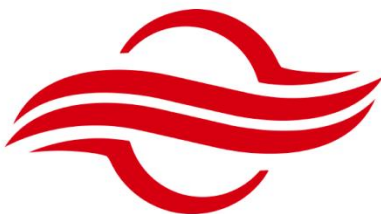


SUNWAVE

COMMISSIONING GUIDE



CROSSFIRE

M2

MID POWER

4T4R Digital Radios
37dBm Output Power
5G NR Compliant
Passive Cooling
Outdoor Rated



Revision History

Revision Number	Revision Date	Summary of Changes	Author
1.0.0	5 th October 2020	Initial Release	Shuochao Zheng
1.0.1	2 nd December 2020	Radio CW Function Update; Optical Indicator Change	Shuochao Zheng
1.0.2	14 th Decemeber 2020	Add Network Settings; Update wired access to slave device	Shuochao Zheng
1.0.3	25 th Decemeber 2020	Add External Alarm of RU	Shuochao Zheng
1.0.4	5 th January 2021	Content Minor Edits	Shuochao Zheng
2.0.0	15 th November 2021	Upgrade System to Support 800MHz Mode	Shuochao Zheng
2.0.1	9 th December 2021	Update Radio Module Test Signal	Shuochao Zheng
2.1.0	7 th April 2022	Update External Alarm of E2-O Update SNMP Community Content Update Operation Bar Content	Shuochao Zheng

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Content

Pre-Commissioning	5
Access Unit (A2)	5
Expansion Unit (EU-O/E2-O)	5
Remote Unit (M2RU).....	5
Optical Indicator Descriptions.....	5
Status Indicator Descriptions	6
System Overview.....	7
System Connection	7
Operation and Maintenance Terminal	8
Access to the OMT on the Master A2	8
Access to the OMT on the Slave Devices	10
User Login	12
Homepage and Basic Functions	13
System Topology	14
Operation Bar	15
Network & Communicating Settings.....	16
NMS Configuration.....	17
SNMP Configuration.....	18
Additional Settings	20
Site Info	20
Time Synchronization.....	20
System Configuration.....	22
A2 Band Configuration	22
5G TDD Configuration	23
4G TDD Configuration	24
Module Gain Adjustment (Attenuation)	25



MID POWER

4 x 37dBm Output
5G NR Compliant

Gain Adjustment on A2 (Active Combiner).....	25
Gain Adjustment on A2 (Digital Board).....	27
Gain Adjustment on M2RU	27
Alarm.....	28
Alarm Severity.....	28
Alarm Threshold.....	28
External Alarm.....	29
External Alarm of A2	29
External Alarm of E2-O.....	31
External Alarm of M2RU	32
Advanced Activities.....	35
Mapping Configuration	35
Radio Module Test Signal.....	37
Master/Slave A2 Transition.....	38
System Delay Configuration.....	39
Auto Logout Time.....	40
Local Debug Port Control	40
Screenshot	41
Backup/Restore Configuration.....	42
Software Upgrade	43
Local Upgrade	43

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Pre-Commissioning

Before starting the commissioning process, verify the status of the equipment as follows:

Access Unit (A2)

- 1 . Verify that the correct band-specific Active Combiner modules are installed.
- 2 . Ensure the RF cables between the BTS and modules are connected as designed.
- 3 . Ensure the fibers are connected to the proper optical ports as designed.
- 4 . Check LED of Status and Optical ports.

Expansion Unit (EU-O/E2-O)

- 1 . Ensure the optical transceivers are inserted and fibers are connected to the proper optical ports as designed.
- 2 . Check LED of Status and Optical ports.

Remote Unit (M2RU)

- 1 . Verify that the correct band-specific PA modules are installed.
- 2 . Ensure the RF cables from each PA module are connected tightly (If using M2RU with external antennas).
- 3 . Ensure the optical transceivers are inserted and fibers are connected to the proper optical ports as designed.
- 4 . Check LED of Status and Optical ports.

Optical Indicator Descriptions

Each pair of optical interface indicators shows the operating status of an optical module, as shown in Figure 2.

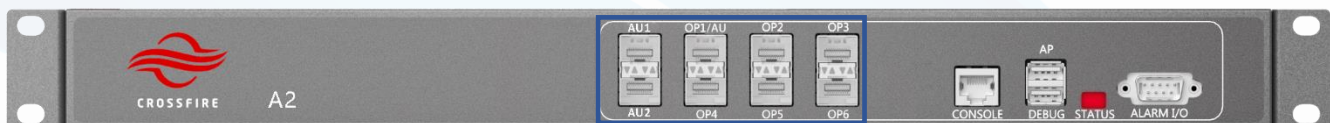


Figure 1. Optical Indicator 1



Figure 2. Optical Indicators 2

Optical Indicator	Description
Green	Normal
Red	The optical path is not synchronized.
Blank	The Optical module is not plugged in

Status Indicator Descriptions

Each element has its own LED STATUS indicator to show its operating status.

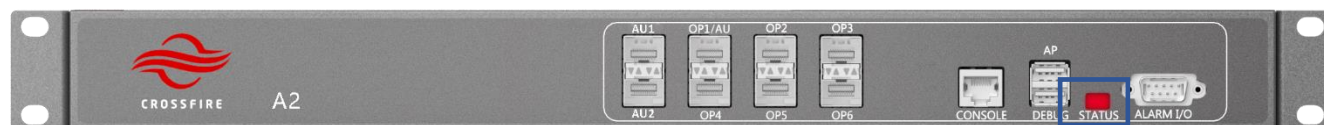


Figure 3. Status Indicator

Status Indicator	Description
Flash Green	Element is working without an alarm
Solid Green	Software is crashed, but it will reboot automatically in 3 mins
Flash Red	Element is working but with alarm
Solid Red	Software is crashed (with alarm), but it will reboot automatically in 3 mins
Flash Orange	Software is upgrading
Solid Orange	Element is booting

System Overview

CrossFire M2 (Mid Power Remote Unit 2nd Generation) system is a distributed antenna system (DAS). It consists of Access Unit (A2), Expansion Unit (E2-O), and Remote Unit (M2RU). The Expansion Unit is an optional unit that can expand the system capacity.

System Connection

A typical CrossFire M2 system connection is shown in Figure 4.

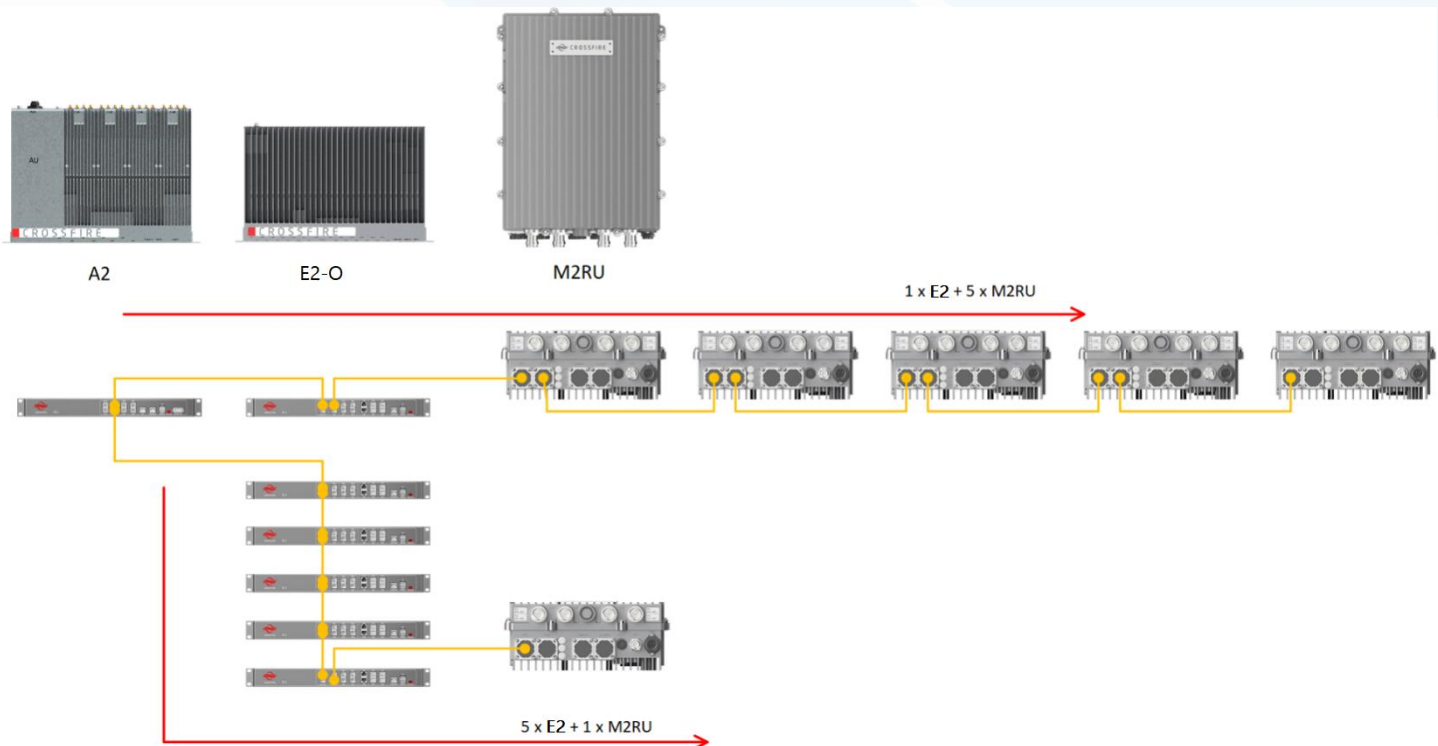


Figure 4. System Connection

- CrossFire supports 1 Master A2 and 2 Slave A2
- Cascading up to 5 levels of E2-O
- Cascading up to 6 levels of E2-O + M2RU

Operation and Maintenance Terminal

The Operations and Maintenance Terminal (OMT) software runs on all devices in the CrossFire system. WebOMT is the interface for OMT. WebOMT is based on a web browser and is compatible with most common browsers such as IE and Google Chrome. WebOMT is customized for CrossFire to query, debug, and configure parameters on devices.

The Master A2 is generally set as the Host of the system. Meanwhile, technicians can access the whole system through the WebOMT of any device (Master or Slave A2, E2-O and M2RU) connected in the system.

Access to the OMT on the Master A2

In the CrossFire system, the Master A2 is defined as Host. The default IP address of the A2 is <https://10.7.3.200>.

To set up wired access to the OMT:

1. Connect a PC to the Master A2 with a network cable in the CONSOLE port on the front panel.
2. Change the TCP/IP properties (see Figure 5):
 - a. Click Network Connections
 - b. Click Local Area Connection Properties
 - c. Click TCP/IP Properties
 - d. Change parameters as indicated:

IP address: 10.7.3.1 (the last number is changeable except for 10.7.3.200)

Subnet mask: 255.0.0.0

Default Gateway: 10.7.3.200 (IP address of Master A2)
3. Check the status of the Local Area Connection and confirm the connection.
4. Open a browser window and enter the default gateway in the navigation bar to access the WebOMT page. Figure 6 shows an example using <https://10.7.3.200> as the default gateway.

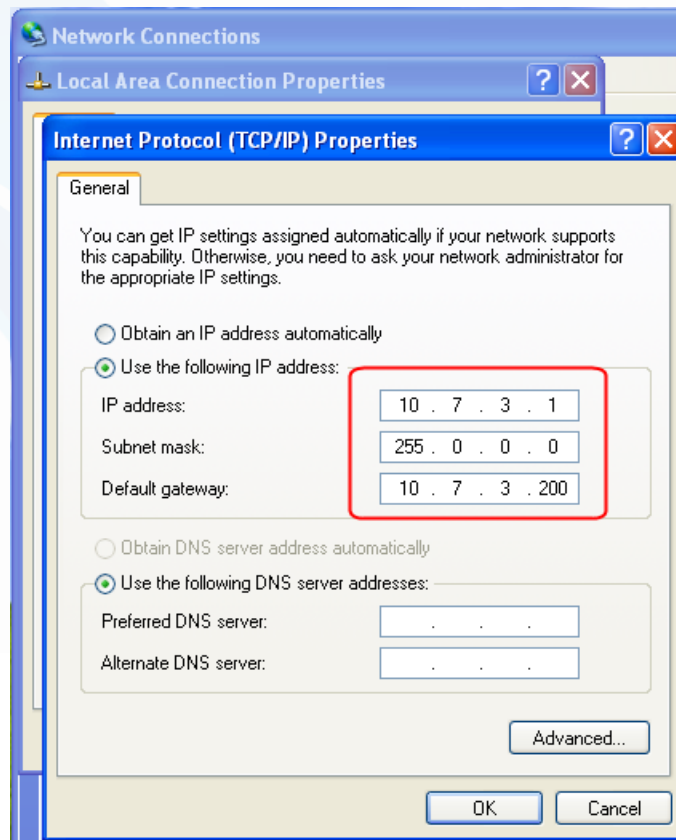


Figure 5. Wired Connection to the OMT on the Master A2

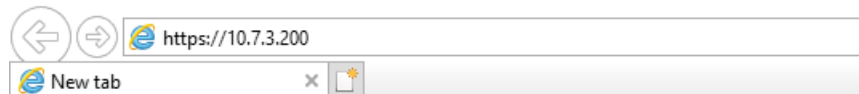


Figure 6. Web Browser OMT Connection for Wired Access

Access to the OMT on the Slave Devices

In the CrossFire system, E2s and M2RU as well as the Slave A2s, are defined as Slaves. They have no fixed IP address. The IP addresses are assigned by the host automatically, based on the network topology.

