● It sets a maximum of 8 numbers to receive a call and message; it is these numbers to command I/O of the device. When it is in Normal Mode, the device only receives a call and short message (SMS) from the specific numbers; the device rejects to receive any call and SMS from other than 8 numbers. If it is number that is set for receiving a call, it can set 9 digits or 10 digits as preferred. For example, if it is the telephone numbers in Bangkok and Bangkok Metropolitan Region are prefixed by 02 such as 021234567; or, if it is telephone numbers in provinces, it is prefixed by area code such as 031123456; or, if it is cell phone number, there are 10 digits such as 0811234567. However, if it is telephone number for receiving SMS, it only sets number with 10 digits such as 0811234567.

● It sets a maximum of 8 numbers to send warning message; it sends SMS to alert user instantly when the device found any change of INPUT according to the specific condition of warning. In this case, it only sets number with 10 digits such as 0811234567.

● It sets a maximum of 8 conditions of warning from the operation of INPUT; user can setup each condition for setting the operating features of INPUT according to the user's requirement. In this case, user can set condition of only one Input or several Inputs that have been changed and the device always checks operating condition or warning every time it found any change of INPUT.

> **NOTE:** Be careful about setting Configuration by DTMF Code because there are limitations when commanding by some series of cell phone, especially low quality. Remember, user should slowly press key to send DTMF and user should set timing suitably while pressing each key. If user continues pressing keys quickly, there is problem for some series of cell phone.

INSTRUCTION FORMAT

There are 2 methods if user requires commanding OUTPUT RELAY and checking INPUT status, including Configurations of ET-GSM REMOTE I/O; DTMF Code and SMS. Firstly, it commands the operation by DTMF Code, user makes a telephone call to the specific telephone number of ET-GSM REMOTE I/O and dials telephone key to send DTMF Code according to the specific the instruction format. Secondly, it commands the operation by SMS, user can type English letter and number according to the specific the instruction format; in this case, it is prefixed by asterisk sign (*) and then ended by hash mark(#). Both DTMF and SMS use the same instruction format as follows;

Instruction group to control and check I/O status

There are 7 digits for this Instruction group; it starts with asterisk sign (*) and it ends by hash sigh (#) as shown in the format below;

*	A	B	C	*	D	#

- * is the initial code or code separates data from command.
- **A** is the Command Code; there is 1 digit that is either 0 or 1.
  - **0:** It means "WRITE"; it is used to specify when user requires enabling/disabling (ON/OFF) the operation of Output.
  - **1:** It means "READ"; it is used to specify when user requires reading value of INPUT or Configuration.
- **B** is code to specify type of I/O.
  - **0:** It means Output (in case of reading, it means Firmware Version).
  - **1:** It means Signal Quality.
  - **2:** It means Signal Status.
  - **3:** It means Configuration.
- **C** specifies Input/Output number.
  - If the value is in the range of 1…4, it means Output Relay1.
  - If the value is 9, it means all.
- **D** specifies the value of Output Relay or condition of command.
  - **0** means OFF.
  - **1** means ON.
  - **2** means Report Status.

Example of using Instruction

Instruction group to enable/disable (ON/OFF) RELAY

Instruction Code	Operation of Instruction
*001*0#	Disable (OFF) operation of RELAY-1
*001*1#	Enable (ON) operation of RELAY-1
*002*0#	Disable (OFF) operation of RELAY-2
*002*1#	Enable (ON) operation of RELAY-2
*003*0#	Disable (OFF) operation of RELAY-3
*003*1#	Enable (ON) operation of RELAY-3
*004*0#	Disable (OFF) operation of RELAY-4
*004*1#	Enable (ON) operation of RELAY-4

Instruction group to report value

Instruction Code	Operation of Instruction
*109*2#	Report Firmware version
*119*2#	Report signal quality
*129*2#	Report current status of all Signal I/O
*139*2#	Report Configuration that is setup in the device

If the command that reports status of Signal I/O and value of Configuration has been done through SMS, the device also reports and resends the status through SMS according to the specified number in Configuration. If it is commanded through DTMF, the device reports the status through audio message to the incoming telephone call instead.

