Ambetronics Engineers Private Ltd

User Manual
Smart IoT Gateway

Model No : SIG Series

Version: 1.0
Effective date: 21-02-2020
Rev no: R1

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TABLE OF CONTENTS

1. SAFETY INFORMATION

Before operating the instrument, ensure that this user manual is read. Pay attention to the warnings and cautions. Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing them. All warnings and cautions are listed here and repeated at appropriate place according to relevant subjects of user manual. Information that may raise safety concerns is indicated by a warning symbol (⚠). Refer to the following safety messages mentioned with (⚠) symbol before performing any tasks.

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2. ⚠ WARNINGS / CAUTIONS

- This instrument is meant to be used in safe and controlled environment only.
- Accessing the interior of the instrument to carry out any repair work the qualified personnel only.
- Opening the box for changing to programming mode for editing the configuration should be done in a clean and dust free environment.
- The device must be used in an RF free environment to reduce the errors in the operation

3. INFORMATION

- This manual is intended to provide guidance for installation, operating and maintaining the SIG series.
- The reader of this manual should ensure that this manual and the corresponding instrument that is referred to are matching with each other. In case of any queries, please contact the supplier / Manufacturer for support.
- In order to minimise the risk of fire or electric shock, the unit must be protected against atmospheric precipitation and excessive humidity.
- Do not use the unit in areas threatened with excessive shocks, vibrations, dust, humidity, corrosive gases and oils.

Do not use the unit in Hazardous areas.

- Ensure that the ambient temperature does not exceed the recommended values. In such cases, forced cooling of the unit must be considered.

4. INTRODUCTION

Figure 1

4.1 OVERVIEW

SMART IoT GATEWAY (SIG) is versatile device which reads Modbus memory map of any RS-485 Modbus protocol device and sends the data to cloud server. The stored data can be viewed as per the customer requirements on Dashboard. SIG mainly consist of GSM module and Microcontroller based control circuit. It supports generic Modbus RTU, Modbus TCP/IP and Modbus over TCP/IP protocols for data acquisitions and uses MQTT protocol to communicate with IT applications like database on cloud. Multiple slave devices can be configured to SIG. It remotely monitors all industrial sensors data to the cloud server.
SIG is very reliable and highly scalable solution for IoT deployment.

4.2 FEATURES

- 48- Nodes (with GSM)
- Waste water treatment plants
- Lora Connectivity
- 124x68 GLCD Display
- 4 - Double changeover Relays
- Buzzer and Bi-colour LED indications
- SMS / Email Alert
- MQTT / TCP-IP Connection
- Cloud Base Support System
- Pen drive Interface
- Ethernet / RS-485 /RS-232 - Input/output Port (For SCADA/PLC/PC Etc.)
- Two settable Alarm set-points per channel (High/Low)

4.3 APPLICATIONS

- Refineries & Petrochemical Area
- Power & Industrial Plants
- Coal Mine and Confined Area
- Waste water treatment plants
- Tank in Farms
- Leak detection in Gas Pipelines
- Cold Storage
- Coal Mine and Confined Area
- Refineries & Petrochemical Area
- Power & Industrial Plants
- Emergency response to off-site leak detection
- Global supporting GSM module (2G-900MHz/1800MHz) , Dual SIM slots

4.4 TECHNICAL SPECIFICATIONS

POWER SUPPLY AND CONSUMPTION		
Power Supply	:	7-24V DC (Optional 12V DC Adaptor)
Connector	:	3-Pin Terminal Block (Optional 12V DC Socket)
Protection	:	Inline bridge and fuse protection circuit.
DATA STORAGE		
Memory-1	:	32000-Records (For Pen-drive)
Memory-2	:	65000-Records (For Network Failure)
COMMUNICATION PORTS		
Ports	:	2 × RS485 (Optional RS-232 and Ethernet)
CELLULAR INTERFACES		
Connectivity	:	2G (3G/4G Optional), GSM850, GSM900, DCS1800, PCS1900
Antenna	:	-3dBi
SIM Slots	:	2
LORA CONNECTIVITY		
Modulation	:	LORA
Frequency	:	850.125 to 931.25 (ISM Band)
Distance	:	1000 meter (Line-of-sight)
CLOUD CONNECTIVITY		
Connector	:	Type-A
Logging mode	:	Online / Offline
Logging interval	:	60 To 999 Seconds
INDICATIONS		
Display	:	64 x 128 GLCD
User Interface	:	1 x SET, 1 x INCR, 1 x SHIFT (Optional Capacitive Touch)
LED Indicators	:	1 × Device Status, 1 × Alarm, 1 × Communication, 1 × Network
ALERT NOTIFICATIONS		
Buzzer	:	Beep Sound
Relay	:	4 x Double Changeover Relays
DEVICE CONFIGURATION		
Nodes	:	48 MODBUS Slaves with GSM (SIG2LRN / SIG4LRN)
Configuration	:	PC Software
Operating Modes	:	Programming and Application
Security	:	Password Protected Configuration
PHYSICAL CHARACTERISTICS		
Protection Class	:	IP-66
Weight	:	~ 1Kg
Dimensions	:	271(L) x 170(W) x 60(H)
Mounting	:	Desktop, Wall Mounting
ENVIRONMENTAL		
Operating Temperature	:	0°C to 50°C
Storage Temperature	:	0°C to 60°C
Relative Humidity	:	10% to 90% RH, Non- Condensing

4.5

4.6 MODULE TYPE AND FUNCTIONS

Table 1

	NODES	PROTOCOL	INPUT COMMUNICATION			OUTPUT COMMUNICATION			CONFIGURATION	NOTIFICATION	
MODEL NO	NO. OF SLAVE	MQTT	RS-485	ETHERNET (OPTIONAL)	RS-232	GSM	USB LOGGING	ETHERNET/ RS -485	RS-485	EMAIL	SMS
SIG2LRN	48	✓	✓	ON REQUEST	ON REQUEST	2G	✓	✓	✓	✓	✓
SIG4LRN	48	✓	✓	ON REQUEST	ON REQUEST	4G	✓	✓	✓	✓	✓

NOTE:

1. Default "✓"settings are available in device.
2. Optional TCP/IP, RS-232, Ethernet settings will be available "On Request".

