



Public Safety Repeaters PSR 700/800

MF0123A1F

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Andrew Wireless Systems GmbH, 15-April-2021

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1. General

1.1. Used Abbreviations

| | |
|-------|--|
| AC/DC | Alternating current / Direct Current |
| AHJ | Authority Having Jurisdiction |
| AIMOS | Andrew Integrated Management and Operating System |
| ALC | Automatic Level Control |
| BBU | Battery Backup Unit |
| BITE | Built-In Test Equipment |
| BTS | Base Transceiver Station |
| CE | "Conformité Européenne" ("European Conformity") |
| CD | Compact Disk |
| CFR | Code of Federal Regulations |
| DL | Downlink |
| DoC | Declaration of Conformity |
| EDGE | Enhanced Data Rates for GSM Evolution |
| EN | European Norm |
| ESD | Electrostatic Discharge |
| ETS | European Telecommunication Standard |
| EULA | End User License Agreement |
| GSM | Global System for Mobile Communication |
| GND | Ground |
| GUI | Graphical User Interface |
| ICP3 | Intercept Point 3rd order |
| ID No | Identification Number |
| ION | Intelligent Optical Network |
| IP | Ingress Protection |
| ISDE | Innovation, Sciences et Développement économique Canada |
| ISED | Innovation, Science and Economic Development Canada; formerly IC / Industry Canada |
| ISO | International Organization for Standardization |
| LED | Light Emitting Diode |
| LMT | Local Maintenance Terminal |
| LTE | Long Term Evolution |
| MIMO | Multiple Input Multiple Output |
| MS | Mobile Station |
| MU | Main Unit |
| NEC | National Electrical Code for the United States |
| NF | Noise Figure |
| NFPA | The National Fire Protection Association |
| PG | Packing Gland |
| PIM | Passive Intermodulation |
| PSR | Public Safety Repeater |
| R&TTE | Radio & Telecommunications Terminal Equipment |
| RF | Radio Frequency |
| RX | Receiver |
| SNMP | Simple Network Management Protocol |
| TX | Transmitter |
| UL | Uplink / Underwriter Laboratories |
| UMTS | Universal Mobile Telecommunication System |
| UPS | Uninterruptible Power Supply |
| US | United States of America |
| WCDMA | Wideband Code Division Multiple Access |
| WDM | Wavelength Division Multiplex |

WEEE Waste Electrical and Electronic Equipment (Directive)

1.2. Health and Safety



1. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current. Obey all general and regional installation and safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.**



2. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current inside the unit in operation. Before opening the unit, disconnect mains power.**



3. **Caution:** High frequency radiation in operation. Risk of health hazards associated with radiation from the unit's inner conductor of the antenna port(s). Disconnect mains before connecting or replacing antenna cables.



4. **Caution:** High frequency radiation in operation. Risk of health hazards associated with radiation from the antenna(s) connected to the unit. Implement prevention measures to avoid the possibility of close proximity to the antenna(s) while in operation.

1.3. Property Damage Warnings

1. **Attention:** Due to power dissipation, the PSR (Public Safety Repeater) may reach a very high temperature. Do not operate this equipment on or close to flammable materials. Use caution when servicing the unit.

2. **Attention:** Only authorized and trained personnel are allowed to open the unit and get access to the inside.

3. **Notice:** Although the PSR is internally protected against overvoltage, it is strongly recommended to ground (earth) the antenna cables close to the antenna connectors of the PSR for protection against atmospheric discharge. In areas with strong lightning, it is strongly recommended to install additional lightning protection.



4. **Notice:** ESD precautions must be observed. Before commencing maintenance work, use the available grounding (earthing) system to connect ESD protection measures.

5. **Notice:** Only suitably qualified personnel are allowed to work on this unit and only after becoming familiar with all safety notices, installation, operation and maintenance procedures contained in this manual.

6. **Notice:** Keep operating instructions within easy reach and make them available to all users.

7. **Notice:** Read and obey all the warning labels attached to the unit. Make sure that all warning labels are kept in a legible condition. Replace any missing or damaged labels.

8. **Notice:** Only license holders for the respective frequency range are allowed to operate this unit.
9. **Notice:** Do not disassemble the unit.
10. **Notice:** Make sure the repeater settings are correct for the intended use (refer to the manufacturer product information) and regulatory requirements are met. Do not carry out any modifications or fit any spare parts, which are not sold or recommended by the manufacturer.

1.4. Compliance

1. **Notice:** For installations, which have to comply with FCC RF exposure requirements, the antenna selection and installation must be completed in a way to ensure compliance with those FCC requirements. Depending on the RF frequency, rated output power, antenna gain, and the loss between the repeater and antenna, the minimum distance D to be maintained between the antenna location and human beings is calculated according to this formula:

$$D_{[cm]} = \sqrt{\frac{P_{[mW]}}{4 * \pi * PD_{[mW/cm^2]}}}$$

where

- P (mW) is the radiated power at the antenna, i.e. the max. rated repeater output power in addition to the antenna gain minus the loss between the repeater and the antenna.
- PD (mW/cm²) is the allowed Power Density limit acc. to 47 CFR 1.1310 (B) for general population / uncontrolled exposures which is
 - F (MHz) / 1500 for frequencies from 300MHz to 1500MHz
 - 1 for frequencies from 1500MHz to 100,000MHz

RF exposure compliance may need to be addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of 1.1307(b)(3).

2. **Notice:** For installations which have to comply with European EN50385 exposure compliance requirements, the following Power Density limits/guidelines (mW/cm²) according to ICNIRP are valid:
- 0.2 for frequencies from 10 MHz to 400 MHz
 - F (MHz) / 2000 for frequencies from 400 MHz to 2 GHz
 - 1 for frequencies from 2 GHz to 300 GHz
3. **Notice:** Installation of this equipment is in full responsibility of the installer, who has also the responsibility, that cables and couplers are calculated into the maximum gain of the antennas, so that this value, which is filed in the FCC Grant and can be requested from the FCC data base, is not exceeded. The industrial boosters are shipped only as a naked booster without any installation devices or antennas as it needs for professional installation.
4. **Notice:** Installation environment: Although this unit is fully designed for proper operation in a location not protected from the weather, the intended installation location is a dry room with an ambient temperature of about 25°C (77°F).

5. Notice: For installations which have to comply with FCC requirements:

This device complies with FCC Part 15. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with Health Canada's Safety Code. The installer of this device should ensure that RF radiation is not emitted in excess of the Health Canada's requirement. Information can be obtained at http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct-eng.php.

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

6. Notice: The unit complies with Overvoltage Category II. It also complies with the surge requirement according to EN 61000-4-5 (fine protection); however, installation of an additional medium (via local supply connection) and/or coarse protection (external surge protection) is recommended depending on the individual application in order to avoid damage caused by overcurrent.

For Canada and US, components used to reduce the Overvoltage Category shall comply with the requirements of IEC 61643-series. As an alternative, components used to reduce the Overvoltage Category may comply with ANSI/IEEE C62.11, CSA Certification Notice No. 516, CSA C22.2 No. 1, or UL 1449. Suitability of the component for the application shall be determined for the intended installation.

7. Notice: Corresponding local particularities and regulations (in particular, National Electrical Code NFPA 70, Fire Code NFPA 1, Life Safety Code NFPA 101, International Fire Code) must be observed.**8. Note:** For a Class A digital device or peripheral:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

9. Note: Class B broadband operations that include the ESMR frequency bands 817-824 MHz and 862-869 MHz are permitted only when installed indoors due to section 90.219(d)(7) of the FCC rules which says: "Except for distributed antenna systems (DAS) installed in buildings, the passband of a [Part 90] Class B booster should not encompass both commercial services (such as ESMR and Cellular Radiotelephone) and part 90 Land Mobile and Public Safety Services."**10. Note:** Follow the Good Engineering Practices and be a Good RF Neighbor:

Good engineering practice must be used in regard to the signal booster's noise radiation. Accordingly, the gain of the signal booster should be set so that the ERP of the output noise from the signal booster should not exceed the level of -43 dBm in 10 kHz measurement bandwidth. In the event that the noise level measured exceeds that value, the signal booster gain should be decreased accordingly. Also, please note that in general, the ERP of noise on a spectrum more than 1 MHz outside of the pass band should not exceed -70 dBm in a 10 kHz measurement bandwidth.

11.Note: For a Class B digital device or peripheral:

This 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 this 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:

- Reorient 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 RF technician for help.

12.Note: This unit complies with European standard EN62368-1.

13.Note: The complete ERRC (Emergency Responder Radio Coverage) system is only compliant with UL 2524 if all devices connected to the PSR, such as the battery backup unit and the dedicated annunciator, comply with UL 2524 as well.

Required Antenna Distances

This system is a RF Transmitter and continuously emits RF energy. Maintain a minimum clearance from the antenna as specified in the table below while the system is operating. Whenever possible, power down the unit before servicing the antenna.

| Model | Antenna gain without cable loss [dBi] | Minimum Distance DL | | Minimum Distance UL | |
|-------------|---------------------------------------|---------------------|--------|---------------------|--------|
| | | FCC | | FCC | |
| | | m | inches | m | inches |
| PSR 700/800 | 9 | 0.687 | 27.05 | 0.345 | 13.58 |

table 1-1 Required antenna distances

WEEE Recycling



Do not put the units into the garbage but dispose of them properly according to local and/or regional regulations.

Country specific information about collection and recycling arrangements per the Waste Electrical and Electronic Equipment (WEEE) Directive and implementing regulations is available on CommScope’s website.

<http://www.commscope.com/About-Us/Corporate-Responsibility-and-Sustainability/Environment/#recycling>

Equipment Symbols Used / Compliance

Please observe the meanings of the following symbols used in our equipment and the compliance warnings:

| Symbol | Compliance | Meaning / Warning |
|---------|------------|---|
| --- | FCC | <p>For industrial (Part 90) signal booster, Class A or B: This is a 90.219 Class A or B device. WARNING: This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC Licensee to operate this device. This booster can be configured as a Class A or Class B signal booster. If configured as Class B signal Booster (as defined in 47 CFR 90.219), you MUST register the signal booster online at www.fcc.gov/signal-boosters/registration. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.</p> |
| | | <p>For industrial (Part 90) signal booster, Class B: This is a 90.219 Class B device. WARNING: This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC Licensee to operate this device. You MUST register Class B signal boosters (as defined in 47 CFR 90.219) online at www.fcc.gov/signal-boosters/registration. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.</p> |
| CE | CE | <p>To be sold exclusively to mobile operators or authorized installers – no harmonized frequency bands, operation requires license. Intended use: EU and EFTA countries</p> |
| | | <p>Indicates conformity with the RED directive 2014/53/EU and/or RoHS directive 2011/65/EU.</p> |
| CE 0700 | CE | <p>Indicates conformity with the RED directive 2014/53/EU and RoHS directive 2011/65/EU certified by the notified body no. 0700.</p> |

1.5. About CommScope

CommScope is the foremost supplier of one-stop, end-to-end radio frequency (RF) solutions. Part of the *CommScope* portfolio are complete solutions for wireless infrastructure from top-of-the-tower base station antennas to cable systems and cabinets, RF site solutions, signal distribution, and network optimization. For patents see www.cs-pat.com.

CommScope has global engineering and manufacturing facilities. In addition, it maintains field engineering offices throughout the world.

Andrew Wireless Systems GmbH based in Buchdorf/Germany, which is part of *CommScope*, is a leading manufacturer of coverage equipment for mobile radio networks, specializing in high performance, RF and optical repeaters. Our optical distributed networks and RF repeater systems provide coverage and capacity solution for wireless networks in both indoor installations and outdoor environments, e.g. tunnels, subways, in-trains, airport buildings, stadiums, skyscrapers, shopping malls, hotels and conference rooms.

Andrew Wireless Systems GmbH operates a quality management system in compliance with the requirements of ISO 9001 and TL 9000. All equipment is manufactured using highly reliable material. To maintain highest quality of the products, comprehensive quality monitoring is conducted at all fabrication stages. Finished products leave the factory only after a thorough final acceptance test, accompanied by a test certificate guaranteeing optimal operation.

Hereby Andrew Wireless Systems declares that the radio equipment type Repeater is in compliance with Directive 2014/53/EU.

The full text of the EU declaration is available from CommScope.

According to the DoC, our “CE”-marked equipment can be used in all member states of the European Union.

To make the most of this product, we recommend you carefully read the instructions in this manual and commission the system only according to these instructions.

For technical assistance and support, please refer to the *CMS Technical Support* contact information in the next chapter.

1.6. Contacting CommScope

1.6.1. CommScope Mobility Solutions (CMS) Technical Support

For additional information, please contact CMS Technical Support:

Telephone Helplines: Call one of the Telephone Helpline numbers listed below to get live support, 24 hours a day.

Global 24X7

+1 888-297-6433
(Toll free for U.S. and Canada)

EMEA 8:00-17:00 (UTC +1)

+ 800 73732837
(Toll free for parts of EMEA and Australia)

+ 49 909969333
(Toll charge incurred)

Calls to an EMEA Helpline outside of the 8:00 to 17:00 time frame will be forwarded to the 24x7 Helpline.

Online Support: Click on the following URL link to submit tickets using the online CMS Technical Support Form:

<http://www.commscope.com/wisupport>

Alternatively, enter the preceding URL into your web browser, and then press ENTER on your keyboard or scan the QR code.



1.6.2. Accessing DCCS User Documentation

To access the Customer Portal of DCCS (Distributed Coverage and Capacity Solutions), scan the QR Code to the right or go to <http://www.commscope.com/membership>. Follow the prompts and click DCCS to open the site. A user account and password are required. Please register for an account if you don't have one. Once you have access, click to select a product line link to access the documentation for that product.



1.6.3. Technical Training

To access the CommScope University Training site, please use the following web address <http://www.commscopeuniversity.com> or scan the QR code to the right.

Both online and classroom training are available. Instructor-led courses are conducted in North America and Europe. Before choosing a course, please verify the region.

For training related questions, please contact us:

Americas: DASTrainingUS@CommScope.com

EMEA: DASTrainingEMEA@CommScope.com



2. Introduction

2.1. Purpose

This manual contains information and procedures for the operation of the CommScope Public Safety Repeaters PSR 700/800 MHz 0.5/2W Class A and Class B. The purpose of this document is to provide a step-by-step procedure to help experienced technicians or engineers install and commission an in-building wireless enhancement system using CommScope repeaters. Follow the instructions in this guide to minimize risks associated with modifying a live system and preclude service interruptions. This document assumes the technician or engineer understands the basic principles and functionality involved with repeater and in-building systems. This guide has been written to address the practical concerns of the installer.

2.2. PSR 700/800 MHz 0.5/2W

This pick-up repeater comes in two variants, one is a digital, channelized Class A repeater and the second is an analogue Class B repeater. Both can be used stand-alone or in combination with an ERA® system.

They are designed to cover the 700 and 800 MHz public safety bands and can be used to establish a wireless connection between a BTS and a passive or active DAS. Via feature keys, this repeater can be configured as a single- or dual-band version with an output power of 0.5 W or 2 W per band. With its battery backup support (only available in combination with a BBU/UPS), UL Type 4X housing, dry alarm contacts and its integrated oscillation detection and healing mechanism, a fully NFPA 1221 and IFC compliance can be guaranteed.

The implemented channel-based muting functionality prevents desensitization of the BTS by switching off UL channels without traffic. The class A variant supports up to 32 channels in a range between 12.5 kHz and 75 kHz, where every channel can be muted while no traffic is active. A detailed filter description can be found in table 8-1 and table 8-2. With the class B variant, the operator can choose between 3, 10 and 18 MHz pass band bandwidths, where every pass band can be muted while no traffic is active.

Features at a glance

- UL 2524, NFPA 1221 and IFC compliant
- Compact, high-performance, economical public safety signal source
- Complies with relevant public safety specifications
- High performance digital programmable architecture supports up to 32 channels per band with .5W and 2W power output
- Automatic Gain Control (AGC) and channelized uplink squelch ensure clear voice transmission
- Output power and band capacity can be field-upgraded via license key (see chapters 5.6.1 and 8.4)
- Web-based GUI and SNMP support for intelligent configuration and monitoring

3. Functional Description

The following figure shows an example of a PSR 700/800 MHz integrated into a possible network setup. The Annunciator and Battery Backup Unit (BBU)* depicted in this illustration are only examples (for DC installations) since they are not provided by CommScope and may look differently in the actual setup. For AC installations, a UPS* has to be used instead of a BBU.

