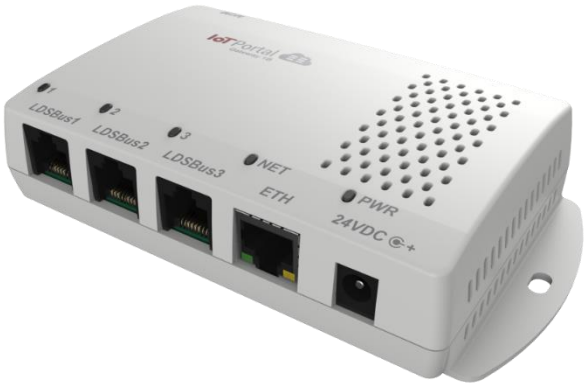
IoTPortal Gateway

Datasheet



1 Introduction

The IoTPortal Gateway allows a wide variety of LDSBus protocol based LDSBus Devices (sensors/actuators) to communicate with BRT Systems IoTPortal Cloud services without the need for a PC. Real time monitoring, alert notifications and control automation can be configured through the cloud via the IoTPortal Mobile app. The IoTPortal Gateway connects to the cloud via Wi-Fi or Ethernet and is powered either via POE or an external DC adaptor (PSU).

The gateway comes with 3 LDSBus RJ45 ports which serve as data communication/power interface to the LDS bus network. Each port can be connected to multiple LDSBus HVT-Junctions using RJ45 cables (Cat5e) and each HVT-junction supports up to 4 LDSBus Devices (Sensors/Actuators) with a distance reaching up to 200 meters.

Applications include remote environment monitoring, agriculture monitoring and control, smart building automation, data center and industrial monitoring etc. Please visit https://bit.ly/Iotportal-resources for more information on the Gateway and the IoTPortal.

1.1 Features

IoTPortal Gateway features include:

- Connect IoT sensors/actuators to the BRT Systems IoTPortal Cloud to enable monitoring, alert, and control features
- Connect to wired sensors/actuators based on the BRT Systems LDSBus protocol
- Sensor/Actuator connectivity reaching up to a distance of 200 meters
- Ethernet Port with 10/100BASE-T
- Wi-Fi 802.11 b/g/n
- POE Gateway version supports both IEEE802.3af and IEEE802.3at standards
- 3 LDSBus RJ45 ports provide power and support data communication
- Machine-to-Machine communication port
- 8MB non-volatile storage for sensor report storage during off-line condition
- Built in temperature sensor
- Built-in Over current protection
- Flush Mount and DIN Rail Mounting options
- PSU (DC Power adaptor): 24VDC/65W
- Operating Temperature: 0°C to +55°C
- Contains FCC ID: 2AC7Z-ESPWROOM32D

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2 Part Numbers

Part#	Naming
LG010101A	IoTPortal Gateway (POE Version)
LG010201A	IoTPortal Gateway (PSU Version)
LA090101A	LDSBus M2M RJ12-USBA Cable (1.8 m)
LA100101A	LDSBus M2M RJ12-UART WE Cable (1.0 m)
LA110101A	LDSBus M2M RJ12-RS485 cable (1.8 m)
LA120101A	LDSBus DIN Rail Mount Set
LA070101A	IoTPortal Gateway PSU

