Everon™ 6000 G2 v1.0

User Manual

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Communications

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Warranties

Hardware Warranty

Corning Optical Communications Wireless, Inc. ("Corning")warrants to the original purchaser ("Customer") that for the duration of the warranty period, one (1) year, commencing on the date of shipment of the Hardware, unless otherwise agreed in writing by Corning (the "Hardware Warranty Period"), the Hardware furnished by Corning shall be free in all material respects from defects in material and workmanship, and shall conform to the applicable portions of the Specifications, as defined below (the "Hardware Warranty"). If notified by Customer of any such defects in material or workmanship or nonconformity with applicable portions of the Specifications within the Hardware Warranty Period, Corning shall promptly, at its own election and expense, repair or replace any such Hardware proven to be defective under the terms of this Hardware Warranty. Such repair or replacement shall be Customer's sole remedy and Corning's sole obligation in the event this Hardware Warranty is invoked. If any components comprising a part of the Hardware are replaced or repaired during the Hardware Warranty Period, the Hardware Warranty Period for such repaired or replaced components shall extend to the longer of (i) the balance of the Hardware Warranty Period or (ii) three (3) months from the date of repair or replacement. For purposes of this Warranty, "Specifications" shall mean the specifications and performance standards of the Products as set forth in documents published by Corning and delivered to Customer which contain technical specifications or performance standards for the Products.

If Customer invokes this Hardware Warranty, it shall notify Corning promptly of the claimed defect. Customer will allow Corning to inspect the Hardware at Customer's location, or to return the Hardware to Corning's closest repair facility. For Hardware returned to Corning's repair facility, Customer shall be responsible for payment of all transportation and freight costs (including insurance) to Corning's repair facility, and Corning shall be responsible for all transportation and freight costs (including insurance) incurred in connection with the shipment of such Hardware to other repair facilities of Corning and/or its return to Customer.

Notwithstanding the foregoing, in no event will Corning be liable for damage to Products resulting from improper

handling during or after shipment, misuse, neglect, improper installation, operation or repair (other than by authorized Corning personnel), alteration, accident, or for any other cause not attributable to defects in materials or workmanship on the part of Corning. Corning shall not reimburse or make any allowance to Customer for any labor charges incurred by Customer for replacement or repair of any goods unless such charges are authorized in advance in writing by Corning.

Software Warranty

Corning warrants to the original purchaser ("Customer") that for the duration of the warranty period, one (1) year, commencing on the date of shipment of the Software, unless otherwise agreed in writing by Corning (the "Software Warranty Period"), the Software shall conform with, and perform the functions set forth in the Specifications, and shall be free from defects in material or workmanship (the "Software Warranty"). In the event the Software is proven to be defective under the terms of this Software Warranty, Corning shall correct such defects or failure and ensure that the Software conforms with, and performs the functions set forth in, the Specifications. Customer will allow Corning to inspect the Software at Customer's location or to return it to Corning's closest repair facility. Notwithstanding the foregoing, Corning shall have no obligation under the Software Warranty if the Software is modified or used with hardware or software not supplied or approved by Corning or if the Software is subject to abuse, improper installation or application, accident, electrical or environmental over-stress, negligence in use, storage, transportation or handling. Third-party software distributed with the Software may carry certain warranties which, to the maximum extent allowed by law, Corning hereby assigns, transfers and otherwise conveys to Customer, provided, however, that Corning itself provides no warranty of any kind, express, implied, statutory or otherwise, for any third-party software provided hereunder.

Corning does not warrant any hardware, software or services not provided by Corning.

This warranty is the only warranty made by corning and is in lieu of all other warranties, express or implied including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Corning shall not be liable for any other damage including, but not limited to, indirect, special or consequential damages arising out of or in connection with furnishing of goods, parts and service hereunder, or the performance, use of, or inability to use the goods, parts and service. Corning sales

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agents or representatives are not authorized to make commitments on warranty returns.

Returns

above warranty, the following procedure shall be followed:

1. Return authorization is to be received from Corning prior to returning any unit. Advise Corning of the model, serial number, and discrepancy. The unit may then be forwarded to Corning, transportation prepaid. Devices returned collect or without authorization may not be accepted.

2. Prior to repair, Corning will advise the customer of our test results and any charges for repairing customer-caused problems or out-of-warranty conditions etc.

3. Repaired products are warranted for the balance of the original warranty period, or at least 90 days from date of shipment.

Limitations of Liabilities

Corning's liability on any claim, of any kind, including

negligence for any loss or damage arising from, connected with, or resulting from the purchase order, contract, quotation, or from the performance or breach thereof, or from the design, manufacture, sale, delivery, installation, inspection, operation or use of any device covered by or furnished under this contact, shall in no case exceed the purchase price of the device which gives rise to the claim.

Except as expressly provided herein, Corning makes no warranty, expressed or implied, with respect to any goods, parts and services provided in connection with this agreement including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Corning shall not be liable for any other damage including, but not limited to, indirect, special or consequential damages arising out of or in connection with furnishing of goods, parts and service hereunder, or the performance, use of, or inability to use the goods, parts and service.

Reporting Defects

The units were inspected before shipment and found to be free of mechanical and electrical defects. Examine the units for any damage that may have been caused in transit. If damage is discovered, file a claim with the freight carrier immediately. Notify Corning as soon as possible in writing.

Note: Keep all packing material until you have completed the inspection.

Warnings and Admonishments

There may be situations, particularly for workplace environments near high-powered RF sources, where recommended limits for safe exposure of human beings to RF energy could be exceeded. In such cases, restrictive measures or actions may be necessary to ensure the safe use of RF energy.

The device has been designed and constructed to prevent, as far as reasonably, practicable danger. Any work activity on or near device involving installation, operation or maintenance must be, as far as reasonably, free from danger.

Where there is a risk of damage to electrical systems involving adverse weather, extreme temperatures, wet, corrosive or dirty conditions, flammable or explosive atmospheres, the system must be suitably installed to prevent danger.

Device provided for the purpose of protecting individuals from electrical risk must be suitable for the purpose and properly maintained and used. This covers a range of activities including lifting, lowering, pushing, pulling, carrying, moving, holding or restraining an object, animal or person from the equipment. It also covers activities that require the use of force or effort, such as pulling a lever, or operating power tools.

Where some of the abovementioned activities are required, the device must be handled with care to avoid being damaged.

Observe standard precautions for handling ESD-sensitive devices. Assume that all solid-state electronic devices are ESD-sensitive. Ensure the use of a grounded wrist strap or equivalent while working with ESD-sensitive devices. Transport, store, and handle ESD-sensitive devices in static-safe environments.

⚠️*WARNINGS!*

According to the device type:

- **For DLRU-678, dHRU-dHPAM-7, dHRU-dHPAM-85:**
- WARNING: THIS IS A 90.219 CLASS B DEVICE. 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 License to operate this device. You MUST register Part 90 Class B signal booster (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

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$100,000 for each continuing violation.

- **For DLRU-G2-17192325, DLRU-G2-25, DLRU-G2-35, dHRU-dHPAM-6, dHRU-dHPAM-17, dHRU-dHPAM-19, dHRU-dHPAM-23, dHRU-dHPAM-25, DMRU-G2-678, DMRU-G2-1719, DMRU-G2-2325, DMRU-G2-25, DMRU-35:**

- 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 License to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.

  For all devices:

  Warning info: Preclude indications that the device supports home/personal use

  Caution：for use of unauthorized antennas, cables, and/or coupling devices not conforming with ERP/EIRP restrictions is not permitted.

  Antenna type and permitted max antenna gain: External Dedicated Antenna with gain 5 dBi or less.

  For dMRU and dHRU:

- For pluggable equipment, the electrical outlet shall be easily accessible.

- The product shall have connection of the device protective earthing conductor to the installation protective earthing conductor (for example, by means of a power cord connected to an electrical outlet with earthing connection).

RF Safety

To comply with FCC RF exposure compliance requirement, adhere to the following warnings:

Warning! Antennas used for this product must be fixed mounted on indoor permanent structures, providing a separation distance of at least 120 and above cm from all persons during normal operation.

Warning! Each individual antenna used for this transmitter must be installed to provide a minimum separation distance of 50 cm or more from all persons and must not be co-located with any other antenna for meeting RF exposure requirements.

Warning! Antenna gain should not exceed 5 dBi.

Warning! The design of the antenna installation needs to be implemented in such a way so as to ensure RF radiation safety levels and non-environmental pollution during operation.

Compliance with RF Safety Requirements:

CAUTION! Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Power Requirements for DC Inputs

Warning! Only use a special DC supply cable with connector

Warning! Always keep DC IN connectors connected during the product operation

Warning! Disconnect all power from the device by means of an external circuit breaker before connecting or disconnecting the DC IN connectors.

RF Parameters

Frequency Range Name	Uplink	Downlink
600-band 71	663-698 MHz	617-652 MHz
700L (Lower Band)- band 12	698-716 MHz	728-746 MHz
700U (Upper Band)-band 13	776-787 MHz	746-757 MHz
FirstNet (700)-band 14	788-798 MHz	758-768 MHz
800/850 -band 26	817-849 MHz	862-894 MHz
1900 (PCS)-band 25	1850-1915 MHz	1930-2020 MHz
EAWS-band 66	1695-1780 MHz	2110-2200 MHz
WCS-band 30	2305-2315 MHz	2350-2360 MHz
2500-band 41	2496-2690 MHz (TDD)	
3500-band 77	3450-3980 MHz (TDD)	

Revision History

Revision	Date	Created by	Reviewed by	Changes
0.1	Sep 2022			First issue

Contents

1. Introduction

Corning Everon^{TM} 6000 G2 is an advanced cellular service solution for small, medium, and large size venues, supporting a broad range of cellular generations, including 3G, 4G and 5G.

Corning Everon^{TM} 6000 G2 is based on venues, advanced digital transport and processing, and channelized implementation, enabling efficient utilization of digital links. It is designed to support multi-band, multi-technology, and multi-operator networks through the single fiber-based infrastructure.

Corning Everon^{TM} 6000 G2 is a high bandwidth distribution architecture that provides preparedness for future radio technologies, broader spectrum, and new frequency bands. Due to its modular design and configuration flexibility, this solution is highly scalable in terms of supported capacity (number of sectors, frequency bands, channels) and remote units (coverage), and can be easily configured to support a large variety of deployment scenarios including single and multi-building ("campus") network topologies.

This solution offers multiple types of digital remote units, supporting a variety of frequency band combinations, with different power levels ranging from 20 dBm per band to 46 dBm per band. Advanced network configuration and management capabilities enable on-site and remote end-to-end configuration, system diagnostics, maintenance, and support network operations center (NOC) connectivity.
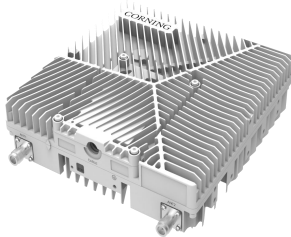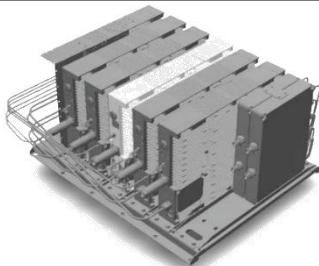
1.1 Key Features and Capabilities

- **Comprehensive service Support** - 600 MHz, 700 MHz, FirstNet, 800/850 MHz, 1900 MHz (PCS), 2100 MHz (EAWS), 2300 MHz (WCS), 2500 MHz (TDD), 3500 MHz (TDD). Supports MIMO services, FDD and TDD. Supports 3G, 4G, and 5G technologies.

- **Multi-X system** - Supports multi-operator, multi-band, multi-technology services through a single infrastructure. Supports single and multi-building ("campus") network solutions.

- **Highly modular/ Highly scalable** - Can be easily expanded to support additional capacity: sectors, frequency bands, channels, and coverage areas, by increasing the number of remotes.

- **Advanced Digital Signal Processing** - Provides higher dynamic range, enables per-channel granularity, delivers enhanced overall power efficiency, and improves overall system performance.

- **Digital CPRI based Transport** - Provides robust signal distribution with flexible scalability.

- **Digital Service and capacity routing** - Enables advanced capacity and coverage management through flexible routing configuration management.

- **Carrier-grade network management** - Network configuration and management capabilities enable on-site and remote end-to-end configuration, system diagnostics, maintenance, support management and control by network management system.

1.2 Terminology, Acronyms, and Abbreviations

Table 1 Abbreviations

Abbreviation	Full Name
RIU	Radio Interface Unit
DCU	Digital Conversion Unit
DEU	Distributed Extension Unit
DLRU	Digital low Power Remote Unit
DMRU	Digital Medium power Remote Unit
DHRU	Digital High-power Remote Unit
NOC	Network Operation Center
SMV	Small Medium Venues
CPRI	Common Public Radio Interface
DSP	Digital Signal Processing
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
EPC	Evolved Packet Core
EUTRA	Evolved Universal Terrestrial Radio Access
EUTRAN	Evolved Universal Terrestrial Radio Access Network
FPGA -	Field Programmable Gate Array
GE / GigE	Gigabit Ethernet
GPS	Global Positioning System
LTE	Long Term Evolution
MNO	Mobile Network Operator
PLMN	Public Land Mobile Network
RF	Radio Frequency
SNMP	Simple Network Management Protocol
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
UE	User Equipment
UL	Uplink
UTRAN	Universal Terrestrial Radio Access Network
UDP	User Datagram Protocol

Table 2 Images

Abbreviation	Image
RIU	
DCU	
DEU	
DLRU	
DMRU	
DHRU	

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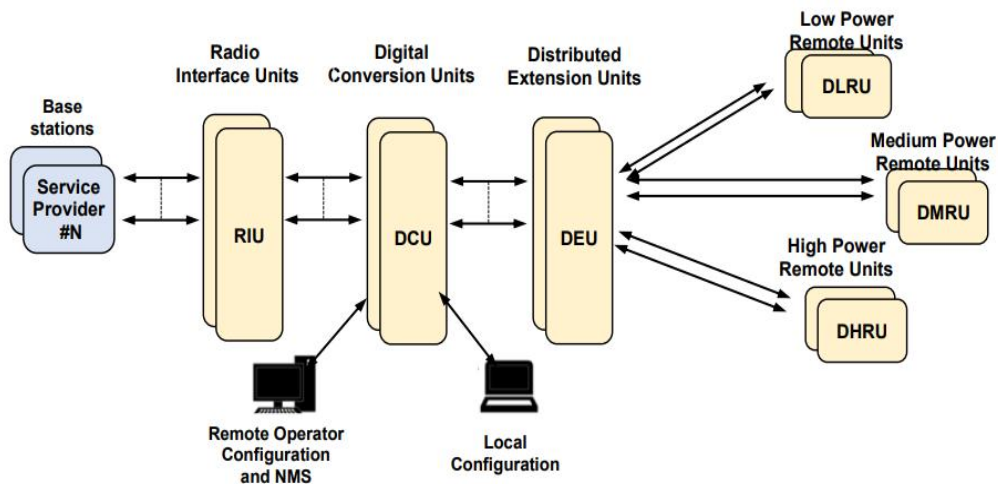## 1.3   Everon™ 6000 G2 Architecture Overview

Figure 1 Architecture diagram

Corning Everon™ 6000 G2 features a fully advanced digital system, which incorporates the RIU (Radio Interface Unit), DCU (Digital Conversion Unit), DEU (Distributed Extension Unit) and multi-type of remotes. All the devices in the system are managed via a web session to the DCU, which provides local and remote management capabilities for all connected system devices using both web GUI (HTTPs) and SNMP interfaces.

1.4   Internal Sub-units

1.4.1 RIU

Figure 2. RIU image

Radio Interface Units (RIU) are modular design used for radio-radio interface between the base stations and the Everon™ 6000 G2. The RIU interfaces up to 8 RF duplexed ports to the base station, and up to 8 simplex ports to the Digital Conversion Unit (DCU) with the following functions:

- Signal combination: the RIU combines different base station signals into one wideband signal, the combination matrix of which is software-controllable, listed as figure 3 to figure 5.

- Downlink/Uplink attenuation: With an embedded fixed attenuator with 30dB in downlink and 40dB in uplink, the RIU bears up to 37dBm average input power (with PARP no more than 10dB).

- Gain control: In addition to the fixed attenuator, the RIU includes an internal digital attenuator controlling the gain between the input and output in the range of 0-25dB.

- Device management: Remote control and monitor of RIU is available on the DCU via the 2xRJ45 connections. In the case of multiple RIU applications, the management can be achieved with a cascading topology, shown in figure 6.