5. HARDWARE DETAILS

5.1 MECHANICAL FITTINGS, INSTALLATION AND INSTRUMENT VIEW OF WEATHERPROOF MODEL

Figure2 **SIG4LRN-WP**

5.2 WALL MOUNTING DETAILS OF WEATHEPROOF MODEL

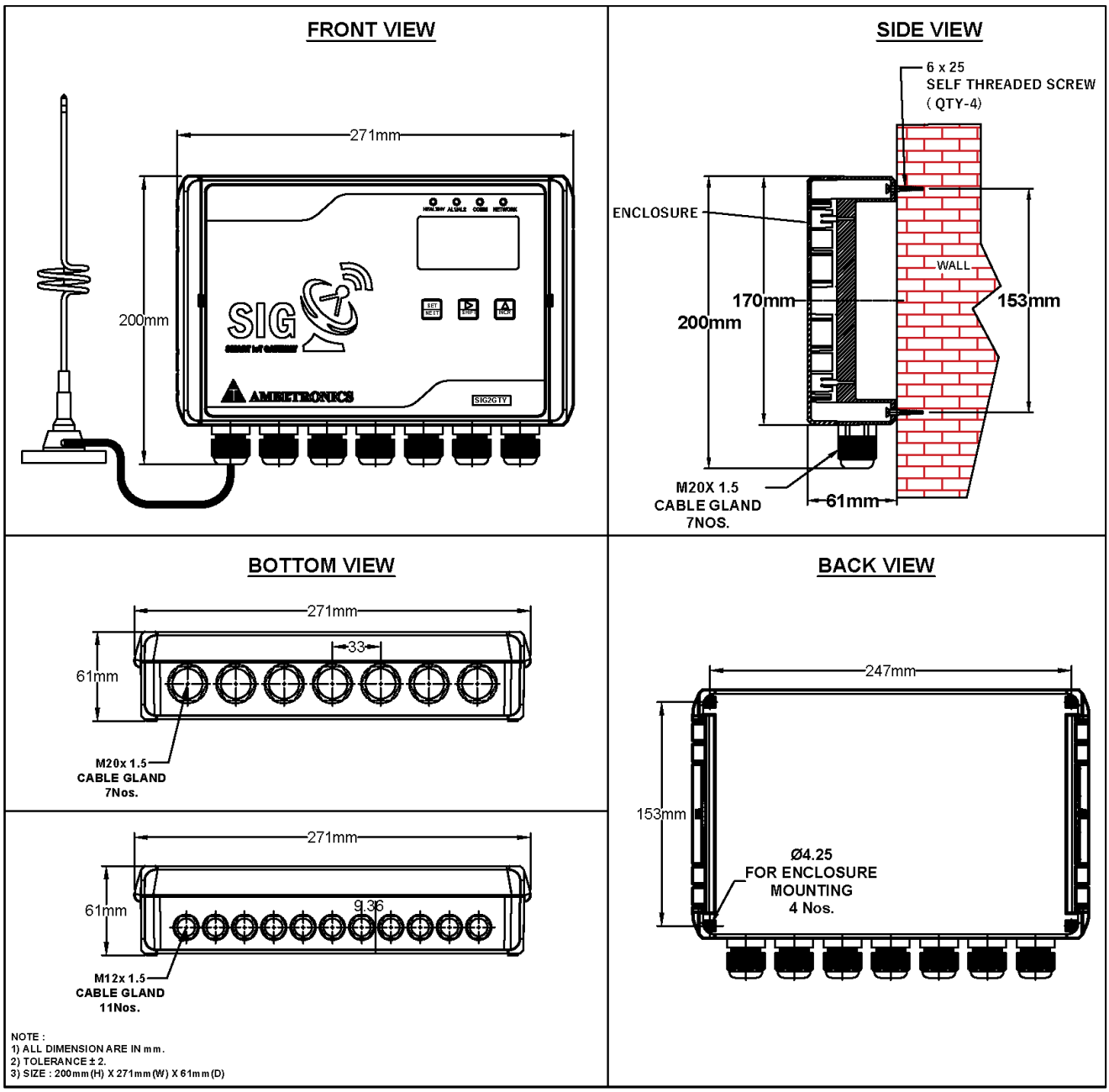


Figure 3 **SIG4LRN-WP**

5.3 MECHANICAL FITTINGS, INSTALLATION AND INSTRUMENT VIEW OF FLAMEPROOF MODEL

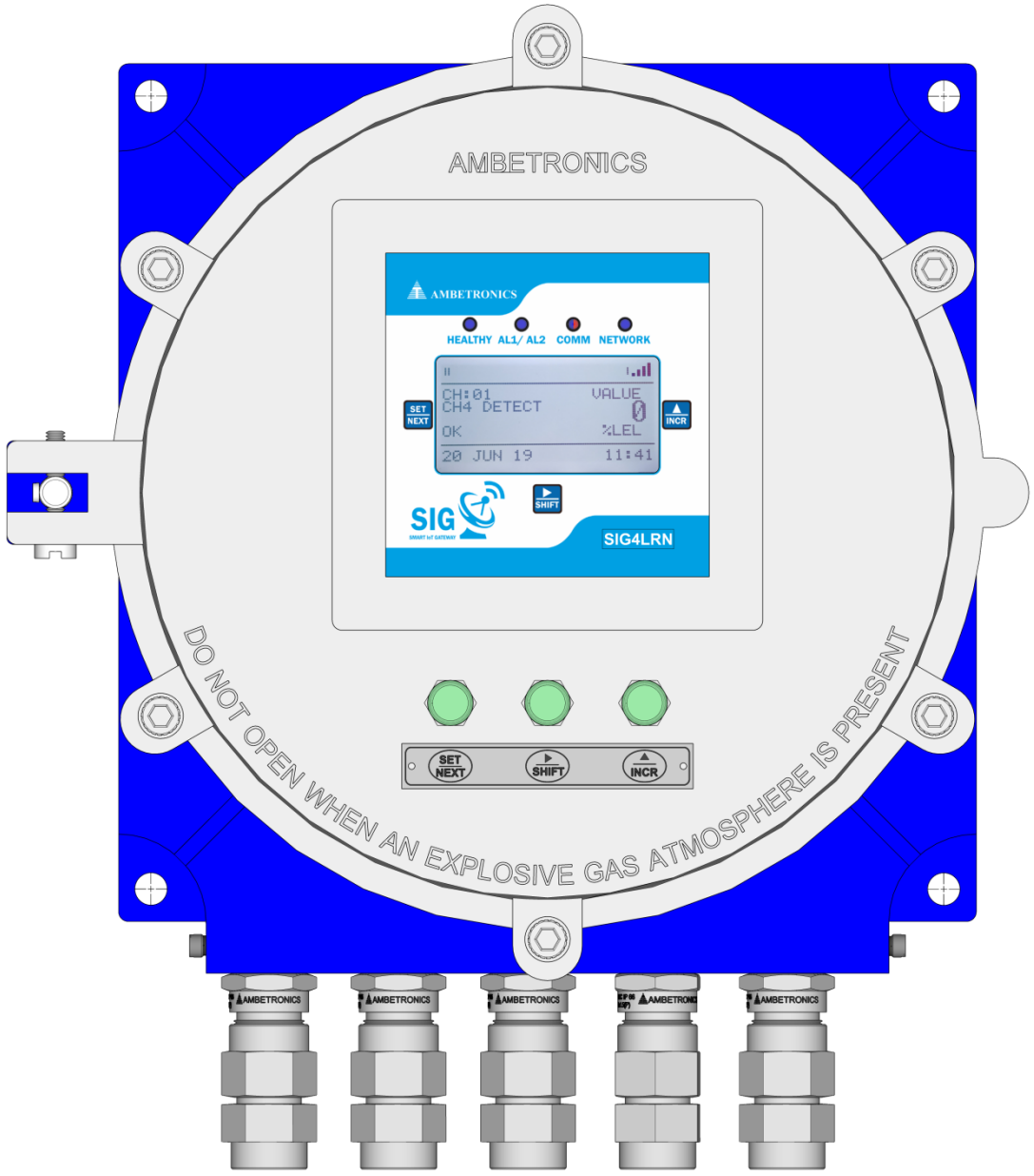


Figure 4 **SIG4LRN-F-IB-12**

5.4 WALL MOUNTING DETAILS OF FLAMEPROOF MODEL

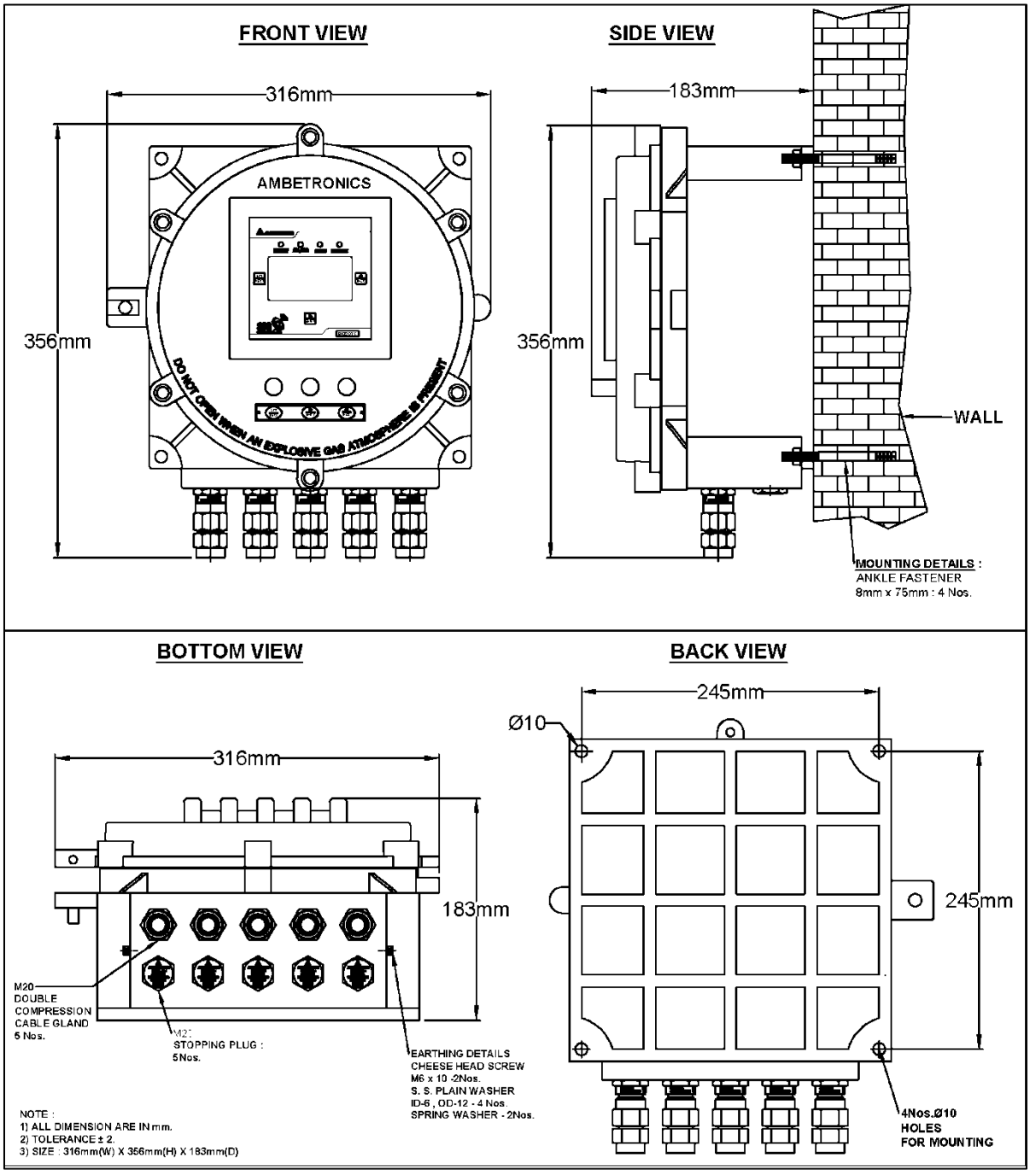


Figure 5 **SIG4LRN-F-IB-12**

5.5 MECHANICAL FITTINGS, INSTALLATION AND INSTRUMENT VIEW OF MS BOX MODEL

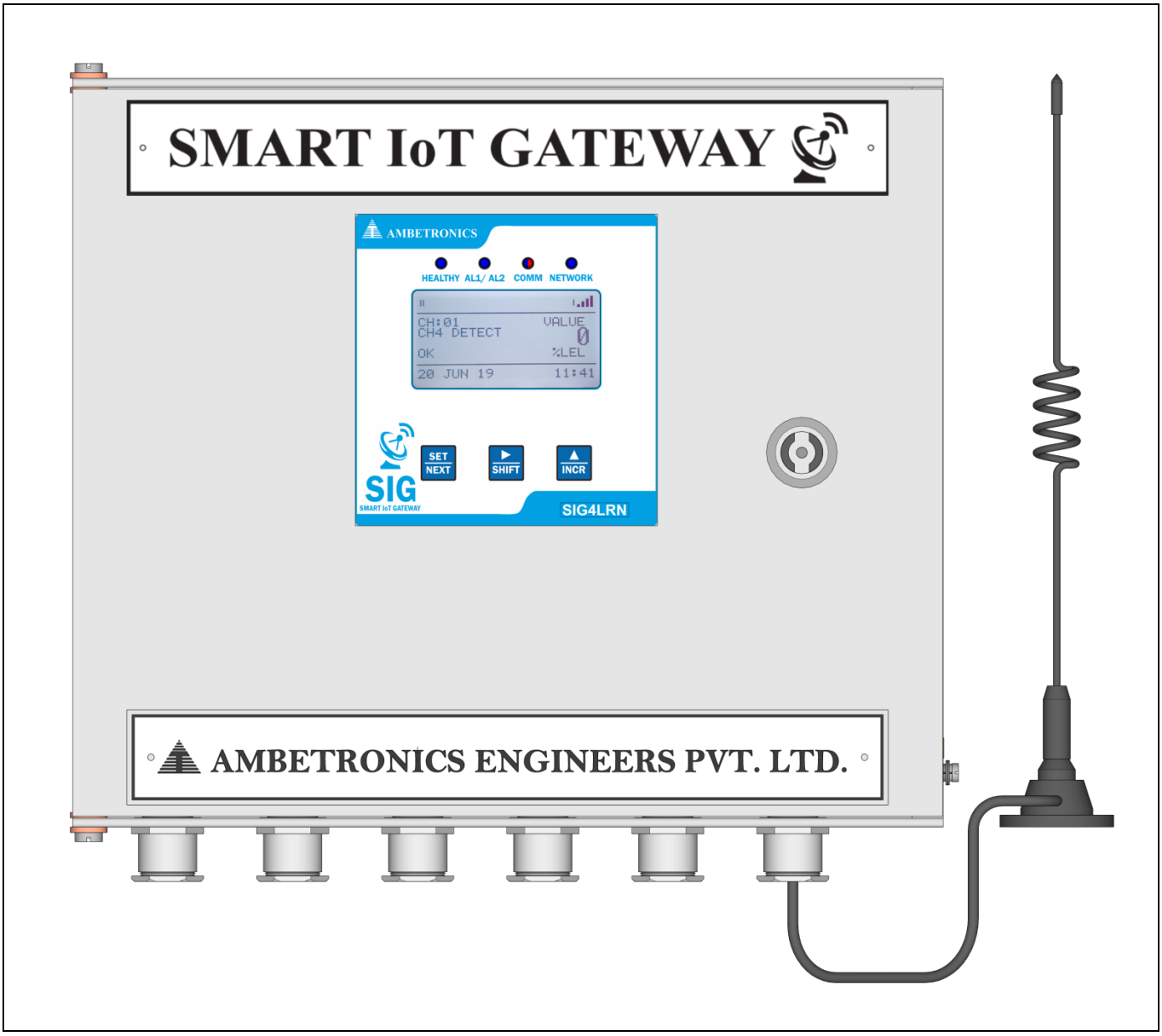


Figure 6 **SIG4LRN-MS BOX**

5.6 WALL MOUNTING DETAILS OF MS BOX MODEL

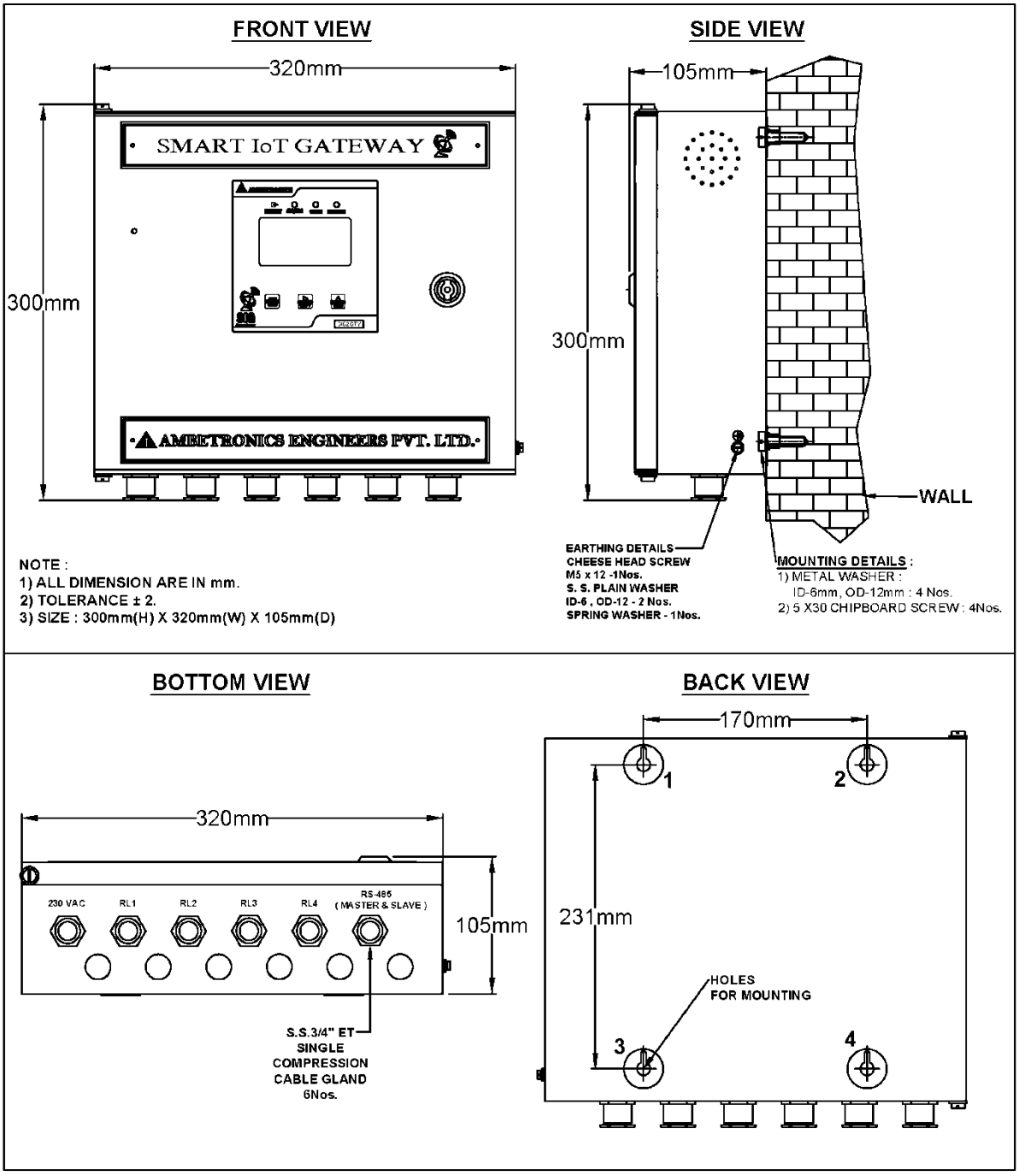


Figure 7 **SIG4LRN-MS BOX**

6. DEVICE PARAMETERS

Table 2

PARAMETERS	SETABLE VALUE	DEFAULT
Channels	• 48 Channels with GSM (SIG2LRN) • 48 Channels with GSM (SIG4LRN)	48 Channels 48 Channels
Function Code	01. Coil register 02. Input status 03. Holding register 04. Input register	03. Holding register
Add resister	0-65,000	0
Decimal point	0. 0000 1. 000.0 2. 00.00 3. 0.000	1. 000.0
Alarm per channel	2	0
Set Point	0-9999	0000
Logic	High / Low	Low
Relay	1-4	1
SMS	0-10	0
Email	0-5	0
Baudrate	9600bps ,19200bps,38400bps, 57600bps	9600bps
Data bit	8	8
Parity	None, Odd, Even	None
Stop bit	1,2	1
APN settings	Automatic, Manual	Automatic
MQTT mode	Log	Log
MQTT Interval (Log Mode)	60 Sec - 3600sec	60 Sec
Polling interval	500 millisecond -1000 millisecond	1000 millisecond
Pendrive data logging interval	60sec – 999sec	60sec

7. GENERAL FUNCTIONAL DETAILS

Figure 8 and Figure 9 shows the display when the device is powered on.

7.1 POWER ON INDICATION ON THE DISPLAY

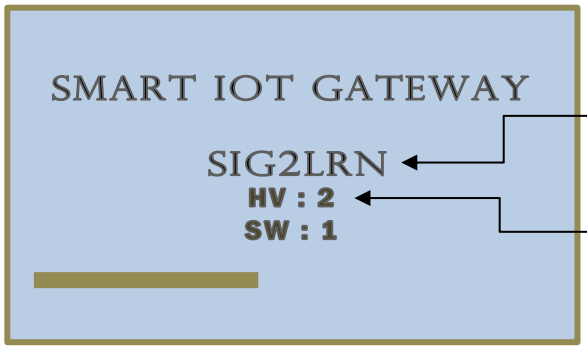


Figure 8

Name of the instrument

Hardware revision, Software version

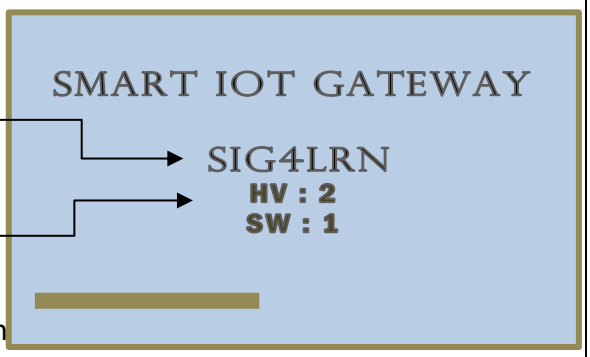


Figure 9

After about 15 sec device enter to warm up mode for 90 sec.

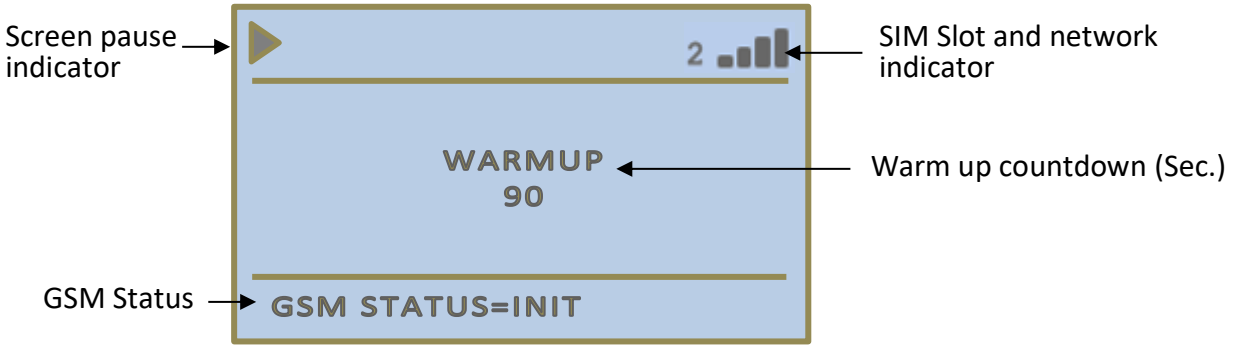


Figure 10 **(SIG2LRN)**

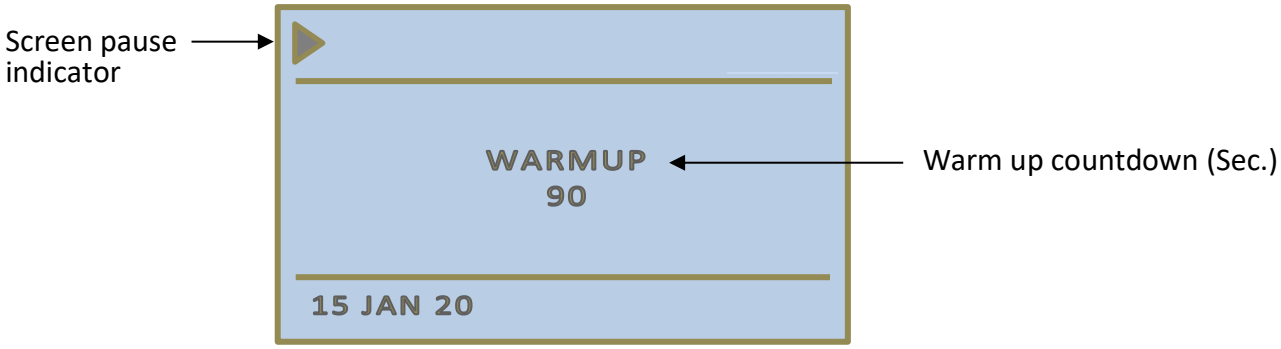


Figure 11 **(SIG4LRN)**

After warm up time device switches to normal working mode.