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3 Product Specifications

Connectivity	LDSBus Devices	BRT Systems LDSBus protocol
	Internet Cloud	Wi-Fi: IEEE802.11 b/g/n (802.11n up to 150 Mbps) Frequency: 2.4 GHz ~ 2.5 GHz Antenna: On Board Antenna Ethernet: 10/100BASE-TX Ethernet Port, Auto-negotiation
Features	LDSBus Interface	3x RJ45 ports (RS485)
	Machine to Machine Interface	1x RJ12 port (UART)
	Power Indicator	1x Dual-color LED Red (PoE af) , Orange (PoE at, DC input)
	Network Indicator	1x RGB LED
	LDSBus Port Indicator	3x Red LEDs
	Sensor	Built in temperature sensor
	Real Time Clock(RTC)	Yes
	Battery	CR1225 3V/52mAh, 5-Year Life cycles
	Hardware Reset	Yes
	Factory Reset	Yes, Multi-function
Power	Input	POE Gateway - PSE: IEEE802.3af standards IEEE802.3at standards PSU Gateway - 24VDC / 65W
	Output (LDSBus Ports)	POE Gateway IEEE802.3af – 24VDC, Max. 400mA / 9.6W IEEE802.3at - 24VDC, Max. 600mA/ 14.4W PSU Gateway - 24VDC, Max. 1500mA / 36W
	Power Consumption	POE Gateway - Max. 20W PSU Gateway - Max. 40W
Physical Characteristics	Color	White
	Housing	Polycarbonate
	Dimensions (mm)	148.8(L) X 81.0(W) X 31.9(H)
	Weight	POE Gateway - 154 grams PSU Gateway - 140 grams
Environmental Limits	Operating Temperature	POE Gateway - 0 to +55°C PSU Gateway - 0 to +40°C
	Storage Temperature	-20 to +85°C
	Ambient Relative Humidity	5 to 95% (non-condensing)
Standards & Certifications	EMC (FCC/CE)	EN 55032:2015+AC:2016 Class B BS EN 55032:2015+AC:2016 Class B EN IEC 61000-3-2:2019 Class A BS EN IEC 61000-3-2:2019 Class A EN IEC 61000-3-3:2013+A1:2019 BS EN IEC 61000-3-3:2013+A1:2019 EN 55024:2010+A1:2015 BS EN 55024:2010+A1:2015 EN 55035:2017+A11:2020 BS EN 55035:2017+A11:2020 FCC CFR Title 47,PART 15, Subpart B, Class B
Standards & Certifications	Radio Equipment Directive (RED)	EN 301 489-1 V2.2.3 EN 301 489-17 V3.2.4 IEC 62368-1:2014 EN 62368-1:2014 +A11:2017
	Safety (LVD)	
	RF (FCC/CE)	EN 300 328 V2.2.2 EN IEC 62311:2020 FCC PART 15, Subpart C (15.247)
Package Contents	POE Version	1x IoTPortal Gateway
	PSU Version	1x IoTPortal Gateway 1x Power Adapter
	Installation (optional)	1x DIN Rail Bracket set

Table 1 - IoTPortal Gateway Specifications

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4 FCC Statements

IoTPortal Gateway complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) These devices may not cause harmful interference, and

(2) These devices must accept any interference received, including interference that may cause undesired operation.

NOTE: The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF exposure guidelines, at least 20cm of separation distance between the IoTPortal Gateway device and the user's body must be maintained at all times.

FCC Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and it also complies with Part 15 of the FCC RF Rules. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and consider removing the no-collocation statement.

Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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5 IoTPortal Ecosystem

Figure 1 shows the IoTPortal ecosystem with the IoTPortal Gateway serving as a vital component connecting the LDSBus devices (Sensors/Actuators) to the cloud.

