



Start-up and Configuration

Start-up & Configuration Manual K-BOW Platform 2
English



INDOO

KATHREIN

1. Product introduce

The Remote Unit (REU) which is mainly used in a Capacity distribution System, Including the power supply module, a digital board, PA module, and DUP module.

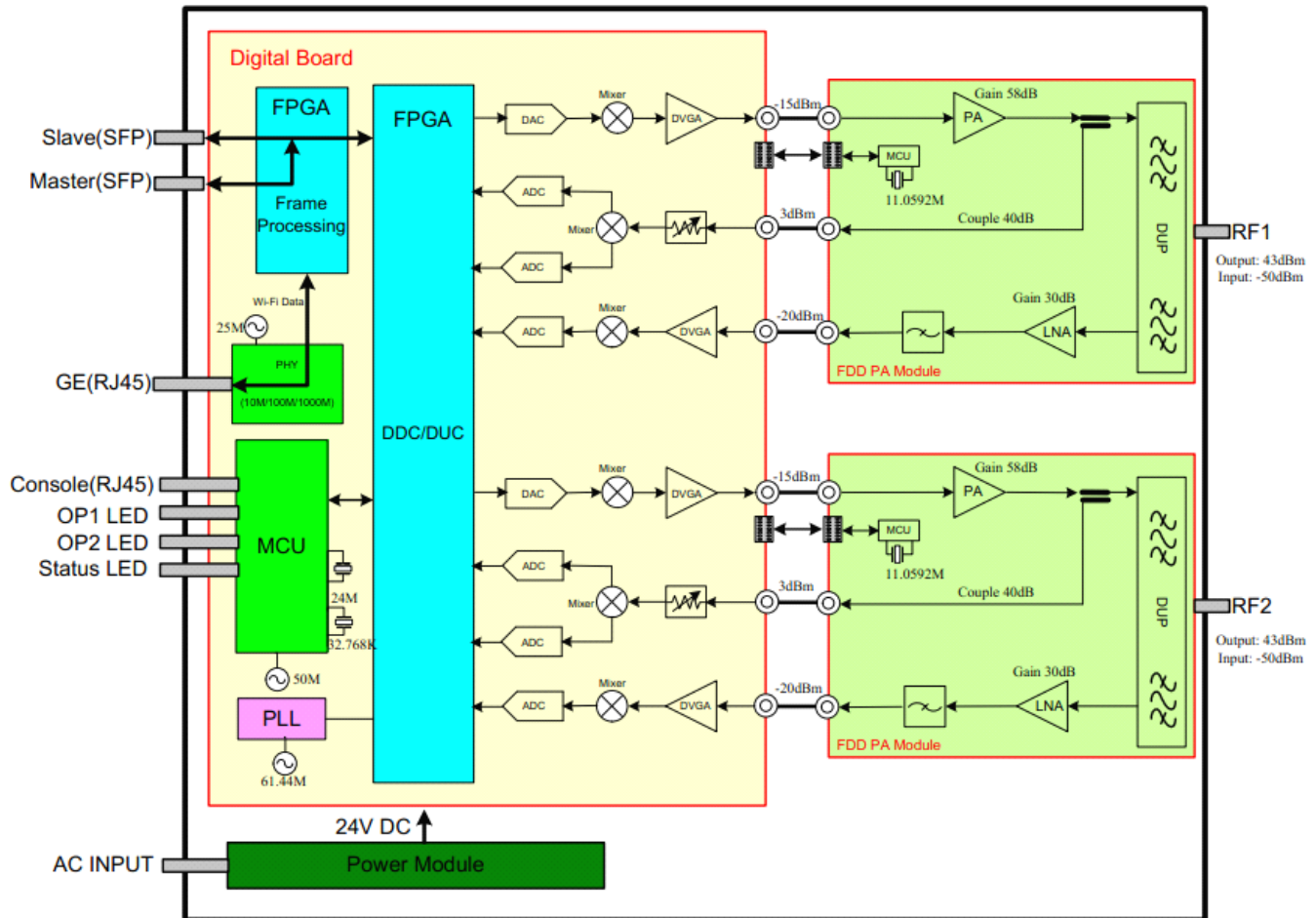


Figure 1 Block Diagram

2. System Description

2.1. Overview

The Capacity distribution system includes the Access Unit (CHU), Expansion Unit (EHU) and Remote Unit (REU). Using digital processing and digital optical transmission technology, the CHU frames radio-frequency signals from base stations of different operators, and of different standards and frequency bands, and transmits the composite signal to the EHU. WLAN and small cell base station signals access the gigabit/megabit Ethernet port on the EHU and are reframed with optical signals from the CHU and then transmitted to the REU. The REU conducts digital-analog conversion and power amplification of the input signals and then achieves radio coverage through the antenna-feeder system for signals of all standards and frequency bands.