7.2 LCD DISPLAY

After warm up time unit enters into the Normal Working Mode. During the Normal Working Mode, the display shows the following screen.

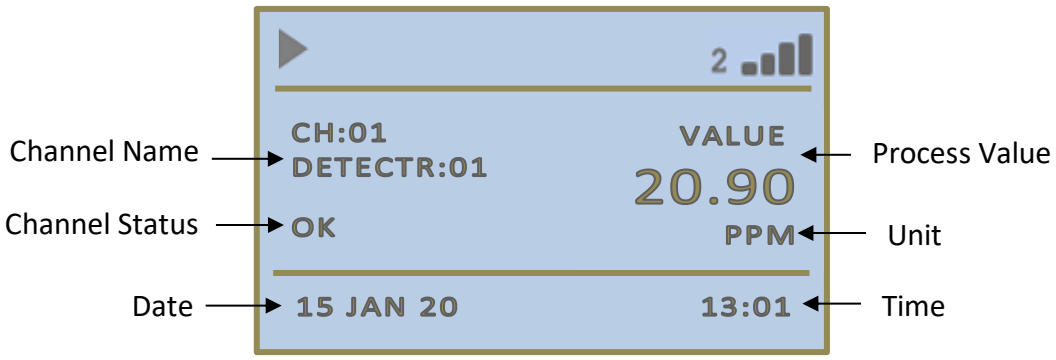


Figure 12 **(SIG2LRN)**

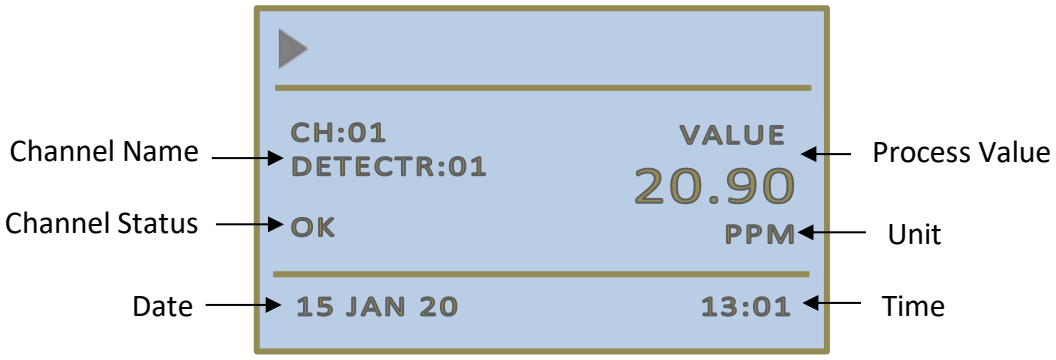


Figure 13 **(SIG4LRN)**

EXAMPLE OF DISPLAY INDICATION ON ALERT GENERATION

Figure 14 **(SIG2LRN/ SIG4LRN)**

8. KEY FUNCTIONALITY

Table 3

SR. NO.	KEY TYPE	PROGRAMMING MODE	NORMAL MODE
1.	SET Key 	It is used to Select & Enter into the menu also used to set/save the parameter	It can also be used to enter into Main Menu by pressing the key for 5 Seconds
2.	SHIFT Key 	It is used for moving cursor on to the digit whose value is to be changed	It is used to hold scrolling channels and also used to acknowledge Alarm
3.	INCREMENT Key 	It is used to change the Digit Value of Desired Parameter Also use for incrementing all Menus	To increase hold channels

8.1 SOME IMPORTANT INDICATIONS

Table 4

OPEN	It indicates slave device is disconnected.
COMMUNICATION ERROR	It indicates communication between SIG2GTY and slave devices is not proper.
HEALTHY LED	This LED blinks Blue continuously to show Healthy device status. This LED also blinks Red to show RS-485 and GSM fault.
ALERT LED	This LED Blinks Red to indicate Alert alarms are generated & if device is in healthy state, this LED remains ON Blue, continuously.
COMMUNICATION LED	This LED blinks Red & Blue to indicate proper RS-485 Communication.
NETWORK LED	In weak network connection this LED blinks Blue at very fast rate & in strong network connection this LED blinks at very slow rate
RELAY	Relay turns ON when alerts and fault conditions are generated in device.
BUZZER	Buzzer starts beeping to indicate alert or fault conditions (GSM fault, RS-485 fault) are generated in device.

9. MENU OPERATION

To enter into menu selection, press **SET KEY** for about 5 sec. Once we enter the programming mode, display shows **SELECT MENU**. Below that, we see **EXIT MENU**. Here on pressing **SET KEY**, we exit from menu.

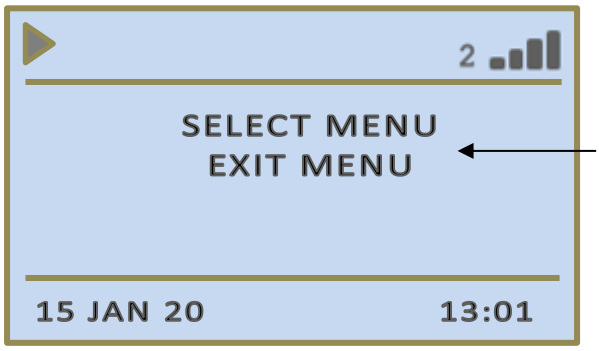


Figure 15 (**SIG2LRN)**

Menu Selection

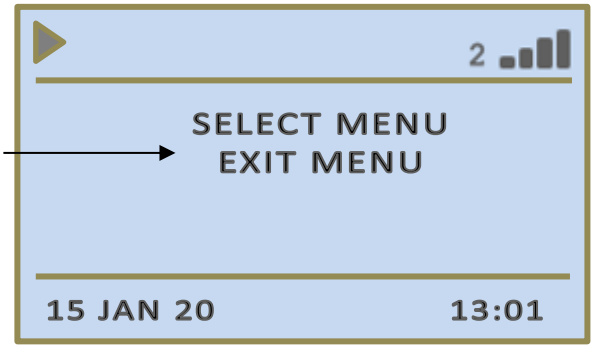
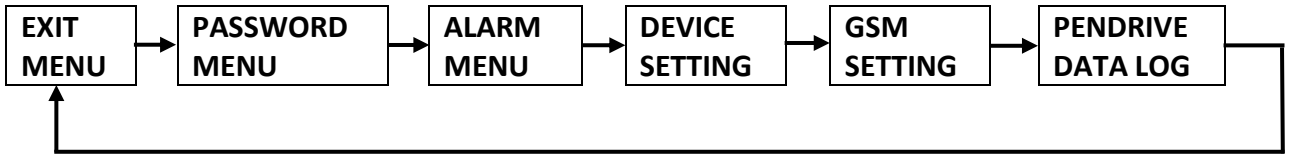


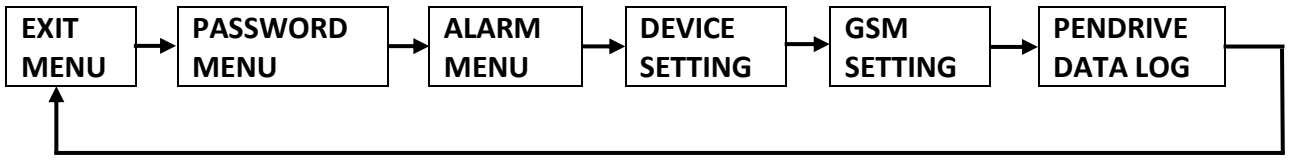
Figure 16 **(SIG4LRN)**

To view menu headers, press **INC KEY,** user will see the headers in following order

- **SIG2LRN MENU**



- **SIG4LRN MENU**



All menu headers are explained below with their functions. To view the steps please refer flowchart. (Refer 8.1)

Table 5

PASSWORD MENU	This menu is used to set a new user password. It is also used for making changes in previous password.
ALARM MENU	This menu is used to make the changes in the Alarm set points. There are two Alarms (AL1/AL2)* for every channel, alarm value can be set in alarm set point submenu as per the requirement. Buzzer and Snooze interval settings are also can be done in this menu.
DEVICE SETTING	This setting is for configuring the device parameters such as Node ID, Unique identifier, Device Location, Buzzer On Key, Communication port, Baud rate, Parity / Stop Bits & Display interval setting, Real Time Clock for display to be scroll.

GSM SETTING	Here 4 parameters are configured for sending SMS alerts on mobile and data on cloud i.e. Enter Number, MQTT Data Interval, Detect Auto APN and Access Point Name. Enter Number parameter belongs to user mobile numbers. The time interval for receiving data on cloud is set in MQTT Data Interval parameter. Configuration of Access Point is done in Detect Auto APN and Access Point Name settings.
PENDRIVE DATA LOG	This menu is used to make settings for USB data logging. Here 2 modes of logging can be set - Offline or Online. Here user can change data logging interval also according to the requirements.

9.1 FLOWCHART

Here BOLD words in flowcharts indicates selected menu. To select the menu and save the setting, press **SET** key. In all the flow charts **SET** key enters next menu unless specified. By scrolling down in the list press **INCR** key. For moving cursor on to the digit whose value is to be change, **SHIFT** key is used. If you don't press any key for 2 minutes in any menu, the display will return to normal working mode.

9.1.1 IF INCORRECT PASSWORD IS ENTERED

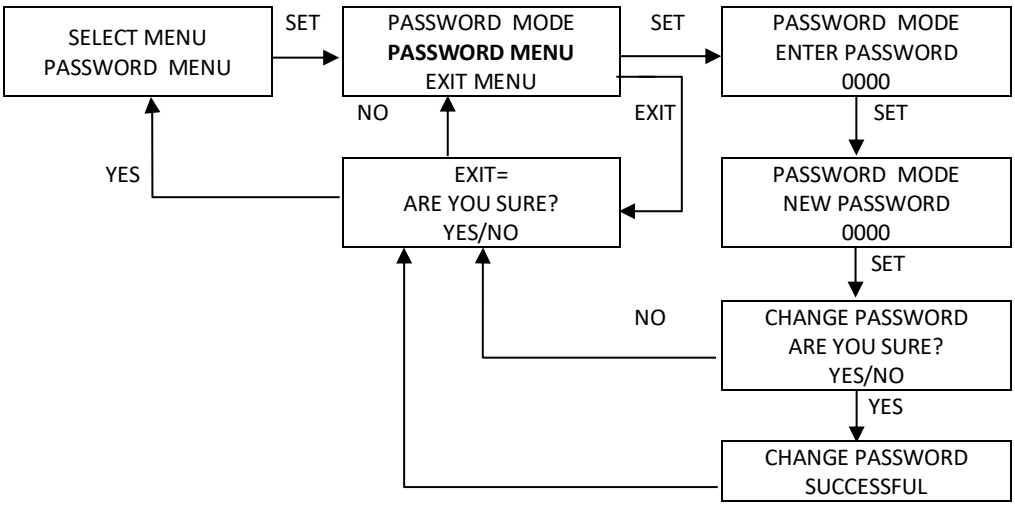
- In all menus if incorrect password is entered then user can enter in menu but can't set any value.
- User can see only previous settings.

NOTE:

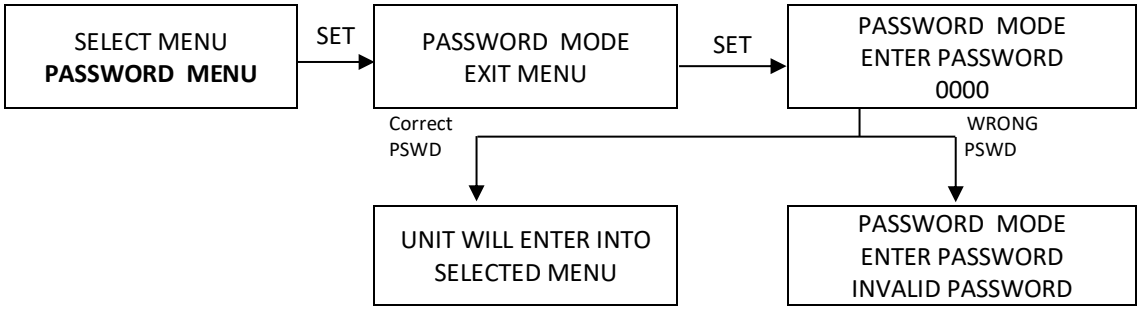
1. In all the above sub-menus, we need to press SET key to enter into the menu and set parameter with ▲& ▶ keys then press set key to save the settings.
2. On entering correct password by ▲& ▶ keys & SET we enter the menu and can make changes.
3. Exit menu – This menu is available in all menus and can be used to come out from present menu.
4. BACK Menu – This menu is used to come out from submenu to exit menu

9.1.2 PASSWORD MENU SETTINGS

9.1.3 TO SET NEW PASSWORD OR CHANGE PREVIOUS PASSWORD



9.1.4 FOR ENTERING PASSWORD IN ALL MENUS



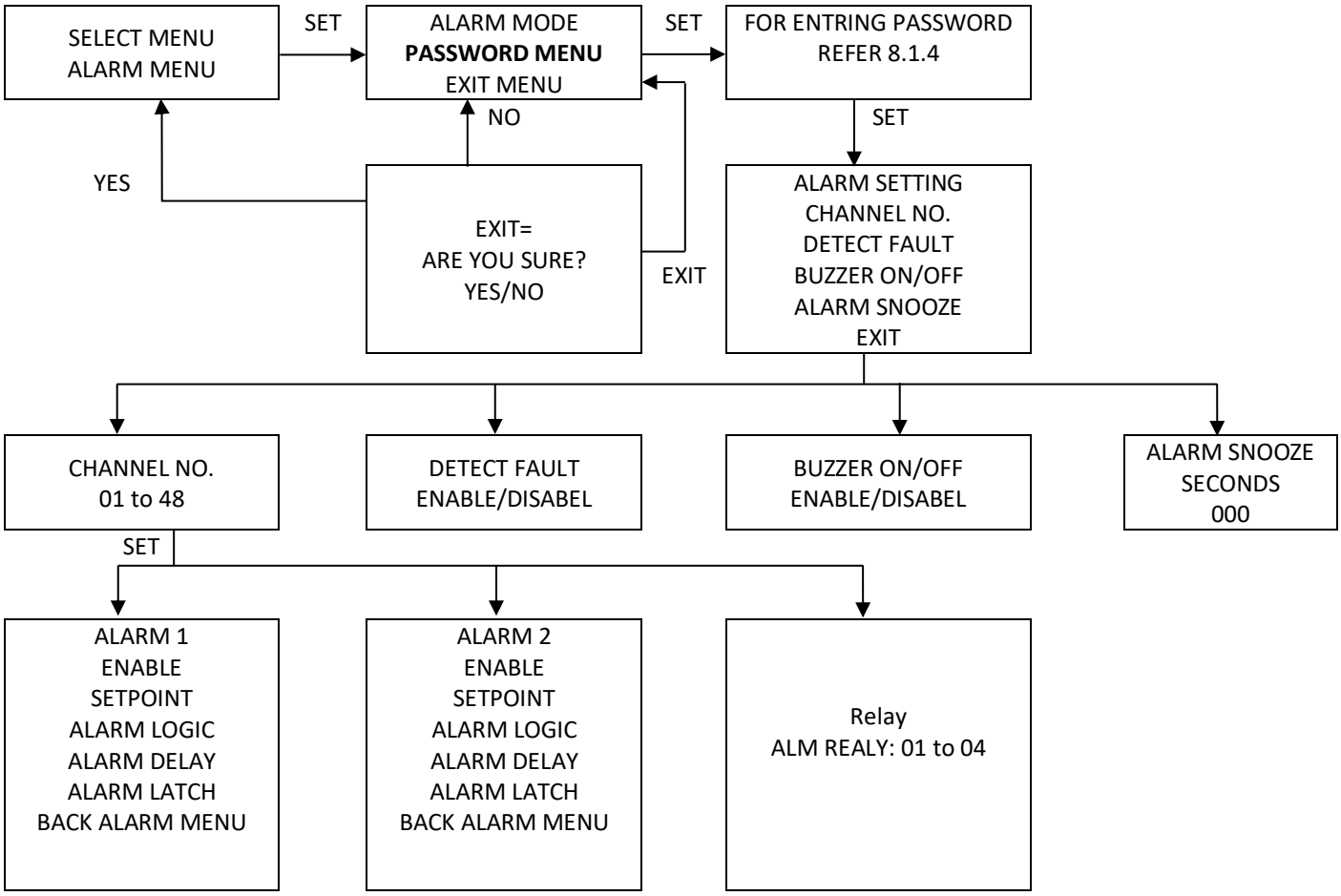
9.2 ALARM MENU

To save Alarm set points Alarm menu is used. There are two Alarms (AL1/AL2)* for every channel. For different channels different alarm value can be set in alarm set point submenu as per the requirement. Buzzer and Snooze interval settings are also set in this menu.