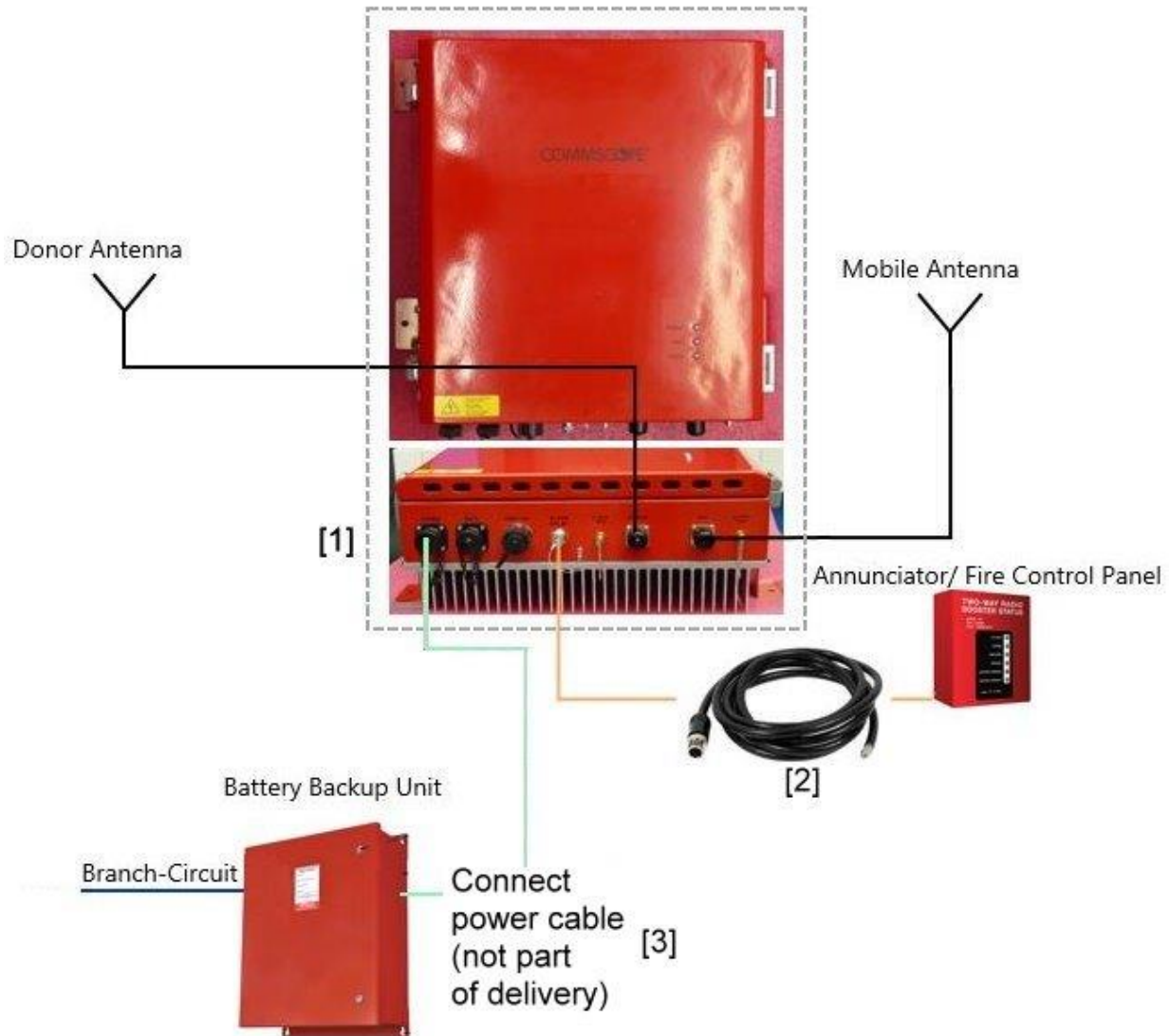


figure 3-1 System overview example of a PSR 700/800 MHz

[1] The usage of the individual connectors is described in chapter 4.2.3.

[2] For the connection of the alarm cable, see chapter 4.2.8.

[3] For the connection of the power cable (not part of the delivery), see chapter 4.2.10.

* **Note:** For the BBU/UPS observe the requirements specified in chapter 8.1.

The block diagrams on the next page illustrate signal processing taking place inside the PSR 700/800 MHz, both for the analogue and digital variant.

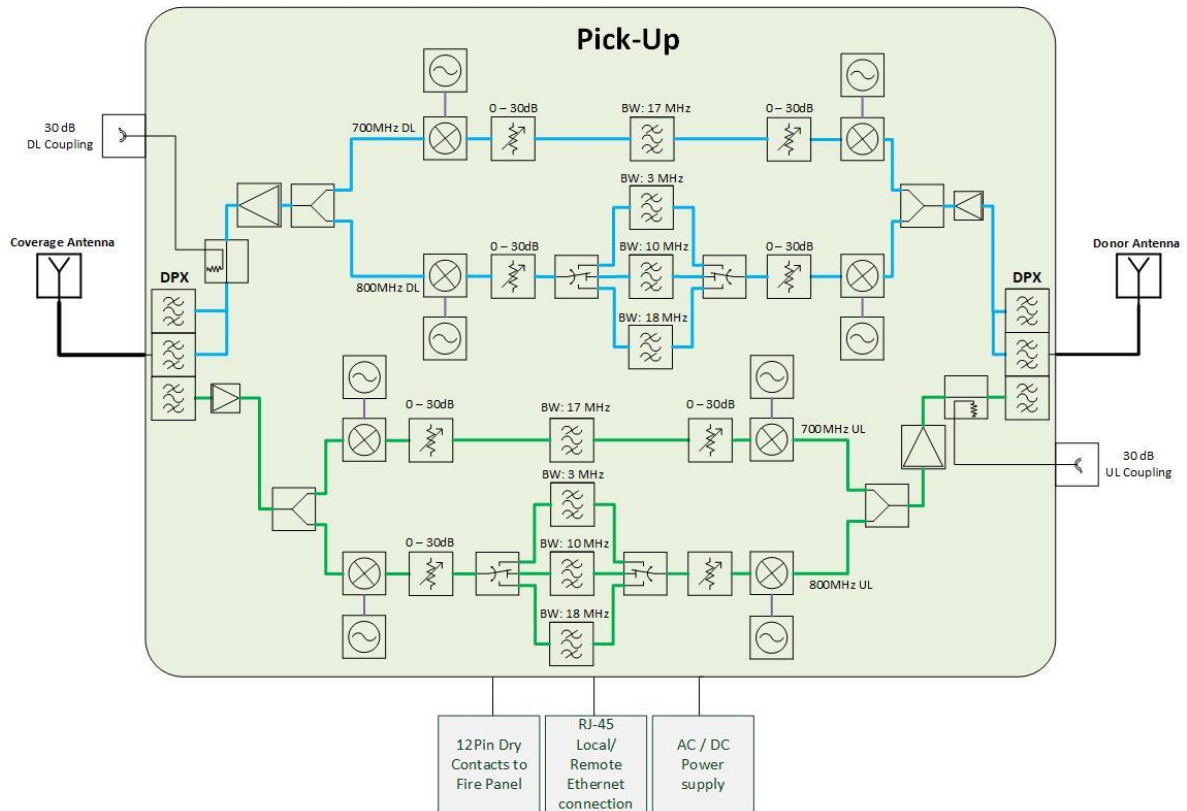


figure 3-2 Configuration of a PSR 700/800 MHz 0.5/2W, analogue variant

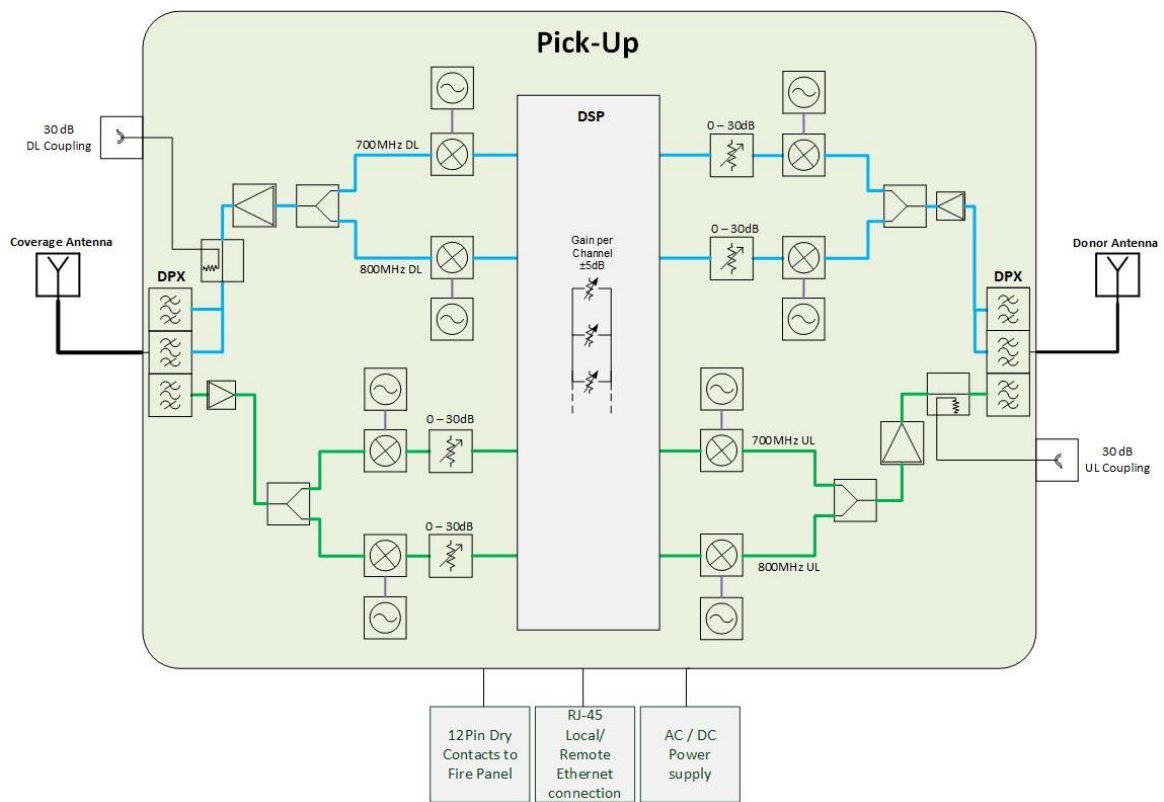


figure 3-3 Configuration of a PSR 700/800 MHz 0.5/2W, digital variant

4. Commissioning

Read and observe the health, safety, and property damage warnings as well as the description carefully to avoid mistakes and proceed step-by-step as described.

- **Attention:** Do not operate the PSR without terminating the antenna connectors. The antenna connectors may be terminated by connecting them to their respective antennas or to a dummy load.
- **Notice:** Only qualified personnel should carry out the electrical, mechanical, commissioning, and maintenance activities that require the unit to be open.
- Ensure that all connections have been performed according to chapter 4.2.3 *Connections*.
- To safeguard correct operation, a device that guarantees uninterruptible power supply (e.g. an appropriate BBU/UPS) has to be connected to the PSR (see chapter 4.2.10).

Unless otherwise agreed to in writing by CommScope, CommScope's general limited product warranty (<http://www.commscope.com/Resources/Warranties/>) shall be the warranty governing the PSRs, including the installation, maintenance, usage and operation of the PSRs.

4.1. Mechanical Installation

4.1.1. Health and Safety for Mechanical Installation



Caution: Risk of injury by the considerable weight of the unit falling. Ensure there is adequate manpower to handle the weight of the system.



Caution: Risk of serious personal injury by equipment falling due to improper installation. The installer must verify that the supporting surface will safely support the combined load of the electronic equipment and all attached hardware and components. The screws and dowels (wall anchors) used should also be appropriate for the structure of the supporting wall.



Caution: Explosive atmospheres. To avoid explosion or fire, do not operate this equipment in the presence of flammable gases or fumes.



Caution: Lightning danger. Do not install or make adjustments to this equipment during an electrical storm.

4.1.2. Property Damage Warnings for Mechanical Installation

1. **Attention:** Do not install the unit in a way or at a place where the specifications outlined in the Environmental and Safety Specifications leaflet of the supplier are not met. Otherwise, the lifespan and performance of the repeater may be reduced.
2. **Attention:** Due to power dissipation, the unit may reach a very high temperature. Ensure sufficient airflow for ventilation.
3. **Attention:** The repeater must be installed in a vertical position.
4. **Notice:** Exceeding the specified load limits may cause the loss of warranty.
5. **Notice:** Do not place cables or tools that may damage the repeater in close proximity to it.
6. **Notice:** Do not wear jewelry or metal accessories when installing this repeater.
7. **Notice:** When connecting and mounting the cables (RF, optical, mains, ...) ensure that no water can penetrate into the unit through these cables.
8. **Notice:** Check all cables for shorts and opens. Verify that there are no cables with loose or poor connections. RF leakage could cause oscillation to occur under some conditions.
9. **Notice:** If any different or additional mounting material is used, ensure that the mounting remains as safe as the mounting designed by the manufacturer. The specifications for stationary use of the Unit must not be exceeded. Ensure that the static and dynamic strengths are adequate for the environmental conditions of the site. The mounting itself must not vibrate, swing or move in any way that might cause damage to the Unit.
10. **Notice:** A spacing of 300 mm (11.81 inch) around the unit is required.

Specified torques must be observed for certain mounting procedures according to the following table:

| Type | Pins | Hex nuts | Screws |
|--------------------------|---------------------|-----------------|---------------|
| Thread | M6 | M6 | M6 |
| Specified torques | 3.3 Nm / 29.2 in lb | | |

table 4-1 Specified torques

4.1.3. Wall Mounting Procedure

Before starting the procedure, read and observe all warnings and notices in chapters 4.1.1 and 4.1.2.

You will need the following contents of the accessory kit for installation:

| Part | Number of parts | Used for |
|------------------------|-----------------|---|
| M6*50mm tapping screws | 5 | Fastening the bracket to the wall (only four of each are required) |
| Washer DIN 126 | 5 | |
| M6 Nut / Washer | 2/2 | Fastening the bolts (one per side) |

table 4-2 Accessories for wall mounting

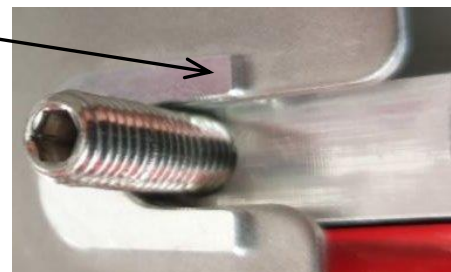
Notice: For the four M6*50mm tapping screws, you will also need four appropriate screw anchors (one for each screw) that are not part of the delivery as the anchor type is dependent on the on-site conditions (wall structure and materials). Use screw anchors that are rated for the mounting surface.

The PSR is installed in the wall mounting bracket for delivery and must be removed for the mounting procedure. The easiest way to do this, is to place the assembly on the floor or a low table with the PSR cover facing downwards and the mounting bracket on top as shown below. When you do so, make sure to provide a smooth surface (e.g. by laying a soft cloth underneath) so that the cover is not scratched or damaged in the process. Then, use an M6 Phillips (cross recess) screwdriver to loosen the six screws (3 per side) by which the PSR is fastened to the bracket. Make sure to keep these screws as they will be required again:



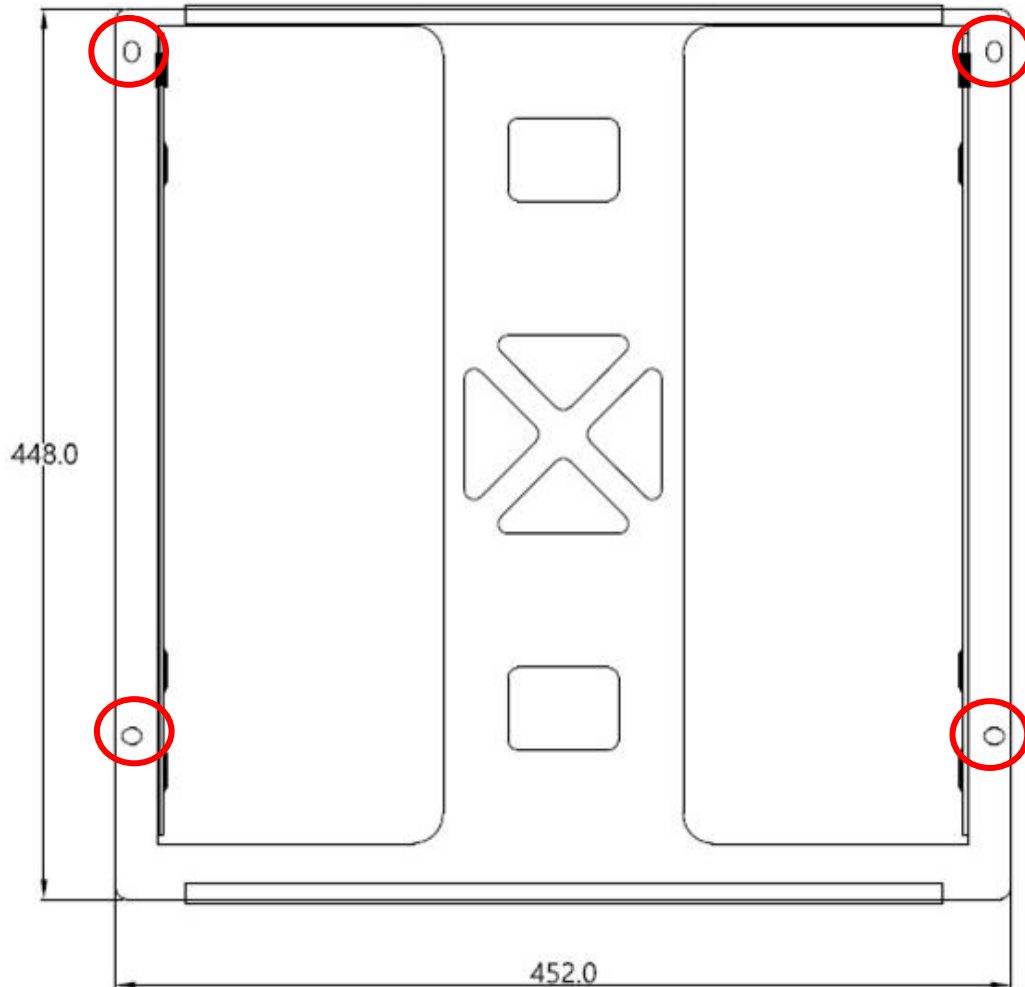
Then, take the bracket off but take care not to damage the threads of the bolts at the PSR (one at each side), which serve to hang the unit on the bracket later.