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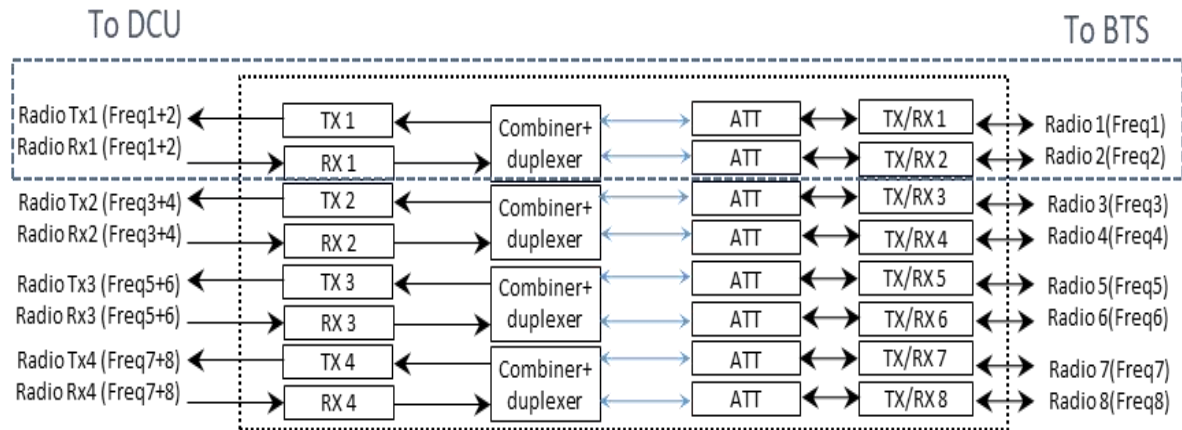Figure 7 and figure 8 shows the RIU interfaces. Table 3 lists the interfaces description.
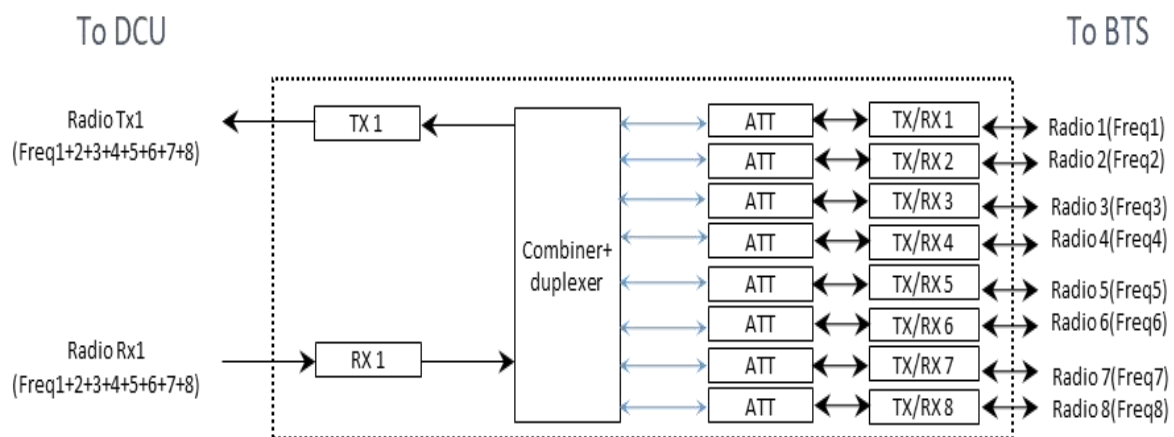

Figure 3. 2 TO 1 matrix
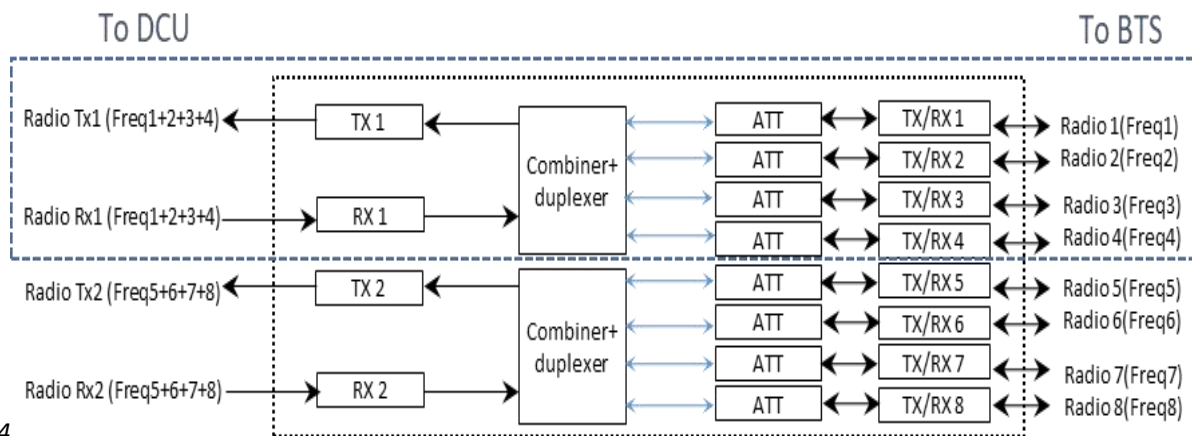
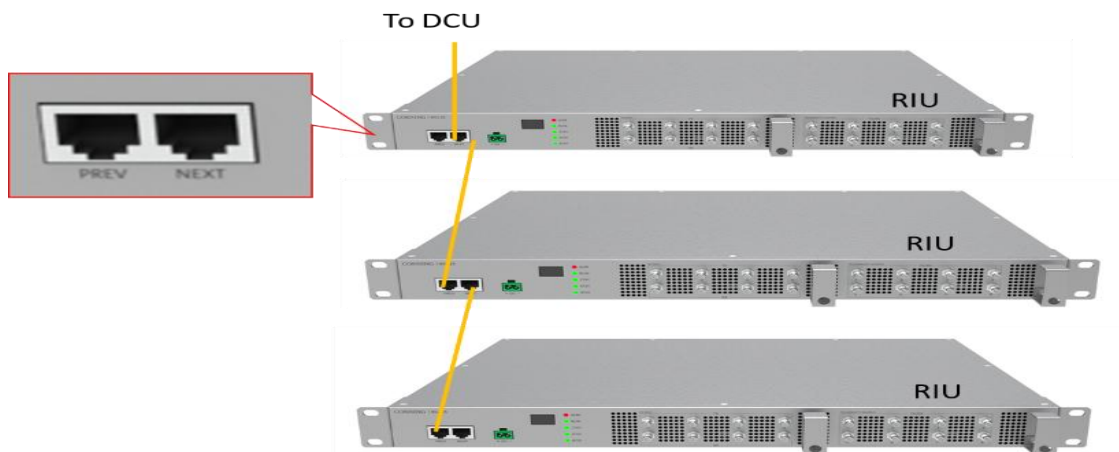*Figure 4. 4 TO 1 matrix*

Figure 5. 8 TO 1 matrix

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Figure 6. RIU monitoring diagram
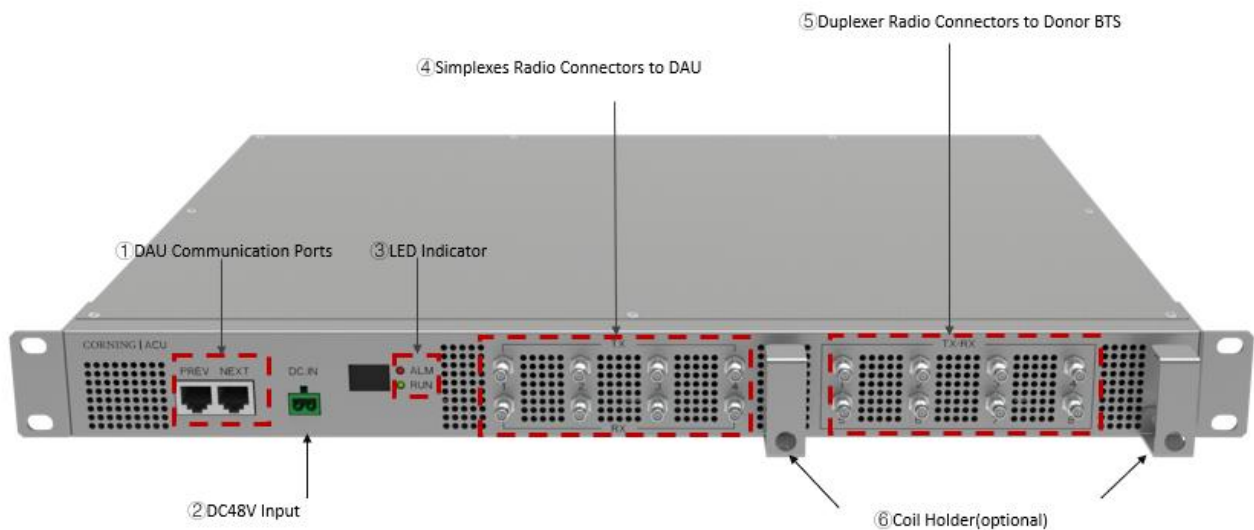
Figure 7. RIU Interface(front view)

Figure 8. RIU Interface (back view)

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Table 3. RIU Interfaces

SN	Interface	Interface Type	Silk Screen	Description
1	DCU communication port	RJ45 x 2	PREV NEXT	PREV: Upper cascade port to DCU or upper level RIU NEXT: Lower cascade port to other RIU
2	DC input	Phoenix connector x 1	DC_IN	48V DC
3	LED indicator	LED x 2	ALM RUN	Please check the "RIU LED Definition" (table 4) for the color definition
4	Radio connectors to DCU	QMA x 8	TX 1~4 RX 1~4	Simplex QMA interface to DCU
5	Radio connector to donor signal	4.3-10 x 8(FDD RIU) QMA x 8(TDD RIU)	TX/RX 1~8	Duplex QMA interface to BTS, small cells or other donor signals
6	Coil holder	Coil holder x 2		The holder for the cable rostering
7	GND	Two holes M4 x 2	GND	Connect to the ground

Table 4. RIU LED Definitions

LED	Description	Color	State
ALM	Alarm	Red	Solid
	Device detection (Identified and controlled by the DCU)	Red	Flash (1Hz, 10s)
	No alarm	OFF	Off
RUN	The system is up and running	Green	Flash(1Hz)
	Software or hardware failure	OFF	Off
2TO1	Working mode: 2 TO 1	Green	Solid
	Other working modes	OFF	Off
4TO1	Working mode: 4 TO 1	Green	Solid
	Other working modes	OFF	Off
8TO1	Working mode: 8 TO 1	Green	Solid
	Other working modes	OFF	Off
LED displayer	Cascade level, displayed as "1" or "2" 1 - First cascade level 2 - Secondary cascade level A maximum of 16 devices can be cascaded	-	-

1.4.2 DCU

Figure 9. DCU

Digital Conversion Units (DCU) is the Everon™ 6000 G2 central controller. The DCU interfaces between the RIU and DEU, implementing signal processing and routing to the Distributed Extension Unit (DEU), major functionalities of which include:

- RF signal processing and routing: The DCU transfers the RIU radio signal to digital signal in CPRI format. One DCU supports up to 8 RIUs of different bands with 2x2 MIMO, and configures all the radio signal features including frequency, attenuation, operation mode (TDD/FDD).

- Optical port router controlling: The DCU controls the digital signals of different DEUs at different CPRI line rates of 10Gbps or 25Gbps.

- TDD synchronization: The DCU introduces a TDD baseband signal processing module, demodulates TDD-LTE or NR RF signals and recovers the TDD switch time in the remote units. For a fast detection and commissioning, parameters in table 5 and table 6 are needed.

- Center management of the complete system: the DCU is the main management entity of the entire system. All the device and operation information are centrally collected by the DCU, and the DCU interfaces to operators' management system through the SNMP interface.

- Flexible networking for different deployment strategies: The DCU supports daisy chain and/or star connections* as shown in figure 10 and figure 11, where distributed deployments can be enabled, e.g., remote slave site deployment.

Figure 12 and figure 13 shows the DCU interfaces. Table 9 lists the interfaces description.

Note: please check the software release note for the DCU daisy chain/star connection limitations and supported version.

Table 5. Uplink-Downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Table 6. Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
	/	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink	/	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_\mathrm{s}$	$2192 \cdot T_\mathrm{s}$	$2560 \cdot T_\mathrm{s}$	$7680 \cdot T_\mathrm{s}$	$2192 \cdot T_\mathrm{s}$	$2560 \cdot T_\mathrm{s}$
1	$19760 \cdot T_\mathrm{s}$			$20480 \cdot T_\mathrm{s}$		
2	$21952 \cdot T_\mathrm{s}$			$23040 \cdot T_\mathrm{s}$		
3	$24144 \cdot T_\mathrm{s}$			$25600 \cdot T_\mathrm{s}$		
4	$26336 \cdot T_\mathrm{s}$			$7680 \cdot T_\mathrm{s}$	$4384 \cdot T_\mathrm{s}$	$5120 \cdot T_\mathrm{s}$
5	$6592 \cdot T_\mathrm{s}$	$4384 \cdot T_\mathrm{s}$	$5120 \cdot T_\mathrm{s}$	$20480 \cdot T_\mathrm{s}$		
6	$19760 \cdot T_\mathrm{s}$			$23040 \cdot T_\mathrm{s}$		
7	$21952 \cdot T_\mathrm{s}$			-	-	-
8	$24144 \cdot T_\mathrm{s}$			-	-	-

Special subframe configuration	Normal cyclic prefix in downlink		
	DwPTS	GP	UpPTS
0	3	10	1
1	9	4	1
2	10	3	1
3	11	2	1
4	12	1	1
5	3	9	2
6	9	3	2
7	10	2	2
8	11	1	2
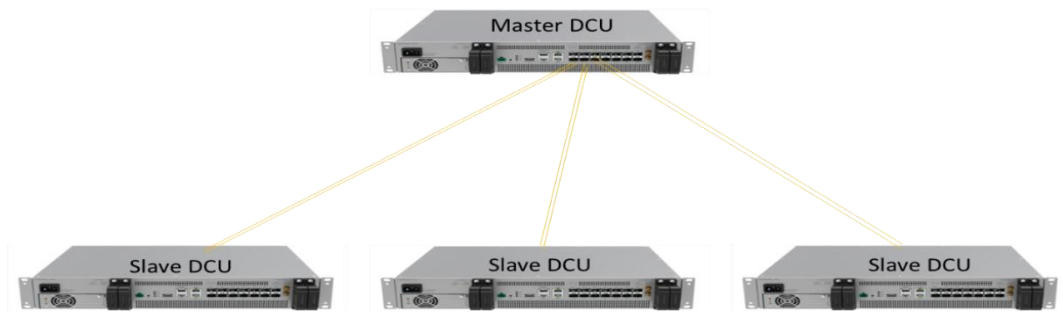
Figure 10. DCU Star Connection

Figure 11.DCU Daisy Connection
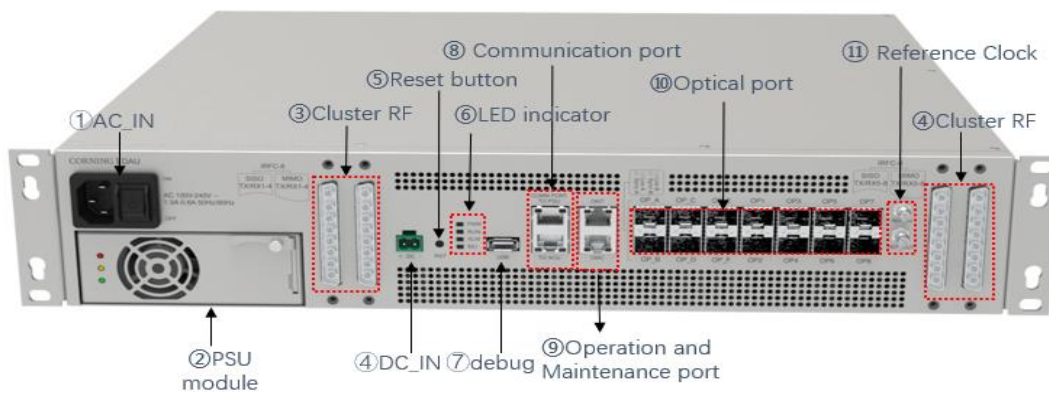
Figure 12. DCU Interface (front view)

Figure 13. DCU interface (back view)

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Table 7. DCU Interface Introduction

SN	Interface	Interface Type	Silk Screen	Description
1	AC_IN	US Type socket	AC IN 100V~240V, 3A, 50/60Hz	AC input connector with switch, 100~240V
2	PSU Module	PSU module x 1		PSU module with replaceable design
3	Cluster RF connector	Cluster RF connector x 4	IRFC1~4 SISO TX/RX 1~4 SISO TX/RX 5~8 MIMO TX/RX 1~4 MIMO TX/RX 5~8	IRFC: Integrated Radio Frequency Cluster There are totally 4 pcs of cluster and each one has 8 radio ports. The operation frequency range of each radio port is listed in table 10
4	DC_IN	Phoenix connector	DC_IN	48V DC input
5	Reset button	Button x 1	RST	Reset button for the system setup to factory config
6	LED indicator	LED x 4	PWR/ALM/RUN/PRI	Please check the 'Appendix B' for LED definition
7	Debug	USB	USB	For internal debug purpose
8	Communication port	RJ4 5 x 2	COMM Port/RIU/PSU	Communication port for RIU and PSU
9	Operation and Maintenance port	RJ45 x 2	OMT OMC	1 for local monitor and config (OMT), 1 for remote monitor (OMC)
10	Optical port	SFP x 14	OP_A~OP_F (LOS A~F / SYNC A~F) OP1~OP8 (LOS 1~8 / SYNC 1~8)	24.3 Gbps CPRI interface, connects to DEU (port 1~8) or cascade DCU (port A~F) Please check the 'Appendix B' for Optical LED definition
11	Reference clock	QMA x 2	REF_IN REF_OUT	10MHz reference signal, input and output clock
12	GND	Two holes M4 x 2	GND	Connect to the ground

Table 8. Radio Spec of Cluster RF port

DCU Input Port	Cluster RF Port number	IBW	Frequency Range
SISO/MIMO TX/RX 1~2	4	300MHz	1710~4000MHz, TDD/FDD
SISO/MIMO TX/RX 3~4	4	300MHz	1710~4000MHz, TDD/FDD
SISO/MIMO TX/RX 5~6	4	200MHz	600~2700MHz, TDD/FDD
SISO/MIMO TX/RX 7~8	4	200MHz	600~2700MHz, TDD/FDD

1.4.3 DEU

Figure 14 DEU diagram

Distributed Extension Units (DEU) is the central Hub and Distribution element. The DEU interfaces between the DCU modules and the remote unit, enabling to receive the operators service signals in CPRI format, and to route these signals to the remote units. The DEU supports all Corning digital remote antenna units' styles, for all services, power levels and antenna configurations. Each DEU includes 4 F/O CPRI ports connected to the DCUs or cascaded DEUs, and 24 F/O CPRI ports for connection to the remote units. When additional remote antenna units are needed, the system can be scaled up easily by adding additional system modules, major functionalities of which include:

● Channelization function: The DEU is the channel controller of Everon™ 6000 G2 system. Tables 5(TDD 2.5GHz + TDD 3.5GHz) and Table 6(Full FDD + TDD 2.5GHz) list the possible channel capacities of the DEU.

● CPRI signal router and transfer: The DEU transfers the dedicated carrier signal to dedicated remote units*. DEU supports 10Gbps or 25Gbps line rate and various kinds of remote units. The line rates and remote units supported are listed in table 11.

● Flexible network architecture: One DCU supports up to 16 DEUs* by star and/or daisy chain connections, which meets flexible site deployment requirement. The DEU connection topology is shown in figure 15.

● The DEU manages all connected remote radios which can be monitored and controlled by the user via SNMP trap.

Figure 16 and figure 17 shows the DEU interfaces. Table 12 lists the interfaces description.