NOTE:

* In normal working mode of device display will remain scrolling, indicating all configured channels.

* If alert or fault conditions are generated display will pause on that channel or starts to blink and respected relay will be indicated on display.



To SET Alarm Menu

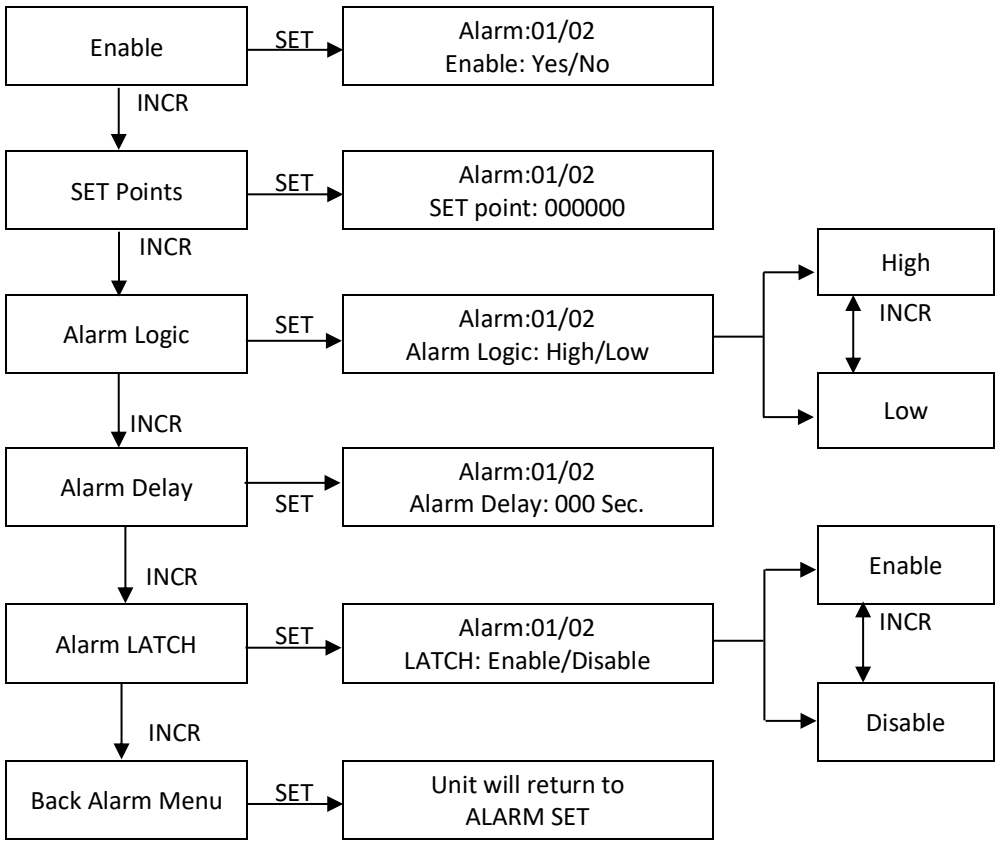


Table 6

Alarm Enable/Disable	This submenu is use to set Alarm 1 and Alarm 2 enable or disable separately
Set points	This submenu is use to set required limits for Process Value. According to saved logic, above or below the set points AL1/AL2 are generated.
Alarm logic	This submenu is use to set Logic for each alarm separately. If logic is high for set points of AL1/AL2 and PV* value > set point value, then High alarm indication appears on display. If logic is low for set points of AL1/AL2 and PV* value < set point value, then Low alarm indication appears on display.
Alarm delay	This submenu is use to set delay time for AL1 & AL2 separately. Sometimes gas level fluctuates during an alarm condition. If delay is set, after the triggering of AL1/AL2, it waits for delay time and checks PV* variations. If after finishing delay time also PV* value is not in safe zone all alarm indications turns on.
Alarm Latch	This submenu works on a process of Acknowledgement (Long press SHIFT key). If latch condition is ON, after triggering of AL1/AL2 if acknowledgement is not provided all alarm indicators remains in ON state, though PV* value returns to safe zone
Alarm Snooze	This Alarm menu is used to Set snooze time interval for alarms. Considering snooze time interval is applied, if AL1/AL2 are triggered and acknowledgement is provided all alarm indicators turns off (except display indication) but within snooze interval PV* value not returns to safe zone all alarm indicators again turns ON.

Relay	This submenu is use to set relay to particular channel. Here total 4 relays are available. Any relay can be configured to any channel. When alarms are generated, relay allocated to that channel will turn ON.
Detect Fault	This submenu is use to detect RS-485 fault. If this setting is enabled and RS-485 fault is generated then first relay will turn ON.
BUZZER	Buzzer settings are done in this submenu. If this setting is enabled and any alert or fault condition is generated buzzer will turn ON.

9.3 DEVICE SETTING

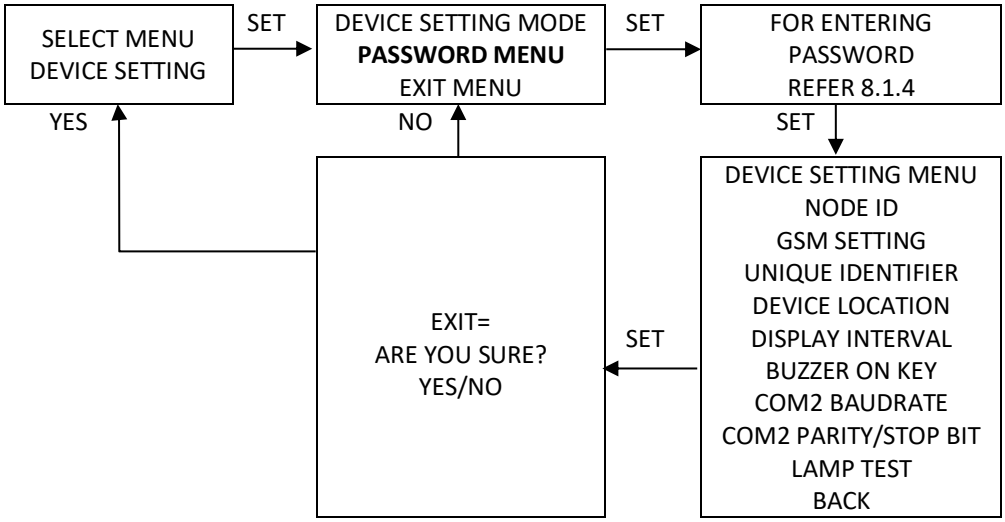
This menu is use to save device settings in device. Node ID, Location, Buzzer, Display Interval, communication port related all settings are done in this menu.

NOTE:

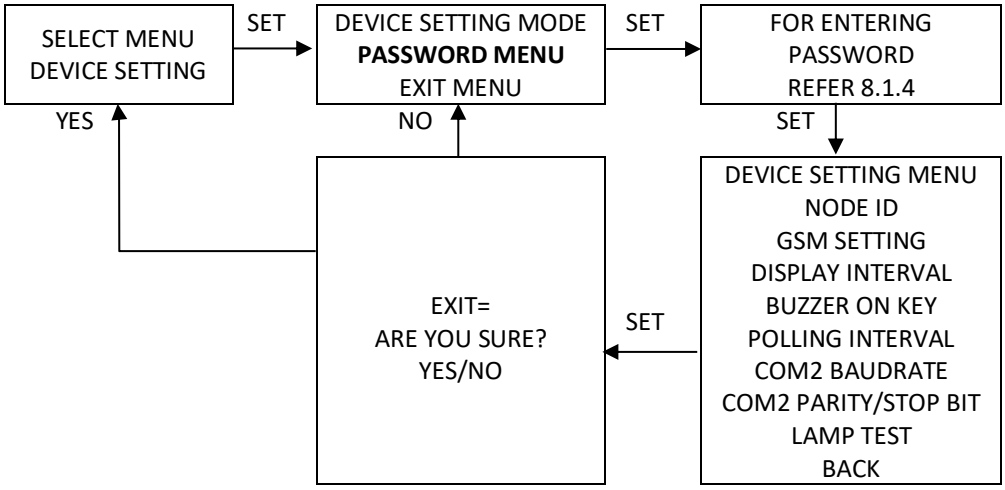
***** In this device 3 ports are available for communication with other devices.

***** 1st port will always remain as master port. 2 nd & 3 rd port can use as master or slave port.

- **SIG2LRN MENU**



- **SIG4LRN MENU**



To set Device Setting Menu

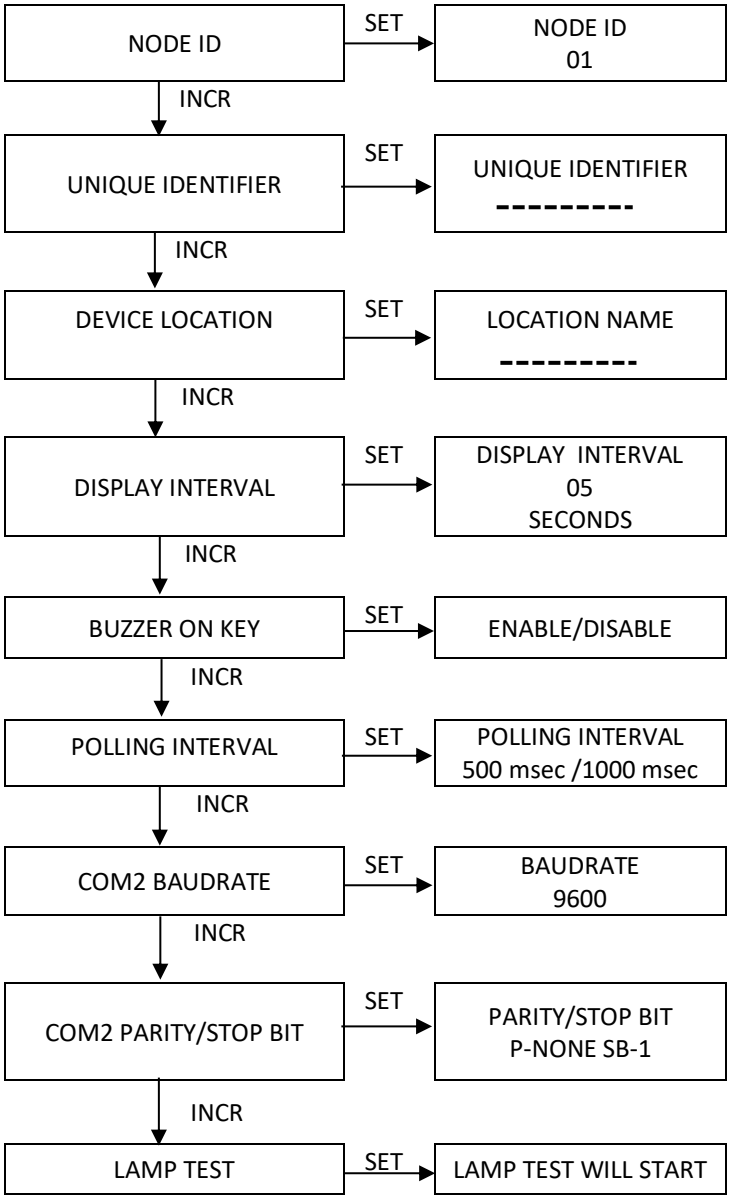


Table 7

NODE ID	This menu indicates Node ID of device. There are maximum 99 Node ID's can be configured in the device.
UNIQUE IDETIFIER	It is 6 digits fixed Unique ID of device. It cannot be change.
DEVICE LOCATION	Location Name of the device can be entering up to 10 digits in this menu. This location name is displayed in received alarm SMS.
DISPLAY INTERVAL	This submenu indicates scrolling interval of display. Available range of scrolling interval is 01 sec to 20 sec
BUZZER ON KEY	This submenu is use to set buzzer setting for key pressing. If this setting is enabled buzzer will beep on every key press.
POLLING INTERVAL	This menu is use to set fetching interval of data from slave device. 500msec and 1000 msec data polling interval are available in device.
COM2 BAUDRATE	This menu is use to set baud rate of 2nd communication port. This port always acts as slave input/output port for device. Following Baud rate ranges are available for settings in a device: 9600bps, 19200bps, 38400bps, 57600bps, 115200bps

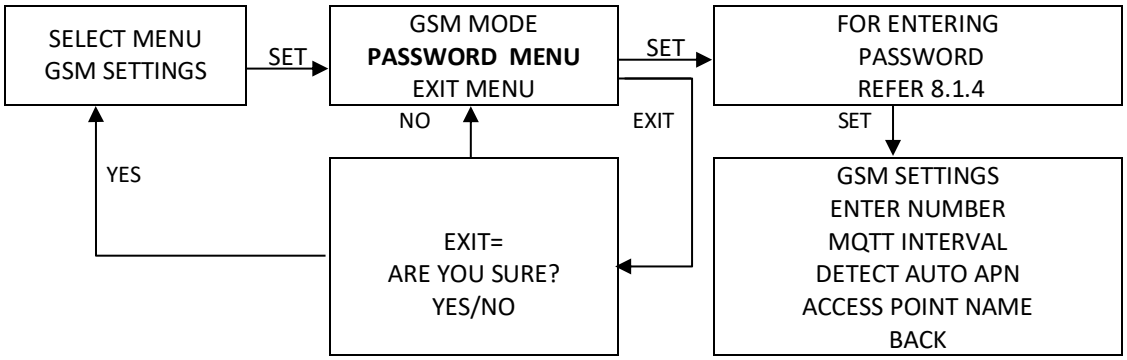
COM2 PARITY/STOP BIT	This menu is also use to set Parity & Stop Bit values for proper communication of device. Here 3 options are present in Parity i.e. None/Even/Odd & 2 options are present in Stop Bit i.e.1/2 to set error-free communication of the device.
Lamp test	This is used to test the all LEDs, Relays and Buzzer of the device itself.