Also take care not to lose the two clips around the bolts (one at each side) which serve to ease positioning of the unit when inserting it back into the bracket. If a clip falls off, keep it for later use.



When the unit has been removed, the bracket can be installed on the wall as explained in the following.

- Use the bracket as a template to mark the positions of the four drill holes at the mounting surface / wall:



- At the four positions marked with the bracket as the template, drill four holes into the wall using a drill bit that matches the thickness of the M6 wall anchors (not part of the delivery; see **Notice** under *table 4-2*). Then, insert each of the four wall anchors into the holes:



- Gently tap the wall anchors with a hammer to fully insert them into the wall.
- While holding the bracket in place, insert the four M6 x 40 mm tapping screws into the wall anchors and tighten them to fasten the bracket to the wall.
- Confirm that the bracket is securely fastened before moving to the next step.

When the bracket is securely fastened to the wall, insert the PSR into the bracket by positioning the two bolts (one at each side) in the corresponding grooves of the bracket. Also, reinstall the positioning clips in case they fell off before:



Notice: When positioning the PSR in the bracket, be careful not to damage the threads of the bolts by pushing or pulling the unit too hard in the process.

When the PSR is correctly positioned, fasten the unit again with the six M6 screws that you unscrewed before (three at each side) using the M6 Phillips (cross recess) screwdriver:



Finally, use a standard 10 mm wrench (or open-ended wrench) to fasten the bolts with the M6 washers and nuts of the accessory kit:



4.2. Electrical Installation

4.2.1. Health and Safety for Electrical Installation

Read and observe chapter 1.2 *Health and Safety*.



1. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current. Obey all general and regional installation and safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.**



2. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current inside the unit in operation. Before opening the unit, disconnect mains power.**

4.2.2. Property Damage Warnings for Electrical Installation

1. **Attention:** It is compulsory to ground (earth) the unit before connecting the power supply. A grounding bolt is provided on the cabinet to connect the ground-bonding cable.
2. **Attention:** The BBU/UPS must be installed within easy reach and it must be equipped with a disconnect device.
3. **Attention:** Before connecting or disconnecting the BBU at/from the PSR, ensure that the BBU/UPS is not connected to the mains power supply.
4. **Attention:** Make sure that an appropriate circuit breaker acting as a disconnect device (as required by NEC, NFPA 70) and an overcurrent limiting device are connected between mains power and the PSR.
5. **Attention:** Incorrectly wired connections can destroy electrical and electronic components.
6. **Notice:** To avoid corrosion at the connectors caused by electrochemical processes, the material of the cable connectors must not cause a higher potential difference than 0.6 V (see electrochemical contact series).
7. **Notice:** Use an appropriate torque wrench for the coupling torques:
for 4.3-10 type connectors (5 Nm, 44 in lb) with 22mm (7/8) in opening,
e.g. item no. TW-4310
Do NOT use your hands or any other tool (e.g. a pair of pliers). This might cause damage to the connector and lead to a malfunction of the PSR.
8. **Notice:** For unstabilized electric networks, which frequently generate spikes, the use of a voltage limiting device is advised.
9. **Notice:** Observe the labels on the front panels before connecting or disconnecting any cables.
10. **Notice:** Unused connectors must be closed with their protective covers to ensure watertightness.
11. Check all cables for shorts and opens. Verify that there are no cables with loose or poor connections. RF leakage could cause oscillation to occur under some conditions.

4.2.3. Connections

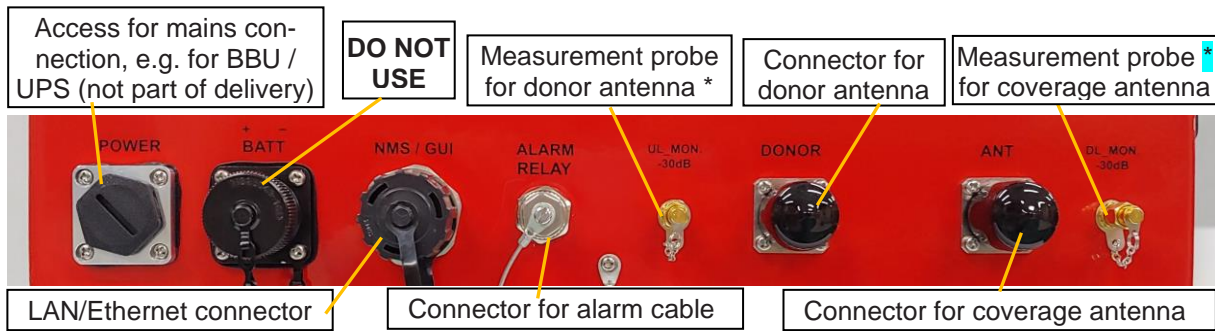


figure 4-1 Connectors of PSR 700/800 MHz

* **Note:** Whenever they are not used, the measurement probes must be terminated with the (golden) SMA terminations.

4.2.4. Grounding (Earthing)

Grounding must be carried out. Connect an earth-bonding cable to the grounding bolt inside the PSR. To get access to the grounding bolt, the front door must be opened by unlocking both locks at the left side of the cabinet with the supplied key.



The PSR is designed to operate under AC (89-264 VAC), DC (-62 to -34 VDC) / max load 160W. A Ground wire needs to be connected correctly without removing or changing the Ground lug of the supply conductors:

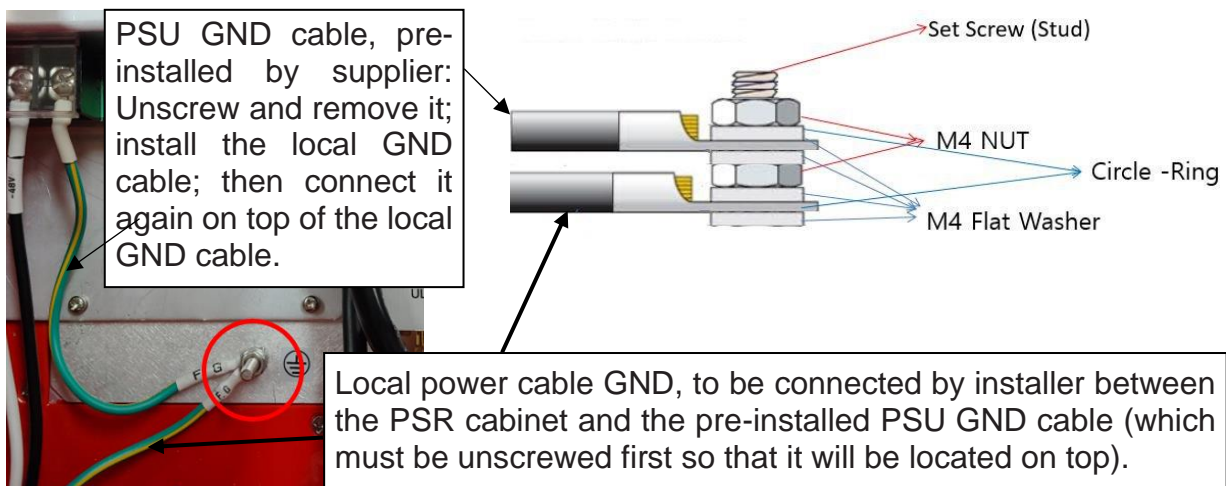


figure 4-2 Grounding bolt (left) and schematic view (right)

After loosening the M4 hexagon nut, connect the ring terminal of the earth-bonding cable to the grounding bolt as illustrated above. Then, fasten all parts again with the M4 hexagon nut. Do not use the grounding connections to connect external devices.

☞ **Note:** Ground of a second unit has to be connected to the same equipotential bonding terminal as the repeater. Use bonding cables of the same length, as short as possible and with a large wire cross section. Follow local electrical code practices.

4.2.5. Connection of the Antenna Cables

The PSR has 4.3-10-type antenna connector. Please refer to section 4.2.3 for its location. Refer to the corresponding documentation of the connector manufacturer for mounting the cable connectors.

The bending radius of the antenna cables must remain within the given specifications.

Choose the type of cable best suited for the antenna. Consider that a cable with higher loss is less expensive but impairs performance.

Notice: Use an appropriate torque wrench for the coupling torques:

- for 4.3-10 type connectors (5 Nm, 44 in lb) with 22 mm (7/8) in opening, e.g. item no. TW-4310

Do NOT use your hands or any other tool (e.g. a pair of pliers)! This might cause damage to the connector and lead to a malfunction of the signal booster.

Attention: To minimize passive inter-modulation (PIM) distortion, attention has to be paid to the physical condition of the connector junctions:

- Do not use connectors that show signs of corrosion on the metal surface.
- Prevent the ingress of water or dirt into the connector.
- Use protective caps for the connectors when not mounted.
- Before mounting clean the connectors with dry compressed air.
- Before mounting clean the mating surfaces of the connector with a lint-free alcohol-drenched cloth on a wooden or non-metallic item.
- Attach and torque the connectors properly.
- Avoid metallic abrasion when mounting the connectors by only screwing the connecting nut, but not turning the whole connector.
- Use a torque wrench to fasten the connector, see above.
- Clean the protective caps before mounting for antenna cable replacement.

☞ **Note:** To use the integrated “Donor Antenna Disconnection Alarm” (required by UL2524), the antenna and antenna cable must fulfill special requirements; see chapter 5.7.5 *VSWR Check and Donor Calibration* for details.

4.2.6. Cleaning Procedure for RF Cable Connectors


The figures in this chapter illustrate the cleaning procedure and do not show the actual unit.

1. What is needed for the cleaning?
 - a. Isopropyl alcohol
 - b. Compressed air
 - c. Lint-free wipe
 - d. Cotton buds

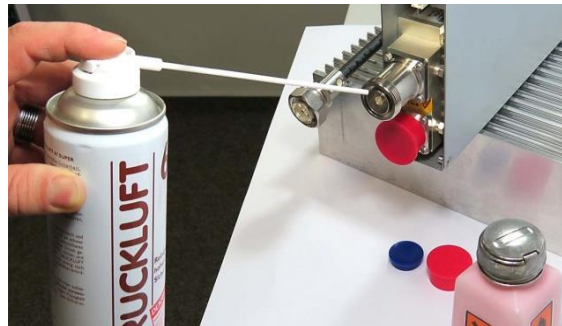



2. Remove protective cap from the RF connector.




 **Caution:** Risk of injury by flying particles when compressed air is used. Wear protective clothing, especially protective glasses.

3. Remove metal chips and small particles from the mating and inner surfaces of the connector using compressed air.



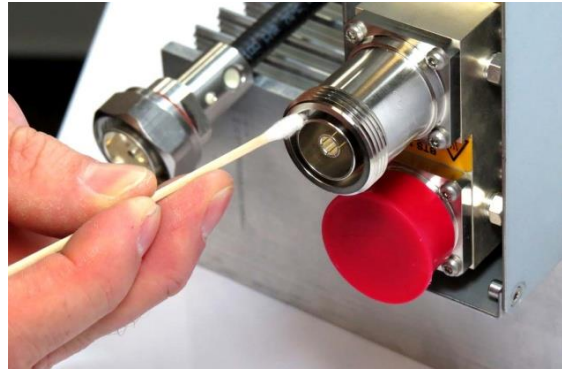
 **Warning:** Flammable material. Risk of fire. Keep away from sources of ignition.

 **Caution:** Eye irritant product. Risk of eye irritation. Avoid contact with eyes and skin. Wear protective clothing, especially protective glasses.

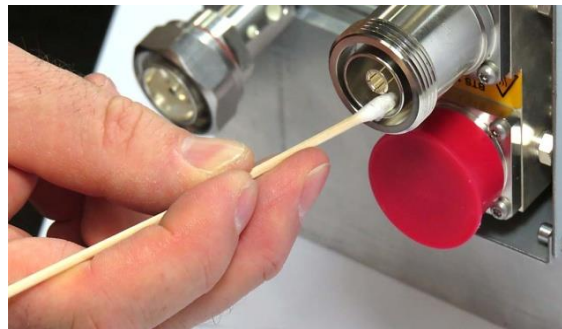
4. Clean the connector winding with lint-free wipe drenched with isopropyl alcohol.



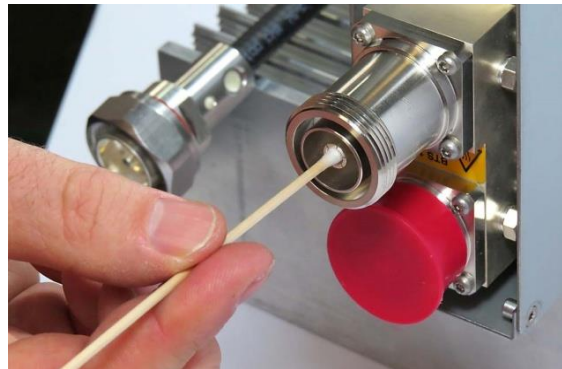
5. Clean the lip of the inner ring with a cotton bud drenched with isopropyl alcohol.



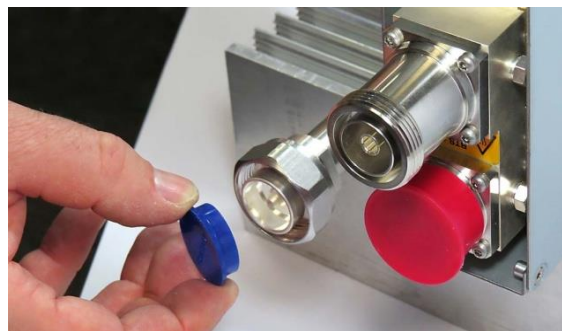
6. Clean the inside surface of the inner ring with a cotton bud drenched with isopropyl alcohol.



7. Clean the inside of the center conductor spring tines with a cotton bud drenched with isopropyl alcohol.



8. Clean in the similar way the connector of the connected cable. Remove protective caps from the unit connector first.



9. Remove metal chips and small particles from the mating and inner surfaces of the connector using compressed air.



10. Continue with the winding area using lint-free wipe drenched with isopropyl alcohol.



11. Continue with the inside mating surface of the inner ring.



12. Clean the outside surface of the center pin.



4.2.7. Antenna Cable Connector Assembly

The figures in this chapter illustrate the connection procedure and do not show the actual unit.

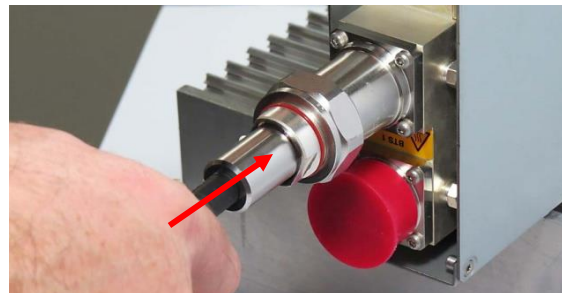
1. What is needed for the connector assembly?
 - a. Torque wrench.
 - b. (Adjustable) counter wrench



2. Join the connectors and turn the coupling nut until the thread grips.



3. Push in the connector until it clicks.

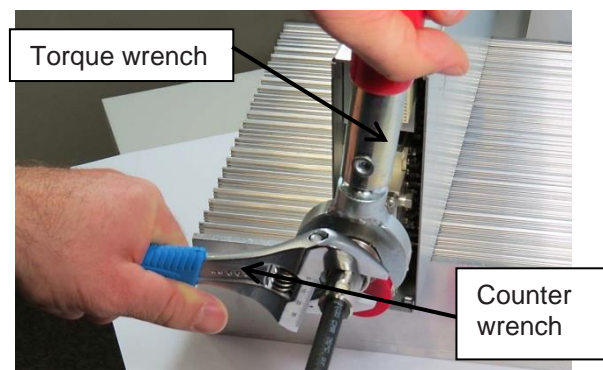


4. Fasten the coupling nut hand-tight. Do not turn the connector but the coupling nut only.



5. Retain the cable connector with the counter wrench and fasten the coupling nut with the torque wrench until the torque is applied (torque wrench clicks).

For angled antenna connectors use your hand to retain the cable connector and fasten the coupling nut with the torque wrench. Make sure only the coupling nut is turned, not the cable connector.



4.2.8. PSR Alarms Connection

For the location of the ALARM RELAY connector, refer to chapter 4.2.3. The corresponding cable is part of the delivery:

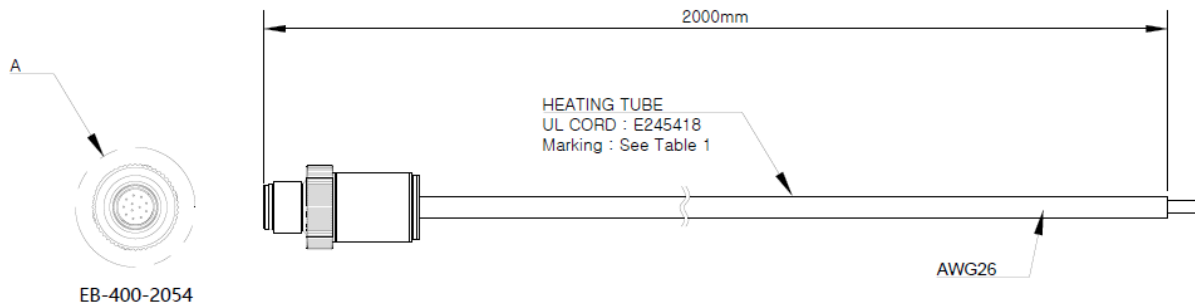


figure 4-3 PSR alarms cable

- ☞ **Note:** The correct connection of this cable to the dedicated annunciator at the site, which must be part of the building's fire alarm system, is the sole responsibility of the installer.
- ☞ **Note:** The connected dedicated annunciator must be capable of detecting a single ground or open. End-of-line resistors with a value of 2.2 k Ohm are installed between the normally open and common relay contacts to support the supervision.
- ☞ **Note:** The source connected to the ALARM RELAY connector (i.e. the dedicated annunciator) must be power limited as defined by UL 2524 Chapter 44.1.2
- ☞ **Note:** The length of the connected cable must not exceed 30 meters (98.5 ft).