2.2. Operating Fundamentals

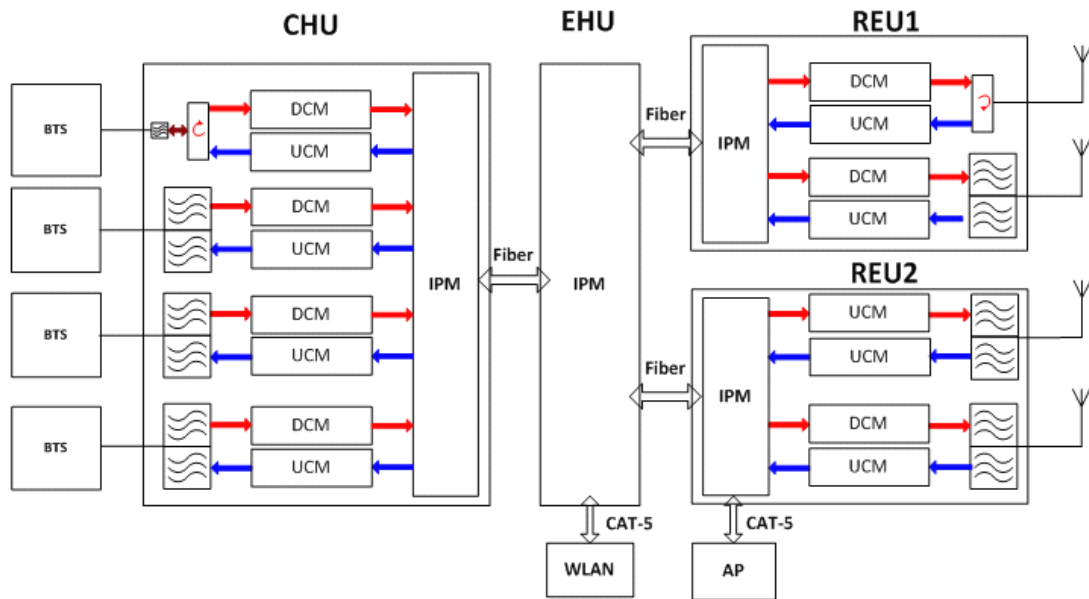


Figure 2 Operating Fundamentals

- Interface Processing Module (IPM): Interface switch and protocol analysis.
- Downlink Channel Module (DCM): The CHU terminal (upper layer of the DCM) converts RF signals into digital signals and includes filtration and ADC conversion. The REU terminal (lower layer of the DCM) converts digital signals into RF signals and includes DAC conversion and IQ modulation.
- Uplink Channel Module (UCM): The REU terminal (upper level of the UCM) converts RF signals into digital signals and includes filtration and ADC conversion. The CHU terminal (lower level of the UCM) converts digital signals into RF signals and includes DAC conversion and IQ modulation.

WARNING: Antenna gain should not exceed 7 dBi.

2.3. ALC Function

The system continuously monitors the input power.

Once the detected input power is greater than nominal input power (0dBm for downlink and -50dBm for uplink), the signal will be reduced to nominal input power by automatically adjusting attenuation, if the attenuator is adjusted for maximum, shut down downlink.

Note: NO AGC function in CAPACITY DISTRIBUTION SYSTEM.