9.4 GSM SETTING MENU

This menu is use for saving all GSM settings. Auto or Manual APN settings, addition of user Mobile Numbers and Email ID's to receive alerts, data receiving time interval on cloud, all these settings are done in this menu.

NOTE:

* In this device 2 SIM slots are available, if failure of any one SIM devices will auto to another SIM.
* If both SIM cards lost the network device will store 65,000 data records.



TO SET GSM SETTING MENU

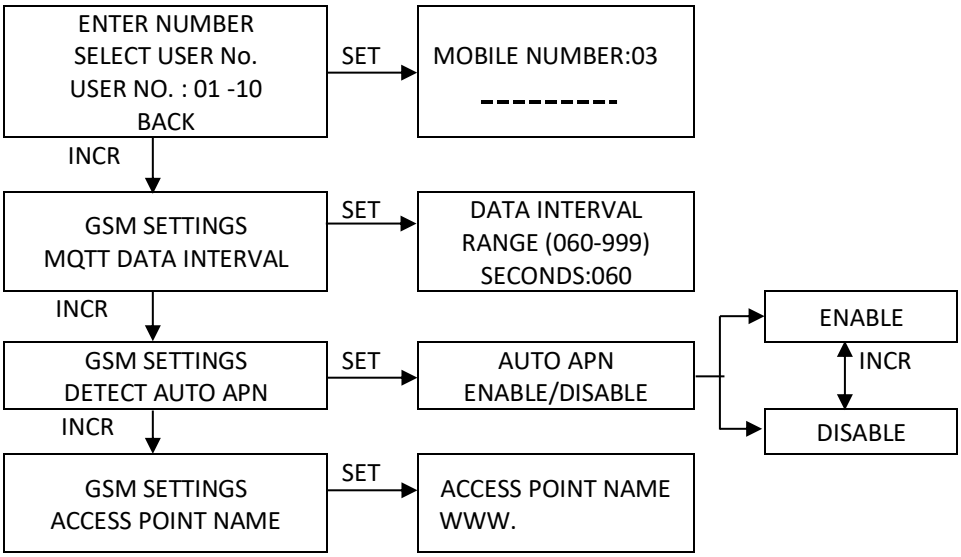


Table 8

Enter number	In this menu total 10 contacts can be save to receive status of the device.
MQTT Data Interval	This menu is used to set data receiving time interval on MQTT cloud. This Time interval can be set in a range of 30sec to 999sec.

Detect auto APN (Access Point Network)	In this menu, Auto APN Detection is selectable. It can be set either ENABLE or DISABLE. If ENABLE is selected, device detects APN automatically and if DISABLE is selected, device will not detect APN automatically.
Access Point Name	This menu is also used for APN settings. If APN is not detected automatically, then it is entered manually in this menu.

10. PENDRIVE DATA LOG

This menu is use to save all pen drive settings. Logging Mode, Logging Interval is saved in this menu.

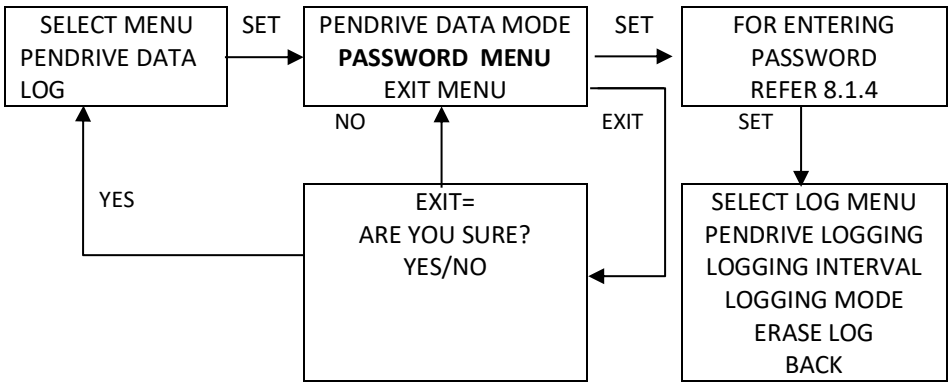
NOTE:

* If pen drive is not connected Green (PEN DRIVE) LED glows continuously. After connecting Pen Drive this LED blinks normally and if data logging is started then this LED will start fast blinking.

* in Offline mode Press SET + SHIFT key for 3-4 sec to start copying of stored data into Pen Drive.

* After copying data eject Pen Drive properly.

* Always Erase or Format Pen Drive before connecting to the device.



TO SET PENDRIVE DATA LOG MENU

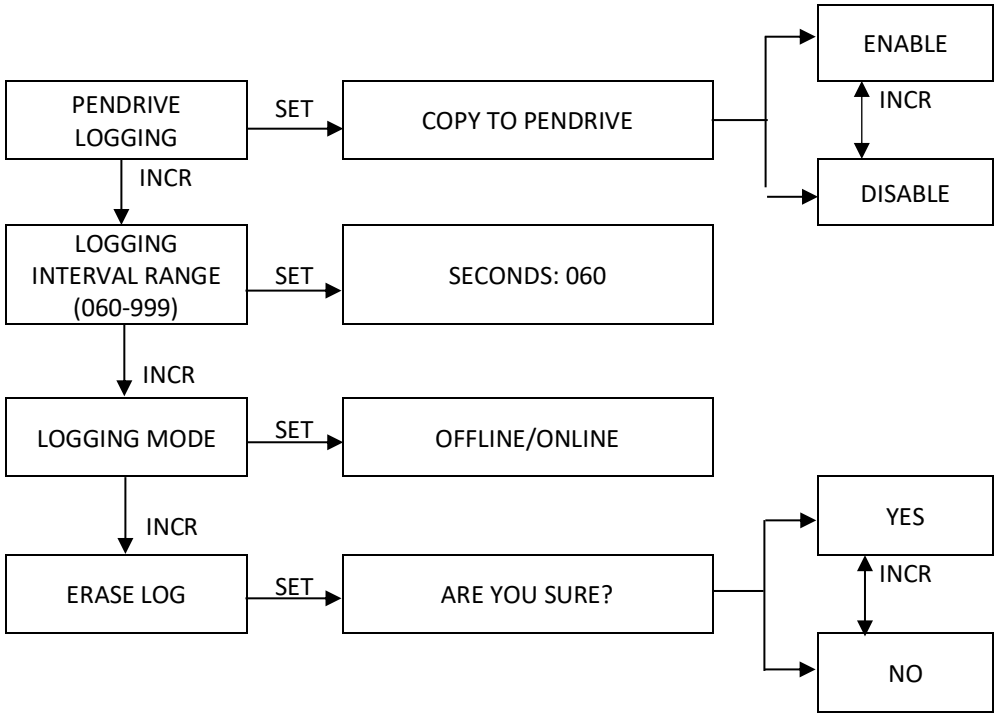


Table 9

PENDRIVE LOGGING	This menu is use to enable or disable Pen drive Logging.
LOGGING INTERVAL RANGE	This menu is used to set data logging time interval for pen drive. This Time interval can be set in a range of 30sec to 999sec.
LOGGING MODE	In this menu Logging Mode is selectable. It can be set either Online or Offline. If Online is selected, device starts data logging in Online mode and if Offline is selected, device will saved all logged data internally and then user can copy to pen drive. Maximum 32000 logs can be saved internally in device.
ERASE LOG	This menu is used to Erase all logged data which is stored internally in device.

11. DEVICE CONFIGURATION

SIG4LRN can be configured with the help of **PC SOFTWARE- "AEPL-IOT"**. This software is available in provided SOFTWARE CD.

11.1 CONFIGURATION VIA SOFTWARE

- The configuration of this device is very simplified with the help of "AEPL-IoT" software. The device can be configured with the help of RS-485 to USB converter.

➢ **SOFTWARE CONNECTION WITH DEVICE**

- For device configuration SIG model need to put in PROGRAMMING MODE. SIG work as MODBUS Master in APPLICATION MODE.
- In PROGRAMMING MODE Healthy/Fault LED will toggle in blue and red colour.
- To put device in PROGRAMMING MODE follow further steps:

➢ **AUTOMATIC PROGRAMMIN MODE:**

a) Attach RS-485 to SIG4LRN model & USB to PC.

b) Run executable file in folder "AEPL-IoT" and window as shown in Figure 17 will open. Select the specific model name from the drop-down and click on submit button. 

c) For connecting device properly with software check "COM" port number. If it is not available click on "Refresh" button  and select proper Communication Port then Change the Baud rate, Parity, Stop bits accordingly as shown in Figure 18 then click on  "Connect" button of software

d) After successful connection, device goes in PROGRAMMING MODE for next 15 minutes.

e) During this time period user can configure required settings. After 15-minutes device automatically switch in APPLICATION MODE.

f) To avoid 15 min waiting user can restart device again after saving all configurations properly. After restart device will be available in application mode.

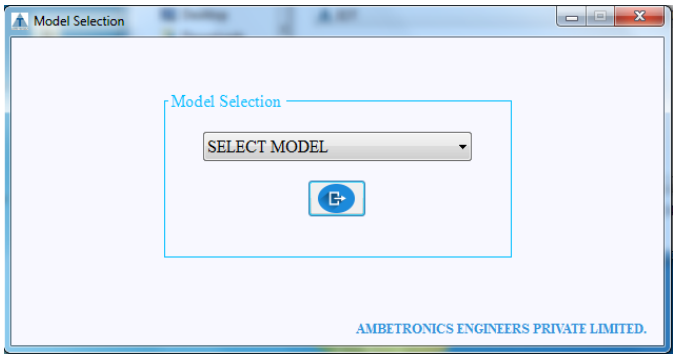


Figure 17

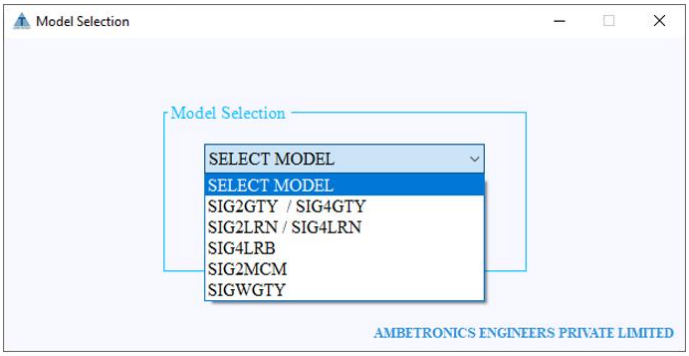


Figure 18

- After selecting a required model, a window will open as shown in following Figure 19.

Figure 19

11.2 SOFTWARE CONFIGURATION VIA USB CONVERTOR

Here, two selections are available for interfacing of software with device - 1. USB, 2. ETHERNET. User can choose any one option to access device settings.

For interfacing with USB CONVERTER click on USB in media section. After selecting media, check COM port number. If it is not available click on  button and select proper Communication Port, Change the Baud rate, stop bits as shown in Figure 20

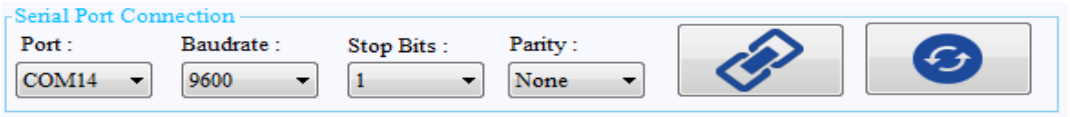


Figure 20

Then to establish connection click on  button. Once the connection is done successfully, the window will open as shown in Figure 21. If connection is disconnected then user will get message as shown in Figure 22 Then click OK button.

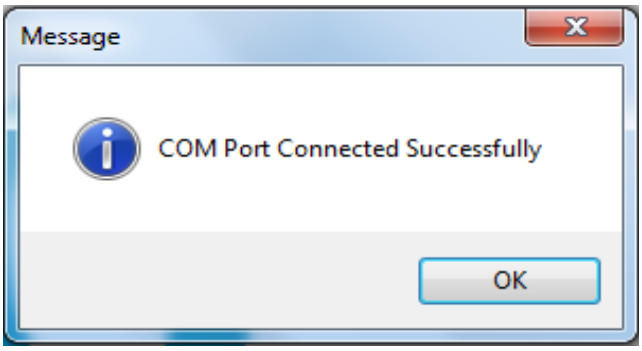


Figure 21

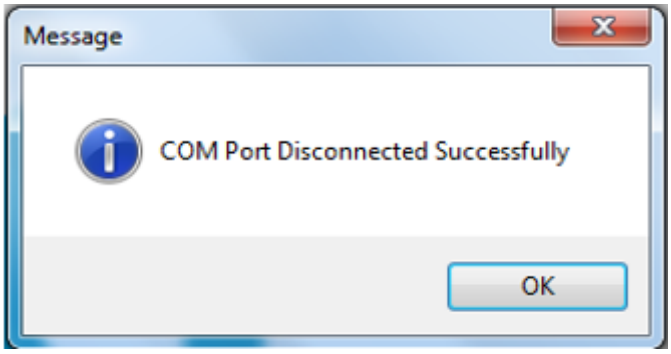


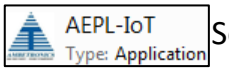
Figure 22

Then Click on  check button. Once the connection checking is OK,  check Right will appear next to check button as shown in Figure 23

Figure23

- If the device is not connected properly or the device is not in programming mode then  wrong check will be displayed next to,  button as shown in Figure 23
- After successful checking software will ask for USERNAME and PASSWORD. User has to enter correct username, password and submit as shown in Figure 23.

11.3 SOFTWARE OPERATION

Configurations are done with the help of 

Software.

11.3.1 CHANNEL CONFIGURATION

In channel configuration window all settings related to Channel Addition, Channel Reading, Alarm Configurations, Alarm Reading, Device Settings, Cloud Settings, Notifications and Software Settings can be saved.

11.3.1.1 SLAVE PARAMETER WINDOW DESCRIPTION

After entering correct password user will enter to channel addition window as shown in Figure 24.If user is using device at very first time, it has to enter all parameters related to connected devices i.e. Device Name (15 Digit), Device Id, Unit (5 Digit), Modbus Details, Address Register (5 Digit). Detail description about slave parameter configurations are given in following Figure 24.

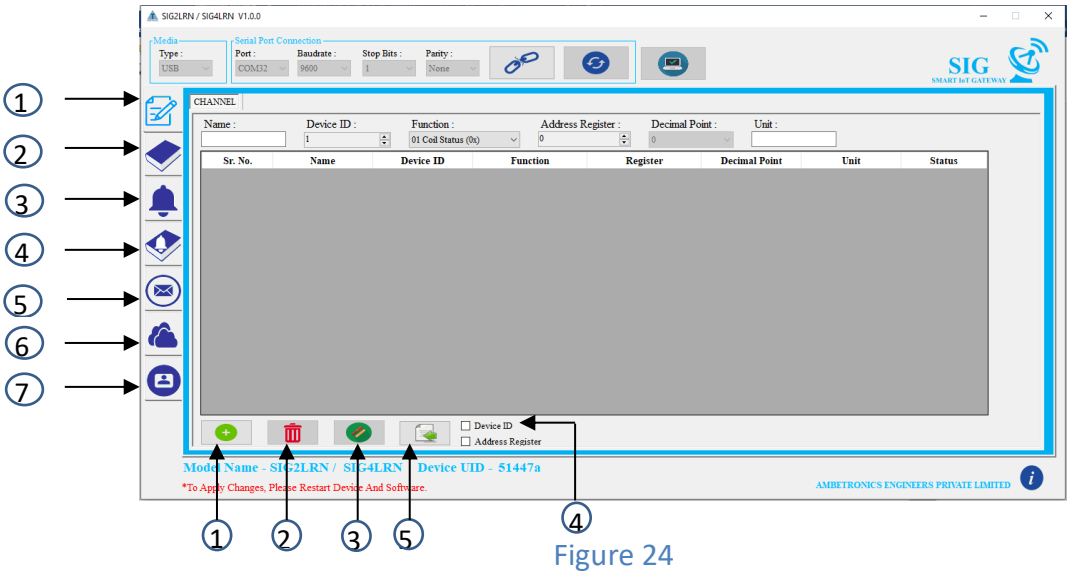


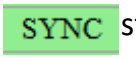
Figure 24

Figure 31 illustrates as follows:

① Add channel data
② Read channel data
③ Add alarm for channels
④ Read alarm data
⑤ SMS and E-Mail notification
⑥ Cloud settings
⑦ Software settings

1 **CHANNEL ADDITION**: Here enter the Device Name, Device Id, select the Modbus Function, enter the Address Register, select Decimal Point and enter Unit. Then click on  button to add the device parameter, which is to be synchronised. Maximum of 48 Slaves can be set. Refer "①" in above figure.