Technical parameters for the delivered alarms cable

Coupling: Thread locking
 Environmental characteristics: Ambient temperature: -40°C ~ +90°C
 IP rating: IP67
 Material:

| art | Material | Finish |
|--------------------|----------|--------|
| Connector | Brass | Gold |
| Coupling nut/screw | Brass | Nickel |
| Insert/Housing | TPU | - |
| Sealing | Epoxy | - |

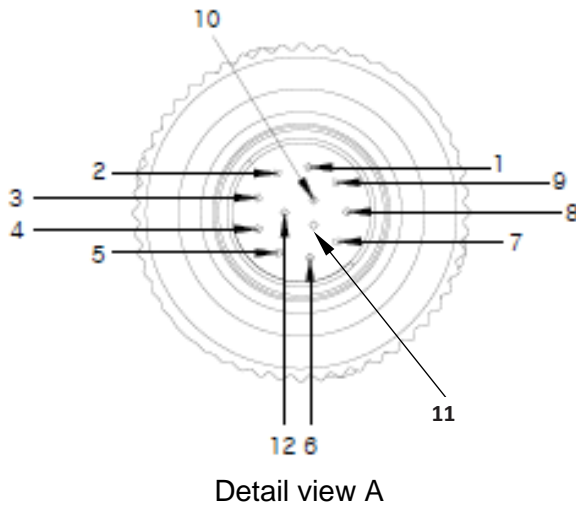
Technical parameters for the alarm relays

Rated current/voltage: 1A / 24VDC
 Contact resistance: <=100m Ohm max.
 Insulation resistance: 1000M Ohm min. (500VDC)

| PSR Alarm Function Description | |
|---------------------------------------|---|
| PSU Fail Alarm | This alarm is raised if there is a problem with internal power supply. |
| DL Shutdown Alarm | If the output level is higher than the DL shutdown level, the amplifier is turned off and the DL shutdown alarm is activated. The shutdown cycle is 60 seconds. |
| UL Shutdown Alarm | If the output level is higher than the UL shutdown level, the amplifier is turned off and the UL shutdown alarm is activated. The shutdown cycle is 60 seconds. |
| Manual Amp Off | This alarm is raised when the user turns off the Amplifier manually. |
| Service Antenna VSWR Alarm | This alarm occurs when the current VSWR ratio is higher than the set VSWR ratio. If it is lower than the set VSWR ratio, it is cleared immediately. |
| Donor Antenna Malfunction Alarm | This alarm is caused by one of the following reasons: |
| | This alarm occurs when the current VSWR ratio is higher than the set VSWR ratio. If it is lower than the set VSWR ratio, it is cleared immediately. This alarm is raised when the DL input power level is below -90 dBm. |
| DL HPA Fail Alarm | This alarm is raised if the DL high power amplifier HPA is on and an overcurrent or low current state is detected. Under this condition, the HPA is automatically switched off. |
| UL HPA Fail Alarm | This alarm is raised if the UL high power amplifier HPA is on and an overcurrent or low current state is detected. Under this condition, the HPA is automatically switched off. |
| PLL Lock Detector Alarm | This alarm occurs when the PLL is unlocked. In addition, all high-power amplifiers will be switched off. |
| Isolation Alarm | This alarm occurs when the isolation between donor and coverage antenna is not at least 20 dB above the repeater gain. |
| Temperature Alarm | This alarm occurs when the repeater is used outside of its specified temperature range. (>80° Celsius device temperature) |
| Donor Antenna Disconnection Alarm | Without UL traffic the donor antenna is checked every 3 minutes to see if it is connected. The alarm is based on the donor antenna calibration described in chapter 5.7.5 VSWR Check and Donor Calibration. |

Note: For possible countermeasures, please refer to chapter 6 Status LEDs, PSR Alarms, and Troubleshooting.

Pinning of M12 Circular Plug-12P (male)



| Relay | Pin | Name | Color |
|-------|-----|------|-------------|
| 1 | 1 | NC | brown |
| | 2 | NO | blue |
| | 3 | CC | white |
| 2 | 4 | NC | green |
| | 5 | NO | pink |
| | 6 | CC | yellow |
| 3 | 7 | NC | black |
| | 8 | NO | gray |
| | 9 | CC | red |
| 4 | 10 | NC | violet |
| | 11 | NO | orange |
| | 12 | CC | light green |

Dry Contacts PSR alarm Information

| Dry Contacts | Relay 1 Pins 1,2,3 | Relay 2 Pins 4,5,6 | Relay 3 Pins 7,8,9 | Relay 4 Pins 10,11,12 | PSR alarm monitoring | Relay picture |
|-----------------------------|--------------------------|--------------------------|--------------------------|-----------------------------|--|------------------|
| Donor Antenna Disconnection | NO+CC | NC+CC | NC+CC | NC+CC | Donor Antenna Connection | |
| DL Shutdown Alarm | NC+CC | NO+CC | NC+CC | NC+CC | System Failure (failure of critical system components) | |
| UL Shutdown Alarm | NC+CC | NO+CC | NC+CC | NC+CC | | |
| PLL Lock Detector Alarm | NC+CC | NO+CC | NC+CC | NC+CC | | |
| Isolation Alarm | NC+CC | NO+CC | NC+CC | NC+CC | | |
| Oscillation Alarm | NC+CC | NO+CC | NC+CC | NC+CC | | |
| Temperature Alarm | NC+CC | NO+CC | NC+CC | NC+CC | | |
| Service Antenna VSWR Alarm | NC+CC | NC+CC | NO+CC | NC+CC | Antenna Failure (malfunction of the donor/ser- vice antennas) | |
| Donor Antenna Malfunction | NC+CC | NC+CC | NO+CC | NC+CC | PA Failure (failure of active RF-emitting devices) | |
| DL HPA Fail Alarm | NC+CC | NC+CC | NC+CC | NO+CC | | |
| UL HPA Fail Alarm | NC+CC | NC+CC | NC+CC | NO+CC | | |
| Manual Amp Off | NC+CC | NC+CC | NC+CC | NO+CC | | |

Alarm Status. Normal (NC+CC), Alarm (NO+CC)
 Relay Contact: NC → 1,4,7,10 / NO → 2,5,8,11 / CC → 3,6,9,12

4.2.9. LAN Connection

For local access to the PSR user interface via LAN (supplementary use; not mandatory for operation), connect an RJ485 network cable to the NMS/GUI connector (location see figure 4-1). Make sure that your local PC meets the requirements specified in chapter 5.1 “LAN Settings at Local PC”. This connector is power limited as defined by UL 2524 Chapter 44.1.2 and therefore there is no need to run the connected cable through conduit.

Note: The length of the connected cable must not exceed 30 meters (98.5 ft).

4.2.10. Power Connection

Before connecting electrical power to the PSR, the system must be grounded as described in section 4.2.4 *Grounding (Earthing)*.

To get access to the terminal blocks the front door must be opened. To open the door, the locks must be opened with the supplied keys.

As illustrated in section 4.2.4, remove the plastic cap to feed the supply cable into the housing. The available 1/2" common thread can be used to connect conduit.

After the system has been grounded as explained in section 4.2.4, the neutral and hot wire (AC system) or the negative and positive wire (DC system) must be connected to the internal power supply unit as described in table 4-2 *Power supply connection (AC)* and table 4-3 *Power supply connection (DC)*. To connect the wires remove the protective plastic cover, loose the desired screw and connect the spade terminals as illustrated in *figure 4-4 AC wires, installation example* or *figure 4-5 DC wires, installed*, respectively.

| <i>Polarity of cable end</i> | <i>Cable end:</i> | <i>Connect to terminal:</i> |
|-------------------------------------|--------------------------|------------------------------------|
| Neutral | spade terminal | N |
| Hot | spade terminal | L |
| Green/Yellow | ring terminal | Ground bolt |

table 4-3 Power supply connection (AC)

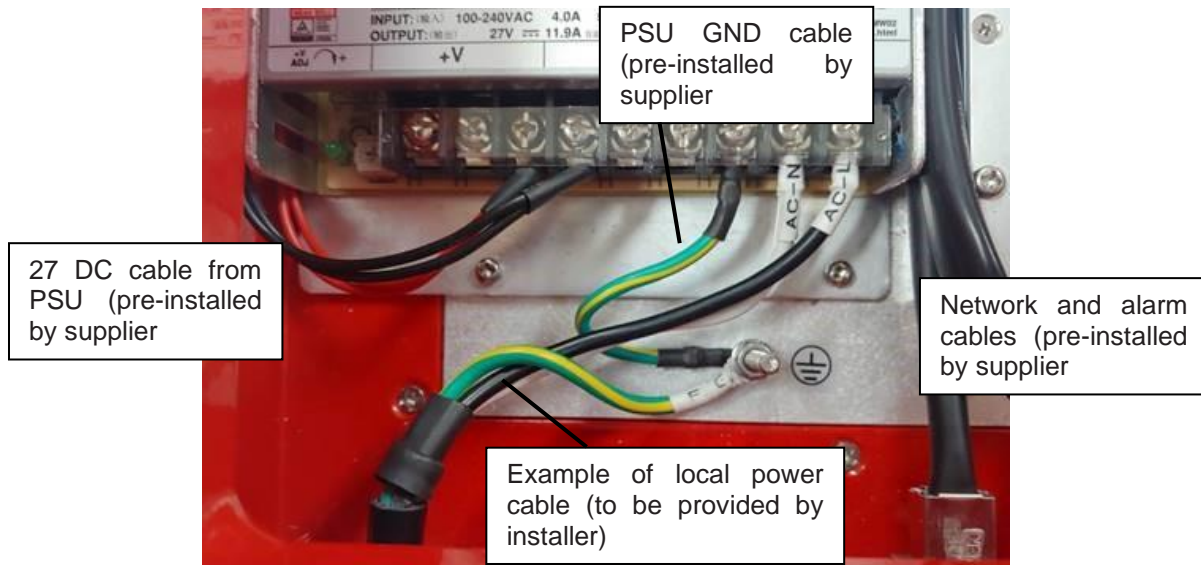


figure 4-4 AC wires, installation example

Notice: For the installation, observe that a minimum air gap of ¼ inch (6.4 mm) must be maintained between the local power cable wires and the network/alarm cables that are pre-installed by the supplier. A good practice is to cut the local cable to a suitable size so that it will be led directly (without being wound up) from the opening in the cabinet to the power connectors (N, L). In that way the air gap can be kept as shown in the example above.

| Polarity of cable end | Cable end: | Connect to terminal: |
|------------------------------|-------------------|-----------------------------|
| Positive | spade terminal | DCIN+ |
| Negative | spade terminal | DCIN- |
| Green/Yellow | ring terminal | Ground bolt |

table 4-3 Power supply connection (DC)

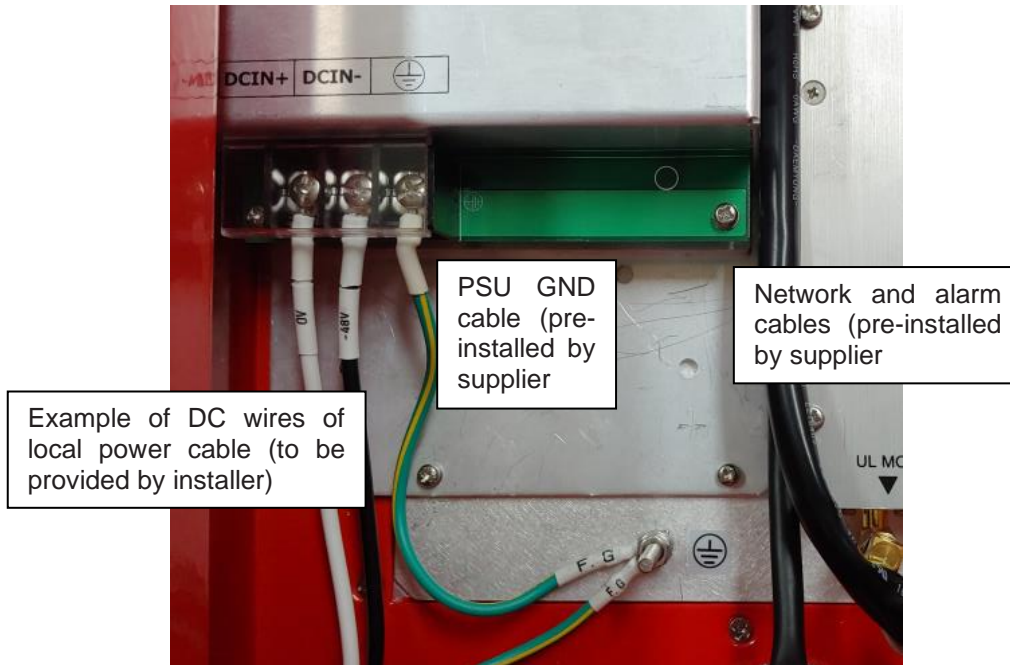


figure 4-5 DC wires, installed

Notice: For the installation, observe that a minimum air gap of $\frac{1}{4}$ inch (6.4 mm) must be maintained between the local power cable wires and the network/alarm cables that are pre-installed by the supplier. A good practice is to cut the local cable to a suitable size so that it will be led directly (without being wound up) from the opening in the cabinet to the power connectors (DCIN+/DCIN-). In that way, the air gap can be kept as shown in the example above.

☞ **Note:** Observe the applicable national regulations regarding loop impedance, voltage drop, and methods of installation. Make sure to connect the correct voltage to the unit.

☞ **Note:** Do not install or deinstall the power wires at the POWER terminal blocks while power is on. Turn off mains power * before connecting the power wires at the PSR, then, engage mains again.

* Mains power must be interruptible with an external delayed-actions mains breaker. For the mains breaker use current state-of-the-art material. The following table can be used as reference but please make sure that your local requirements / local regulations of the AHJ are kept.

| | | | |
|---|----------------------------|----------------------------|----------------------------|
| Supply source | 115 VAC | 230 VAC | 48 VDC |
| Inrush current | 20 A | 40 A | 45 A |
| Nominal current (max.) | 1.5 A | 0.75 A | 3.5 A |
| Examples for suitable mains breakers | 3 A Class C 2 A Class K | 7 A Class C 4 A Class K | 8 A Class C 5 A Class K |

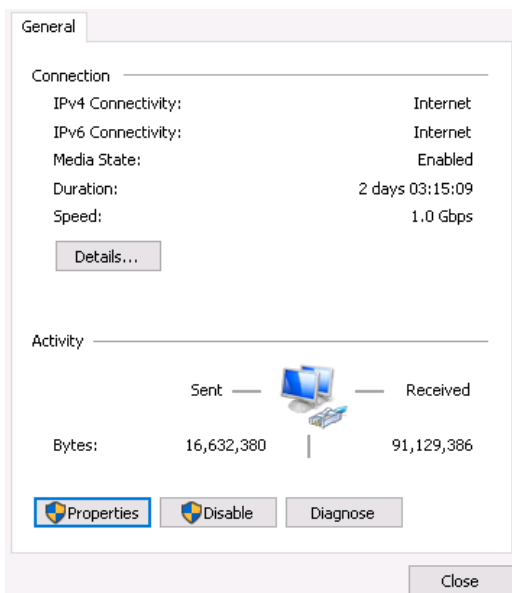
5. Setting up the Web GUI

| NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES | | | |
|--|----------------------------|---------------------------------|--|
| This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for In-building 2-Way Emergency Radio Communication Enhancement Systems, UL 2524 certain programming features or options must be limited to specific values or not used at all as indicated below. | | | |
| Program feature or option | Permitted in UL 2524 (Y/N) | Possible settings | Settings permitted in UL 2524 |
| Deactivate Alarms | N | | |
| Delay Alarms | Y | 1, 5, 10, 60, 600, 1380 minutes | 1 minute for all alarms 5, 10, 60, 600, 1380 minutes only for donor antenna malfunction alarm |

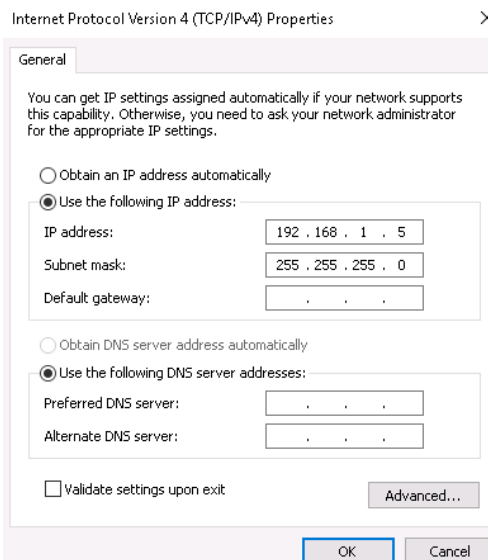
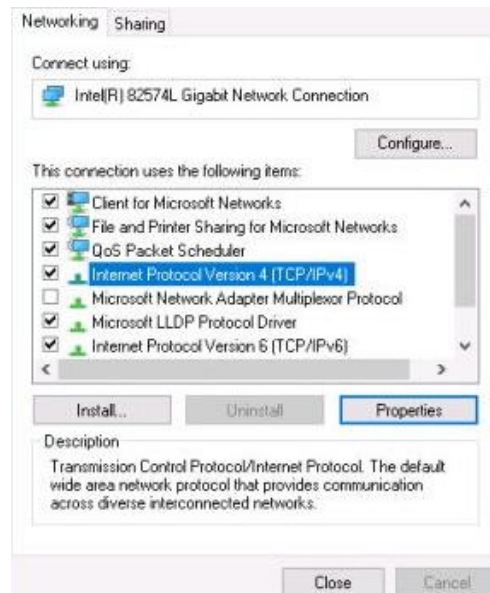
5.1. LAN Settings at Local PC

In order to have access to the Web GUI, the following network adapter settings need to be set at the local PC. Setting a static IP address in the same address range (see below 192.168.1.5) is required:

Access the LAN settings of your local PC and click **Properties**:



Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**:



→ Enter the IP address.