2.4. RF technical specification

ELECTRICAL SPECIFICATION			
Maximum RF Modules per HP-RU		2	
AC Power		100-240vAC, 50/60Hz	
VSWR		1.5:1	
Modulation Accuracy UTRA		< 10% RMS	
Modulation Accuracy E-UTRA		< 8% RMS	
Frequency Error		< ± 0.01 ppm	
Gain Flatness		< ±2dB	
Ripple		< 4dB	
Electromagnetic Compatibility/Interference (EMC/EMI)		EN 301 489-1, EN 301 489-50	
Forward Path (Downlink)			
Output Power per Carrier			
Maximum Gain		+43±2dB	
Manual Gain Control		> 15dB@ 1dB/step	
System Delay (1*C-HUB+1*E-HUB+1*HP-RU)		14µS	
Reverse Path (Uplink)			
Maximum Output Power		-7dBm	
Maximum Gain		+43±2dB	
Maximum Input Power		-25dBm	
Manual Gain Control		> 15dB@ 1dB/step	
System Delay (1*C-HUB+1*E-HUB+1*HP-RU)		14µS	
Noise Figure @ Max. Gain		6dB	
Frequency Information			
Module	3GPP Band	Downlink	Technology
700A	12	728-746M; 698-716M	FDD-LTE
700B	13	746-757M; 776-787M	FDD-LTE
850	5	869-894M; 824-849M	CDMA, UMTS, HSPA+, FDD-LTE
	26	859-894M; 814-849M	
AWS	4	2110-2155M; 1710-1755M	UMTS, HSPA+, FDD-LTE
	10	2110-2170M; 1710-1770M	
1800	3	1805-1880M; 1710-1785M	UMTS, HSPA+, FDD-LTE
PCS	25	1930-1995M; 1850-1915M	CDMA, UMTS, HSPA+, FDD-LTE
2100	1	2110-2170M; 1920-1980M	UMTS, HSPA+
WCS	30	2350-2360M; 2305-2315M	FDD-LTE
2600	7	2620-2690M; 2500-2570M	UMTS, HSPA+, FDD-LTE

3. OMT Operation

3.1. SET IP ADDRESS OF COMPUTER

In the CAPACITY DISTRIBUTION SYSTEM, the Master CHU is defined as the host, with the other CHUs, EHUs and REUs defined as slaves. The Master CHU default IP address is "10.7.3.200", while the slaves have no fixed IP address. The IP addresses of the slaves are assigned by the host automatically, based on the network topology.

IP address of computer has to be set in the same subnet and the default gateway of computer has to be set to IP address of CHU. Figure 4 shows an example as "10.7.3.1","255.0.0.0","10.7.3.200"

Note: It's strongly recommended to keep the Master CHU IP address in default value.

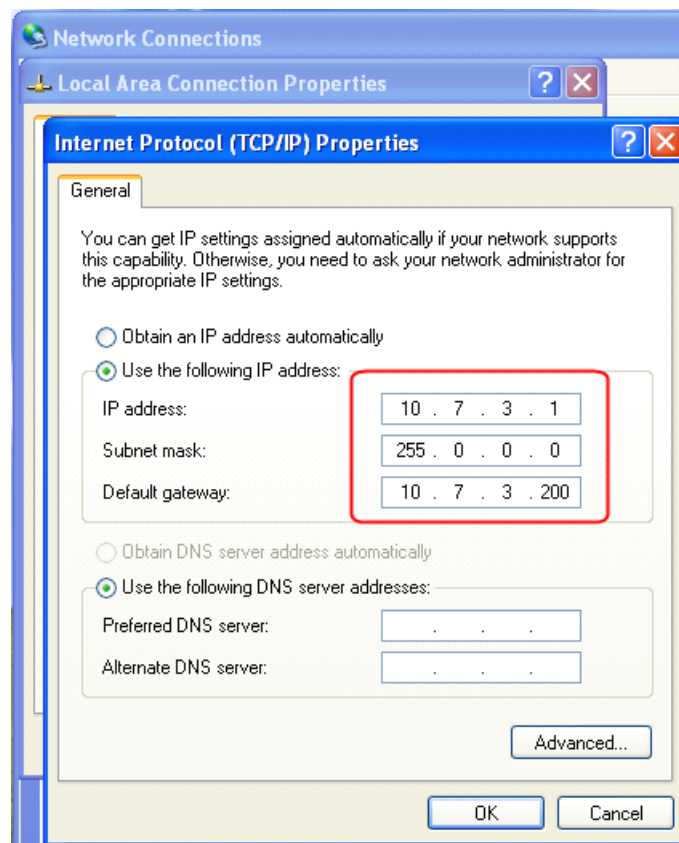


Figure 3 Set IP address of computer

3.2. CONNECT DEVICE VIA OMT on Master CHU

Connect the computer to the **OMC** port on Master CHU via STP. Check the status of the Local Area Connection and confirm the connection is connected.

The interface to the OMT is WebOMT. WebOMT is based on a web browser and is compatible with most common browsers such as IE and Google Chrome. Open a browser window and enter the default gateway in the navigation bar. This will access the WebOMT page. Figure 5 shows an example using 10.7.3.200 as the default gateway.