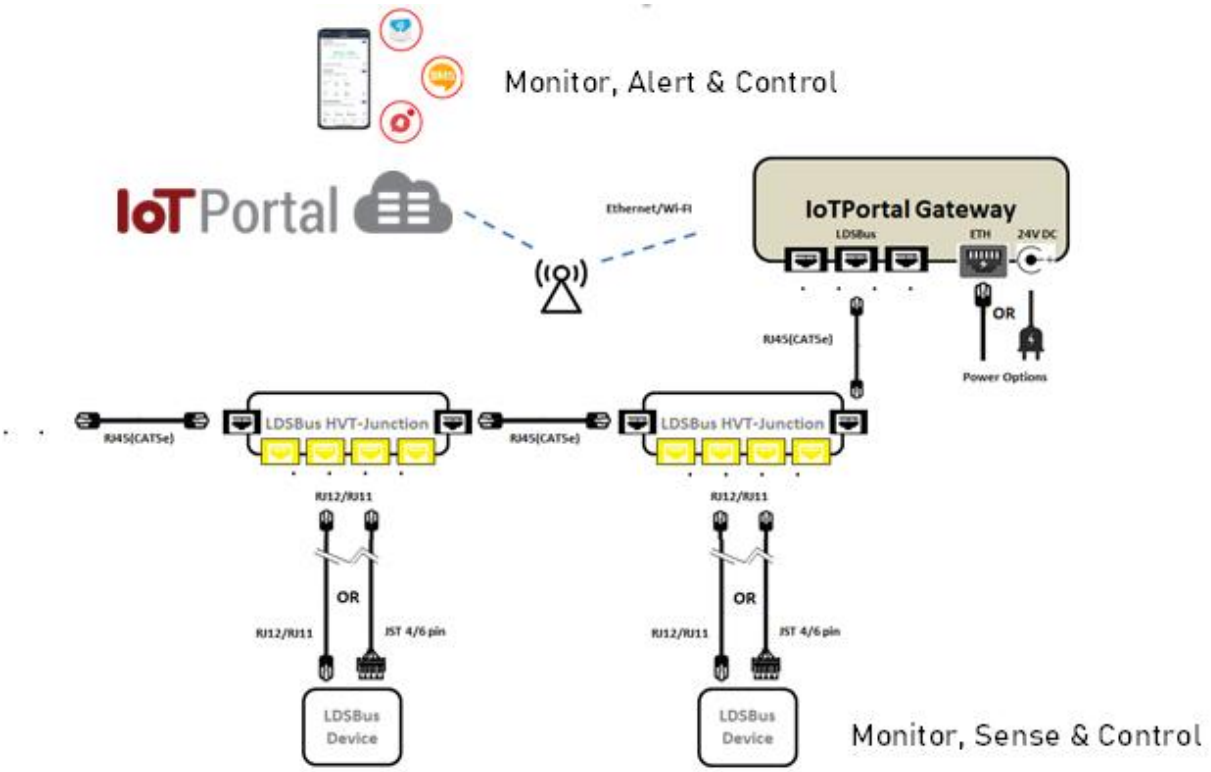

Figure 1 - IoTPortal Ecosystem

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6 Hardware Features

6.1 IoTPortal Gateway (POE Version)

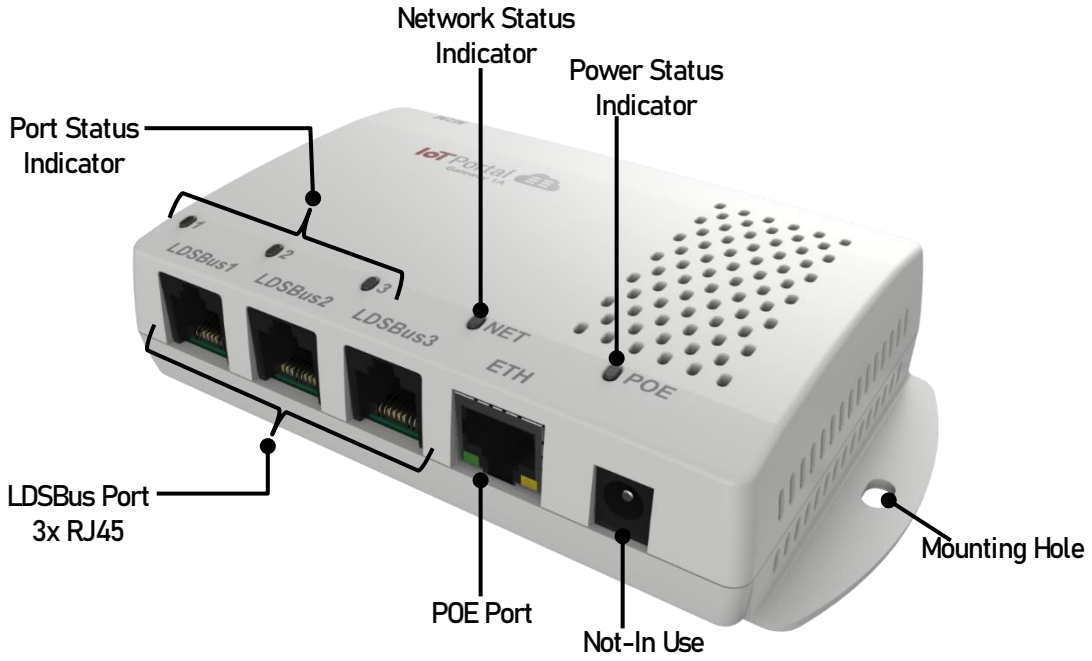

Figure 2 - IoTPortal Gateway (POE) - Top View

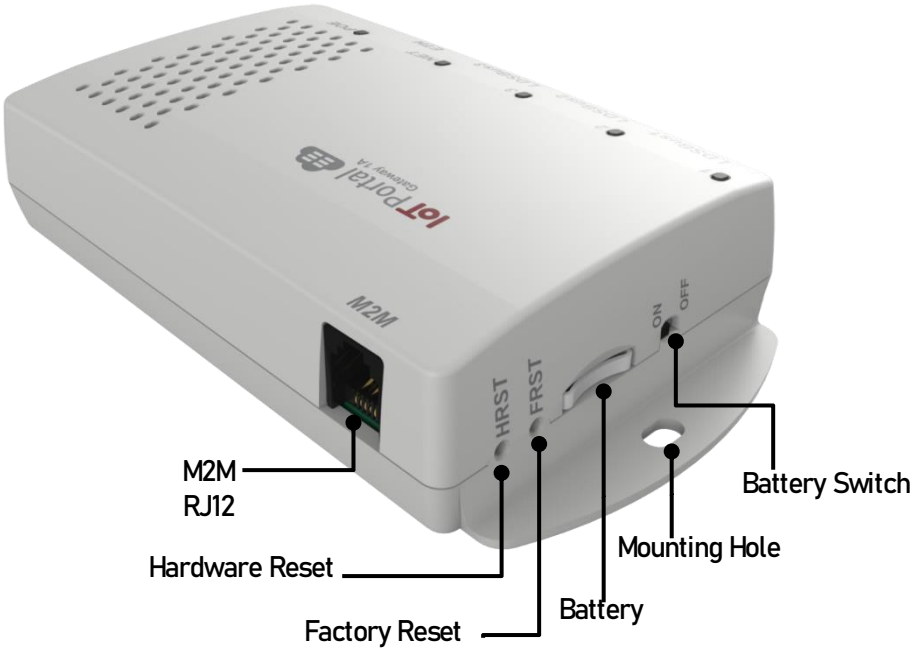

Figure 3 - IoTPortal Gateway (POE) - Side View

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6.2 IoTPortal Gateway (PSU Version)