→ Click **OK**.

5.2. Network Management Requirements

The Web GUI uses Ethernet TCP/IP communication, and as protocol SNMPv2 MIB is used.

Default Ethernet telecommunication specification:

- URL Address: http://192.168.1.150
- Default Username: admin
- Default Password: admin
- Browser: Chrome Internet Browser

5.3. EULA Acceptance Page

When a user connects first time or after a factory reset, the EULA Acceptance page appears.

End User License Agreement (EULA)



End User License Agreement(EULA)

For Owners, end users
If you are a member of the end user organization (typically the owner organizations) please read and accept the EULA.
The acceptance dialog will reappear after login until a member of the End User Organization has checked the EULA Acceptance box.

COMMSCOPE
End-User License Agreement
=====

Last updated: April 22, 2019

Please read this End-User License Agreement ("Agreement") carefully before clicking the "I Agree" button, downloading or using Pickup Repeater Web UI ("Application").

By clicking the "I Agree" button, downloading or using the Application, you are agreeing to be bound by the terms and conditions of this Agreement.

This Agreement is a legal agreement between you (either an individual or a single entity) and Pickup Repeater Web UI and it governs your use of the Application made available to you by Pickup Repeater Web UI.

If you do not agree to the terms of this Agreement, do not click on the "I Agree" button and do not download or use the Application.

The Application is licensed, not sold, to you by Pickup Repeater Web UI for use strictly in accordance with the terms of this Agreement.

License

Pickup Repeater Web UI grants you a revocable, non-exclusive, non-transferable, limited license to download, install and use the Application solely for your personal, non-commercial purposes strictly in accordance with

Accept the EULA

Continue

Tag to **Accept the EULA** and click **Continue**.

If you do not accept the EULA, login to the repeater is not possible.

5.4. Login Page

Enter Username and password exactly:

- Default Username: admin
- Default Password: admin

If you enter Username and Password incorrectly, the following message is shown:

Login Failed : Invalid Username / Password

After three false trials input of username and password will be locked for 30 seconds.

5.5. Main Page

In the upper header of the main page you can select between the two main menus **System Settings** (see chapter 5.6) and **System Operation** (see chapter 5.7) by clicking the corresponding tab to get access to their individual submenus by the corresponding links in the left frame.

The following buttons are also available in the upper header:

- **Reboot system:** The entire system reboots (about 10 seconds are required.)
- **Logout:** User logging out of system.

The lower header provides the following information:

- **Version:** the installed SW version is displayed
- **Alarm Status:** If no alarm is present, the indication is **Clear**; if at least one critical alarm is present, the indication is **Critical**. Clicking on the coloured alarm status field (**Clear** or **Critical**) opens the *Active Alarm* page (see chapter 5.7.1).
- **Temperature:** The system temperature is displayed.

5.6. System Settings

5.6.1. License Upgrade

A license upgrade is always required in case of feature upgrades. The corresponding license key (SW feature key) has to be entered in the **Update License Key** field as described below.

License Upgrade

Device Information

Device Type:

Device ID:

MAC Address:

Serial No:

S/W version:

Update License Key

Enter the new license key and click 'Save'

Band Authorization

| Band | Authorization Status | Expiration |
|-------------|----------------------|------------|
| Single Band | Unlocked | Permanent |
| Dual Band | Unlocked | Permanent |

Power Level Authorization

| Power Level | Authorization Status | Expiration |
|-------------|----------------------|------------|
| 0.5W/27 dBm | Unlocked | Permanent |
| 2W/33dBm | Unlocked | Permanent |

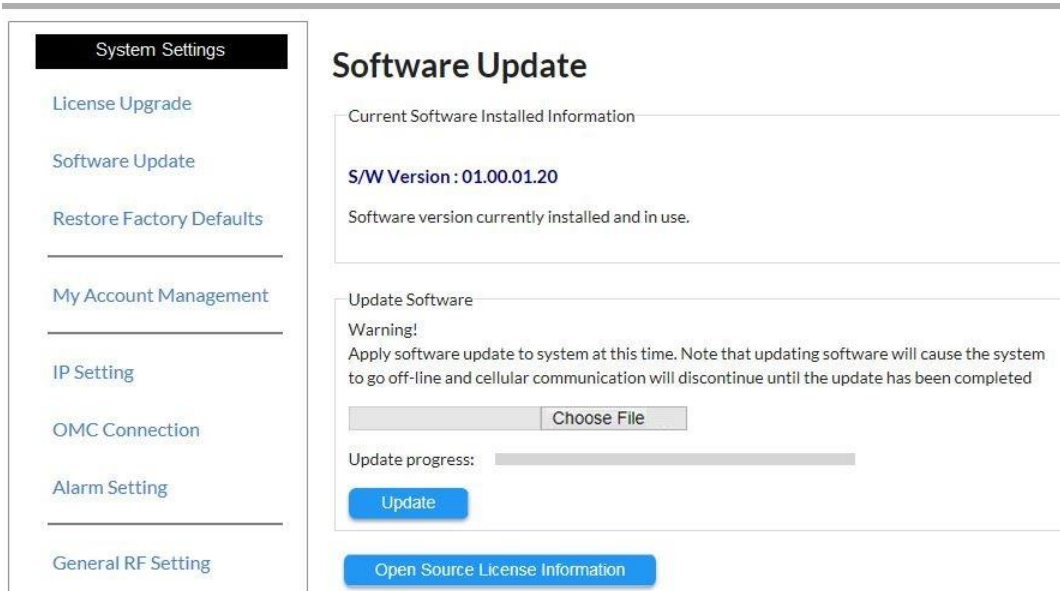
- **Device Information:** Information on Device ID, MAC Address, Serial No, and S/W Version is displayed
- **Update License Key** (= SW Feature Key)
If you want to upgrade a license, you can enter the new license key and click the Save button. For a list of available license keys, see chapter 8.4 Available Configurations and SW Feature Keys.
- **Band Authorization:**
If dual band is unlocked, single band is automatically unlocked as well.
- **Power Level Authorization:**
If Power level 2 W is unlocked, 0.5W is automatically unlocked.

5.6.2. Software Upgrade

Note: The SW update process will take approximately 3min 45sec overall. A loss of service for about 3 min 15 sec has to be expected.

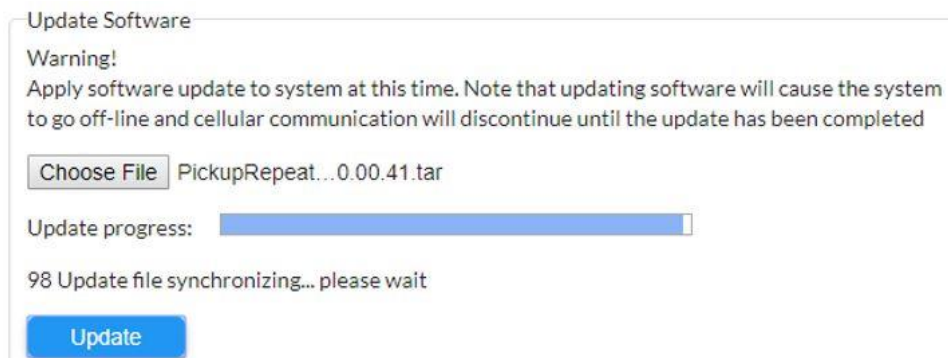
Proceed as follows:

Get an update file from CommScope Technical Support (see chapter 1.6.1) and store the file at a suitable location where you can access it.



Click the **Choose File** button and select the software update file from where you stored it previously. Open the file and click the **Update** button to start the software update.

NOTE: Do not turn off the device during software updates since this might result in system corruption.



During the update process the following information is displayed:

Updating software. Please wait it will take a few minutes

Do NOT turn off the power

When the update is complete, you automatically move to the Login page.



5.6.3. Restore Factory Defaults

Note: Be aware that only RF Settings (i.e. OMC IP Address, Band / Channel settings, Broad and Narrow Band Mute Threshold Level, Return Loss Threshold, User ATTN) will be saved in the backup file. All "General RF Setting" buttons e.g. ALC, HPA stay at their current positions.

Restore Factory Defaults

Backup

Save Backup

Manually save backup file to external device
This file can only used to restore systems running current software version or newer software

Restore and Factory Defaults

Warning!
Apply factory and restore to system at this time. Note that restoring data will cause the:
to go off-line cellular communication will discontinue until the update has been completed
However, feature key will be remain

Restore File No file chosen

Description of buttons:

Save Backup: The system's RF Setting information is downloaded to your PC as backup.dat file.

Restore File / **Choose File:** Click to select the backup file to be opened.

Restore: The RF Setting information is restored from the backup file.

Factory Default: The RF Setting information is restored to Factory Default status. Both the Alarm History log and Event History log files are deleted, and the system is rebooted.

5.6.4. My Account Management

This page serves to enter your account data.

My Account Information

My Information

Username :

Company :

Contact Number :

Email Address :

Role :

Change Password

Password : Minimum 8 characters

Confirm Password :

Password Requirements:

- * Between 8~16 characters long
- * Contain only Latin based alphanumeric characters
- * Must contain at least one capital letter, one small letter and one number

My Information:

You can update Username, Company, Contact Number, Email Address, and Role information. Confirm your settings with the **Update** button.

Change Password:

To change your password, enter the new one in both fields and confirm with the **Change Password** button.

The following password requirements which are also listed on the page must be observed:

- It must be between 8 and 16 characters long.
- It must contain only Latin-based alphanumeric characters.
- It must contain at least one capital letter, one small letter, and one number.

In case you forget or inadvertently change this information, a reset to factory defaults is required. To do so, refer to chapter 6.

5.6.5. IP Settings

The factory default IP settings are as follows:

- IP Address: 192.168.1.150
- Subnet Mask: 255.255.255.0
- Broadcast: 192.168.1.255
- Gateway: 192.168.1.1
- Primary DNS: 0.0.0.0
- Secondary DNS: 0.0.0.0

Note: If you change these settings as described below make sure to safely store the new IP settings: You will always need them to reach the PSR.

IP Settings

Use the following IP Address

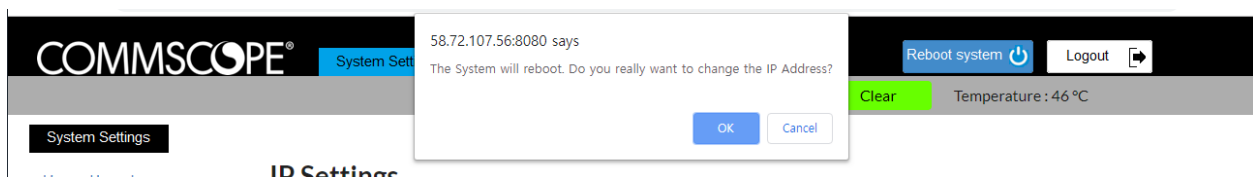
| | |
|-----------------|--|
| IP Address : | <input type="text" value="192.168.1.150"/> |
| Subnet Mask : | <input type="text" value="255.255.255.0"/> |
| Broadcast : | <input type="text" value="192.168.1.255"/> |
| Gateway : | <input type="text" value="192.168.1.1"/> |
| Primary DNS : | <input type="text" value="0.0.0.0"/> |
| Secondary DNS : | <input type="text" value="0.0.0.0"/> |

Warning!

Apply IP address update to system at this time. Note that updating ethernet port will cause the system to go off-line and cellular communication will discontinue until the update has been completed

Save

To change the settings (e.g. to integrate the PSR into an existing network), type in the corresponding data and click the **Save** button to confirm. The following message appears:



Click the **OK** button to confirm the changed IP Settings and the system will reboot.

System will reboot in few minutes...



5.6.6. OMC Connection

The following parameters can be entered:

OMC Server IP Address:

A total of 5 OMC Server IP Addresses can be entered.

Factory default IP Address: 0.0.0.0

Alarm Notification:

Heartbeat ON / OFF function

Heartbeat Interval time set function: 1 to 1440 min can be set.

OMC Connection

OMC Server IP Address

| | |
|----------------------------|---------|
| Main OMC IP Address [A]: | 0.0.0.0 |
| Backup OMC IP Address [B]: | 0.0.0.0 |
| OMC IP Address [C]: | 0.0.0.0 |
| OMC IP Address [D]: | 0.0.0.0 |
| OMC IP Address [E]: | 0.0.0.0 |

Warning!
Apply IP address update to system at this time. Note that updating ethernet port will cause the system to go off-line and cellular communication will discontinue until the update has been completed

Alarm Notification

HeartBeat: ON

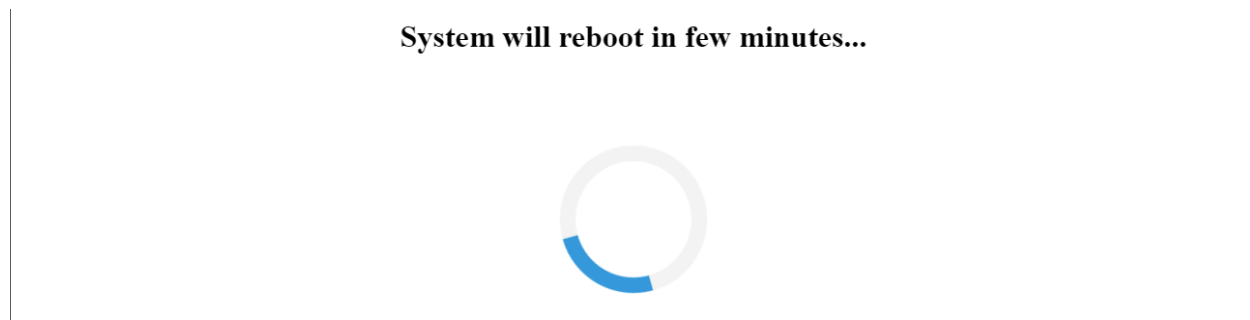
HeartBeat Interval:
HeartBeat Interval:
1440min
30min

Alarm Type: NOTIFICATION [Trap]

SNMP Version: V2.0

Save

Click the **Save** button to confirm the changed OMC Connection settings and the PSR will reboot for the SNMP daemon to restart.



5.6.7. Alarm Settings

This page serves to mask / unmask alarms:

Alarm Settings

| Alarm Information | Active | Delay |
|--------------------------------------|-------------------------------------|------------|
| PSU Fail Alarm | <input checked="" type="checkbox"/> | |
| DL Shutdown Alarm | <input checked="" type="checkbox"/> | |
| UL Shutdown Alarm | <input checked="" type="checkbox"/> | |
| Manual AMP Off | <input checked="" type="checkbox"/> | |
| Service Antenna VSWR Alarm | <input checked="" type="checkbox"/> | OFF ▾ |
| Donor Antenna VSWR/Malfunction Alarm | <input checked="" type="checkbox"/> | 23 hours ▾ |
| DL HPA Fail Alarm | <input checked="" type="checkbox"/> | |
| UL HPA Fail Alarm | <input checked="" type="checkbox"/> | |
| PLL Lock Detector Alarm | <input checked="" type="checkbox"/> | |
| Isolation Alarm | <input checked="" type="checkbox"/> | OFF ▾ |
| Temperature Alarm | <input checked="" type="checkbox"/> | OFF ▾ |
| Donor Antenna Disconnection Alarm | <input checked="" type="checkbox"/> | 10 min ▾ |

Save

Click the corresponding symbol in the **Active** column to set the respective alarm ON (blue) or OFF (dark grey). This setting has the following effect:

- **Active ON:** When an alarm is triggered, the corresponding alarm LED and alarm relay are selected and a MIB Notification Alarm is generated.
- **Active OFF:** When an alarm is triggered, neither the corresponding alarm LED nor the alarm relay are selected, and the MIB Notification Alarm is also masked.
- **Delay:** All alarms related to the installation can be delayed between 1 minute and 23 hours. The status "OFF" means that the time between an alarm condition and the corresponding alarm depends on the measurement cycle, e.g. 3 minutes for "Donor Antenna Disconnection Alarm". The alarm settings cannot exceed the programmable limits indicated in the table at the beginning of chapter 5.

Click the **Save** button to confirm the settings.

5.6.8. General RF Setting

Band Selection: If the Feature Key ID is dual-band (as in the example below) both the 700 MHz Band and 800 MHz Band can be selected. If the Feature Key ID is single-band, you can select either the 700 MHz Band or the 800 MHz Band. Only the items corresponding to the Feature Key ID, including RF Settings, are *Active*.

