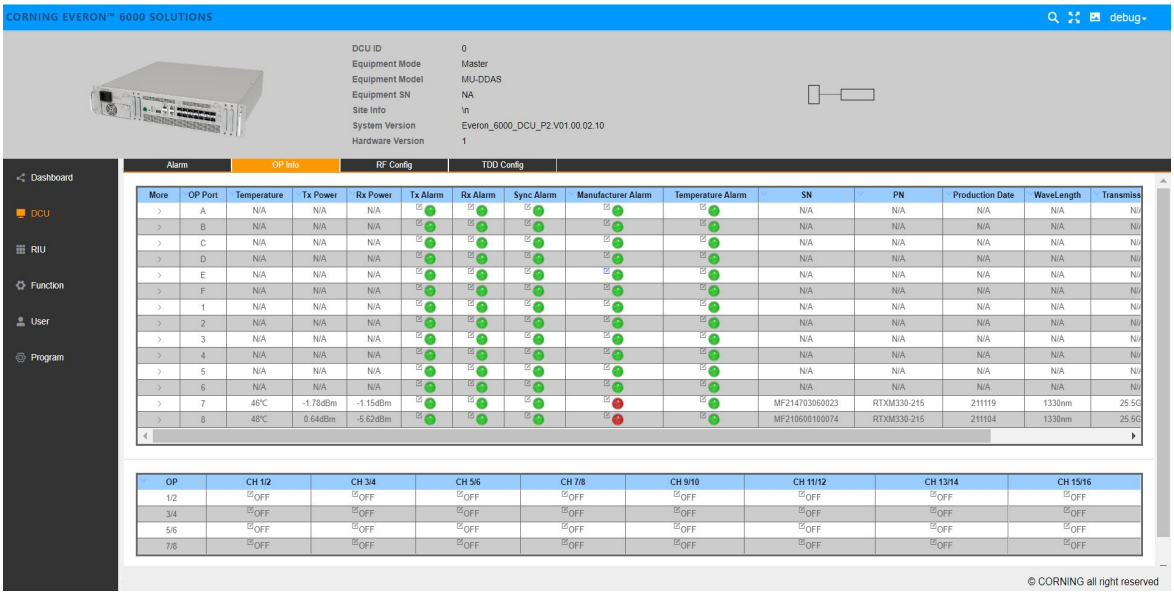


Figure 74 DCU OP info

In this interface, you can view the information of all optical ports which is convenient for users to query the alarm info of optical modules.

Click the edit icon  in front of the alarm indicator to enter the alarm enabling and shielding settings page. Then click Finish to complete the setting, as shown in the following figure:

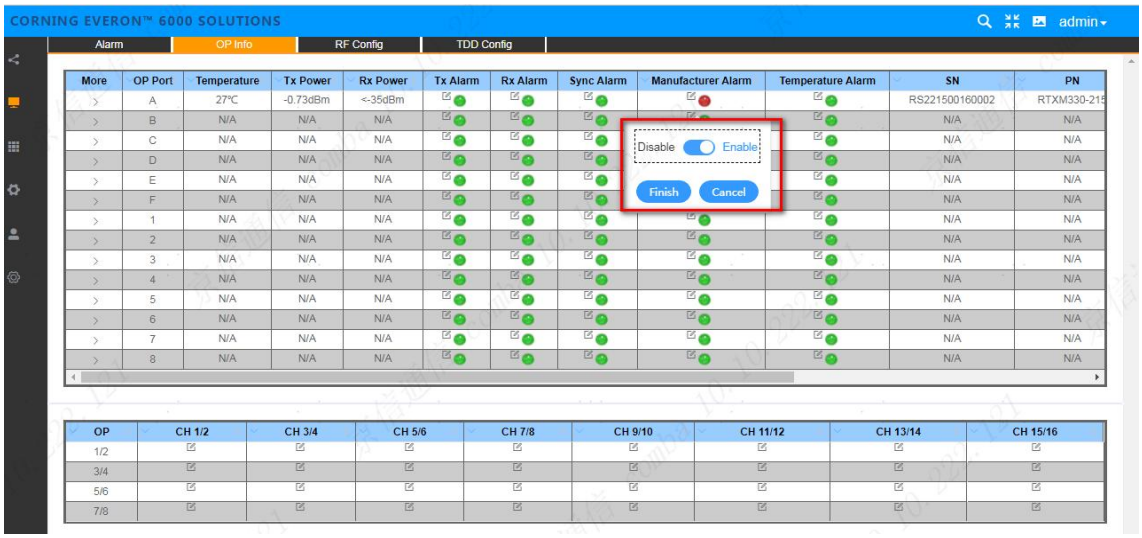


Figure 75 DCU→ OP Info →  →Disable/Enable→Finish/Cancel

Click OP Info →More to view the optical module info, as shown in the figure below:

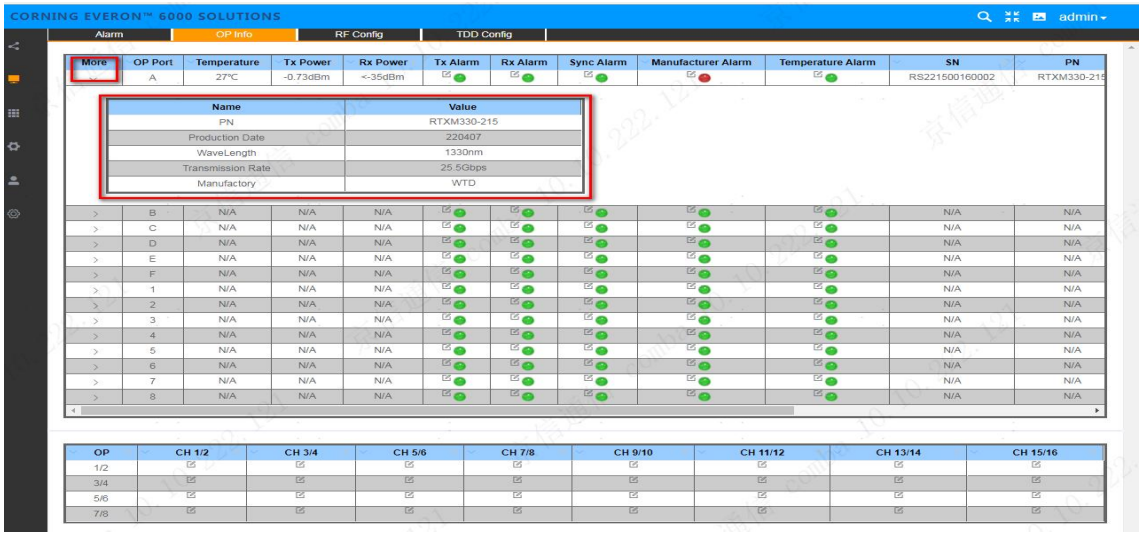


Figure 76 DCU→ OP Info →More

The optical port source can be select by clicking  shown in the figure below:

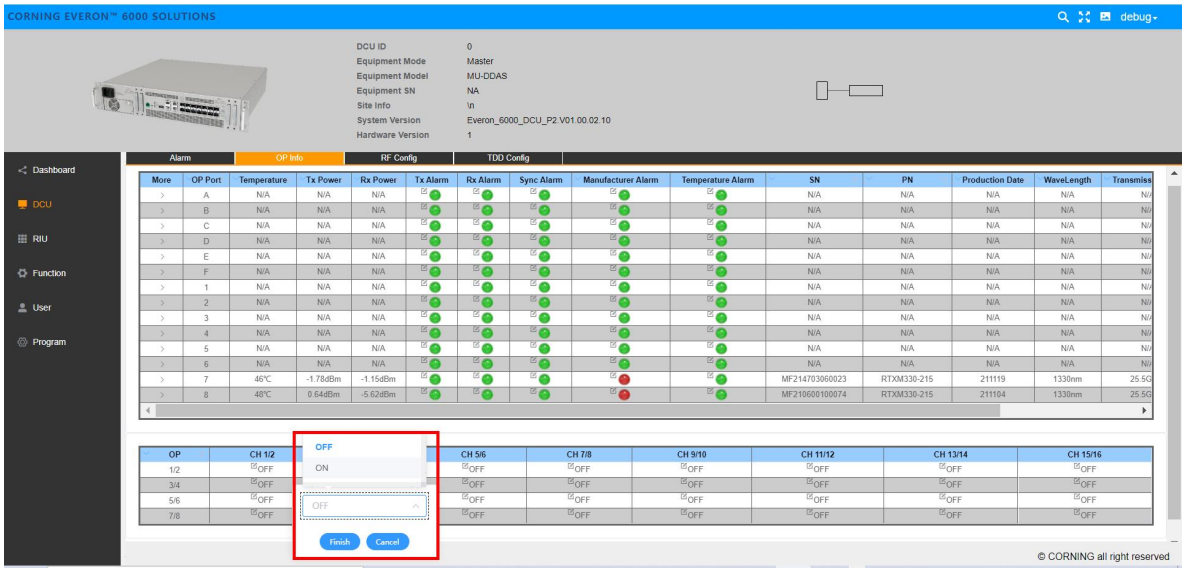


Figure 77 DCU→ 

5.2.2.2 DCU RF Config

Click DCU→ RF Config, as shown in the figure below:

SN	DCU parameters	Range	Recommend value
1	Band (Set based on RIU type)	2500T (2496-2690) N3500F (3450-3700) N3500G (3700-3980)	Choose based on the RIU BTS connections
2	BW (Set Based on Band)	194 MHz (2500T) 250 MHz (N3500F) 280 MHz (N3500G)	Choose based on the RIU BTS connections
3	DL Center Freq	2593 MHz (2500T) 3575 MHz (N3500F) 3840 MHz (N3500G)	Choose based on the RIU BTS connections
4	Signal Mode	FDD (not used in this release) TDD-NR TDD-LTE TDD-NR + TDD-LTE	Choose based on the RIU BTS connections
5	RF Switch	On/Off	On

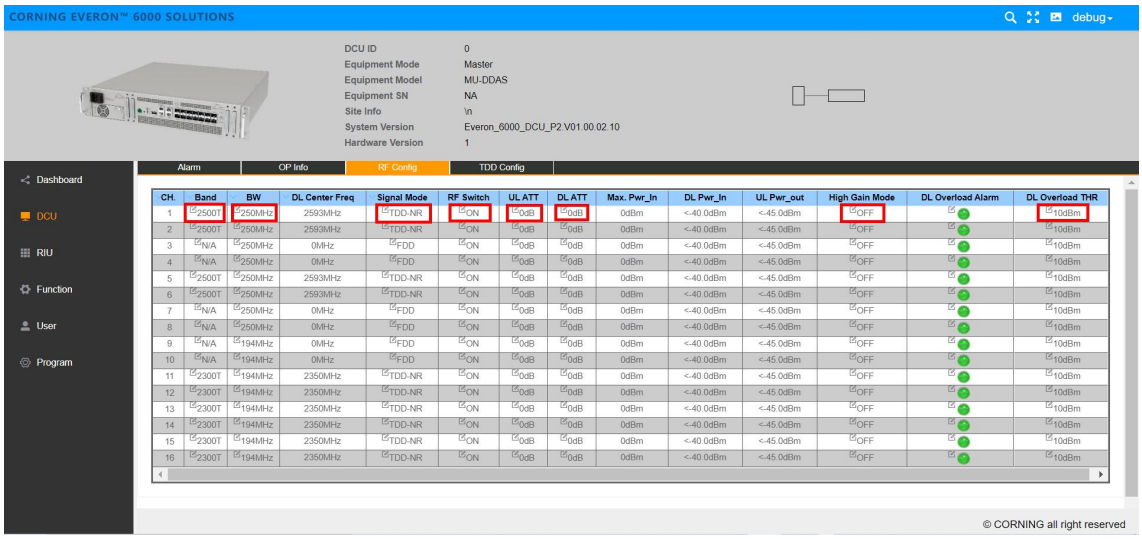


Figure 78 DCU→RF Config1

5.2.2.3 DCU TDD Config

UL/DL Slot Configuration: User-defined parameters are supported, but should be the same as the operator parameters.

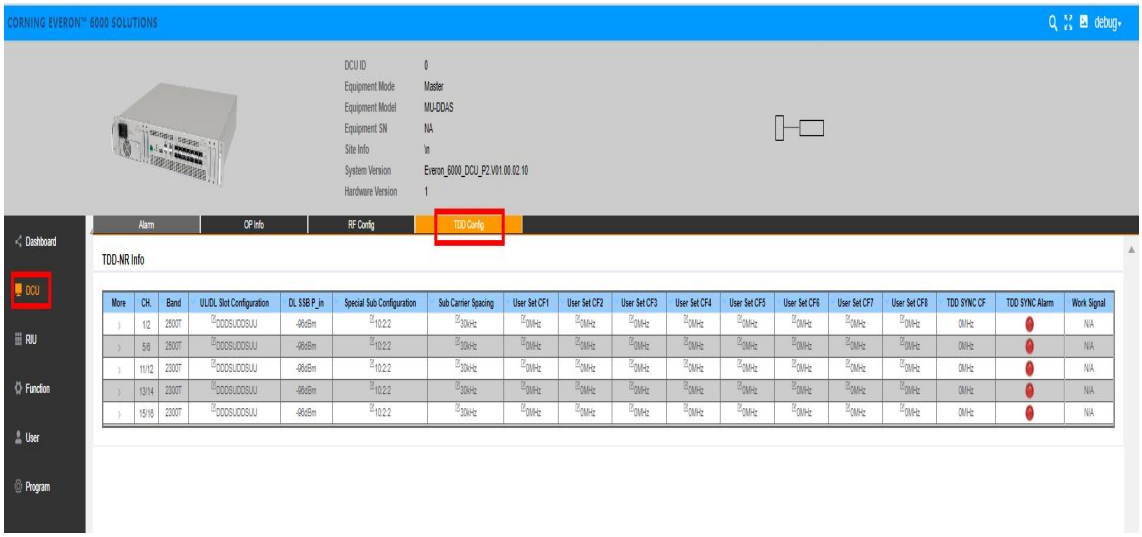


Figure 79 DCU→ TDD Info

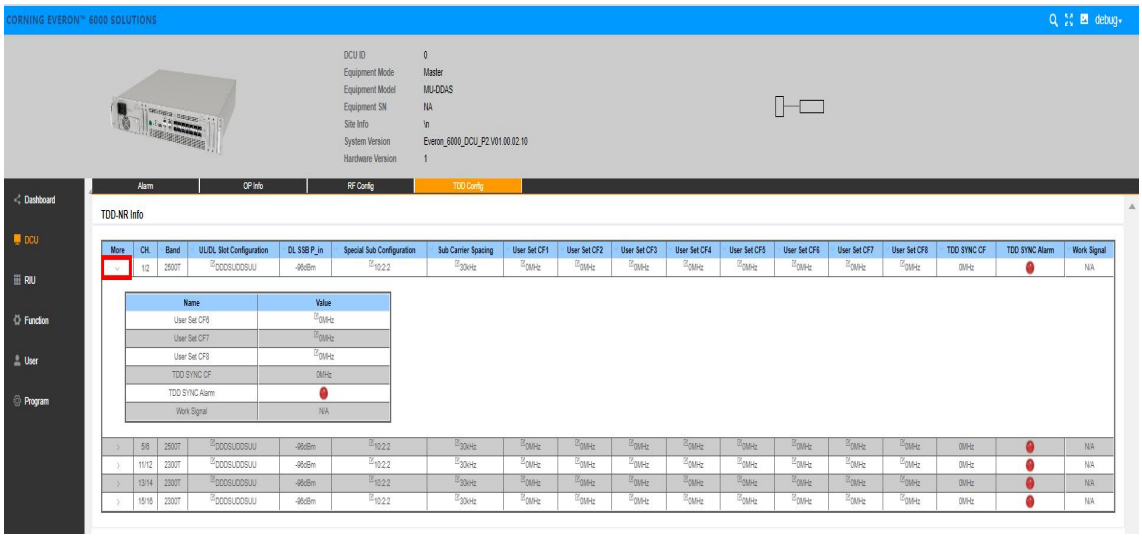


Figure 80 TDD configuration

5.2.3 DCU -> RIU

As shown in the figure, click DCU → RIU to query and set the information of the RIU connected to the DCU unit.