2 **CHANNEL DELETE**: Deletes the selected channel. Refer "②" in above figure.

3 **CHANNEL SYNCHRONIZATION**: Clicking on  button will synchronise all data of table with device. One by one, the data will be transmitted to the device. When the data is transferred successfully,  status will be displayed on window.  Button will be active only when the data is available to be sent. Refer "③" in above figure.

4 **DEVICE ID**: If this option is checked right, only Device Id will be incremented automatically. Refer "④" in above figure.

5 **ADDRESS REGISTER**: This option is also use to increment only address register automatically without changing any other parameters. Refer "⑤" in above figure.

11.3.1.2 CHANNEL ADDITION PROCEDURE

- If a new device is to be configured, then add the function code, addresses, device ID of new device.
- If user wants to configure SIBLTRH (Node) with SIG4LRN (Gateway) then user should be set SIBLTRH ID in SIG4LRN.
- Once the data is filled click  button. This will add the data to the table as shown in Figure 25.

- In case of mistake, you can delete the data from the row using the click on button.
- Once all the data is added click on button and wait till “SYNC” is filled in the status column as shown in Figure 25.
- Out of total added channels how many channels are synchronized is also displayed on window as shown in Figure 25.

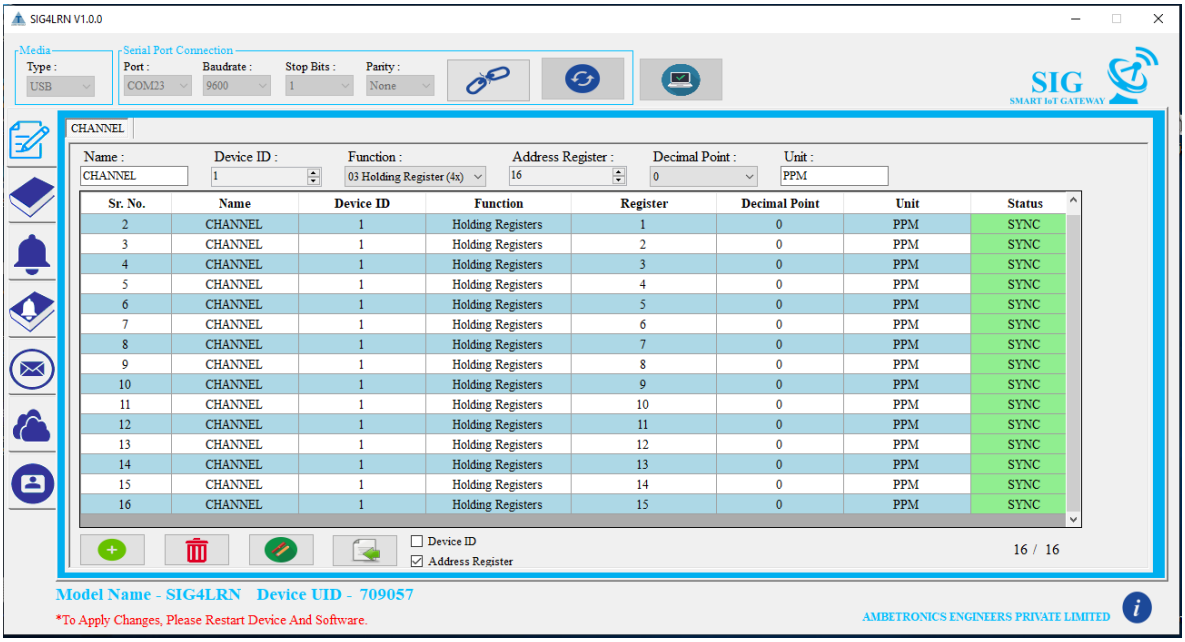


Figure 25

11.3.1.3 READ CHANNELS DATA

- This button is used to read the existing settings from the device and display it on window. After clicking on button following window will be open. Refer Figure 26
- This button is use to copy all read data to the channel addition table so that user can do any minor modifications.

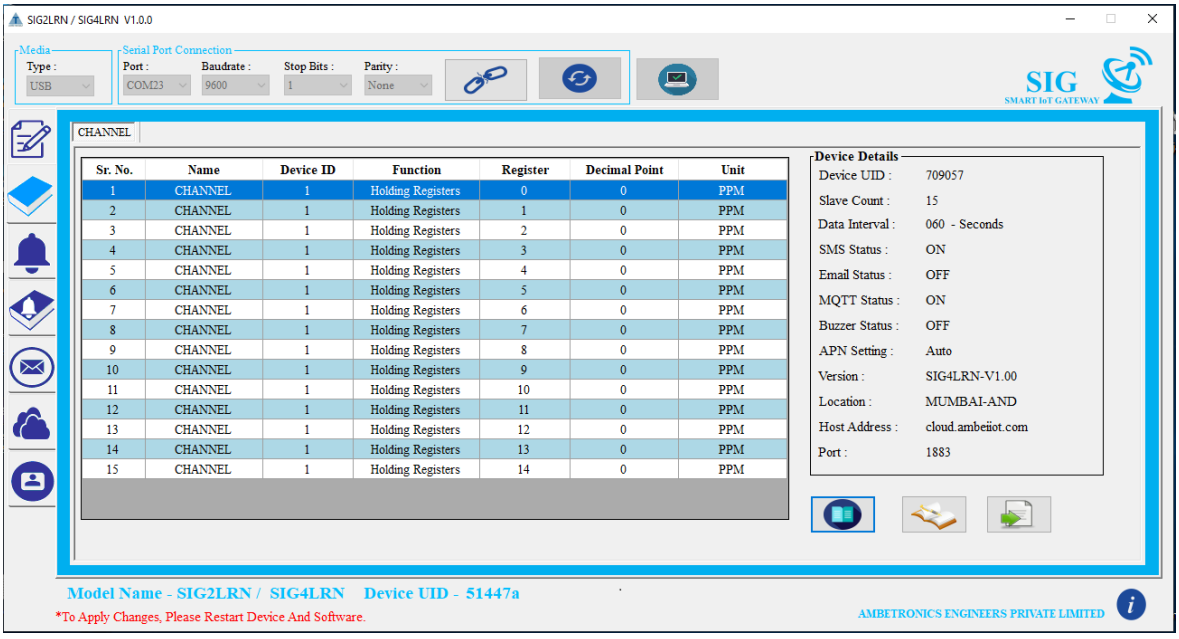


Figure 26

11.3.2 ADD ALARM FOR CHANNELS

Here multiple options are available for setting of alarm to channels. User can set different set points for every channel or one set point for all channels according to requirements.
User can set 2 alarms per channel i.e. Alarm-1 And Alarm-2. Status, Set Points, Logic, Delay, Latch, Relay, this options can be set individually to both alarms.
Snooze settings cannot be set individually different for per channel. This setting will apply to all channels.

11.3.2.1 ALARM SETTINGS FOR PER CHANNEL

- After adding channel click on button. Then alarm-setting window will open. Then for per channel setting click on individual channel button. For setting alarm, first user has to read channels i.e. click on button. After clicking on read button window will show all added channels.
- Then select that channel on which alarm is to be set and then set all alarm settings parameter
- After setting all parameters, click on button. If all configurations are done successfully then right check will appear on window or if settings are not done properly, then wrong check will appear on window as show in Figure 27.

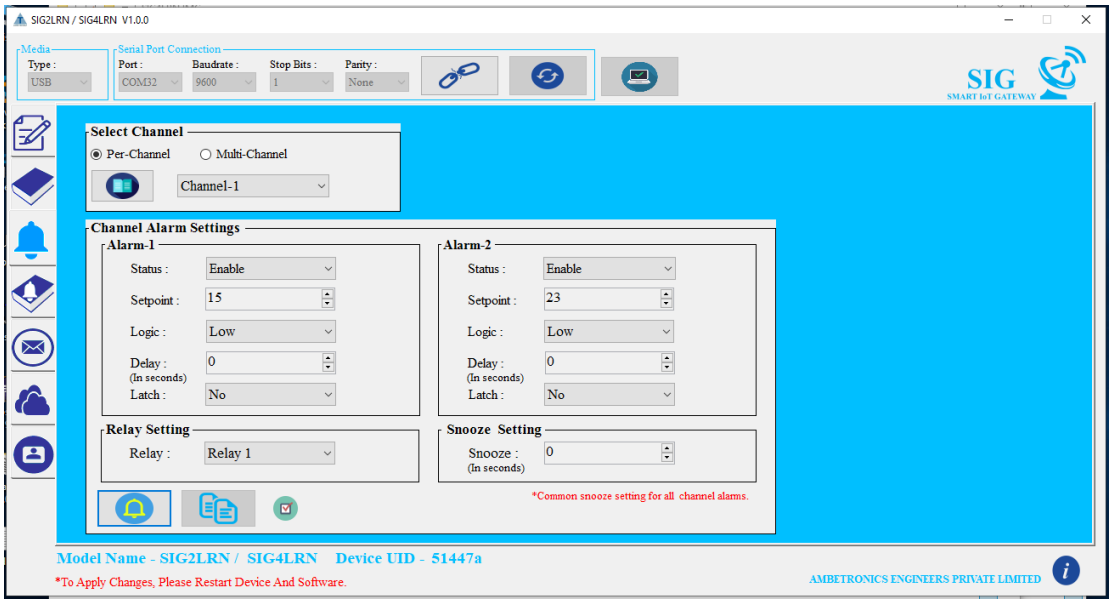


Figure 27

11.3.2.2 ALARM SETTINGS FOR MULTIPLE CHANNELS

- For multiple channel-setting click on Multi-Channel option. For setting alarm, first user has to read channels i.e. click on button.
- After clicking on button window will show all added channels.
- Then user will choose from total channels (starting channel and ending channel), for which channels same settings are required and then all alarm settings can be configured as shown in
- After configuring alarm, settings click on button. This button is only applicable for multiple channels alarm settings. If all configurations are done successfully then Right

Check will appear on window or if settings are not done properly, then Wrong Check will appear on window. Shown in Figure 28.

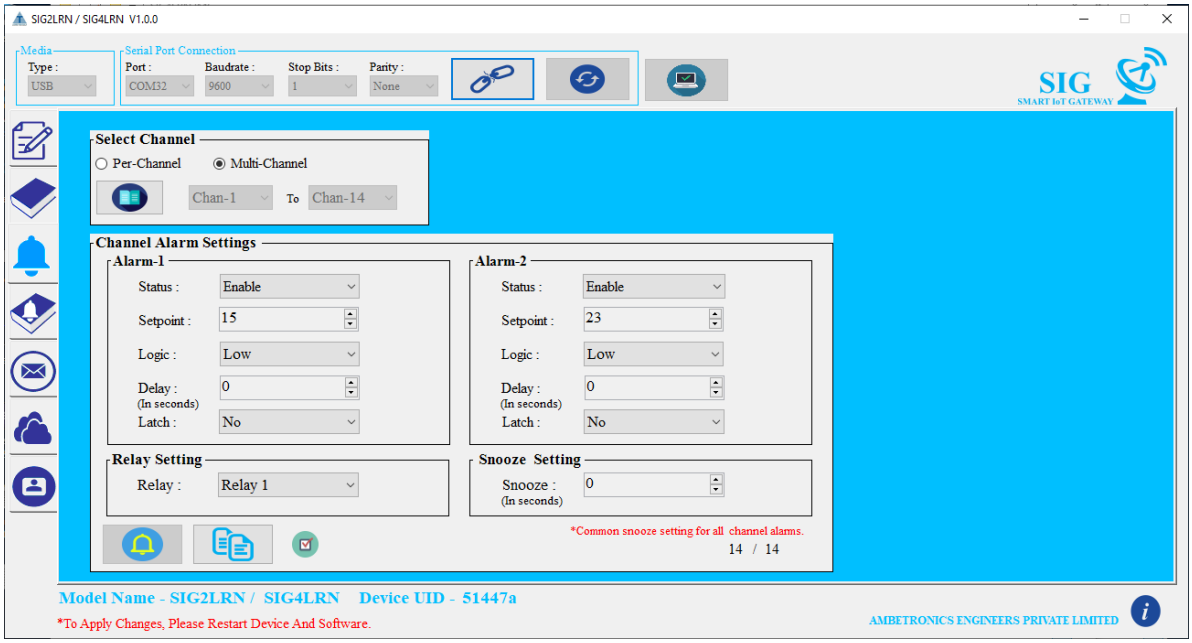


Figure 28

11.3.2.3 READ ALARM DATA

- To read all saved alarm settings click on button. After clicking on read button window will show all saved alarms as shown in Figure 29.

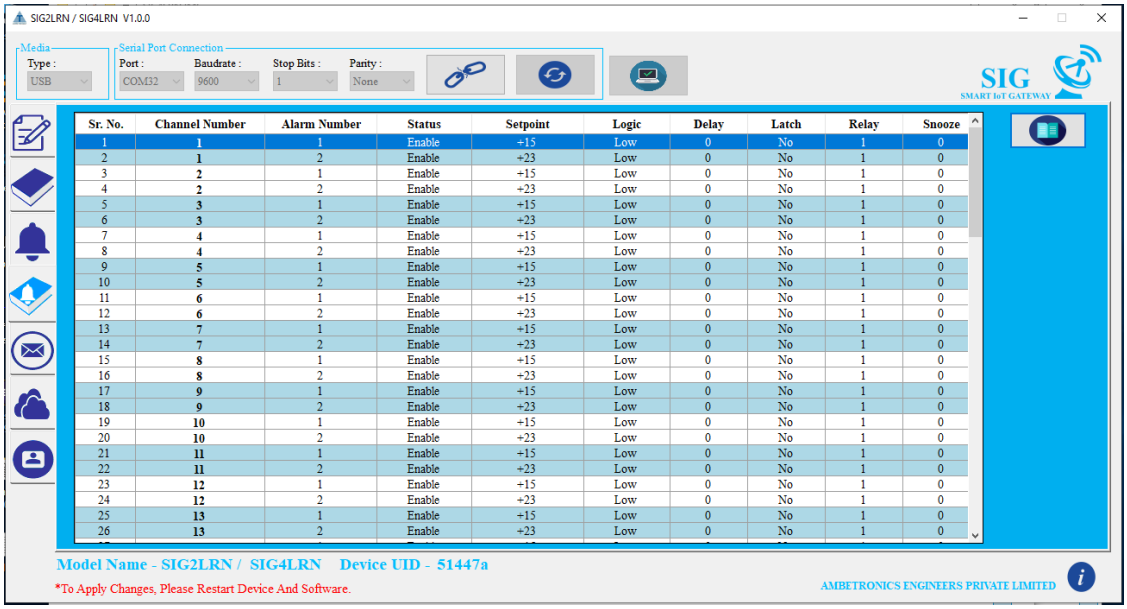


Figure 29

11.3.3 NOTIFICATIONS

After reading all alarm, settings click on tab. All alert notifications can be set in this menu. Here 10 Mobile Numbers and 5 Emails ID's for remote alert notifications are configured according to the requirements of user.