To set up wired access to the OMT:

1. Connect a PC to the slave device with a network cable in the CONSOLE port on the front panel.
2. Change the TCP/IP properties:
 - a. Enable Obtain an IP address automatically by clicking the check box.
 - b. Enable Obtain DNS server address automatically by clicking the check box.
3. Check the status of the Local Area Connection and confirm the connection.
4. Open a browser window and enter the default gateway in the navigation bar to access the WebOMT page. The default fixed IP address is <https://12.7.1.1> as the default gateway.

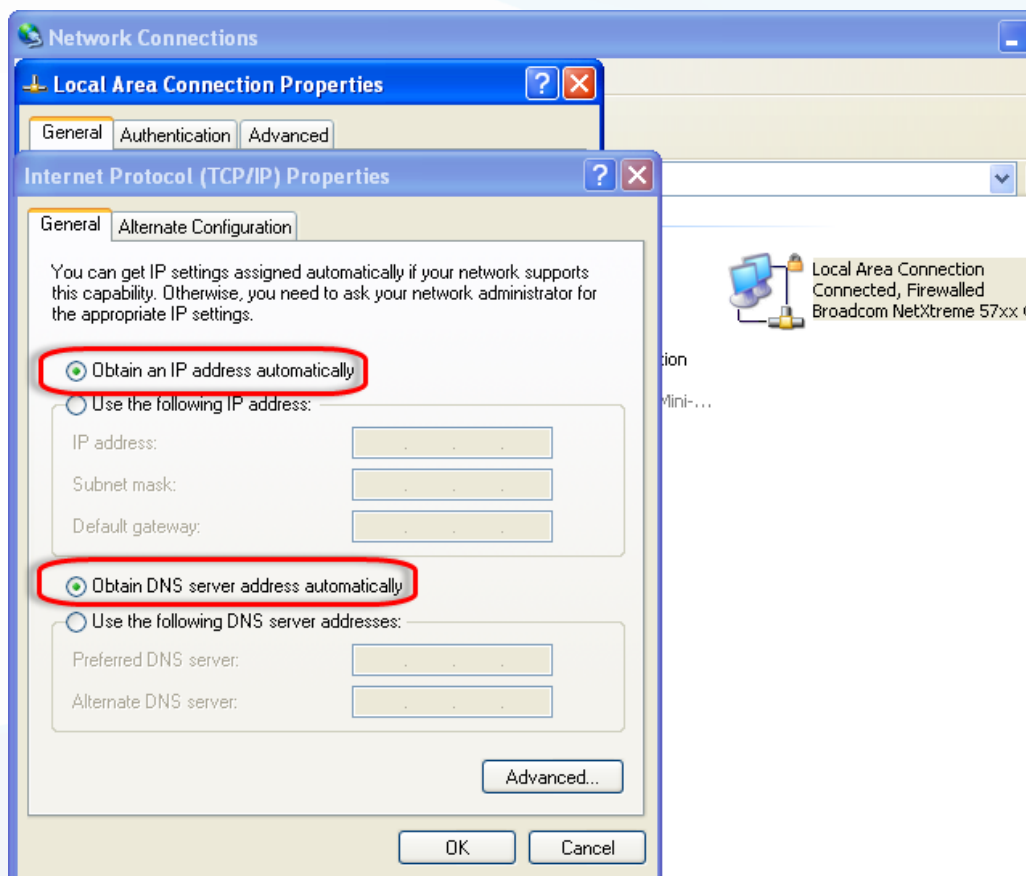


Figure 7. TCP/IP Properties Configuration – Slave devices

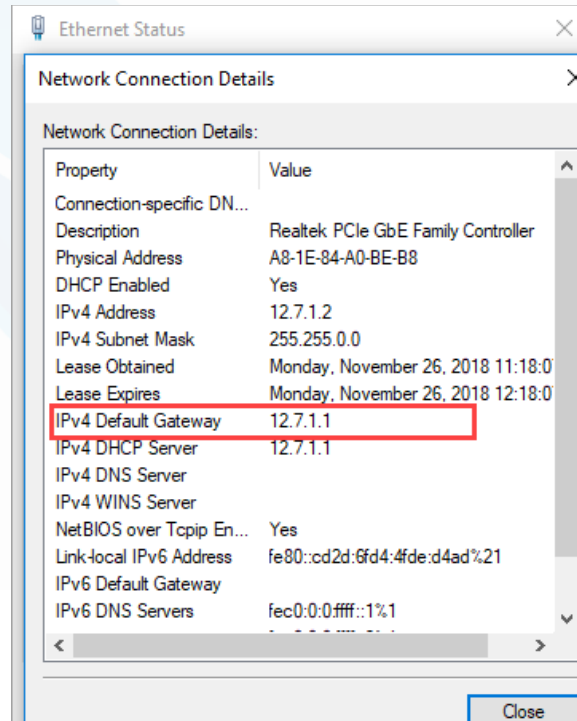


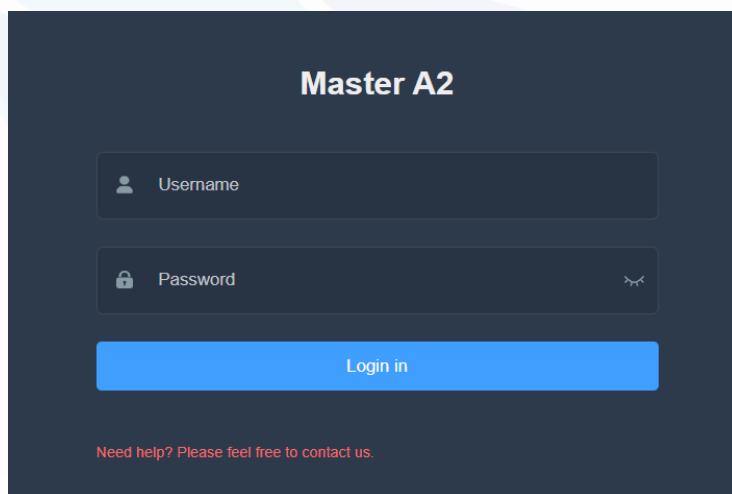
Figure 8. Wired Connection to the OMT on the Master A2



Figure 9. Web Browser OMT Connection for Wired Access

User Login

1. Enter the IP address of the OMT you are trying to access.
2. Type the username and password in the field.



The login screen for Master A2 features a dark blue background. At the top, the text 'Master A2' is displayed in white. Below this, there are two input fields: 'Username' with a user icon and 'Password' with a lock icon and a toggle for visibility. A bright blue 'Login in' button is positioned below the password field. At the bottom, a red link reads 'Need help? Please feel free to contact us.'

Figure 10. Login Screen

Account	Password	Access Level
admin	admin (default)	Fully administration permissions. (User Management)
Others	(null)	Installer, configuration, monitoring

Note: Only the **admin** account has the permission of user management, including creating a user profile, changing password.

Homepage and Basic Functions

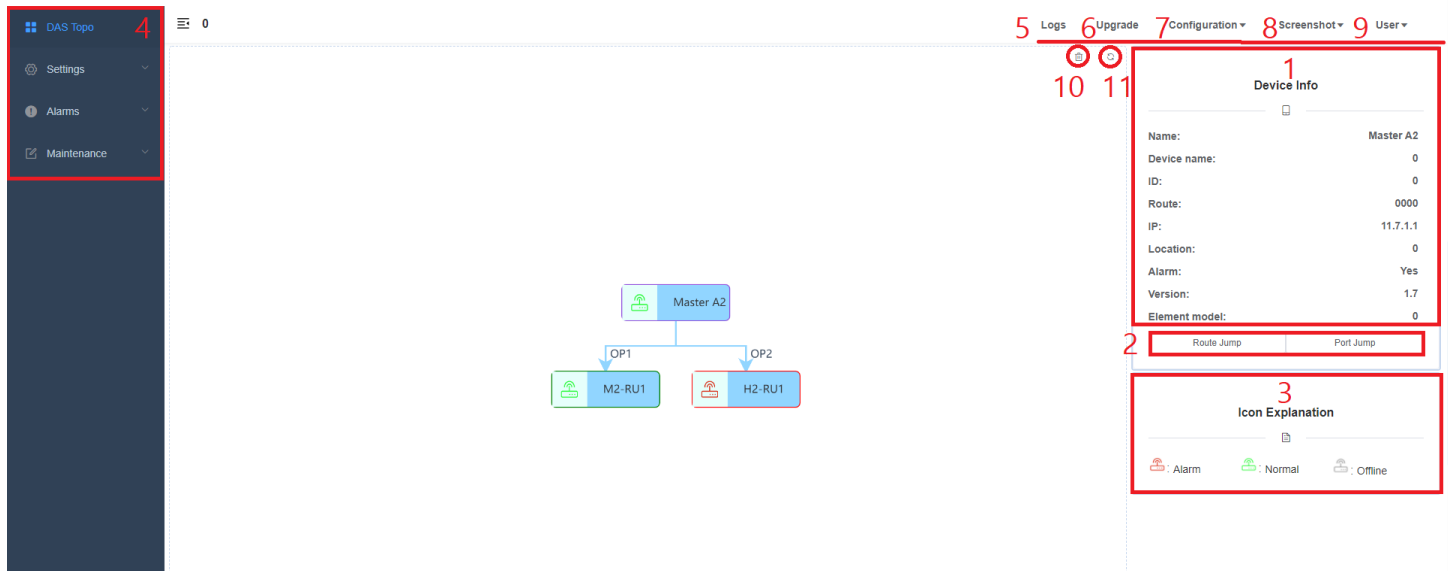


Figure 11. WebOMT Homepage

The OMT homepage includes System Topo, tabs, and fields (refer to corresponding numbers in Figure 11):

1. **Device Info:** After clicking to select the element's icon in DAS Topo, it shows Element Type, Element ID, Internal IP address, Location and status
2. **Jump Button:** After clicking to select the element's icon in DAS Topo, click Jump Button to switch to the element's OMT in the new tab.

Note: A common issue is that internet browsers cannot transfer to other devices from current OMT when your laptop is multi-connected to device and wireless network at the same time. Use **Port Jump** to skip this issue.

3. **Icon Explanation:** Shows that device icons in the topology have 3 colors to display different statuses.
4. **Element Configuration:** Tabs that access the page for parameter configuration and query.
5. **Logs:** Records the operating status of the devices. The logs can be downloaded and deleted on the Logs page.
6. **Upgrade:** Used to upgrade the software.
7. **Configuration:** Used to save and load factory or engineering configuration.
8. **ScreenShot:** One step to download all current parameters, information, and device operating status. When Sunwave assistance is required to troubleshoot the system, it will be helpful to send the ScreenShot files(.json) to Sunwave technicians.
9. **User:** Account management and logout
10. **Remove Slave:** used to remove all slave devices in Topo.
11. **Refresh:** refresh DAS Topo

System Topology

System Topology is set as the default homepage of OMT. Using the following steps to display the System Topology:

1. Select the DAS Topo tab.
2. Click Refresh to display Topology.

The system topology is shown in Figure 12. The Master A2 icon is on the left of the frame as host. Lower level elements are placed as a tree structure based on the physical optical connections. Except for the Master A2, all other slaves are named after the optical port they are connected to.

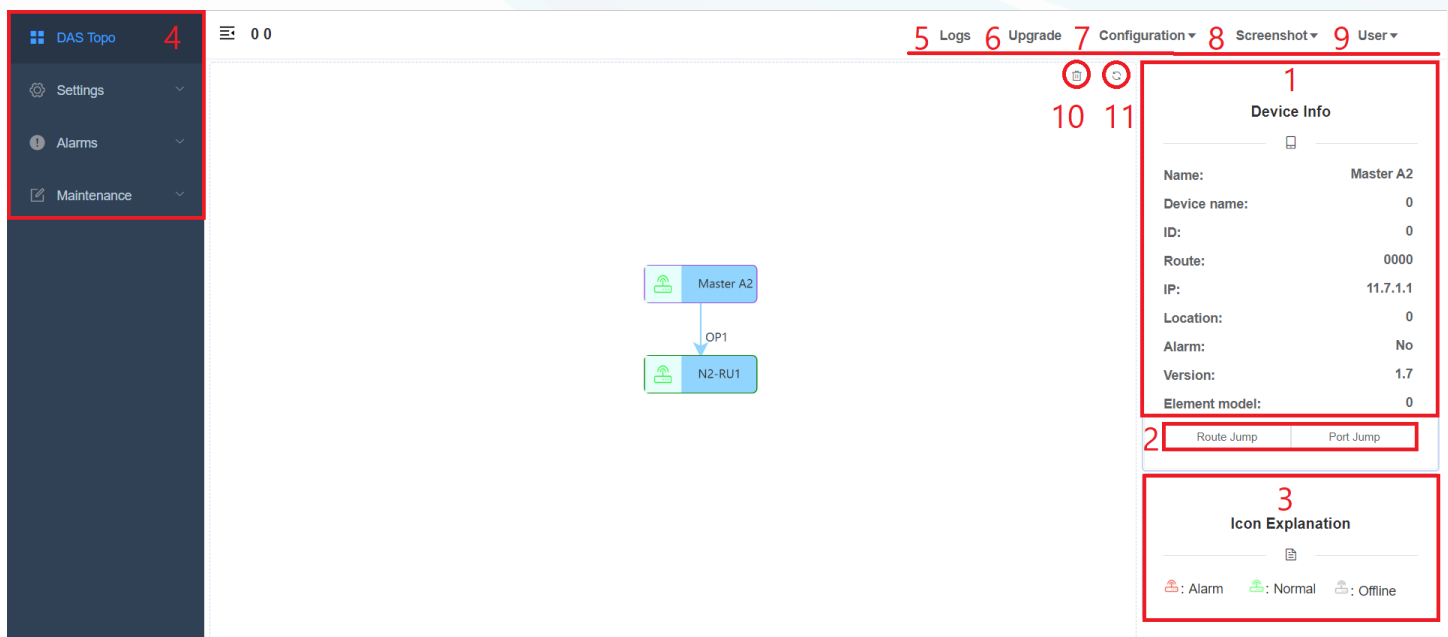


Figure 12. Displaying the System Topology

Device icons in the topology have 3 colors — green, Grey and red:

Green icon  **with green box line:** indicates this element is connected and online without alarm.