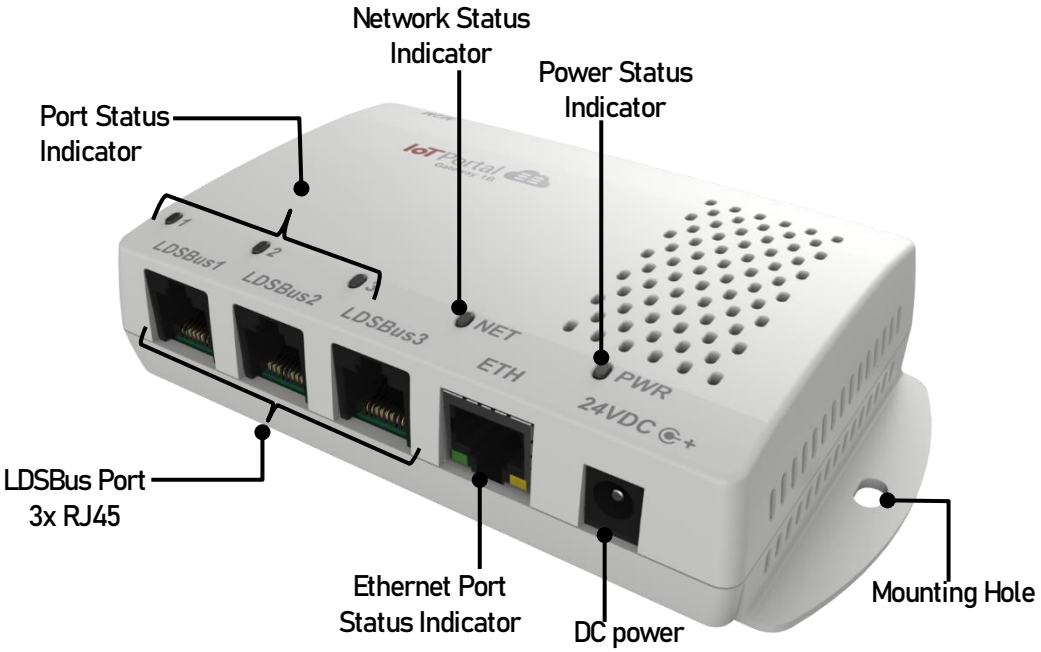

Figure 4 - IoTPortal Gateway (PSU Version) - Top View

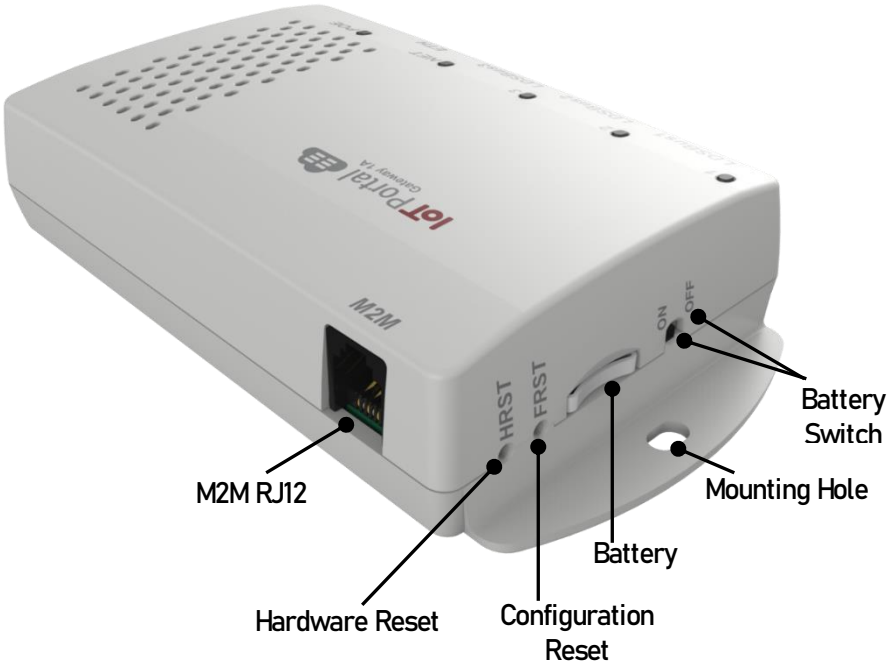

Figure 5 - IoTPortal Gateway (PSU Version) - Side View

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6.3 Mounting Options

6.3.1 Flush Mount

The IoTPortal Gateway can be flush mounted directly on a wall or any flat surface using 2 M3.5*16mm (thread) screws.

Figure 6 - IoTPortal Gateway Flush Mount

6.3.2 DIN Rail Mount

The IoTPortal Gateway can be mounted on a DIN Rail using the LDSBus DIN Rail Mount set. This set is optional and includes the bracket and mounting screws.

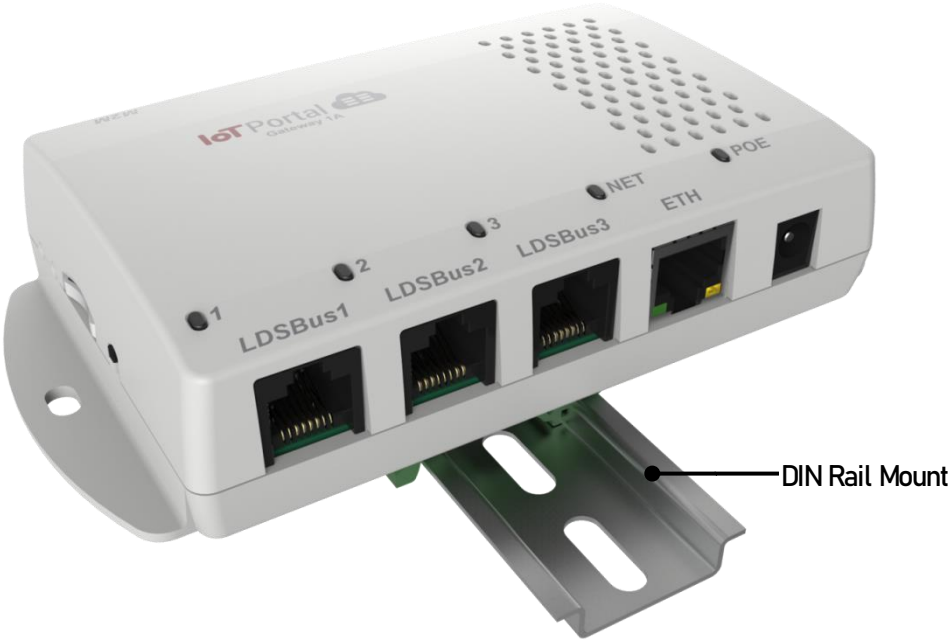

Figure 7 - IoTPortal Gateway DIN Rail Mount

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6.4 Power Supply

6.4.1 POE Gateway

The IoTPortal Gateway shall be powered through an IEEE 802.3af or an IEEE 802.3at POE switch. The DC jack is not used in this version. Refer to Table 2 for details on the Power supply.

6.4.2 PSU Gateway

The IoTPortal Gateway shall be powered through a 24VDC / 65W adaptor. Refer to Table 2 for details on the Power supply.

Power Source	Input Voltage	LDSBus Port Voltage	Max. Current (Per port)	Max. Current (3x ports)
IEEE802.3af	37.0V~57.0V	24.0V	400mA	400mA
IEEE802.3at	42.5V~57.0V	24.0V	400mA	600mA
Power Adaptor	24.0V / 65W	24.0V	500mA	1500mA

Table 2 - Power Supply

6.5 LDSBus Output Ports

The IoTPortal Gateway comes with 3 LDSBus ports that provide 24VDC bus power. LDSBus devices can be connected via Cat5e cable up to a distance of 200 meters. The Gateway scans each port for LDSBus devices and disables the port when no devices are detected or if device loading exceeds rated power.