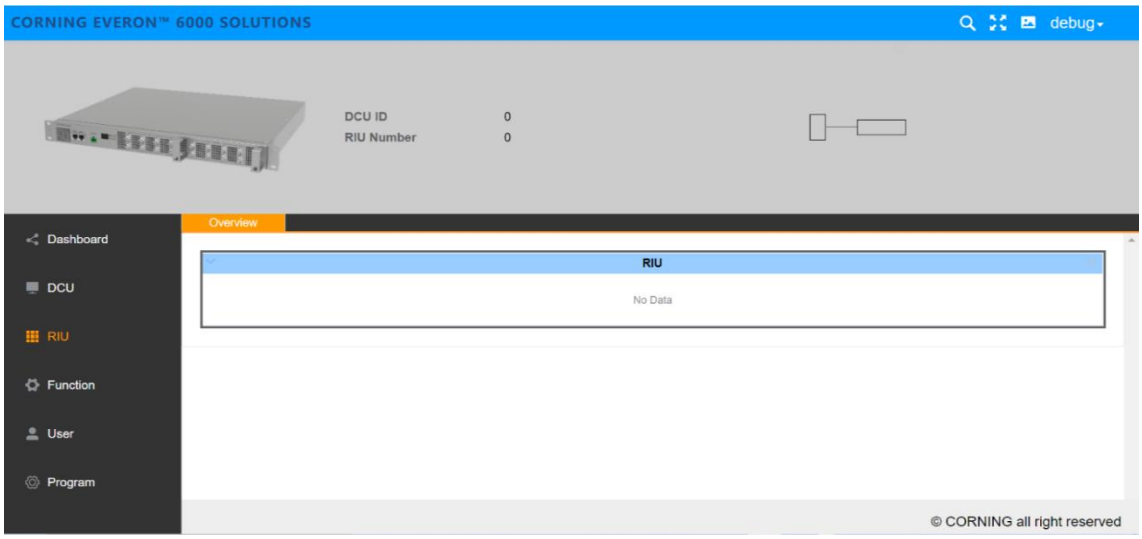


Figure 81 RIU overview

5.2.4 DCU -> Function

Configure the max input according to specific needs.

5.2.4.1 Device Info

Click Function →Device Info to query the names and values of the device, as shown in the figure:

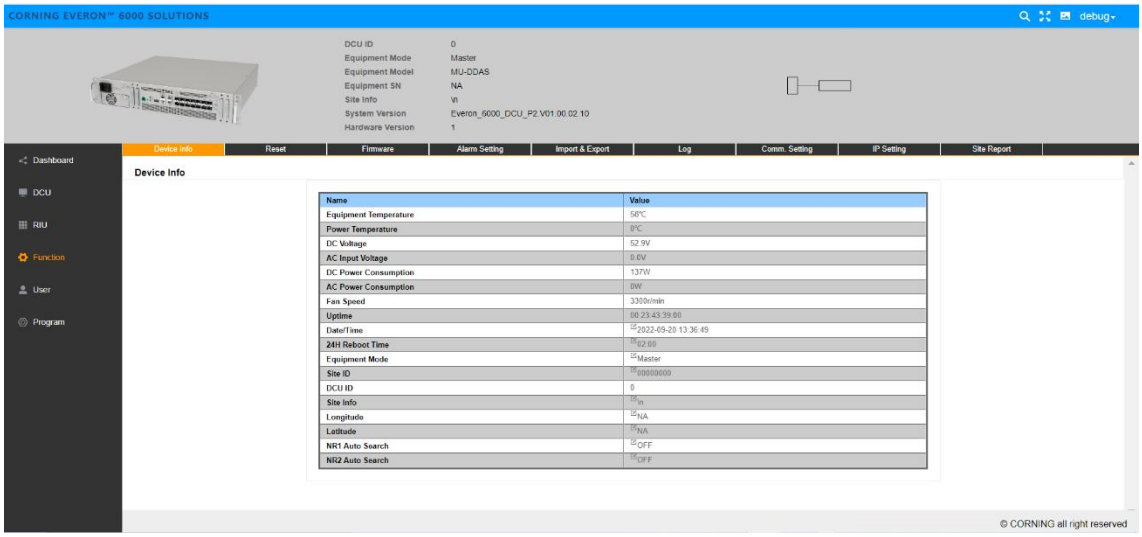


Figure 82 DCU →Function →Device Info

24h reboot time, site info, site ID, user model and device mode can be customized by users.

24H Reboot Time is set by the user which can be reset within 24 hours; Device Mode is used to set the work mode of DCU. (Note: when DCU is in master mode, it can be connected to DEU; when DCU is in slave mode, it fails to connect to DEU and work independently. It can only connect to master DCU for normal use.)

5.2.4.2 Reset

Click Function →Reset to reset the software and hardware of DCU and clear the historical alarms.

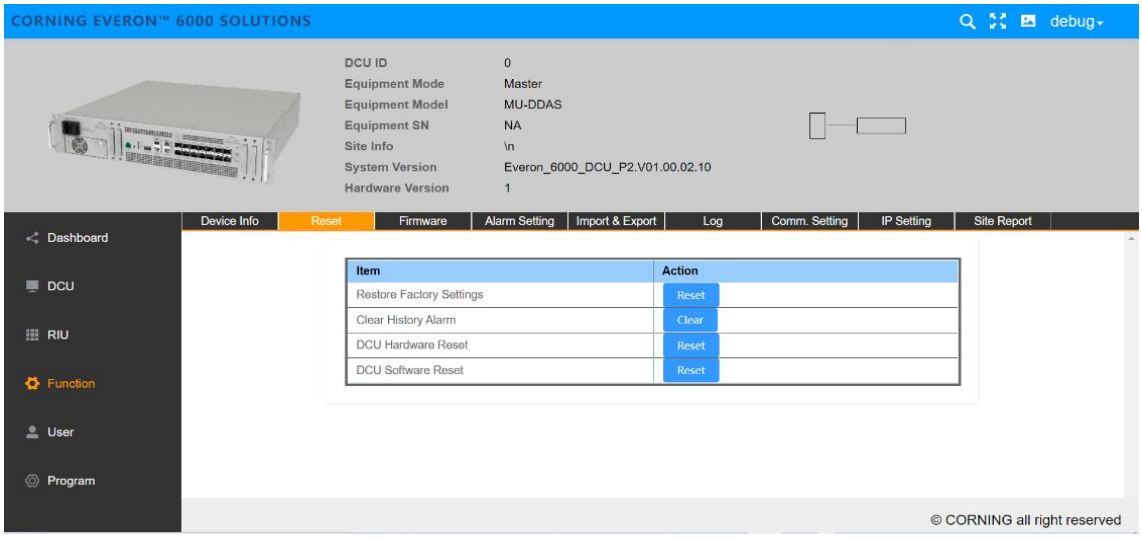


Figure 83 DCU →Function →Reset

5.2.4.3 Firmware

Click Function →Firmware and the firmware info can be viewed and upgraded.

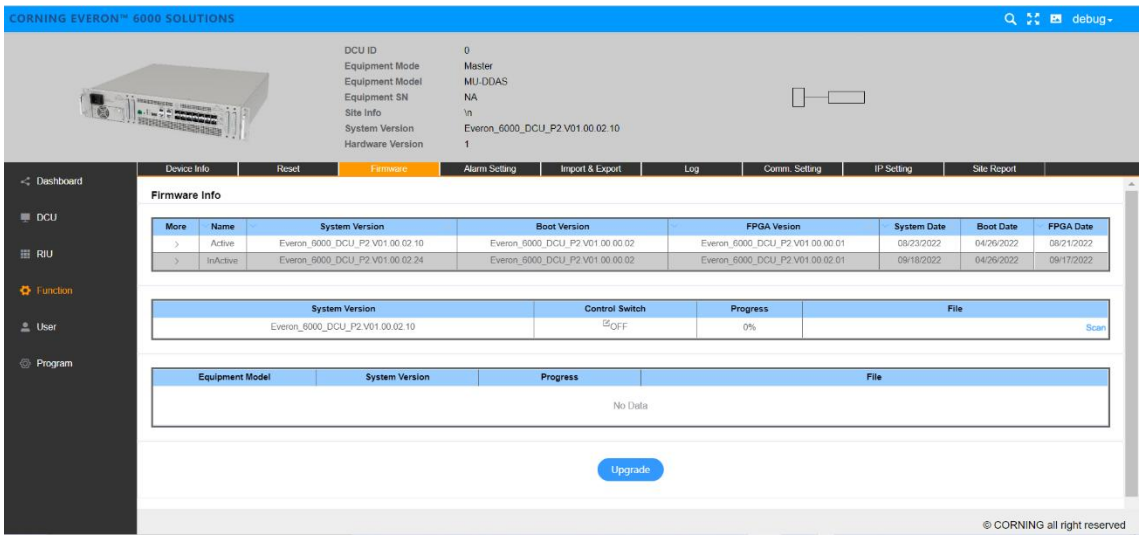


Figure 84 DCU →Function → Firmware

Two upgrade modes are supported by 5G digital DAS products of D430 series of the system software of all NE: centralized upgrade and decentralized upgrade. The settings of the two modes can be configured in Control Switch:

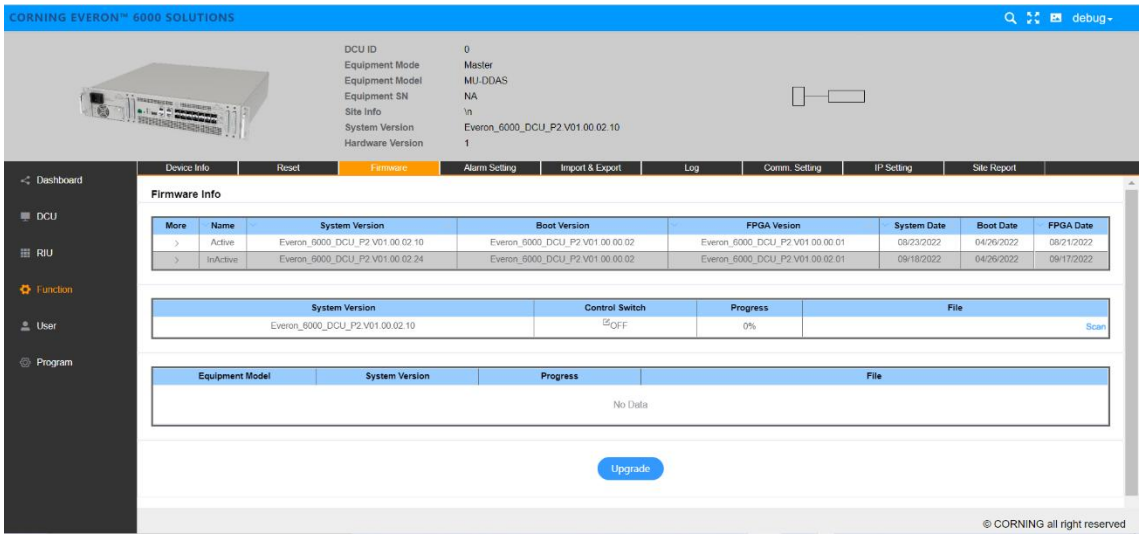


Figure 85 Firmware upgrade configuration

1. Decentralized upgrade : the Control Switch is OFF and only the software of the current DCU unit can be upgraded in this mode. The steps to upgrade the software are the followings:

Step1: Click SCAN to import the software version to be upgraded.

Step2: Click Upgrade. When the progress of downloading the software to the device is 100% and FINISH is prompted, the software is successfully downloaded.

Step3: After the device is reset, the software will be upgraded automatically.

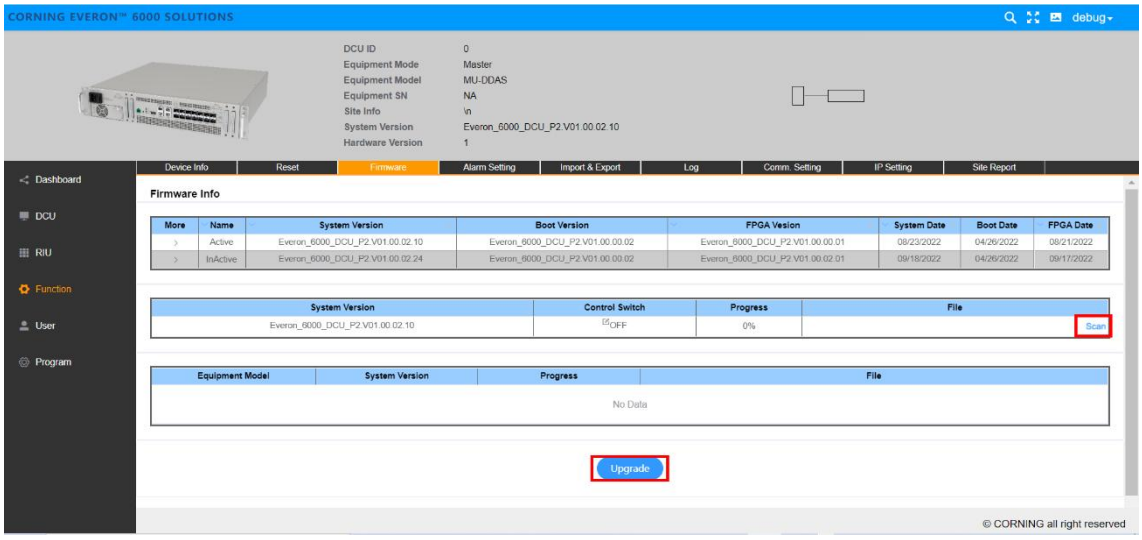


Figure 86 Select file

2. Centralize upgrade: the Control Switch is ON. The system software of seven NE (RIU, DCU, DEU, DLRU-2.5, DLRU-3.5, DMRU-2.5, DMRU-3.5) in the 5G digital DAS products will be stored after they are imported into the internal storage by the users. All the slave NE (slave DCU, DEU, DLRU) connected to this seven NE will automatically take the system software to be upgraded independently.