Grey icon  **with grey box line:** indicates this element was once connected but is currently disconnected.

Red icon  **with red box line:** indicates this element has an alarm.

The device icons with purple box line indicates which element's OMT user is logged in.

When a grey icon shows up, check whether this device exists or not. If the device does not exist anymore, delete the device in the DAS Topo page.

Note: deleting one device or all slave devices must be under **Factory Mode**. Access **Factory Mode** through **Maintenance -> Factory Command -> Factory Mode**. Enable the mode and click **Set** to validate it.

Operation Bar

OMT has an Operation Bar on each page for configuration and query.

☰

A2[master] 23F-t

Logs

Upgrade

Configuration ▾

Screenshot ▾

User ▾

☐	Element Identification		unit	range	🔍 query ⚙️ set 🗑️ clear 🔄 query all
☐	Vendor	Sunwave			
☐	Element Model Number	0			
☐	Element Serial Number	123			
☐	Software Version	1.1			
☐	Device ID	A2000001		hexadecimal	
☐	Device Sub ID	3		decimalism	
☐	Installed Location Label	NA		20 characters	
☐	Site Name	A2[master]		100 characters	
☐	Device Name	NA		40 characters	
☐	Date And Time		unit	range	
☐	System Date And Time	2000-01-04 21:17:54			

Figure 13. Operation Bar

Network & Communicating Settings

The CONSOLE port of the Master A2 is pre-assigned from the factory with the default IP address – 10.7.3.200. To enable local/remote access to the system, you must assign a unique routable address within the domain of the local/wide-area-network.

Configure the IP address of the CONSOLE port as follows:

1. Log in the Master A2 OMT, and go to the LAN Connectivity section.
2. Go to the IP Settings section and assign the following fields as appropriate:

Protocol - The CrossFire system supports SNMP (Get & Set, Trap, etc.) and SUNWAVE NMS for remote monitoring.

Device IP Addr - address assigned to the A2 for local and remote access

Subnet Mask

Default gateway

Device Recv Port (UDP) - The Port number assigned for communication with SUNWAVE NMS.

Heartbeat Interval - The interval in which the Master A2 sends a heartbeat to the surveillance server.

3. Click Set to save the setting.

☒	CONSOLE IP setting		unit	range
☐	Protocol	UDP		
☐	Primary NMS IP Address	10.7.3.100		
☐	Secondary NMS IP Address	10.7.3.101		
☐	Primary NMS Port Number	80		
☐	Secondary NMS Port Number	80		
☒	Device IP Addr	10.7.3.198		
☒	Subnet Mask	255.255.255.0		
☒	Default Gateway	10.7.0.1		
☒	Device Recv Port(UDP)	100		
☒	Heartbeat Clock	30	s	

Figure 14. IP Address Configure

NMS Configuration

SUNWAVE Network Management System (NMS) is a software system to achieve remote monitoring, alarm reporting, and remote configuration of all the devices.



Figure 15. NMS System Architecture

Use the following steps to configure NMS IP settings.

1. Log in the Master A2 OMT, and go to the LAN Connectivity section.
2. Go to the IP Settings section and select UDP protocol, as shown in Figure 14.
3. Locate the fields and set the appropriate values:

NMS IP Address (1~2) - The target IP address of NMS Server.

NMS Port Number - The target port of NMS Server (default defined port of 80).

4. Click Set to save the setting.

☐	CONSOLE IP setting		unit	range
☐	Protocol	UDP		
☐	Primary NMS IP Address			
☐	Secondary NMS IP Address			
☐	Primary NMS Port Number			
☐	Secondary NMS Port Number			

Figure 16. NMS Configuration

SNMP Configuration

The Master A2 generates SNMP traps and delivers them through the CONSOLE Ethernet interface.

The CrossFire system supports SNMP V2 and V3 in this current version.

To configure SNMP settings:

1. Log in the Master A2 OMT, and go to the SNMP Configuration section.
2. Go to the IP Settings section and select the SNMP protocol, as shown in Figure 16.
3. Click Set to save the setting.
4. Go to the SNMP Configuration section and select the appropriate SNMP Trap Protocol.

SNMP Trap Protocol - The trap protocol to send the SNMP trap.

☐	Trap Settings		unit	range
☐	Protocol	SNMP		
☐	SNMP Trap Protocol	SNMPV2		
☐	Trap IP Address 1	SNMPV2		
☐	Trap IP Address 2	SNMPV3		

Figure 17. SNMP Trap Protocol

5. Locate the fields and set the appropriate values:

For **SNMP V2**

Trap IP Address (1~2): Up to 2 target IP address of SNMP trap receiver.

Trap Port: The target port of the SNMP trap (default defined port of 162).

For **SNMP V3** (See Figure 17 for details)

Reset USM - USM Reset

Security User Name - Security User Name

Authentication Protocol - Authentication Protocol

Authentication Password - Authentication Password

Privacy Protocol - Privacy Protocol

Privacy Password - Privacy Password

Edit User Confirm - Edit User Confirm

Trap IP Address (1~2) - Up to 2 target IP address of SNMP trap receiver.

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Trap Port - The target port of SNMP trap (default defined port of 162).

Trap IP Addr Security EngineID - The Security EngineID of target Trap IP address.

☐	SNMPV3 USM Reset	
☐	Reset USM	Reset
☐	SNMPV3 USM Edit	
☐	Security User Name	cmcadmin
☐	Authentication Protocol	None
☐	Authentication Password	password
☐	Privacy Protocol	None
☐	Privacy Password	password
☐	Edit User Confirm	Confirm
☐	Trap Settings	
☐	Protocol	SNMP
☐	SNMP Trap Protocol	SNMPV3
☐	Trap IP Address 1	192.168.1.6
☐	Trap IP Address 2	192.168.1.221
☐	Trap Port	1967
☐	Trap IP Address 1 Security Engine ID	80000523010A0703
☐	Trap IP Address 2 Security Engine ID	80000523010A0703

Figure 18. SNMP V3 Configuration

6. Go to the Trap Resend section at the bottom of the page.

Trap Resend Enable: **On / Off** to enable / disable trap resend.

Trap Resend Interval: The interval time to resend the SNMP trap.

Community: Community Identifier.

Delete History Alarm: Click **Confirm** to delete history alarms.

7. Click Save to save the settings.

☐	Trap Resend		unit	range
☐	Resend Enable	☐		
☐	Resend Interval	30MIN		
☐	Community	public		20 characters
☐	Delete History Alarm	Confirm		

Figure 19. Trap Resend

Note that the Write/Read Community in SNMP server to communicate with CrossFire Device is 'Community + Device Sub ID'. For example, the default community is 'public' and the Device Sub ID of Master A2 is '0'. SNMP Server must use 'public0' to communicate with Master A2.

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Additional Settings

Site Info

1. Log in the Master A2 OMT, and go to the Overview.

2. Locate the fields and set the appropriate values:

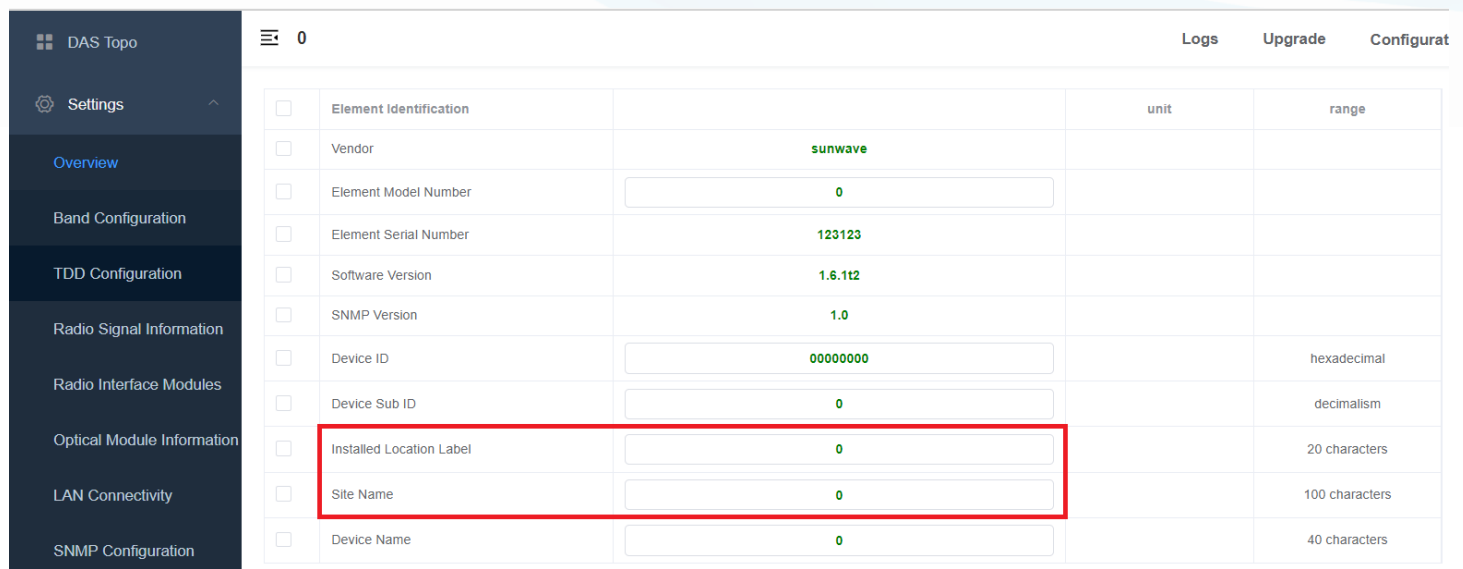
Device ID - Unique hexadecimal number used to identify the site, default 00000000.

Device Sub ID - Device number in a single system, auto-assigned by Master A2 or manually set by the user.

Device Location - The detailed device installation location.

Site ID - Indicates the details of the current site.

3. Click Set to save the setting.



	unit	range
☐ Element Identification		
☐ Vendor	sunwave	
☐ Element Model Number	0	
☐ Element Serial Number	123123	
☐ Software Version	1.6.1t2	
☐ SNMP Version	1.0	
☐ Device ID	00000000	hexadecimal
☐ Device Sub ID	0	decimalism
☐ Installed Location Label	0	20 characters
☐ Site Name	0	100 characters
☐ Device Name	0	40 characters

Figure 20. Site Info Configuration

Note: The Installed Location and Site Name labels cannot contain the following special characters: %, &, ', ", \

Time Synchronization

The Master A2 synchronizes time to NTP time servers when NTP Switch is on .

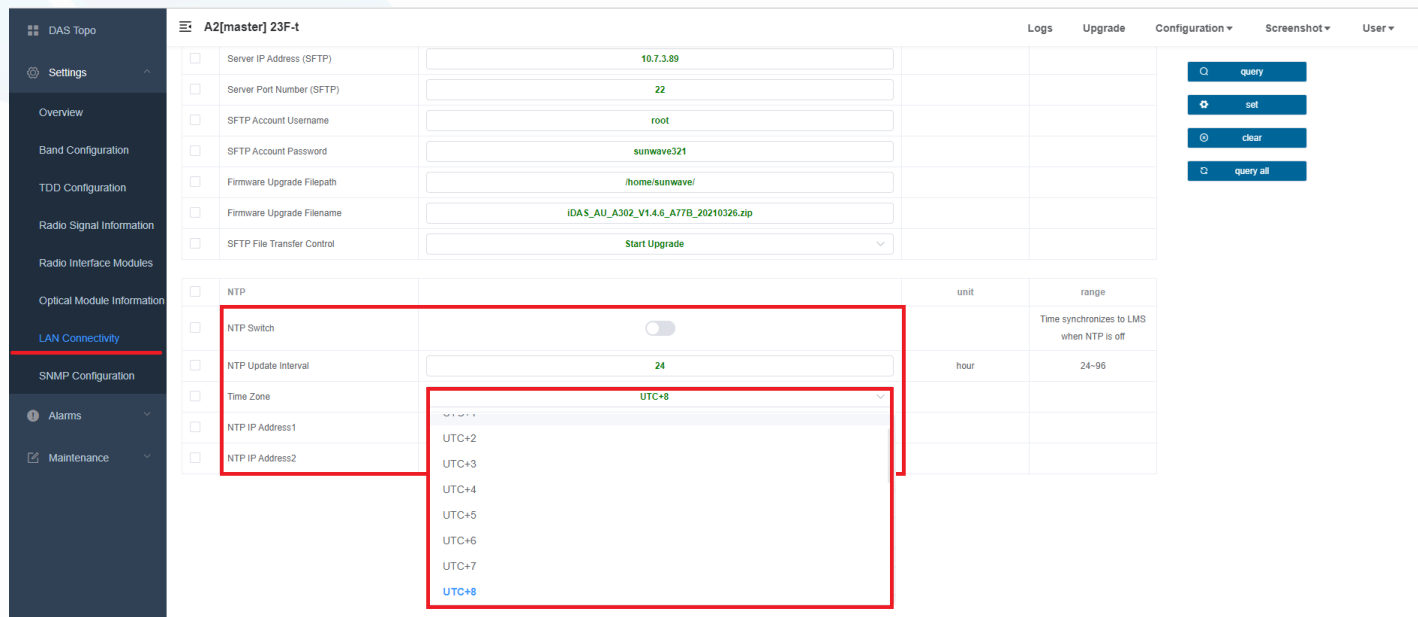
1. Log in the Master A2 OMT, and go to **Settings -> LAN Connectivity**
2. Go to the **NTP** section and Turn on the NTP Switch
3. Input **NTP Update Interval** in certain time horizon and select the appropriate **Time Zone**
4. Input **NTP IP Address** and Click Set to save the settings.