Instruction group to setup Configuration

Command to setup number to receive a phone call and message

Command Code	Operation of Command
*03x*123456789#	Setup number to receive a phone call x as 123456789 (9 digits)
*03x*1234567890#	Setup number to receive a phone call and message x as 1234567890 (10 digits)
03x#	Cancel number to receive a phone call and message x

Example of using Command

Command Code	Operation of Command
*031*021234567#	Setup number to receive a phone call 1 as 02-1234567 (9 digits)
*032*056123456#	Setup number to receive a phone call 2 as 056-123456 (9 digits)
*033*0811234567#	Setup number to receive a phone call and message 3 as 081-1234567 (10 digits)
031#	Cancel number to receive a phone call and message 1
032#	Cancel number to receive a phone call and message 2
033#	Cancel number to receive a phone call and message 3
034#	Cancel number to receive a phone call and message 4
035#	Cancel number to receive a phone call and message 5
036#	Cancel number to receive a phone call and message 6
037#	Cancel number to receive a phone call and message 7
038#	Cancel number to receive a phone call and message 8

Command to setup number to alert warning through SMS

Command Code	Operation of Command
*04x*1234567890#	Setup number to alert warning through message x as 1234567890 (10 digits)
04x#	Cancel number to alert warning through message x

Example of using Command

Command Code	Operation of Command
*041*0811234567#	Setup number to alert warning through message 1 as 081-1234567 (10 digits)
041#	Cancel number to alert warning through message 1
042#	Cancel number to alert warning through message 2
043#	Cancel number to alert warning through message 3
044#	Cancel number to alert warning through message 4
045#	Cancel number to alert warning through message 5
046#	Cancel number to alert warning through message 6
047#	Cancel number to alert warning through message 7
048#	Cancel number to alert warning through message 8

Command to setup condition of warning

This instruction group is used to setup condition to detect any change of Input and it warns user instantly when the condition of Input has been changed according to the specified value; in this case, user can setup condition of only one Input or several Inputs at the same time. For example, if user setup condition of warning to alert user when Input DC1 only operates, the device only sends the warning message to the specified number when it found that the status of Input DC1 has been changed from stop to run. If user setup condition of warning to alert user when Input DC1 operates but Input DC2 and DC3 stops operating, the device only sends the warning message when the condition of all 3 Inputs accords with the specified condition. While detecting this warning, user also setup condition of this device to enable/disable OUTPUT when it found the condition.

User can setup this condition of warning through SMS or DTMF; however, it only setup the condition while the device is operating in Setup Mode only. If it is operating in Normal Mode, it cannot setup any condition or cannot change any condition. In case of using DTMF Code that presses telephone keys ('0'-'9',*,#), the ignore condition is replaced by the key number 2; if it is SMS, it is replaced by question mark (?) instead.

Command Code	Operation of Command
*05x*12345*6789#	Setup condition of warning through message x when 12345 and control 6789 Setup condition of warning through message x when it found the condition • 1 = Input DC1 Status (0=OFF, 1=ON, ?(2)=Ignore) • 2 = Input DC2 Status (0=OFF, 1=ON, ?(2)=Ignore) • 3 = Input DC3 Status (0=OFF, 1=ON, ?(2)=Ignore) • 4 = Input DC4 Status (0=OFF, 1=ON, ?(2)=Ignore) • 5 = Input AC1 Status (0=OFF, 1=ON, ?(2)=Ignore) Output changes when it found condition of warning • 6=Output Relay1 Control (0=OFF, 1=ON, ?(2) Unchanged) • 7=Output Relay2 Control (0=OFF, 1=ON, ?(2) Unchanged) • 8=Output Relay3 Control (0=OFF, 1=ON, ?(2) Unchanged) • 9=Output Relay4 Control (0=OFF, 1=ON, ?(2) Unchanged)
05x#	Cancel condition of warning through message x

Example of using Command

Command Code	Operation of Command

*051*1????*????#
or
*051*12222*2222#
	Setup condition of warning through message 1 when it found any condition
	  • Input DC1 Operate
	  • Input DC2 Ignore
	  • Input DC3 Ignore
	  • Input DC4 Ignore
	  • Input AC1 Ignore
	Output changes when it found condition of warning
	  • Output Relay1 Unchanged
	  • Output Relay2 Unchanged
	  • Output Relay3 Unchanged
	  • Output Relay4 Unchanged

