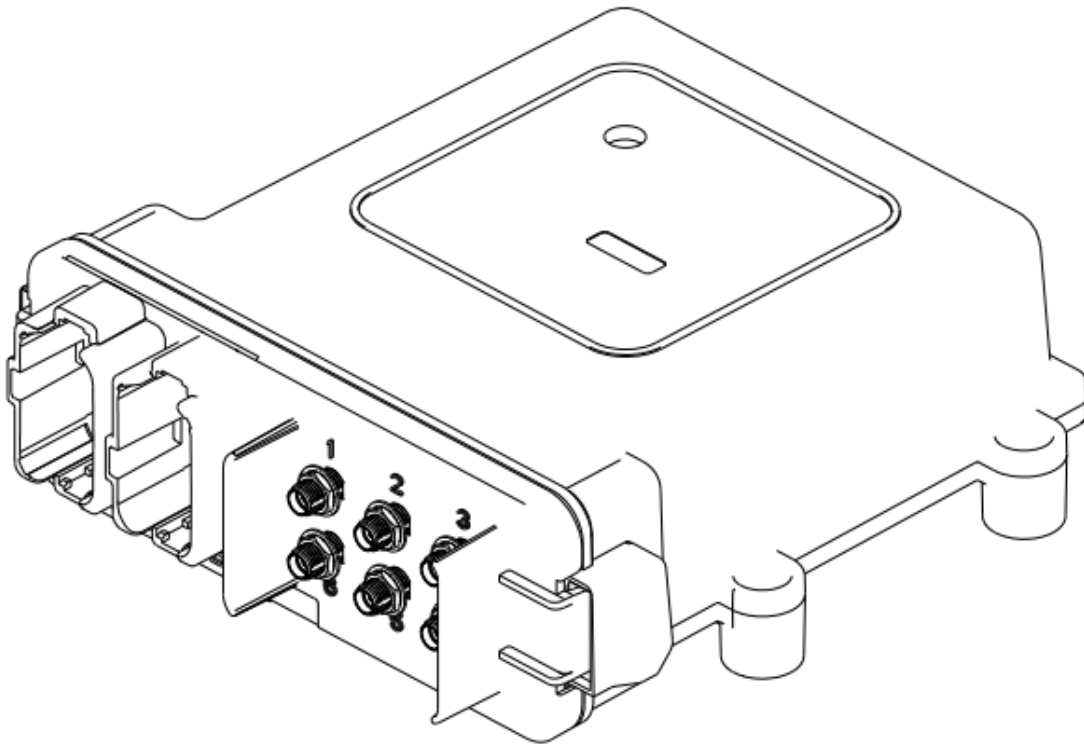


APPAREO

Gateway Installation Manual

GW03



This document and the information contained herein are the property of Appareo Systems, LLC and are confidential. They may not be disseminated or redistributed without the written permission of Appareo Systems, LLC

APPAREO SYSTEMS, LLC
FARGO, NORTH DAKOTA 58102

Gateway Installation Manual

DOCUMENT NUMBER

600840-000038

Document Type

Manual

Last Revised

3/22/16

REV

1.2

Sheet

1 of 9

Record of Revisions

Revision Number	Change Description	Effective Date	Inserted By
1.0	Initial Release	1/13/16	Lee Hinsz
1.1	Change " 30 cm separation distance" to "40 cm" per check from NCEE test lab	2/3/16	Lee Hinsz
1.2	Addition of "60 cm" for Canada per RSS-102. Addition of section 3.4.4 Condition of operation section and statement.	3/22/16	Lee Hinsz

Table of Contents

List of Figures	4
List of Tables	4
1. SYSTEM OVERVIEW	5
2. PURPOSE	5
3. GENERAL INFORMATION	5
3.1. SPECIAL TOOLS REQUIRED	5
3.2. INSTALLATION INSTRUCTIONS OVERVIEW	6
3.3. PARTS LIST FOR INSTALLATION	6
3.4. HARDWARE COMPONENTS BACKGROUND	7
3.4.1. Electrical Characteristics	7
3.4.2. Weight and Balance Information.....	7
3.4.3. Equipment Dimensions	7
3.4.4. Conditions for operation	7
4. CONFIGURATION	8
4.1. Gateway System Separation Distances.....	8
4.2. Gateway System Separation Distance Illustration	9

List of Figures

Figure 1 Separation Distance.....	9
-----------------------------------	---

List of Tables

Table 1 System Component Minimum Spacing.....	6
Table 2 Parts List for Installation	6
Table 3 Weight and Balance Information.....	7
Table 4 Equipment Dimensions	7
Table 5 Separation Distance	8

1. SYSTEM OVERVIEW

Gateway is an embedded computer that provides interfacing capability among a variety of wired and wireless networks. It implements WAN designs, with the additions of Bluetooth, WIFI, 433-MHz radio, and Satcom interfaces.