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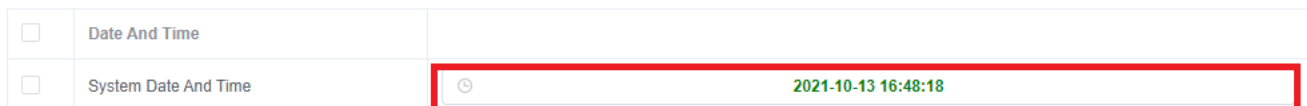


Configuration	Value	Unit	Range
Server IP Address (SFTP)	10.7.3.89		
Server Port Number (SFTP)	22		
SFTP Account Username	root		
SFTP Account Password	sunwave321		
Firmware Upgrade Filepath	/home/sunwave/		
Firmware Upgrade Filename	IDAS_AU_A302_V1.4.6_A77B_20210326.zip		
SFTP File Transfer Control	Start Upgrade		
NTP	☒		
NTP Switch	☒		
NTP Update Interval	24	hour	24-96
Time Zone	UTC+8		
NTP IP Address1			
NTP IP Address2			

Figure 21. NTP Configuration

The CrossFire system also uses a local timeclock on Master A2 to create time stamps for locally generated alarms when not connected to the NTP Server.

- Log in the Master A2 OMT, and go to the [Overview](#).
- Go to the Date and Time section at the bottom of the page and click Query to check the current setting.
- Click now to synchronize the system time with the local PC time.



☐	Date And Time	
☐	System Date And Time	2021-10-13 16:48:18

Figure 22. Time Synchronization

Note: If the NMS is connected to the NTP server, the CrossFire system time is updated automatically and periodically.

System Configuration

A2 Band Configuration

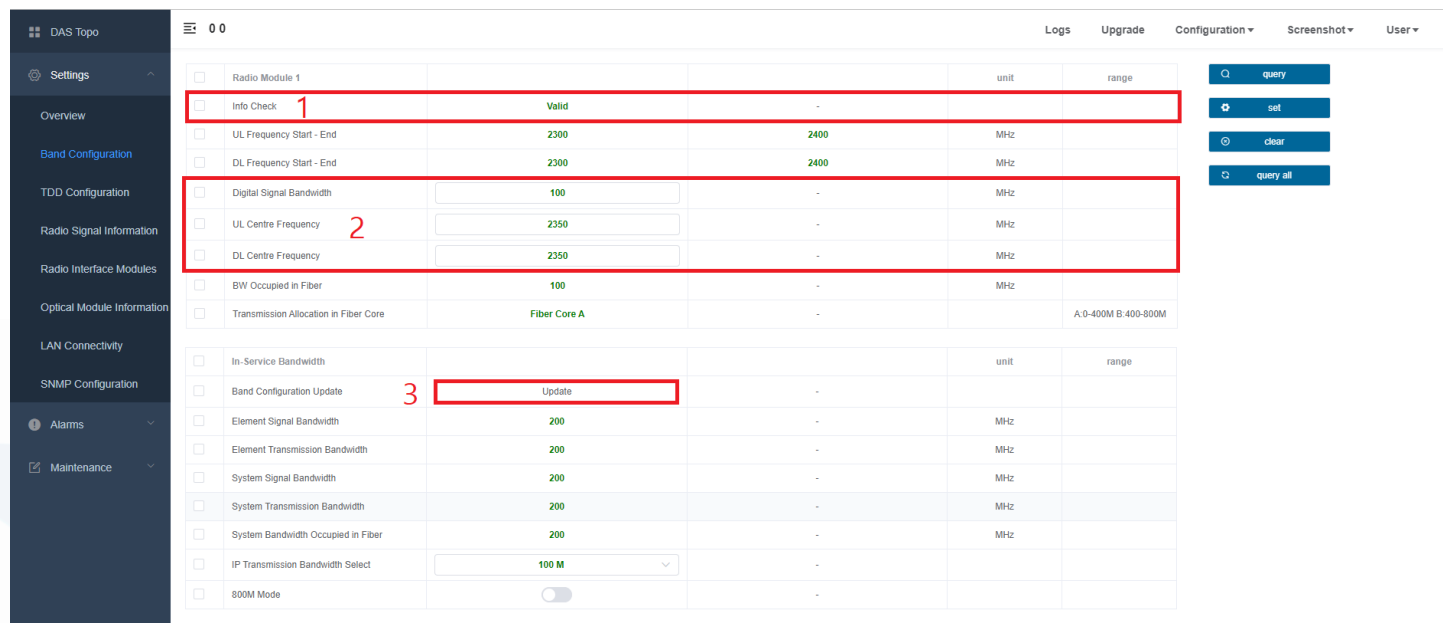
According to the different base station operating frequency bands for each operator, select the passive RF modules for the A2 and active RF modules for the M2RU with the corresponding frequency band and set the Band properties in the OMT of the Master A2. The limits of the uplink and downlink operating frequency bands correspond to the effective RF range of the selected RF modules.

To set the Band properties:

1. Open the Master A2 OMT.
2. Go to **Settings -> Band Configuration**.
3. Check the Info Check to see if the module is valid in **#1**.
4. For modules 1~4, set the **Uplink and Downlink Centre Frequencies** and the **Digital Signal Bandwidth** in **#2**.

Note: The maximum bandwidth per operating band should not exceed 100MHz.

5. Click **Set** in operation bar.
6. In **In-Service Bandwidth** frame, click **Update** button of **Band Configuration Update** to update band configuration (See **#3**). Then click **Query all** to ensure the value of Module 1~4 **Info Check** is valid in **#1**.



Radio Module 1	unit	range
Info Check 1	Valid	-
UL Frequency Start - End	2300	2400 MHz
DL Frequency Start - End	2300	2400 MHz
Digital Signal Bandwidth	100	MHz
UL Centre Frequency 2	2350	MHz
DL Centre Frequency	2350	MHz
BW Occupied in Fiber	100	MHz
Transmission Allocation in Fiber Core	Fiber Core A	A:0-400M B:400-800M
In-Service Bandwidth	unit	range
Band Configuration Update 3	Update	-
Element Signal Bandwidth	200	MHz
Element Transmission Bandwidth	200	MHz
System Signal Bandwidth	200	MHz
System Transmission Bandwidth	200	MHz
System Bandwidth Occupied in Fiber	200	MHz
IP Transmission Bandwidth Select	100 M	-
800M Mode	☐	-

Figure 23. Band Properties

5G TDD Configuration

To configure 5G TDD properties:

1. Open the A2 OMT.
2. Go to **Settings -> TDD Configuration**.
3. Turn on the **TDD Switch** in #1.
4. Select the corresponding TDD modules in #2.
5. Input the 5G SSB Type in #3. CrossFire is supporting Case A and Case C.
6. Input whole 20 Slots Format for DL-UL configuration in #4.
7. Input Special Slot Format for DL-UL symbols configuration in #5.
8. Input SSB ARFCN in #6.
9. Select all TDD configurations and click **Set** in operation bar to validate them all.

Note: CrossFire supports the same TDD configuration for enabled modules in one system.

10. Click **Query All** to check if **Sync Status** is turning green to see if the module is configured to be paired to TDD signal.



Item	Value	Unit	Range
5G TDD			
TDD Switch	1		
Sync Status			
Radio Module 1			
Radio Module 2	2		
Radio Module 3			
Radio Module 4			
SSB Type	3	CASE C	
Slot Configuration	4	0	
Special Slot symbol Format1	5	0:0:0	
Special Slot symbol Format2	6	0:0:0	
SSB ARFCN	6	0	

Figure 24. TDD Configuration

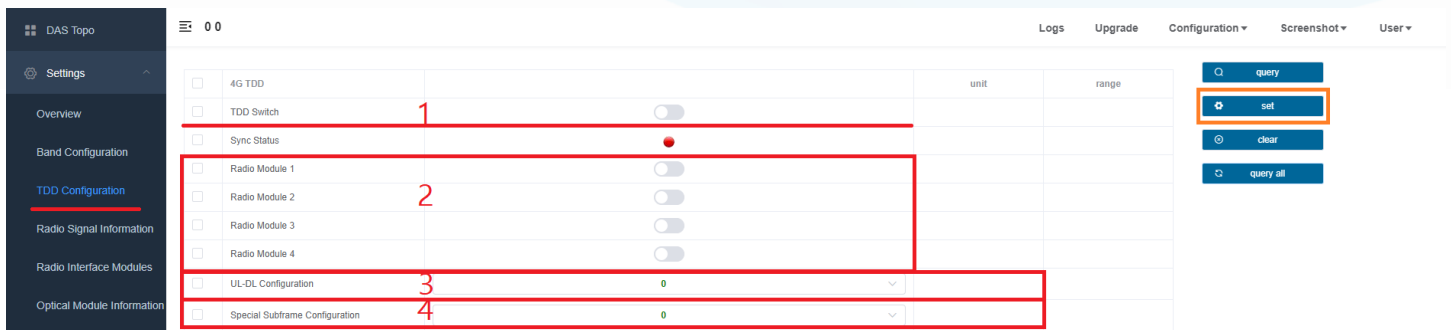
4G TDD Configuration

To configure 4G TDD properties:

1. Open the A2 OMT and go to **Settings -> TDD Configuration**.
2. Turn on the **TDD Switch** in **#1** and select the corresponding TDD modules in **#2**.
3. Select the UL-DL configuration in **#3** and Select the Special Subframe Configuration in **#4**.
4. Select all TDD configurations and click **Set** in operation bar to validate them all.

Note: CrossFire supports the same TDD configuration for enabled modules in one system.

5. Click **Query All** to check if **Sync Status** is turning green to see if the module is configured to be paired to TDD signal.



	unit	range
☐ 4G TDD		
☐ TDD Switch		
☐ Sync Status		
☐ Radio Module 1		
☐ Radio Module 2		
☐ Radio Module 3		
☐ Radio Module 4		
☐ UL-DL Configuration		
☐ Special Subframe Configuration		

Figure 25. TDD Configuration

Module Gain Adjustment (Attenuation)

In CrossFire, the downlink input power of the A2 is specified as 0dBm, and the maximum allowable input power is 15dBm. CrossFire has an automatic level control (ALC) function to maintain the input power around 0 at the A2 input port. What's more, the A2 and M2 digital board have attenuation configuration for Gain Adjustment.

Gain Adjustment on A2 (Active Combiner)

1. Open the Master A2 OMT.
2. Go to **Settings -> Radio Interface Modules -> General**.
3. Dropdown **Attenuation Control Mode** and select **Manual/Automatic** mode as designed.

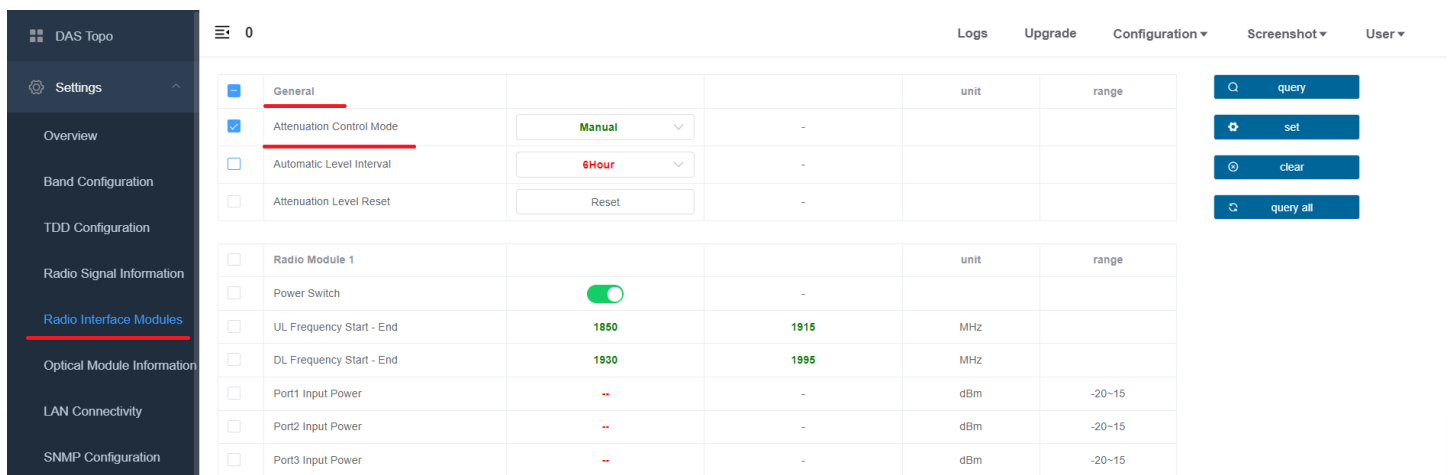
Automatic Mode: The internal ALC function is working when the peak input power exceeds 0 dBm.

Manual Mode: Reduce the input power by setting the attenuation manually.

Adjust Interval: The interval time to automatically reduce the attenuation in 2dB step when the peak input power decrease in Automatic Mode.

Combiner Att Reset: Reset all the attenuation values.