General RF Setting

Band Selection

700MHz
 800MHz
 700/800MHz
 All Feature Deactive

DOWNLINK

| Band | Gain | ALC Level | ALC | User ATTN | HPA | RL Threshold |
|--------|------|-----------|-----------------------------------|----------------------------------|------------------------------------|---------------------------------|
| 700MHz | 60.0 | -57 | <input type="button" value="ON"/> | <input type="text" value="0.0"/> | <input type="button" value="OFF"/> | <input type="text" value="10"/> |
| 800MHz | 90.0 | -57 | <input type="button" value="ON"/> | <input type="text" value="0.0"/> | <input type="button" value="ON"/> | |

UPLINK

| Band | Gain | ALC Level | ALC | User ATTN | HPA | RL Threshold | Broad Mute Level | Narrow Mute Level | Mute |
|--------|------|-----------|-----------------------------------|----------------------------------|------------------------------------|---------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 700MHz | 60.0 | -63 | <input type="button" value="ON"/> | <input type="text" value="0.0"/> | <input type="button" value="OFF"/> | <input type="text" value="10"/> | <input type="text" value="-105"/> | <input type="text" value="-110"/> | <input type="button" value="ON"/> |
| 800MHz | 60.0 | -63 | <input type="button" value="ON"/> | <input type="text" value="0.0"/> | | | | | |

Analog Band Selection [Class B]

Analog Band Selection [Class B]: (only available for analog Class B variant): The 800 MHz passband can be set to 851 - 869 MHz, 851 - 861 MHz and 851 - 854 MHz.

DOWNLINK / UPLINK:

Band: The band to which the settings in this line correspond is displayed.

Gain. This parameter shows the current PSR gain (default setting is 90 dB): This value can be reduced with the User ATTN setting (see below).

ALC: Use this button to switch ALC ON /OFF, however deactivating ALC can cause the system to exceed allowed FCC levels.

HPA: Use this button to switch High Power Amplifier ON /OFF. If switched to OFF, the entire band is deactivated.

User ATTN: The PSR gain can be reduced by 0 (= default) to 30 dB in steps of 0.5 dB to a minimum value of 60 dB. For additional adjustments per channel see chapters 5.6.10 and 5.6.11.

RL Threshold: The return loss threshold used for the *VSWR Check* (see chapter 5.7.5) can be set in the range from 0 to 30 dB.

Broad Mute Level: Set the UL mute threshold level [broadband] (-105 to -60 dBm).*

Narrow Mute Level: Set the UL mute threshold level [narrowband] (-110 to -60 dBm).*

* If the UL input power falls below the set threshold, UL squelch/mute is activated. Default is -105 dBm for broadband channels and -110 dBm for narrowband channels (Class A only). For Class B type units, the whole band will be muted. With UL squelch/mute active, the UL gain is reduced by 30 dB. With the **Mute ON/OFF** button, muting can be generally deactivated/activated. The button indicates the currently chosen muting status.

Once you have finished RF setting, press the **Save** button to change the settings.

5.6.9. Channelized ALC (Class A Only)

If the input power for one active channel results in an output power that exceeds the maximum output power per channel, the related channel gain is automatically and individually reduced. The maximum possible output power per channel depends on the enabled power class (0.5 W or 2 W) and the number of active channels and can be calculated by dividing the maximum possible output power per band by the number of active channels. Examples are shown in the following table.

| Power class | Maximum UL output power per channel | | Maximum DL output power per channel | |
|-----------------|-------------------------------------|--------|-------------------------------------|--------|
| | 0.5 W | 2 W | 0.5 W | 2 W |
| Active Channels | | | | |
| 1 | 27 dBm | 27 dBm | 27 dBm | 33 dBm |
| 4 | 21 dBm | 21 dBm | 21 dBm | 27 dBm |
| 8 | 18 dBm | 18 dBm | 18 dBm | 24 dBm |
| 16 | 15 dBm | 15 dBm | 15 dBm | 21 dBm |
| 32 | 12 dBm | 12 dBm | 12 dBm | 18 dBm |

The user gain setting is immediately restored when the channel output power is equal to or below the maximum possible value.

5.6.10. 700 MHz Channels (Class A Only)

700 MHz Band Digital Filter Channels Configuration:

- Broadband (LTE): CH1, CH2 Filter BW: OFF, 5, 10, 17 MHz*
- Narrowband: CH3 ~ CH34 Filter BW: OFF, 12.5, 25, 50, 75, 100, 150, 250 kHz*

* Filters above 75 kHz are only available in Class B mode. For a detailed explanation on using this mode, refer to chapter 5.6.12 and strictly observe the important COMPLIANCE Notice in this chapter.

700 MHz Channels

Save

| Channels | Downlink Center Frequency [MHz] | Bandwidth [KHz] | Downlink Gain Offset +/- 5 [dB] | Uplink Gain Offset +/- 5 [dB] | DL/UL Gain [dB] | Downlink Start Freq [MHz] | Downlink Stop Freq [MHz] | Uplink Start Freq [MHz] | Uplink Stop Freq [MHz] | Uplink Center Freq [MHz] |
|-------------|--|-----------------|----------------------------------|----------------------------------|-----------------|---------------------------|--------------------------|-------------------------|------------------------|--------------------------|
| Broad CH1 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Broad CH2 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH1 | <input type="text" value="772,00000"/> | 75 | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | 771.96250 | 772.03750 | 801.96250 | 802.03750 | 802.00000 |
| Narrow CH2 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH3 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH4 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH5 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH6 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH7 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH8 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH9 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |
| Narrow CH10 | <input type="text"/> | OFF | <input type="text" value="0.0"/> | <input type="text" value="0.0"/> | 60.0/60.0 | - | - | - | - | - |

For filter details also observe *table 8-1 Digital filters (narrowband) for Class A repeaters* or *table 8-2 Digital filters (broadband) for Class A repeaters*, respectively.

Center Freq. Setting: Set up the Center Freq. per each channel.

Center Freq. Range: 758.000000 ~ 775.000000 (MHz) Ref: DL Freq.

Digital Gain Setting: DL/UL gain control per each channel *

Digital Gain Control Range: +/- 5 dB in steps of 0.5 dB

Start Freq.: Calculate Center Freq - (Bandwidth/2) (display Only)

Stop Freq.: Calculate Center Freq + (Bandwidth/2) (display Only)

* An additional gain offset between -5 and +5 dB can be set for each defined channel to compensate components with frequency-dependent insertion loss, e.g. external filters or splitters. The end-to-end gain (total system gain) including external components (not antennas) must not exceed a gain of 90 dB. If you require more detailed information with an example of an end-to-end gain equation, ask our Technical Support (for contact data, please refer to chapter 1.6.1).

Once you have finished Channel settings, press the **Save** button to change the settings.

5.6.11. 800 MHz Channels (Class A Only)

800 MHz Band Digital Filter Channels Configuration

- Broadband (LTE): CH1, CH2 Filter BW : OFF, 5, 10, 17 MHz*
- Narrowband: CH3 ~ CH34 Filter BW : OFF, 12.5, 25, 50, 75, 100, 150, 250 kHz

* Filters above 75 kHz are only available in Class B mode. For a detailed explanation on using this mode, refer to chapter 5.6.12 and strictly observe the important COMPLIANCE Notice in this chapter.

800 MHz Channels

Save

| Channels | Downlink Center Frequency [MHz] | Bandwidth [KHz] | Downlink Gain Offset +/- 5 [dB] | Uplink Gain Offset +/- 5 [dB] | DL/UL Gain [dB] | Downlink Start Freq [MHz] | Downlink Stop Freq [MHz] | Uplink Start Freq [MHz] | Uplink Stop Freq [MHz] | Uplink Center Freq [MHz] |
|-------------|---------------------------------|-----------------|---------------------------------|-------------------------------|-----------------|---------------------------|--------------------------|-------------------------|------------------------|--------------------------|
| Broad CH1 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Broad CH2 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH1 | 855,00000 | 25 | 0.0 | 0.0 | 60.0/60.0 | 854.98750 | 855.01250 | 809.98750 | 810.01250 | 810.00000 |
| Narrow CH2 | 857,00000 | 75 | 0.0 | 0.0 | 60.0/60.0 | 856.96250 | 857.03750 | 811.96250 | 812.03750 | 812.00000 |
| Narrow CH3 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH4 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH5 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH6 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH7 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH8 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH9 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |
| Narrow CH10 | <input type="text"/> | OFF | 0.0 | 0.0 | 60.0/60.0 | - | - | - | - | - |

For filter details also observe *table 8-1 Digital filters (narrowband) for Class A repeaters*.

Center Freq. Setting: Set up the Center Freq. per each Channel.
 Center Freq. Range: 851.000000 ~ 869.000000 (MHz) Ref: DL Freq.
 Digital Gain Setting: DL/UL gain control per each channel *
 Digital Gain Control Range: +/- 5 dB in steps of 0.5 dB
 Start Freq.: Calculate Center Freq. - (Bandwidth/2) (Display Only)
 Stop Freq.: Calculate Center Freq. + (Bandwidth/2) (Display Only)

* An additional gain offset between -5 and +5 dB can be set for each defined channel to compensate components with frequency-dependent insertion loss, e.g. external filters or splitters. The end-to-end gain (total system gain) including external components (not antennas) must not exceed a gain of 90 dB. If you require more detailed information with an example of an end-to-end gain equation, ask our Technical Support (for contact data, please refer to chapter 1.6.1).

Once you have finished Channel settings, press the **Save** button to change the settings.

5.6.12. Digital Channels (Class B mode)

Special circumstances, such as high carrier density combined with low group delay or a combined use of FirstNets Band 14 with narrow PS carriers, require a mix of the flexible filters of a class A repeater and the low group delay of a class B repeater. To cover these requirements as well, the digital class A repeater has been designed and granted by FCC to be easily configured as a class A or class B repeater.

COMPLIANCE Notice:

When using Class B mode, you **MUST** register the PSR as a Class B signal booster (as defined in 47 CFR 90.219) online at www.fcc.gov/signal-boosters/registration.

To use the Class B mode, simply choose a filter above 75 kHz (marked in red), observe the WARNING message, and accept it by pressing **Ok**.

Version : 01.00.05.01 Alarm Status : Critical Ter

700 MHz Channels

| Channels | Downlink Center Frequency [MHz] | Bandwidth [KHz] | Downlink Gain Offset +/- 5 [dB] | Uplink Gain Offset +/- 5 [dB] | DL/UL Gain [dB] | Downlink Start Freq [MHz] |
|-------------|---------------------------------|-----------------|---------------------------------|-------------------------------|-----------------|---------------------------|
| Broad CH1 | | OFF | 0.0 | 0.0 | 60.0/60.0 | - |
| Broad CH2 | | OFF | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH1 | 772.00000 | 75 | 0.0 | 0.0 | 60.0/60.0 | 771.96250 |
| Narrow CH2 | | OFF | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH3 | 774 | OFF | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH4 | | OFF | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH5 | | 12.5 | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH6 | | 25 | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH7 | | 50 | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH8 | | 75 | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH9 | | 100 | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH10 | | 150 | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH11 | | 250 | 0.0 | 0.0 | 60.0/60.0 | - |
| Narrow CH12 | | OFF | 0.0 | 0.0 | 60.0/60.0 | - |

WARNING. You have chosen to allow this booster to operate as a Class B booster. You MUST register Class B signal boosters (as defined in 47 CFR 90.219) online at: <http://www.fcc.gov/signal-boosters/registration>. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation. To enable Class B operation press the OK button. To continue operation in Class A mode, press the CANCEL button.

Ok Abbrechen

5.6.13. Site Location

Use this page to enter the **Site Location** information:

Site Location

Company/Name

Address

City

State/Province/Territory

Zip/Postal Code

Contact

CompanyName:

You can enter up to 30 characters.

Address:

You can enter up to 30 characters.

City:

You can enter up to 30 characters.

State/Province/Territory:

You can enter up to 10 characters.

Zip/Postal Code:

You can enter up to 10 characters.

Contact:

You can enter up to 20 characters.

Click the **Save** button to save the Site Location information on the device.

5.6.14. Time and Date

Use this page to enter the **Time and Date** information:

Time and Date

Set Repeater Time and Date

Time Zone

*Time Zone setting support daylight saving time

Date/Time

Time Zone: Asia/Seoul

PC Date and Time: 2019-10-22 10:44:46

Time Zone: When Time Zone is selected, the daylight-saving time is applied.

Date and Time: Press the **Refresh** button to get the current repeater date and time; the user can change the Date and Time manually.

Save Button: Save the changed Date/Time and Time Zone on the Device.

Save with PC Time: Save the date/time of the connected PC to the device (you should have set the Time Zone before).

Note Date/Time is reset if PSR power is off for more than 2 days.

5.6.15. Summary

Use this page to display a summary of all device, RF, and Alarm settings.

The user can download the summary to PC by using the "Create Report" button located at the end of the summary.

Summary File: The summary file is named as occurred date and time and the file is saved in the chosen folder, e.g. summary_190729AA0005_20201117_1509.html.

5.7. System Operation

5.7.1. Active Alarm

- 1) You can view the currently active alarms.
- 2) Alarm test is a function that performs an alarm simulation: This includes sending SNMP traps as well as activating the related LED and relay.

Active Alarm

| Alarm Information | Alarm Status | Alarm Count | Alarm Test | Test Duration |
|--------------------------------------|--------------|-------------|------------|---------------|
| PSU Fail Alarm | Clear | 5 | OFF | 10:00 |
| DL Shutdown Alarm | Critical | 2 | ON | 08:41 |
| UL Shutdown Alarm | Clear | 1 | OFF | 10:00 |
| Manual AMP Off | Clear | 2 | OFF | 10:00 |
| Service Antenna VSWR Alarm | Clear | 0 | OFF | 10:00 |
| Donor Antenna VSWR/Malfunction Alarm | Critical | 4 | OFF | 10:00 |
| DL HPA Fail Alarm | Critical | 2 | ON | 09:44 |
| UL HPA Fail Alarm | Clear | 3 | OFF | 10:00 |
| PLL Lock Detector Alarm | Clear | 0 | OFF | 10:00 |
| Isolation Alarm | Clear | 0 | OFF | 10:00 |
| Temperature Alarm | Clear | 0 | OFF | 10:00 |
| Donor Antenna Disconnection Alarm | Critical | 19 | OFF | 10:00 |

Clear Count

Alarm Count: Auto / Manual Alarm count displayed.

Alarm History Storage:

When Alarm Test is ON, the alarm is stored as a manually triggered alarm in the alarm history.

Test Duration:

When Alarm Test is switched ON, a 10-minute counter starts. After the counter has reached zero, the alarm test is switched OFF automatically. The individual remaining time is displayed in the Test Duration column.

Temperature Alarm test is not available.

5.7.2. Alarm History

If an Alarm occurs in the Repeater, it will be stored in the Alarm History. If the user switches On the Alarm Test to test the alarm, it is stored as a manually triggered alarm in the alarm history.

Alarm History

Show entries Search:

| Date/Time | Level | Trigger | Alarm Details |
|---------------------|----------|---------|-----------------------------|
| 2020-11-02_15:19:19 | Critical | Auto | Donor Antenna Disconnection |
| 2020-11-02_15:13:59 | Critical | Auto | Manual AMP Off |
| 2020-11-02_15:13:59 | Clear | Auto | Donor Antenna Disconnection |
| 2020-10-30_07:49:13 | Critical | Auto | Donor Antenna Disconnection |
| 2020-10-27_16:27:28 | Critical | Auto | Donor Antenna Disconnection |
| 2020-10-27_11:25:06 | Critical | Auto | Donor Antenna Disconnection |
| 2020-10-27_11:22:06 | Critical | Auto | Donor Antenna Malfunction |
| 2020-10-21_16:24:43 | Critical | Auto | Donor Antenna Disconnection |
| 2020-10-21_16:21:43 | Critical | Auto | Donor Antenna Malfunction |
| 2020-10-19_10:09:23 | Critical | Auto | Donor Antenna Malfunction |

Showing 1 to 10 of 264 entries

Previous **1** 2 3 4 5 ... 27 Next

[Download Alarm Logs](#)

[Clear Alarm History](#)

The alarm history can be cleared by using the [Clear Alarm History](#) button.

Alarm History Log File: The Alarm Event file is named as occurred date and the file is saved in the chosen folder, e.g. 20190226.log.

Alarm History Log File Content: Saved as a Csv file, separated by commas, e.g. 2019021613:00:22, Critical,Auto,PSU Fail Alarm

Download the Alarm History Log File to PC: The user can download the Alarm History log file to PC, and then perform the download function by compressing all of the Alarm Log files at one time.

Alarm History Search Function: You can search by Event Date, Alarm Item, Alarm Trigger, and Alarm Level, e.g. when Manual AMP is entered in the Search window, only the detected alarm is displayed.

Show entries Search:

| Date/Time | Level | Trigger | Alarm Details |
|---------------------|----------|---------|----------------|
| 2019-10-21_13:26:12 | Clear | Auto | Manual AMP Off |
| 2019-10-21_13:24:12 | Critical | Auto | Manual AMP Off |

5.7.3. Event History

This page shows the user log in information and history of changes to the RF settings.

Event History

Show entries

Search:

| Date and Time | User | Event Description |
|---------------------|-------|--|
| 2020-11-17_13:44:39 | admin | Login occurred |
| 2020-11-17_13:43:57 | admin | Logout occurred |
| 2020-11-02_15:22:49 | admin | Narrow 800MHz CH-1 and Bandwidth Setting Changed |
| 2020-11-02_15:19:18 | admin | 700MHz LTE Broad band CH-1 and Bandwidth Setting Changed |
| 2020-11-02_15:15:58 | admin | Narrow 700MHz CH-1 and Bandwidth Setting Changed |
| 2020-10-30_07:44:18 | admin | Login occurred |
| 2020-10-30_07:41:17 | | System started |
| 2020-10-30_07:40:44 | | System started |
| 2020-10-30_07:38:43 | | System started |
| 2020-10-30_07:37:02 | admin | Login occurred |

Showing 1 to 10 of 36 entries

← The event history can be cleared by using the Clear Event History button.