Command Code	Operation of Command

*052*10?1?*10?1#
or
*052*10212*1021#
	Setup condition of warning through message 2 when it found any condition
	  • Input DC1 Operate
	  • Input DC2 Stop
	  • Input DC3 Ignore
	  • Input DC4 Operate
	  • Input AC1 Ignore
	Output changes when it found condition of warning
	  • Output Relay1 Operate
	  • Output Relay2 Stop
	  • Output Relay3 Unchanged
	  • Output Relay4 Operate

053????1*???1#
or
*053*22221*2221#
	Setup condition of warning through message 3 when it found any condition
	  • Input DC1, 2, 3, 4 Ignore
	  • Input AC1 Operate
	Output changes when it found condition warning
	  • Output Relay1, 2, 3 Unchanged
	  • Output Relay4 Operate

051#	Cancel condition of warning through message 1
052#	Cancel condition of warning through message 2
053#	Cancel condition of warning through message 3
054#	Cancel condition of warning through message 4
055#	Cancel condition of warning through message 5
056#	Cancel condition of warning through message 6
057#	Cancel condition of warning through message 7
058#	Cancel condition of warning through message 8

Audio Report (setting DIP-SW3 at ON position)

If setting position of DIP-SW3 at ON, operation of the device is reported by audio message through Connector Audio; in this case, user can interface signal from Connector Audio with Amplifier such as amplifier and speaker of computer PC in order to follow up the operation of the device.

Picture illustrates an example of interfacing Amplifier of computer PC with ET-GSM REMOTE I/O.

Audio report while setting device in Normal Mode or Setup Mode

- ET-GSM REMOTE IO
- Firmware Code + (0 1 0 1 2 0 1 3)
- Start booting the system
- Opening the Communication system
- The Communication system starts operating
- (Normal Mode, Setup Mode) + be ready to run
- The system is ready.
- DTMF is ready.
- The Communication system is ready.
- Signal quality + (0,1,2,3,4,5,6,7,8,9,10+)
- Level + (poor, fair, good, excellent)
- ….

Audio report while setting device in Restore Default Mode

- ET-GSM REMOTE IO
- Firmware ID + (0-1-0-1-2-0-1-3)
- Start booting the system
- Confirm the standard value for system

When ON/OFF DIP-SW2 for 5 times, it confirms values of the system are reset to be standard value.

- Reset values of the system to be standard value
- Report setting values
- Report number to receive a phone call + (1,2,3,4,5,6,7,8) + haven't set any value yet
- Report number to alert warning message + (1,2,3,4,5,6,7,8) + haven't set any value yet
- Report condition of warning + (1,2,3,4,5,6,7,8) + haven't set any value yet
- End of report setting value

- Reboot the Communication System
- Open the Communication System

…(waiting for a moment, the communication system is rebooting..)

- The Communication system starts operating
- (Normal Mode, Setup Mode) + be ready to run
- The System is ready
- DTMF is ready
- The Communication system is ready
- Signal quality + (0,1,2,3,4,5,6,7,8,9,10+)
- Level + (poor, fair, good, excellent)
- ….

Audio Warning Report when it found condition of warning

When ON/OFF of any Input (DC1, DC2, DC3, DC4, AC1) is changed, it reports

- Found + Input + (DC1, DC2, DC3, DC4, AC1) + (run, stop running)

If user has set condition of warning and it is correct, it reports

- Found the warning message + (1,2,3,4,5,6,7,8)

If it does not set any condition of change for Output and when it found any condition, it reports

- Haven't command Output Relay yet

If it sets condition of change for Output and when it found any condition, it reports

- (ON, OFF, Unchanged) + Output Relay + 1
- (ON, OFF, Unchanged) + Output Relay + 2
- (ON, OFF, Unchanged) + Output Relay + 3
- (ON, OFF, Unchanged) + Output Relay + 4

Report condition of warning

- Report condition of warning + (1,2,3,4,5,6,7,8)

If it does not set any condition of warning, it reports

- Haven't set any value yet

If it sets condition of warning, it reports

- Report warning when it found condition
- Input DC1 + (run, stop running, ignore)
- Input DC2 + (run, stop running, ignore)
- Input DC3 + (run, stop running, ignore)
- Input DC4 + (run, stop running, ignore)
- Input AC1 + (run, stop running, ignore)

If it does not set any condition of change for Output and when it found any condition, it reports

- Output is unchanged when it found warning

If it sets condition of change for Output and when it found any condition, it reports