4. Click the checkbox to select this parameter and click **Set** to validate it.



		unit	range
☒	General		
☒	Attenuation Control Mode	Manual	-
☐	Automatic Level Interval	6Hour	-
☐	Attenuation Level Reset	Reset	-
☐	Radio Module 1		
☐	Power Switch	☒	-
☐	UL Frequency Start - End	1850	1915 MHz
☐	DL Frequency Start - End	1930	1995 MHz
☐	Port1 Input Power	--	-20~15 dBm
☐	Port2 Input Power	--	-20~15 dBm
☐	Port3 Input Power	--	-20~15 dBm

Figure 26. Attenuation Control Mode

5. Go to **Settings -> Radio Interface Modules -> Radio Module**
6. Locate the field and set the appropriate values:

Manual Mode: Set the appropriate value in the field of **Port Attenuation Value**.

for example: if Port 1 input power is 5.5dBm / Port 2 input power is 9.0dBm and the composite output power is divided by fifty-fifty, set 8.5 dB (5.5dB + 3dB) in Port 1 Attenuation Value and 12.5 dB (9.0dB + 3dB) in Port 2 Attenuation Value.

Note: Extra 3dB attenuation is used for power distribution.

Automatic Mode: Set the appropriate value (%) in the field of **Port Power Distribution** for power distribution.

Note: The input power is reduced to 0dBm automatically then it is calculated for distribution.

7. Set the operator information in the field of **Port 1 ~4 Label (Operator/Service)**.
8. Click the checkbox to select these parameters and click **Set** to validate them.

DAS Topo

Settings

Overview

Band Configuration

TDD Configuration

Radio Signal Information

Radio Interface Modules

Optical Module Information

LAN Connectivity

SNMP Configuration

Alarms

Maintenance

0

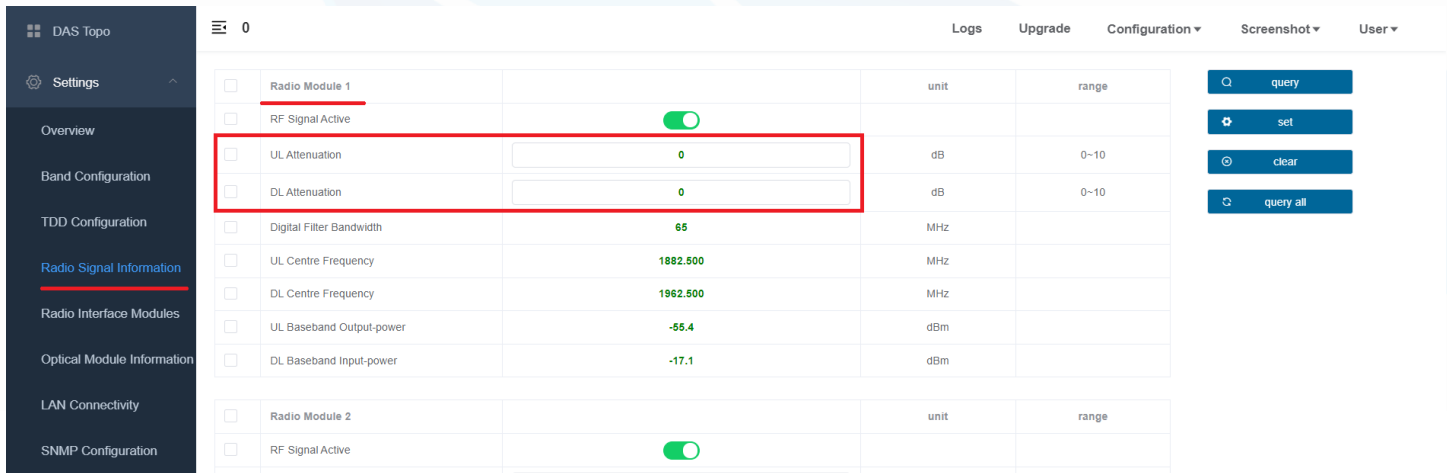
Logs Upgrade Configuration Screenshot User

☐	Radio Module 1				unit	range
☐	Power Switch	☒	-			
☐	UL Frequency Start - End	2300	2400		MHz	
☐	DL Frequency Start - End	2300	2400		MHz	
☐	Port1 Input Power	--	-		dBm	-20~15
☐	Port2 Input Power	--	-		dBm	-20~15
☐	Port3 Input Power	--	-		dBm	-20~15
☐	Port4 Input Power	--	-		dBm	-20~15
☐	Port1 Attenuation	0	-		dB	0~15
☐	Port2 Attenuation	0	-		dB	0~15
☐	Port3 Attenuation	0	-		dB	0~15
☐	Port4 Attenuation	0	-		dB	0~15
☐	Port1 Power Distribution	0	-		%	0~100
☐	Port2 Power Distribution	0	-		%	0~100
☐	Port3 Power Distribution	0	-		%	0~100
☐	Port4 Power Distribution	0	-		%	0~100
☐	Port 1 Label (Operator/Service)		-			20 characters
☐	Port 2 Label (Operator/Service)		-			20 characters
☐	Port 3 Label (Operator/Service)		-			20 characters
☐	Port 4 Label (Operator/Service)		-			20 characters

Figure 27. Attenuation in Radio Interface Module

Gain Adjustment on A2 (Digital Board)

1. Go to **Settings -> Radio Signal Information -> Radio Module**.
2. Input attenuation value in **UL and DL Attenuation**.
3. Click the checkbox to select these parameters and click **Set** to validate them.



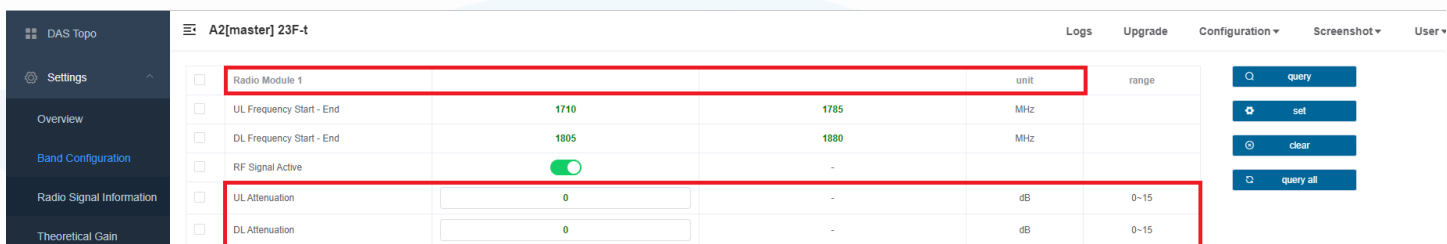
checkbox	Parameter	Value	Unit	Range
☐	Radio Module 1		unit	range
☐	RF Signal Active	☒		
☐	UL Attenuation	0	dB	0-10
☐	DL Attenuation	0	dB	0-10
☐	Digital Filter Bandwidth	65	MHz	
☐	UL Centre Frequency	1882.500	MHz	
☐	DL Centre Frequency	1962.500	MHz	
☐	UL Baseband Output-power	-55.4	dBm	
☐	DL Baseband Input-power	-17.1	dBm	

Figure 28. Attenuation in Radio Signal Information

Gain Adjustment on M2RU

To set attenuation in M2RU:

1. Jump to M2RU OMT.
2. Go to **Settings -> Band Configuration**.
3. Input attenuation value in **UL and DL Attenuation**.
4. Click the checkbox to select these parameters and click **Set** to validate them.



checkbox	Parameter	Value	Unit	Range
☐	Radio Module 1		unit	range
☐	UL Frequency Start - End	1710 - 1785	MHz	
☐	DL Frequency Start - End	1805 - 1880	MHz	
☐	RF Signal Active	☒		
☐	UL Attenuation	0	dB	0-15
☐	DL Attenuation	0	dB	0-15

Figure 29. Gain Adjustment on RU WebOMT

Alarm

Alarm Severity

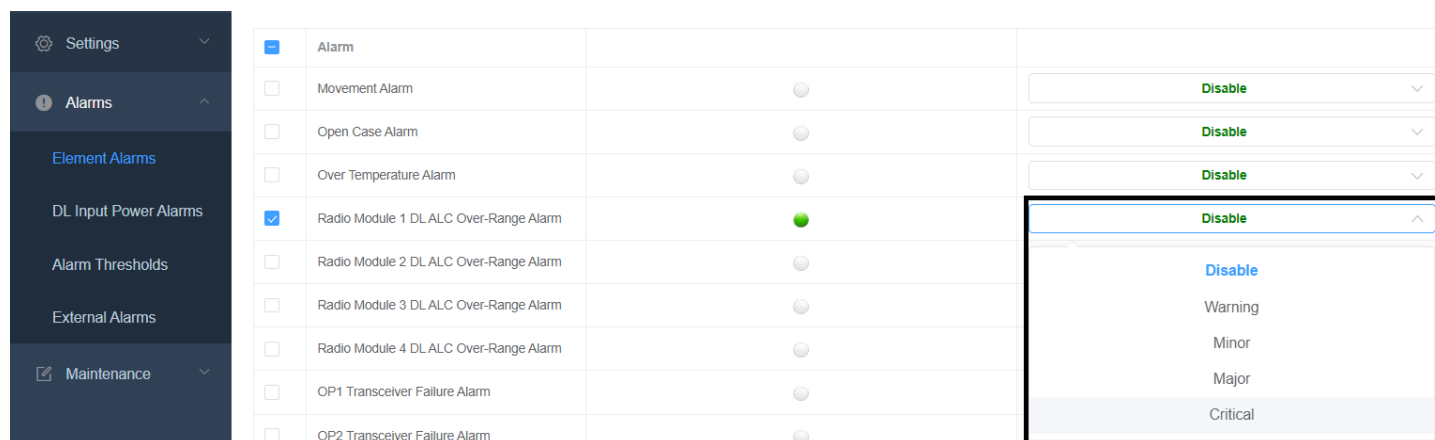
The CrossFire System supports four different alarm levels – Warning, Minor, Major, and Critical.

Use the following steps to set up the appropriate alarm severity.

1. Log in the WebOMT, and go to the **Alarms** section.
2. Select the appropriate severity in the drop-down box for the alarm in use.
3. Click **Set** to save the settings.
4. Wait 3 minutes after completing the setup, then query to see if there is an alarm.
 - Blank Indicator means alarm disabled;
 - **Green** color means no alarm;
 - **Red** color means the alarm is triggered.

Note: All alarms are default disabled at the factory. Disable the alarms not in use to avoid false alarms.

Note: Power Interruption Alarm and Battery Failure Alarm can **NOT** be enabled if there is no accumulator installed.



Alarm	Indicator	Severity
☐ Movement Alarm		Disable
☐ Open Case Alarm		Disable
☐ Over Temperature Alarm		Disable
☒ Radio Module 1 DL ALC Over-Range Alarm	●	Disable
☐ Radio Module 2 DL ALC Over-Range Alarm		
☐ Radio Module 3 DL ALC Over-Range Alarm		
☐ Radio Module 4 DL ALC Over-Range Alarm		
☐ OP1 Transceiver Failure Alarm		
☐ OP2 Transceiver Failure Alarm		

Figure 30. Alarm Severity Setup

Alarm Threshold

To set up the alarm threshold:

1. Log in the OMT, and go to the **Alarm Thresholds** section.
2. Locate the fields and set the appropriate values.
3. Click **Set** to save the settings.

DAS Topo

Settings

Alarms

Element Alarms

DL Input Power Alarms

Alarm Thresholds

External Alarms

Maintenance

0

Logs Upgrade Configura

	Alarm Threshold		unit	range
☐	Radio Module 1 Input Under-power Threshold	--	dBm	-20~20
☐	Radio Module 2 Input Under-power Threshold	--	dBm	-20~20
☐	Radio Module 3 Input Under-power Threshold	--	dBm	-20~20
☐	Radio Module 4 Input Under-power Threshold	--	dBm	-20~20
☐	Radio Module 1 Input Over-power Threshold	10	dBm	-20~20
☐	Radio Module 2 Input Over-power Threshold	10	dBm	-20~20
☐	Radio Module 3 Input Over-power Threshold	10	dBm	-20~20
☐	Radio Module 4 Input Over-power Threshold	10	dBm	-20~20
☐	Over Temperature Threshold	85	°C	

Figure 31. Alarm Threshold Setup

External Alarm

The CrossFire system supports external alarms inputs that as UPS failure, condition of air, entrance guard, etc.

External Alarm of A2

The external alarms are input to a DB9 dry contact interface in the front panel of A2. See the details of the pin in Figure 32. The external alarms can be monitored as normally closed or normally open

Use the following steps to view and configure the external alarms.

1. Log in the A2 OMT, and go to the Element **Alarms** section.
2. Select the appropriate alarm level for external alarm in use at the bottom of the page.
3. Click **Set** to save the settings.
4. Go to the **External Alarms** section
5. Type **External alarm name** and select **Normally closed** or **Normally open** mode.
6. Click **Set** to save the name.



Figure 33. External Alarms on A2 OMT

Figure 34. External Alarms Name and mode

External Alarm of E2-O

The external alarms are input to a RJ45 interface located on the front panel of E2-O. See Figure 35 for the detailed PIN configuration of this connector. The external alarms can be monitored as normally closed or normally open.

Use the following steps to view and configure the external alarms.

7. Log in the E2-O OMT, and go to the Element **Alarms** section.
8. Select the appropriate alarm level for external alarm in use at the bottom of the page.
9. Click **Set** to save the settings.
10. Go to the **Alarm Thresholds** section
11. Type **External alarm name** and select **Normally closed** or **Normally open** mode.
12. Click **Set** to save the name.