2. PURPOSE

This Installation Manual is intended to inform installers and users of the proper placement, configuration and distances between system components.

3. GENERAL INFORMATION

3.1. SPECIAL TOOLS REQUIRED

In addition to SAE standard and/or metric wrenches, sockets, and screw drivers, the following tool are required:

- 1) Torque Wrench (in-lbs)
- 2) Wrench set

3.2. INSTALLATION INSTRUCTIONS OVERVIEW

System installation is accomplished in the following steps:

- 1) Installation of Gateway into the tractor cab headliner
 - a. Torque the antenna terminations to Gateway RF SMA connectors with a torque spec of 7-10 in-lbs +/- 0.5 in-lbs. Mount the Gateway enclosure to the cab with ¼” or 6-mm fasteners and a torque of 30 in-lbs.
- 2) Installation of Antennas
 - a. Find a location on the equipment such that the following distances are the minimum spacing between system components.

Table 1 System Component Minimum Spacing

	Operator	Gateway
Antenna Hub 1 (Recommended minimum spacing between antenna hubs is 7.5 cm)	40 cm (USA) 60 cm (Canada)	20 cm
Antenna Hub 2	40 cm (USA) 60 cm (Canada)	20 cm
Gateway	20 cm	N/A

- b. Ensure the antennas have a ground plane of 300 x 300 mm around them.
- c. Torque the antenna mounting nut (M14x1) to 30 +/- 0.5 in-lbs.

3.3. PARTS LIST FOR INSTALLATION

The following parts are required for the installation of Gateway.

Table 2 Parts List for Installation

Parts List for Installation			
Item	Nomenclature	Part Number	QTY
1	Gateway	153510-000003	1
2	Antenna Hub 1	NA	1
3	Antenna Hub 2	NA	1

3.4. HARDWARE COMPONENTS BACKGROUND

3.4.1. Electrical Characteristics

Input Power Requirements: 9-16 VDC
 Current Draw at 14VDC: 250mA (nominal)

3.4.2. Weight and Balance Information

The total weight of the Garrison and antenna is listed below.

Table 3 Weight and Balance Information

Component	Weight (oz)	Weight (lbs)
Gateway	70.544	4.409
Antenna Hub 1 (HCEL-S2-0164A-01)	26.624	1.664
Antenna Hub 2 (HIRD-S2-0146A-01)	26.624	1.664

3.4.3. Equipment Dimensions

Equipment dimensions are outlined in the table below for all required components in Gateway. All figures given are representative of maximum equipment dimensions (where applicable).

Table 4 Equipment Dimensions

Component	Length (mm)	Width (mm)	Height (mm)
Gateway	165	159	54
Antenna Hub 1 (HCEL-S2-0164A-01)	124.3	80.3	80.3
Antenna Hub 2 (HIRD-S2-0146A-01)	124.3	80.3	80.3

3.4.4. Conditions for FCC 15.231 (a-d) operation

IMPORTANT NOTICE!!!!

This device can be configured to transmit on the 433 MHz frequency following the requirements of 47 CFR 15.231. Failure to adhere to this requirement void's the authority to operate the equipment!

The developer configuring Gateway's control signal for the user application is responsible for ensuring compliance to FCC 15.231(a-d).

In the event where the specific application in which the installed Gateway will be used, will not ensure that a control signal will always be sent as the purpose of the transmission, then the installer must set the Gateway to only operate in 15.231(e) mode (i.e., "periodic operation").

To set the device to transmit in FCC Part 15.231(e) mode, use the API command string as indicated below in quotes (“ ”).

```
“iLPD433.send(“MyMessage”,9,  

    FCC_PERIODIC_15_231_E,suggestedRetryIntervalMS,100,actualSentPowerDBM);”
```

Otherwise in the above command, replace the argument “FCC_PERIODIC_15_231_E” with “FCC_APERIODIC_15_231_AD” for 15.231(a-d) mode with the appropriate control message setup.

4. CONFIGURATION

With equipment installed, final configuration must meet the minimum separation distance in Table 5 and Section 4.2.