Event History Log File: Event file is named as occurred date, and the file is saved on System Event History Folder, e.g. 20190226.log.

Event History Log File Content: Saved as a Csv file, separated by commas, e.g. 2019021613:00:22,David,logged in

Download the Event History Log File to PC: The user can download the Event History log file to PC, and then perform the download function by compressing all of the Event Log files at one time.

Event History Search Function: You can search by Event Date, Event, and User Name.

5.7.4. Antenna Isolation Check

Isolation Check

| BAND | Isolation [dB] | Maximum Gain [dB] |
|---------|----------------|-------------------|
| 700 MHz | - | - |
| 800 MHz | - | - |

 → Click the **TEST** button to start the Antenna Isolation Check.

The progress is displayed: **Isolation Check**

| BAND | Isolation [dB] | Maximum Gain [dB] |
|---------|----------------|-------------------|
| 700 MHz | - | - |
| 800 MHz | - | - |





Isolation Check

When the Isolation Check is completed, the Isolation value and Maximum Gain are displayed (maximum gain is calculated with Isolation minus 20 dB):

| BAND | Isolation [dB] | Maximum Gain [dB] |
|---------|----------------|-------------------|
| 700 MHz | 110 | 90 |
| 800 MHz | 110 | 90 |

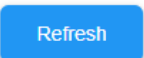


Maximum Gain: 90 (Green color), Maximum Gain : 89~ 60 dB (Orange color),
Maximum Gain: < 60dB (Red color) – Isolation Fail

5.7.5. VSWR Check and Donor Calibration

VSWR Check

| Antenna | VSWR [Ratio] | Return Loss [dB] | Threshold [dB] |
|---------|--------------|------------------|----------------|
| Donor | 1.00 : 1 | 66.0 | 10 |
| Service | 1.00 : 1 | 66.0 | 10 |

 → Click the **Refresh** button to display the current VSWR Ratio.

 → Click the **Donor Calibration** button to start the calibration.

If the Return loss value is less than the Threshold value, the VSWR Fail Alarm is generated. The shading will change from green to red in case of an alarm.

The threshold (RL Threshold) under which an alarm will be generated can be set in the *General RF Setting* (see chapter 5.6.8).

With the donor calibration, the reference level for the Donor Antenna Disconnection (DAD) Alarm can be set. Follow the procedure described below to successfully activate the donor antenna connection supervision.

- I. Connect the donor antenna cable* without antenna to BDA
- II. Press the “Donor Calibration” button on page System Operation--> VSWR Check
- III. The DAD alarm will appear within 3 minutes
- IV. The DAD alarm shall disappear within 3 minutes after donor antenna** is connected

* A maximum donor antenna cable loss of 8 dB at 900 MHz (ca. 328 ft /100 m with CNT-600) is supported. Please use a donor cable with a larger diameter or install a UL2524 certified 3rd party device capable of supervising the antenna connection in case longer cable runs are necessary.

** An antenna with at least 7 dB RL must be used

5.7.6. 700MHz Band Overview

This page displays the current 700 MHz band setting and the Input/Output Power Level.

700MHz Band Overview

| Channel | Downlink | | | | | Uplink | | | |
|---------|--------------------|----------|-------------|--------------|-----------|--------------------|-------------|--------------|-----------|
| | Center Freq. [MHz] | BW [KHz] | Input [dBm] | Output [dBm] | Gain [dB] | Center Freq. [MHz] | Input [dBm] | Output [dBm] | Gain [dB] |
| CH1 | 763.00000 | 10000 | -106.2 | -46.2 | 60.0 | 793.00000 | -108.6 | -48.6 | 60.0 |
| CH2 | 770.00000 | 5000 | -81.3 | -21.3 | 60.0 | 800.00000 | -102.5 | -42.5 | 60.0 |

If you want to check the status again, you can click the 700 MHz Band menu button or F5 refresh key to perform the status check. Automatic gain reduction is indicated by orange color.

5.7.7. 800MHz Band Overview

This page shows the current 800 MHz band setting and the Input/Output Power Level.

800MHz Band Overview

| Channel | Downlink | | | | | Uplink | | | |
|---------|--------------------|----------|-------------|--------------|-----------|--------------------|-------------|--------------|-----------|
| | Center Freq. [MHz] | BW [KHz] | Input [dBm] | Output [dBm] | Gain [dB] | Center Freq. [MHz] | Input [dBm] | Output [dBm] | Gain [dB] |
| CH1 | 852.00000 | 5000 | -114.1 | -24.1 | 90.0 | 807.00000 | -111.9 | -51.9 | 60.0 |
| CH3 | 867.00000 | 75 | -116.7 | -26.7 | 90.0 | 822.00000 | -117.1 | -57.1 | 60.0 |
| CH4 | 867.07500 | 75 | -118.4 | -28.4 | 90.0 | 822.07500 | -117.1 | -57.1 | 60.0 |
| CH5 | 867.03750 | 150 | -113.2 | -23.2 | 90.0 | 822.03750 | -117.1 | -57.1 | 60.0 |

If you want to check the status again, you can click the 800 MHz Band menu button or F5 Key to perform the status check.

6. Status LEDs, PSR Alarms, and Troubleshooting

For local supervision, three multi-color LEDs (Power, OSC, and Alarm) are part of the front panel to display unit status information.

During booting and SW update, all three LEDs blink green, indicating that initialization and isolation measurement are in process. When the boot process is finished, and the repeater works properly, all three LEDs are green to indicate normal operation.

The table below shows possible PSR alarm conditions indicated by the LEDs as well as possible countermeasures.

| Status LED | Indication | PSR alarm condition | Trouble & Status condition | Possible countermeasure |
|-----------------|----------------|-------------------------|--|---|
| Power LED | Red | DC/DC failure | Try to reboot the unit; if this is of no effect, the unit has to be sent back to the supplier. | |
| OSC LED | Red Blinking | Isolation Alarm | Insufficient isolation between antennas | Increase isolation between donor and coverage antenna above gain + 20dB. |
| | Green Blinking | VSWR Alarm | UL/DL VSWR Alarm, Antenna failure | Check for proper connection between antennas and antenna ports. Check for obstacles close to antennas. Check for short-circuit of antenna cables. |
| OSC & Alarm LED | Red Blinking | PLL Lock Detector Alarm | PLL is unlocked | Reset unit via <i>Reset</i> button in Web GUI*. If the alarm is still present, contact your supplier. |
| Alarm LED | Red | HPA Fail Alarm | UL/DL High Power Amplifier failure | Reset unit via <i>Reset</i> button in Web GUI*. If the alarm is still present, contact your supplier. |
| | Red Blinking | Shutdown Alarm | UL/DL Shutdown or Temperature Alarm | Make sure that RF input power and ambient temperature are within specified limits and try a manual restart. |
| | Green Blinking | Manual Amp Off | Amplifier turned off by factory setting or by user. | Turn amplifier on via Web GUI. |

* Do not use the HW Reset button in the unit for this purpose, as it will set back all data to factory defaults. Only use the HW button (as described in chapter 7.2) if the IP address or password was inadvertently changed or forgotten.

table 6-1 Status LED indication and troubleshooting

7. Maintenance

7.1. General

Read and observe chapter 1.2 *Health and Safety*.



Caution: The unit reaches high temperature in operation. Risk of burns by hot surface. Do not touch the unit before it has sufficiently cooled down.

- ☞ **Note:** The repeater does not require preventative maintenance measures.
- ☞ **Note:** We recommend checking the cleanliness of the unit and in particular of the heat sink at appropriate intervals depending on the degree of dust and dirt at the installation site. If necessary, any dusty or dirty areas / parts should be cleaned from debris at regular intervals, which also depend on the degree of debris at the installation site.

Unless otherwise agreed to in writing by CommScope, CommScope's general limited product warranty (<http://www.commscope.com/Resources/Warranties/>) shall be the warranty governing the unit, including the installation, maintenance, usage and operation of the units.

- ☞ **Note:** **Ensure the repeater has been disconnected from mains power during maintenance.**
- ☞ **Note:** When sending back the unit, use appropriate packaging (see also section 8.3.2 Mechanical Specifications for details). Use of the original packaging for shipping the unit is strongly recommended.
- ☞ **Note:** Defective parts should only be replaced by original parts from the supplier. All service-work performed inside the housing is performed at the user's own risk.
- ☞ **Note:** Label any unlabeled cables before disconnecting them to ensure correct reconnection.

For some maintenance procedures, appropriate tools may be required to ensure correct handling. All of these tools can be ordered from the supplier.

- ☞ **Note:** All repeater screws have a right-hand thread and are tightened by turning the screws clockwise and loosened by turning them counter-clockwise with an appropriate tool.

The following spare parts are also listed with their corresponding IDs in chapter 8.5.

| Description | For installation / connection, refer to chapter ... |
|-----------------------|--|
| Alarm cable 2m AWG 26 | 4.2.8 |
| Key for Lock | --- |

- ☞ **Note:** Ensure that all relevant compliance rules listed in chapter 1.4 are observed when the system is powered up again after maintenance.

7.2. Reset to Factory Defaults

If the IP address or password was inadvertently changed or forgotten so that access to the Web GUI is not possible, a Reset button inside the unit is provided.

Note: Be aware that this button will set back ALL data to factory defaults.

Notice: As using the Reset button requires the unit to be in operation while open, only suitably qualified personnel are allowed carry out the procedure described in the following and only after becoming familiar with all safety notices, installation, operation and maintenance procedures contained in this manual.

Note: Read and observe chapter 7.1 before starting with the procedure.



Danger: Electrical hazard. Danger of death or fatal injury from electrical current. Obey all general and regional installation and safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.

Use the key provided with the unit to unlock both locks at the left side of the cabinet and unlatch them. Then, you can open the cabinet door.



Danger: Electrical hazard. Danger of death or fatal injury from electrical current inside the unit in operation. Make sure not to touch anything but the Reset button.

The Reset button is located on the Control Board (located in the top right corner of the repeater):

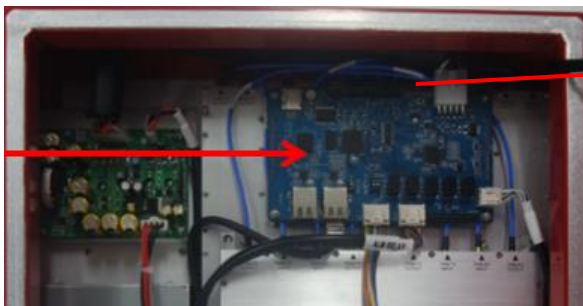


figure 7-1 Location of Control Board

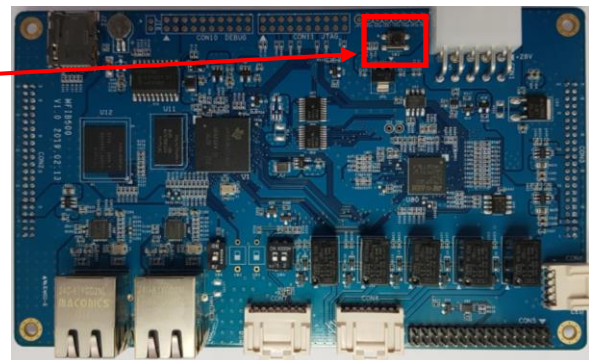


figure 7-2 Reset button on Control Board

Press the button for 5 seconds and a restart of the Web GUI will be initiated, setting back the settings to the factory defaults:

| | |
|---------------------------|------------------------------------|
| IP Address: 192.168.1.150 | OMC Connection IP Address: 0.0.0.0 |
| Heartbeat ON | Heartbeat Interval: 30min |

Thus, you can login to the Web GUI with the default password again.

Note: Do not forget to close the cabinet, latch the two locks and lock them with the key.

7.3. Cleaning the Heat Sink

☞ **Note:** Read and observe chapter section 7.1 before starting with the procedure. Then, proceed as follows:

Checking the cleanliness of the heat sink is recommended at appropriate intervals depending on the degree of dust and dirt at the installation site. If necessary, any dusty or dirty areas / parts should be cleaned as explained in the following:

Read and observe chapter 1.2 *Health and Safety* as well as the instructions in section 7.1 *General* before starting with the cleaning.

Disconnect the mains cable from the POWER connector (see figure 4-1).



Caution: The unit reaches high temperature in operation. Risk of burns by hot surface. Do not touch the unit before it has sufficiently cooled down.

Use a soft brush to remove dust and dirt from the fins of the heat sink.

After cleaning reconnect power cable.

8. Appendix

8.1. BBU/UPS Requirements

- 1) In order to obtain a system that is compliant with UL 2524, the BBU/UPS must be compliant with UL 2524 too.
- 2) Choose a BBU/UPS capacity that fits to the responsible AHJs (Authority Having Jurisdiction) requirements. You can use this table for reference:

| | | |
|------------------------|-------|-------|
| BBU capacity (48 VDC) | 12 h | 24 h |
| Single Band | 31 Ah | 61 Ah |
| Dual Band | 40 Ah | 80 Ah |
| UPS capacity (110 VAC) | 12 h | 24 h |
| Single Band | 16 Ah | 32 Ah |
| Dual Band | 19 Ah | 38 Ah |

- 3) The BBU/UPS output voltage must be within the range of the specified input voltage range of the BDA:

| | | |
|-----|--------------------|----------------|
| BBU | DC operating range | -62 to -34 VDC |
| UPS | AC input rating | 104 ~ 240 VAC |
| | AC operating range | 89 to 264 VAC |