11.3.3.1 NOTIFICATIONS SETTING

- Now for setting SMS or Email Notification first click on  button. After clicking this button  window will ask user to either Enable (ON) or Disable (OFF) this setting as shown in Figure 30.

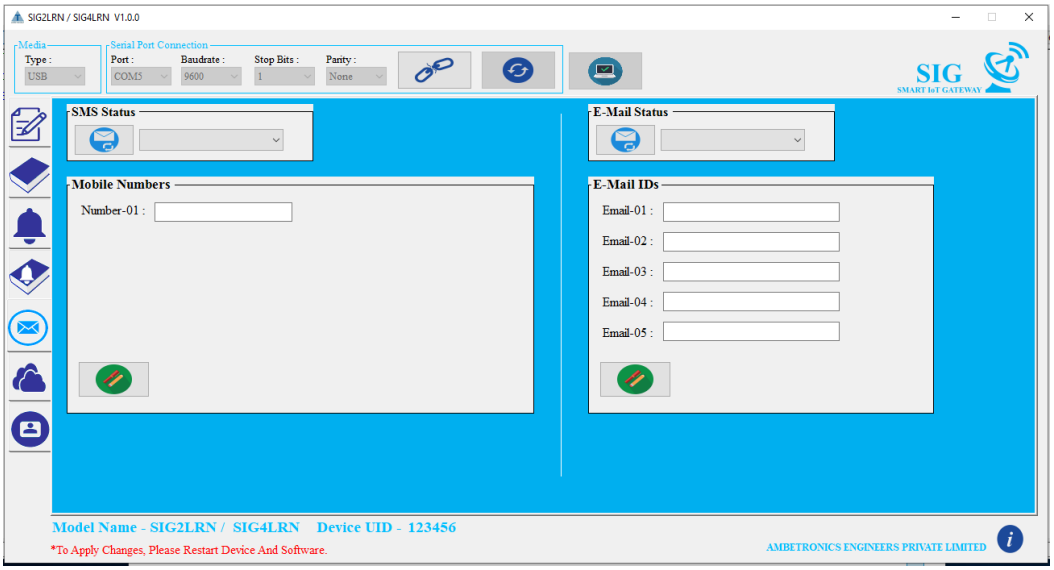


Figure 30

- Now select ON or OFF according to requirements. If user requires SMS or Email Notifications then select ON. After selection enter mobile numbers and email addresses as shown in Figure 31.
- After configuring all Mobile Numbers or Emails Id's click on  button to write all configurations into device. If all configurations are done successfully then right,  check will appear on window or if settings are not done properly, then  wrong check will appear on window. As shown in Figure 31.

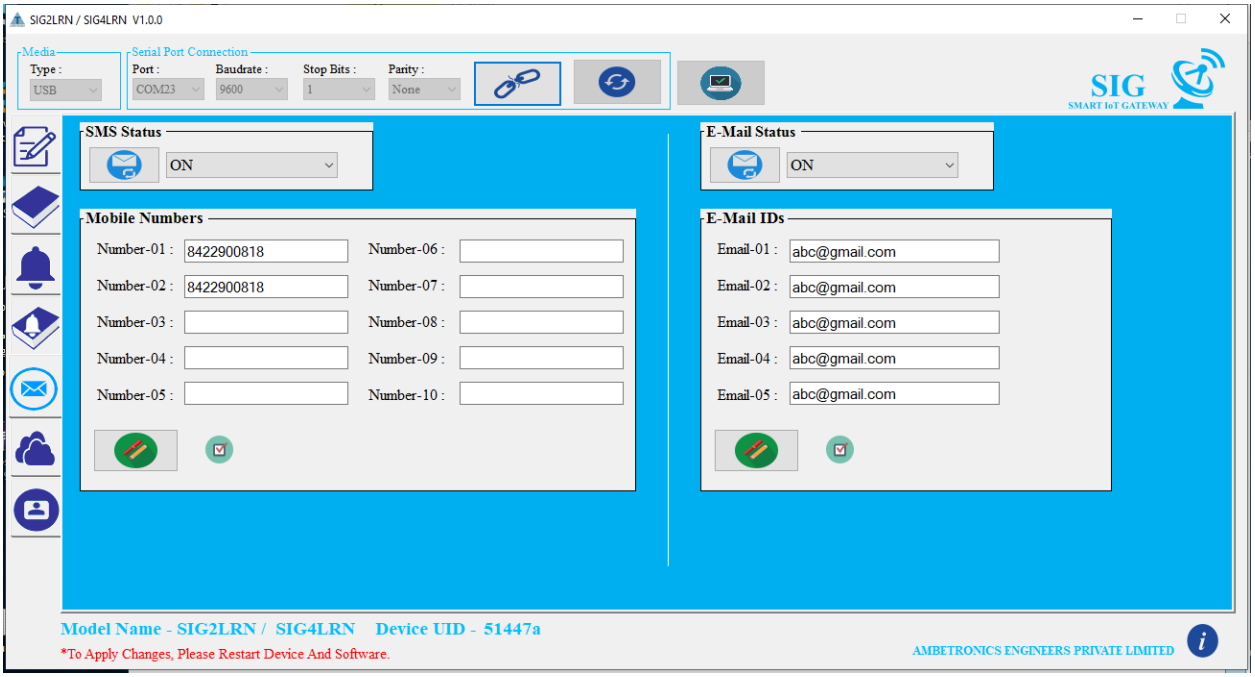


Figure 31

11.3.4 DEVICE & CLOUD SETTINGS

All settings related to Cloud Connectivity, Device Location, Buzzer, APN (Access Point Name), Communication Settings are done in this menu as shown in Figure 32.

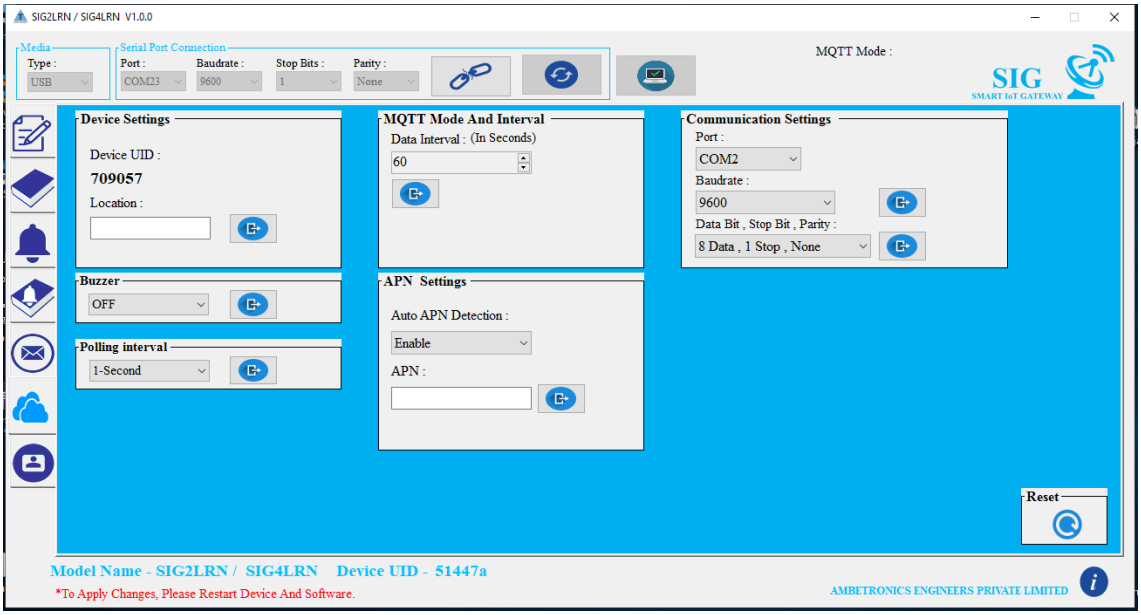


Figure 32

11.3.4.1 DEVICE SETTINGS

- If location is set correctly then Right check will appear on window or if setting is not done properly, then Wrong check will appear on window as shown in Figure 33 & Figure 34 respectively.

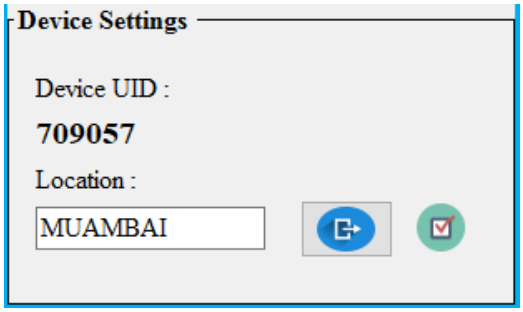


Figure 33

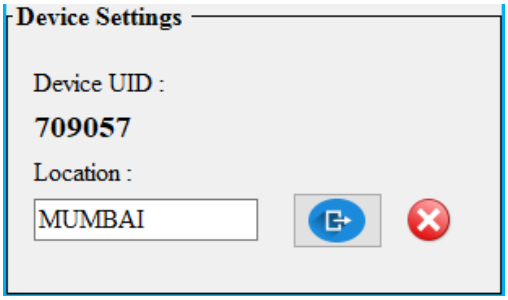


Figure 34

10.4.4.2 MQTT SETTINGS

- Select logging mode and set Data Interval.
- If all settings are done correctly then right check will appear on window or if setting is not done properly, then wrong check will appear on window as shown in Figure 35

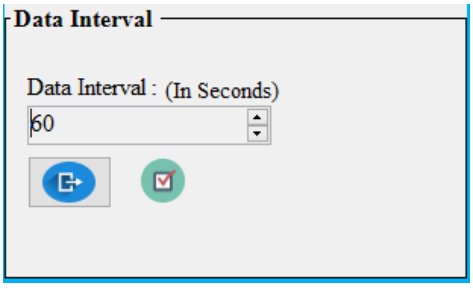


Figure 35

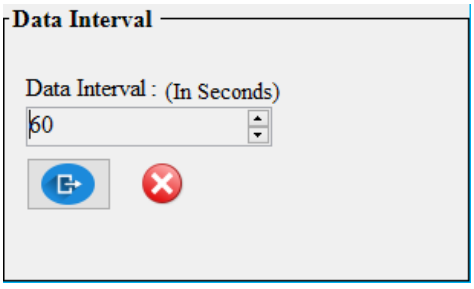


Figure 36

11.3.4.2 COMMUICATION SETTINGS.

- Here 2 ports are available for communication. User can select port according to requirement.
- There are different Baud rates; Data Bit, Parity and Stop Bit combinations are available for settings as shown in Figure 37

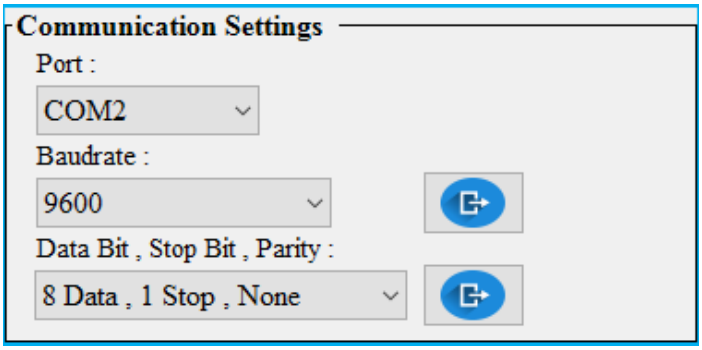


Figure 37

- User can select required combination and click on button to set Communication Port, Baud rates, Data Bit, Parity and Stop Bit.
- If the setting is saved successfully right check will appear next to button. In case of error, wrong check will appear as shown in Figure 38 & Figure 39 respectively.

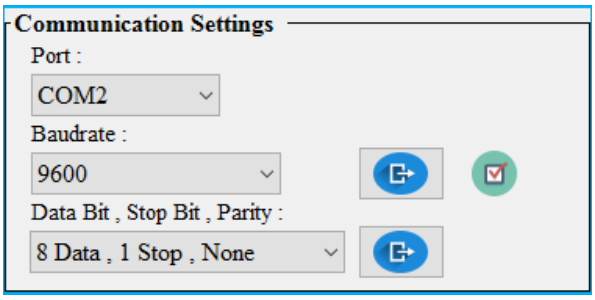


Figure 38

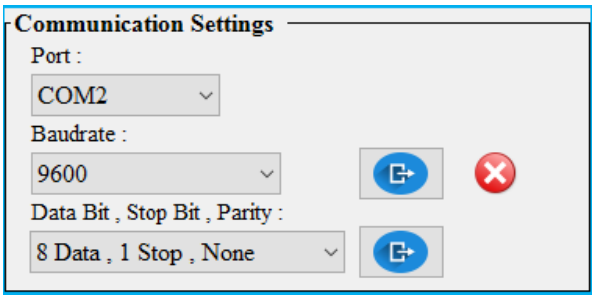


Figure 39

NOTE:

After changing the settings device will apply settings immediately. Restart software and device to communicate properly

11.3.4.3 BUZZER SETTINGS

- In this menu user can set buzzer settings, either Enable (ON) or Disable (OFF) as shown in this Figure 40
- If the setting is saved successfully right check will appear next to ON/OFF button as shown in Figure 41. In case of error, wrong check will appear.

Figure 40

Figure 41

11.3.4.4 APN SETTINGS

- These settings are used to set ACCESS POINT NAME. It can be set automatically or manually as shown in Figure 42.
- To set APN, select mode of APN and then click on  button. If it saved correctly then  right check will be appear next to submit button as shown in Figure 43. In case of error,  wrong check button will appear.

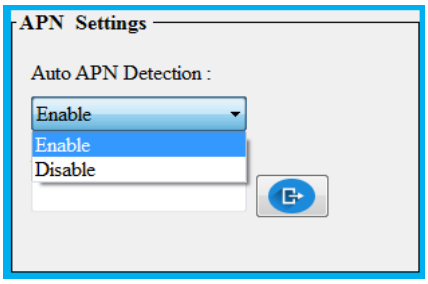


Figure 42

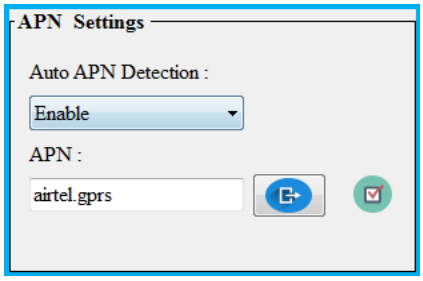


Figure 43

11.3.4.5 POLLING INTERVAL

- This submenu is use for setting data fetching interval of device. Here two interval options are available for settings as shown in Figure 44.
- To set polling interval user first has to select one polling interval and then click on  button. If it saved correctly then  right check will be appear next to submit button as shown in Figure 45. In case of error,  wrong check will appear.