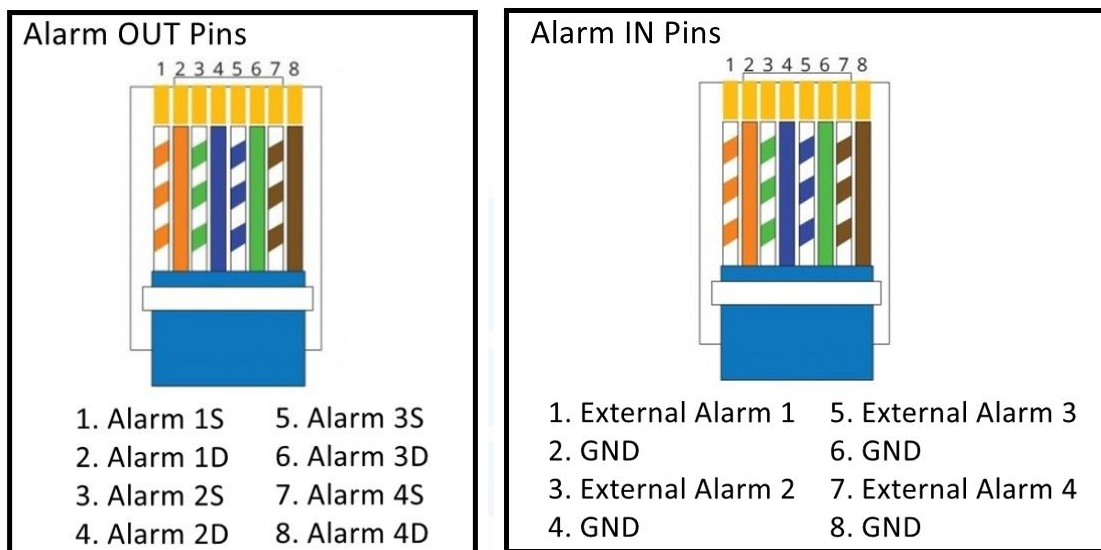
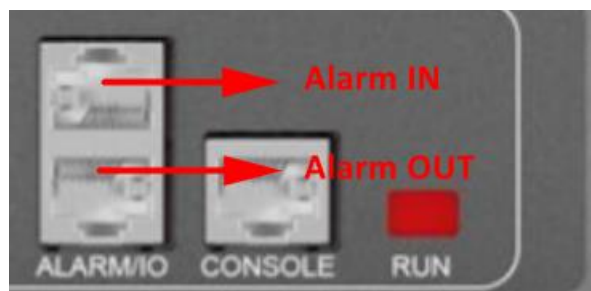


Figure 35. RJ45 Pins Description

☐	External Alarm 1		Warning 		
☐	External Alarm 2		Warning 		
☐	External Alarm 3		Warning 		
☐	External Alarm 4		Warning 		

Figure 36. External Alarms on E2 OMT

External Input Alarm 1 Mode Select	Normally open 		
External Input Alarm 2 Mode Select	Normally open 		
External Input Alarm 3 Mode Select	Normally open 		
External Input Alarm 4 Mode Select	Normally open 		
External Input Alarm 1 Label	null		20 characters
External Input Alarm 2 Label	null		20 characters
External Input Alarm 3 Label	null		20 characters
External Input Alarm 4 Label	null		20 characters
External Output Alarm(warning) Mode Select	Normally closed 		
External Output Alarm(minor) Mode Select	Normally closed 		
External Output Alarm(major) Mode Select	Normally closed 		
External Output Alarm(critical) Mode Select	Normally closed 		
External Output Alarm(warning)			
External Output Alarm(minor)			
External Output Alarm(major)			
External Output Alarm(critical)			

Figure 37. External Alarms Name and mode in E2-O

External Alarm of M2RU

The external alarms are connected to the M2RU using a RJ45 dry contact interface located on the front panel of the M2RU (2 inputs and 2 outputs). See Figure 38 for detailed PIN configuration of this connector. The external alarms can be monitored as normally closed or normally open.

Use the following steps to view and configure the external alarms.

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1. Log in the M2RU OMT, and go to the Element **Alarms** section.
2. Select the appropriate alarm level for external alarm in use at the bottom of the page.
3. Click **Set** to save the settings.
4. Go to the **External Alarm** section
5. Type **External Alarm Label**, **External Alarm Level** and select **Normally closed** or **Normally open** mode.
6. Click **Set** to save the name.

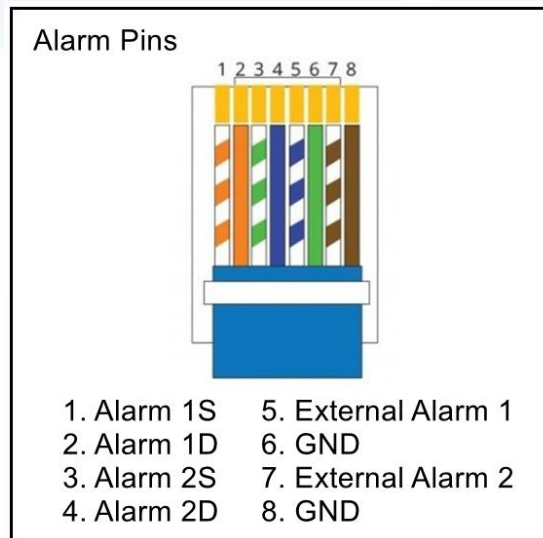


Figure 38. RJ45 Pins Description

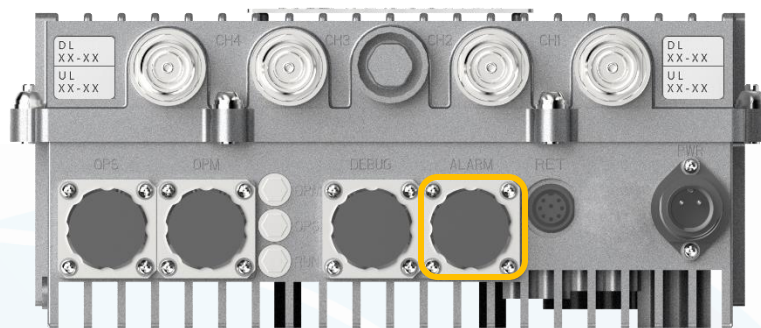


Figure 39. External Alarm Port (RJ45) in M2RU

☐	External 1 Alarm		Disable
☐	External 2 Alarm		Disable

Figure 40. External Alarms on M2 OMT

DAS Topo

Settings

Alarms

Element Alarms

Alarm Thresholds

External Alarms

Maintenance

Management

A2[master] 23F-t

Logs Upgrade Configuration Screenshot User

☐	External Alarm		unit	range	query
☐	External Input Alarm 1 Mode Select	Normally closed			set
☐	External Input Alarm 2 Mode Select	Normally closed			clear
☐	External Input Alarm 1 Label	null		20 characters	query all
☐	External Input Alarm 2 Label	null		20 characters	
☐	External Output Alarm 1 Mode Select	Normally closed			
☐	External Output Alarm 2 Mode Select	Normally closed			
☐	External Output Alarm 1 Level	Disable			
☐	External Output Alarm 2 Level	Disable			
☐	External Output Alarm 1 Indication				
☐	External Output Alarm 2 Indication				

Figure 41. External Alarms Name and mode

Advanced Activities

Mapping Configuration

The CrossFire M2 system can comprise many M2 to achieve extensive area coverage. CrossFire maintains the mapping mechanism between the A2 and M2, so all M2 units in the system can transmit the signal as long as M2 is correctly mapped to A2. Generally, the original mapping order is set automatically via the module sequence as the physical device assembly (A2_1 -> A2_2 -> A2_3 -> A2_4).

Note: If A2 modules do not have configured band properties(invalid), modules are not able to be mapped.

If there are two same band modules (Module 3 and Module 4) on an M2 and two corresponding band modules (Module 1 and Module 2) in A2, the mapping information is M2-Module3 to A2-Module1 and M2-Module4 to A2-Module2.

If there are two same band modules (Module 3 and Module 4) on an M2 but only one corresponding band module (Module 2) in A2, the mapping information is M2-Module3 to A2-Module2 and M2-Module4 to null.

To check the mapping information:

1. Jump to M2 OMT
2. Go to **Settings -> Band Configuration -> Module Mapping**

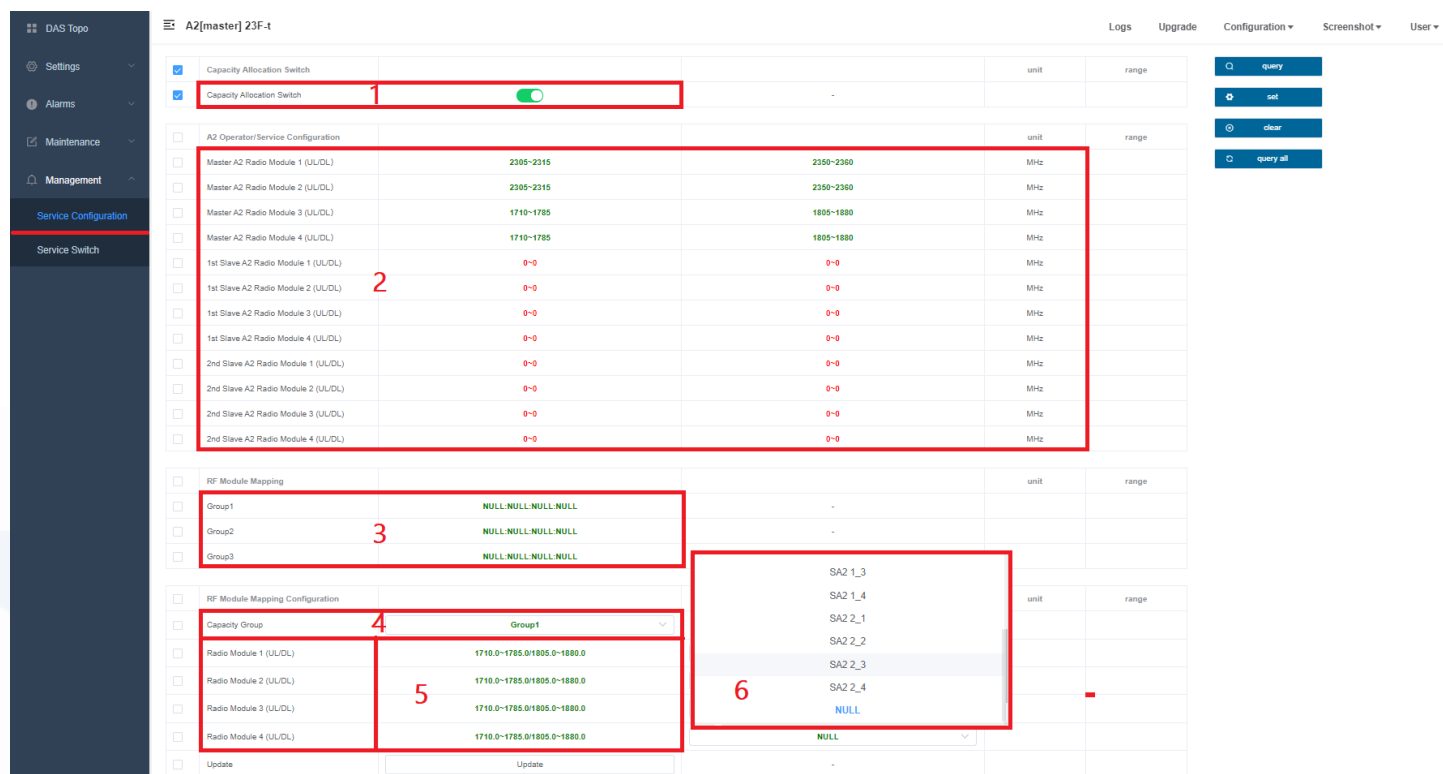
DAS Topo	A2[master] 23F-t	Logs	Upgrade	Configuration	Screenshot	User
Settings	☐ UL Attenuation 0 dB 0~15 ☐ DL Attenuation 0 dB 0~15			query set clear query all		
Overview	☐ Radio Module 3 ☐ UL Frequency Start - End 1710 MHz 1785 MHz ☐ DL Frequency Start - End 1805 MHz 1880 MHz ☐ RF Signal Active ☒ ☐ UL Attenuation 0 dB 0~15 ☐ DL Attenuation 0 dB 0~15					
Band Configuration	☐ Radio Module 4 ☐ UL Frequency Start - End 1710 MHz 1785 MHz ☐ DL Frequency Start - End 1805 MHz 1880 MHz ☐ RF Signal Active ☒ ☐ UL Attenuation 0 dB 0~15 ☐ DL Attenuation 0 dB 0~15					
Radio Signal Information	☐ Module Mapping (with Access Unit Radio Module) ☐ Radio Module 1 (UL/DL) 1710.0-1785.0/1805.0-1880.0 A2_3 ☐ Radio Module 2 (UL/DL) 1710.0-1785.0/1805.0-1880.0 A2_4 ☐ Radio Module 3 (UL/DL) 1710.0-1785.0/1805.0-1880.0 NULL ☐ Radio Module 4 (UL/DL) 1710.0-1785.0/1805.0-1880.0 NULL					
Theoretical Gain						
Optical Module Information						
Alarms						
Maintenance						
Management						

Figure 42. Mapping Information

The CrossFire provides Service Management to configure the mapping information with different orders according to the various situations, swap the mapping of M2 modules, M2-Module3 to A2-Module2 and M2-Module4 to A2-Module1.