- It runs when it found condition
- Output Relay 1 + (run, stop running, unchanged)
- Output Relay 2 + (run, stop running, unchanged)
- Output Relay 3 + (run, stop running, unchanged)
- Output Relay 4 + (run, stop running, unchanged)

Report status of receiving command through DTMF

If it found the instruction format as *001*0#, it reports

- Receive command + OFF + Output Relay + 1

If it found the instruction format as *001*1#, it reports

- Receive command + ON + Output Relay + 1

If it found the instruction format as *002*0#, it reports

- Receive command + OFF + Output Relay + 2

If it found the instruction format as *002*1#, it reports

- Receive command + ON + Output Relay + 2

If it found the instruction format as *003*0#, it reports

- Receive command + OFF + Output Relay + 3

If it found the instruction format as *003*1#, it reports

- Receive command + ON + Output Relay + 3

If it found the instruction format as *004*0#, it reports

- Receive command + OFF + Output Relay + 4

If it found the instruction format as *004*1#, it reports

- Receive command + ON + Output Relay + 4

If it found the instruction format as *109*2#, it reports

- Receive command to report Firmware ID ET-GSM REMOTE IO
- Firmware ID + (0-1-0-1-2-0-1-3)

If it found the instruction format as *119*2#, it reports

- Receive command to report the signal quality
- Level of Signal quality + (0,1,2,3,4,5,6,7,8,9,10+)
- Level + (poor, fair, good, excellent)

If it found the instruction format as *129*2#, it reports

- Receive command to report signal status()
- Input + DC1 + (run, stop running)
- Input + DC2 + (run, stop running)
- Input + DC3 + (run, stop running)
- Input + DC4 + (run, stop running)
- Input + AC1 + (run, stop running)
- Output + Relay 1 + (run, stop running)
- Output + Relay 2 + (run, stop running)
- Output + Relay 3 + (run, stop running)
- Output + Relay 4 + (run, stop running)
- End of report signal

If it found the instruction format as *139*2#, it reports (it reports the status of setting value)

- **Receive command to report on setup value**

- **Report number to receive a phone call + (1,2,3,4,5,6,7,8)**

If it sets number to receive a phone call, it reports

- *Number + (XXX…X)*

If it hasn't set any number to receive a phone call yet, it reports

- *Haven't set any value yet*

- **Report number to alert warning message + (1,2,3,4,5,6,7,8)**

If it sets number to receive a phone call, it reports

- *Number + (XXX…X)*

If it hasn't set any number to receive a phone call yet, it reports

- *Haven't set any value yet*

If it sets condition of warning, it reports

- *Report warning when it found the condition*
- *Input (DC1, DC2, DC3, DC4, AC1) + (run, stop running, ignore)*

If it hasn't set any condition of change for Output and when it found the specific condition, it reports

- *Output is unchanged when it found the condition of warning.*

If it sets condition of change for Output and when it found the specific condition, it reports

- *It operates when it found the condition.*
- *Output Relay (1,2,3,4) + (run, stop running, unchanged)*

- **End to reports status of setting value**

> **If it found the instruction format as *03?*XXX…X# and it is in Setup Mode, it reports**

- Receive command to save the number that receives a phone call (1,2,3,4,5,6,7,8)
- Number (XXX…X)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at position of ON, it reports**

- Reject to setup any value in Normal Mode

> **If it found the instruction format as *03?*# and it is in Setup Mode, it reports**

- Receive command to cancel the number that receives a phone call (1,2,3,4,5,6,7,8)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at position of ON), it reports**

- Reject to setup any value in Normal Mode

> **If it found the instruction format as *04?*XXXXXXXXX# and it is in Setup Mode, it reports**

- Receive command to save the number that alerts warning (1,2,3,4,5,6,7,8)
- Number + (XXXXXXXXXX)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports**

- Reject to setup any value in Normal Mode

> **If it found the instruction format as *04?*# and it is in Setup Mode, it reports**

- Receive command to cancel the number that alerts warning (1,2,3,4,5,6,7,8)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports**

- Reject to setup any value in Normal Mode

If it found the instruction format as *05?*XXXXX*YYYY# and it is in Setup Mode, it reports

- Receive command to save condition of warning
(1,2,3,4,5,6,7,8)