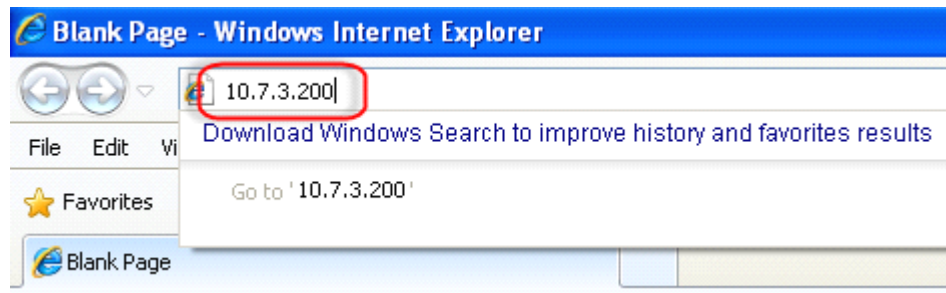


Figure 4 Connect Device via OMT on Master CHU

3.3. LOGIN AND HOMEPAGE INTRODUCTION

Input **User Name (default username: admin)** and **Password (default password: admin)**. Click **Sign in**. See the figure below for details.

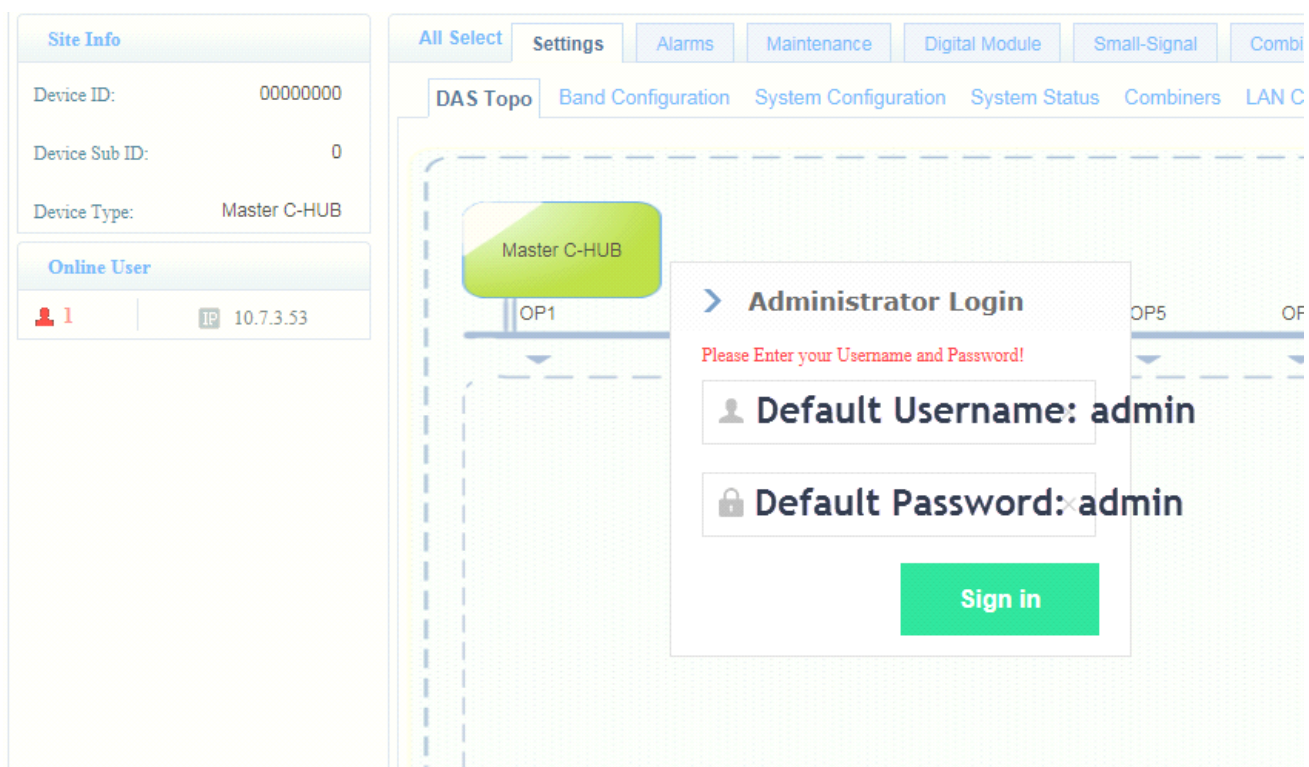


Figure 5 User Name and Password for Login

After log in, the OMT homepage will appear.