*Note: please check the software release note for the DEU signal router features and its supporting range of remote units

Note: please check the software release note for the DEU cascade features and limitation on each software version

Table 9. Carrier Config Option 1. Full FDD band + TDD 2.5GHz band

Band	Maximum Carrier Number (2T2R)				Maximum Total Carrier Number	Maximum Total BW
	10/20MHz	30/40/50MHz	60/80/100MHz	150/200MHz		
2.5GHz	3	2	2	0	5	190MHz
3.5G-A (3450~3700MHz)	8	3	3	1	8	250MHz
3.5G-B (3700~3980MHz)	8	3	3	1	8	280MHz

Table 10.Carrier Config Option 2. Full FDD band + TDD 2.5GHz band

Type	Band	Maximum Carrier Number (2T2R)			Maximum Total Carrier Number	Maximum Total BW
		5/10MHz	15/20MHz	40/60/80/100MHz		
DMRU –678 DLRU-678	600M	3	1	0	12	35MHz
	700L+700U	4	1	0		40MHz
	850M	3	1	0		32MHz
DMRU –1921 DLRU-19212325	PCS	4	4	0	14 (Each sub-band ≤8)	90MHz
	EAWS	4	4	0		90MHz
DMRU-2325 DLRU-19212325	WCS	1	0	0	6	10MHz
	2500M	0	3	2		190MHz

Table 11. DEU Line Rate Application

DEU Line Rate	Remote Unit Type
10Gbps	DLRU-G2-678/DLRU-G2-17192125/DHRU-G2-600/DHRU-G2-700/DHRU-G2-800/DHRU-G2-1900/DHRU-G2-2100/DHRU-G2-2300
25Gbps	DLRU-G2-25/DLRU-G2-35/DMRU-G2-678/DMRU-G2-1719/ DMRU-G2-2325/DMRU-G2-25/DMRU-G2-35/DHRU-G2-25/DHRU-G2-35

1. DEU supports flexible network architecture of 4 level daisy chain connections as shown in figure 15.
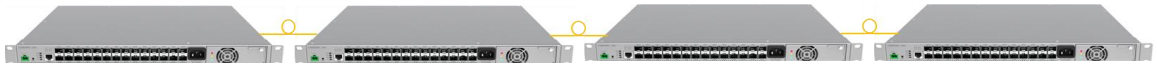
Figure 15. DEU Daisy chain connection

Note: Please check the software release note for the DEU cascading features and limitation of each software version.

Figure 17. DEU interface (front view)
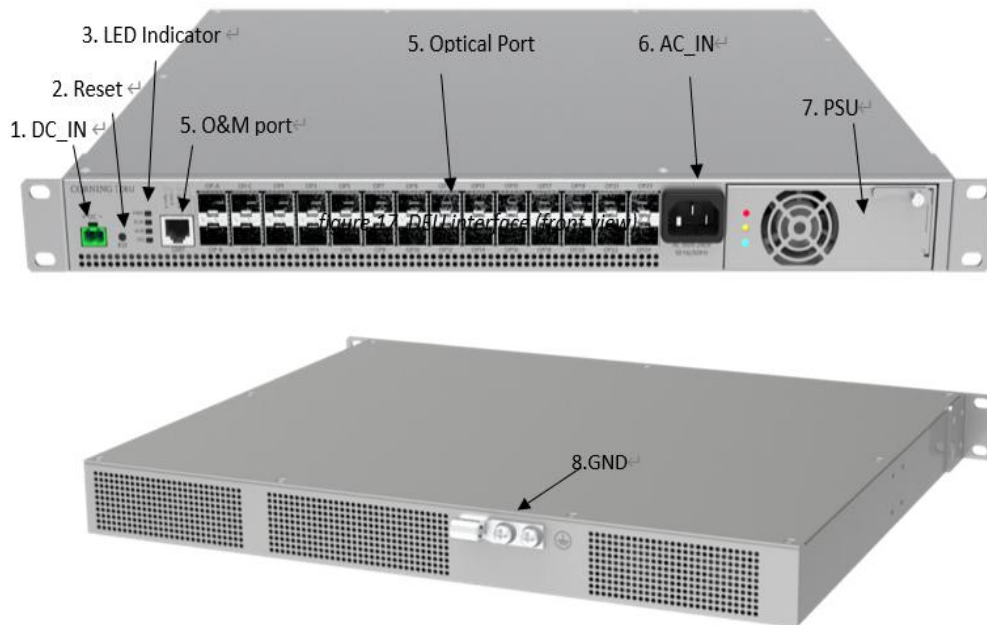
Figure 17．DEU interface (back view)

Table 12. DEU interface introduction

NO.	Interface	Interface Type	Silk Screen	Description
1	DC_IN	Phoenix connector	DC_IN	48V DC input
2	Reset Button	Button x 1	RST	Reset button for the system reset to factory config
3	LED Indicator	LED x 4	PWR RUN ALM 25G	ALM/RUN/PWR: Indicates the DEU working mode and alarm status 25G: Indicates the DEU is running in 24.3Gbps line rate
4	Operation and Maintenance port	RJ45 x 1	OMT	Ethernet connection for a local setup session
5	Optical Port	SFP x 28	OP_A~OP_D OP1~OP24	24 ports (1~24) for RU connection, 10.1Gbps/24.3 Gbps CPRI interface, 2 ports(A~B) for upper unit connection, 2 ports(C~D) for lower unit cascade, 24.3 Gbps CPRI interface,
6	AC_IN	US Type socket + Switch x 1	AC IN 100V~240V, 3A,50/60Hz	AC input connector, Max current 3A, 100~240V
7	PSU Module	PSU module x 1	POWER MODULE	PSU module with easy assembly installation design
8	GND	Two holes M4 x 2	GND	Connect to the ground

1.4.4 Remote Units
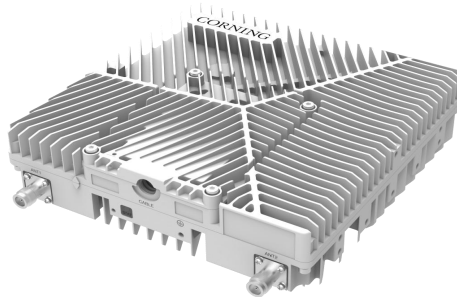
Figure 18. DLRU image

Figure 19. DLRU image
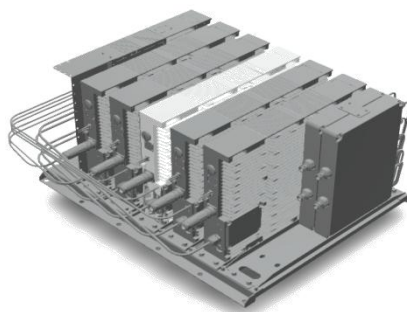
Figure 20. DLRU image

Remote Unit (RU) is the radio coverage unit located at the end of the DAS system. The Remote unit interfaces between DEU and the UE (User Equipment), enabling to receive the operator service signals in CPRI format, transfer to RF signal and send to UE. Corning digital remote antenna units includes three power level types: DLRU/DMRU/DHRU. The power levels vary from 20dBm to 43dBm to meet different coverage scenarios. The major functionalities include:

● Digital and analog signal transfer: the RU transfer digital and analog signal between DEU and antenna port. The DU supports up to 530 IBW signal in C-band with its powerful transceiver

● Multi-band signal process: The RU supports multiple band signal of the single unit. One DLRU supports up to 4 bands, one DMRU supports up to 2 bands and one DHRU supports single band.

● Channel control function: The RU config all emission channels including power level, ON/OFF status and working mode (UL/DL/TDD).

● Control and management function: The RU can be remotely upgraded and monitored. All RU's parameters including the alarm, device status and emission power are all transferred to DEU via CPRI lines in optical ports.

Table 13 shows RU band, CPRI line rate and optical port number.

The DLRU interfaces and the description are shown in figure 21 and table 14.

Table 13. RU Band, CPRI, Optical port list

RU Type	RU	Operation band	CPRI Line Rate	Optical Fiber Number
DLRU	DLRU-G2-678	600 700L 700U FirstNet 800/850MHz	10Gbps	1
	DLRU-G2-19212325	1900(PCS) 2100(EAWS) 2300(WCS) 2500 TDD	10Gbps	2
	DLRU-G2-25	2500 TDD	25Gbps	1
	DLRU-G2-35	3500 TDD	25Gbps	2
DMRU	DMRU-G2-678	600 700L 700U FirstNet 800/850MHz	25Gbps	1
	DMRU-G2-1921	1900(PCS) 2100(EAWS)	25Gbps	1
	DMRU-G2-2325	2300(WCS) 2500 TDD	25Gbps	1
	DMRU-G2-25	2500 TDD	25Gbps	1
	DMRU-G2-35	3500 TDD	25Gbps	2
DHRU	DHRU-G2-06	600	10Gbps	1
	DHRU-G2-07	700L/700U/FirstNet	10Gbps	1
	DHRU-G2-08	800/850MHz	10Gbps	1
	DHRU-G2-19	1900(PCS)	10Gbps	1
	DHRU-G2-21	2100(EAWS)	10Gbps	1
	DHRU-G2-23	2300(WCS)	10Gbps	1
	DHRU-G2-25	2500 TDD	10Gbps	1
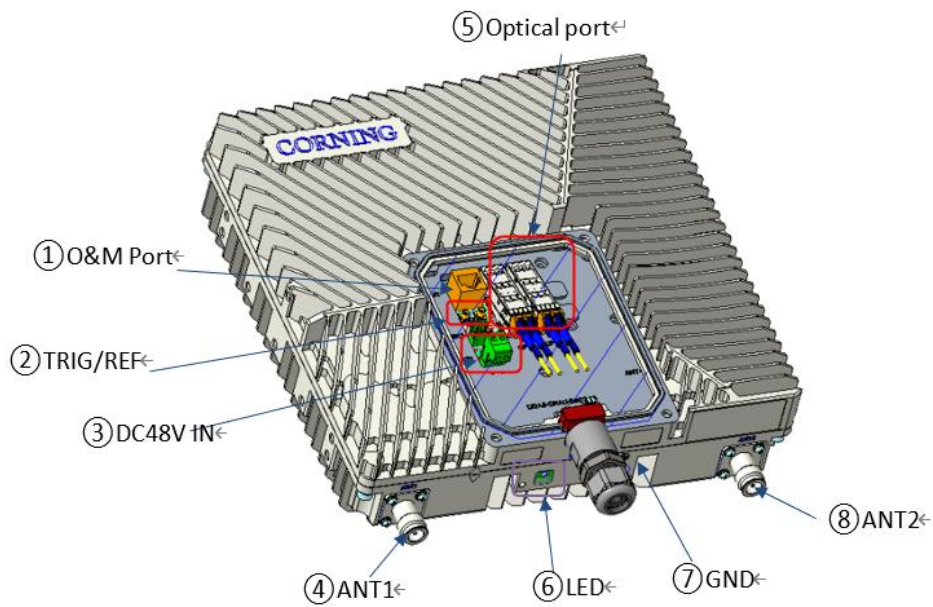
Figure 21. DLRU interface image

Table 14. DLRU interface introduction

NO.	Item	Interface Type	Silk Screen	Description
1	Operation and Maintenance port	RJ45	OMT	Ethernet connection for the local setup
2	TRIG/REF	MCX interface	TRIG/REF	Synchronous trigger signal, used for device test
3	DC48V IN	Power input port	DC48V IN	Power input port, voltage input range 38V~58V, PWR1 and PWR2 will be combined inside the device before supplying power to the device
4/8	ANT	4.3-10 interface	ANT1	RF input and output, used for external antenna connection
			ANT2	
5	Optical Port	SFP optical port	OP1/OP2	24.3/9.8 Gbps CPRI interface for DEU connection
6	Status	LED indicator	STAT	Indicating the operation status of the equipment
7	GND	GND interface		Used for grounding the chassis and the earth, single hole

Figure 22. DMRU Interfaces

Table 15. DMRU Interface Introduction

NO.	Item	Interface Type	Silk Screen	Description
1	ANT	4.3-10 interface	ANT1	RF input and output, used for external antenna connection
			ANT2	
2	Couple port	SMA	Couple 2	RF couple port, used for signal test and debug
3	Optical port	SFP optical port	OP1/OP2	24.3 Gbps CPRI interface for DEU connection
4	Operation and Maintenance port	RJ45	OMT	Ethernet connection for the local setup
5	LED	LED indicator	STAT	The operation status of the equipment
6	AC IN	Power input port	AC IN	Power input port, voltage input range 100V~240V, 3A

1.4.5 System topology and gain assignment

The system topology contains the following network elements:

- One master DCU- All the configs and alarms of RIUs, DCUs, DEUs and remote units are transferred to it, and also interfaces the SNMP server of DAS system.

- Slave DCU - one master DCU connects to 3 slave DCUs

- RIUs – each DCU can connect up to 16 RIUs

- DEU –one master DCU connects up to 4 DEUs, and each DEU connects to 4 DEU in cascade, so that one master DCU supports 16 DEUs

- Remote units – each DEU connects to 12 or 24 remote units, depending on the types and line rates of the remote unit. For more detail, please refer to Table 11.
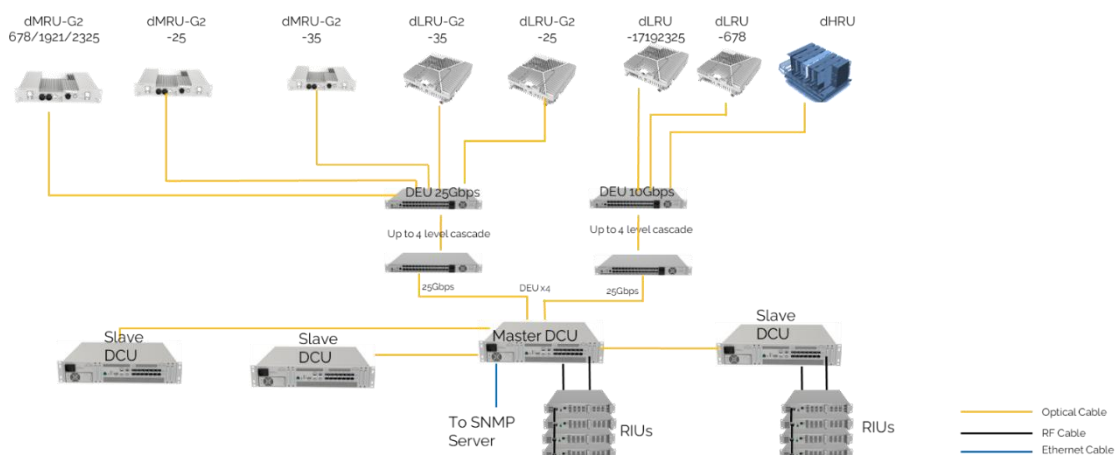
Figure 23. System topology

Two switches for gain control are available in the system– RIU high gain mode switch and DCU high gain mode switch. The suggestions for the switches are listed in the following table.

- The RIU high gain mode will add 30dB insert loss while switching to OFF status
- The DCU high gain mode will add 12dB insert loss while switching to OFF status

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Table 16. Gain setting guide

Base station power	RIU high gain mode switch	DCU high gain mode switch	RIU input power	DCU input power	DCU output power	DLRU output power
	30dB IL while OFF; -7dB IL while ON	12dB gain while OFF	RIU ATT range (0~20dB)	DCU ATT range (0~20dB)	-7dBFS mapping to max output power	
37dBm	OFF -30dB	OFF 0	37dBm (RIU ATT set to 14, total IL=44dB)	-7dBm (DCU ATT set to 0)	-7dBFS	24dBm
23~37dBm	OFF -30dB	OFF 0	23~37dBm (RIU ATT set to 0~14, total IL=30~44dB)	-7dBm (DCU ATT set to 0)	-7dBFS	24dBm
0~23dBm	ON -7dB	OFF 0	0~23dBm (RIU ATT set to 0~20, IL=7~27dB)	-7~-4dBm (DCU ATT set to 0~3 dB)	-7dBFS	24dBm
-10~0dBm	ON -7dB	ON +12dB	-10~0dBm (RIU ATT set to 0~12, IL=7~19dB)	-17~-19dBm (DCU ATT set to 0~2dB, gain=10~12 dB)	-7dBFS	24dBm

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2. System Installation

This chapter provides installation instructions for the system units. Refer to the specific elements required in your deployment:

- Head End (HEU, HIU), see 2.1
- DRU, see 2.5.
- Remote Units Installation:
- LRU, see 2.5
- MRU, see 2.6.