8.2. Illustrations

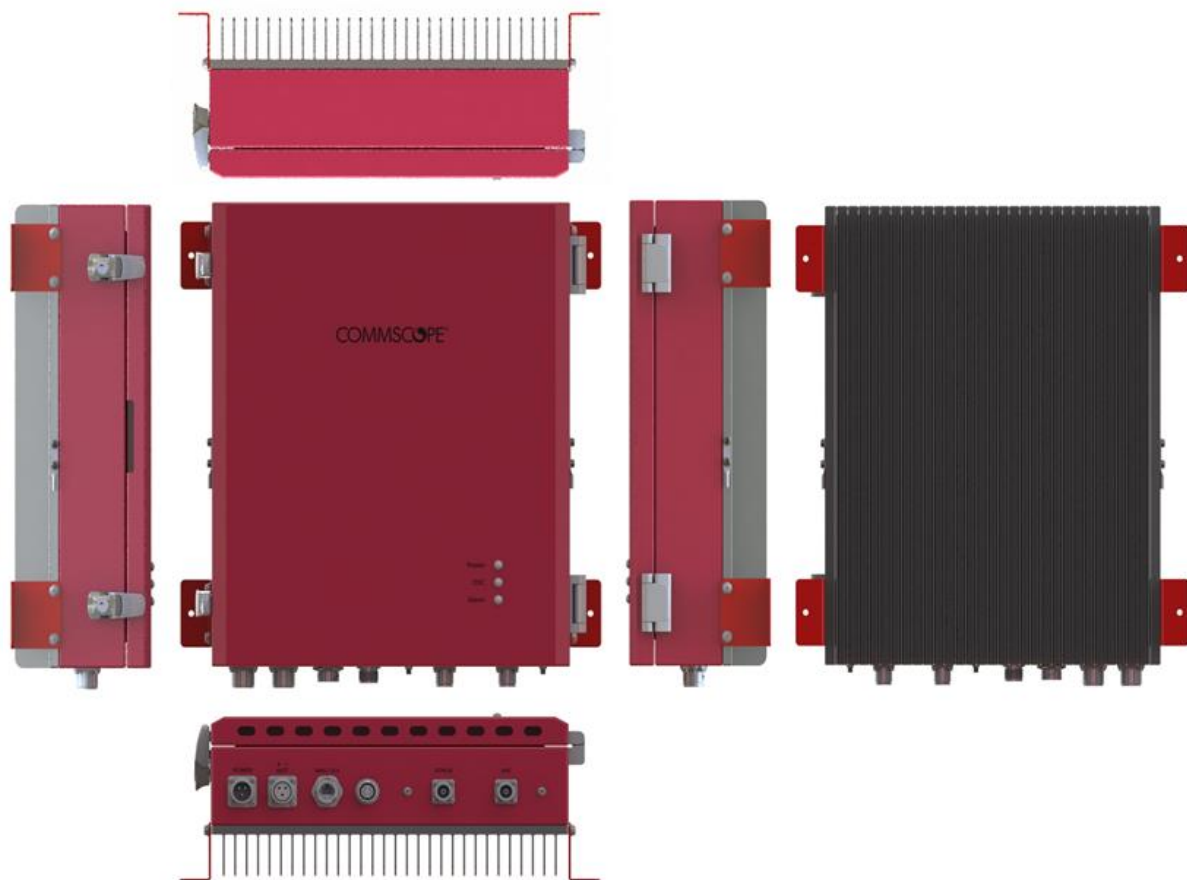


figure 8-1 External configuration

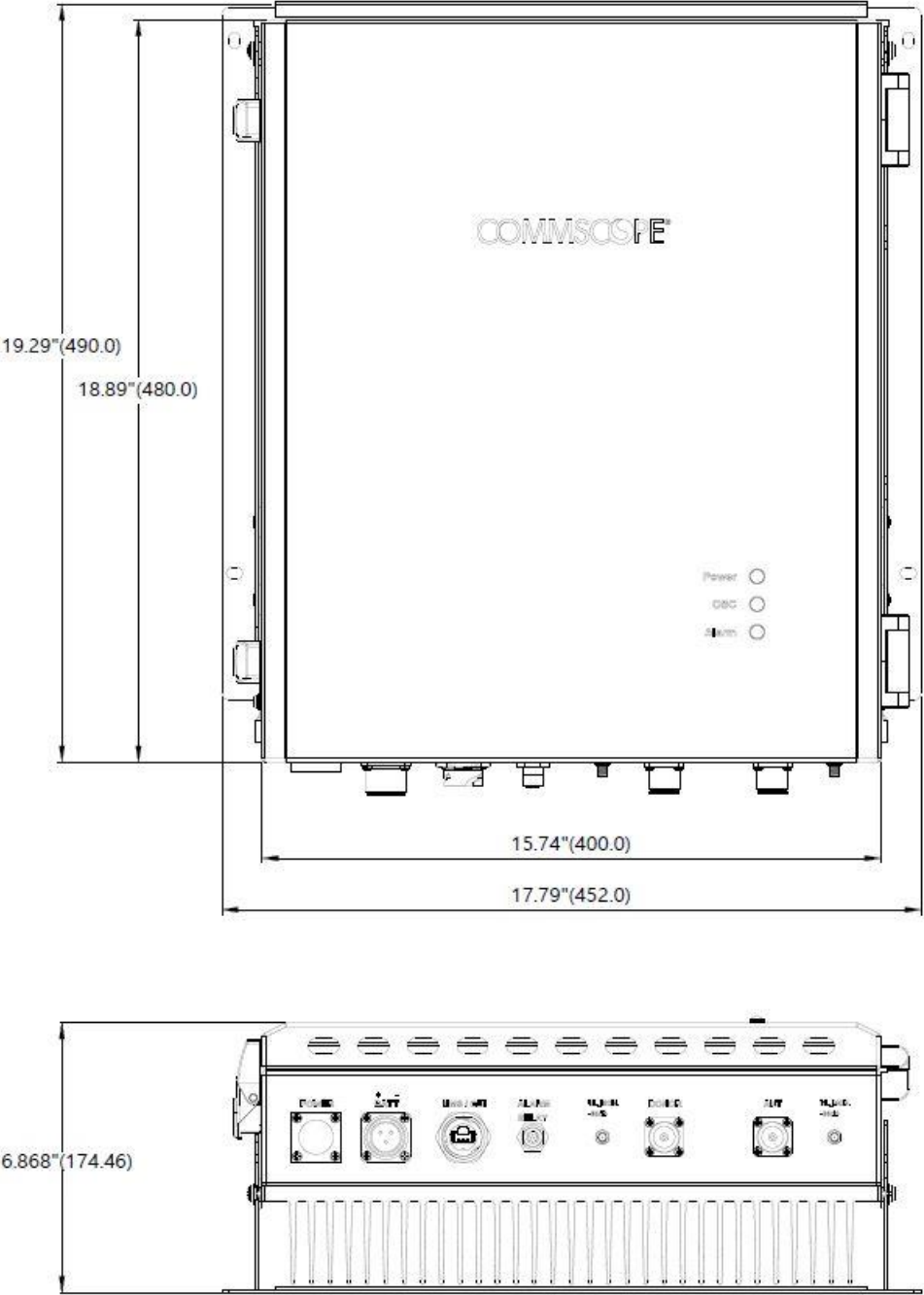


figure 8-2 Cabinet measurements

The following cabling plan shows the example of a DC installation with a BBU; the setup of AC installations using a UPS is the same (for details on the UPS installation, refer to the corresponding installation manual of the UPS):

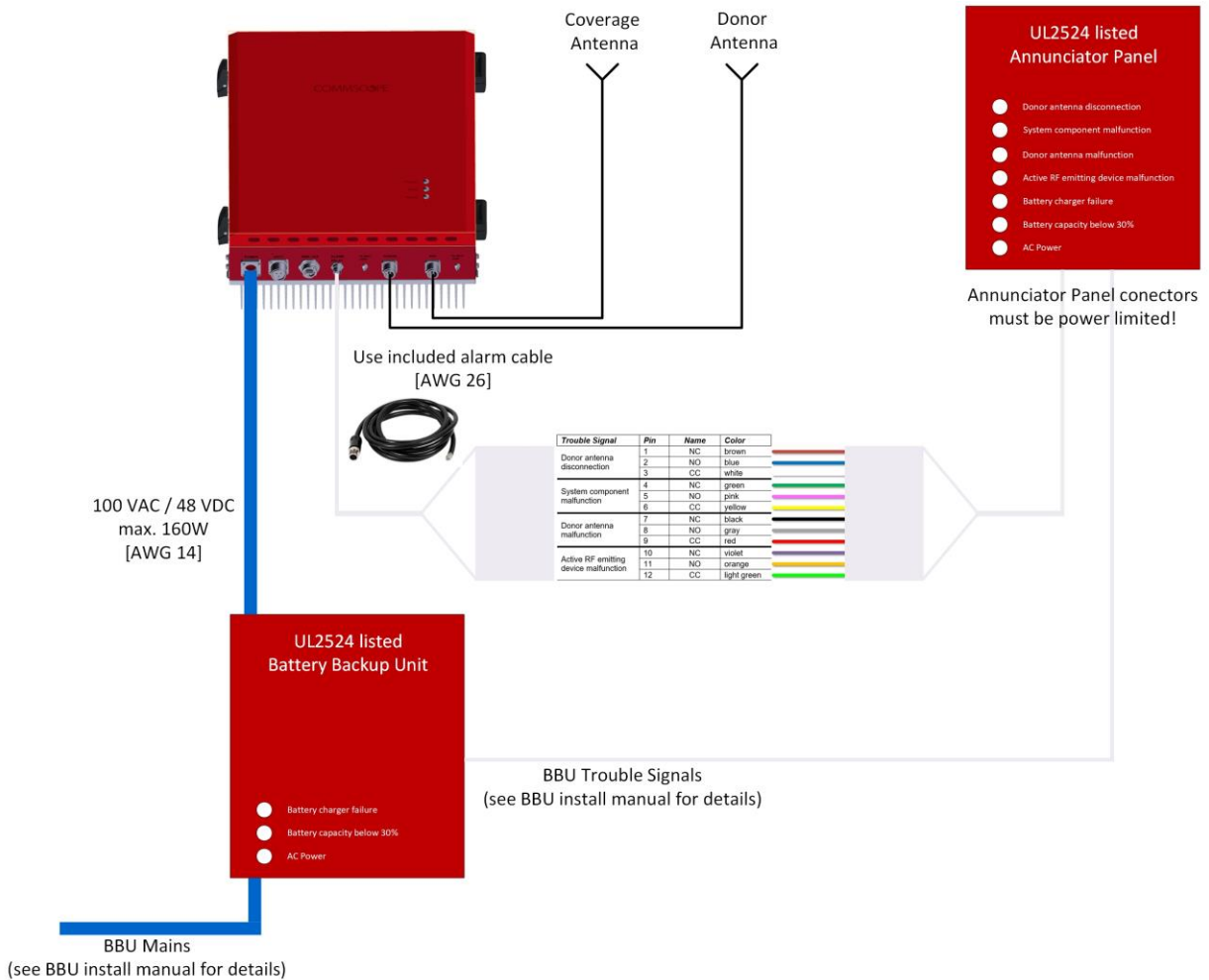


figure 8-3 Cabling plan (with BBU for DC installations)

8.3. Specifications

8.3.1. RF Performance

| 700MHz Band | |
|---|---|
| Frequency range UL | 788 to 805 MHz |
| Frequency range DL | 758 to 775 MHz |
| Instantaneous bandwidth | 17 MHz |
| RF technology | P25 + LTE (758 – 768 MHz) |
| Duplex | FDD |
| UL/DL output power max. per band for 2 W type | 27/33 dBm / carrier @ 1 carrier 24/30 dBm / carrier @ 2 carriers 21/27 dBm / carrier @ 4 carriers 18/24 dBm / carrier @ 8 carriers |
| UL/DL output power max. per band for 0.5 W type | 27/27 dBm / carrier @ 1 carrier 24/24 dBm / carrier @ 2 carriers 21/21 dBm / carrier @ 4 carriers 18/18 dBm / carrier @ 8 carriers |

| 800MHz Band | |
|---|---|
| Frequency range UL | 806 to 824 MHz |
| Frequency range DL | 851 to 869 MHz |
| Instantaneous bandwidth | 18 MHz |
| RF technology | P25 |
| Duplex | FDD |
| UL/DL output power max. per band for 2 W type | 27/33 dBm / carrier @ 1 carrier 24/30 dBm / carrier @ 2 carriers 21/27 dBm / carrier @ 4 carriers 18/24 dBm / carrier @ 8 carriers |
| UL/DL output power max. per band for 0.5 W type | 27/27 dBm / carrier @ 1 carrier 24/24 dBm / carrier @ 2 carriers 21/21 dBm / carrier @ 4 carriers 18/18 dBm / carrier @ 8 carriers |

All figures are typical values, unless otherwise stated.

All data is subject to change without notice.

| No. | Channel Bandwidth (kHz) | 3 dB Bandwidth (kHz) | Delay typ. (μ s) | Rejection $F_{c\pm}$ (kHz) | | Ripple (dB) | Channel Distance * (kHz) |
|-----|-------------------------|----------------------|-----------------------|----------------------------|--------|-------------|--------------------------|
| 1 | 12.5 | 23 | 98.5 | ± 13 | 72 dBc | 0.49 | 31.25 |
| 2 | 25 | 46 | 52 | ± 26 | 71 dBc | 0.46 | 56.25 |
| 3 | 50 | 92 | 27.5 | ± 52 | 72 dBc | 0.49 | 106.25 |
| 4 | 75 | 138 | 20 | ± 78 | 78 dBc | 0.52 | 156.25 |
| 5 | 100 | 184 | 16 | ± 105 | 88 dbc | 0.54 | 206.25 |
| 6 | 150 | 276 | 12 | ± 155 | 74 dbc | 0.56 | 312.5 |
| 7 | 200 | 459 | 9 | ± 255 | 78 dbc | 0.61 | 512.5 |

table 8-1 Digital filters (narrowband) for Class A repeaters

* The center frequencies of two filters with the same bandwidth must have at least this distance; center frequencies are set in the channel pages of the System Settings (see chapter 5.6.10 and 5.6.11).

| No. | Channel Bandwidth (MHz) | 3 dB Bandwidth (kHz) | Delay typ. (μ s) | Channel Distance * (kHz) |
|-----|-------------------------|----------------------|-----------------------|--------------------------|
| 1 | 5 | 4950 | 5 | 5000 |
| 2 | 10 | 9470 | 5 | --- |

table 8-2 Digital filters (broadband) for Class A repeaters

* The center frequencies of two filters with the same bandwidth must have at least this distance; center frequencies are set in the channel pages of the System Settings (see chapter 5.6.10 and 5.6.11).

| Parameter | | Value | | |
|-------------|---------|-------------------|------------------------------------|----------------------|
| Selectivity | Band | Channel Bandwidth | Delay $RF_IN \rightarrow RF_OUT$ | Rejection |
| | 700 MHz | 17 MHz | 3.5 μ s | 40 dBc @ ± 2 MHz |
| | 800 MHz | 3 MHz | | |
| | | 10 MHz | | |
| | 18 MHz | | | |

table 8-3 Selectable passbands for class B repeaters

All figures are typical values, unless otherwise stated.

All data is subject to change without notice.

8.3.2. Mechanical Specifications

| Parameter | Specification | Remark |
|------------------|--|--|
| Size * | 400 x 480 x 170 mm (15.75 x 18.9 x 6.69 in) | W x L x H |
| Weight | 19 kg (41.89 lb) | --- |
| Connectors | Antenna port | 4.3.10 (female) |
| | Monitoring port | SMA (female) -30dB coupling |
| | Battery Back-up port (not for customer use) | YJ3102R-16-10S |
| | Dry Contacts for alarming | M12 12Pin Female Circular Connector Panel Mount |
| | NMS/Local GUI | RJ-45 Ethernet (17-101754) |
| Mounting Type | Wall Mounting | --- |
| Heat Dissipation | Natural Convection | --- |

* Spacing required: 300 mm (11.81 in) around unit

All data is subject to change without notice.

8.3.3. Power Specifications

| Parameter | Value | |
|------------------------------------|-------------------------|---------------------------------------|
| Power consumption Dual Band | Typ. 140 W, Max. 160 W. | |
| Power consumption Single Band | Typ. 100 W, Max. 120 W. | |
| AC Power supply input range | Voltage | 104 ~ 240 VAC / 60 Hz (50 Hz / 60 Hz) |
| | Current (Single Band) | 1.15 – 0.5 A |
| | Current (Dual Band) | 1.38 – 0.6 A |
| DC Power supply operating range | Voltage | -62 ~ -34 VDC |
| | Current (Single Band) | 1.63 – 2.97 A |
| | Current (Dual Band) | 2.13 – 3.88 A |

All figures are typical values, unless otherwise stated.

All data is subject to change without notice.

8.3.4. Environmental and Safety Specifications

| Environmental | |
|---------------|-------------------|
| Sealing class | UL Type 4X / IP66 |

| Storage (ETS 300 019 –2 –1, class 1.2) | |
|--|--|
| Temperature | - 25° to + 70° C |
| Vibration (sinusoidal) | 5 – 62 Hz / 0.5 mm displacement 0.2 g @ 62 – 200 Hz, 3 x 5 sweeps |
| Vibration (random) | 0.02 m ² /s ³ 10 – 50 Hz +12 dB / Oct. 5 – 10 Hz -12 dB / Oct. 50 – 100 Hz 3 x 30 min |
| Shock | none |
| Humidity | + 30° C / 93 % / 96 h |
| Water | none |

| Stationary use | |
|-----------------------|------------------------|
| Operating temperature | -25° to +50 °C * |
| Humidity | +32°C / 93% / 24 hours |

* The ambient temperature intended for installation and operation is 25°C (77°F), but the PSR is fully functional between -25° and +50°C.

All data is subject to change without notice.

8.4. Available Configurations and SW Feature Keys

The Feature Key IDs (listed at the end of this chapter) do not distinguish between Class A, B and DC, AC type. A detailed list of available configurations is provided below.

Class A:

| AC Configurations | ID No. |
|--|---------------|
| PSR 700 OR 800 MHZ 2W CLASS A AC | 7831758-0001 |
| PSR 700 AND 800 MHZ 2W CLASS A AC | 7831758-0011 |
| PSR 700 OR 800 MHZ 0.5W CLASS A AC | 7831758-0012 |
| PSR 700 AND 800 MHZ 0.5W CLASS A AC | 7831758-0013 |
| PSR 700/800 MHZ 0.5/2W LOCKED CLASS A AC | 7831758-0014 |
| DC Configurations | ID No. |
| PSR 700 OR 800 MHZ 2W CLASS A DC | 7831758-0002 |
| PSR 700 AND 800 MHZ 2W CLASS A DC | 7831758-0021 |
| PSR 700 OR 800 MHZ 0.5W CLASS A DC | 7831758-0022 |
| PSR 700 AND 800 MHZ 0.5W CLASS A DC | 7831758-0023 |
| PSR 700/800 MHZ 0.5/2W LOCKED CLASS A DC | 7831758-0024 |

Class B:

| AC Configurations | ID No. |
|--|---------------|
| PSR 700 OR 800 MHZ 2W CLASS B AC | 7831851-0001 |
| PSR 700 AND 800 MHZ 2W CLASS B AC | 7831851-0011 |
| PSR 700 OR 800 MHZ 0.5 CLASS B AC | 7831851-0012 |
| PSR 700 AND 800 MHZ 0.5W CLASS B AC | 7831851-0013 |
| PSR 700/800 MHZ 0.5/2W LOCKED CLASS B DC | 7831851-0014 |
| DC Configurations | ID No. |
| PSR 700 OR 800 MHZ 2W CLASS B DC | 7831851-0002 |
| PSR 700 and 800 MHz 2W Class B DC | 7831851-0021 |
| PSR 700 or 800 MHz 0.5W Class B DC | 7831851-0022 |
| PSR 700 AND 800 MHZ 0.5W CLASS B DC | 7831851-0023 |
| PSR 700/800 MHZ 0.5/2W LOCKED CLASS B DC | 7831851-0024 |

Feature Keys:

| Feature Key ID | Feature Description |
|-----------------------|----------------------------|
| 7835720 | 2W, Dual Band |
| 7835721 | 2W, Single Band |
| 7835687 | 0.5W, Dual Band |
| 7835689 | 0.5W, Single Band |
| 785359 | Lock Device |

Note: In order to get new feature keys, contact CommScope Technical Support (see chapter 1.6.1).

8.5. Spare Parts

The following spare parts are available for the PSR 700/800 MHz:

| Material ID | Description |
|--------------------|-----------------------|
| 7841377 | Alarm cable 2m AWG 26 |
| 7841374 | Key for Lock |

The manufacturer reserves the right to replace the parts listed above by equivalent substitutes.

9. List of Changes

| Version | Changes | Release Date |
|----------------|---|---------------------|
| MF0123A1E | | 22-March-2021 |
| MF0123A1F | <ul style="list-style-type: none">- Additional filters and Class B mode information added in chapters 5.6.10 and 5.6.11- Chapter 5.6.12 on Class B mode added- Additional filters added in <i>table 8-1</i>- Restriction for Canada removed in chapter 8.3.1 (editorial) | 15-April-2021 |

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