The OMT homepage includes the following buttons, tabs and fields (refer to corresponding numbers in Figure 7):

1. **Site Info:** Includes "Site ID", "Site Sub ID", "Dev Type" and "Dev Name" information.
2. **ScreenShot:** Used for saving the current parameter information and device operating status.
3. **Logs:** Records the operating status of the devices. The logs can be downloaded and deleted from this page. To ensure that the correct log has been selected, check the filename and date before downloading the file.
4. **Upgrading:** Used to upgrade the software.
5. **Register:** This function is not relevant for maintenance activities.
6. **Configuration:** Button that used for parameters configuration.
7. **Operation interface:** Queries status and sets parameters.
8. **Online User:** Shows the number of users that are currently connected to the OMT and the IP address of each user's

device.

10. **Parameters:** Tabs that access pages that display and allow setting of device parameters. The default displays the connection diagram of the system.
11. **Parameter configuration field:** Buttons that show/hide the parameter ID number & checkbox and save configuration parameters.
12. **Log out:** Button that used for logging out.
13. **Users:** Button that used for user management.

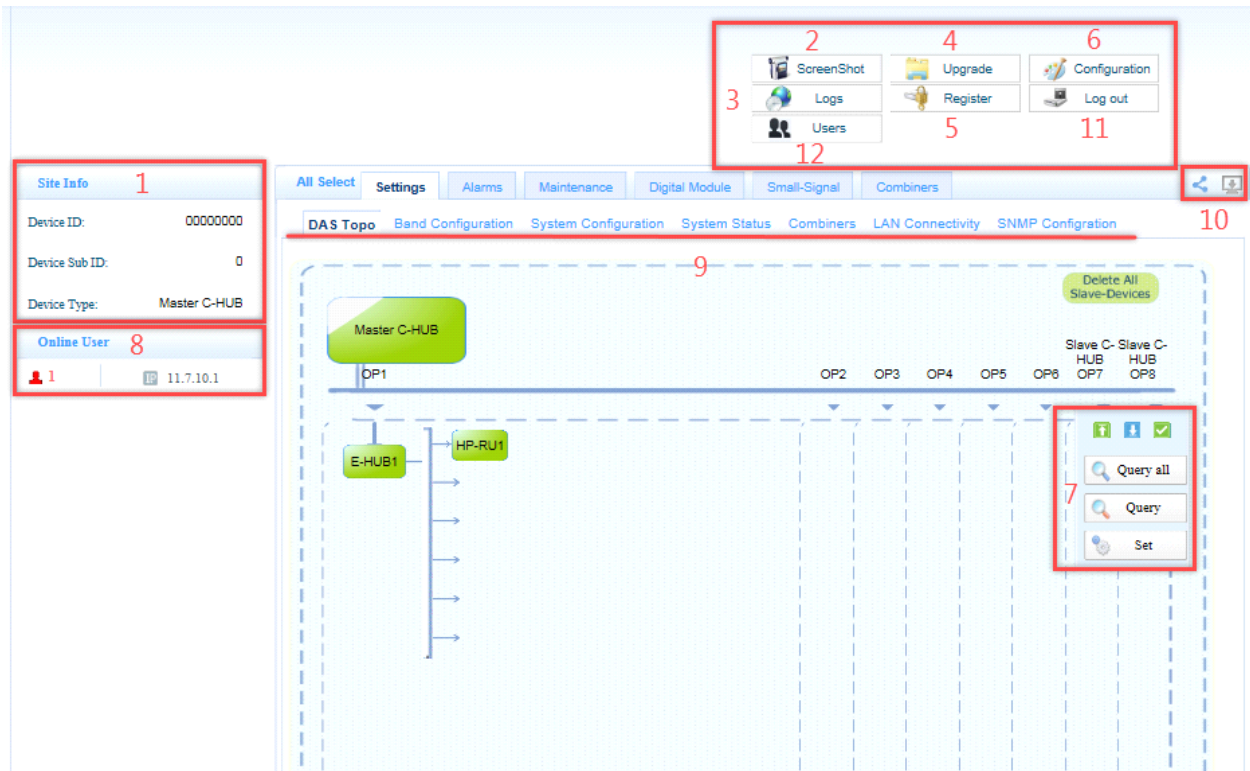


Figure 6 OMT Homepage

3.4. CANNEL PROPERTIES CONFIGURATION

According to the different base station operating frequency bands for each operator, select the passive RF modules for the CHU and active RF modules for the REU with the corresponding frequency band and set the module properties in the WebOMT of the Master CHU. The limits of the uplink and downlink operating frequency bands correspond to the effective RF range of the selected RF modules.