*Note: Refer to chapter 6 for dimensions and specifications.
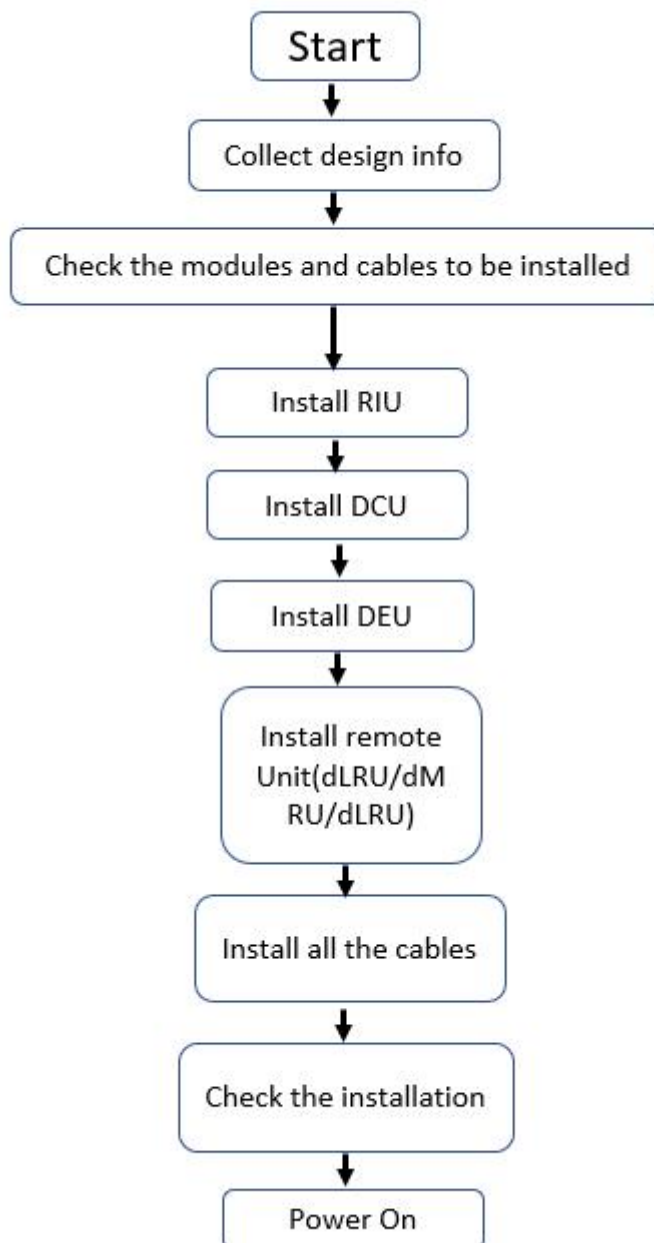
Figure 24 The installation process

2.1 Head End Units – Architecture Example

Example: 2X2 MIMO, 1 Operator
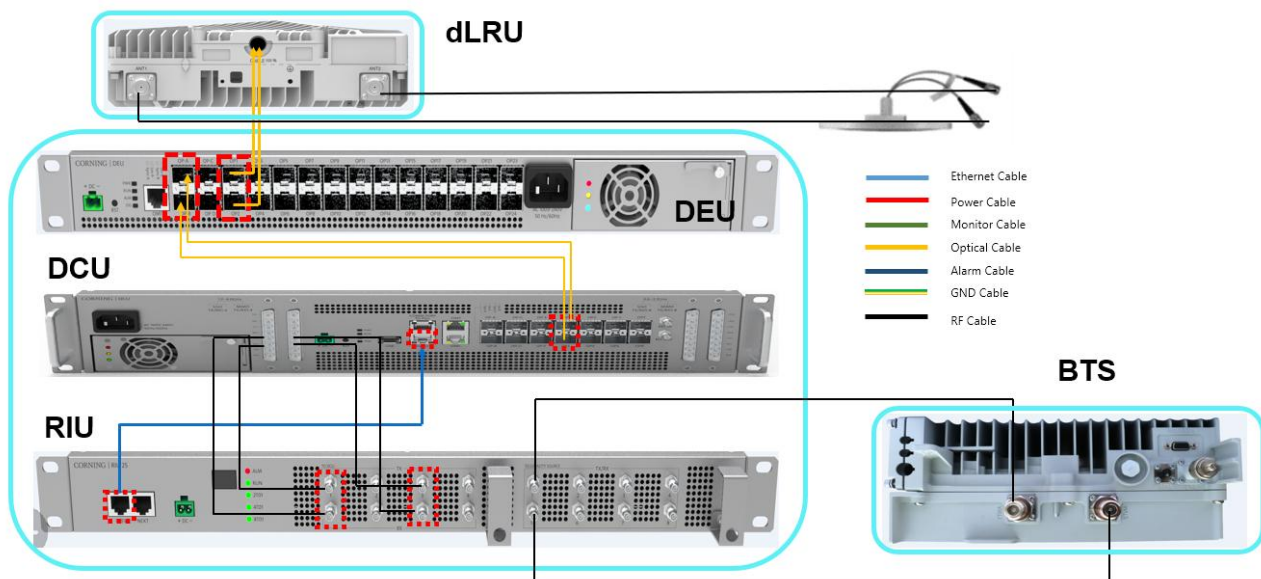
Figure 25 dLRU architecture image

2.2 RIU Installation

➢ **Example of system connection**

See 2.1 example: 2x2 MIMO

Contact the site designer for cable connection topology of the system.

➢ **To install the RIU, follow these steps:**

1. Verify the box contents, see 2.2.1

2. Mount the RIU, see 2.2.2

3. Connection RIU cable, see 2.2.3

2.2.1 Verify Box Contents

Open the package and verify that all items in the table below are available.

Notes:

● *Refer to APPENDIX B: Ordering information for details.*

● *See the example of package unpacking under the table.*

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Table 1: RIU Package Items List

Item	Quantity	Image		Part Number
HARDWARE – provided in the box				
RIU unit	1			
Ethernet Communication Cable	1			Connected to the DCU or RIU of next slave device
DC Power Adapter	1			
HARDWARE – not provided				
4 screws #8 or 4mm (For attachment to rack)	4			
SOFTWARE				
NA				
Required TOOLS				
Cross Screwdriver				

2.2.2 Mount the RIU

Place the RIU horizontally in the 19-inch rack, align the four holes on the lugs on both sides of the equipment with the nuts, install the M6 screws and fasten them.
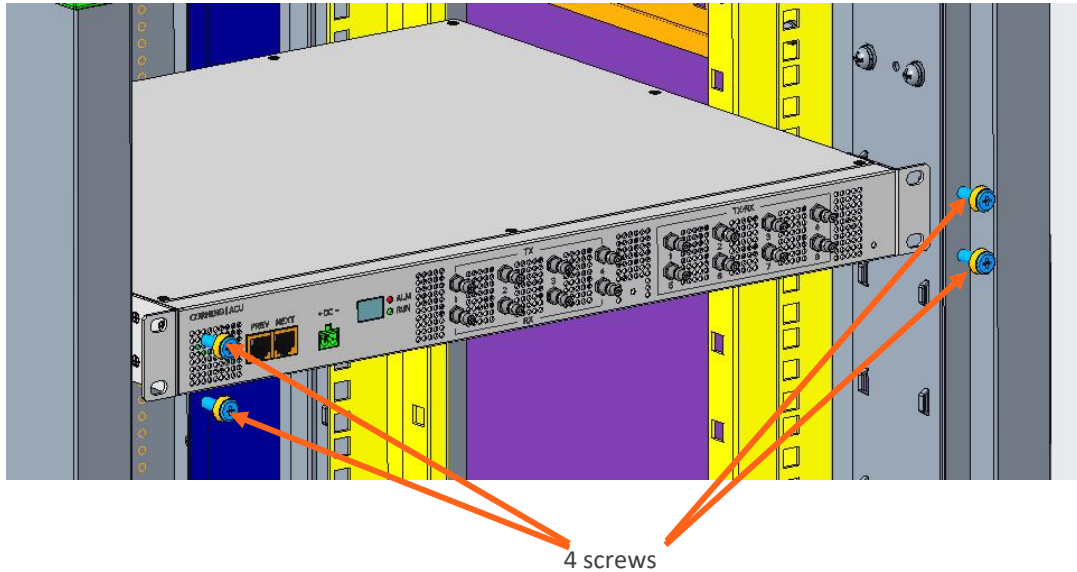
4 screws

Figure 26. RIU rack Installation

1) Connect the RF cables on the chassis with M3 screws, and sort out the RF cables.
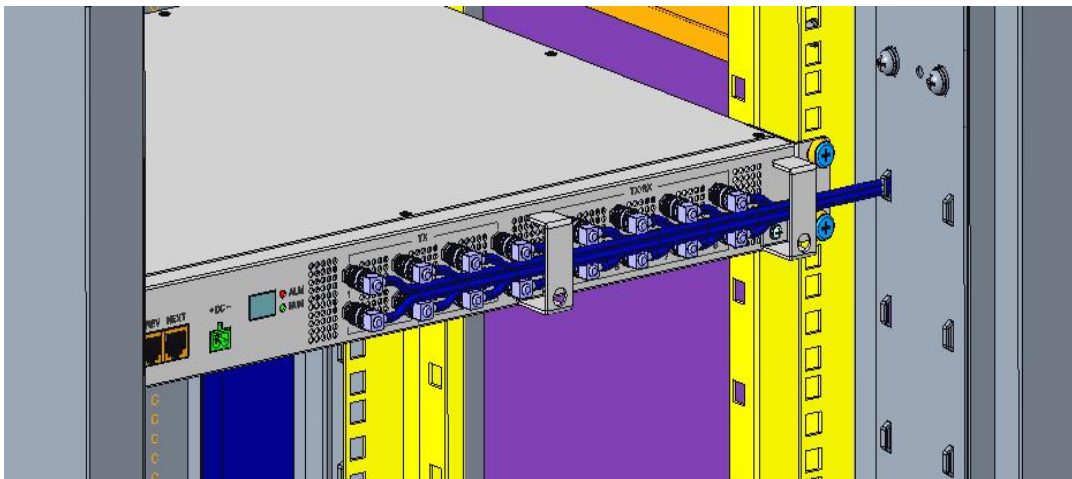
Figure 27 RIU rack Installation with cables

2.2.3 RIU Cable Connection

Connect the external cable as the following diagram shows.
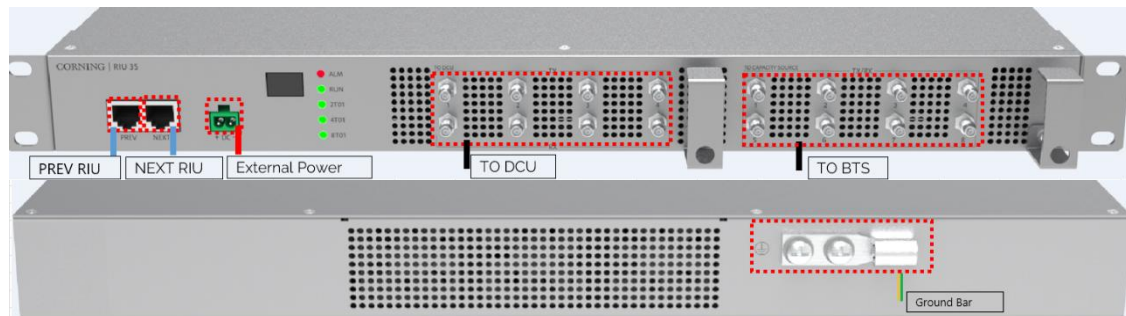
Figure 28 RIU cable connection

Cable list for RIU				
Cable	**One End**		**The Other End**	
	Connector	Connected to...	Connector	Connected to...
GND cable	OT terminal (M4)	Ground screw on the RIU	OT terminal (M4)	Ground terminal on the external ground bar
DC power cable (indoor)	Phoenix connector	DC power input socket on the RIU	2-pin plug	External power input socket
RF cable	QMA connector	Simplex radio connectors	Cluster RF connector	DCU
	QMA connector	Duplexer radio connectors	Required for BTS	BTS
Ethernet communication cable	Communication port (RJ45 x 2)	PREV: Upper cascading port to DCU or upper level RIU NEXT: Lower cascade port to other RIU	Communication port (RJ45 x 2)	RIU/DCU

2.3 DCU Installation

➢ **Example of system connection**

See 2.1 for the installation example (2x2 MIMO).

➢ **Follow these steps to install the DCU:**

1. Verify the box contents, see 2.3.1

2. Mount the DCU, see 2.3.2

3. Connect the DCU cable, see 2.3.3

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2.3.1 Verify Box Contents

Open the package and verify that all the items in the table below are available:

Table: DCU Package Items List

Item	Quantity	Image	Part Number
HARDWARE – provided in the box			
DCU unit	1		
Ethernet Communication Cable	1		
DC Power Adapter	1		
HARDWARE – not provided			
4 Screws #8 or 4mm (For ceiling mounting)	4		
SFP+ Pluggable transceivers (Hot-pluggable optical transceiver module) Support 24.3 Gbps line rate, single mode	1		
Optical cables Up to 10km LC/UPC SM DX	1~14		
SOFTWARE			
NA			
Required Tools			
Cross Screwdriver	1		

2.3.2 Mount the DCU

Step 1: Take the DCU out of the package.

Figure 29 DCU image

Step 2: Put the DCU horizontally into the rack, tighten the M6 screws as shown below, and the installation is completed.
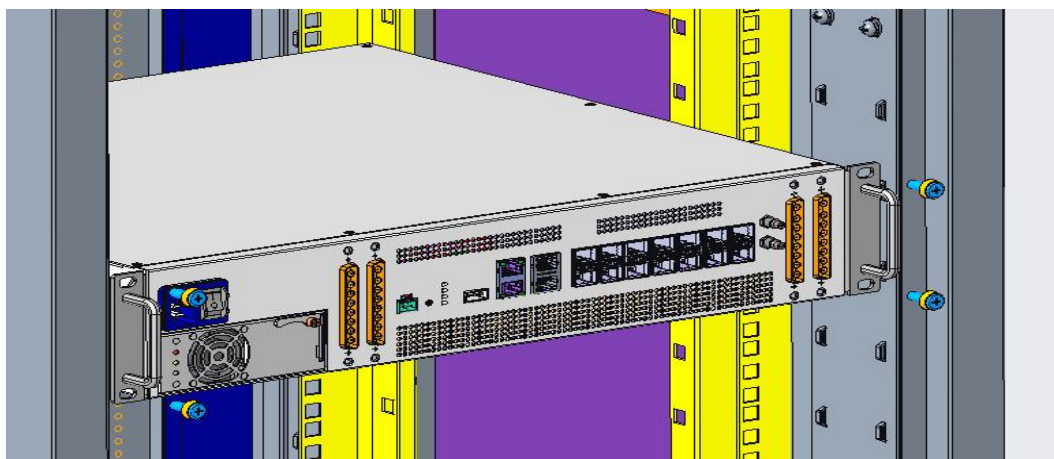
Figure 30 Installation diagram of DCU in the Rack

Step 3: Plug in the RF cable plug (RF cable not shown in the below), as shown in Figure 31.

Figure 31 DCU RF cable plug installation

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2.3.3 DCU Cable Connection
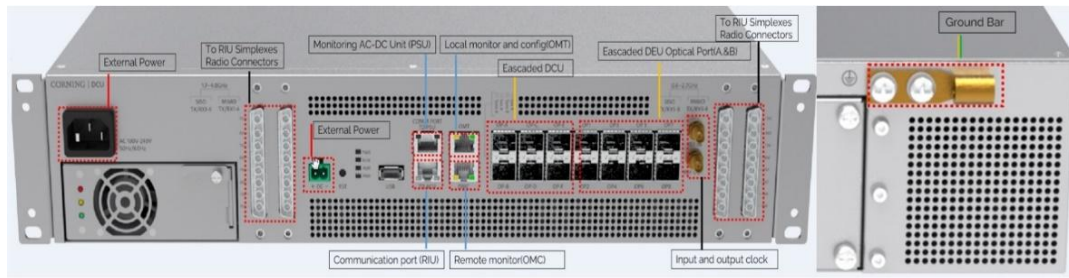
Figure 32 DCU cable connection

Cable List of Dual DCU				
Cable	**One End**		**The Other End**	
	Connector	**Connected to...**	**Connector**	**Connected to...**
GND cable	OT terminal (M4)	Ground screw on the RIU	OT terminal (M4)	Ground terminal on the external grounding bar
DC power cable (indoor)	Phoenix connector	DC power input socket on the RIU	2-pin plug	External power input socket
AC power cable (indoor)	US Type socket + Switch x 1	AC IN	Depending on power device	External power device
		100V~240V, 1.3A-0.6A,50/60Hz	(100V-240V,50Hz/60Hz)	(100V-240V,50Hz/60Hz)
RF Cable	Cluster RF connector	IRFC1~8	QMA Connector	RIU
		SISO TX/RX 1~4		
		SISO TX/RX 5~8		
		MIMO TX/RX 1~4		
		MIMO TX/RX 5~8		

2.4 DEU Installation

➢ **Example of system connection**

See 2.1 for the installation example (2x2 MIMO).

➢ **To install the HEU, follow these steps:**

- Verify the box contents, see 2.4.1
- Mount the DEU, see 2.4,2
- Connect the DEU cable, see 2.4.3

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2.4.1 Verify Box Contents

1. Open the package and verify that all items the table below are available:

Table 1: DEU Package Items List

Item	Quantity	Image	Part Number
HARDWARE – provided in the box			
DEU unit	1		
DC Power Adapter			
HARDWARE – not provided			
4 Screws #8 or 4mm (For ceiling mounting)	4		
SFP+ Pluggable transceivers (Hot-pluggable optical transceiver module) Support for 24.3 Gbps line rate, single mode	1		
Optical cables Up to 10k meters LC/UPC SM DX			
SOFTWARE			
NA			
TOOLS Required			
Cross Screwdriver			

2.4.2 Mount the DEU

1. Take the DEU out of the package.

Figure 32. Rack Installation -Step1

2. Mount the DEU in the rack with 4 pcs of M6 screws.

Figure 33. Rack Installation- Step 2

3. Install the DEU in the rack.

Figure 34 Rack Installation Step- 3

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2.4.3 DEU Cable Connection
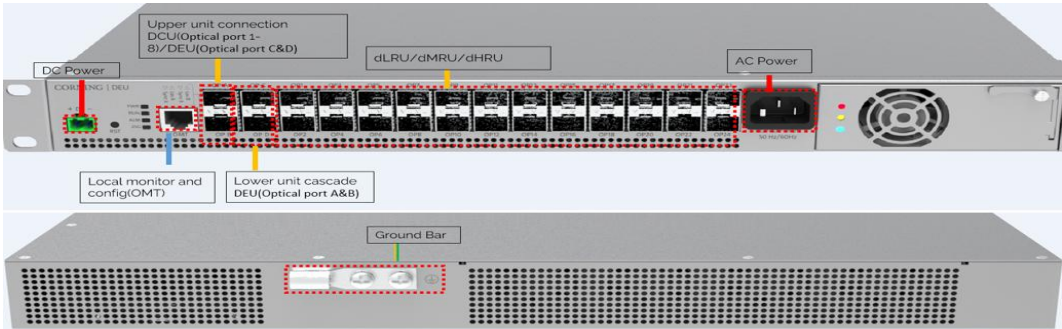
Figure 35 DEU cable connection
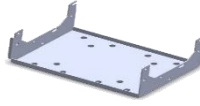
Cable List of Dual DEU				
Cable	**One End**		**The Other End**	
	Connector	Connected to...	Connector	Connected to...
GND cable	OT terminal (M4)	Ground screw on the RIU	OT terminal (M4)	Ground terminal on the external bar
AC power cable (indoor)	US Type socket + Switch x 1	AC IN	Depending on power device	AC Power device
		100V~240V, 1.3A-0.6A,50/60Hz	(100V-240V,50Hz/60Hz)	(100V-240V,50Hz/60Hz)
Fiber Cable	Optical port	Optical module	Optical port	dLRU/dMRU/dHRU or DEU
				DCU or DEU

2.5   dLRU Installation

2.5.1 Verify box Contents

1.   Open the package and verify that all items in the following table are available:

Table 17: dLRU Package Items List

NO.	Description	Model	Image	Quantity
1		dLRU unit		1
2		Wall mounting bracket (may also be used for pole)		1
3		Left side brackets for dual-unit configuration		1
4	dLRU-2.5/3.5 Unit	Right side brackets for dual-unit configuration		1
5		Hinge		1
6		Combiner – for dual unit configuration		1
7		RF jumper cables		1
8		DC power adapter		1

2.5.2 Mount the dLRU

The LRU may be mounted on a wall or on a pole: single or dual.