4.1. GATEWAY SYSTEM SEPARATION DISTANCES

	Operator	Gateway
Antenna Hub 1, 2 (Recommended minimum spacing between antenna hubs is 7.5 cm)	40 cm (USA) 60 cm (Canada)	20 cm
Gateway	20 cm	N/A

Table 5 Separation Distance

4.2. GATEWAY SYSTEM SEPARATION DISTANCE ILLUSTRATION

Gateway and the following components must follow the distances in the following illustration to comply with FCC part 1.310.

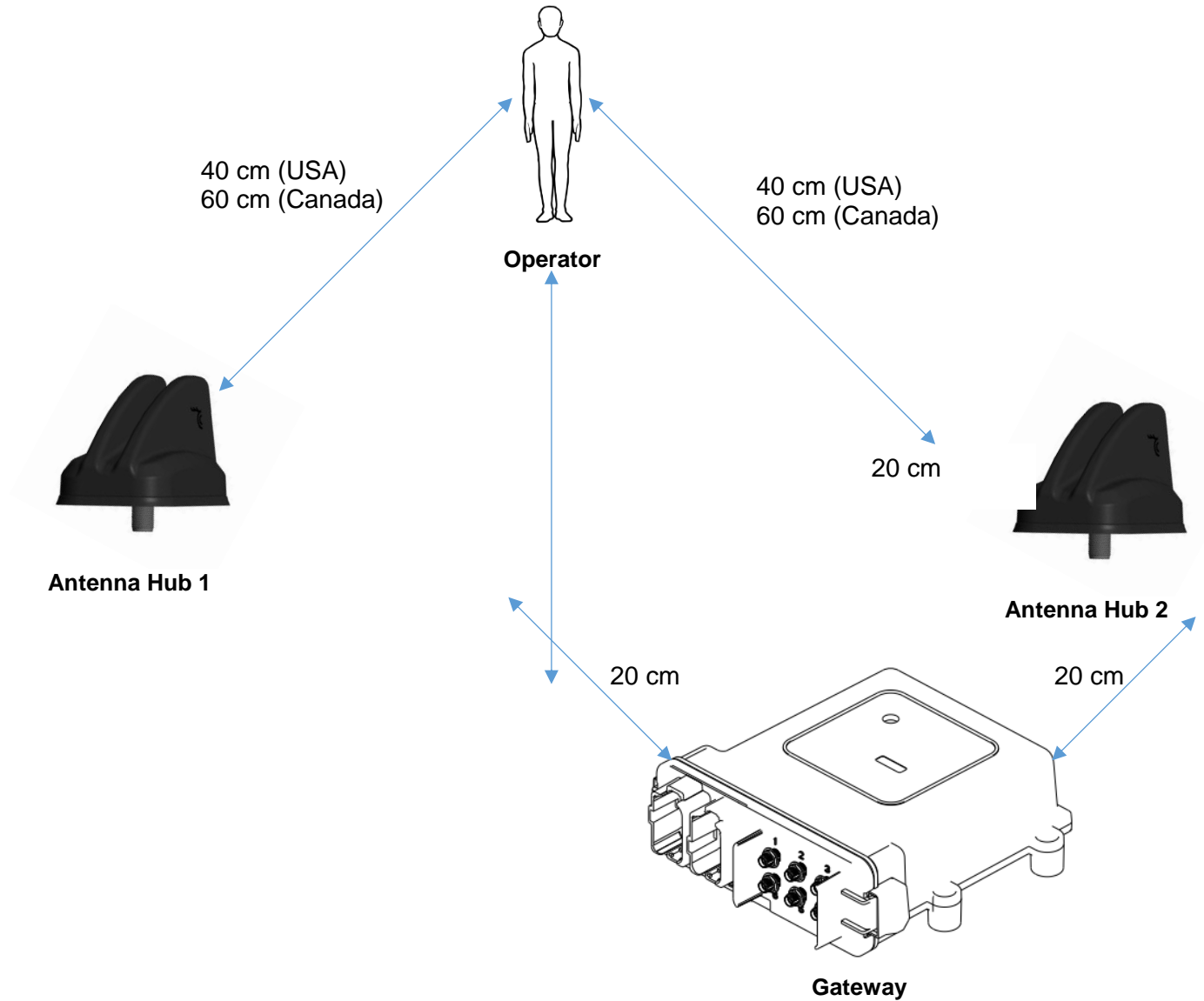


Figure 1 Separation Distance