To set the module properties (see Figure 8):

1. In the WebOMT, select the **Settings** tab.
2. Select the **Band Configuration** sub-tab on the **Settings** page.
3. Set the CB1 and CB2 bandwidth of modules 1, 2, 3 and 4. (See #1 in Figure 8.)
4. Set the UL and DL centre frequencies for each carrier bundle of signals 1, 2, 3 and 4. (See #1 in Figure 8.)
5. Click **Set** to validate the parameter values. (See #3 in Figure 8.) Ensure the value of **Module1~4 Info Check** is **valid**.
6. In the **General** section, set **Band Configuration Update** to "Update". (See #2 in Figure 8.)

Note: The maximum bandwidth per operating band should be less than 80MHz and the maximum bandwidth for all operators should be less than 280 MHz

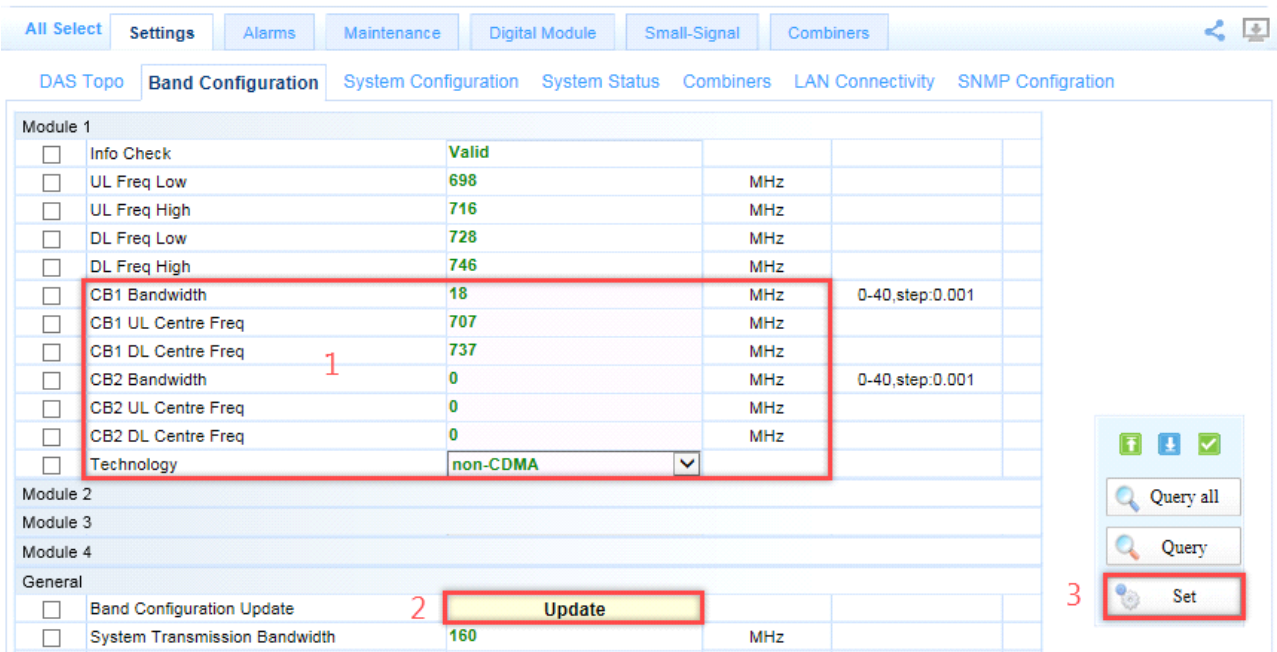


Figure 7 Module Properties Configuration

3.5. MODULE GAIN ADJUSTMENT

After setting the module properties, access the RF signals. In the CAPACITY DISTRIBUTION SYSTEM, the nominal downlink input power of the CHU is 0dBm and the maximum allowable input power is 15dBm. Therefore, before accessing the RF signals, estimate the signal power. Monitor the downlink input power with a spectrum analyser or read the downlink input power value from the “Combiners” on the WebOMT in order to set the downlink input power within the appropriate range.

To adjust gain on CHU WebOMT (see Figure 10):

- 1) In the **CHU** WebOMT, select the **Settings** tab.
- 2) Select the **Combiners** sub-tab on the **Settings** page.
- 3) Check the input power value of the port which signals input in by clicking **Query All**. See Figure 10 for active combiner ports.
- 4) Set the attenuation value. For example, if the input power value of port 1 of Module 1 is 3.499 dBm, then enters 3.50 attenuation in **Port 1 Attenuation** and click **set** to confirm.