Select the configuration related to your deployment.

Note: For dual unit installations, the internal cable must be connected before connected between the units.

1. Open the cover by unscrewing 4 screws

Unscrew and open the cover
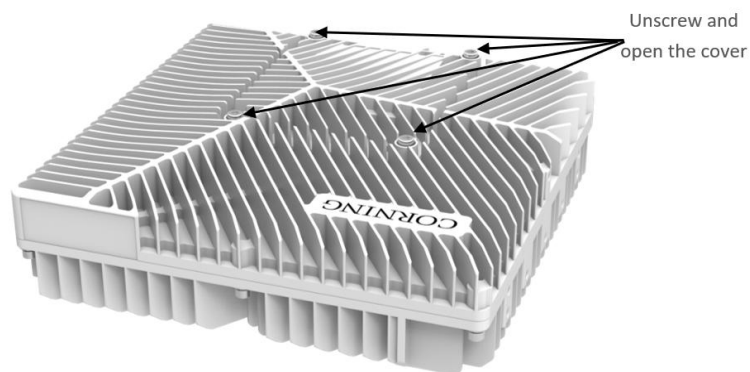
2. Connect the DC wire pair (48V) to any one of the two power connectors, via the DC power adapter (terminal block connector)

3. Remove the rubber stopper from the SFP+ connector located in the dLRU cable port. Connect the SFP+ LC/UPC SM DX optic cable to the dLRU optic connector.
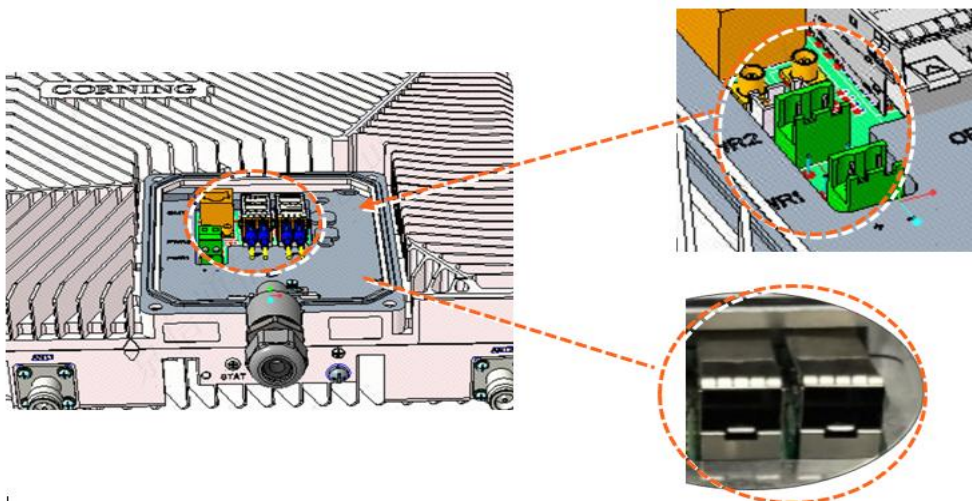
Power Socket /optical ports in dLRU

2.5.2.1   Wall Installation

● **For a single unit**

1) Connect the bracket to the wall with 4 screws, as shown in the figure below:
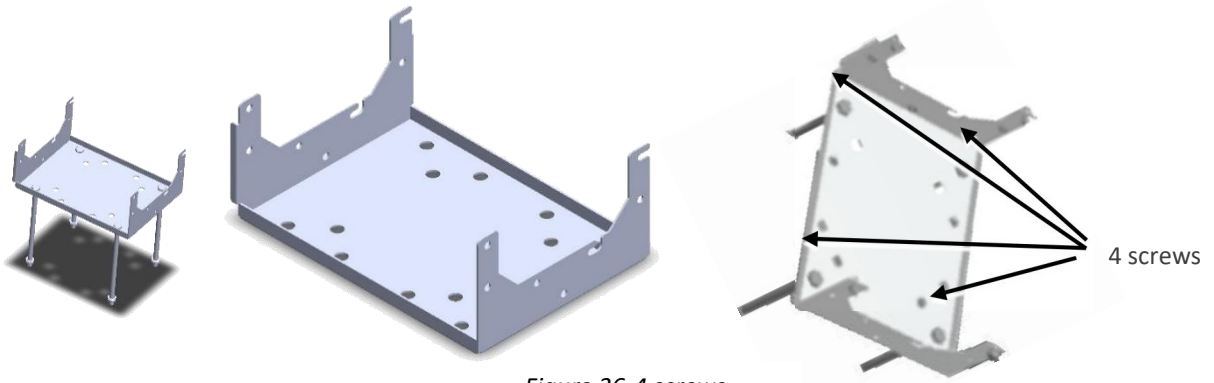
4 screws

Figure 36-4 screws

2) mount the LRU on the bracket with 4 screws.

4 screws

Figure 37-4 screws

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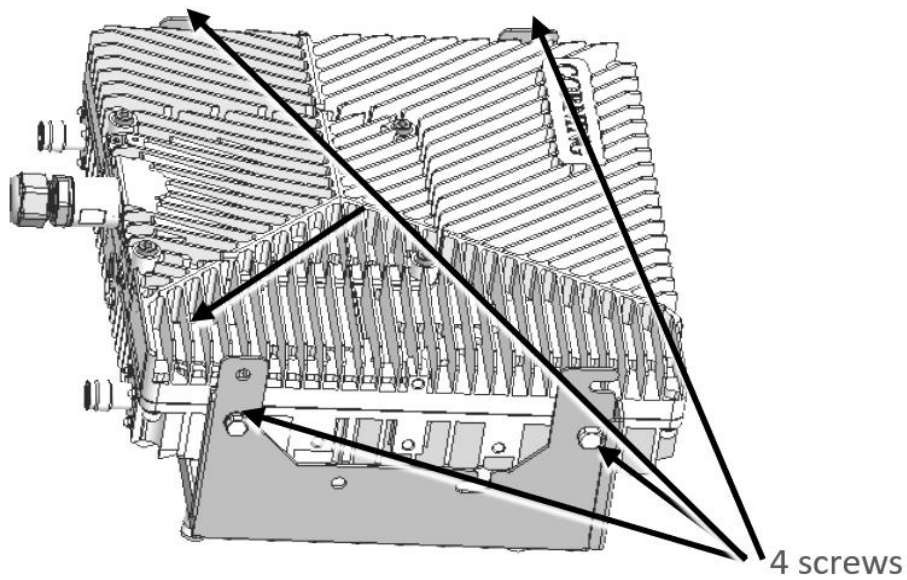
- **For a dual unit:**

1) Connect the combiner to the mounting bracket with 4 screws.

Combiner in bracket
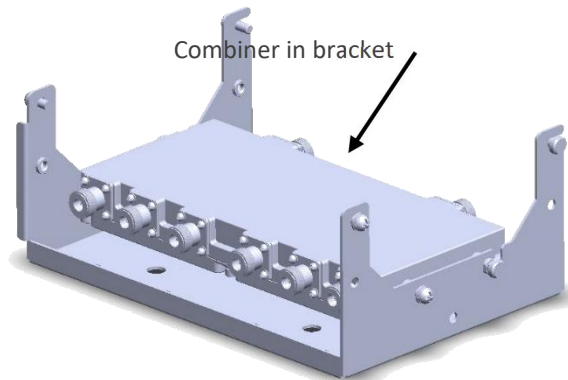
Figure 38 Combiner in the bracket

2) Connect between the low band and mid-band units with the side bracket:
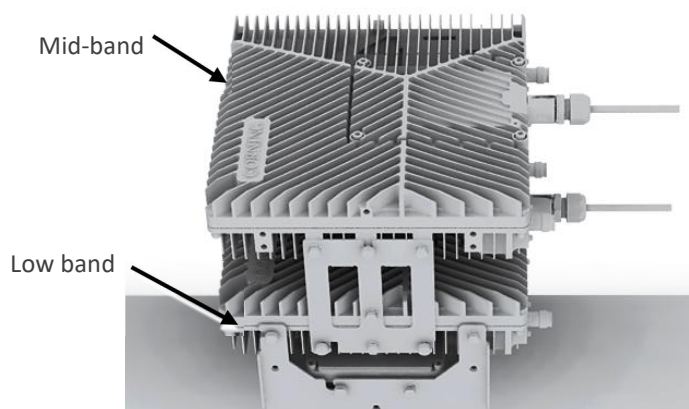
Mid-band

Low band

Figure 39 Combiner in the bracket

Note: Ensure that the low band device is connected at the bottom, and the mid-band at the top.

Connect between the two devices and the bracket (already carrying the combiner) with 4 screws.

2.5.2.2   Ceiling Installation

- **Single unit ceiling installation**

Note: The ceiling needs to be cement board or hard wood board which enables to bear the weight of 18 pounds.

The installation is shown in Figure 41:

1) Drill holes on the ceiling at a distance of 200mm*160mm according to the size of the mounting holes of bracket, then drive the expansion bolts into the holes, install the mounting bracket, pad gaskets, and lock the nuts.
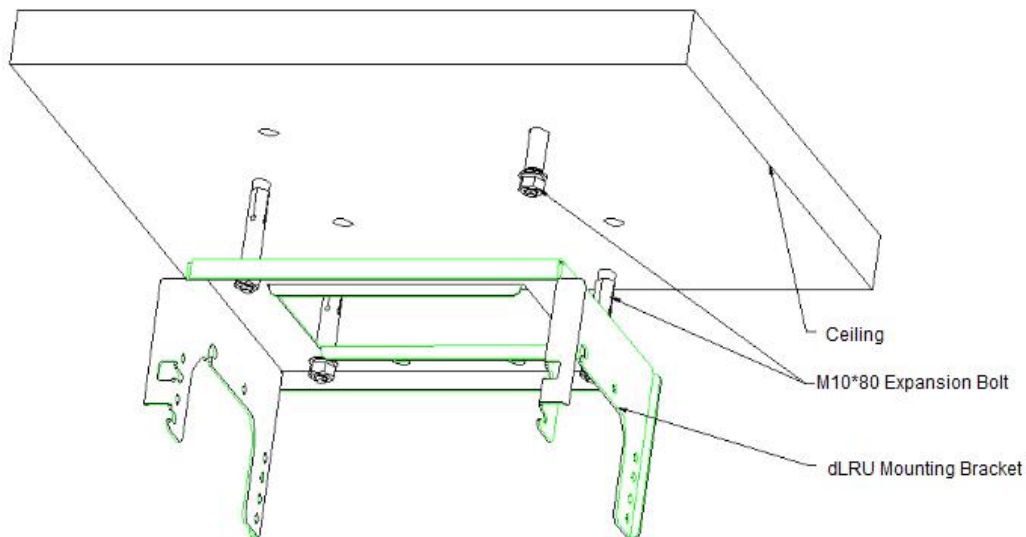
2) Tighten the M6 bracket screws on the left and right sides of the upper part of the dLRU, and then hang the device on the mounting bracket.

3) Lock the device on the mounting frame with M6 combination screws, as shown below
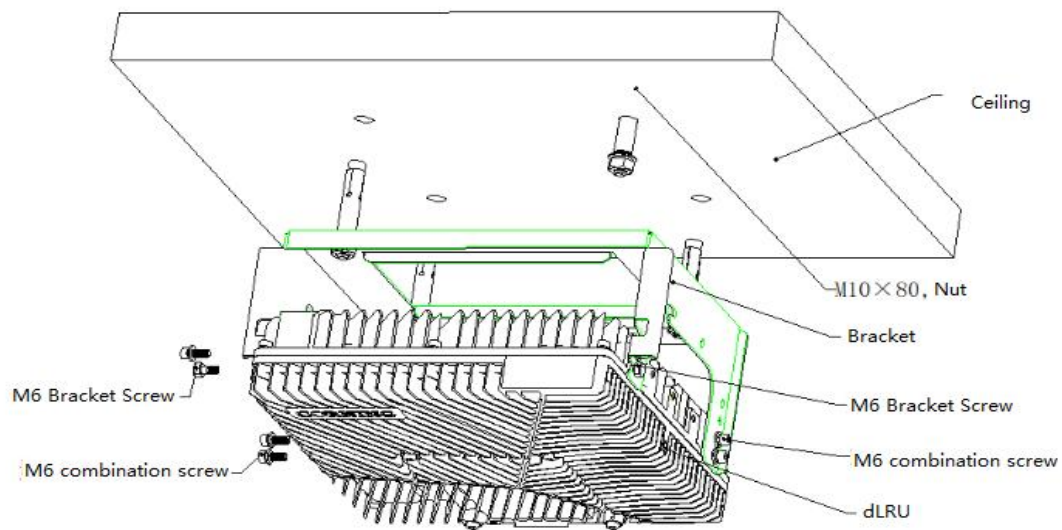
Figure 41 Single unit ceiling installation

● **Dual unit combined ceiling installation**

If the application scenario requires the use of low frequency and intermediate frequency devices, it is suggested to use the cascading installation.

Note: The ceiling needs to be cement board or hard wood board which enables to bear the weight of 45 pounds.

The installation steps are as follows:

1) Assembly of right bracket and hinge

The installation of the right bracket and hinge is shown in Figure 42.
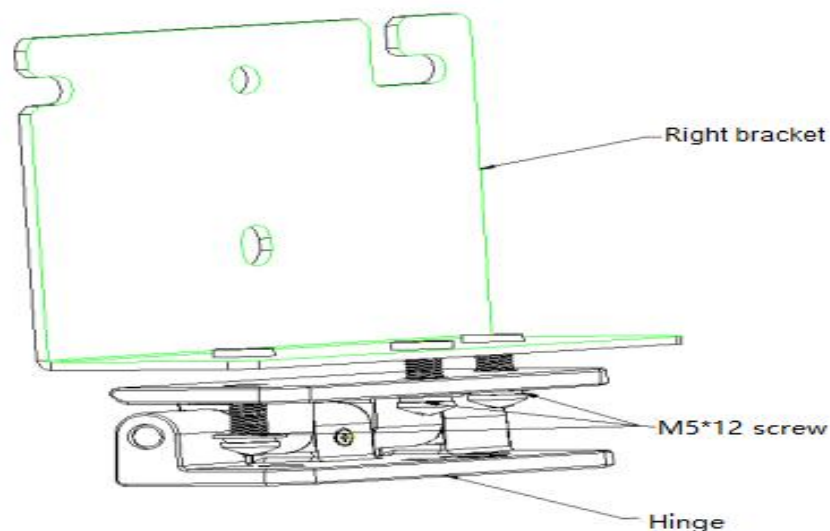
Figure 42 Right bracket and hinge installation

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2) Assembly of left bracket, right bracket and equipment, as shown in Figure 43.
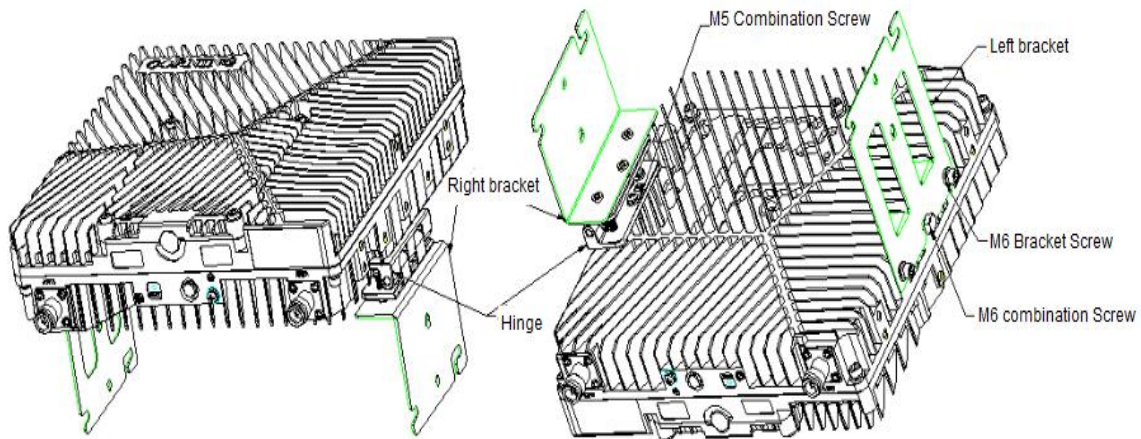
Figure 43 Installation of the left and right brackets and device bracket

3) Bracket installation:

Drill holes on the ceiling at a distance of 200mm*160mm according to the size of the mounting holes of bracket, then drive the expansion bolts into the holes, install the mounting bracket, pad gaskets, and lock nuts, as shown in Figure 44.

Figure 44 Mounting bracket installation diagram

4) Combiner Installation:

Tighten the M6 bracket screws in advance in the left and right screw holes on the upper side of the combiner (the upper side with two RF outlets). Then hang it in the mounting bracket as shown in Figure 45, and fasten it with M6×15 pentagonal combination screws.

Note: If the device is installed outdoors, please connect the RF jumper cable before installing the combiner, and take waterproof measures for the connector in advance. Otherwise, it is inconvenient to take waterproof measures for the connector after the device is installed.