Figure 44

Figure 45

11.3.4.6 RESET

- This 

option is use to reset Device. After clicking on reset button all stored settings in device will be reset (device will contain default values) except Baudrate, Data Bit, Parity and Stop Bit as shown in Figure46. These three parameters doesn't affect by reset button. If user wants to change these parameters then refer 9.4.8.3

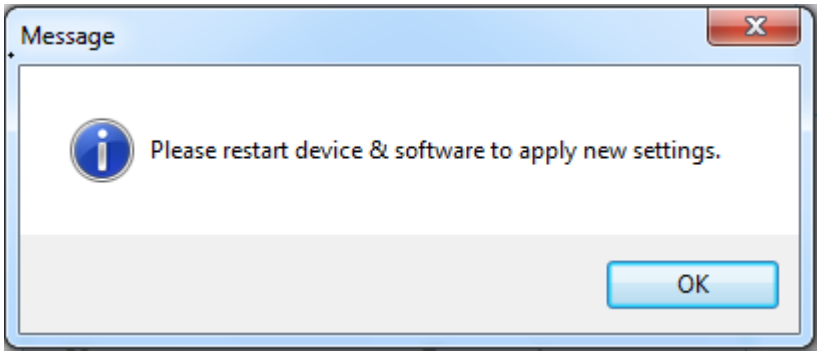


Figure 46

11.3.5 SYSTEM SETTINGS

- After finishing with cloud, settings click on tab to set security for device.
- To set Username and Password user has to type New Username and Password in text box.
- Then click on button. Once the password is set, the dialog box stating the password set successfully will be displayed.If the confirmation password different from the new password entered or username is incorrect, password incorrect dialog box will be displayed .Then click OK button.

12. NOTIFICATIOS

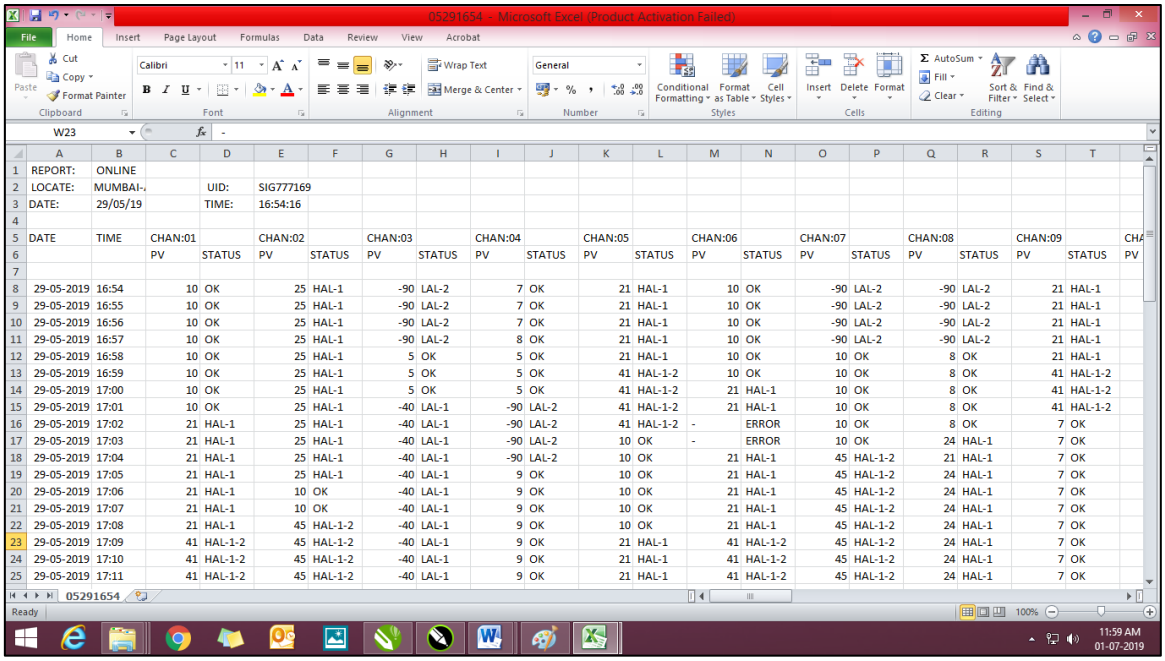
1. All alert notifications are provided via SMS.
2. SMS notifications can be configured up to 10 users.
3. Below figures shows received SMS format on mobile

• **SMS FORMATE**	
• **ALERT NOTIFICATION**	
CH: 48 (CHANNEL 1) ST: AL-1: HIGH PV: +31 DEGC TM: 20/02/20 12:00 LOC: AMBE_R&D UID: SIG709057 RSSI: -51	CH: 48 (CHANNEL 1) ST: OK PV: +18 DEGC TM: 20/02/20 12:10 LOC: AMBE_R&D UID: SIG709057 RSSI: -51
Figure 47	Figure 48
• **FAULT NOTIFICATION**	
CH: 41 (CHANNEL 1) ST: COMM ERR TM: 20/02/20 12:20 LOC: AMBE_R&D UID: SIG709057 RSSI: -52	CH: 01 (CHANNEL 1) ST: OPEN TM: 20/02/20 12:30 LOC: AMBE_R&D UID: SIG709057 RSSI: -54
Figure 49	Figure 50
• **EMAIL FORMATE**	
Reply Reply All Forward Fri 5/17/2019 3:45 PM SIG-AMBETRONICS <ambeiot@ambetronics.com> SIG-AMBETRONICS @17/05/19 15:44 To rnd4@ambetronics.com; rnd8@ambetronics.com CH: 48 (WGD_08_825356) ST: AL-1: HIGH PV: +32 %LEL TM: 17/05/19 15:44 LOC: AMBE_R&D	Reply Reply All Forward Fri 5/17/2019 3:45 PM SIG-AMBETRONICS <ambeiot@ambetronics.com> SIG-AMBETRONICS @17/05/19 15:44 To rnd4@ambetronics.com; rnd8@ambetronics.com CH:48 (WGD_08_825356) ST: OK PV: +18 %LEL
Figure 51	Figure 52

13. LOGGING REPORT

1. There are 2 modes of pen drive data logging- online mode and offline mode
2. Data report can be generated in both modes.
3. Following Figures shows data log report generated by SIG

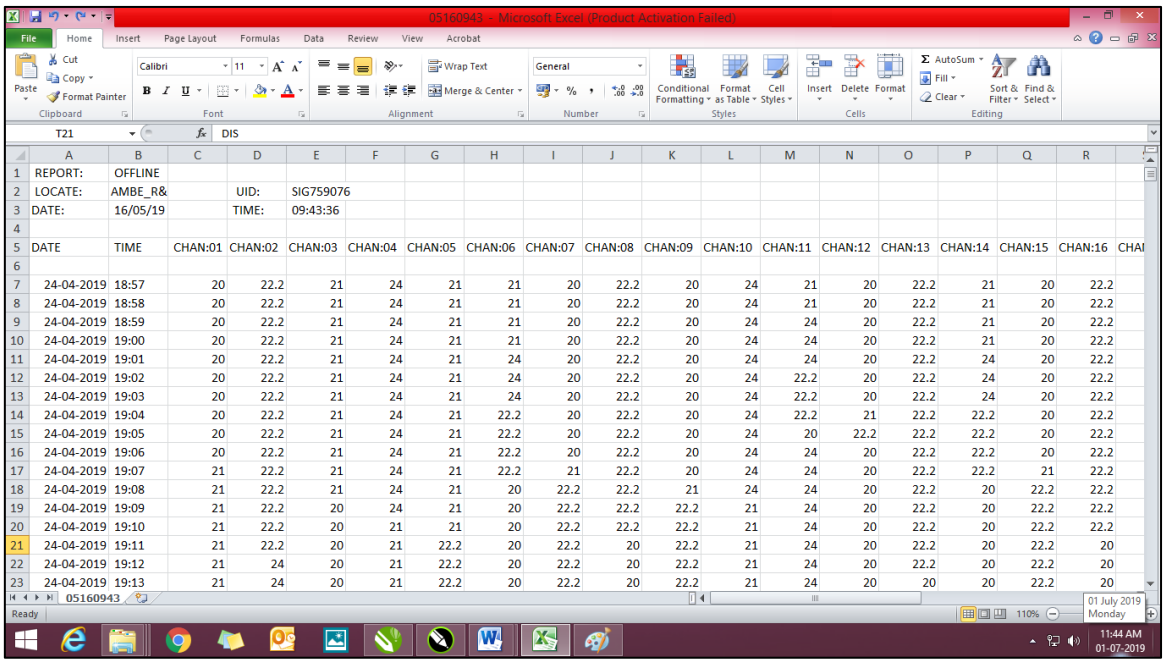
- **ONLINE REPORT**



REPORT:	ONLINE																		
LOCATE:	MUMBAI-		UID:	SIG777169															
DATE:	29/05/19		TIME:	16:54:16															
DATE	TIME	CHAN:01		CHAN:02		CHAN:03		CHAN:04		CHAN:05		CHAN:06		CHAN:07		CHAN:08		CHAN:09	
		PV	STATUS	PV	STATUS	PV	STATUS	PV	STATUS	PV	STATUS	PV	STATUS	PV	STATUS	PV	STATUS	PV	STATUS
29-05-2019	16:54	10	OK	25	HAL-1	-90	LAL-2	7	OK	21	HAL-1	10	OK	-90	LAL-2	-90	LAL-2	21	HAL-1
29-05-2019	16:55	10	OK	25	HAL-1	-90	LAL-2	7	OK	21	HAL-1	10	OK	-90	LAL-2	-90	LAL-2	21	HAL-1
29-05-2019	16:56	10	OK	25	HAL-1	-90	LAL-2	7	OK	21	HAL-1	10	OK	-90	LAL-2	-90	LAL-2	21	HAL-1
29-05-2019	16:57	10	OK	25	HAL-1	-90	LAL-2	8	OK	21	HAL-1	10	OK	-90	LAL-2	-90	LAL-2	21	HAL-1
29-05-2019	16:58	10	OK	25	HAL-1	5	OK	5	OK	21	HAL-1	10	OK	10	OK	8	OK	21	HAL-1
29-05-2019	16:59	10	OK	25	HAL-1	5	OK	5	OK	41	HAL-1-2	10	OK	10	OK	8	OK	41	HAL-1-2
29-05-2019	17:00	10	OK	25	HAL-1	5	OK	5	OK	41	HAL-1-2	21	HAL-1	10	OK	8	OK	41	HAL-1-2
29-05-2019	17:01	10	OK	25	HAL-1	-40	LAL-1	-90	LAL-2	41	HAL-1-2	21	HAL-1	10	OK	8	OK	41	HAL-1-2
29-05-2019	17:02	21	HAL-1	25	HAL-1	-40	LAL-1	-90	LAL-2	41	HAL-1-2	-	ERROR	10	OK	8	OK	7	OK
29-05-2019	17:03	21	HAL-1	25	HAL-1	-40	LAL-1	-90	LAL-2	10	OK	-	ERROR	10	OK	24	HAL-1	7	OK
29-05-2019	17:04	21	HAL-1	25	HAL-1	-40	LAL-1	-90	LAL-2	10	OK	21	HAL-1	45	HAL-1-2	21	HAL-1	7	OK
29-05-2019	17:05	21	HAL-1	25	HAL-1	-40	LAL-1	9	OK	10	OK	21	HAL-1	45	HAL-1-2	24	HAL-1	7	OK
29-05-2019	17:06	21	HAL-1	10	OK	-40	LAL-1	9	OK	10	OK	21	HAL-1	45	HAL-1-2	24	HAL-1	7	OK
29-05-2019	17:07	21	HAL-1	10	OK	-40	LAL-1	9	OK	10	OK	21	HAL-1	45	HAL-1-2	24	HAL-1	7	OK
29-05-2019	17:08	21	HAL-1	45	HAL-1-2	-40	LAL-1	9	OK	10	OK	21	HAL-1	45	HAL-1-2	24	HAL-1	7	OK
29-05-2019	17:09	41	HAL-1-2	45	HAL-1-2	-40	LAL-1	9	OK	21	HAL-1	41	HAL-1-2	45	HAL-1-2	24	HAL-1	7	OK
29-05-2019	17:10	41	HAL-1-2	45	HAL-1-2	-40	LAL-1	9	OK	21	HAL-1	41	HAL-1-2	45	HAL-1-2	24	HAL-1	7	OK
29-05-2019	17:11	41	HAL-1-2	45	HAL-1-2	-40	LAL-1	9	OK	21	HAL-1	41	HAL-1-2	45	HAL-1-2	24	HAL-1	7	OK

Figure 53

- **OFFLINE REPORT**



REPORT:	OFFLINE																	
LOCATE:	AMBE_R&		UID:	SIG759076														
DATE:	16/05/19		TIME:	09:43:36														
DATE	TIME	CHAN:01	CHAN:02	CHAN:03	CHAN:04	CHAN:05	CHAN:06	CHAN:07	CHAN:08	CHAN:09	CHAN:10	CHAN:11	CHAN:12	CHAN:13	CHAN:14	CHAN:15	CHAN:16	
24-04-2019	18:57	20	22.2	21	24	21	21	20	22.2	20	24	21	20	22.2	21	20	22.2	
24-04-2019	18:58	20	22.2	21	24	21	21	20	22.2	20	24	21	20	22.2	21	20	22.2	
24-04-2019	18:59	20	22.2	21	24	21	21	20	22.2	20	24	24	20	22.2	21	20	22.2	
24-04-2019	19:00	20	22.2	21	24	21	21	20	22.2	20	24	24	20	22.2	21	20	22.2	
24-04-2019	19:01	20	22.2	21	24	21	24	20	22.2	20	24	24	20	22.2	24	20	22.2	
24-04-2019	19:02	20	22.2	21	24	21	24	20	22.2	20	24	22.2	20	22.2	24	20	22.2	
24-04-2019	19:03	20	22.2	21	24	21	24	20	22.2	20	24	22.2	20	22.2	24	20	22.2	
24-04-2019	19:04	20	22.2	21	24	21	22.2	20	22.2	20	24	22.2	21	22.2	22.2	20	22.2	
24-04-2019	19:05	20	22.2	21	24	21	22.2	20	22.2	20	24	20	22.2	22.2	22.2	20	22.2	
24-04-2019	19:06	20	22.2	21	24	21	22.2	20	22.2	20	24	24	20	22.2	22.2	20	22.2	
24-04-2019	19:07	21	22.2	21	24	21	22.2	21	22.2	20	24	24	20	22.2	22.2	21	22.2	
24-04-2019	19:08	21	22.2	21	24	21	20	22.2	22.2	21	24	24	20	22.2	20	22.2	22.2	
24-04-2019	19:09	21	22.2	20	24	21	20	22.2	22.2	22.2	21	24	20	22.2	20	22.2	22.2	
24-04-2019	19:10	21	22.2	20	21	21	20	22.2	22.2	22.2	21	24	20	22.2	20	22.2	22.2	
24-04-2019	19:11	21	22.2	20	21	22.2	20	22.2	20	22.2	21	24	20	22.2	20	22.2	20	
24-04-2019	19:12	21	24	20	21	22.2	20	22.2	20	22.2	21	24	20	22.2	20	22.2	20	
24-04-2019	19:13	21	24	20	21	22.2	20	22.2	20	22.2	21	24	20	20	20	22.2	20	

Figure 54

14. ACRONYMS USED IN THIS MANUAL

Table 10

GC	:	Gas concentration	PV	:	Process Value
COM	:	Communication	AL	:	Alarm
	:	Submit		:	Refresh
	:	Check		:	Connect
	:	Wrong check		:	Right check
	:	Synchronize		:	Add
	:	Read		:	Delete
	:	Alarm		:	Filling of data
	:	Read alarm		:	Copy
	:	SMS On/Off		:	SMS / E-MAIL
	:	cloud settings		:	Reset
	:	User			

15. REVISION HISTORY

Table 11

SR. NO	VERSION NO	REVISION	EFFECTIVE DATE	REMARK
1.	V 1.0	R1	21-01-2020	NEW RELEASE

16. MISCELLANEOUS

Table 12

SR. NO	VERSION NO	REVISION	EFFECTIVE DATE	TOTAL TABLE NO.	TOTAL FIGURE NO.
1.	V 1.0	R1	21-01-2020	12	54

THE END

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