6.6 Machine to Machine (M2M) Port

The IoTPortal Gateway also has an RJ12 port (Yellow) for communication between machines. The M2M port is made up of an UART running at 115200 Baud rate, 8-N-1. AT commands may be sent to the gateway to achieve the following:

a. Send an email
b. Send a push notification to a mobile number
c. Send an SMS to a mobile number
d. Send a text message to a remote gateway using its UUID

6.7 Real Time Clock (RTC)

The IoTPortal Gateway synchronizes time using Network Time Protocol (NTP). In case, NTP is not desired, then the onboard Real Time Clock may be used. The contents of the RTC are backed by a battery which can be switched on and off via the Battery Switch. A CR1225 coin battery is included (3V/52mAh) and battery life is approximately 5 years.

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6.8 Reset

There are two reset buttons on the IoTPortal Gateway, namely HRST and FRST.

6.8.1 Hardware Reset (HRST)

When HRST (Hardware Reset) is pressed, a system level, hardware reset is initiated.

6.8.2 Configuration Reset (FRST)

FRST (Firmware Reset) is a menu driven firmware-controlled reset. Three options are available on the FRST menu, and these are:

1. Initialize the gateway into Wireless Access Point (AP) mode for wireless on-boarding
2. Reset gateway configuration
3. Factory Reset

6.8.2.1 Wireless Access Point

1. Press and hold the FRST button for 5 seconds and the NET status LED will turn to solid red.
2. Release FRST and wait 10 seconds and the NET status LED will blink red.
3. Wait another 5 seconds and the gateway will enter AP mode and becomes discoverable
4. Onboarding shall begin within 60 seconds
5. After 60 seconds of no activity, the operation is cancelled, and gateway returns to previous state.

6.8.2.2 Reset Gateway Configuration

1. Press and hold the FRST button for 5 seconds and the NET status LED will turn to solid red.
2. Release FRST and within 10 seconds, press and hold FRST again for at least 2 seconds or until NET status LED turns to solid cyan.
3. Release FRST and wait 10 seconds and NET status LED turns to blink cyan to indicate gateway configuration reset is initiated.
4. After releasing FRST in step 2 and followed by 60 seconds of no activity (no button presses), the operation is cancelled, and gateway returns to previous state.

6.8.2.3 Factory Reset

1. Press and hold the FRST button for 5 seconds and the NET status LED will turn to solid red.
2. Release FRST and within 10 seconds, press and hold FRST again for at least 2 seconds or until NET status LED turns to solid cyan.
3. Release FRST and within 10 seconds, press and hold FRST again for at least 2 seconds or until NET status LED turns to solid orange.
4. Release FRST and wait for 10 seconds. NET status LED will blink orange to indicate factory reset is initiated.
5. After releasing FRST in step 4, pressing the FRST again within 10 seconds will cancel the reset operation.