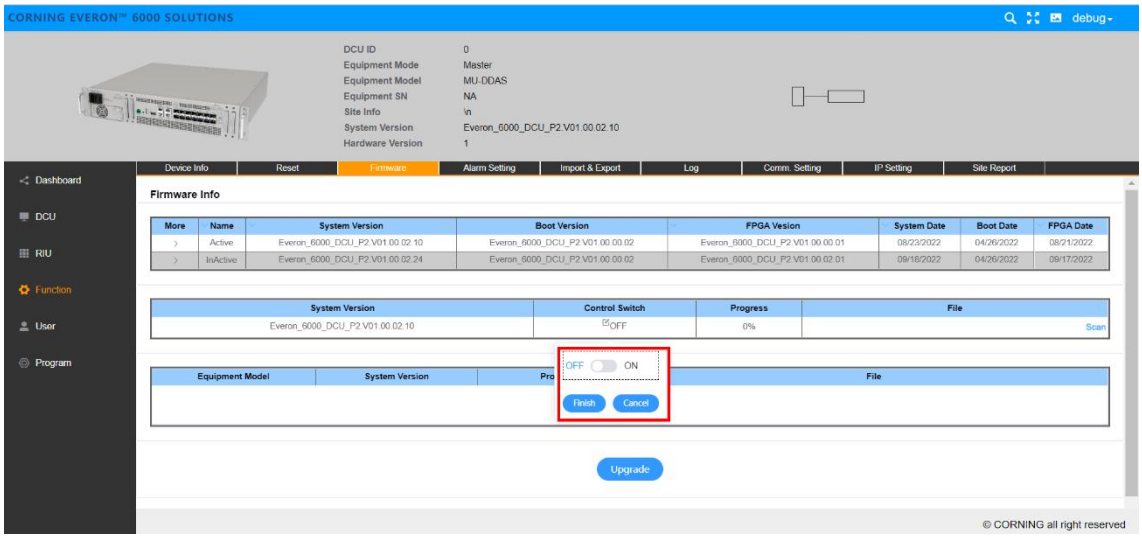


Figure 87 System upgrade on/off

5.2.4.4 Alarm Setting

Through Function → Alarm Setting, setting the alarm duration can be achieved. When it is set to1~253, it shows alarm duration, with the unit of 10s. Setting to 254 indicates an immediate level alarm; Set to 0 and the alarm will not occur until 3 minutes later;

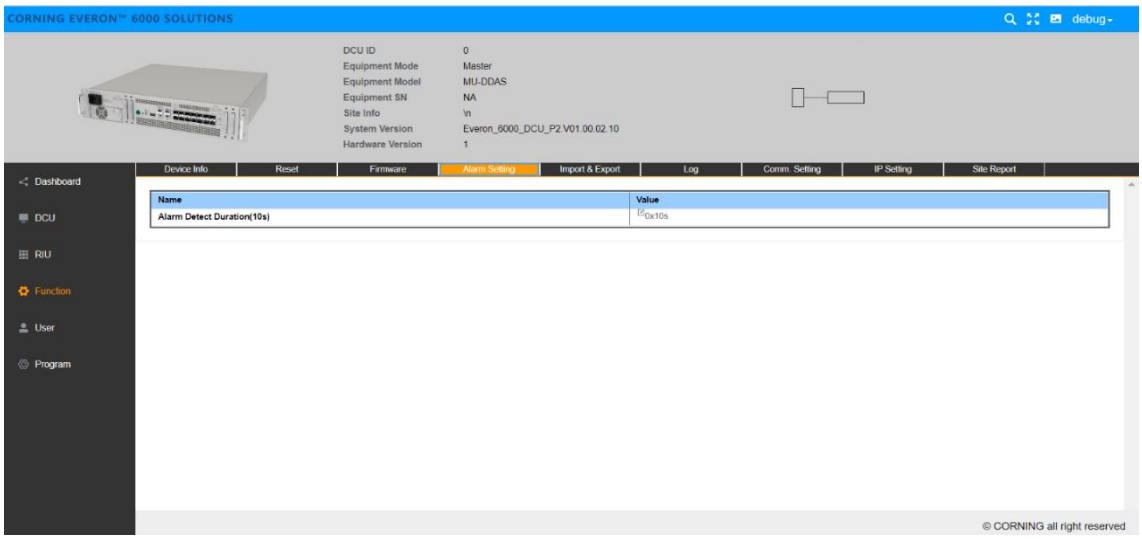


Figure 88 DCU →Function → Alarm Setting→Alarm Detect Duration

5.2.4.5 Import & Export

The user can import and export DCU configuration by clicking Function → Import & Export, as shown in figure:

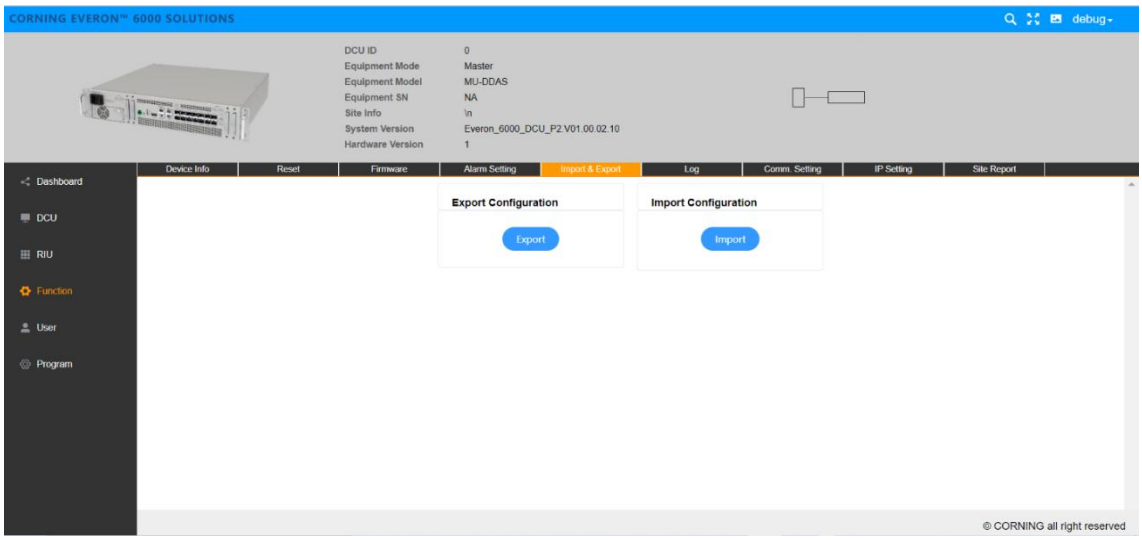


Figure 89 DCU →Function → Import & Export

5.2.4.6 Log

Click Function →Log to export the log of DCU for problem analysis, as shown in the figure:

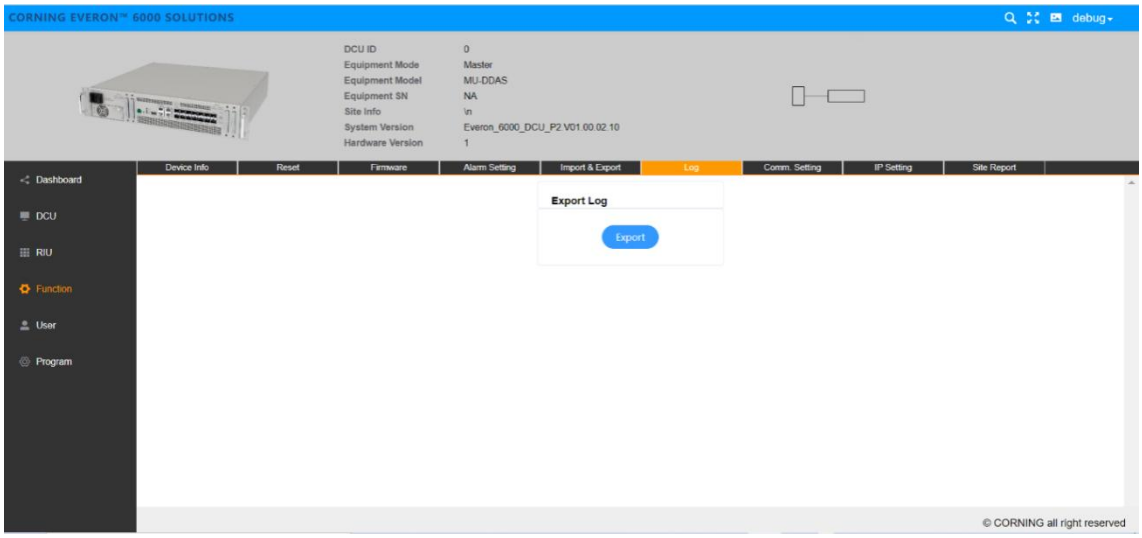


Figure 90 DCU →Function → Log

5.2.4.7 Comm. Setting

Click Function → Comm. Setting to set the network management communication types, as shown in the figure:

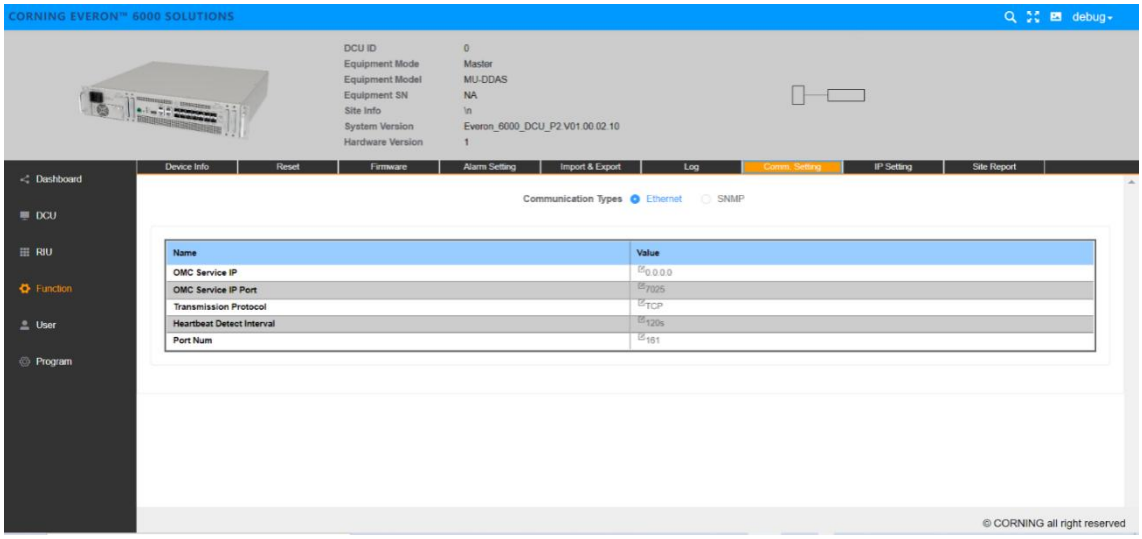


Figure 91 DCU →Function → Comm. Setting

5.2.4.8 IP Setting

Click Function → IP Setting to set DCU IP for OMC communication, as shown in the figure:

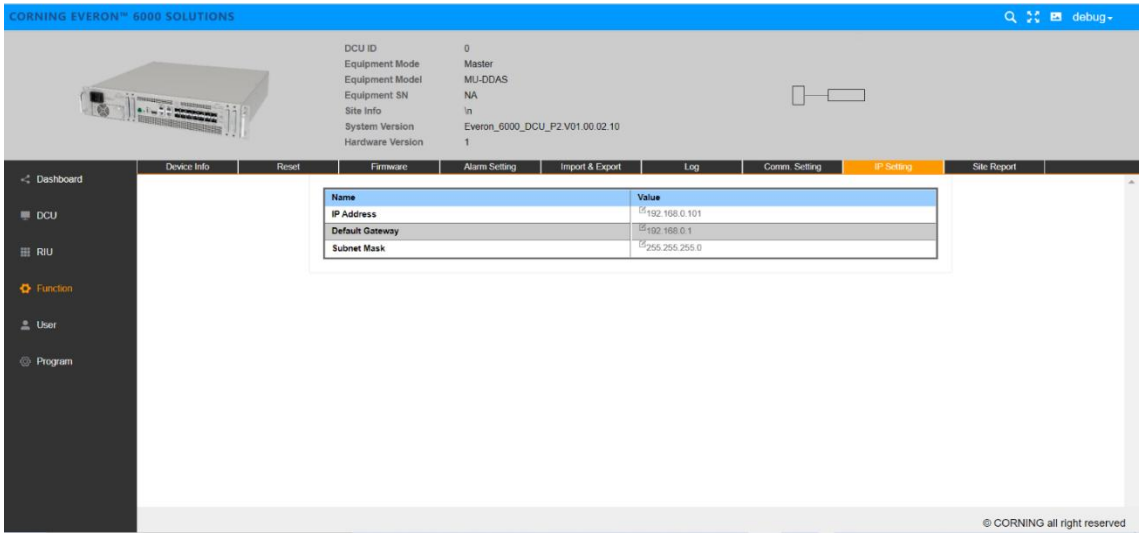


Figure 92 DCU →Function → IP Setting

5.2.4.9 Site Report

Click Function → Site Report and the site report of DCU enables it to be recognized by NMS, as shown in the following figure:

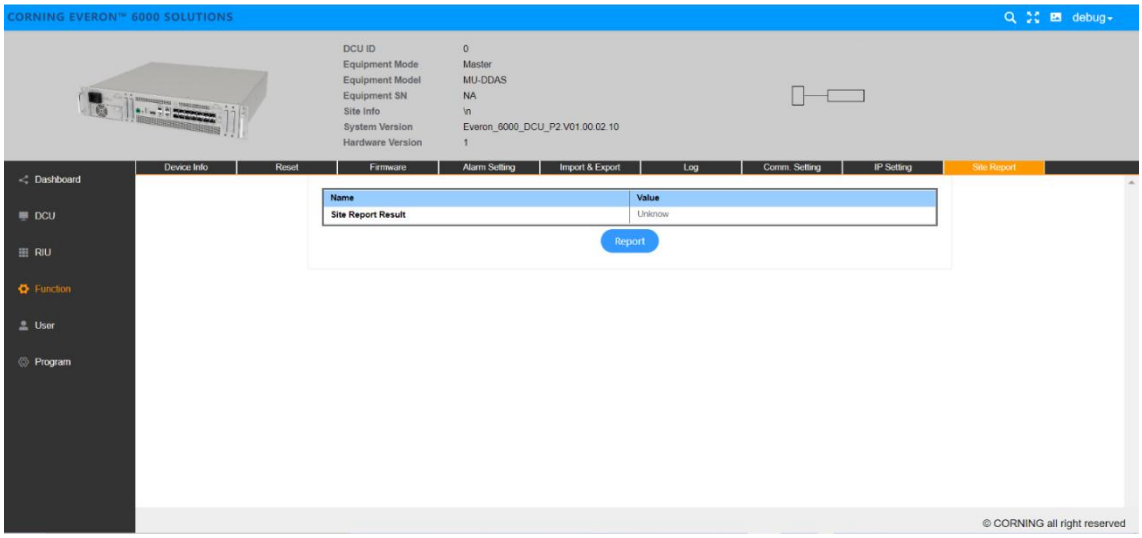


Figure 93 DCU →Function → Site Report

5.2.5 DCU -> UserInfo

5.2.5.1 Password

Click User->Password to reset the DCU password which should include capital and lower-case letters and 13 digits in length, and the recommended password is zaq1XSW2cde34.