Report new condition of warning

If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports

- Reject to setup any value in Normal Mode

If it found the instruction format as *05?*# and it is in Setup Mode, it reports

- Receive command to cancel condition of warning
(1,2,3,4,5,6,7,8)

If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports

- Reject to setup any value in Normal Mode

If the instruction format is incorrect, it reports

- Command is incorrect

Report operating status in Normal Mode and Setup Mode

When there is an incoming telephone call while it is in Setup Mode or it comes from the specific number, it reports

- Receive a phone call (XXX…X)
- Please input Command Code

When there is an incoming phone call from unspecified number in Normal Mode, it reports

- Reject to receive any phone call from number (XXX…X)

When there is a message from unspecified number in Normal Mode, it reports

- Ignore the number that receives a message

When there is a message from the specific number or it receives any message while it is in Setup Mode, it reports

- receive message

After it received the message completely and it found that it is the right command according to the specific condition, it reports every command that it found.

*If it found the instruction format as *001*0#, it reports*

- Found the Command message + OFF + Output Relay + 1

*If it found the instruction format as *001*1#, it reports*

- Found the Command message + ON + Output Relay + 1

*If it found the instruction format as *002*0#, it reports*

- Found the Command message + OFF + Output Relay + 2

*If it found the instruction format as *002*1#, it reports*

- Found the Command message + ON + Output Relay + 2

If it found the instruction format as *003*0#, it reports

- Found the Command message + OFF + Output Relay + 3

If it found the instruction format as *003*1#, it reports

- Found the Command message + ON + Output Relay + 3

If it found the instruction format as *004*0#, it reports

- Found the Command message + OFF + Output Relay + 4

If it found the instruction format as *004*1#, it reports

- Found the Command message + ON + Output Relay + 4

If it found the instruction format as *129*2#, it reports

- Found the Command message, report the signal status

The device sends a short message to report status of signal to the specific number; in this case, the format of short message (SMS) is shown in the example below;

Report Signal

DC1=ON

DC2=OFF

DC3=OFF

DC4=OFF

AC1=OFF

RY1=ON

RY2=OFF

RY3=OFF

RY4=OFF

End of Report

If it found the instruction format as *139*2#, it reports

- **It found the Command Message that reports status of setting value through message**

> *The device sends 3 short messages to report status of setup number to receive a phone call, setup number to alert warning, and setup condition of warning to the specific number. In this case, the format of short message is shown in the example below;*

Report Cal Number

1=XXX…X

2=XXX…X

3=XXX…X

…

…

…

8=XXX…X

End of Report

Report SMS Number

1=0811234567

2=Not Config

3=Not Config

…

…

…

8=Not Confog

End of Report

Report Config Alarm

1=1????,1???

2=?????,????

3=?????,????

…

…

…

8=?????,????

End of Report

> **If it found the instruction format as *03?*XXX…X# and it is in the Setup Mode, it reports**

- Found the Command message
- Save the number that receives a phone call (1,2,3,4,5,6,7,8)
- Number (XXX…X)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports**

- Reject to setup any value in Normal Mode

> **If it found the instruction format as *03?*# and it is in the Setup Mode, it reports**

- Found the command message
- Cancel the number that receives a phone call(1,2,3,4,5,6,7,8)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports**

- Reject to setup any value in Normal Mode

> **If it found the instruction format as *04?*XXXXXXXXXX# and it is in the Setup Mode, it reports**

- Found the command message
- Save the number that alerts warning (1,2,3,4,5,6,7,8)
- Number + (XXXXXXXXXX)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports**

- Reject to setup any value in Normal Mode

> **If it found the instruction format as *04?*# and it is in the Setup Mode, it reports**

- Found the Command Message
- Cancel number that alerts warning (1,2,3,4,5,6,7,8)

> **If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports**

- Reject to setup any value in Normal Mode

> *If it found the instruction format as *05?*XXXXX*YYYY# and it is in the Setup Mode, it reports*

- Found the Command Message
- Save condition of warning (1,2,3,4,5,6,7,8)

> *If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports*

- Reject to setup any value in Normal Mode

> *If it found the instruction format as *05?*# and it is in the Setup Mode, it reports*

- Found the Command Message
- Cancel condition of warning (1,2,3,4,5,6,7,8)

> *If the operation mode is not in Setup Mode (DIP-SW1 is not at the position of ON), it reports*

- Reject to setup any value in Normal Mode