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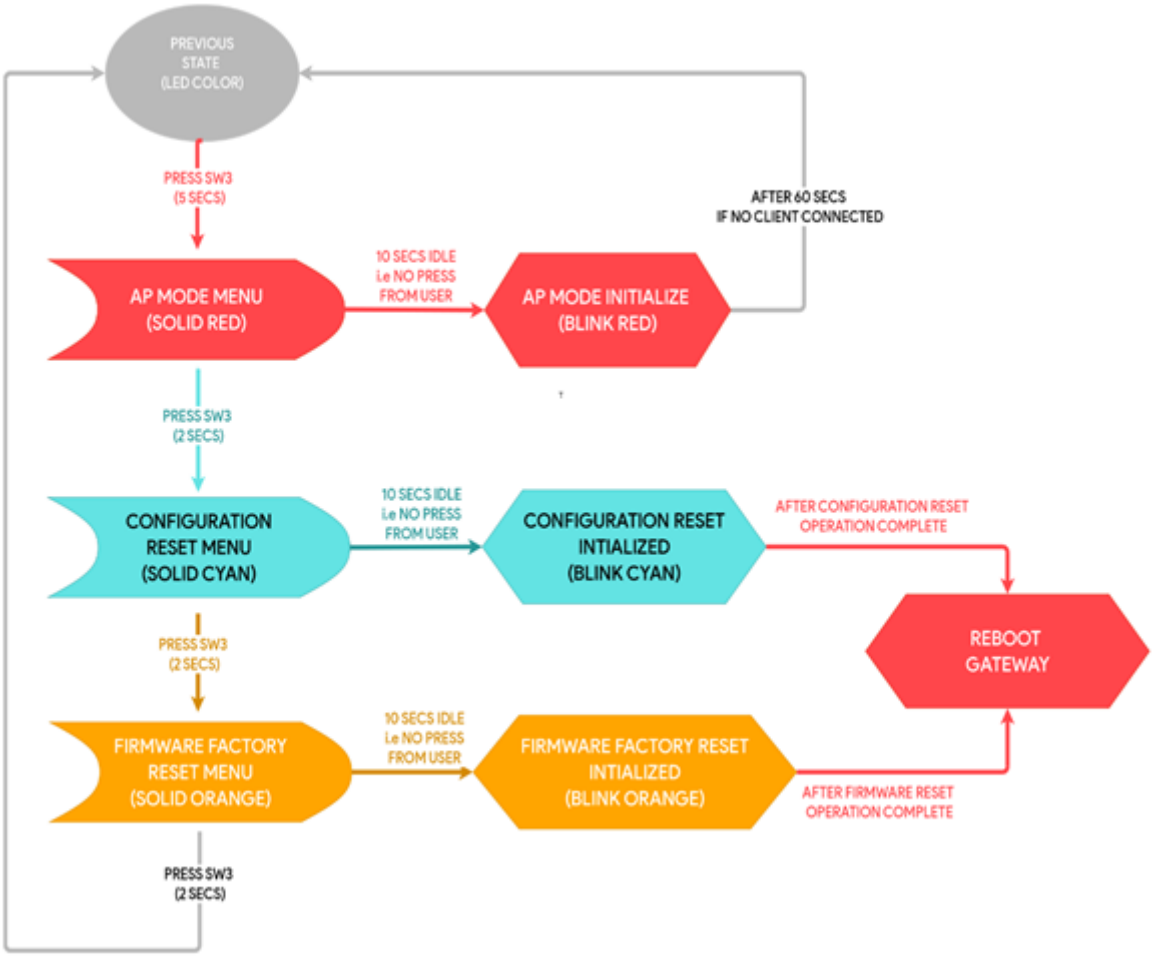

Figure 8 - IoTPortal Gateway Firmware - RESET Button Functionality Flow Diagram

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7 System Status LED Indicators

The following status indicators are available on the IoTPortal Gateway -

1. Network and FRST Status LED Indicator (NET)
2. Power Status LED Indicator (PWR / POE)
3. Ethernet Port Status LED Indicator (ETH)
4. LDSBus Port Status LED Indicator (LDSBus)

7.1 Network and FRST Status LED Indicator (NET)

LED Color		Description
RED – Stable		Device is in bootup mode
BLUE – Blinking		While connecting to network (either Ethernet or Wi-Fi)
BLUE – Stable		Upon successful connection to network (either Ethernet or Wi-Fi)
GREEN - Blinking		While connecting to IoTPortal Cloud
GREEN - Stable		Upon successful connection to IoTPortal Cloud
RED - Blinking		If in Wi-Fi AP mode and waiting for configuration from Mobile app
YELLOW - Blinking		When firmware upgrade (OTA) is in progress

Table 3 - IoTPortal Gateway Network and FRST Status LED Indicator

7.2 Power Status LED Indicator (PWR/POE)

LED Color		Description
RED - Stable		Indicates that the device is Powered ON with POE that supports IEEE802.3af
ORANGE – Stable		Indicates that the device is Powered ON with POE that supports IEEE802.3at **or** Indicates that the device is Powered ON with +24VDC (PSU)

Table 4 - IoTPortal Gateway Power Status LED Indicator

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7.3 Ethernet Port Status LED Indicator (ETH)

LED	LED Color		Description
Link Indicator	Off		Network link is down
	YELLOW – Stable		Network link is up
	YELLOW - Blinking		Network link is up and data transfer in progress
Speed Indicator	Off		If link indicator is yellow, network is operating at 10Mbps otherwise no speed is available
	GREEN - Stable		Network is operating at 100Mbps

Table 5 - IoTPortal Gateway Ethernet Port Status LED Indicator

7.4 LDSBus Port Status LED Indicator (LDSBus)

LED Color		Description
Off		Indicates that the port is disabled (not powered)
RED – Stable		Indicates that the port is enabled (idle)
RED- Blinking		Indicates that the port is active, and communication is in progress