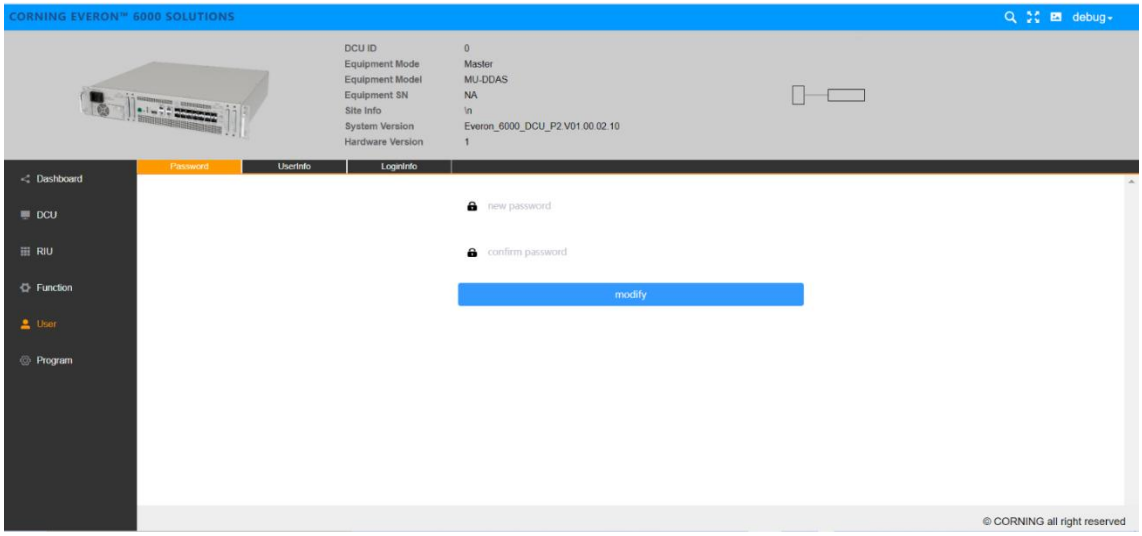


Figure 94 DCU→User→Password

5.2.5.2 UserInfo

Click User->UserInfo to add a user and set the role and password, as shown in the following figure.

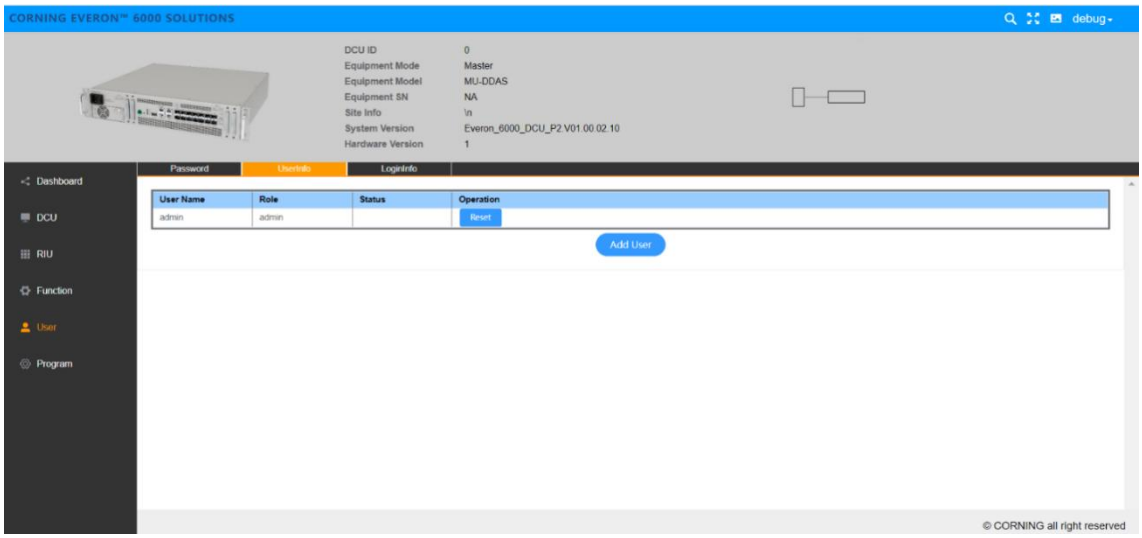


Figure 95 DCU→User→UserInfo

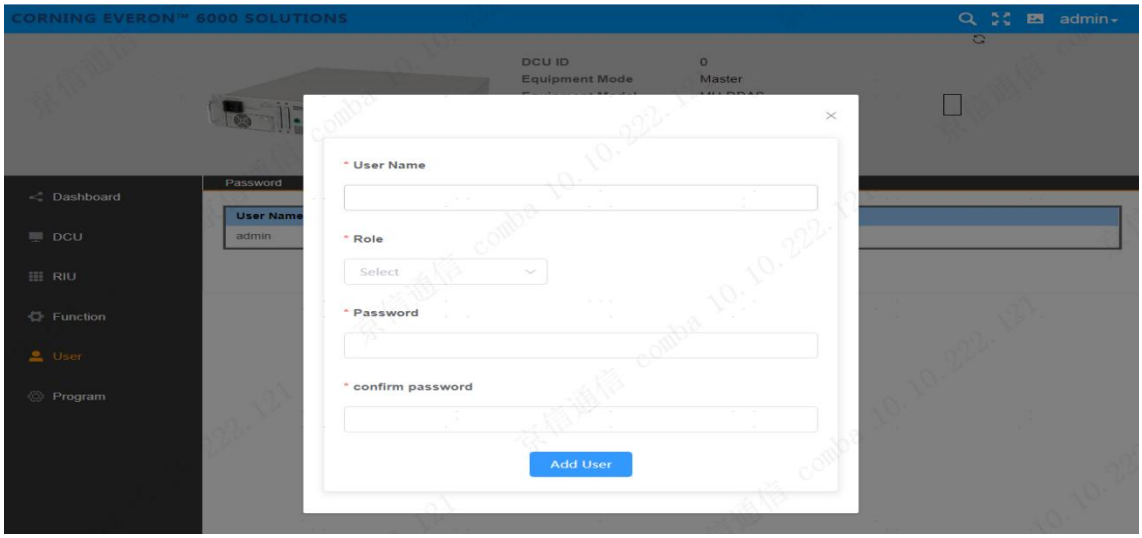


Figure 96 DCU→User→UserInfo→Add User

5.2.5.3 LoginInfo

As shown in figure 91, click User->LoginInfo to set the maximum value of password input attempts. This function indicates that when a user logs in, the system will be locked if the times of password input exceeds the maximum.

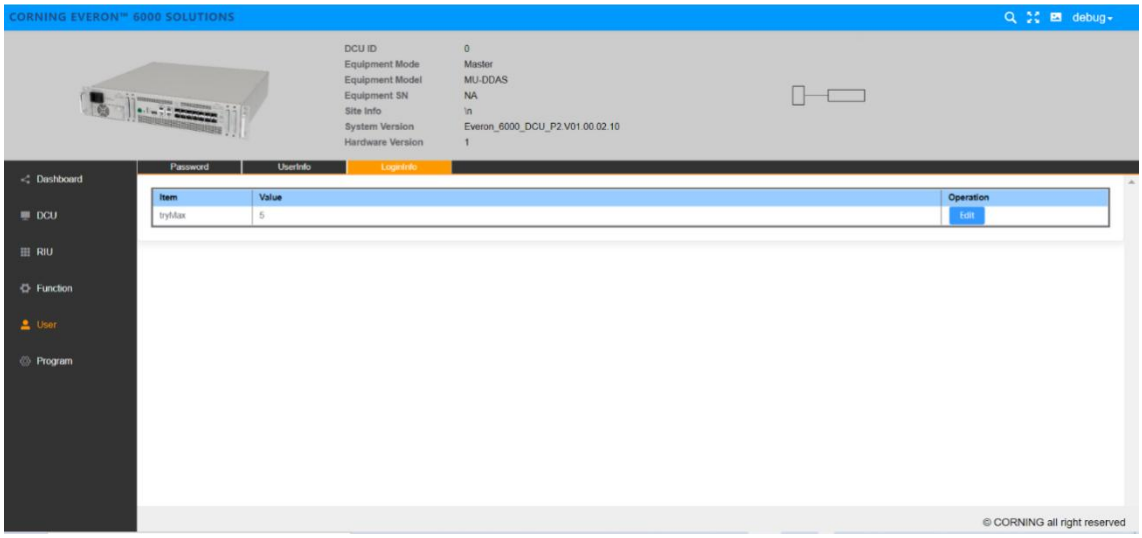


Figure 97 DCU DCU→User→LoginInfo

5.2.6 Program

Click Program→Site Management to clear the site ID of the DCU reported to OMC.

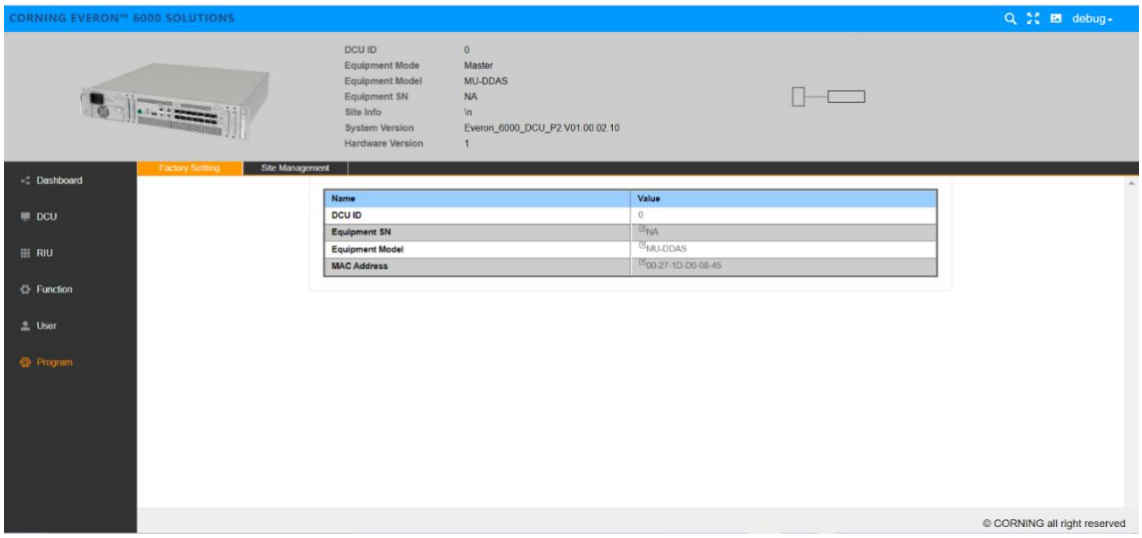


Figure 98 DCU factory setting

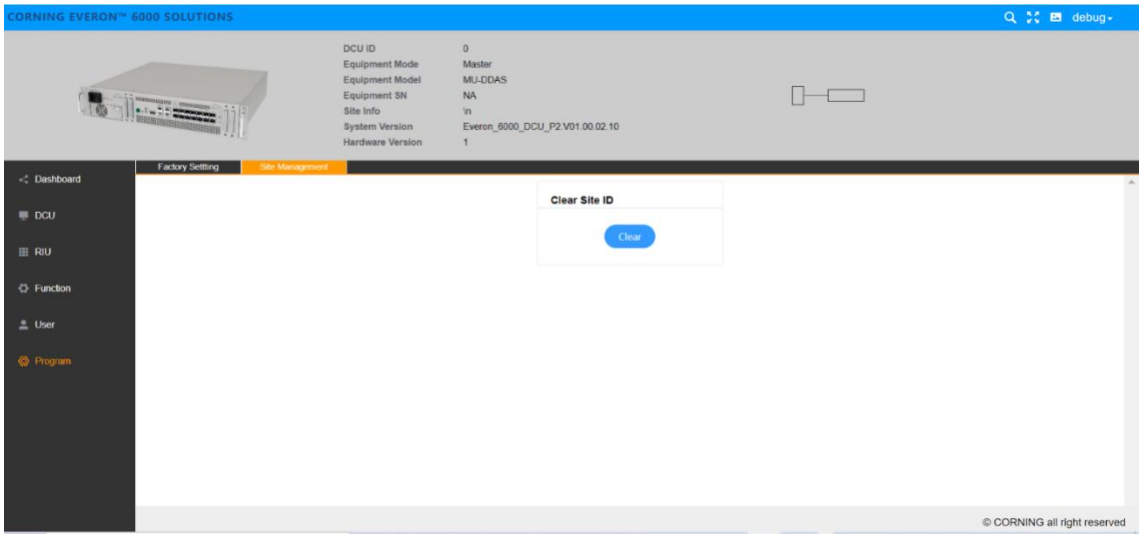


Figure 99 DCU→ Program

5.3 DEU Config

5.3.1 DEU -> 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 DEU unit. And the info query and configuration management page of other NE can be switched to after clicking NE ID in the topology.

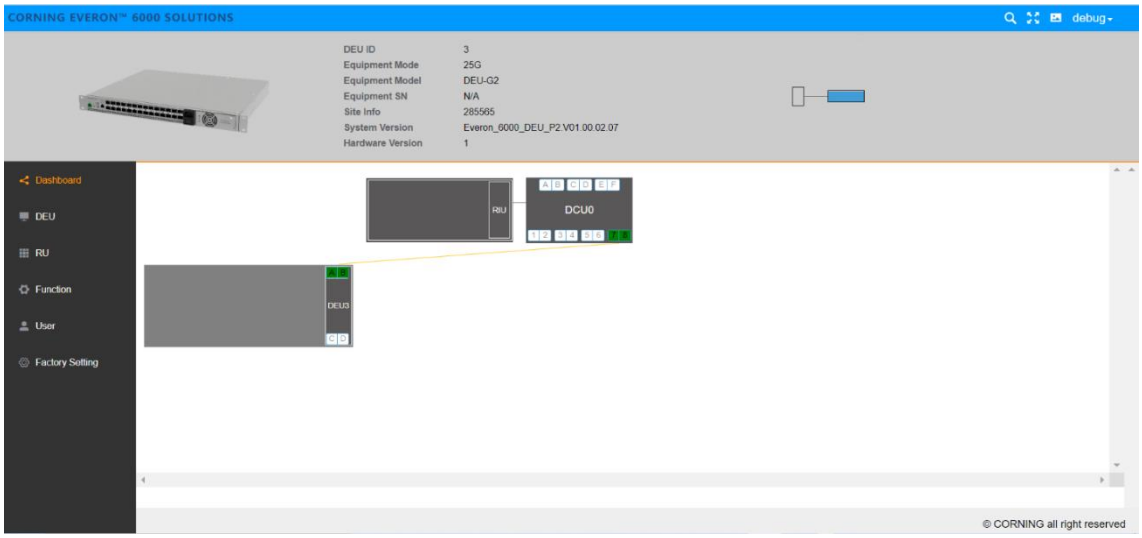


Figure 100 DEU→Dashboard

5.3.1.1 Alarm Info

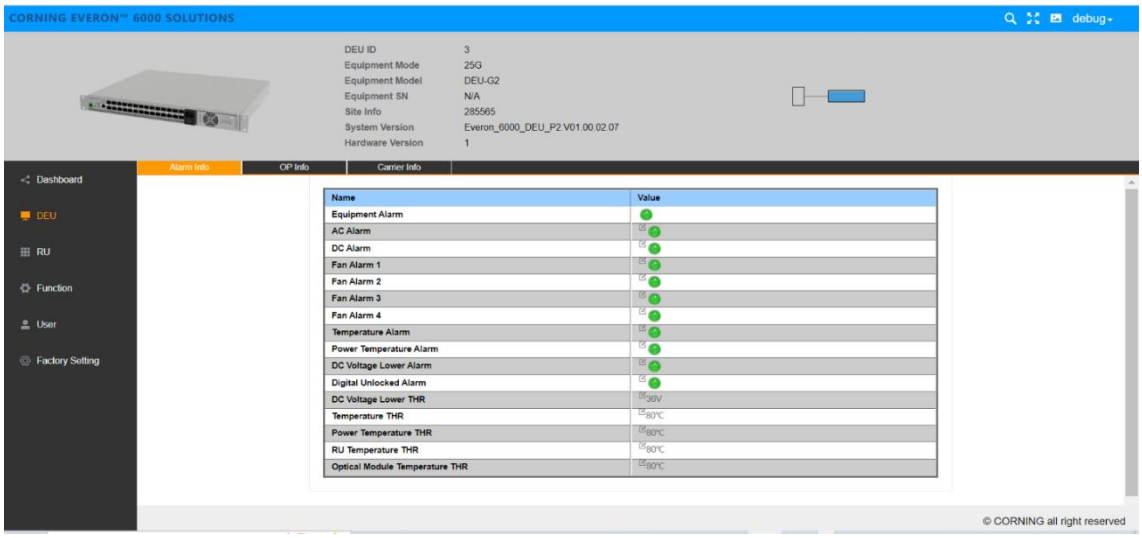


Figure 101 DEU→DEU→Alarm Info

Alarms can be set and viewed in this function which are defined as follows:

1) Equipment Alarm: if any alarm is valid, the alarm will take effect.
2) AC Alarm: if the input voltage is abnormal, the alarm will take effect.
3) DC Alarm: if the output of the power module is abnormal, the alarm will take effect.
4) Fan Alarm1~4: if any fan (4 in total) in the fan module is abnormal, the alarm will take effect.
5) Temperature Alarm: when the device temperature is higher than the device over temperature THR (80 ℃ by default), the alarm will take effect.
6) Power Temperature Alarm 1~2: when the temperature of any PSE is higher than the device over temperature THR (80 ℃ by default), the alarm will take effect.
7) Digital Unlocked Alarm: when the device is unlocked, the alarm will take effect.