Note: The range of Port X attenuation value is 0—15dB.

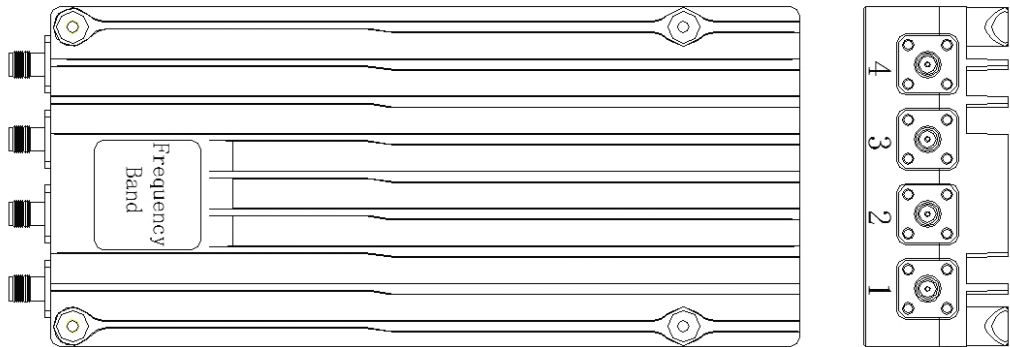


Figure 9 Active Combiner Ports

The screenshot shows the 'Combiners' settings page in the REU WebOMT. The 'General' tab is selected, and the 'Module 1' section is expanded. The 'Port1 Input Power' is highlighted in red, and the 'Port1 Attenuation' is set to 0. A red box highlights the 'Port1 Attenuation' row. A blue text overlay says 'Enter the appropriate Attenuation to reduce the input power to 0 dBm'. A red box highlights the 'Set' button in the bottom right corner, with a blue text overlay saying 'Click Set to confirm'.

General				
☐	Combiner Att Control Mode	Manual		
☐	Adjust Interval	12Hour		
Module 1				
☐	Power Switch	On		
☐	UL Freq Low	698	MHz	
☐	UL Freq High	716	MHz	
☐	DL Freq Low	728	MHz	
☐	DL Freq High	746	MHz	
☐	Port1 Input Power	-7.002	dBm	
☐	Port2 Input Power	-6.975	dBm	
☐	Port3 Input Power	-1.197	dBm	
☐	Port4 Input Power	-18.326	dBm	
☐	Port1 Attenuation	0	dB	0~25,step:0.5
☐	Port2 Attenuation	0	dB	0~25,step:0.5
☐	Port3 Attenuation	0	dB	0~25,step:0.5
☐	Port4 Attenuation	0	dB	0~25,step:0.5
☐	Port1 Power Offset	0	dB	0~10,step:0.5
☐	Port2 Power Offset	0	dB	0~10,step:0.5
☐	Port3 Power Offset	0	dB	0~10,step:0.5
☐	Port4 Power Offset	0	dB	0~10,step:0.5
☐	Port1 Operator	NA	20 characters	
☐	Port2 Operator	NA	20 characters	
☐	Port3 Operator	NA	20 characters	
☐	Port4 Operator	NA	20 characters	
Module 2				
☐	Power Switch	On		
☐	UL Freq Low	698	MHz	

Figure 10 Port Input Power and Gain Adjustment on CHU Combiners

5) Click Query all to check the **Port Input Power**.

If the input power exceeds 0 dBm, set the appropriate Port Attenuation to reduce the input power to 0dBm. See Figure 10 for details.

Note: The range of UL/DL attenuation value is 0—15dB.

To adjust gain on REU WebOMT (see Figure 12 for details):

- 1) In the **REU WebOMT**, select the **Settings** tab.
- 2) Select the **System Status** sub-tab on the **Settings** page to check the input and output power.
- 3) Set the **Attenuation** for UL/DL and each CB to achieve the desired input output power in **System Configuration**.

Note: The range of UL/DL attenuation value is 0—15dB.