To manage the mapping:

1. Jump to the M2 OMT
2. Go to **Management -> Service Configuration -> Allocation Switch**
3. Turn the **Capacity Allocation Switch** on in #1 and click **Set** to validate it
4. Click **QueryAll** to check the **A2 Operator/Service Configuration** in #2 and **M2 Module Information** in #5
5. Dropdown the **Capacity Group** to select the group in #4
6. Select the A2 module which is required for mapping in the **RF Module Mapping Configuration** in #6
7. Select all checkbox of **RF module Mapping Configuration - Capacity Group, Radio Module** mapping and **Update**
8. Click **Set** and then **Update** to validate the mapping
9. Click **QueryAll** to check **RF Module Mapping** in #3



The screenshot displays the 'Service Configuration' page in the Sunwave OMT. The interface includes a sidebar with navigation options like 'DAS Topo', 'Settings', 'Alarms', 'Maintenance', 'Management', 'Service Configuration', and 'Service Switch'. The main content area shows several configuration sections:

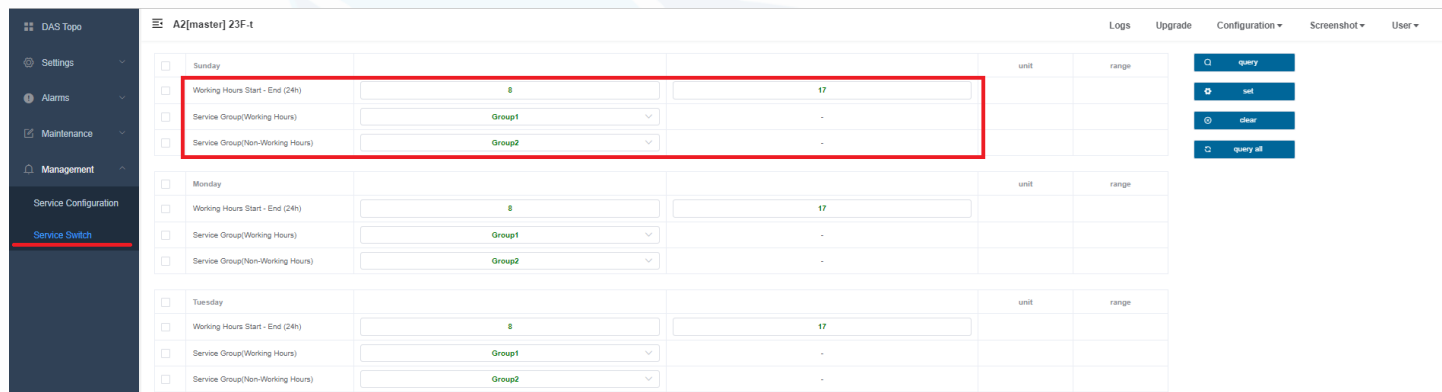
- Capacity Allocation Switch:** A toggle switch is turned on (indicated by a green circle and the number 1).
- A2 Operator/Service Configuration:** A table listing various radio modules (Master A2, 1st Slave A2, 2nd Slave A2) and their frequency ranges. A red box highlights this table with the number 2.
- RF Module Mapping:** A table showing mapping groups (Group1, Group2, Group3) with NULL values. A red box highlights this table with the number 3.
- RF Module Mapping Configuration:** A section with a 'Capacity Group' dropdown (highlighted with number 4) and a table of radio modules and their frequency ranges (highlighted with number 5).
- SA2 Mapping:** A table showing SA2 mappings (SA2_1_3, SA2_1_4, SA2_2_1, SA2_2_2, SA2_2_3, SA2_2_4, NULL) with a red box highlighting this table with the number 6.

On the right side, there are buttons for 'query', 'set', 'clear', and 'query all'.

Figure 43. Service Configuration

10. Go to **Management -> Service Group Scheduling**

11. Dropdown **Service Group (Working Hours)** and **Service Group (Non-Working Hours)** to select the Group for RF test so that the mapping will not be changed during the test.



Day	Working Hours Start - End (24h)	Service Group(Working Hours)	Service Group(Non-Working Hours)
Sunday	8 - 17	Group1	Group2
Monday	8 - 17	Group1	Group2
Tuesday	8 - 17	Group1	Group2

Figure 44. Service Group Scheduling

Radio Module Test Signal

CrossFire M2RU system provides the Radio Module Test Signal function for M2RU to transmit a CW signal to test the coverage.

Use the active button in A2 to enable all modules mapped to AU-AC in RU to transmit CW signal for pre-test the coverage without BTS feeding.

To active the Radio Module Signal in A2:

1. Log to the A2 OMT, and go to **Maintenance -> Engineering -> RU Radio Module Signal Test Active**.
2. Select the status button.
3. Click **Set** to active/deactive radio test signal.
4. After the test, turn off the switch or reboot the A2 to disable the function.

Note: After RU Radio Module Signal Test Active is enabled, the unit will send CW signal at “the module physical center frequency” + 2 MHz.

Note: The CW signal power level is the maximum output power of the unit without any attenuation in OMT. The digital attenuation of A2 and RU can correspondingly reduce DL CW signal level.

For example, the A2 module Band 1 (DL 2110-2170 MHz) under test is enabled without any attenuation. Then module Band 1 in M2RU will transmit 37dBm DL output power at 2142MHz.

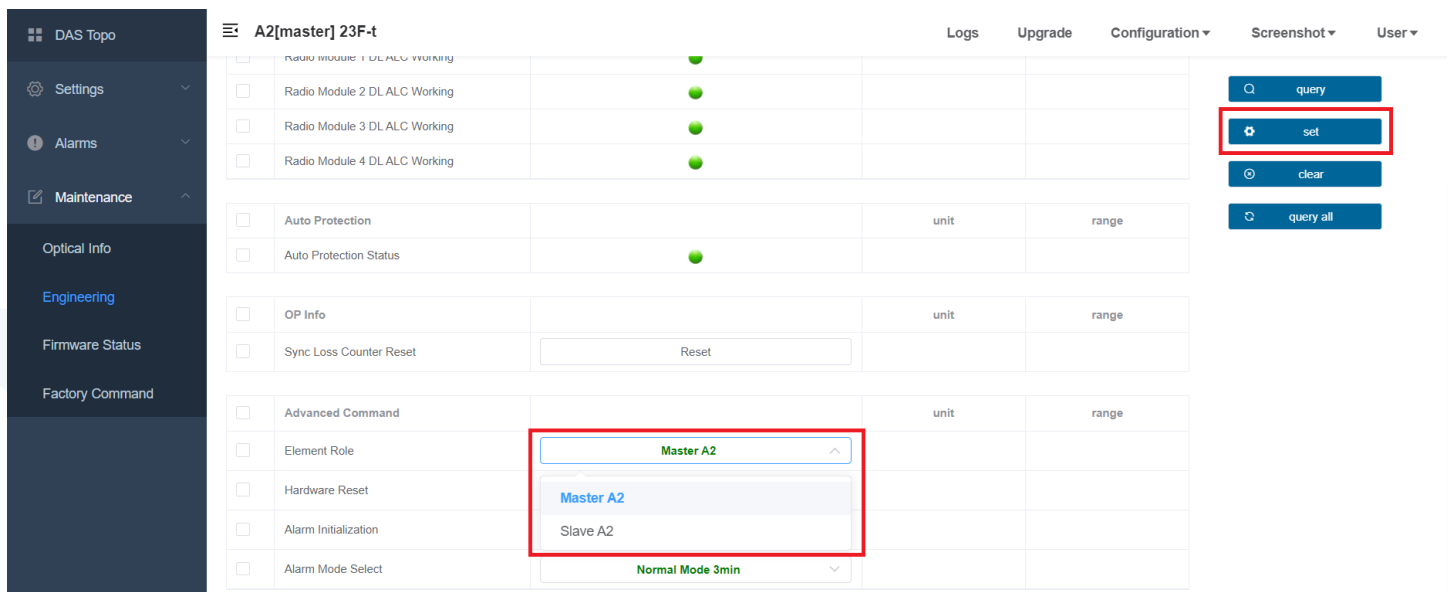
☐	RU Radio Module Signal Test Active		unit	range
☐	RU Radio Module Signal Test Active	☐		

Figure 45. Test Signal Switch in A2

Master/Slave A2 Transition

Slave A2 is used for expanding the system up to 12 band modules to support more band inputs or MIMO scenarios. Master and Slave A2 have the same hardware and software. The A2 is default as Master, and it can change between Master and Slave via OMT.

1. Open A2 OMT and check Device Info about the A2
2. Go to [Maintenance -> Engineering -> Advanced Command](#)
3. Select the required type in [Master/Slave A2](#)
4. Wait 2 minutes for A2 rebooting
5. Open A2 OMT and recheck Device Info to see if the A2 is changed to the required one



The screenshot shows the A2 OMT interface for 'A2[master] 23F-t'. The left sidebar contains navigation options: DAS Topo, Settings, Alarms, Maintenance, Optical Info, Engineering, Firmware Status, and Factory Command. The main area displays various system status and configuration options. In the 'Advanced Command' section, a dropdown menu is open, showing 'Master A2' as the selected option. The 'set' button is highlighted with a red box. Other buttons like 'query', 'clear', and 'query all' are also visible.

Figure 43. Master / Slave A2 Transition

Device Info



Name:	[OP7]-Slave A21
Device name:	0
ID:	2
Route:	7000
IP:	11.7.70.1
Location:	0
Alarm:	No
Version:	1.7
Element model:	0

Route Jump

Port Jump

Figure 44. Device Type Check

System Delay Configuration

CrossFire provides 3 methods to balance the system delay - Automatic, Manual, and Triggered.

Automatic: The system adjusts the delay automatically.

Manual: Delay value can be customized equal to or larger than max delay value.

Triggered: Click the Confirm button to adjust the system delay or set the max delay value automatically per minute.

To set the system delay procedure:

1. Open A2 OMT
2. Go to **Setting -> Band Configuration -> System Delay**
3. Select the required method in **Delay Adjustment Method**
4. Click **Set** to validate.

☐	System Delay			unit	range
☐	Delay Adjustment Method	Automatic	Automatic		
☐	Max Delay Value Measured	1.22	Trigger	us	
☐	Max Delay Value Adjust	0	Manual	us	
☐	Triggered Delay Activation	Confirm	-		
☐	Customize Delay Value	4	-	us	



Figure 45. System Delay Configuration

Auto Logout Time

The OMT has an auto-logout function in case of no operation in a period. The auto-logout time can be configured from 5 to 60 minutes.

To set up the OMT logout time:

1. Log to the A2 OMT.
2. Go to **Settings -> LAN Connectivity**.
3. Input the period in the field of **OMT Logout Time**.
4. Click **Set** to validate it.

The screenshot shows the OMT configuration interface. On the left is a sidebar with navigation options: DAS Topo, Settings, Overview, Band Configuration, TDD Configuration, Radio Signal Information, Radio Interface Modules, Optical Module Information, LAN Connectivity (highlighted), and Alarms. The main area displays the 'LAN Connectivity' settings. A table lists various configuration items:

Item	Value	Unit	Range
Firmware Upgrade Filepath	/home/dasftp/		
Firmware Upgrade Filename	debug_up.sh		
SFTP File Transfer Control	Start Upgrade		
NTP		unit	range
NTP Switch	☐		Time synchronizes to LMS when NTP is off
NTP Update Interval	24	hour	24-96
Time Zone	UTC+8		
NTP IP Address1	0.0.0.0		
NTP IP Address2	0.0.0.0		
OMT Logout		unit	range
OMT Logout Time	30	Min	5-60

On the right side of the table, there are buttons: query, set, clear, and query all. The 'OMT Logout Time' field and its value '30' are highlighted with a red box.

Figure 46. Logout Time

Local Debug Port Control

CrossFire has enhanced security functions that disable the A2 AP USB port and other elements' console port.

To control the AP USB port and other elements' console port:

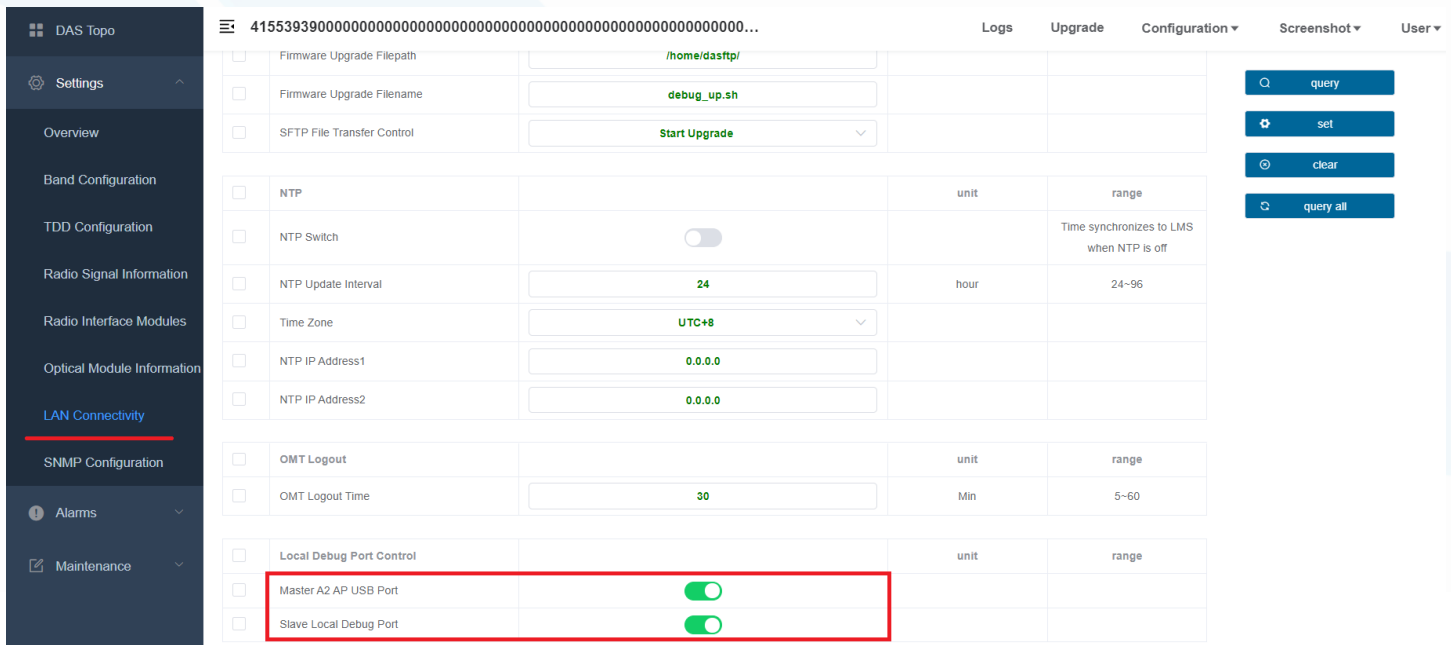
1. Log to the Master A2 OMT.
2. Go to **Settings -> LAN Connectivity**.
3. Enable/disable the port access in **Local Debug Port Control**.
4. Click **Set** to validate it.