5.3.1.2 OP Info

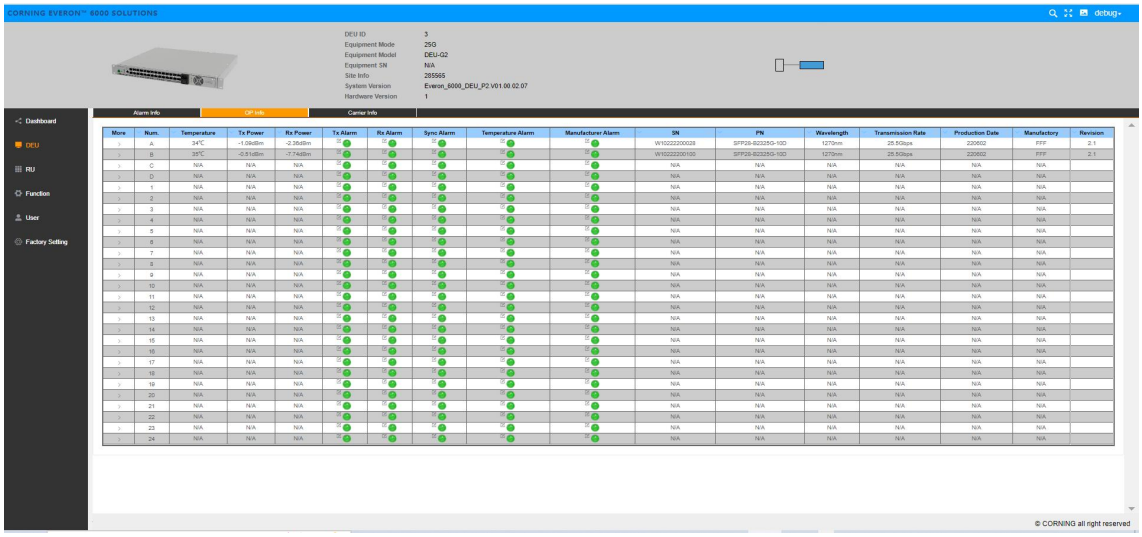


Figure 102 DEU→DEU→OP Info

The range of optical module transmitting power (Tx PWR) is -3dBm~5dBm; The range of Rx PWR shall be greater than -10dBm. The maximum operating temperature must be lower than 80 ° C and the optical module must be correctly matched. Otherwise, an exception may occur. Alarms can be queried on this interface.

Click ">" under the OP Info→More to view the optical module info, as shown in the figure below:

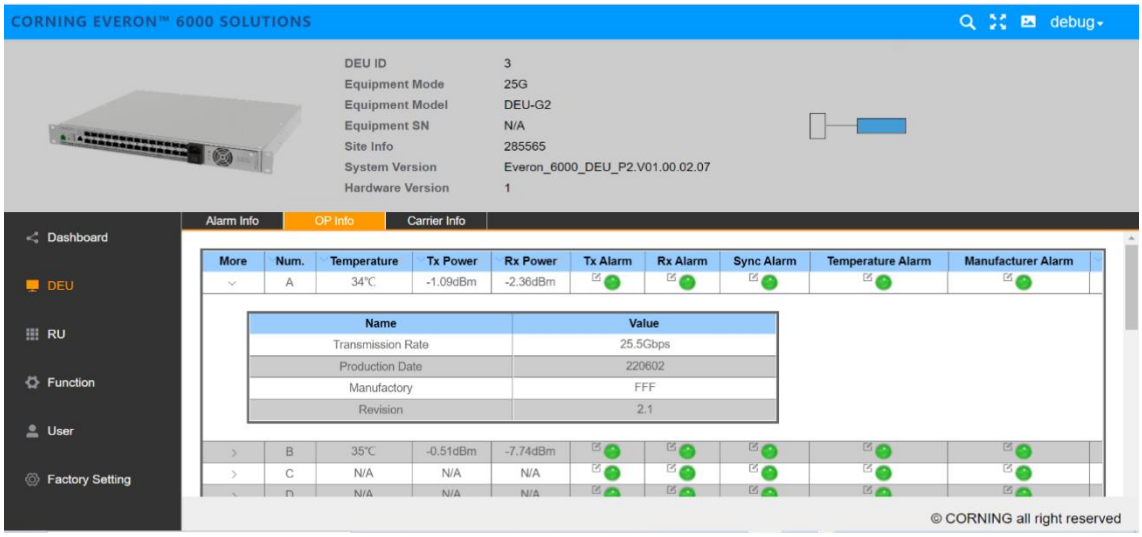


Figure 103 DEU→DEU→OP Info→More

5.3.1.3 Carrier Info

Click Function→Carrier Info→Add to set uplink and downlink band information.

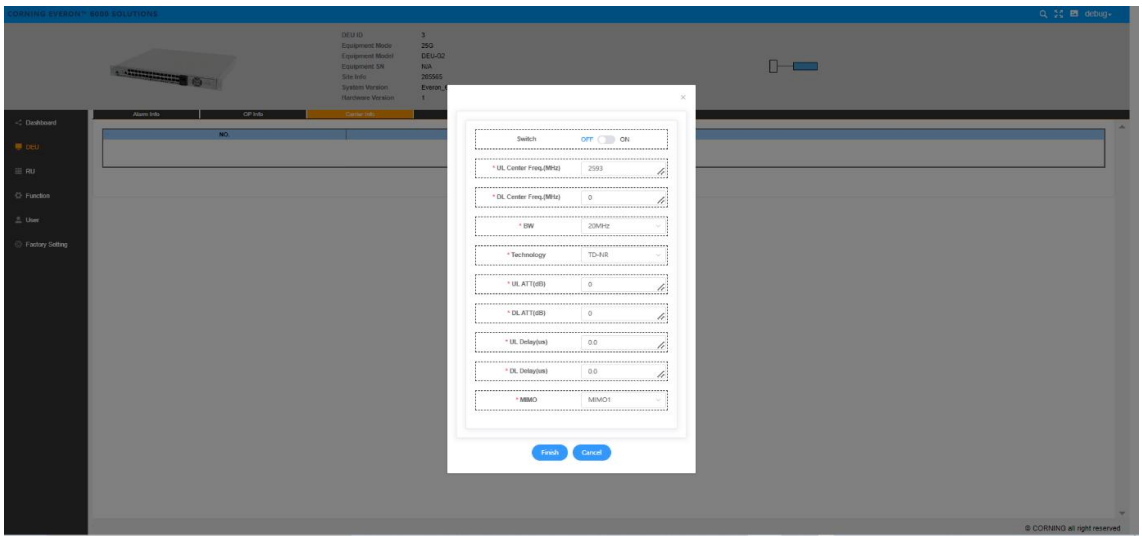


Figure 104 DEU→Function→Carrier Info→Add

5.3.2 DEU -> Function

5.3.2.1 Device Info

Click Function →Device Info to view the time, latitude, longitude, and other information of 10G/25G device. The site info is defined by the user, as shown in the figure below:

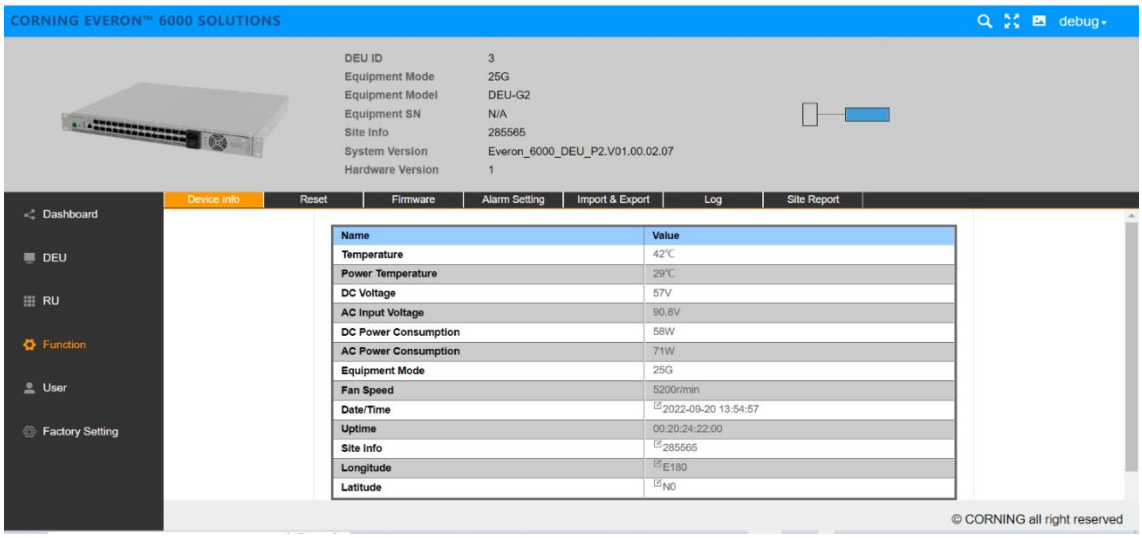


Figure 105 DEU→Function→Device Info

5.3.2.2 Reset

Click Function →Reset to clear the historical alarm, reset the software and hardware of the DEU, and reset the software and hardware of the RU connected to the DEU, as shown in the figure below:

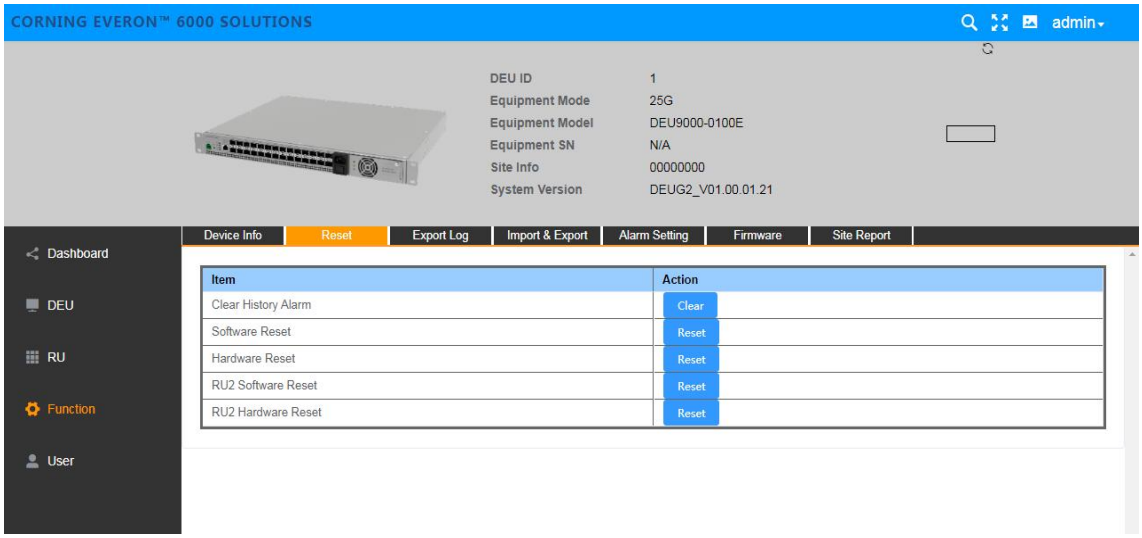


Figure 106 DEU→Function→Reset

5.3.2.3 Export Log

Click DEU->Function->Export Log to export the DEU log for problem analysis, as shown in the figure below:

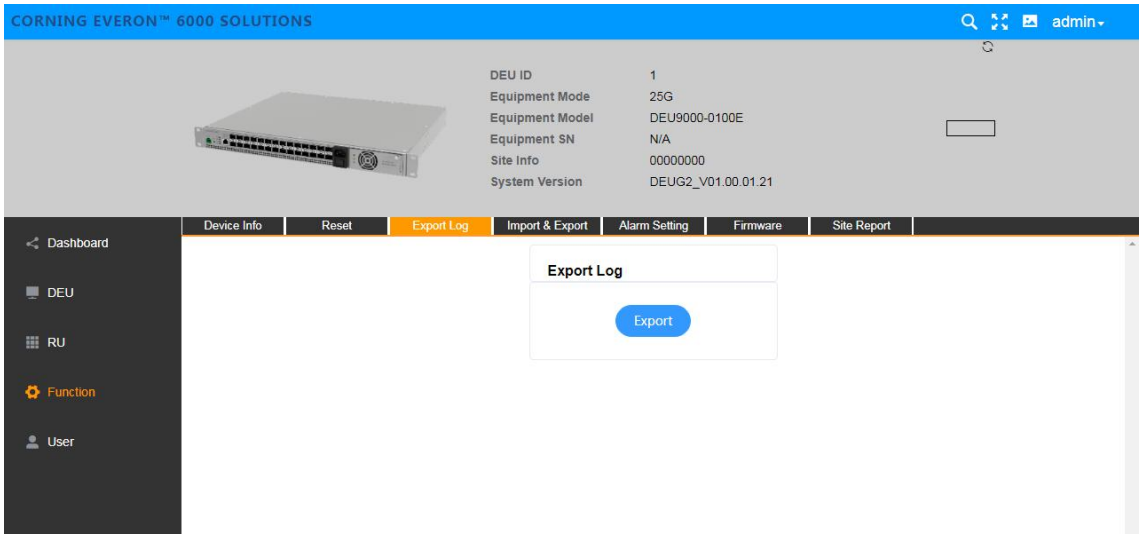


Figure 107 DEU→Function→Export Log

5.3.2.4 Import & Export

Import and export the DEU configuration by clicking Function → Import & Export, as shown in the figure below:

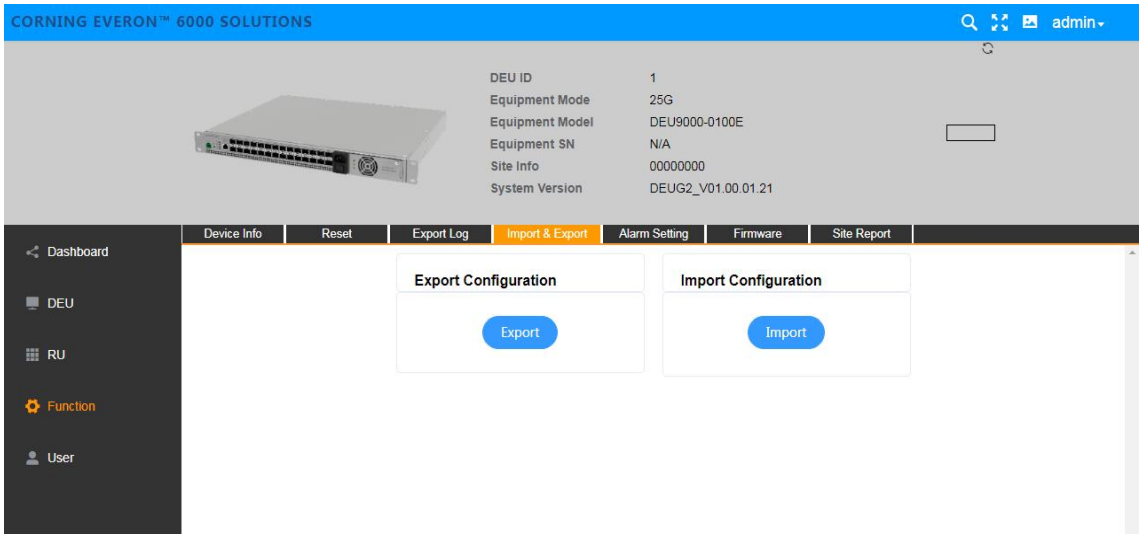


Figure 108 DEU→Function→Import & Export

5.3.2.5 Alarm Setting

Click Function → Alarm Setting to set the DEU alarm detect duration, as shown in the figure below:

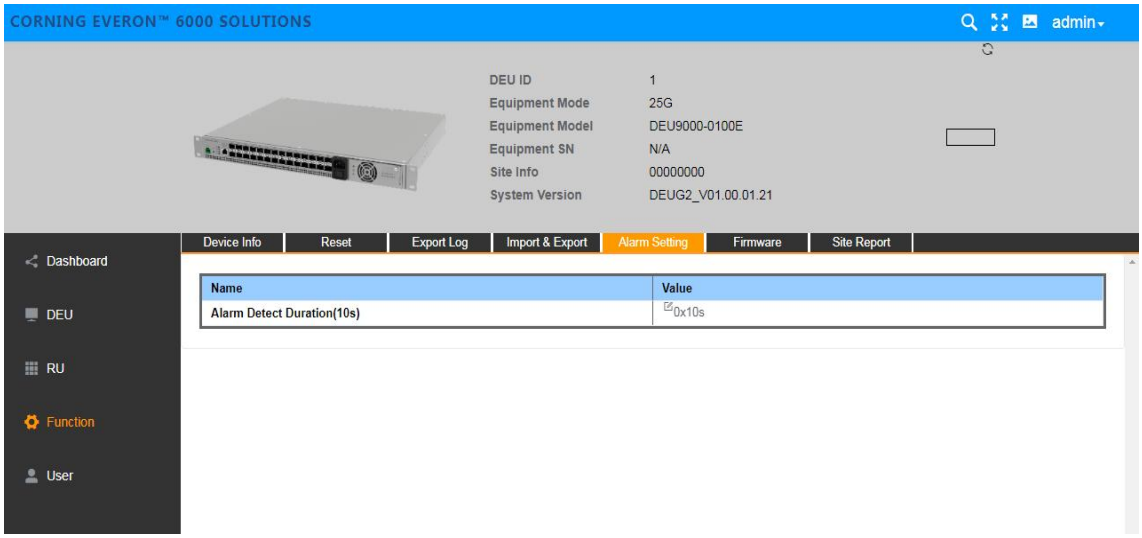


Figure 109 DEU→Function→Alarm Setting

5.3.2.6 Firmware

Click Function →Firmware and the firmware info can be viewed and upgraded.

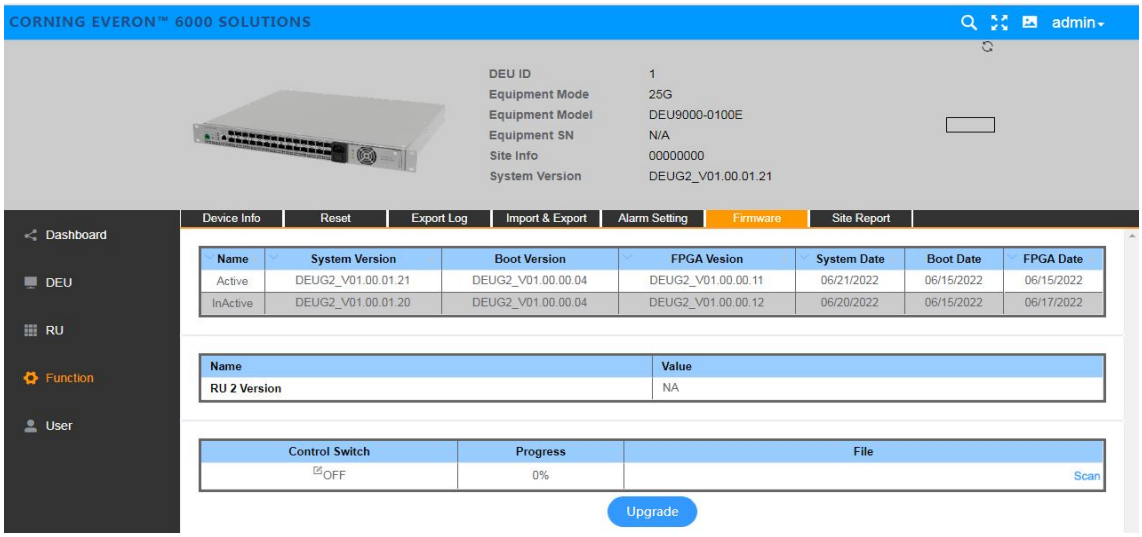


Figure 110 DEU→Function→Firmware

5.3.2.7 Site Report

Click Function→Site Report and The NE of DEU can be recognized only after the site report result is reported, as shown in the figure below:

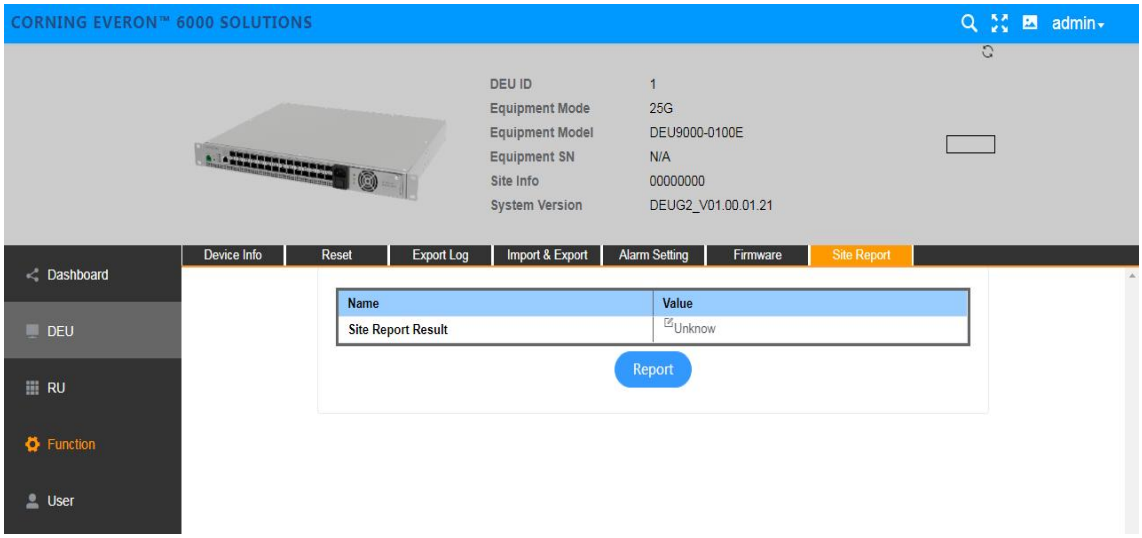


Figure 111 DEU→Function→Site Report

5.3.3 DEU -> UserInfo

5.3.3.1 Password

Click User->Password to reset DEU password, as shown in in the figure below:

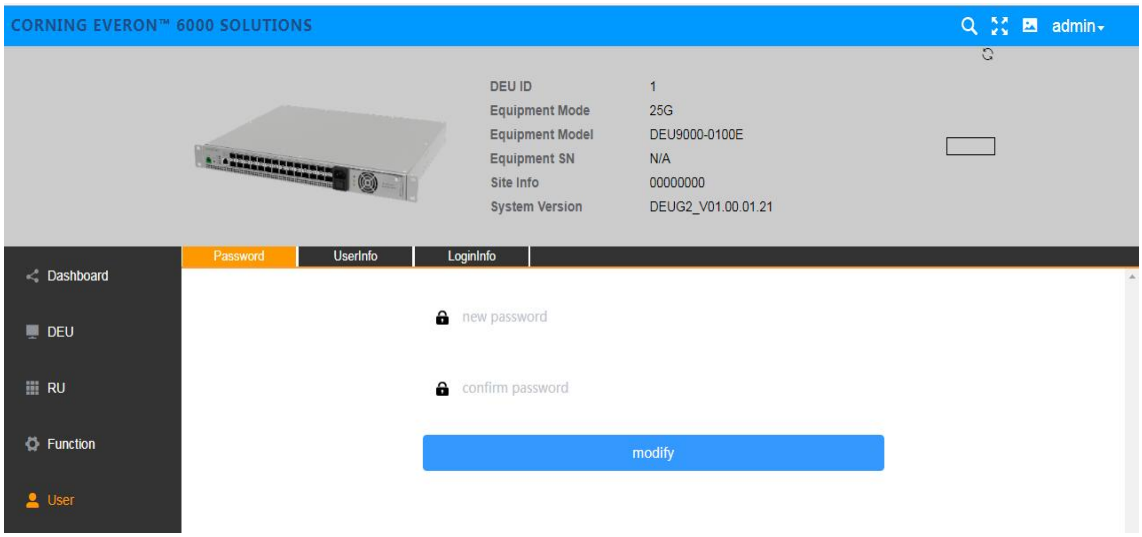


Figure 112 DEU→User→Password

5.3.3.2 UserInfo

Click User->UserInfo to add a user to set the role and password, as shown in the figure below.

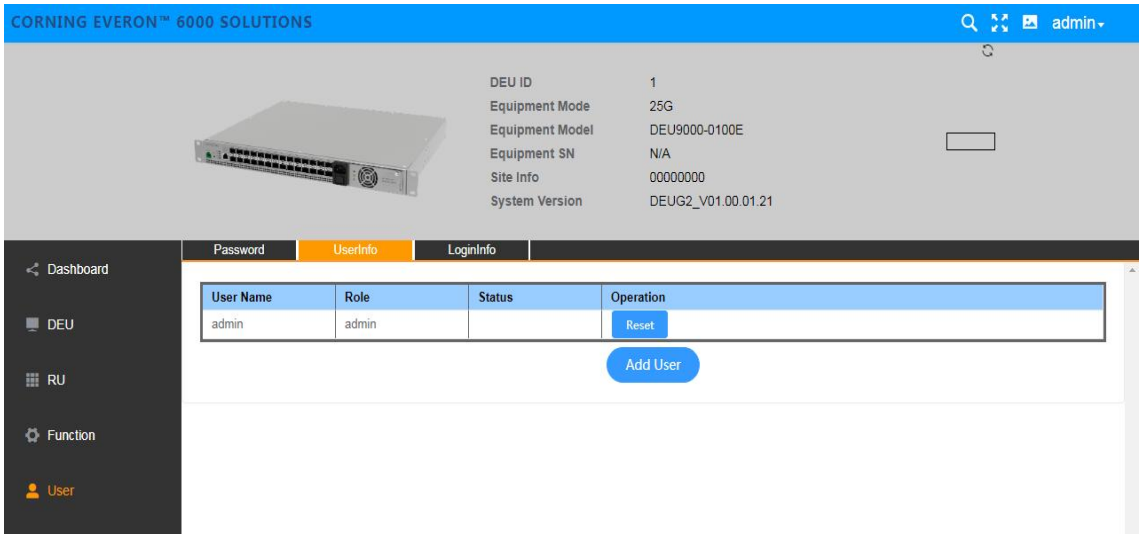


Figure 113 DEU→User→UserInfo

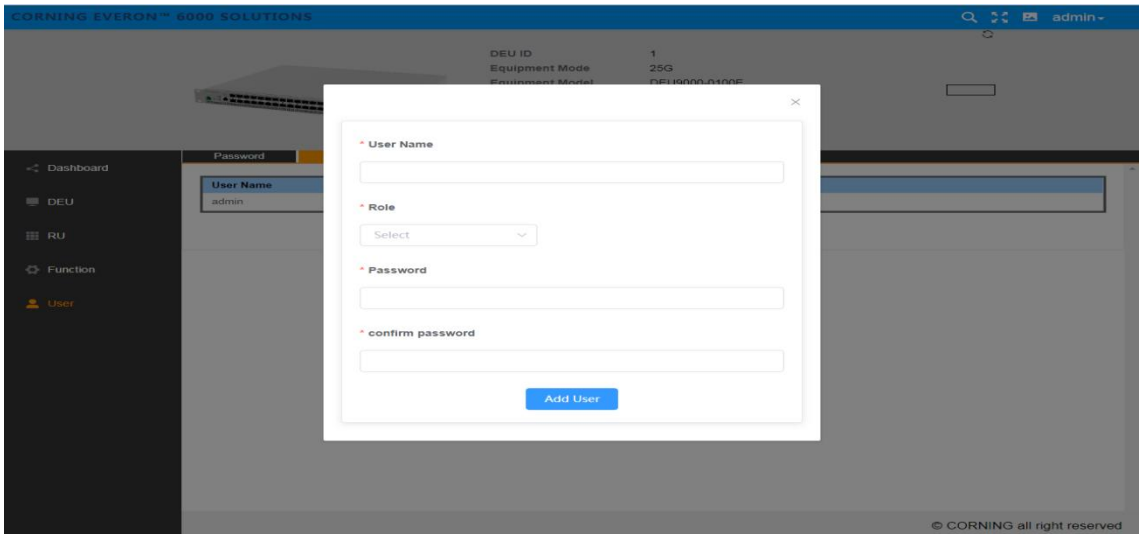


Figure 114 DEU→User→UserInfo→Add User

5.3.3.3 LoginInfo

Click User->Login Info to set the max value of entering the password, as shown in in the figure below:

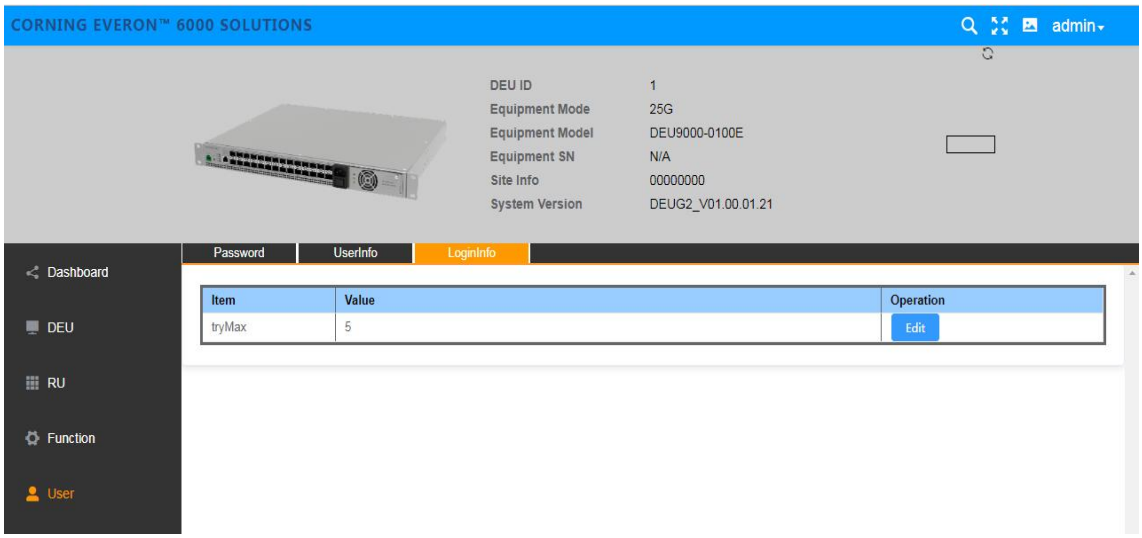


Figure 115 DEU→User→LoginInfo

5.4 dLRU Config

5.4.1 RU -> Overview&Alarm

Click RU to enter the Overview interface and view the current status of RU alarms (e.g., link Alarm).