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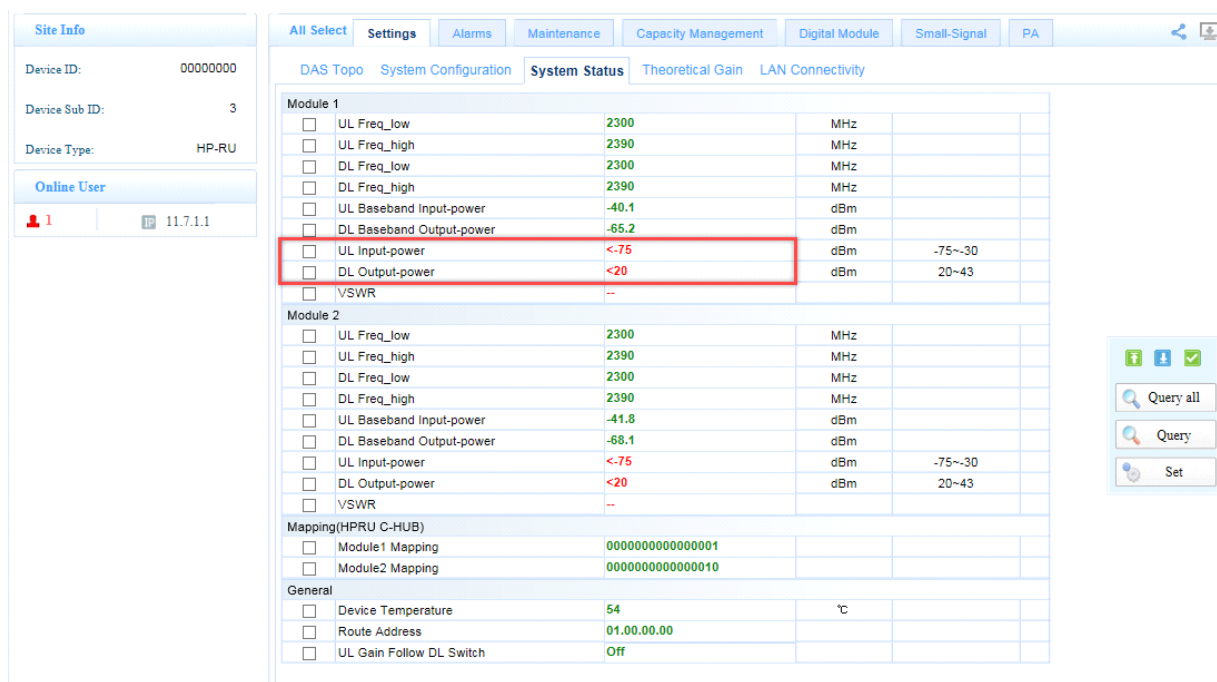


Figure 11 DL Output Power on REU

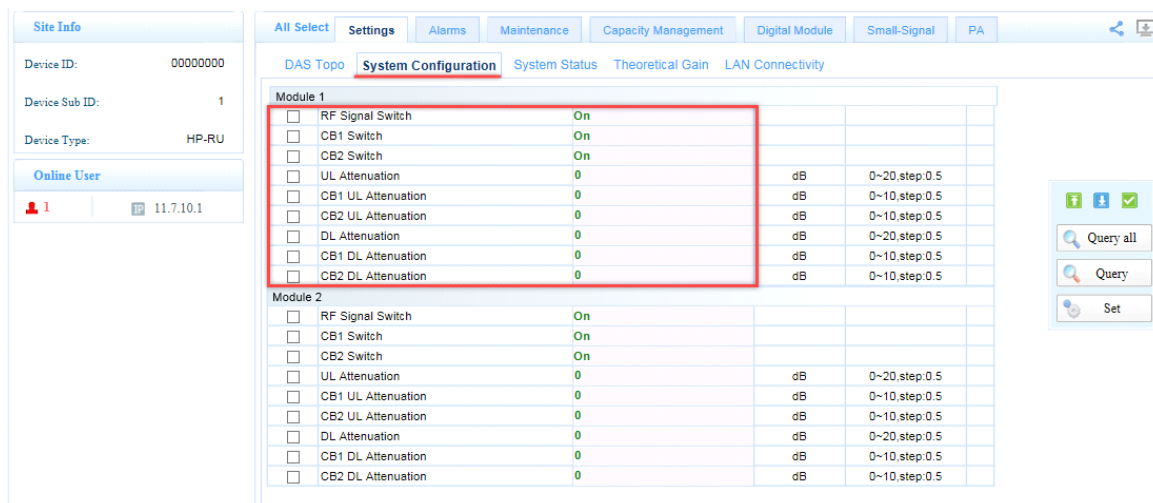


Figure 12 Gain Adjustment on REU WebOMT

Note: The range of nominal output power is 13—43dBm of attenuation on CHU/REU is 0—15dB.