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The screenshot shows the OMT GUI with the 'Settings' menu on the left. The 'Local Debug Port Control' section is highlighted with a red box. It contains two rows, each with a checkbox and a toggle switch. The first row is 'Master A2 AP USB Port' and the second row is 'Slave Local Debug Port'. Both checkboxes are checked and the toggle switches are turned on.

Item	Value	Unit	Range
Firmware Upgrade Filepath	/home/dasftp/		
Firmware Upgrade Filename	debug_up.sh		
SFTP File Transfer Control	Start Upgrade		
NTP		unit	range
NTP Switch	☐		Time synchronizes to LMS when NTP is off
NTP Update Interval	24	hour	24~96
Time Zone	UTC+8		
NTP IP Address1	0.0.0.0		
NTP IP Address2	0.0.0.0		
OMT Logout		unit	range
OMT Logout Time	30	Min	5~60
Local Debug Port Control		unit	range
Master A2 AP USB Port	☒		
Slave Local Debug Port	☒		

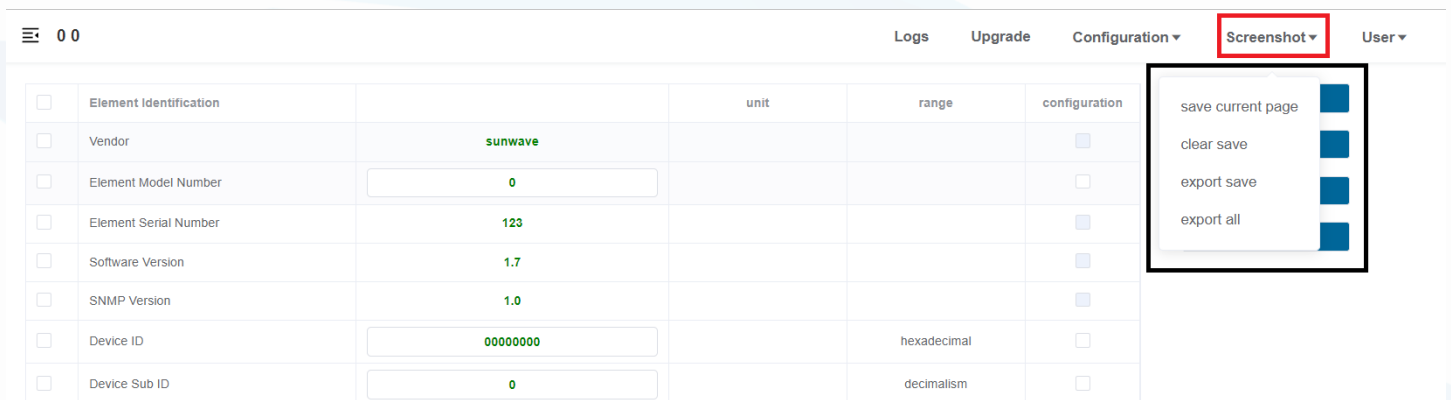
Figure 47. Local Debug Port Control

Screenshot

CrossFire OMT supports a one-click screenshot which is saved as .pdf file.

To get a screenshot for all page:

1. Click **ScreenShot** button in the upright of the OMT GUI
2. Click **export all** and wait a moment. The Screenshot function goes through all pages to collect all parameters
3. When all parameters are captured, the screenshot .pdf file could be downloaded automatically
4. Click **save current page** to capture the specified page and click **export save** to download



The screenshot shows the OMT GUI with the 'Screenshot' button highlighted in the top right. A dropdown menu is open, showing four options: 'save current page', 'clear save', 'export save', and 'export all'. The 'export all' option is selected.

Item	Value	Unit	Range	Configuration
Element Identification				
Vendor	sunwave			☐
Element Model Number	0			☐
Element Serial Number	123			☐
Software Version	1.7			☐
SNMP Version	1.0			☐
Device ID	00000000		hexadecimal	☐
Device Sub ID	0		decimalism	☐



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Figure 48. Screenshot Steps

MID POWER

4 x 37dBm Output
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Backup/Restore Configuration

To back up element's configuration:

1. Click the **Configuration** button in the upright of the OMT GUI.
2. Click **open configuration** and Check boxes for the parameters you want to back up.
3. Check boxes for the parameters you want to back up.

Note: The **Port Att** is used for manual mode but the **Port Power Distribution** is used for auto mode. Do **Not** to select the **Port ATT** and **Port Power Distribution** at same time on **Radio Interface Modules** on A2/SA2. Otherwise loading configuration will fail if the file has both of **Port Att** and **Port Power Distribution**.

4. Click **export Configuration** button to download all saved configuration in a .json file

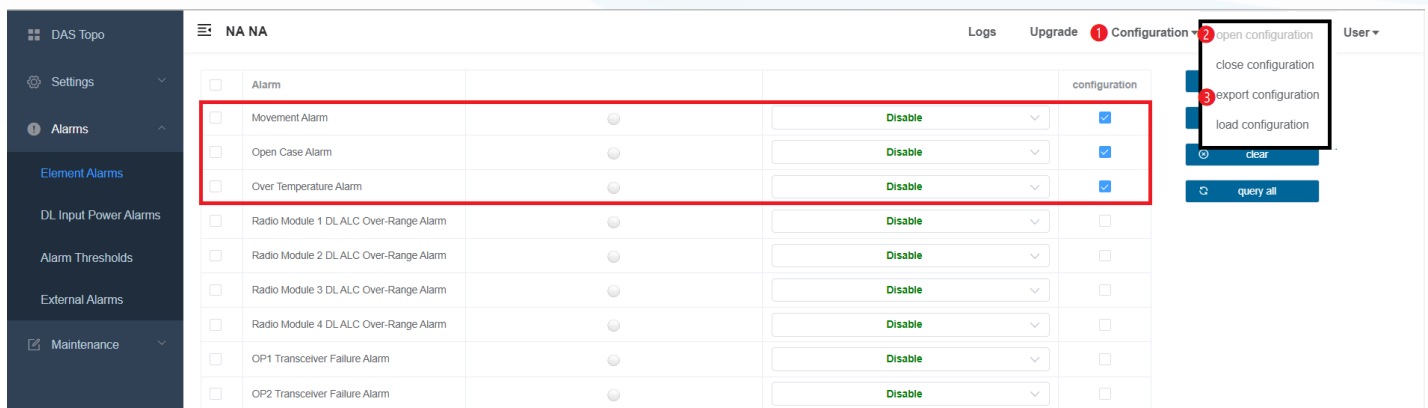


Figure 49. Create a back-up file

iDAS_A302_Configuration_A302_2021_10_13.json

Figure 50. Create a backup file successfully

To restore the element's configuration:

1. Click the **Configuration** button in the upright of the OMT GUI
2. Click the **Load Configuration** button
3. Upload the .json file and click the **Load** button to restore the configurations.

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File Name	File Size	Date		
 IDAS_A302_Configuration_5746_2021_9_30.json	336 KB	2000-1-5 06:09	☐	



 refresh
  delete
  download
  load

Figure 51. Restore Configuration

Software Upgrade

The Master A2 consolidates the management of software upgrades for the entire system and saves the last software package information for A2, E2-O, and M2RU. Slave devices will compare the local software with the latest information saved in Master A2 by checking CRC at run time. If the CRC is different, slave devices will be synchronized via the current software package from Master A2. Therefore, when a slave device is replaced, its software will be upgraded automatically without any additional operation.

Note: If it is the Master A2 to be replaced in a system, check the software version of the new Master A2 before connecting it to the system. If the software version is not the latest, upload the latest software packages to the new Master A2.

Local Upgrade

The CrossFire system supports local sync-upgrade. There are two steps for the system software local sync-upgrade. First, upload the software package to the Master A2. Second, slave devices are synchronized automatically via the Master A2 if the CRC is different. Please make sure the upgrading from the lowest level device to the highest level device (M2RU -> E2 -> A2). The A2 must be the last one to be upgraded.

As an example, to do an M2RU or E2 local upgrade:

1. Log into the OMT on the Master A2. Click the **Upgrade** button on the main page to navigate to the software upgrade page. See Figure 52.

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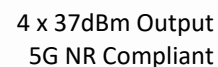


Figure 52. Software Upgrade 1

- Figure 53. Software Upgrade 2

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- After the software is uploaded successfully, select the file that was just uploaded and click the **Upgrade** button to complete the software upgrade, as shown in Figure 54 for an M2RU upgrade.

	File Size	Date		
31114.zip	13135 KB	2019-11-18 11:14	☒	
14.zip	13412 KB	2019-11-18 11:13	☐	
116.zip	12742 KB	1970-1-1 00:02	☐	

refresh
delete
download
upgrade
check version
forced upgrade

Figure 54. Software Upgrade 3

- After the upgrade has been completed and devices reset, log in to the devices' OMT and go to **Maintenance -> Software Package** to confirm that the software version is correct as shown in Figure 55.

DAS Topo
Settings
Alarms
Maintenance
Optical Info
Engineering
Firmware Status
Factory Command

0

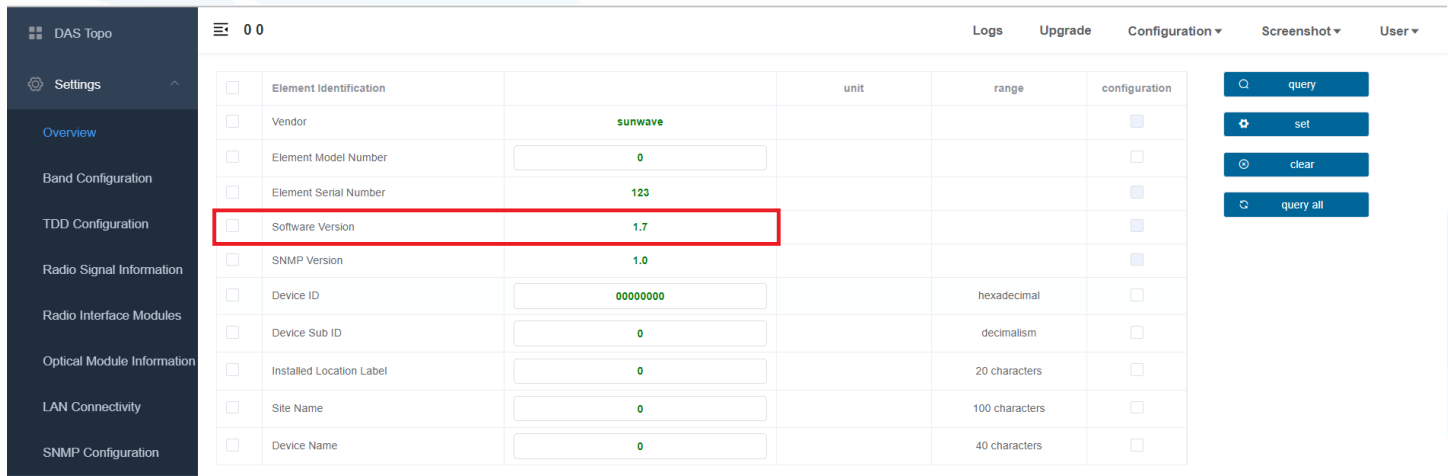
Logs Upgrade Configuration Screenshot User

query

filename	crc	delete
IDAS_AU_A302_V1.7_15EB_20210930.zip	0X15EB	delete
IDAS_H2RU_R311_V1.1_125E_20210930.zip	0X125E	delete

Figure 55. Software Version Check 1

- Then go to **Settings -> Overview** to confirm that the software matches the version in the upgrade package as shown in the red frame of Figure 56.



	unit	range	configuration
☐ Element Identification			
☐ Vendor	sunwave		☐
☐ Element Model Number	0		☐
☐ Element Serial Number	123		☐
☐ Software Version	1.7		☐
☐ SNMP Version	1.0		☐
☐ Device ID	00000000	hexadecimal	☐
☐ Device Sub ID	0	decimalism	☐
☐ Installed Location Label	0	20 characters	☐
☐ Site Name	0	100 characters	☐
☐ Device Name	0	40 characters	☐

Figure 56. Software Version Check

Note: If the software version is not incompatible, please upgrade the same software again to make the upgrade completed.



MID POWER

4 x 37dBm Output
5G NR Compliant

FCC Warning:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Part20 Warning :

WARNING. This is **NOT** a **CONSUMER** device. It is designed for installation by **FCC LICENSEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENSE** or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.

FCC Warning:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Part20 Warning :

Note: This product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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