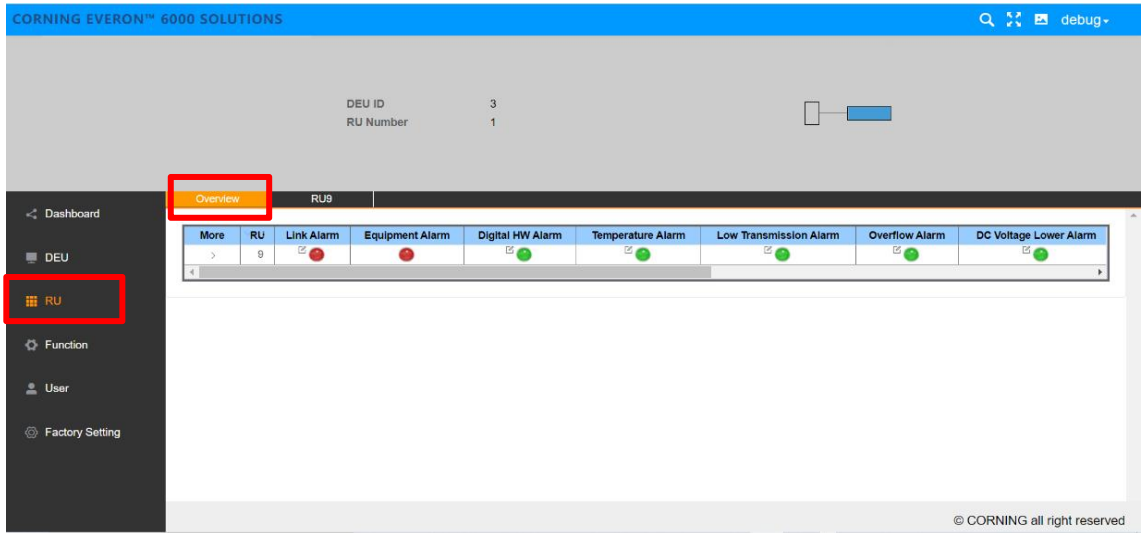


Figure 116 DEU→RU

Each alarm is defined as follows:

- Link Alarm
- RU Device Alarm
- Digital HW ALM
- Temperature Alarm
- Low Transmission Alarm
- Overflow Alarm
- DC Voltage Lower Alarm
- Drag the scroll bar to view more information (e.g., Temperature) as shown in the figure below.

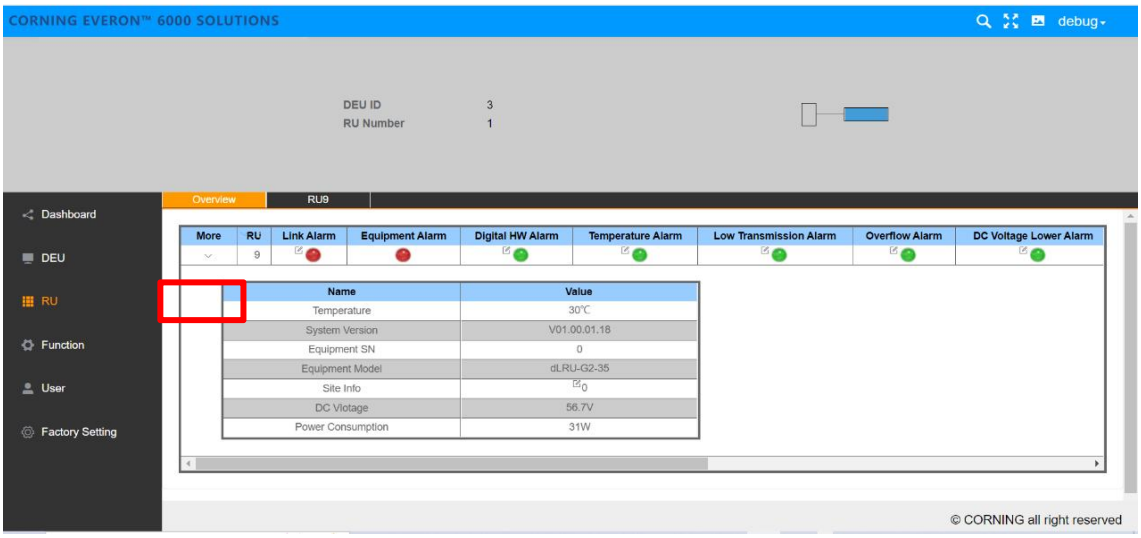


Figure 117 DEU→RU

5.4.2 RU Parameter config

5.4.2.1 OP Info

The OP Info list box displays the current optical port connection status and information reading volume of the device, as shown in the figure below:

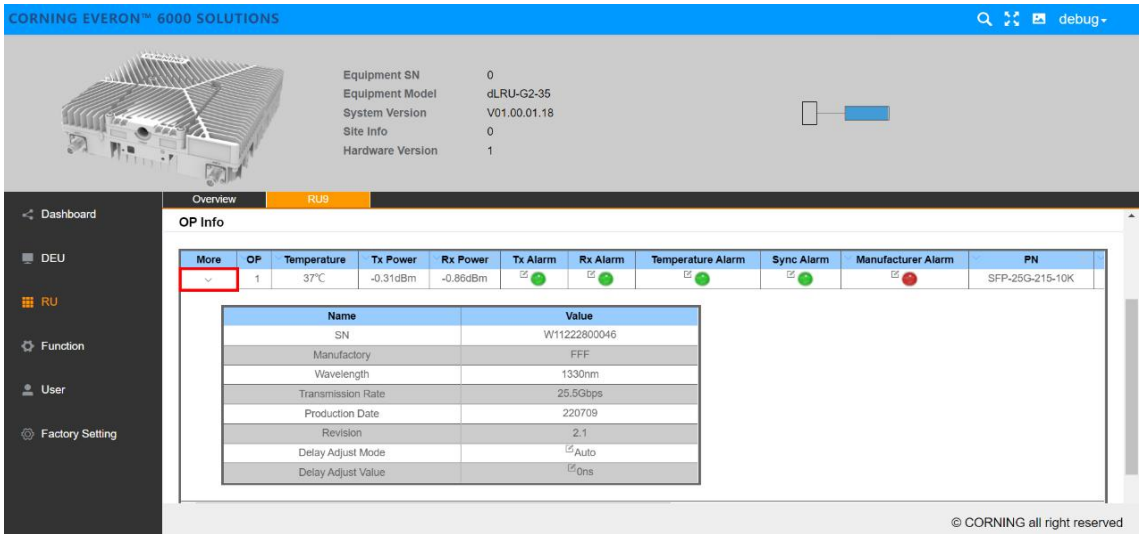


Figure 118 RU9→OP Info

5.4.2.2 RF Info

Click RU → RU01~08 to read various RF information of RU, as shown in the figure below:

SN	DCU parameter	Range	Recommend value
1	RF Switch	ON/OFF	ON
2	DL ATT	(0~20)	10
3	UL ATT	(0~20)	10
4	Work Mode	Normal DL force uplink UL force uplink	Normal

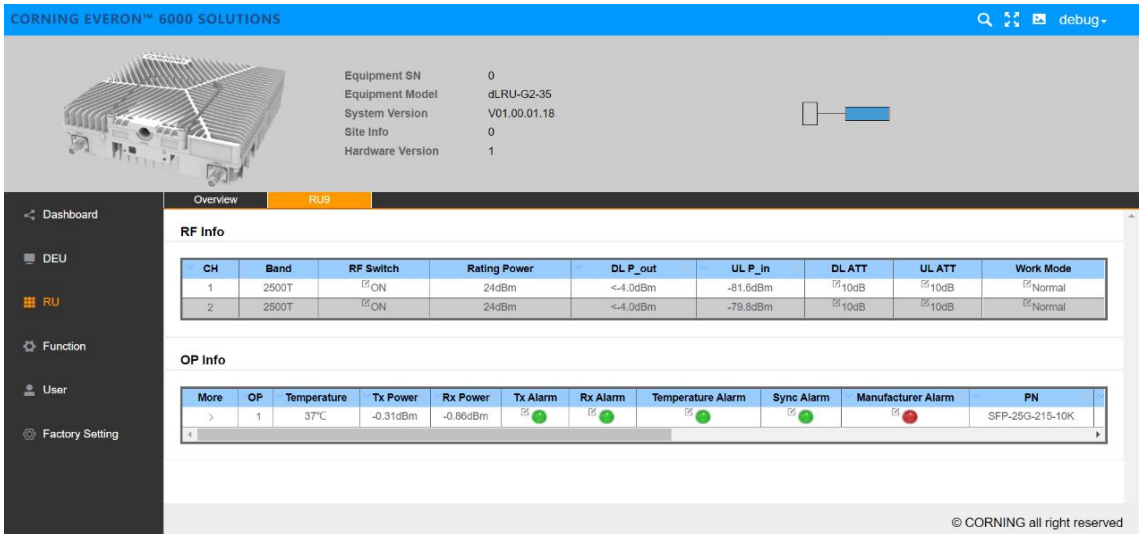


Figure 119 RF info & OP info

6. APPENDIX A: Specifications

➢ **Digital Conversion Unit (DCU-G2)**

RF donor connection: 600 MHz ~ 4000 MHz

14 x 25Gbps Optical Interface for extension/cascading

Integrated OMT & remote management system

RF Specification		
Bands	Technologies	Frequency Range (MHz)
3500 MHz	LTE/NR	TDD:3400~4000
2500 MHz	LTE/NR	TDD:2496~2690
WCS	LTE/NR	UL:2305~2315, DL:2350~2360
EAWS	LTE/NR	UL:1695~1780, DL:2110~2200
PCS	LTE/NR	UL:1850~1915, DL:1930~2020
850A	LTE/NR	UL:817~849, DL:862~894
700U	LTE/NR	UL:776~798, DL:746~768
700L	LTE/NR	UL:698~716, DL:728~746
600 MHz	LTE/NR	UL:663~698, DL:617~652
Electrical Specification		
Operation Frequency	MHz	RF Cluster 1~2: 2300~4200 MHz, TDD/FDD RF Cluster 3~4: 600~2700 MHz, TDD/FDD
Input Power Range	dBm	-7~ +3
Maximum Instantaneous Bandwidth	MHz	RF Cluster 1~2: 300 MHz RF Cluster 3~4: 200 MHz
VSWR		<1.8

Interfaces and Mechanical		
CPRI Ports		8 x SFP+ (25 Gbps) to DEU
CPRI Ports		6 x SFP+ (25 Gbps) to secondary DCU
Ethernet Ports		2 x RJ45 - local monitor, remote monitor
Ethernet Ports		2 x RJ45 - to RIU, PSU
RF ports		4 x Cluster RF connectors to donor radio head Each Cluster RF connector contains 8 simplex ports to RIU
External Synchronization		2 x QMA, 10 MHz In/Out
Dimensions (H x W x D)	Inch (mm)	3.46 x 19.09 x 15.75 (88 x 485 x 400)
Weight (approx.)	Lbs (kg)	33 (15)
Powering		48V DC or AC 220/110V
Power Consumption	Watt	250
Operating Temperature		-10°C to +45°C (14°F to 113°F)
Operating Humidity		≤ 85%
Ingress Protection		IP30
Cooling		Fan
Mounting and Installation		19-in Rack mount
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1

➢ **Distributed Extension Unit (DEU-G2)**

Radio hub/router for system extension

28 x 25 Gbps Optical Interface

Support DEU cascading

Interfaces and Mechanical		
CPRI Ports		4 x SFP+ (25 Gbps) for DEU cascading
CPRI Ports		24 x SFP+ (25 Gbps) for dLRU/dMRU/dHRU connection
Ethernet Ports		1 x RJ45 - local & remote monitor
Dimensions (H x W x D)	Inch (mm)	1.73 x 19.09 x 14.17 (44 x 485 x 360)
Weight (approx.)	Lbs (kg)	16.75 (7.6)
Power Supply		48V DC or AC 220/110V
Power Consumption	Watt	200
Operating Temperature		-10°C to +45°C (14°F to 113°F)
Operating Humidity		≤ 85%
Ingress Protection		IP30
Cooling		Fan
Mounting and Installation		19-in Rack mount
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1

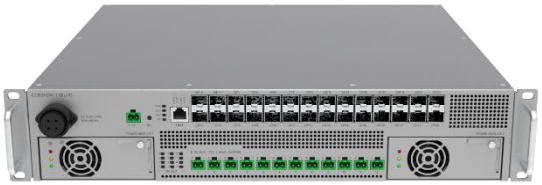
➢ **Distributed Extension Unit (DEU-G2-PS)**

Radio hub/router for system extension

28 x 25 Gbps Optical Interface

Support DEU cascading

PSU for dLRU



Interfaces and Mechanical		
CPRI Ports		4 x SFP+ (25 Gbps) for DEU cascading
CPRI Ports		24 x SFP+ (25 Gbps) for dLRU/dMRU/dHRU connection
Ethernet Ports		1 x RJ45 - local & remote monitor
Dimensions (H x W x D)	Inch (mm)	3.46 x 19.09 x 14.17 (88 x 485 x 360)
Weight (approx.)	Lbs (kg)	26.46 (12)
Power Supply		Input 48V DC or AC 220/110V PSU output : 48V DC (works with AC 220/110V input)
Power Consumption	Watt	1500
Operating Temperature		-10°C to +45°C (14°F to 113°F)
Operating Humidity		≤ 85%
Ingress Protection		IP30
Cooling		Fan
Mounting and Installation		19-in Rack mount
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1

7. APPENDIX B: LED Functionality and Colour Definition

Table 18. Optical LED definition

		Green	Amber
		(SYNC)	(LOS)
SFP Plug out	SFP Plug out	OFF	OFF
Optic Link Fail	1. Optic cable disconnected	OFF	ON
	2. SFP fail	OFF	ON
	2.1 SFP fault	OFF	ON
	2.2 SFP warning	OFF	ON
	2.3 SFP alarm	OFF	ON
	3. CPRI link down	OFF	ON
Optic Link Ok	1. Optic cable connected	ON	ON
	2. SFP ok	ON	ON
	3. CPRI link down	ON	ON
CPRI Link Ok	1. Optic cable connected	ON	OFF
	2. SFP ok	ON	OFF
	3. CPRI link up	ON	OFF

Table 19. ALM/RUN/Power LED definition

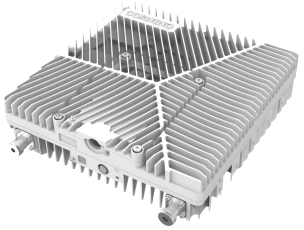
LED	Description	Color
ALM	1.Alarm	Red
	2.Device detect (Identify and is controlled from DCU)	Red Flash (1Hz, 10s)
	3.No alarm	OFF
RUN	1.The system is up and running	Green Flash(1Hz)
	2.Software or hardware failure	OFF
Power	1.Power on	Green
	2.Power off	OFF