Corning Restricted - Controlled content (R2)
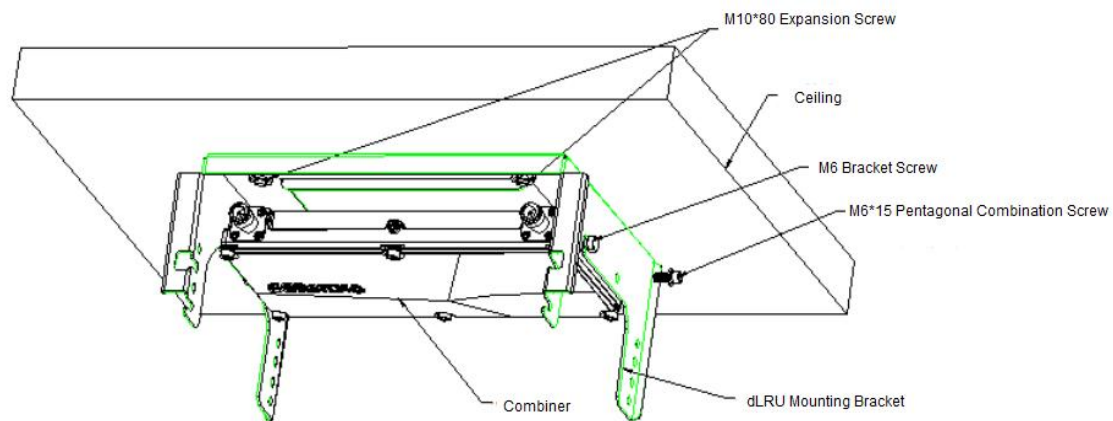
Figure 45 Combiner installation diagram

- **Low Band dLRU installation**

Tighten the M6 bracket screws on the left and right sides of the upper part of the dLRU, and then hang the device on the mounting bracket. as shown in the figure below.
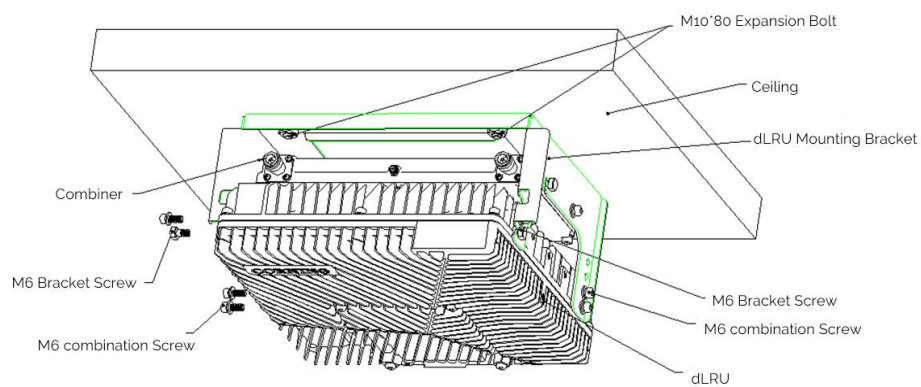
Figure 46 Low band dLRU installation

- **Hang the combination**

Hang the combination of the left and right brackets with four M6 bracket screws, and then use M6×15 pentagonal combination screws to fastened the second dLRU as shown in the figure below.
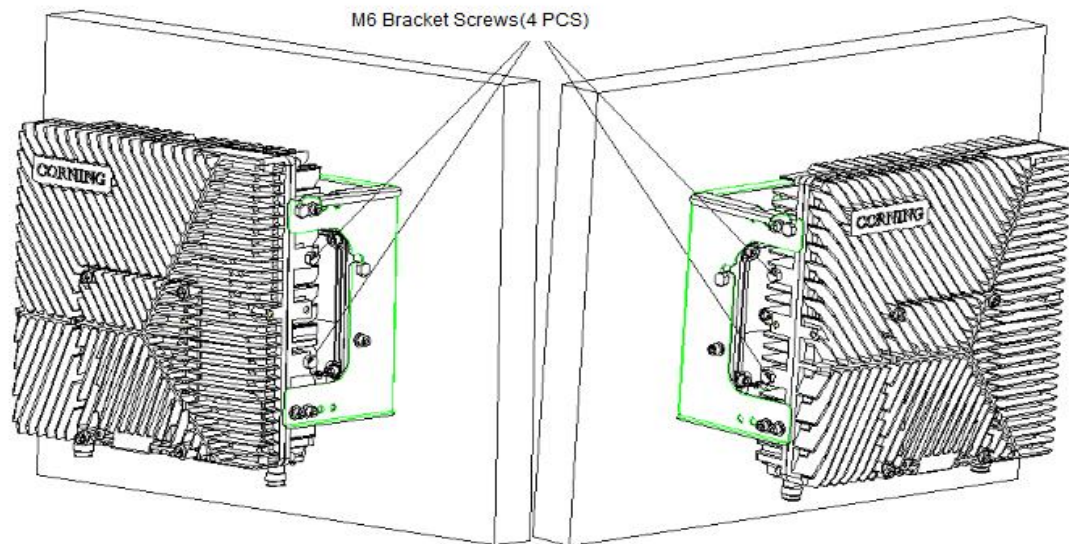
CORNING

Figure 47 M6 bracket screw holes
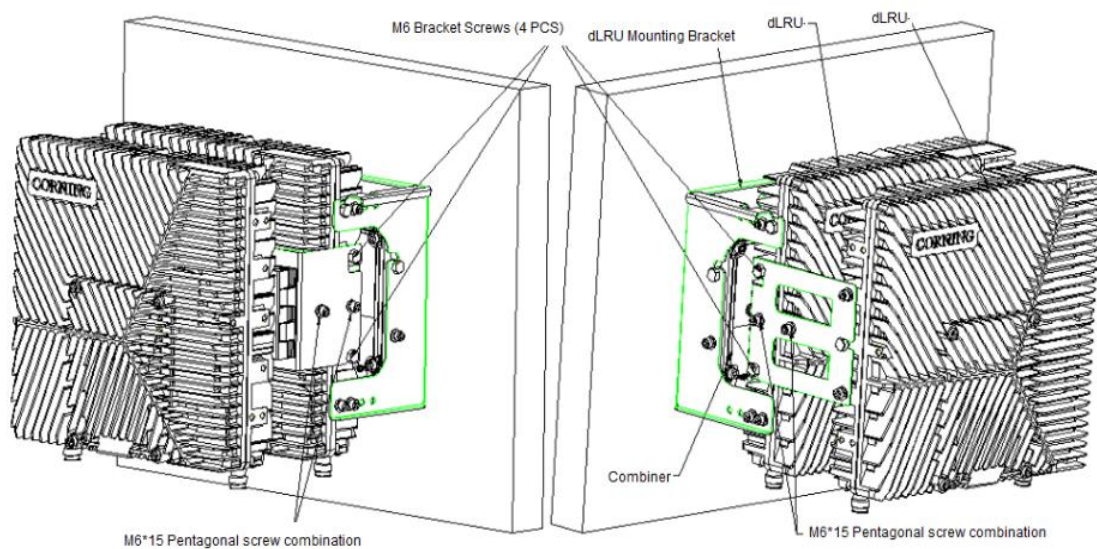
Figure 48 dLRU installation diagram

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2.5.2.3 Pole Installation

➢ Single unit pole installation

The pole mounting installation of all device is the same as the wall mounting installation above, except that the equipment is installed on a pole. As shown in Figure 49, M10 bolts, M10 nuts, elastic flat washers, and pole mounting brackets are required. They can be installed on poles from φ65mm to φ140mm depending on the length of the M10 bolts selected (the recommended length is 12cm and 20cm).
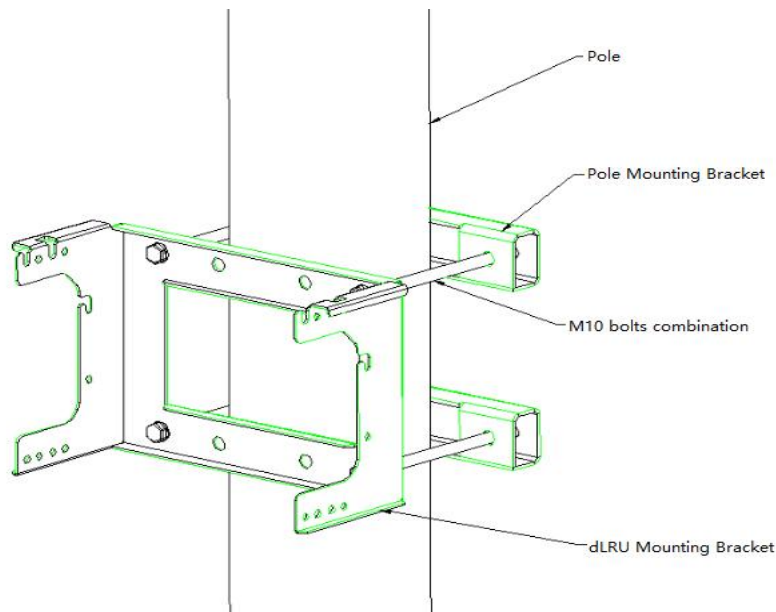
Figure 49 Pole mounting diagram

Tighten the M6 mounting screws on the left and right sides of the upper part of the device, then hang the device on the corresponding positions of the dLRU mounting bracket, and finally tighten the M6 combination screws as shown in Figure 51.
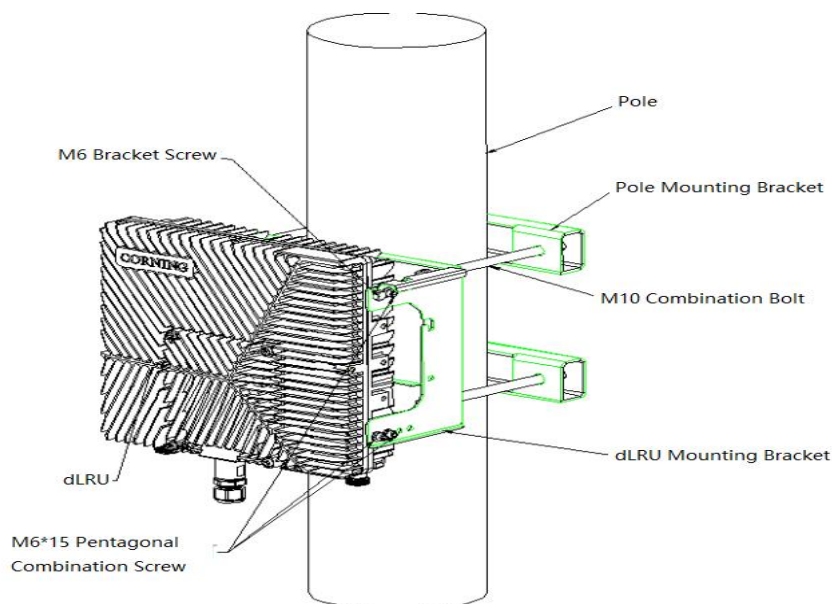
Figure 50 Diagram of pole installation for single unit

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➢ Dual unit pole installation

Before installing the bottom device, please install the combiner first. Put the M6 bracket screws on the left and right sides of the combiner, and then hang the combiner on the mounting bracket. Finally, tighten the M6×15 pentagonal combination screws, as shown in the figure below.
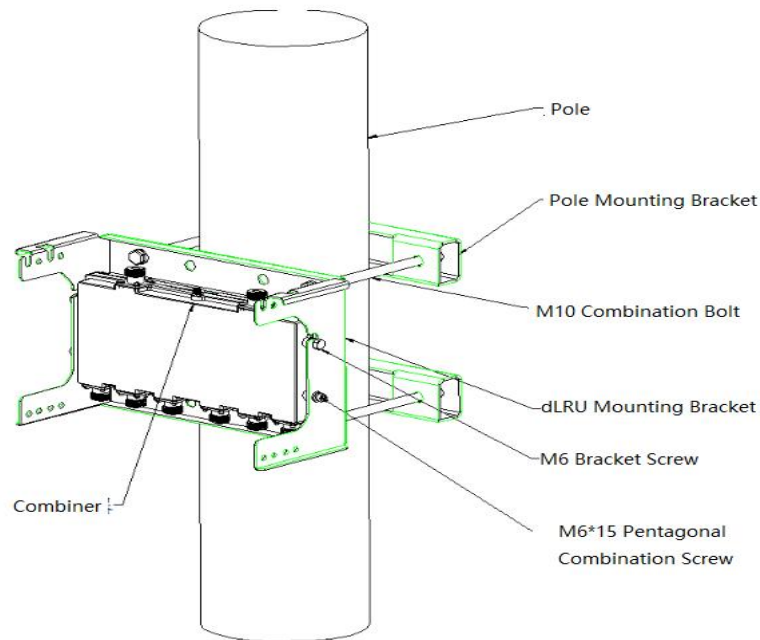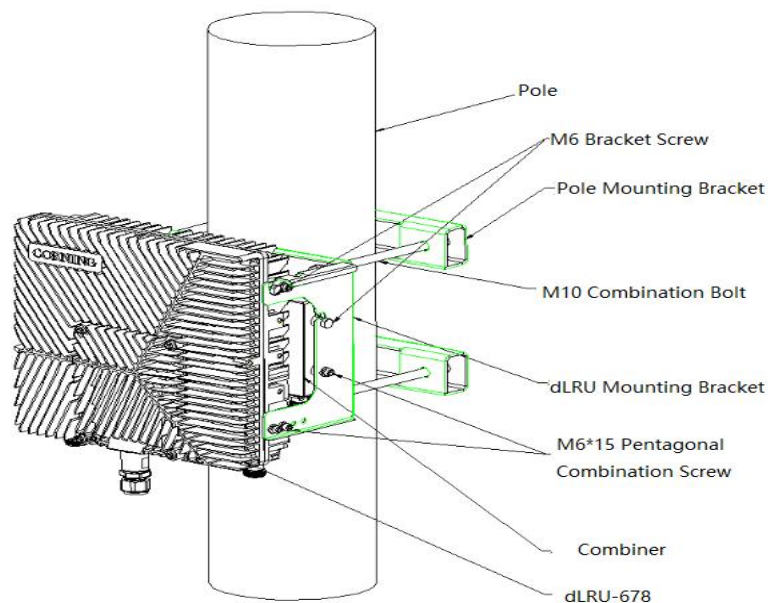

Figure 51 Installation diagram of the combiner

Figure 52 Installation diagram of dLRU pole
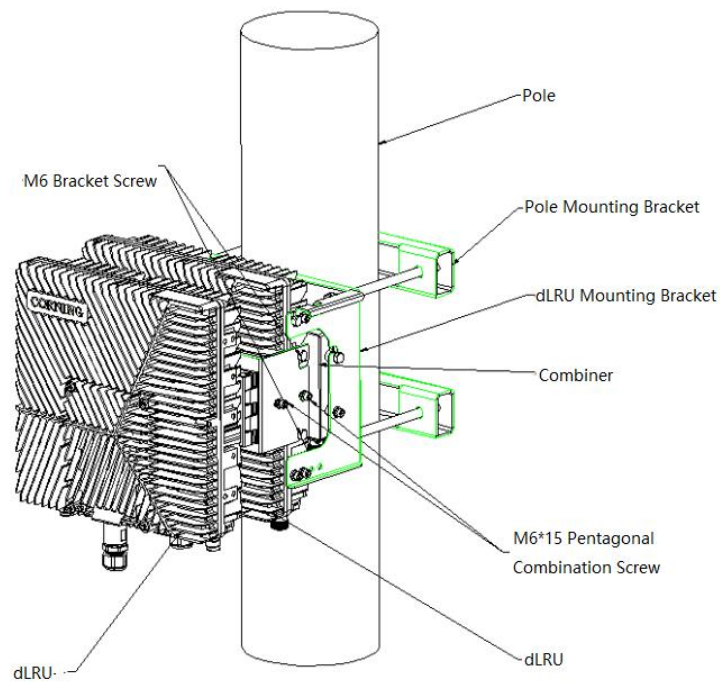
Corning Restricted - Controlled content (R2)

Figure 53 Dual unit installation diagram

2.5.3 Power+ SPF+ Cable

For each unit, open the cover by removing 4 screws:
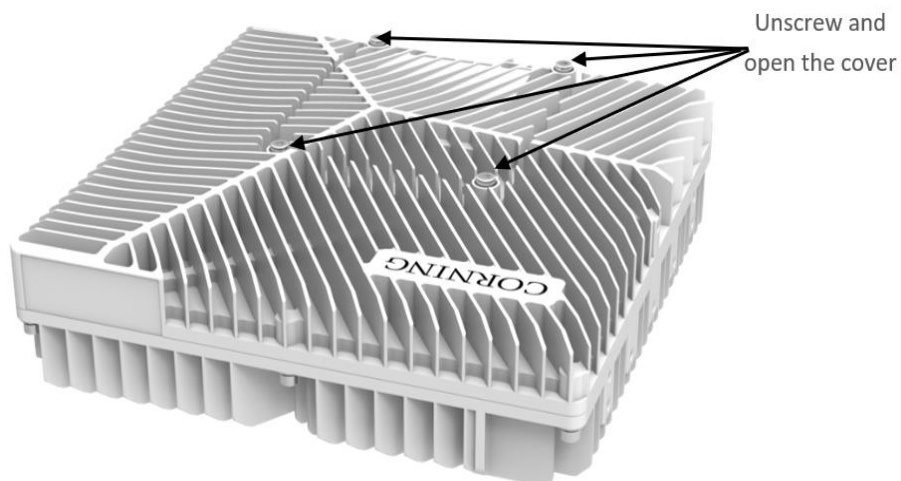
Figure 54 Connection of two units and a combiner

For each unit, connect the internal (under-cover) cables as follows:

- Power socket, see Figure 55.
- SFP+, see Figure 56.

The voltage range of the device power supply is DC36V～57V.

Remove the rubber plug from the SFP+ connector located in the LRU RF port.

Connect the SFP+ LC/UPC SM DX optical cable to the LRU optical connector.

Corning Restricted - Controlled content (R2)

Figure 55 Power socket

SFP+ Pluggable
Transceivers

SFP+ Cable
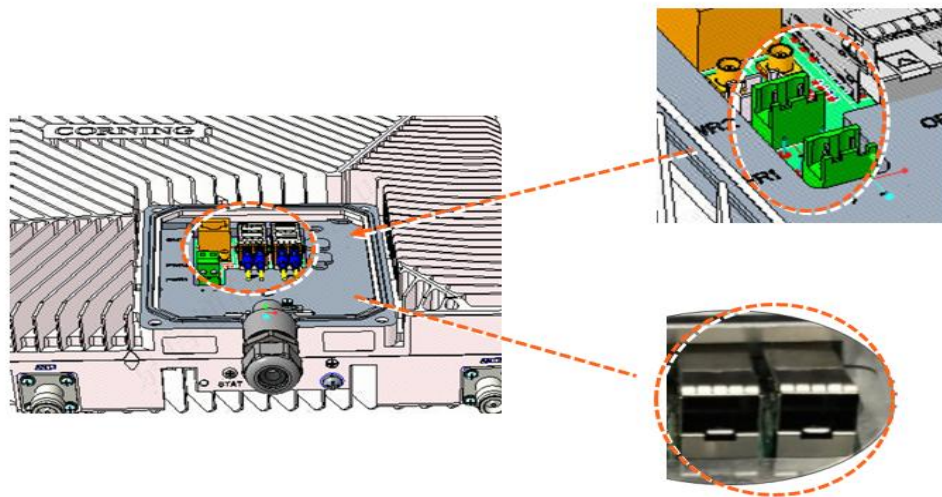
*Figure 56 Remove rubber plug from the port and insert the SFP+ Pluggable
Transceivers (hot-pluggable optical transceiver module) into it.*

2.5.4 Connect the Ground and Antenna Cables

2.5.4.1   Ground

Note: Ground according to local regulations.