Table 6 - LDSBus Port Status LED Indicator

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8 Mechanical Dimension

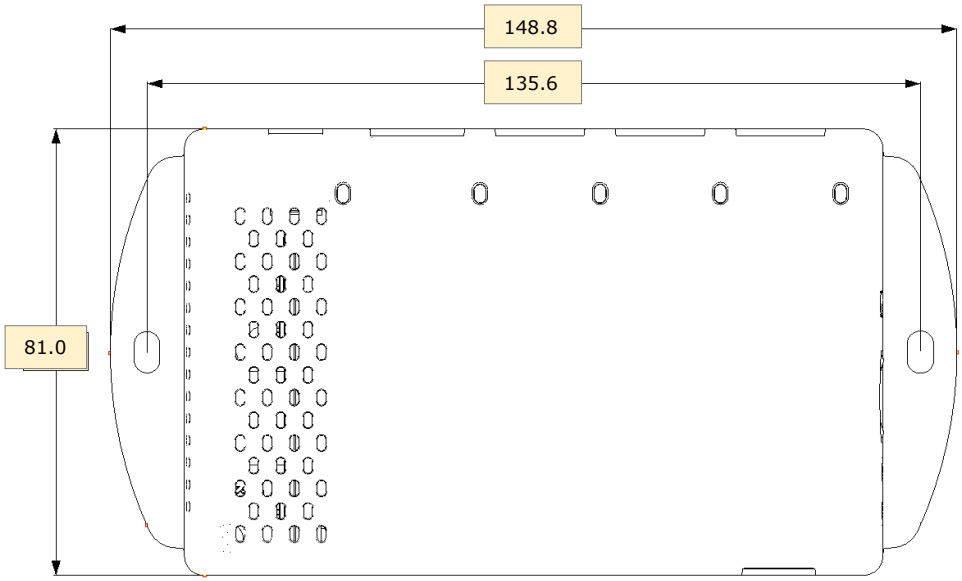

Figure 9 - IoTPortal Gateway Dimension - Top View

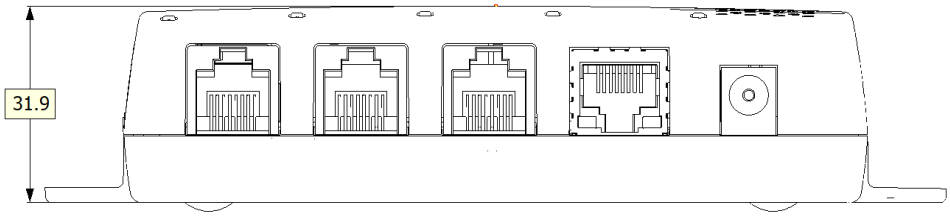

Figure 10 - IoTPortal Gateway Dimension - Side View

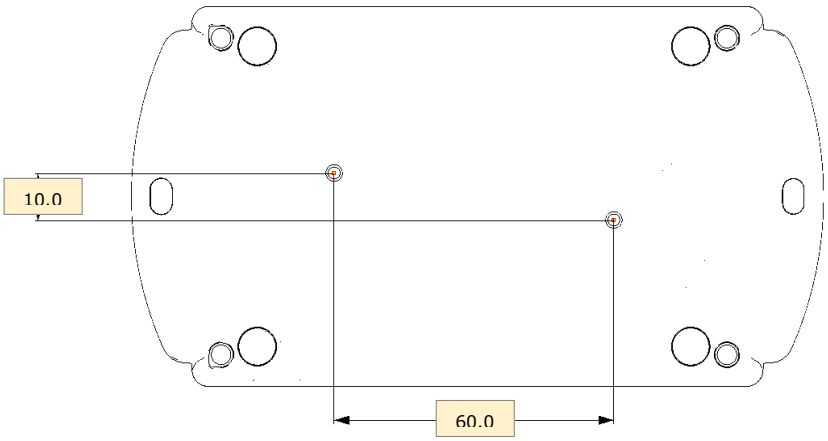

Figure 11 - IoTPortal Gateway Dimension - Bottom View

Note: All dimensions are in millimeters.

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9 Contact Information

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Appendix A – References

Document References

IoTPortal Gateway Quick Start Guide

Acronyms and Abbreviations

Terms	Description
HVT	High Voltage Terminal
IoT	Internet of Things
LED	Light Emitting Diode
LDSBus	Long Distance Sensor Bus
M2M	Machine to Machine
POE	Power Over Ethernet
PSU	Power Supply Unit
RTC	Real Time Clock

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Appendix C – Revision History

Document Title: IoTPortal Gateway Datasheet
Document Reference No.: BRTSYS_000007
Clearance No.: BRTSYS#002
Product Page: https://brtsys.com/iotportal/
Document Feedback: Send Feedback

Revision	Changes	Date
Version 1.0	Initial Release	27-10-2021
Version 1.1	Updated release under BRT Systems	14-09-2022

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