➢ **Digital Low-power Remote Units-2.5G (dLRU-G2-25)**

194 MHz IBW with 2T2R MIMO

1 x 25 Gbps Optical Interface to DEU

Compact design for easy installation



RF Specification		
Frequency Range	MHz	2496-2690
Max. Operating Bandwidth-Noncontiguous		Full band
Unit Configuration		2T2R
Instantaneous Bandwidth	MHz	194
Downlink Output Power	dBm	23
Attenuator Adjustable Range (1dB step)	dB	0-20
Channel Bandwidth	MHz	10/20/40/60/80/100
Uplink Noise Figure (typical)	dB	8
Uplink IIP3 (typical)	dBm	-12
VSWR		≤ 1.6
EVM (256 QAM) (TM3.1A @ Rated power)	%	< 3.5
Spurious Emission		3GPP TS 36.106; 3GPP TS 38.104 V15.5.0 (sections 6; 7)
Interfaces and Mechanical		
CPRI Port		1 x SFP+ (25 Gbps) to DEU
Antenna Ports		2 x 4.3-10 female to external antenna
Dimensions (W x H x D)	Inch (mm)	10.6 x 10.6 x 2.95 (270 x 270 x 75)

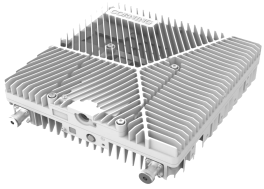
Weight (approx.)	Lbs (kg)	11 (5)
Powering		48V DC
Power Consumption	Watt	65
Operating Temperature		-40°C to +55°C (-40°F to 131°F)
Operating Humidity		≤ 95%
Ingress Protection		IP66
Cooling		Convection
Mounting and Installation		Ceiling/Wall/Shell
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1
Radio		FCC CFR 47, Part 27

➢ **Digital Low-power Remote Units High Band (dLRU-G2-35)**

530 MHz IBW with 2T2R MIMO

2 x 25 Gbps Optical Interface to DEU

Compact design for easy installation



RF Specification		
Frequency Range	MHz	3450-3980
Max. Operating Bandwidth-Noncontiguous		Full band
Unit Configuration		2T2R
Instantaneous Bandwidth	MHz	530
Downlink Output Power	dBm	27
Attenuator Adjustable Range (1dB step)	dB	0-20
Channel Bandwidth	MHz	10/20/40/50/60/80/100
Uplink Noise Figure (typical)	dB	8
Uplink IIP3 (typical)	dBm	-12
VSWR		≤ 1.6
EVM (256 QAM) (TM3.1A @ Rated power)	%	< 3.5
Spurious Emission		3GPP TS 36.106; 3GPP TS 38.104 V15.5.0 (sections 6; 7)

Interfaces and Mechanical		
CPRI Port		2 x SFP+ (25 Gbps) to DEU
Antenna Ports		2 x 4.3-10 female to external antenna
Dimensions (W x H x D)	Inch (mm)	10.6 x 10.6 x 2.95 (270 x 270 x 75)
Weight (approx.)	Lbs (kg)	11 (5)
Powering		48V DC
Power Consumption	Watt	75
Operating Temperature		-40°C to +55°C (-40°F to 131°F)
Operating Humidity		≤ 95%
Ingress Protection		IP66
Cooling		Convection
Mounting and Installation		Ceiling/Wall/Shell

Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1
Radio		FCC CFR 47, Part 27

➢ **Digital Medium-power Remote Unit-2.5GHz (dMRU-G2-25)**

194 MHz IBW with 2T2R MIMO

1 x 25 Gbps Optical Interface to DEU

Compact design for easy installation

RF Specification		
Frequency Range	MHz	2496-2690
Max. Operating Bandwidth-Noncontiguous		Full band
Unit Configuration		2T2R
Instantaneous Bandwidth	MHz	194
Downlink Output Power	dBm	39
Attenuator Adjustable Range (1dB step)	dB	0-20
Channel Bandwidth	MHz	10/20/40/60/80/100
Uplink Noise Figure (typical)	dB	6
Uplink IIP3 (typical)	dBm	-12
VSWR		≤1.5
EVM (256 QAM) (TM3.1A @ Rated power)	%	< 3.5
Spurious Emission		3GPP TS 36.106; 3GPP TS 38.104 V15.5.0 (sections 6; 7)
Coupling value	dB	35

Interfaces and Mechanical		
CPRI Port		1 x SFP+ (25 Gbps) to DEU
Antenna Ports		2 x 4.3-10 female to external antenna
Coupling port		2 x QMA for testing
Dimensions (W x H x D)	Inch (mm)	17.3 x 3.5 x 14.6 (440 x 88 x 370)
Weight (approx.)	Lbs (kg)	30.8 (14)
Powering		AC 220/110V
Power Consumption	Watt	140
Operating Temperature		-40°C to +55°C (-40°F to 131°F)
Operating Humidity		≤ 95%
Ingress Protection		IP65
Cooling		Convection Fan (Optional for extreme cases)
Mounting and Installation		Wall/19-in Rack mount
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1
Radio		FCC CFR 47, Part 27

➢ **Digital Medium-power Remote Unit High Band (dMRU-G2-35)**

530 MHz IBW with 2T2R MIMO

2 x 25 Gbps Optical Interface to DEU

Compact design for easy installation

RF Specification		
Frequency Range	MHz	3450-3980
Max. Operating Bandwidth-Noncontiguous		Full band
Unit Configuration		2T2R
Instantaneous Bandwidth	MHz	530
Downlink Output Power	dBm	40
Attenuator Adjustable Range (1dB step)	dB	0-20
Channel Bandwidth	MHz	10/20/40/50/60/80/100
Uplink Noise Figure (typical)	dB	8
Uplink IIP3 (typical)	dBm	-12
VSWR		≤1.5
EVM (256 QAM) (TM3.1A @ Rated power)	%	< 3.5
Spurious Emission		3GPP TS 36.106; 3GPP TS 38.104 V15.5.0 (sections 6; 7)
Coupling value	dB	35

Interfaces and Mechanical		
CPRI Port		1 x SFP+ (25 Gbps) to DEU
Antenna Ports		2 x 4.3-10 female to external antenna
Coupling port		2 x QMA for testing
Dimensions (W x H x D)	Inch (mm)	17.3 x 3.5 x 14.6 (440 x 88 x 370)
Weight (approx.)	Lbs (kg)	33 (15)
Powering		AC 220/110V
Power Consumption	Watt	250
Operating Temperature		-40°C to +55°C (-40°F to 131°F)
Operating Humidity		≤ 95%
Ingress Protection		IP65
Cooling		Convection Fan (Optional for extreme cases)
Mounting and Installation		Wall/19-in Rack mount
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1
Radio		FCC CFR 47, Part 27

➢ **Radio Interface Unit-2.5 GHz (RIU-G2-25)**

8 input ports for donor RF signal connection

Active ATT, input power detection & ALC protection for RF module

Max. input power of 37 dBm/port

RF Specification			
Frequency Range		MHz	2496-2690 (LTE/NR)
Downlink Input Power		dBm	-10~37
Insert Loss	Downlink	dB	30
	Uplink	dB	40
ATT Adjustable Range (1dB step)		dB	0-25
Return Loss		dB	≤ -15
Interfaces and Mechanical			
RF input ports			8 x QMA (Duplexer) to donor signal
RF Output ports			8 x QMA (Simplex) to DCU
Ethernet Ports			2 x RJ45 - Upper cascade / Lower cascade
Dimensions, H x W x D		Inch (mm)	1.73 x 19.09 x 14.2 (44 x 485x 360)
Weight (approx.)		Lbs (kg)	13.2 (6)
Powering			48V DC
Power Consumption		Watt	20
Operating Temperature			-10°C to +45°C (14°F to 113°F)
Operating Humidity			≤ 85%

Ingress Protection		IP30
Cooling		Fan
Mounting and Installation		19-in Rack mount
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1

➢ **Radio Interface Unit-3.5 GHz (RIU-G2-35)**

8 input ports for donor RF signal connection

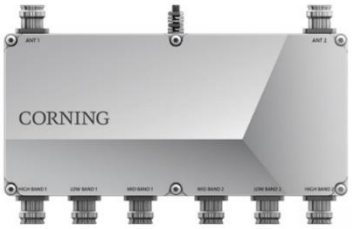
Active ATT, input power detection & ALC protection for RF module

Max. input power of 37 dBm/port

RF Specification			
Frequency Range		MHz	3400-4000 (LTE/NR)
Downlink Input Power		dBm	-10~37
Insert Loss	Downlink	dB	30
	Uplink	dB	40
ATT Adjustable Range (1dB step)		dB	0-25
Return Loss		dB	≤ -15
Interfaces and Mechanical			
RF input ports			8 x QMA (Duplexer) to donor signal
RF Output ports			8 x QMA (Simplex) to DCU
Ethernet Ports			2 x RJ45 - Upper cascade / Lower cascade
Dimensions, H x W x D		Inch (mm)	1.73 x 19.09 x 14.2 (44 x 485x 360)
Weight (approx.)		Lbs (kg)	13.2 (6)
Powering			48V DC
Power Consumption		Watt	20
Operating Temperature			-10°C to +45°C (14°F to 113°F)
Operating Humidity			≤ 85%

Ingress Protection		IP30
Cooling		Fan
Mounting and Installation		19-in Rack mount
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1

➢ **Antenna Multiplexer (COMB-G2-FDD-25-35)**



6-in/2-out multiplexer for 2X2 MIMO

6 input ports for low, medium, and high band remote radio unit connection

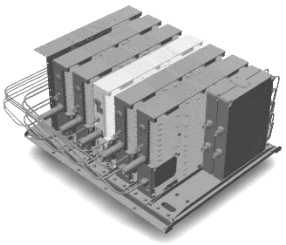
2 output ports for antenna connection

Compatible with both low- and medium-power remote radio unit

Electrical Characteristics				
Port		Port1, Port4 (FDD Bands)	Port2, Port5 (2.5 Band)	Port3, Port6 (3.5 Band)
Frequency Range	MHz	617-2360	2496-2690	3450-4000
Bandwidth	MHz	1743	194	550
Insert Loss	dB	≤0.6(25°C) ≤1(-40 to +85°C)	≤0.6(25°C) ≤1(-40 to +85°C)	≤0.6(25°C) ≤1(-40 to +85°C)
Pass Band Ripple	dB	≤0.5	≤0.5	≤0.5
Out of Band Attenuation	dB	≥50@2496-2690 ≥50@3450-4000	≥50@617-2360 ≥50@3450-4000	≥50@617-2360 ≥50@2496-2690
Maximum Input Power (Per Port, Average)	W	50	15	15
PIM	dBc	-155 (@ 2x10W)		
Return Loss	dB	≥18		
Isolation	dB	≥40		
Port Type		4.3-10 F		
Impedance	Ω	50		
Mechanical Characteristics				

Dimensions, H x W x D	Inch (mm)	10.6 x 6.6 x 1.6 (270 x 168 x 41)
Weight (approx.)	Lbs (kg)	4.8 (2.2)
Operating Temperature		-40°C to +85°C (-40°F to 185°F)
Ingress Protection		≤ 95%
Environmental		IP66
Regulation		
EMC		EMC FCC 47 CFR Part 15 sub part B
Safety		UL62368-1

- **HRU -High-Power Remote Unit**
- **System performance (Head End to High power Remote Unit)**



RF										
Frequency Range Name			**600**	**700L & 700U & FirstNet**		**800 /850**	**1900**	**EAWS**	**WCS**	**2500**
Frequency Range	Uplink	MHz	663-698	698-716	777-798	817-849	1850-1915	1695-1780	2305-2315	2496-2690
	Downlink		617-652	728-746	746-768	862-894	1930-1995	2110-2180	2350-2360	
Max. Operating Bandwidth-Non-contiguous	MHz		Full Band							
Instantaneous Bandwidth	MHz		35	18	21	32	65	70	10	100
Downlink Output Power	dBm		43	43		43	43	43	43	43
Attenuator Adjustable Range (1 dB step)	dB		0-20							
Pass Band Ripple (p-p)	dB		≤ 4							
Channel Bandwidth	MHz		5/10/15/20							5/10/15/20 for 4G 40 or 60 for 5G
Uplink Noise Figure (typical)	dB		6							
Uplink IIP3 (typical)	dB		-20							
VSWR			≤ 1.8							

EVM (256 QAM) (TM3. 1A@ Rated power)	%	< 3.5	
Spurious Emission		3GPP TS 36.106/25.106; 3GPP TS 38.104 V 15. 5. 0 (sections 6; 7)	
Electrical Specifications			
Power Consumption (Typical)	Watt	OEU (Optical Expansion Unit) – connected to RFU's	50
		RFU (RF Unit) – MIMO 2:2 for the bands 600,700,800/850, 1700. 1900, 2300, 2500TDD	220
AC voltage	AC	100-240	

Interfaces and Mechanical			
CPRI Port		4, SFP+ 10. 1Gbps	
Antenna Ports		1 ,4.3-10 female	
Dimension (W x H x D)	Inch (mm)	OEU	14.6 x 3.2 x 13.8 (370 x 80 x 355)
		RFU except 700	19.7 x 3.2 x 13.8 (500 x 80 x 355)
		RFU 700	19.7 x 4. 8 x 13.8 (500 x 121 x 355)
Mounting and installation		Wall mount	
Weight	Lbs (Kg)	OEU	26.4 (12)
		RFU except 700	39.6 (18)
		RFU 700	44 (20)
Cooling		Convection	
Environmental			
Operational Temperature	°F (°C)	-40° to 131° (-40° to 55°)	
Outdoor installation (Ingress Protection)		IP 65	

*Technical specs are subject to change without notice

Low Bands Combiner specifications The Low band combiner is designed to combine the following services :600MHz,700MHz, 800/850MHz and high frequencies from the Medium Band combiner					
Frequency Name		**600**	**700**	**800/850**	**High Freq**
Port Name		Port 1	Port 2	Port 3	Port 4
Frequency Range	MHz	617-716	728-798	817-894	1695-2690
Insertion Loss	dB	≤0.3			
Port Isolation	dB	≥50			
Return Loss	dB	≤20			
Pass band ripple	dB	≤0.2			
PIM	dBc	≤155@2×43dBm			
Power Capacity	Watt	250 per port			
Interface					
Connector		4.3-10 Mini DIN-Female			

*Technical specs are subject to change without notice.

Medium Bands Combiner specifications The medium band combiner is designed to combine the services: 1900, EAWS, WCS and 2.5GHz. If a single module is required, a single input (2500) is used. If 2 * 2.5GHz RF modules are used (to support 4G and 5G services), 2 inputs are required (2500 IN1 and 2500 IN2) .								
Frequency Name			**1900**	**EAWS**	**WCS**	**2500**	**2500 IN1**	**2500 IN 2**	**2500 OUT**
Port Name			Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port7
Frequency Range		MHz	1850-2020	1695-1780 2110-2200	2305-2360	2496-2690			
Insertion Loss	dB		≤ 0.3				≤3.3		
Port Isolation	dB		≥50				≥20, 2500 IN1 to 2500 IN2 ≥50 to other ports		
Return Loss	dB		≤20						
Pass band ripple	dB		≤ 0.2						
PIM	dB		≤155@2 ×43 dBm						
Power Capacity	Watt		250 per port						
Interface									
Connector			4.3-10 Mini DIN-Female						

*Technical specs are subject to change without notice.