The following additional (not supplied) tools and components are required for connecting the system ground:

- The size of ground shall meet the local and national installation requirements. The provided ground lug supports 14 AWG to 10 AWG stranded copper (or 12 AWG to 10 AWG solid) wire conductors.
- Use a wire-stripping tool to remove approximately 0.4 inch (10.9 mm) of the covering from the end of the ground.
- Insert the stripped end of the ground into the open end of the ground lug.
- Crimp the ground in the barrel of the ground lug. Verify that the ground is securely attached to the ground lug by holding and gently pulling on it.
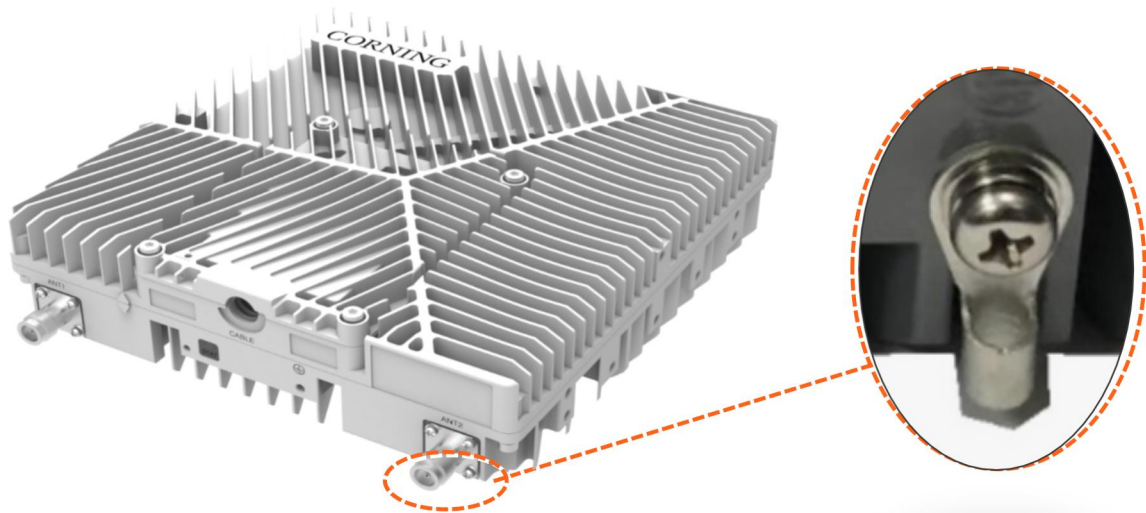- Prepare the other end of the ground and connect it to an appropriate ground point.

Figure 57 The ground

2.5.4.2 Antenna

Connect the MRU male 4.3-10 Type duplexed RF ANT port to the broadband antenna(s) with proper cables.
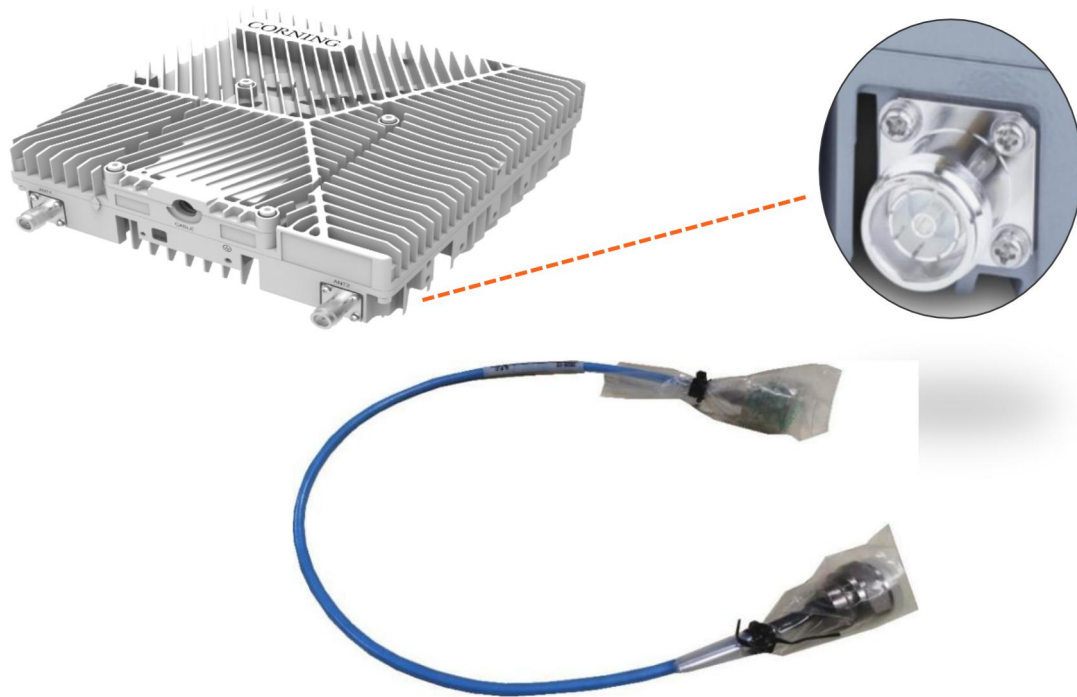

Figure 58 Antenna

Notes:

- *To avoid MIMO disruption, ensure that the antennas are connected correctly according to the combiner labels.*

- *There may be some configurations/use-cases which are not required for the combiner, as there is only one type of unit (either low or mid band).*

2.5.5 Combiner cables
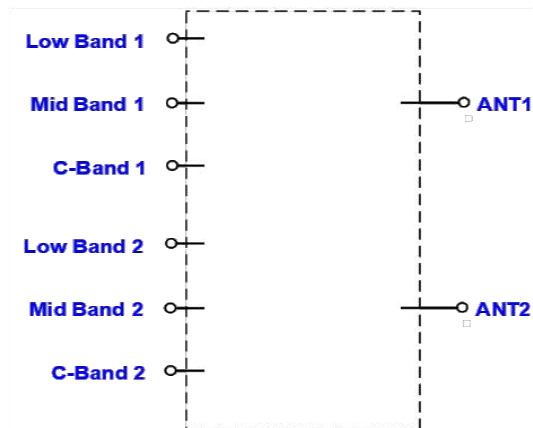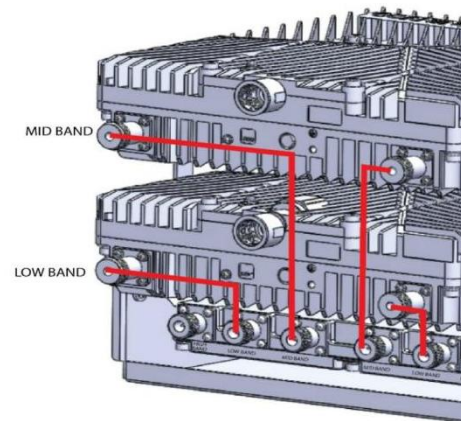
Connect the Antenna cables as the figure shows below.
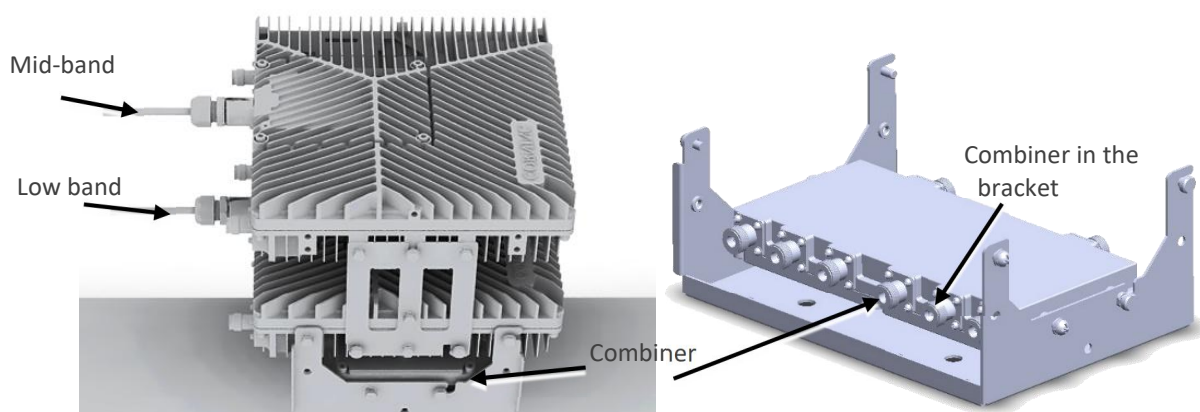
Figure 59 Combiner in the bracket

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Figure   *60 The entire system connection*

*Notes:

- *To avoid MIMO disruption, ensure that the antennas are connected correctly according to the combiner labels.*

- *There may be some configurations/use-cases which are not required for the combiner as there is only one type of the unit (either low or mid band).*

2.5.6 Verify normal operation

The LED indicator is located on the side panel of the dLRU, as shown in the figure below.

Figure 61 *LED Indicator*

The indicator status description is shown in table below.

Table 4-1 dLRU Low Power Remote unit LED Indicator

LED Indicator	Status	Description
STAT	Green	Power on or chip configuration process
	Green flashes (1time /second)	Normal operation
	Green flashes (2time /second)	Identify
	Red flashes (1time /second)	Over temperature alarm
	Red	Hardware alarm

Corning Restricted - Controlled content (R2)

3. GUI – General Description

This section provides general guidelines and tools for navigating the system GUI:

- Screen layout, see 3.1
- Main menu options, see 3.2.
- Default network settings, see 3.3.
- Supported access options, see 3.3

3.1 Screen Layout

The information board (located at the top of the window) lists the device information.

The Navigation board (located on the left down of the window) lists the device and their functions.

The Control board (located on the right down of the window) lists the control functions.

Figure 62 RIU screen layout

3.2 Function Options

The function options on the Web-GUI are listed in the following table.

Function	Description
Device info	View the system topology and info about different system elements
Reset	Software reset for the selected device
Firmware	Upgrade or downgrade the firmware
Alarm Setting	Set the alarm including alarm enable/disable, alarm threshold
Import & Export	Import or export the config file
Log	Import or export the log file
Comm. Setting	Communication setting on the SNMP parameters
IP Setting	IP setting for the device
Site Report	Site information inventory

3.3 Supported Access Options

This section describes the HW and SW required for connecting to the HCM.

First, connecting to the HCM should be done with a laptop or a tablet.

The following browsers are supported:

- Microsoft Internet Explorer 11.0 and above
- Mozilla Firefox 42.0, 43.0 and above
- Google Chrome 45.0, 46.0 and above

After the initial configurations are done, it is recommended to establish remote access to the HCM by using the following:

LAN Ethernet connection to the HCM with a minimum connectivity and throughput capability of 256 Kbps

4. Session Access and first-time settings

When all the system elements are installed, the system administrator can login the system GUI and perform initial configurations.

It is recommended to start using Corning ® Everon ™ 6000 and the specific steps are as follows:

- **Open a local session to the DCU**, see chapter 4.1.
- **Configure the LAN IP settings** (remote management) to enable remote access, see chapter 4.2.
- **Perform the initial configurations (commissioning)** using the system GUI, see chapter 5.

4.1 Open a Local Session

The following are the instructions for opening a local management session to perform basic system configurations via the system GUI.

➢ **To Open the system GUI**

1) Connect a computer (e.g., laptop) to the DCU OMT port via an RJ45 Cat 5 Ethernet cable as follows:

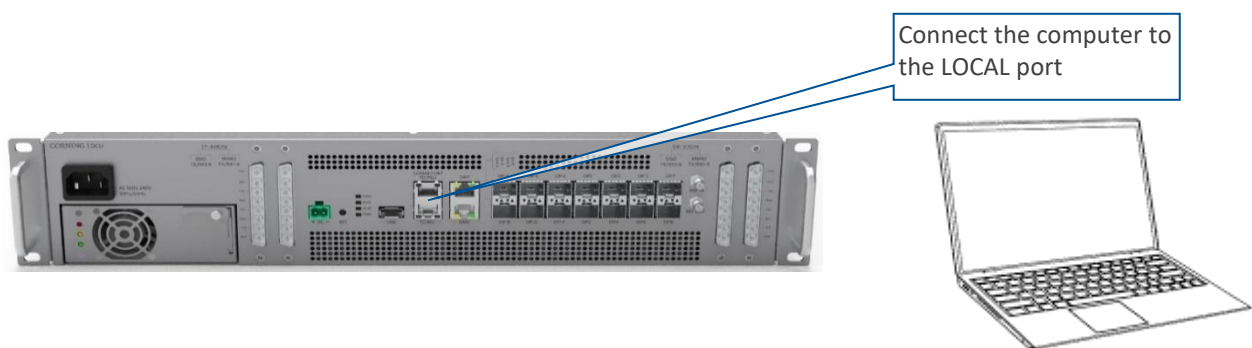Connect the computer to the LOCAL port

Figure 63 GUI connection

Notes:

- *The LOCAL port is set to a static IP Address by default: 192.168.8.101; Subnet Mask: 255.255.0.0. Your laptop/tablet network parameters must be set to match the subnet of the default IP address.*
- *The laptop/tablet IP address must be different from the LOCAL port IP address.*

2) Set up your laptop/tablet network parameters by following the steps below (the steps may vary slightly depending on the OS version used):
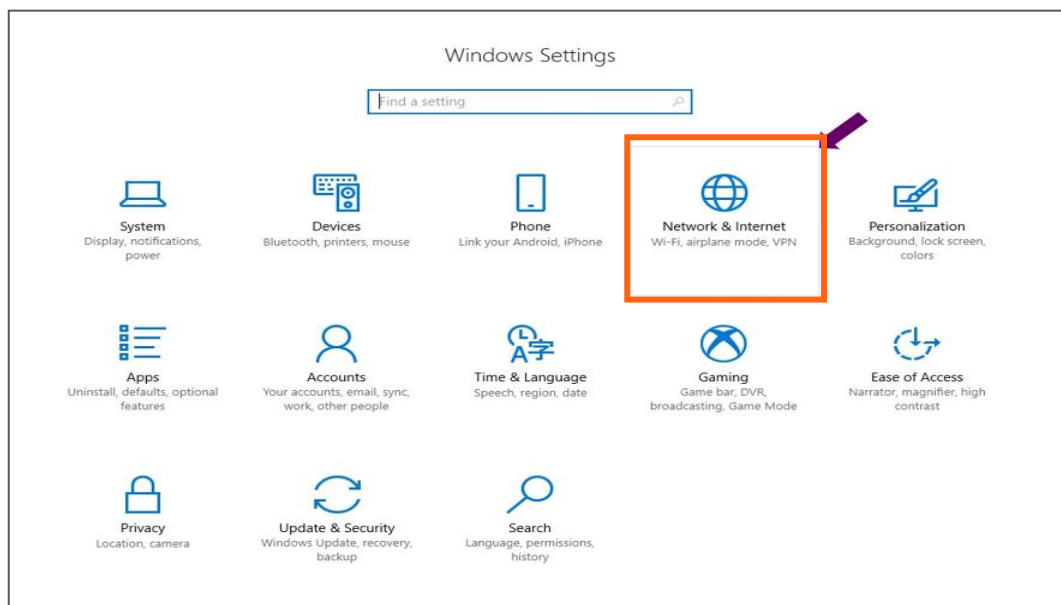
  a. Click **Start → Settings → Network & Internet**

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Figure 64 Network &Internet setting
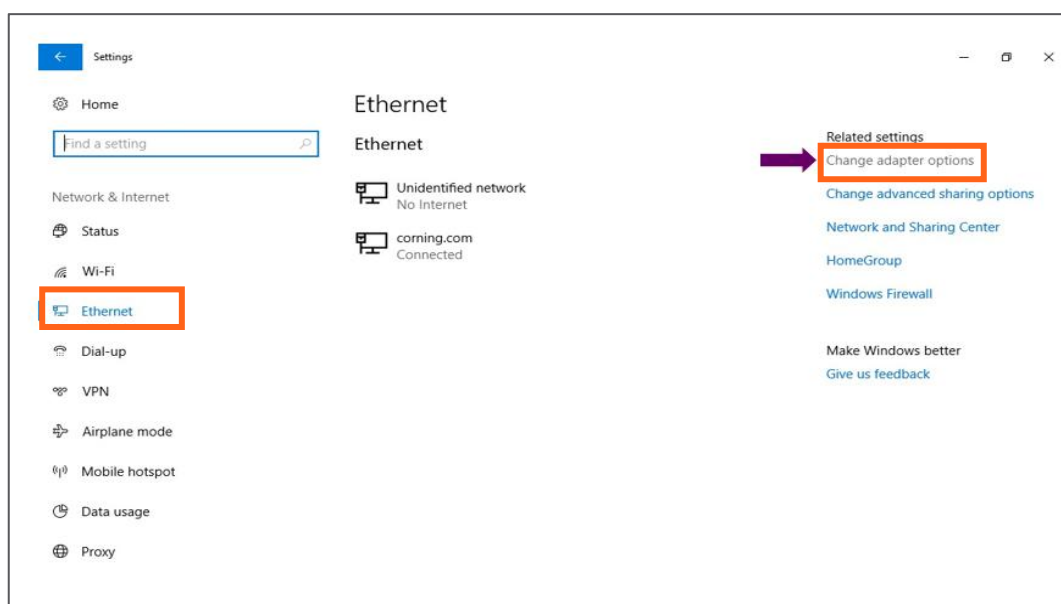
b. Select **Ethernet → Change adapter options**

Figure 65 Ethernet setting

c. Right click **Ethernet 3** and select **Properties.**
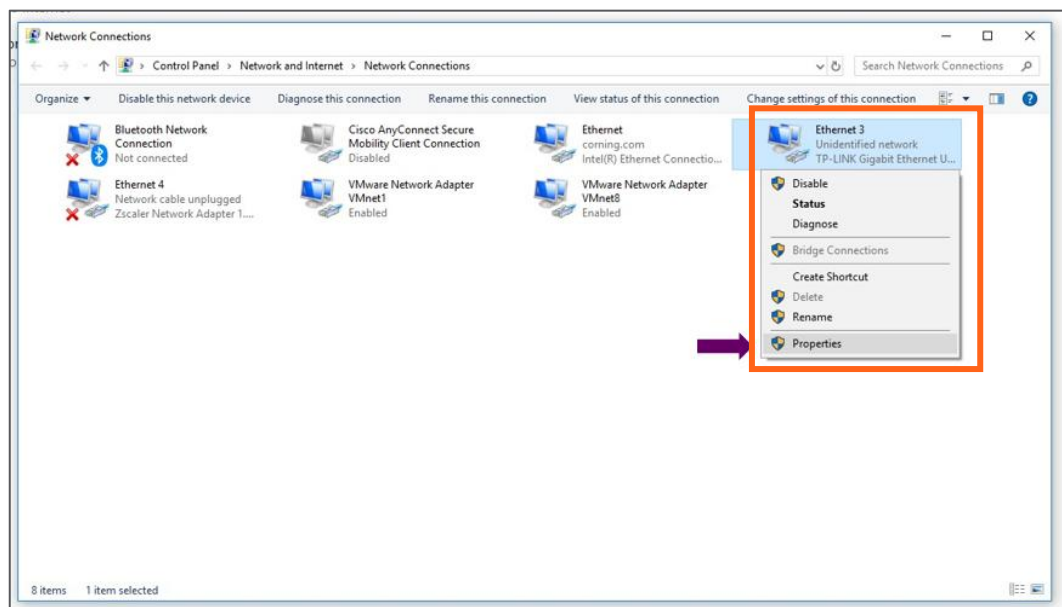
Corning Restricted - Controlled content (R2)

Figure 66 Ethernet 3

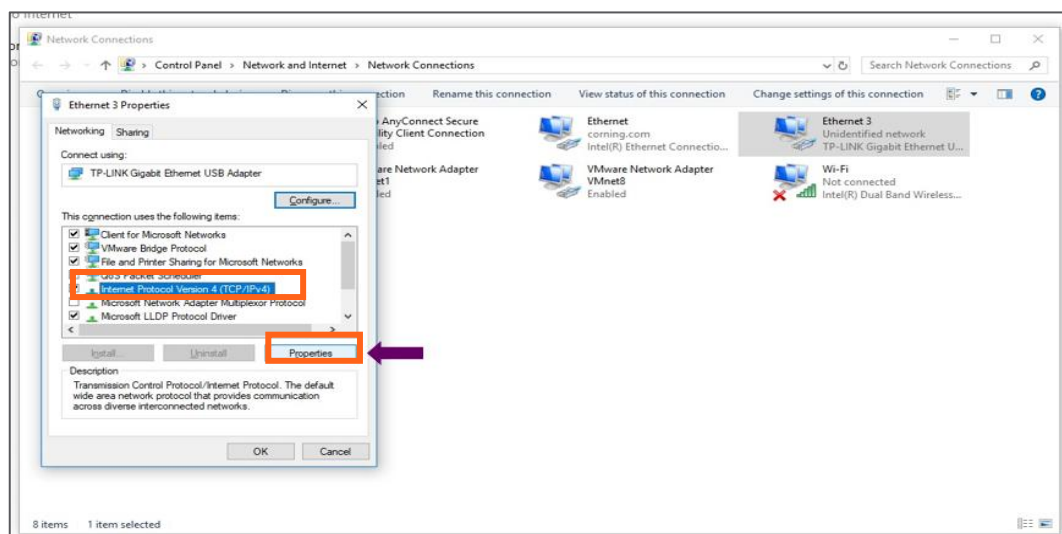d. Select **Internet Protocol Version 4（TCP/IPv4）** and click **Properties**

Figure 67 Ethernet 3 properties

i. Type in the properties: 192.168.8.3   255.255.0.0 → click **OK**

ii. Examples of IP addresses:

Corning Restricted - Controlled content (R2)

- **Allowed: 192.168.8.3**

- **Not allowed: 192.168.8.101 (this IP is used by the LOCAL port).**
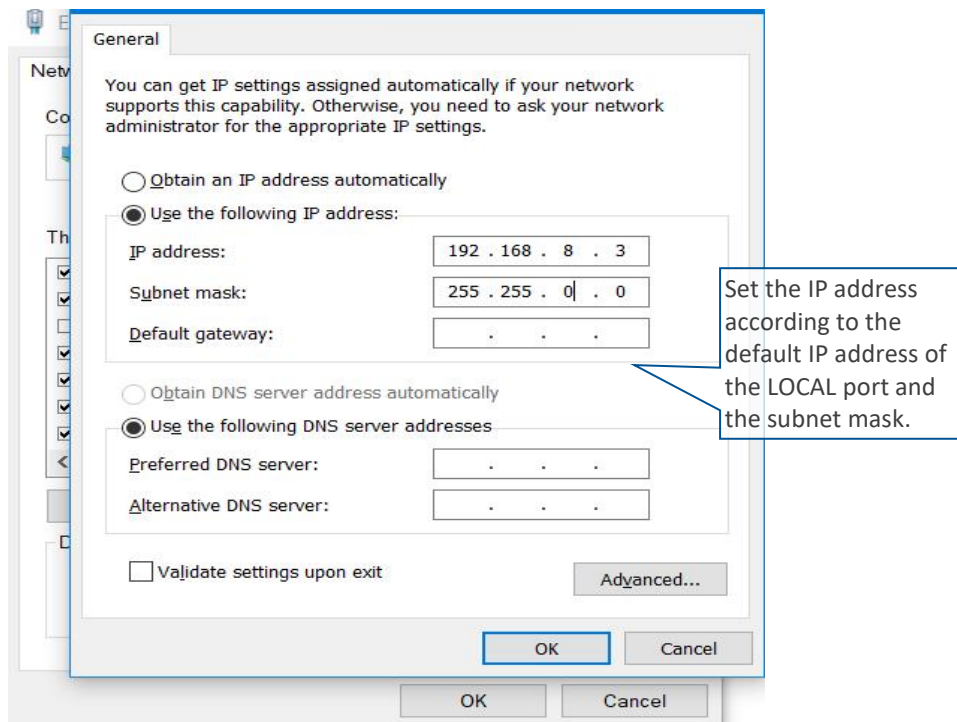
iii.   Click **OK** and close the control panel

Figure 68 General setting

3)   When the connection is established (can be verified by accessing through command prompt: cmd→
      ipconfig), open a browser and type in the LOCAL port default IP address in the address bar:
      192.168.8.3. Ping the IP address also works. See section 4.2 for instructions on how to continue.

5. Commissioning

Configure the DAS for each frequency during the commissioning process which requires a basic understanding of link, budgets and RF technology. Most system commissioning scenarios are covered and the process should be adjusted based on the site requirements and instructions of Corning Support.
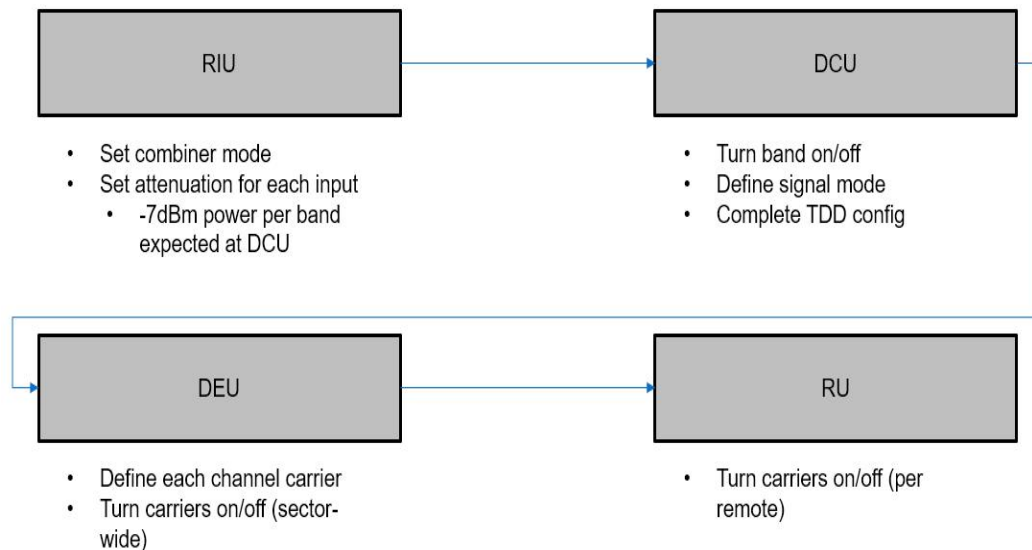
webGUI Workflow

RIU
- Set combiner mode
- Set attenuation for each input
  - -7dBm power per band expected at DCU

DCU
- Turn band on/off
- Define signal mode
- Complete TDD config

DEU
- Define each channel carrier
- Turn carriers on/off (sector-wide)

RU
- Turn carriers on/off (per remote)

Figure 69 webGUI Workflow

*Note: In order to protect the whole system, please don't input eNodeB signal before commissioning.

Commissioning tools:

Tools	Description
Laptop	Debug tool
Network cable	Connect DCU OMT port with laptop

5.1 RIU Config

5.1.1 RIU WEB overview

Click RIU on the left side shown in the figure below to enter the RIU overview control interface where the information (e.g., RIU alarm) can be viewed. Drag the scroll bar under the information list box or the arrow in in the column of More to view more.

Configure the following parameters:

● Band: Read Only. This shows the current frequency band supported by the RIU

Corning Restricted - Controlled content (R2)
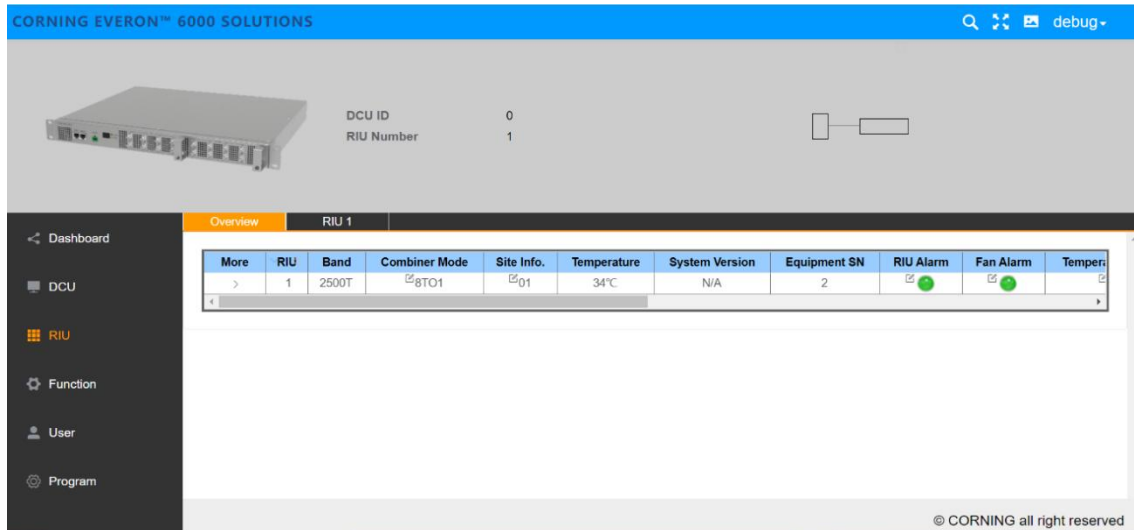
- Combiner Mode: 8TO1/4TO1/2TO1

Figure 70 RIU overview

5.1.2 RIU Parameter Config

RIU parameters:

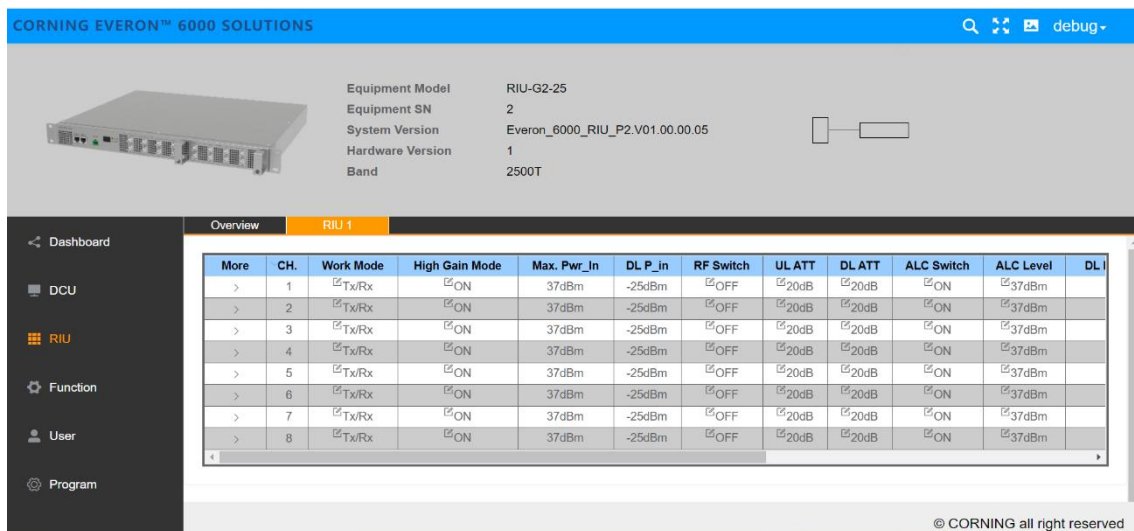| SN	RIU parameters	Ranges	Recommend values
1	Work Mode	TxRx/Tx/Rx	TxRx
2	High Gain Mode	On/Off	On
3	DL P_in	Read only	Read only
4	RF Switch	On/Off	On
5	UL ATT	0-30dB	20
6	DL ATT	0-30dB	20

Figure 71 RIU RF information

Corning Restricted - Controlled content (R2)

5.2 DCU Config

5.2.1 DCU -> Dashboard

Click the Dashboard navigation button to enter the dashboard page shown in the figure below, where you can query the full topology of all the dependent NE connected to the DCU unit. Click NE ID in the topology, and switch to the info query and configuration management page of other NE to facilitate the user.
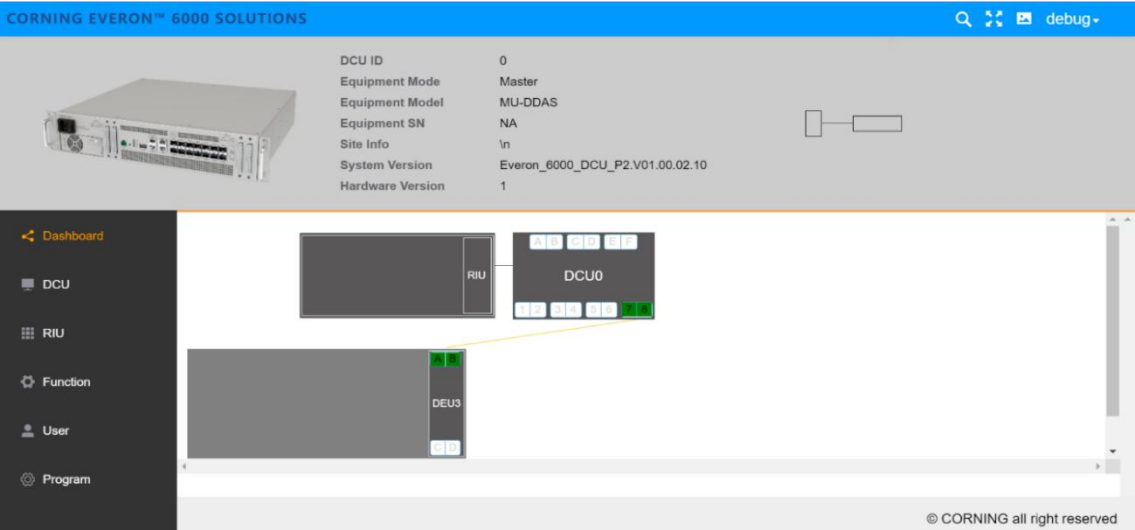

Figure 72 DCU dashboard

5.2.2 DCU Alarm

On the left navigation page of the DCU unit, click DCU → Alarm shown in the figure below. On this page, all alarm quantities of the device are displayed to facilitate the user to query and monitor the alarm info.
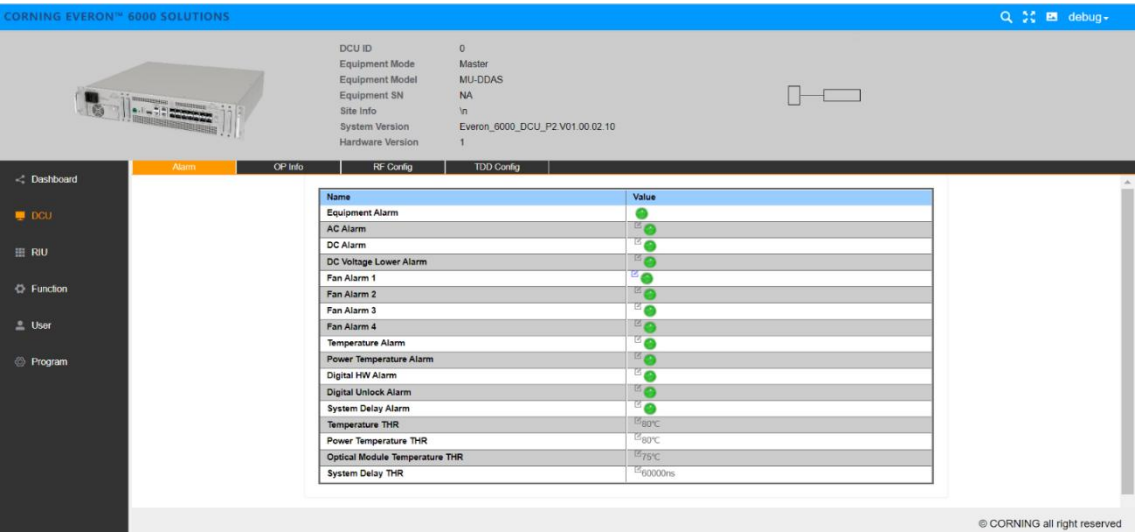

Figure 73 DCU alarm info

5.2.2.1 DCU OP Info

Click the left navigation button DCU→OP Info, as shown in the figure: