DIFFERENT BY DESIGN™

JMA DAS Platform
Remote Monitoring and Management
User Guide

DAS Supervision Version: 4.3.6

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About this Guide

The DAS (Distributed Antenna System) supervision module web interface allows the monitoring, configuration, and commissioning of all the components managed by the DAS supervision module.

This document provides instructions on how to remotely access the supervision module for the monitoring (all users) and management (role-based capabilities) of the system. Users with admins or superusers privileges will also find guidance on how to set the options for an effective monitoring of the system.

For detailed descriptions of the software commissioning tools, which are available for users with the **admins** privileges, refer to the *JMA DAS Platform Local Commissioning User Guide*.

What's New

This revision (rev.7) of the *JMA DAS Platform Remote Monitoring and Management User Guide* describes release 4.3.6 of the DAS supervision module, which adds support for the following new products:

- ED35B35TD, next generation dual-band optical transceiver, which operates in the 3450-3550MHz and 3700-3980MHz frequency bands (35B and 35T). See "NG OTRX Panel" on page 125
- ED35B35TDM and ED35B35TDS, next generation dual-band Master and Secondary Point-to-Point units, which operate in the 3450-3550MHz and 3700-3980MHz frequency bands (35B and 35T). See "NG PtoP Master" on page 141 and "NG PtoP Secondary" on page 144.
- RD35B35TWX2AT and RD35B35TWX2DT, next generation, dual-band, upgradable 10/20/40W, MIMO Software Defined Remote Units (SDRU), which operate in the 3450-3550MHz and 3700-3980MHz frequency bands (35B and 35T). See "NG RU and NG SDRU Panels" on page 131
- RD35B35TWH2AT and RD35B35TWH2DT, next generation, dual-band, 5W, MIMO remote units, which operate in the 3450-3550MHz and 3700-3980MHz frequency bands (35B and 35T). See "NG RU and NG SDRU Panels" on page 131

Release 4.3.6 of the DAS supervision module also introduces support for simulcast on dual-band Secondary Point-to-Point unit. See "NG PtoP Secondary" on page 144 and "Selecting the Dual-band NG PtoP Secondary Simulcast Configuration" on page 47.

Accessing the DAS Supervision Module Web Interface

Note: When the DAS includes next generation point-to-point links, the DAS components installed at the master unit location and the DAS components installed at the remote location are managed by two separate supervision modules:

- The supervision module, which manages the DAS components installed at the master unit location, including the next generation point-to-point master component.
- The remote supervision module, which manages the DAS components installed at the remote location, including the next generation point-to-point secondary component, distant optical transceivers, and all connected remote units.

You need to connect to the supervision modules separately to manage the entire DAS.

To access the supervision module web interface:

1. Start a web browser.

   Note: In the web browser options it is advisable to set the security level to medium (or lower) and disable the pop-up blocker, to correctly display the web interface.

2. In the URL bar, enter the IP address of the DAS supervision module.

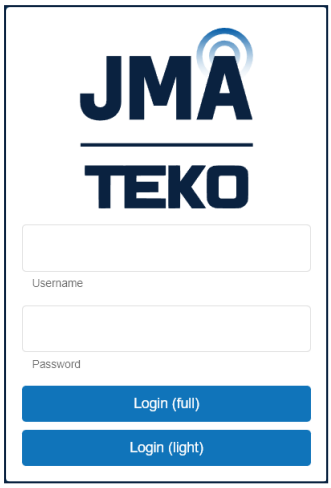
   Contact the network administrator to get the DAS supervision module IP address.

   Note: For local connections, refer to the *JMA DAS Platform Local Commissioning User Guide* and to the *JMA DAS Platform Quick Start Procedure*.

3. Press the Enter key on your keyboard.
   - If a certificate error message appears (untrusted connection), bypass the warning page.
   - If a **Connection failed** message appears:
     - In the web browser options, check that the security level is set to medium (or lower) and that the pop-up blocker is disabled.
     - Make sure that:
       - The DAS is turned on.
       - The DAS IP address is correct.
       - The network connection is available.
     - Check the status of the VPN Server and the VPN connectivity.

4. Enter the username and password of a registered account.

When the login panel appears, enter username and password of a registered account. Contact the software administrator to get the parameters.



Note: Each user is assigned a role that is associated with a set of allowed capabilities.

The following table lists the capabilities associated with each role and the factory-set username and password for each role:

User Role (Community)	Factory-set Username and Password	Capabilities
admins	User name: admin Password: Password1	Total control over all parameters.
superusers	User name: superuser Password: Password1	Control over all parameters except users table.
users	User name: user Password: Password1	Control over modules parameters, no supervision (SPV).
guests	User name: guest Password: Password1	Can read but not edit parameters of the system (read-only user).

5. Click either Login (full) or Login (light).

Note: For low data rate connections, select the light version option **Login (light)**.

- **Access Denied**

  If access is denied, check the username and password spelling, then log in with the correct details.

  Note:

  Both **Username** and **Password** fields are case-sensitive; make sure to type the username and password with correct upper-case and lower-case letters.

  If you lose your account information, contact customer support. Refer to "Getting Help: Technical Support Contact Information" on page 147.

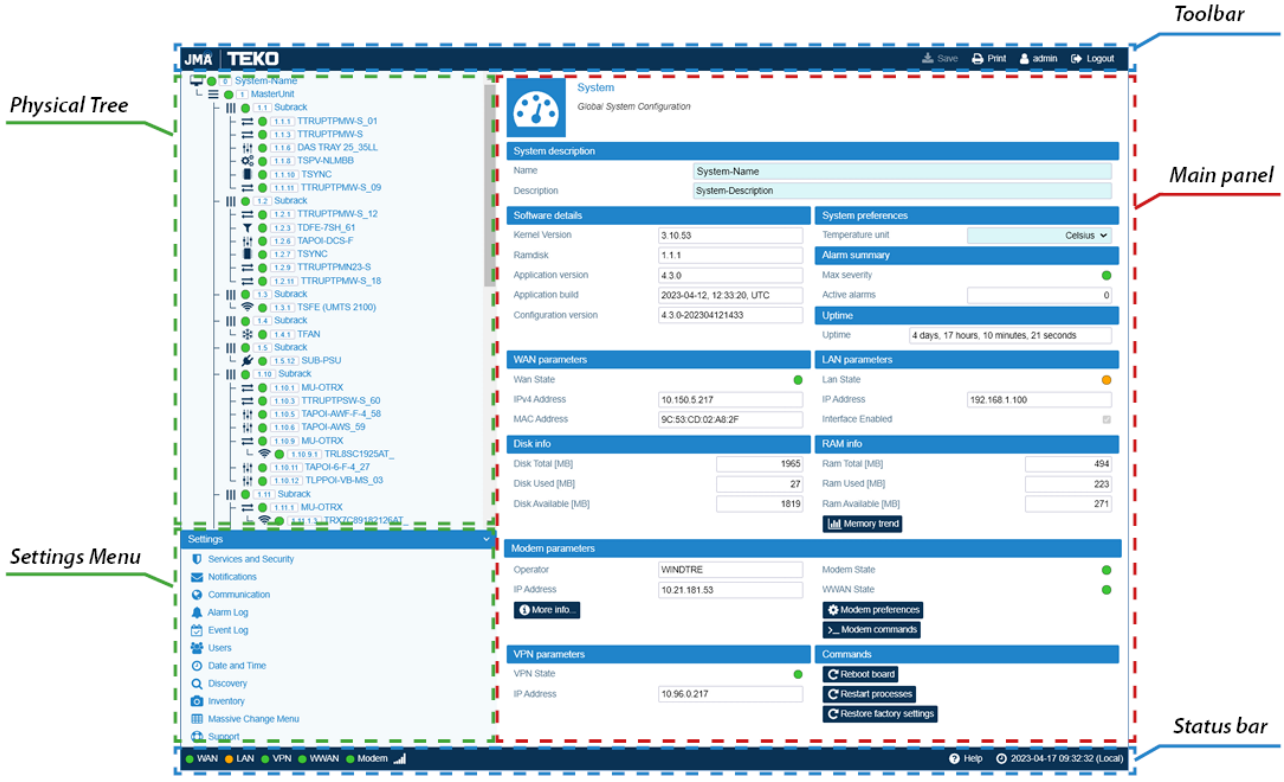
- **Successful Login**

  After successful login, the user interface opens with the **System** panel displayed.

User Interface Description

The main elements of the supervision module web user interface (UI) are the following:

- The **Toolbar**, at the top of the UI. See "Toolbar" on the next page.
- The **Physical Tree**, on the left side of the UI, displays the hierarchy of the DAS components managed by the supervision module and provides an at-a-glance view of the alarm status of the whole DAS. See "Viewing the System Architecture" on page 18 and "Viewing the Alarm Status of Managed Components" on page 21.
- The **Settings** menu, below the Physical Tree, includes DAS monitoring, configuration, and commissioning tools. See "Settings Menu" on page 15.
- The **Main panel**, to the right of the Physical Tree. The content of the main panel changes depending on the user's selection in the UI. See "Main Panel" on page 13.
- The **Status bar**, at the bottom of the UI, displays:
  - The status of the supervision module communication interfaces (WAN, LAN, VPN, WWAN, Modem).
  - The browser current date and time. Click the date and time to toggle between local time and UTC.
  - The relationship between icon color and alarm severity level (Help).



Toolbar

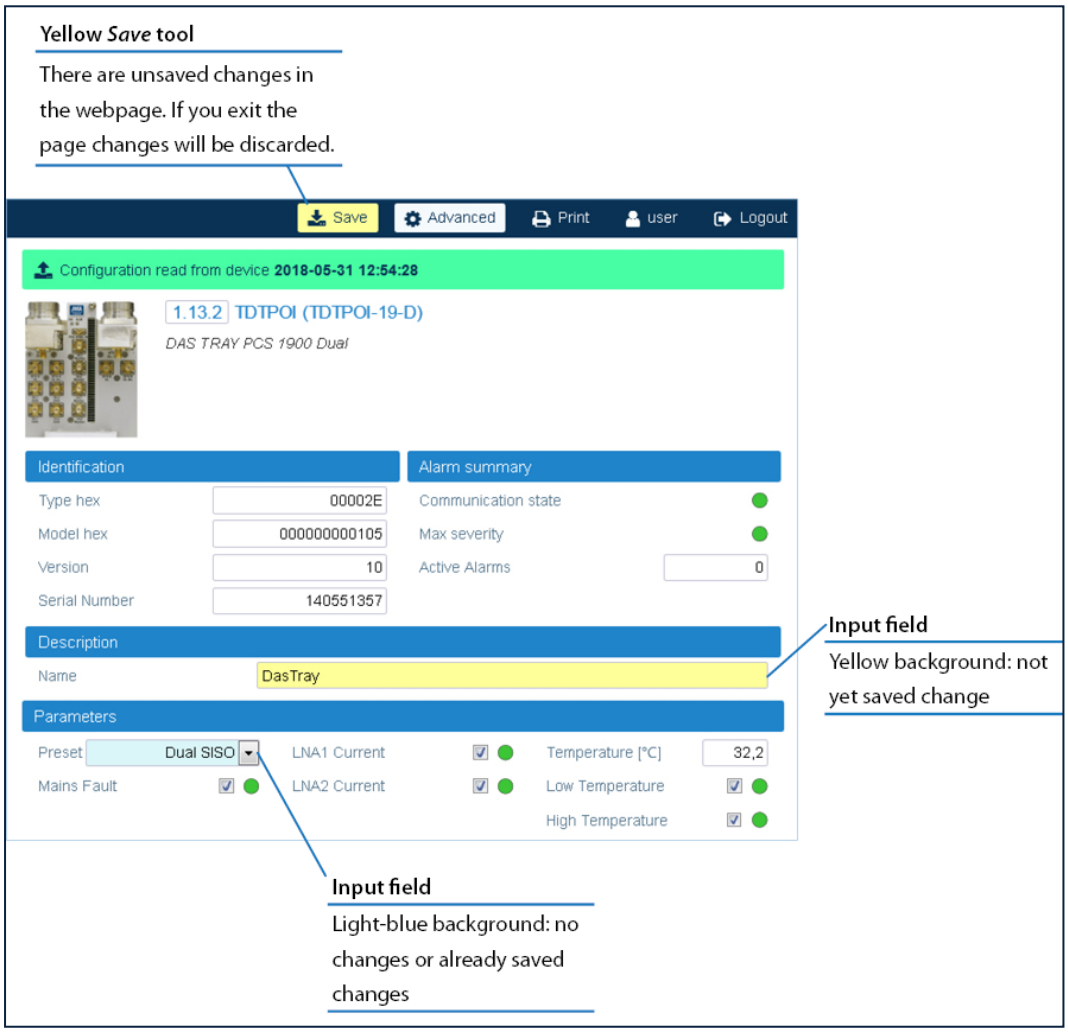
The **Toolbar** is located at the top of the supervision module UI.

The **Toolbar** includes the following tools:

- **Save**

  The **Save** tool is available when fields can be edited by users. Editable fields have a light-blue background. When changes to editable fields are detected, the field background and the **Save** tool turn yellow.

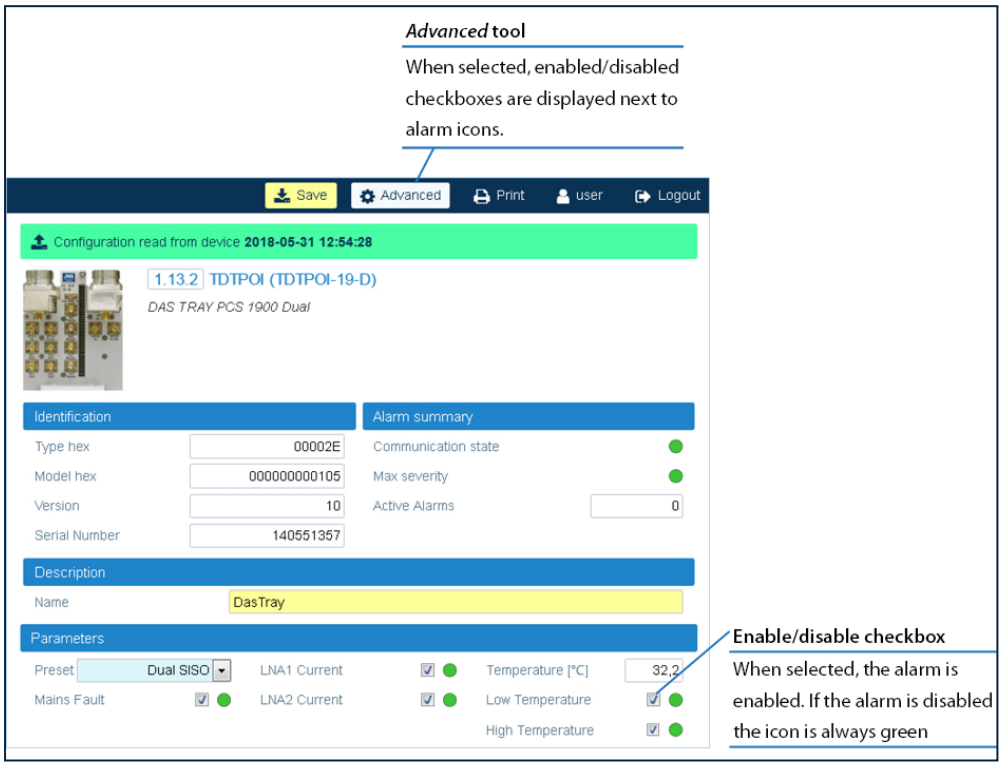
  Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save all the changes in the page.



- **Advanced**

  The **Advanced** tool is available when the main panel includes alarms. Select the **Advanced** tool to display enabled and disabled alarms. See "Enabling and Disabling Alarms" on page 36.

  Note: If an alarm is disabled its icon is always green.



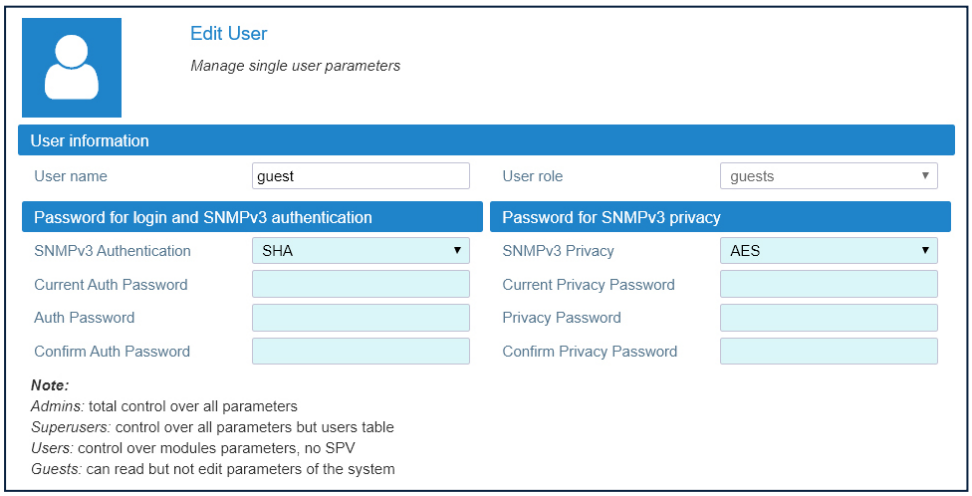
- **Print**

  Print the main panel of the current web page.

- **<User name of the account currently logged in>**

  Select the account name to open the **Edit User** panel, which is available for all users to:

  - View their account details: user name and role.
  - Change their own password to access the application and for SNMPv3 authentication and privacy. See "Changing Your Password and Username" on page 62.

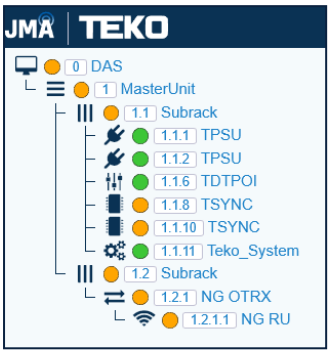


- **Logout**

  Exit the supervision module user interface. You will be redirected to the **Login** page.

Physical Tree

The **Physical Tree** displays the hierarchical architecture of the DAS components managed by the supervision module. The **Physical Tree** is generated or updated after a discovery is accepted. See "Discovering the DAS Components" on page 39.



Each node in the **Physical Tree** is associated with an icon and an ID number. The icon identifies the component type; the ID number represents the component position in the DAS. See "Viewing the System Architecture" on page 18 for a detailed description of the **Physical Tree** device hierarchy.

To the left of the ID number, a color-coded icon gives immediate indication of the component alarm status. See "Viewing the Alarm Status of Managed Components" on page 21 for details.

Click a node in the **Physical Tree** to display the main panel with detailed information about the selected device.

Main Panel

The content of the main panel changes depending on the user's selection in the user interface.

- **Selection in the Settings menu**

  When you select a tool from the **Settings menu**, the main panel displays related content and options. See "Settings Menu" on page 15 for details.

- **Selection in the Physical Tree**

  - When you select the root node, the **System** panel provides information about the supervision module and the entire managed System. See "Viewing the Global System Configuration" on page 16.

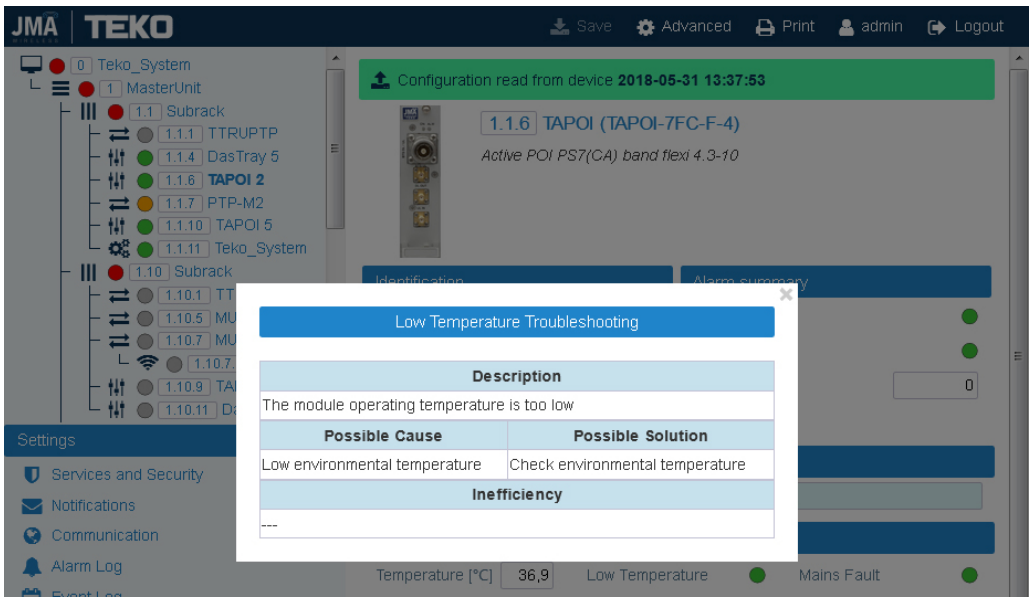
- When you select a component of the DAS, the main panel provides detailed information about the component. In the main panel, authorized users can set preferences and operating parameters. See "Editing Parameters" on page 53.

  At the top of the component main panel, a green bar indicates that the configuration of the component is read from the device. If a previously generated inventory is available, an **Inventory** button displays.

  The Inventory button allows users with admins or superusers role permissions to load the device configuration from the selected Inventory. See "Creating and Managing Inventory Lists" on page 56 and "Loading Device Configuration from Inventory" on page 59 for details.

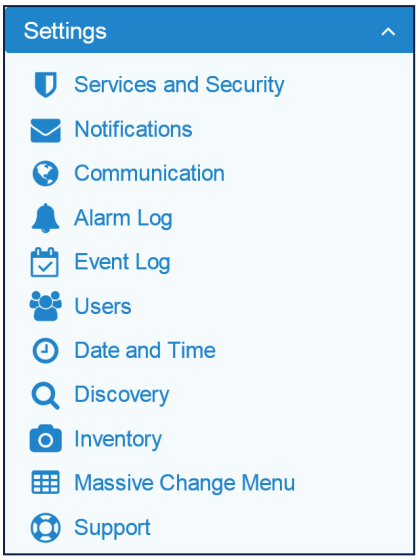
  A red bar at the top of the web page indicates a lack of communication with the component.

  Alarms description and troubleshooting tips are also available clicking on alarm names.



Settings Menu

The **Settings** menu displays on the left side of the user interface, below the **Physical Tree**.



The **Settings** menu allows access to the following DAS monitoring, configuration, and commissioning tools:

- **Monitoring Tools**
  - Alarm Log. See "Viewing Alarms" on page 23.
  - Event Log. See "Viewing Events" on page 27.
- **Monitoring Tools Options**
  - Notifications. See "Setting Alarm and Heartbeat Notifications" on page 29.
- **Device Management and Commissioning Tools**
  - Discovery. See "Discovering the DAS Components" on page 39
  - Massive Change Menu. See "Editing Parameters with the Massive Change Menu" on page 54.
    Note: The **Massive Change Menu** is a useful tool for users with **admins** role permissions to speed up the RF commissioning of Points of Interface (POIs) and remote units. Refer to the *JMA DAS Platform Local Commissioning User Guide* for details.
  - Inventory. See "Creating and Managing Inventory Lists" on page 56.
- **Account Management Tools**
  - Users. See "Managing Accounts" on page 62.
- **Network Configurations Tools**
  - Communication. See "Setting the Supervision Module Communication Interface for Remote Management" on page 65.
  - Services and Security. See "Setting the Network Security" on page 69.
  - Date and Time. See "Setting the System Date and Time" on page 71.

Monitoring the System

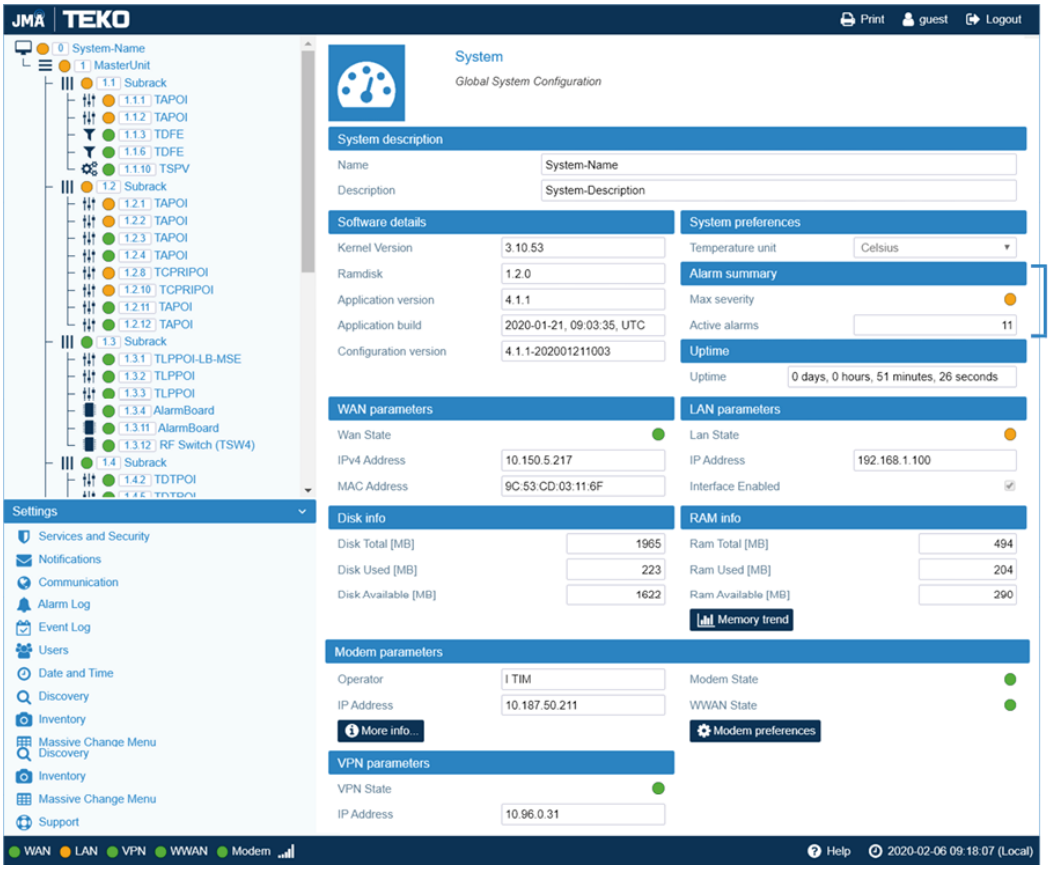
This section describes the features available to all users for viewing:

- The global system configuration. See "Viewing the Global System Configuration" below.
- The system architecture. See "Viewing the System Architecture" on page 18.
- The alarm status of the system components. See "Viewing the Alarm Status of Managed Components" on page 21.
- Details about active and cleared alarms. See "Viewing Alarms" on page 23.
- The system events. See "Viewing Events" on page 27.

Viewing the Global System Configuration

The **System** panel displays when you access the supervision module UI.

To return to the **System** panel from any other panel, select the root node at the top of the **Physical Tree**. The root node is identified by this icon: .



The **System** panel includes the following information:

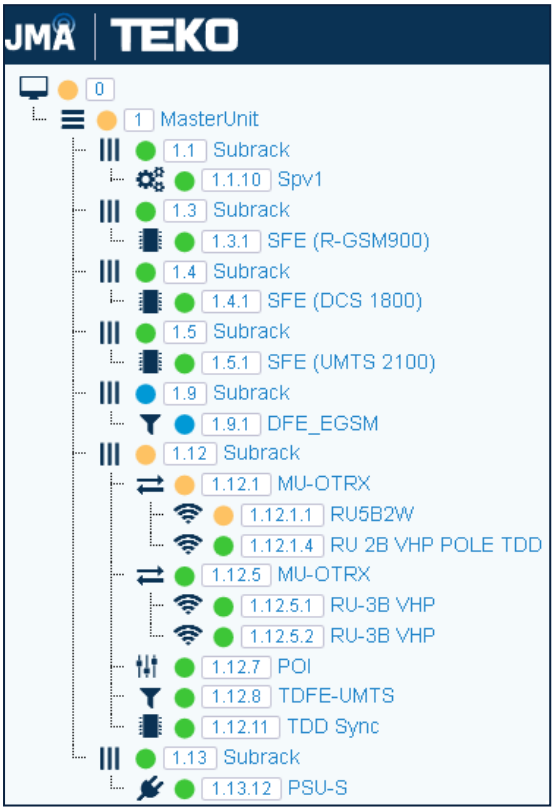
- **System Name and Description** – Users with **admins** or **superusers** role permissions can modify the system name and description. See "Modifying the System Name and Description" on page 43.

- **Software Details** – Kernel Version, Ramdisk, Application version and build, Configuration version.
- **Uptime** – Amount of the Supervision module (TSPV) uptime.
- **Disk and RAM Info** – Supervision module (TSPV) hard disk and RAM details.
- **System preferences** – Users with the **admins** or **superusers** role permissions can set temperatures to display either in Fahrenheit or Celsius.
- **WAN parameters** – Status and settings of the Ethernet WAN (Wide Area Network) Interface.
- **LAN parameters** – Status and settings of the Ethernet LAN (Local Area Network) Interface.
- **Modem parameters** – Modem and WWAN (Wireless Wide Area Network) status and settings. The **Modem preferences** button is available for all users to view the mobile connection settings and for users with **admins** or **superusers** role permissions to configure the wireless connection. The **Modem commands** button is available for users with **admins** or **superusers** permissions to reboot the modem and restart the WWAN connection.
- **VPN Parameters** – Status and settings of the VPN connection.
- **Alarm Summary** – Summary of the system current alarm status, detailing the maximum severity level (color-coded icon) and the total number of alarms currently active in all managed components.

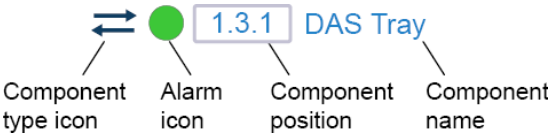
The **Reboot board**, **Restart processes**, and **Restore factory settings** buttons are available for users with the **admins** or **superusers** role permissions.

Viewing the System Architecture

The **Physical Tree** displays upon the successful discovery of the DAS components. It displays the hierarchical architecture of all the DAS components managed by the supervision module. Click a node in the **Physical Tree** to display the main panel with detailed information about the selected component.



In the **Physical Tree**, each node is associated with an icon and an ID number. The icon identifies the component type; the ID number represents the component position in the System. See "Device Hierarchy" on the next page for details.



To the left of the ID number, a color-coded icon provides immediate indication of the component alarm status. See "Viewing the Alarm Status of Managed Components" on page 21.

Device Hierarchy

The root node is the **System** (position 0), which includes all the DAS components managed by the supervision module. Clicking the root node takes you back to the system page.

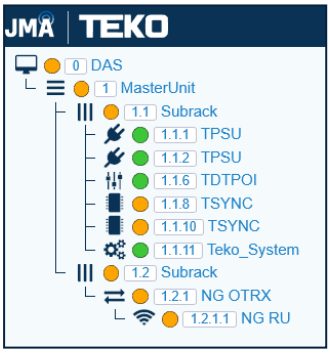
The **Master Unit** (position 1) is a container node for all the DAS components.

- **Subrack**. The position of the sub-racks is 1.x, with x=1 to 13. The sub-rack hosting the supervision module is assigned position 1.1. The position of the other sub-racks depends on the supervision module port connected to the sub-racks: for example, a sub-rack position of 1.2 means that the sub-rack is connected to the supervision module port 1, a position of 1.3 means that the sub-rack is connected to the supervision module port 2.

  The sub-rack is a container node for the following components:

  - Next generation optical sub-rack **NG OTRX** (ED35TD, ED35BD, ED35ID, ED35B35TD).
    - Next generation remote units (**NG RU** and **NG SDRU**) are contained within the NG OTRX optical sub-rack.

      The remote unit position includes the number of the NG OTRX optical port connected to the remote unit.

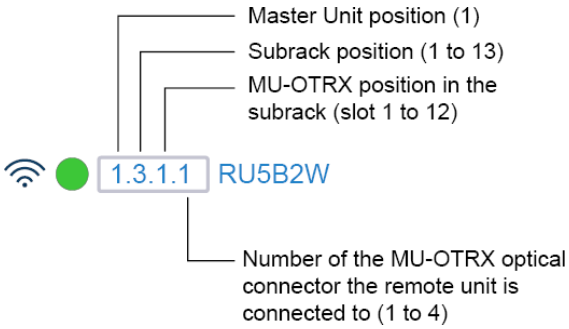
      

  - Next generation master point-to-point **NG PtoP** (ED35TDM, ED35BDM, ED35IDM, ED35B35TDM).
  - Next generation secondary point-to-point **NG PtoP** (ED35TDS, ED35BDS, ED35IDS, ED35B35TDS).
  - Next generation Points Of Interface:
    - Multi-band Points of Interface **LP POI MB** (IY7E8E19AFD21, IY7E8E19AF23D21)
    - O-RAN Points of Interface **POI ORAN** (IO35ID21)
  - Forced-air cooling unit, **TFAN**.

- Power supply unit, **SUB-PSU**.

  Note: The position of the SUB-PSU is 1.1.12 when the SUB-PSU is connected to the supervision module in addition to other 12 monitored sub-racks.

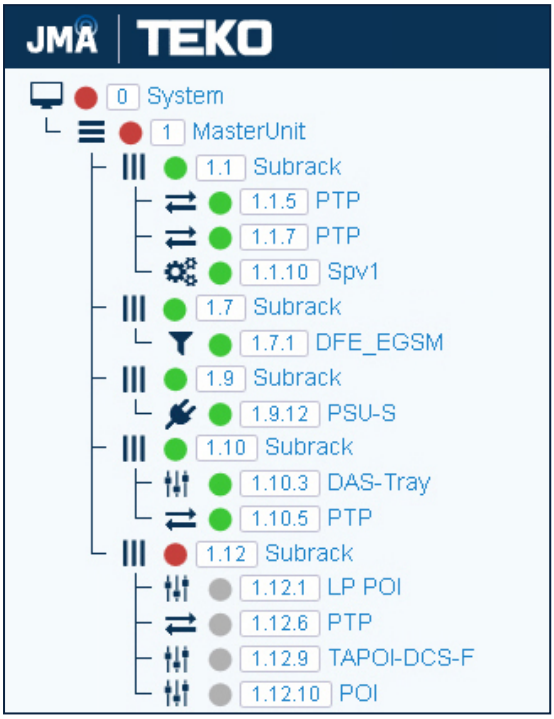
- The following modules (position 1.x.y, where y is the module slot in the x active subrack):
  - **TSPV**, supervision module for the management of the entire DAS. The module is able to manage the sub-rack it is equipped in (master sub-rack, position 1.1), the power supply subrack (SUB-PSU), up to other 12 active subracks, and all connected remote units.
  - Points Of Interface, POIs, such as TDTPOI, TLPPOI, TAPOI, TCPRIPOI.
  - Donor Front End (TDFE, TDFE-F).
  - RF Switch, TSYNC modules, and Alarm Board.
  - Power supply unit (TPSU).
  - Optical modules: optical Tx/Rx (MU-OTRX) and Point to Point Master and Secondary (TTRUPTP).
    - Remote units (RUs) are contained within MU-OTRX modules as they are hierarchically lower. The RU position ID number includes the number of the MU-OTRX optical port connected to the RU (1.x.y.z, where y is the MU-OTRX slot in the x active subrack and z is the MU-OTRX optical port number).

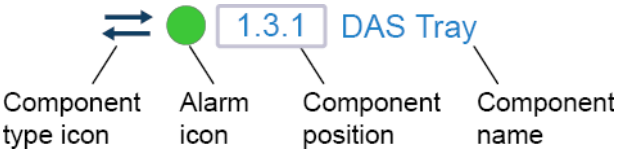
      Note: The add-on remote unit connected to the port 1 (DL1/UL1) of the TTRU2W-S-M-C2 optical module is assigned z = 3; the add-on remote unit connected to the port 2 (DL2/UL2) of the TTRU2W-S-M-C2 is assigned z = 4.

Viewing the Alarm Status of Managed Components

The **Physical Tree** provides an at-a-glance view of the alarm status of all managed components.



In the **Physical Tree**, each node is associated with an icon, which identifies the component type. To the right of the component-type symbol, a color-coded icon provides immediate indication of the alarm status of each component. See "Alarms Severities" on page 25 for descriptions of alarm severities and their associated color.

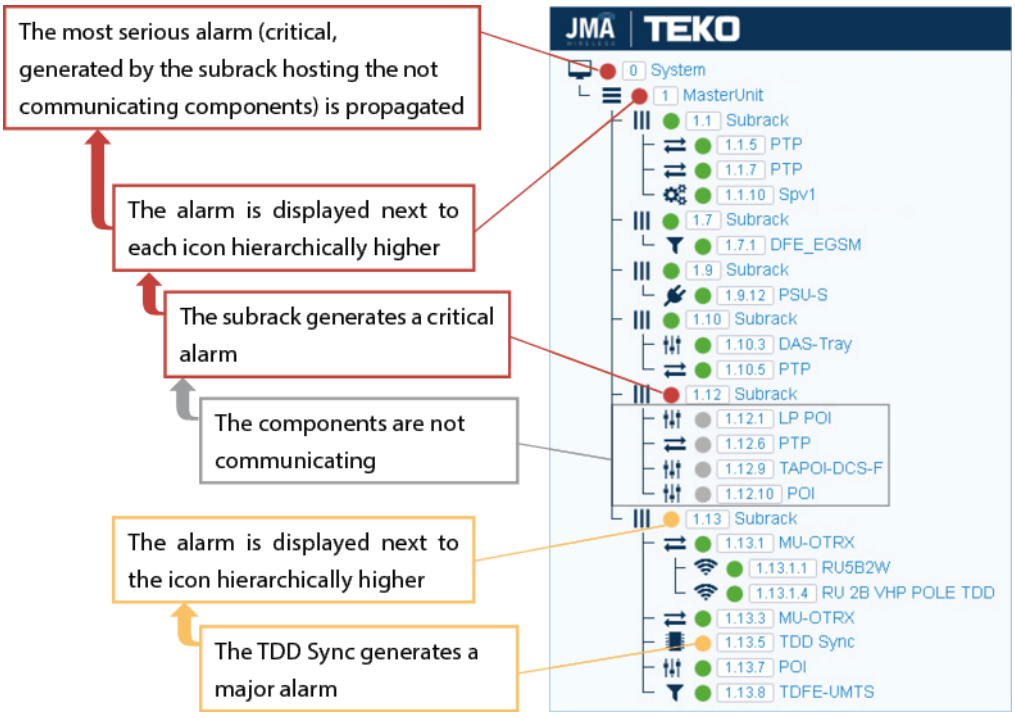


Alarms Propagation

The color-coded icon is displayed next to the node that generated the alarm and also next to hierarchically higher nodes. When multiple alarms are active, the most serious alarm is propagated.

Alarm propagation helps users to recognize active alarms and their source.

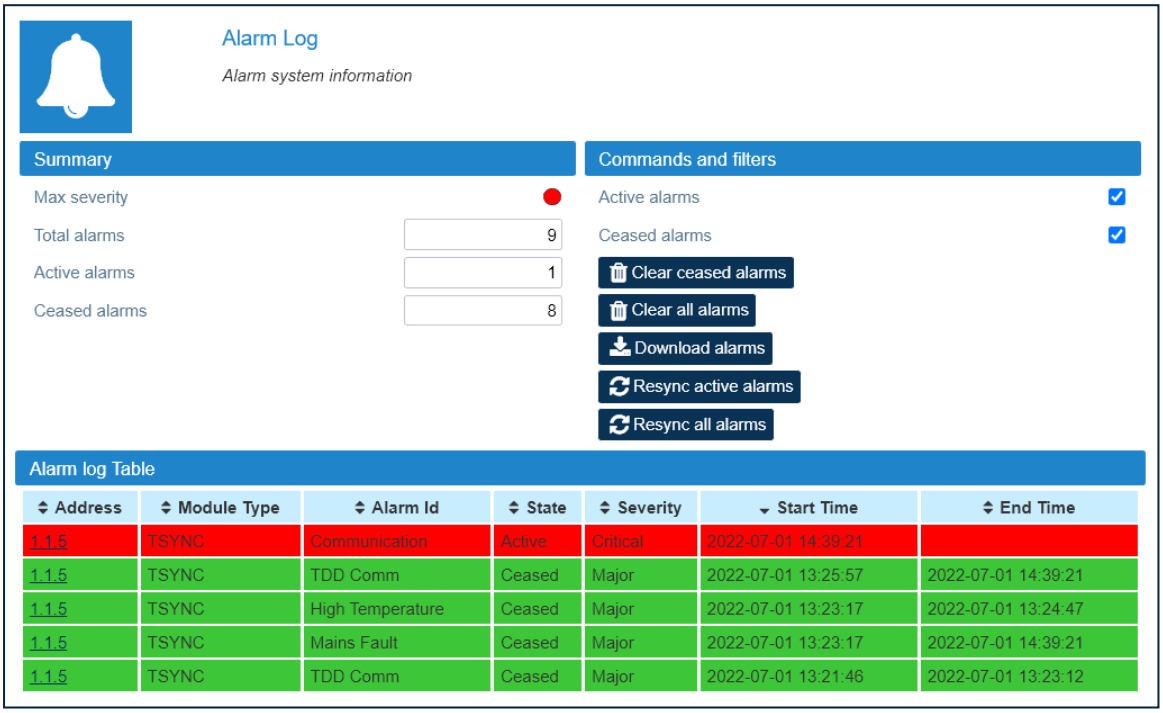
The following figure shows an example of alarm propagation:



Viewing Alarms

In the **Settings** menu, select **Alarm Log** to open the **Alarm Log** panel, which includes:

- The **Alarm log Table**, which reports detailed information about the active and cleared alarms that have been triggered in managed components.
- The **Summary** of the current DAS alarms listed in the **Alarm log Table**.
- **Commands and Filters** to manage the **Alarm log Table** logs.



Alarm Details

The **Alarm log Table** lists active and cleared alarms occurred in the DAS.

Note: Users with **admins** or **superusers** role permissions can clear alarms from the **Alarm log table**. The **Alarm log Table** includes all the alarms occurred in the DAS, after the last *Clear ceased alarms* or *Clear all alarms* command.

In the table, alarms are sorted by time. When a new alarm occurs, a row displaying the alarm details is added at the top of the table. The **Alarm log Table** can be sorted on a particular column clicking the header of the column.

Each alarm entry provides the following information:

- **Address** and **Module Type** – Information about the component that generated the alarm.

  The **Address** is the position of the component that generated the alarm in the DAS, as displayed in the **Physical Tree** (see "Device Hierarchy" on page 19). Clicking the address opens the panel with the details of the component.

- **Alarm Id** – Name of the alarm.
- **State** – Alarm status, either *Active* or *Ceased*.

- **Severity** – Severity of the alarm. For active alarms, the row background color is related to the alarm severity: warning, minor, major, or critical. Ceased alarms have a green background. See "Alarms Severities" on the next page for the relationship between icon color and alarm severity.
- **Start Time** – Date and time when the alarm occurred.
- **End Time** – Date and time when the alarm ceased (if applicable).

Alarm log Table

Address	Module Type	Alarm Id	State	Severity	Start Time	End Time
1.5.9.2.4	TDDU	PLL Unlock	Active	Major	2020-02-04 16:39:31	
1.5.9.2.4	TDDU	TDD Unlock	Active	Major	2020-02-04 16:39:31	
1.1.10	TSPV	Mains Absence	Ceased	Critical	2020-02-03 17:14:09	2020-02-03 17:14:14
1.5.7.2	RU 2B LP MIMO TDD	Rx Opt Low M2	Active	Major	2020-02-03 12:16:03	
1.5.7.2	RU 2B LP MIMO TDD	PLL Unlock	Active	Major	2020-02-03 12:16:03	
1.5.7.2	RU 2B LP MIMO TDD	TDD Unlock	Active	Major	2020-02-03 12:16:03	

Address and Type of the module that generated the alarm. The Address is the component position in the DAS, as displayed in the *Tree View*

Alarm Id, State (active/ceased), and Severity

Date and time when the alarm occurred

Date and time when the alarm ended (ceased alarms)

Time is displayed in local time standard (time zone where the PC used for monitoring resides)

Refer to the *JMA DAS Platform Troubleshooting Charts* for a detailed description of the alarms that can occur in the DAS.

Alarms Severities

In the supervision module user interface, each alarm is associated with a color to immediately identify its severity level (that is, how serious the problem is).

Four service-affecting levels of severity are managed by the software: warning, minor, major, and critical, according to the ITU X.733 recommendation (CCITT Recommendation X.733 - "Alarm Reporting Function").

The following table describes the alarm severities and their associated color:

Alarm Severity	Color	Fault Description	Corrective Action Required
Critical	Red	The problem compromises functionality, and service cannot be provided.	Immediate action needed.
Major	Orange	The problem is affecting functionality, but the service can still be provided.	Urgent action needed, to prevent more serious fault.
Minor	Yellow	The problem might affect functionality but is not yet affecting it.	Monitor situation carefully. Corrective actions may be needed to prevent more serious fault.
Warning	Blue	The problem does not affect functionality.	Investigate further during scheduled maintenance.
–	Green	No alarm / cleared alarm.	–
–	Gray	Indeterminate alarm status due to lack of communication: the severity level cannot be determined.	–

Alarms Summary

In the **Summary** pane, you can view a summary of the alarms occurred in the DAS and listed in the Alarm log Table:

- **Total alarms** – Number of active and cleared alarms.
- **Active alarms** – Total number of active alarms.
- **Ceased alarms** – Total number of ceased alarms.
- **Max Severity** – The Max Severity icon shows the highest severity level of active alarms. See "Alarms Severities" above for details.

Note: Users with **admins** or **superusers** role permissions can clear alarms from the **Alarm log Table**. The **Alarm log Table** includes all the alarms, recorded after the last *Clear ceased alarms* or *Clear all alarms* command.

Commands and Filters

- To filter alarms to display in the Alarm log Table:
  - Clear the **Active alarms** and **Ceased alarms** check boxes to filter the records to display.
  - Select the **Active alarms** and **Ceased alarms** check boxes to remove filters.

- To download alarms:

  Click the **Download alarms** button to download the list of alarms as a Comma Separated Value file (.csv).
- To synchronize the table on the SNMP manager with the current **Alarm log Table**:
  - Click the **Resync active alarms** button to synchronize active alarms on the SNMP manager.
  - Click the **Resync all alarms** button to synchronize all alarms (active and ceased) on the SNMP manager.
- To clear alarms from the **Alarm log table** (users with **admins** or **superusers** role permissions):
  - Click the **Clear ceased alarms** button to remove cleared alarms from the **Alarm log Table**.
  - Click the **Clear all alarms** button to remove all the alarms from the **Alarm log Table**.

Viewing Events

In the **Settings** menu, select **Event Log** to open the **Event Log** panel, which includes a summary of the events occurred in the DAS and a list providing details about each event.

Note: Events do not cause DAS service interruption.

The **Event Log** view includes the **Remote log** table, which allows users with **admins** or **superusers** role permissions to enable and configure up to five external Syslog servers to collect the events recorded by the system. See "Configuring Remote Log Servers" on page 34.

Event Details

The **Event Table** lists the events logged by the system.

The **Event Table** can be sorted by clicking the header of the column to sort rows by (Time, Event Type, Severity, and Description).

Each item in the list describes an event, providing the following information:

- **Time** – Date and time when the event occurred.
- **Event Type** – Type of event.

  Note: The **User actions** event type allows tracking each access to the system and each configuration change.
- **Severity** – Severity of the event.

Event Severity	Color
Critical	Red
Major	Orange
Minor	Yellow
Warning	Blue
Info	Green

- **Description** – Description of the event.

Summary, Commands, and Filters

- **Summary of the Events Occurred in the DAS and Filters**
  - **Total Events** – Total number of the events logged by the system.
  - **Filtered Events** – Number of filtered events.
  - In the **Filters** pane, several filtering options are available to filter the events listed in the **Event Table**.

    Note: The *User actions* event type filter allows tracking each access to the system and each configuration change.
- **Commands**
  - Click **Download all events** to download the list of all the events occurred in the DAS as a Comma Separated Value (.csv).
  - Click **Download filtered events** to download the list of filtered events as a Comma Separated Value (.csv).

Setting the Monitoring Options

This section describes the following monitoring options, which can be set for an effective monitoring of the DAS:

- Notifications can be forwarded to periodically test the system availability and to alert operators when alarm events occur in the system. See "Setting Alarm and Heartbeat Notifications" below.
- Remote Log Servers can be configured to collect the events recorded by the supervision. See "Configuring Remote Log Servers" on page 34.
- Alarms can be enabled and disabled. See "Enabling and Disabling Alarms" on page 36.
- Entries to be included in the SNMP alarm table can be selected. See "Selecting the SNMP Alarm Table Entries" on page 37.

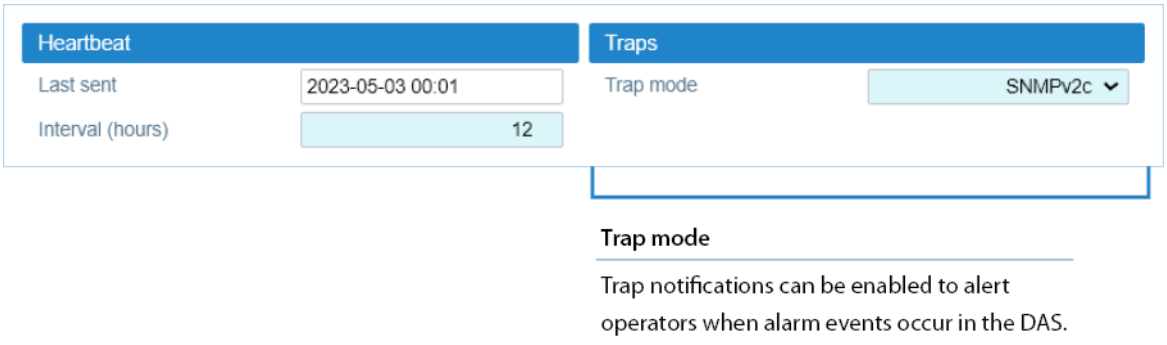
Setting Alarm and Heartbeat Notifications

SNMP traps and SMS alerts can be forwarded to periodically test the system availability and to alert operators when alarm events occur in the DAS.

Note: The following configuration options are available for users with **admins** or **superusers** role permissions.

Enabling SNMP Traps

1. In the **Settings** menu, select **Notifications** to access the **Notifications** panel.
2. From the **Trap mode** drop-down list, in the **Traps** pane, select either *SNMPv2c* or *SNMPv3* to enable alarm notifications to be sent out.



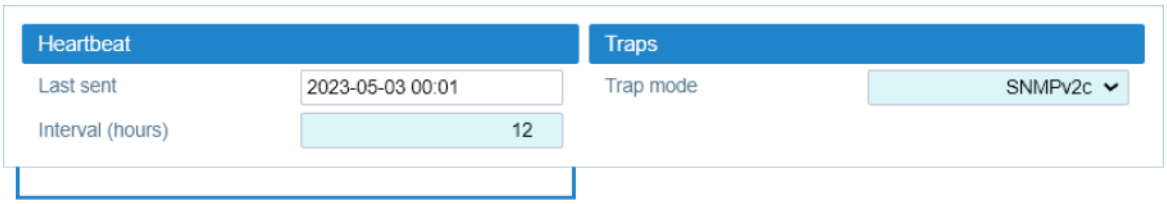
3. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Setting Heartbeat Notifications

1. In the **Heartbeat** pane, set the time **Interval (hours)** between heartbeat notifications.

2. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Note: When the heartbeat interval is set to 0 (zero) heartbeat notifications are disabled.



Heartbeat

- *Last sent*: date and time of the last Heartbeat message sent.
- *Interval*: time interval (hours) between KeepAlive messages. When the Interval is set to 0 (zero) KeepAlive notifications are disabled.

Setting Alarms and Heartbeat Trap Destinations

In the **Trap notifications** table, you can set up to five trap destinations to receive SNMP notifications.

1. Add each trap receiver as follows:
   a. Set the **IP address** and **Port** of the SNMP trap destination.

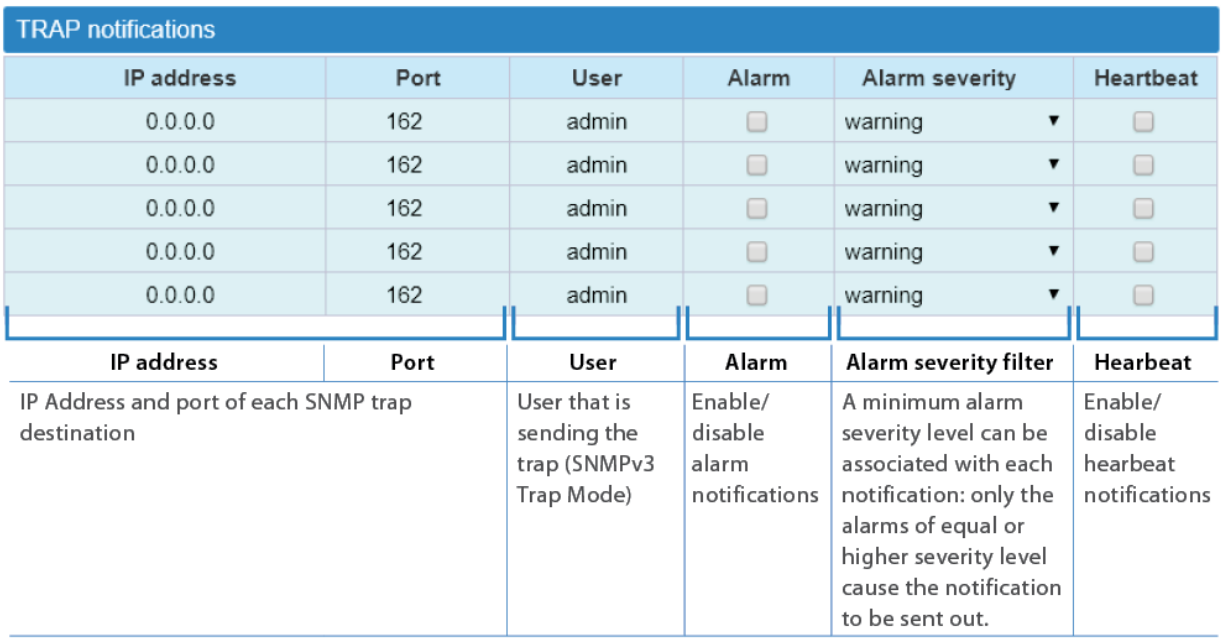
      Note: When the DAS is part of a Network managed via JMA Operation Management Centre (OMC), the OMC Server IP address can be set as one of the recipients of the SNMP trap notifications, in order to optimize the alarm monitoring of the DAS (refer to the *OMC Software Installation and Configuration Guide*).

   b. Select the **User/Community** that is sending the trap (SNMPv3 Trap Mode only).

   c. From the **Alarm severity** drop-down list, select the minimum alarm severity for notifications to be sent out. Only the events of equal or higher severity level cause the trap notification to be sent out.

   d. Select the **Alarm** check box to enable SNMP traps to be forwarded to the trap destination.

   e. Select the **Heartbeat** check box to enable heartbeat notifications to be forwarded to the trap destination.

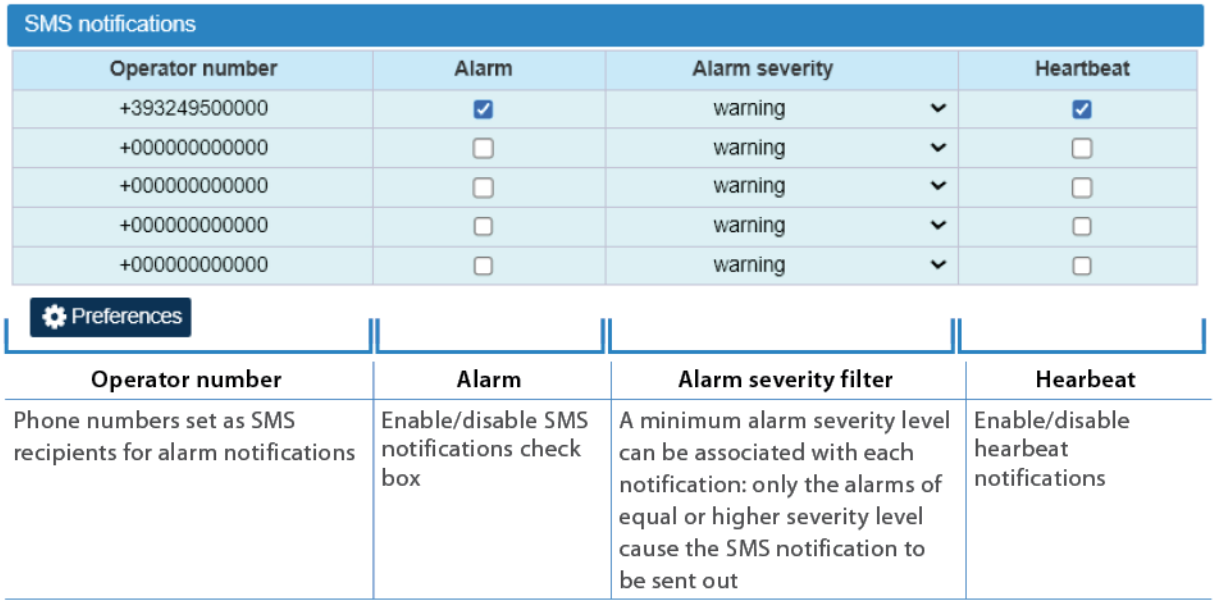


2. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

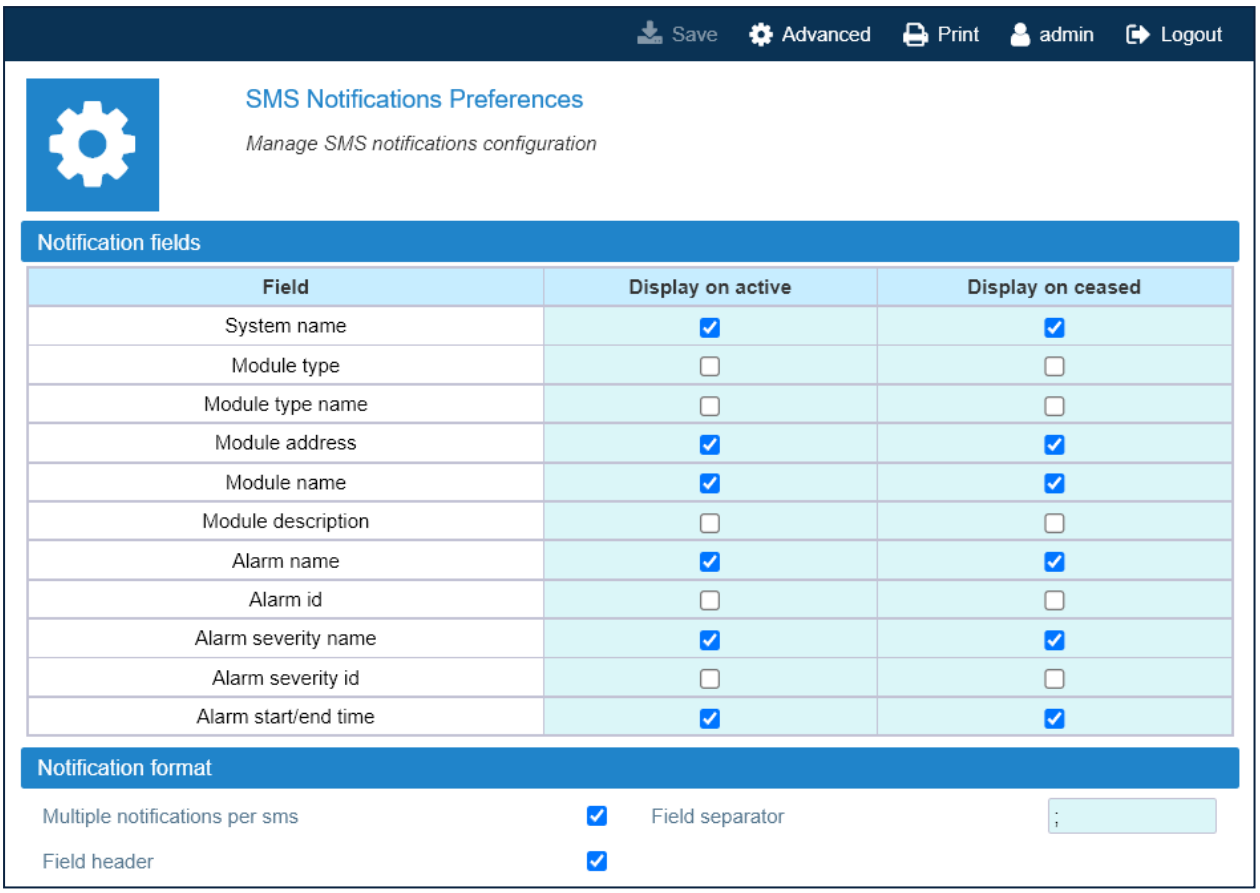
Setting SMS Notifications

In the **SMS notifications** table, you can set up to five operators' phone numbers to receive SMS alarm and heartbeat notifications.

1. In the **Settings** menu, select **Notifications** to access the **Notifications** panel.



2. Add each SMS recipient as follows:
   a. In **Operator number**, insert the recipient's phone number.
   b. From the **Alarm severity** drop-down list, select the minimum alarm severity for SMS notifications to be sent out. Only the events of equal or higher severity level cause the notification to be sent out.
   c. Select the **Alarm** check box to enable SMS notifications.
   d. Select the **Heartbeat** check box to enable heartbeat notifications.
3. Click the **Preferences** button to select information to be included in the SMS (*Notification fields*) and to select the SMS notification format preferences (*Notification format*).



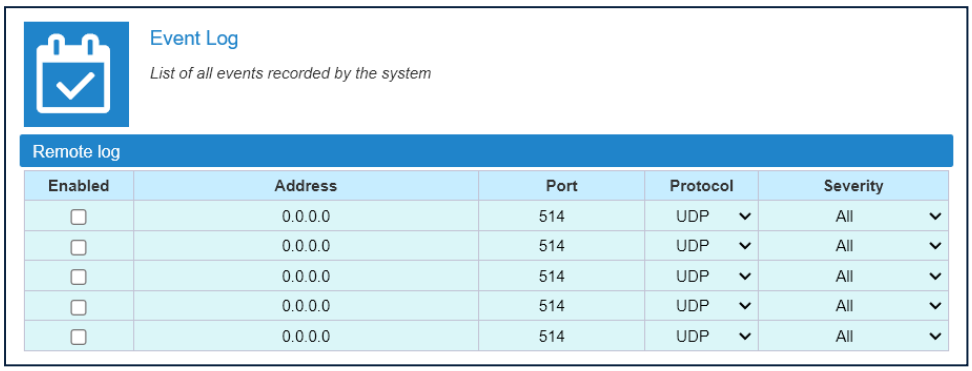
4. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Configuring Remote Log Servers

Note: The following configuration options are available for users with **admins** or **superusers** role permissions.

1. In the **Settings** menu, select **Event Log**.

   In the **Remote Log** table, you can configure and enable up to five external Syslog servers to collect the events recorded by the supervision module.



2. Insert the **Address** of the remote syslog server to receive the logs.
   The address can be either a fully qualified domain name (FQDN), or an IPv4 or IPv6 address.
3. Insert the **Port** for syslog service on the server (1 to 65535).
   Verify the syslog server configuration to set the correct port number.
4. From the **Protocol** drop-down list, select the protocol to be used for log forwarding, either UDP, or TCP, according to the syslog server configuration.
5. From the **Severity** drop-down list, select the events to be forwarded to the syslog server:

- **All**: All the events logged by the supervision module and listed in the Event Log table (see "Viewing Events" on page 27) are forwarded to the syslog server.
- **> = Critical, > = Major, > = Minor, >=Warning**: Only the events of equal or higher severity level are forwarded to the syslog server. For example, if you select "> = Major", only the "Major" and "Critical" events are sent out.

6. Select the **Enabled** check box to enable event logs to be forwarded to the syslog server.
7. Click the yellow **Save** tool or press the **Enter** key on your keyboard to save changes.

Note: Each Syslog message includes a priority, calculated using facility and severity values.

For SPV events:

- The facility is 17 (local1).
- The severity depends on the severity of the supervision event. The conversion is as follows:

SPV event severity	Syslog event severity
Critical	1: ALERT
Major	2: CRITICAL
Minor	3: ERROR
Warning	4: WARNING
Info	5: NOTICE

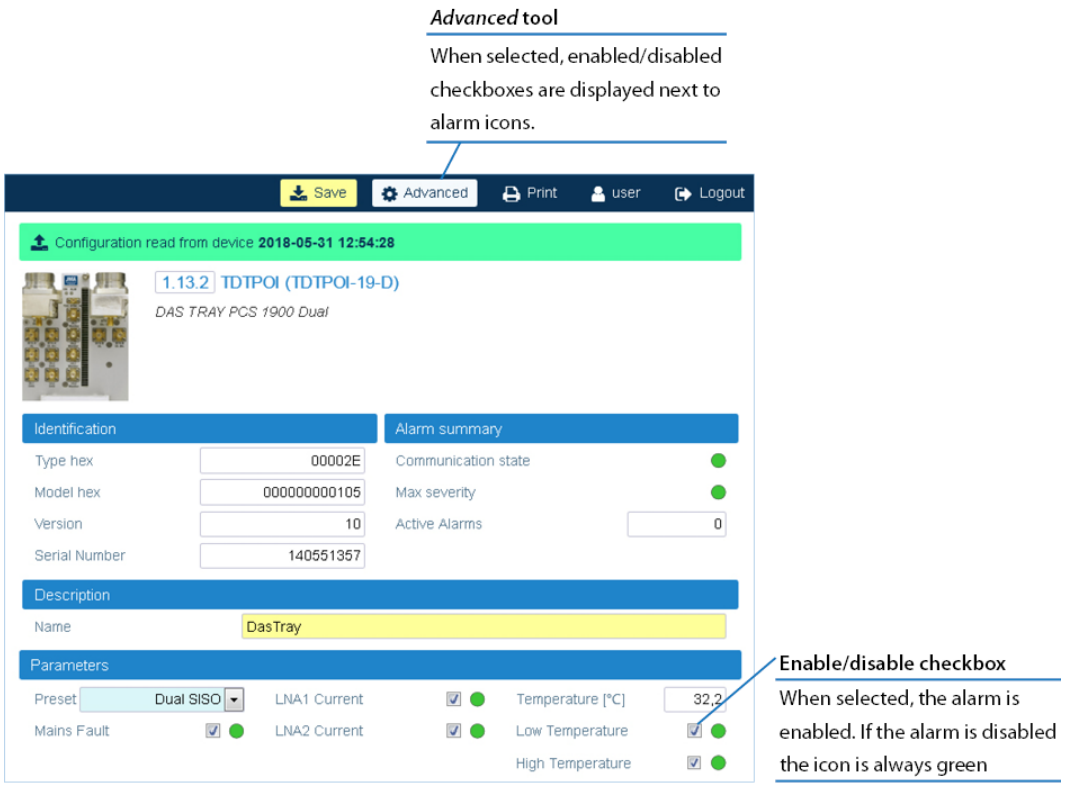
Enabling and Disabling Alarms

Note: The following configuration options are available for users with **admins**, **superusers,** and **users** role permissions.

Alarms can be enabled or disabled in the detail panel of each component as follows:

- In the **Physical Tree**, select the DAS component to display its details panel.
- In the **Toolbar**, select the **Advanced** tool to display check boxes next to the alarm icons.
- Select the check box next to an alarm to enable the alarm. The **Save** tool in the toolbar turns yellow.
- To disable an alarm, deselect the check box. The Save tool in the toolbar turns yellow.

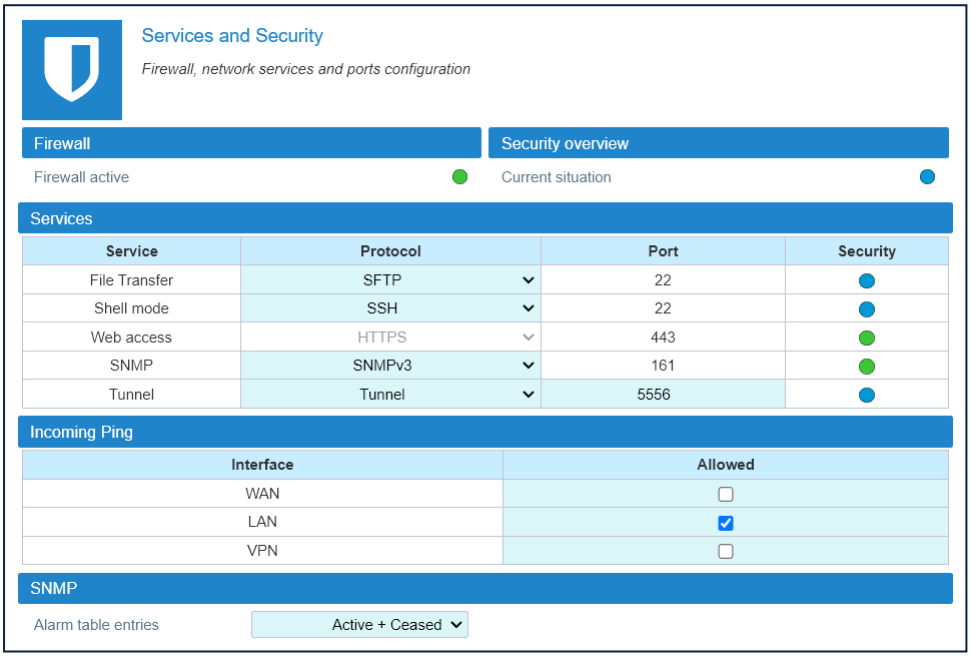
  Note: If an alarm is disabled, the icon is always green.
- Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.



Selecting the SNMP Alarm Table Entries

Note: The following configuration options are available for users with **admins** or **superusers** role permissions.

1. In the **Settings** menu, select **Services and Security**.
2. In the **SNMP** pane, select the alarms to be included in the alarm table, retrieved by the SNMP agent embedded in the supervision module, when an authorized SNMP manager sends the request.



Two options are available:

- **Active+Ceased**: All the records in the **Alarm Log Table** (see "Viewing Alarms" on page 23) are included in the SNMP table.
- **Active**: Only active alarms are included in the SNMP table.

3. Click the yellow **Save** tool or press the **Enter** key on your keyboard to save settings.

Managing Devices

This section describes how to:

- Identify the DAS components. See "Discovering the DAS Components" on the next page.
- Change the system name and description. See "Modifying the System Name and Description" on page 43.
- Assign names to the DAS components. See "Assigning Names to the DAS Components" on page 44.
- Select the proper NG OTRX Simulcast Configuration. See "Selecting the NG OTRX Simulcast Configuration" on page 45.
- Select the proper Simulcast Configuration for the Dual-band NG PtoP Secondary. See "Selecting the Dual-band NG PtoP Secondary Simulcast Configuration" on page 47.
- Set the Next Generation Point-to-Point link RF gain. See "Adjusting the Next Generation Point-to-Point Link RF Gain" on page 48.
- Set the Point-to-Point link RF gain. See "Adjusting the Point-to-Point Link RF Gain" on page 49.
- Set external alarms and relays. See "Setting External Alarms and Relays" on page 50.
- Edit parameters. See "Editing Parameters" on page 53.
- Create and manage inventory lists. See "Creating and Managing Inventory Lists" on page 56.
- Load configuration of devices from a previously generated inventory. See "Loading Device Configuration from Inventory" on page 59.
- Power cycle (reset) remote units. See "Power Cycling a Remote Unit" on page 60.
- Enable and Disable RF for the Remote Unit Downlink Path. See "Enabling or Disabling RF for the Remote Unit Downlink Path" on page 61.

Discovering the DAS Components

To manage the physical components connected to the supervision module they must first be identified.

Two tools are available for users logged in with the **admins** or **superusers** role to search and identify the physical components of the DAS: **Discovery full** and **Discovery incremental**.

- Select the **Discovery full** tool to identify the components of never discovered systems.

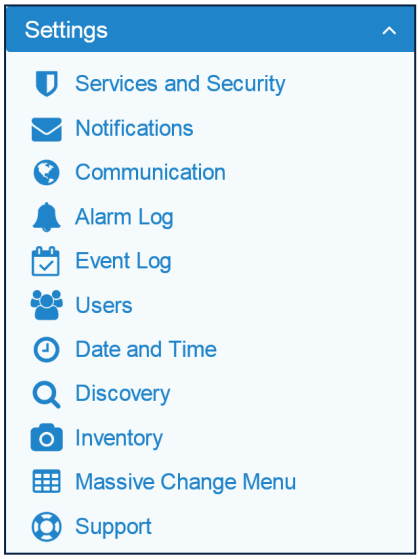
  Note: If a previous discovery already exists, the **Discovery full** tool updates the entire DAS architecture. When the new full discovery is accepted, **all existing configuration data, inventory lists, and alarm logs are cleared. Components that are not communicating with the DAS supervision module are removed.**

- Select the **Discovery Incremental** tool to keep the discovered topology current. The **Discovery Incremental** tool only detects and identifies new devices. Current configuration data (Alarm Logs and Inventory Lists) are still available.

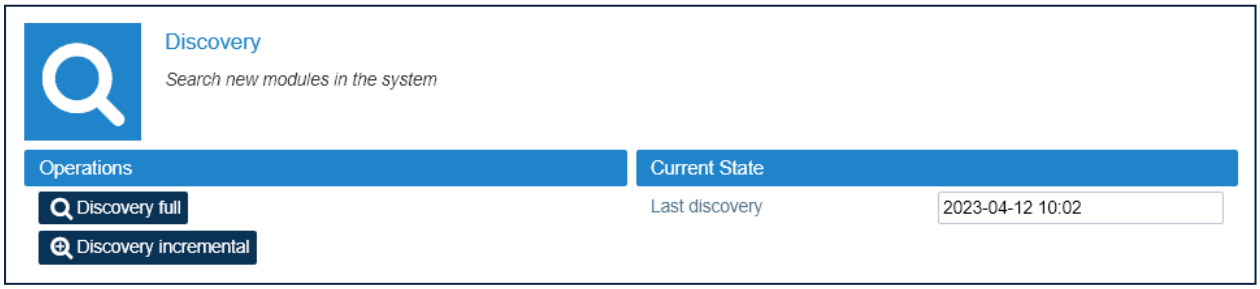
Note: Discovery tasks are shared with all connected users, whose activity will stall until the operation is complete.

Identifying the Components of Never Discovered Systems

1. In the **Settings** menu, select **Discovery** to open the **Discovery** panel.



2. In the **Discovery** panel, click **Discovery full**.



3. In the **Please Confirm** dialog box, click **Proceed**.

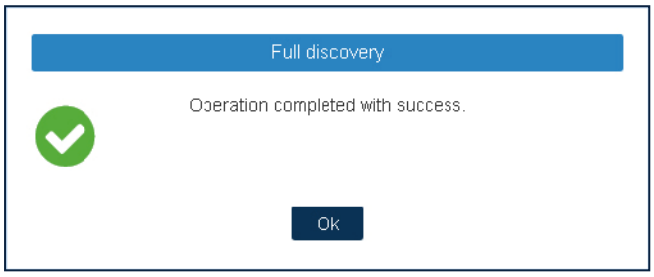
If the discovery process is successful, the hierarchical architecture of the DAS components displays in the **New Tree** pane.

4. Verify that all expected components are listed in the tree.

   If not all expected devices are found by the discovery, check connections and power supply, then repeat the discovery.

5. Click **Accept discovery** to accept the discovery.

   The supervision module uploads the names of all the detected components and the **Full discovery** dialog box displays.



6. In the **Full discovery** dialog box, click **Ok** to complete the discovery.

Note: The discovery must be accepted to unlock the supervision system. Only after the full discovery is accepted, inventory lists and alarm logs, if any, are cleared, and the supervision module starts collecting the DAS alarms.

The discovered DAS physical components are populated in the **Physical Tree** only after the discovery is accepted. A progress bar below the **Physical Tree** indicates the progress of the operation.

Identifying the Components for Already Discovered Systems

If the physical network changes, use the **Discovery incremental** tool to keep the discovered topology current.

Note: The **Discovery Incremental** cannot be completed successfully when the DAS includes the following components:

- **MU OTRX** with version 8 or lower.
- Optical sub-rack **NG OTRX**.
- Next Generation remote units (**NG RU** and **NG SDRU**).

When the DAS includes these components use the **Discovery full** tool to identify new components. See "Discovery Full" on the next page.

- **Discovery Incremental**

  The **Discovery incremental** tool is suitable for:

  - Master Unit components added to an already discovered DAS.
  - Remote units added to an already discovered DAS.
  - Swapped remote units, replacing even different models of remote units.

  1. In the **Settings** menu, select **Discovery** to open the **Discovery** panel.

2. In the **Discovery** panel, click **Discovery incremental**. The **Please Confirm** dialog box displays.
3. In the **Please Confirm** dialog box, click **Proceed**. If the discovery process is successful, the hierarchical architecture of the entire DAS displays in the **New Tree** pane.
4. Verify that all expected components are listed in the tree.
5. Click **Accept discovery** to accept the incremental discovery. The **Discovery successful** dialog box displays.
6. Click **Ok** to complete the discovery.

Note: The **Discovery incremental** tool detects and identifies only new devices, current configuration data (Alarm Logs and Inventory Lists) are still available.

- **Discovery Full**

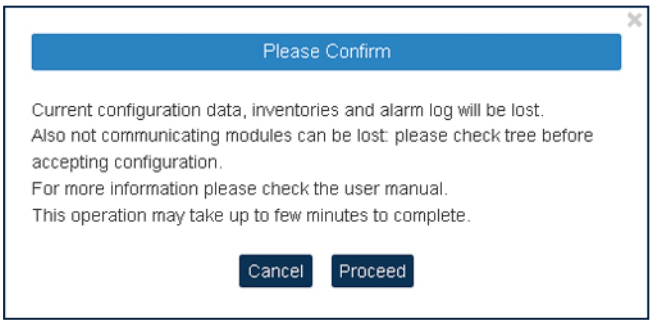
  The **Discovery full** tool is necessary for:

  - Master unit components, replaced with components of another type.
  - Systems equipped with MU OTRX modules version 8 or lower (the incremental discovery cannot be completed successfully).
  - Systems equipped with NG OTRX and NG remote units (the incremental discovery cannot be completed successfully).
  - Swapped MU OTRX modules.

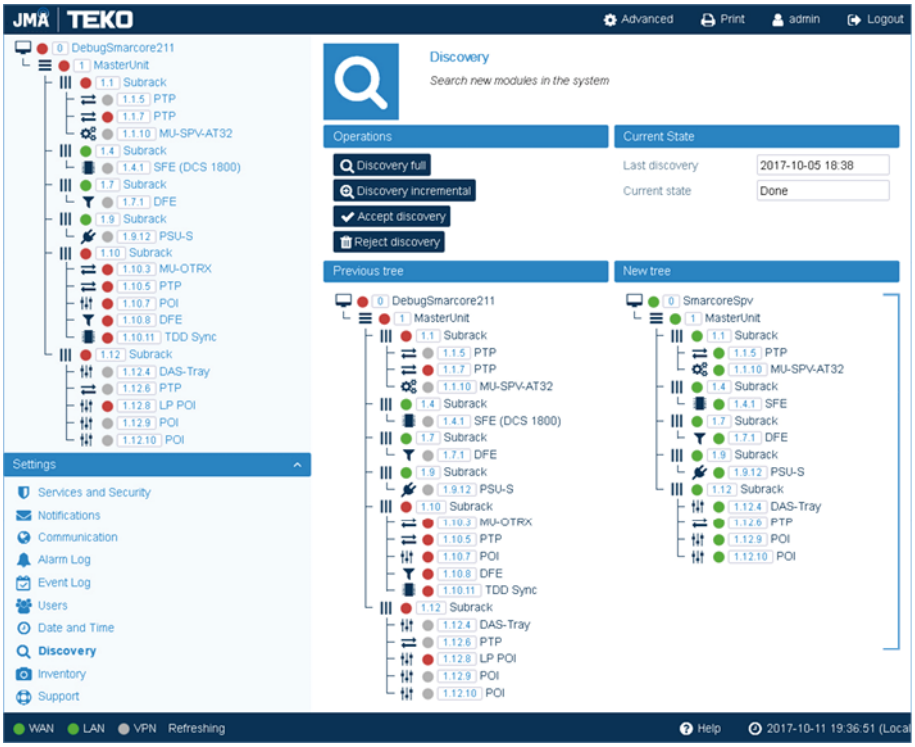
  Note: When a previous discovery already exists, the **Discovery full** tool updates the entire DAS architecture. After the discovery is accepted, **current configuration data, existing inventory lists, and alarm logs are cleared. Components that are not communicating with the DAS supervision module are removed from the tree**.

  1. In the **Settings** menu, select **Discovery** to open the **Discovery** panel.
  2. In the **Discovery** panel, click **Discovery full**. The **Please Confirm** dialog box displays.

     Carefully read the warning in the box.



3. In the **Please Confirm** dialog box, click **Proceed**. If the discovery process is successful, the hierarchical architecture of the entire DAS displays in the **New Tree** pane.



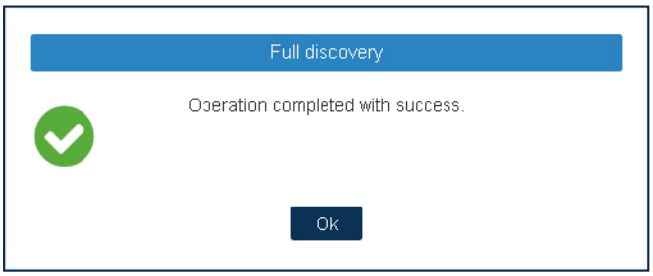
New tree generated by a full discovery (previously discovered DAS)

When the DAS has already been discovered, the *Discovery full* updates the whole DAS architecture: components that are not communicating cannot be discovered.

4. Verify that all expected components are listed in the tree.

   Note: If not all expected devices are found by the discovery, check connections and power supply, then repeat the discovery.

5. Click **Accept discovery** to accept the discovery. The **Full discovery** dialog box displays.



6. In the **Full discovery** dialog box, click **Ok** to complete the discovery.

   Note: The discovery must be accepted to unlock the supervision system.

   Only after the discovery is accepted, inventory lists and alarm logs, are cleared, and the supervision module starts collecting the DAS alarms.

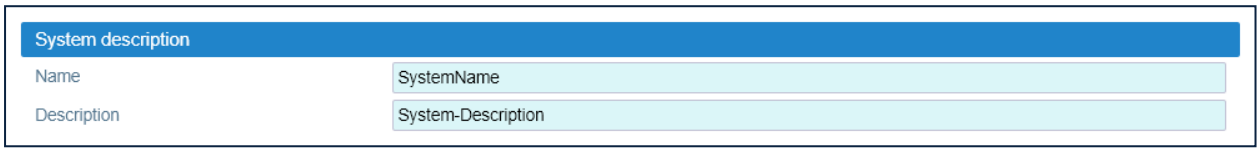
   The discovered DAS physical components are populated in the **Physical Tree** only after the discovery is accepted. A progress bar below the **Physical Tree** indicates the progress of the operation.

Modifying the System Name and Description

Note: Users logged in with the **admins** or **superusers** role can modify the system name and description.

1. Select the root node at the top of the **Physical Tree** to open the **System** panel.
   The root node is identified by this icon: .

2. In the **System Description** pane, enter the new name and description.



   The following characters are allowed:

   - Lowercase letters (a through z)
   - Uppercase letters (A through Z)
   - Base 10 digits (0 through 9)
   - Hyphen (-) and underscore (_)

   The application input validation feature warns users if invalid characters are entered and details what input is expected for the field.

   The **Save** tool in the toolbar and the background of modified fields turn yellow to highlight unsaved changes.

3. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to assign the new name and description to the DAS. The new system name is displayed in the **Physical Tree**.

Assigning Names to the DAS Components

Note: Users logged in with the **admins**, **superusers,** or **users** role can assign names to the DAS components.

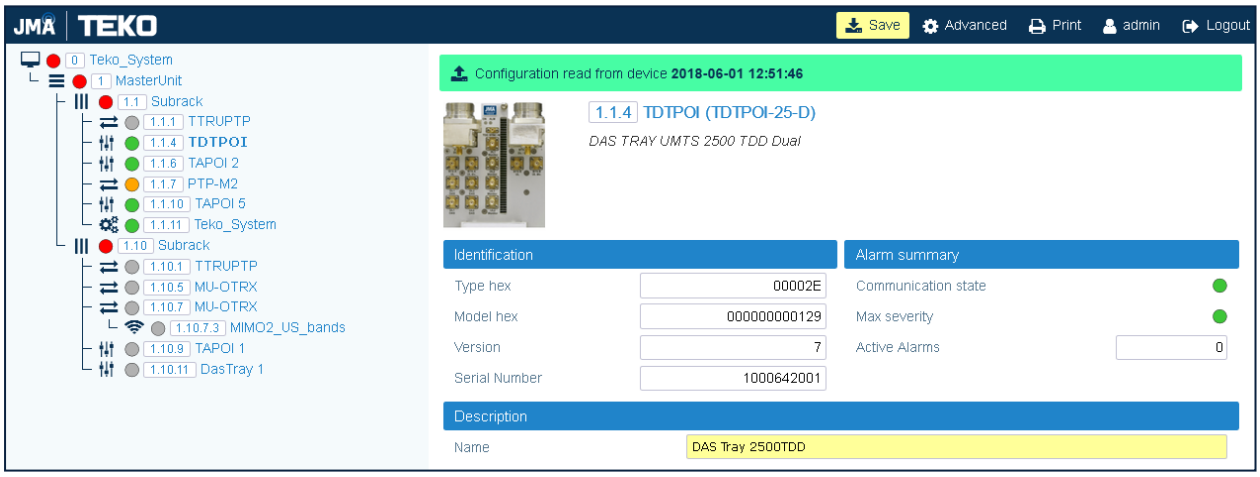
1. In the **Physical Tree**, select the component to display its details panel.
2. In the **Name** field, type a descriptive name for the node.

   The following characters are allowed:

   - Lowercase letters (a through z)
   - Uppercase letters (A through Z)
   - Base 10 digits (0 through 9)
   - Hyphen (-) and underscore (_)

   The application input validation feature warns users if invalid characters are entered and details what input is expected for the field.

   The **Save** tool in the toolbar and the background of modified fields turn yellow to highlight unsaved changes.



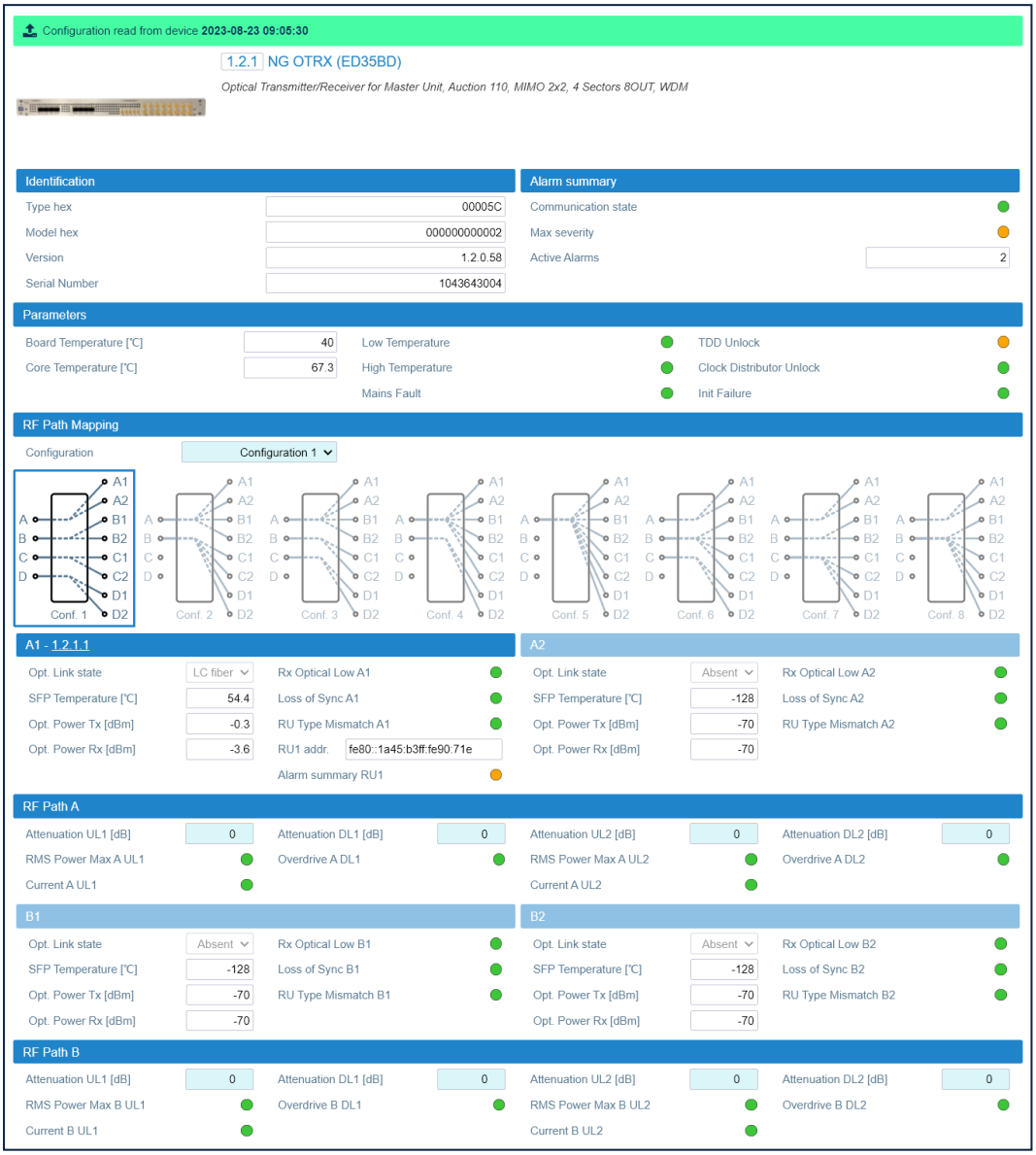
3. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to assign the new name to the DAS component. The name assigned to the component is displayed in the **Physical Tree**.

Note: The names of active points of interface (POIs) and remote units can be set either individually, in each component panel, or globally, accessing the Massive Change Menu. See "Editing Parameters with the Massive Change Menu" on page 54.

Selecting the NG OTRX Simulcast Configuration

Note: Users logged in with the **admins**, **superusers,** or **users** role can select the NG OTRX (Next Generation Optical Transceiver) simulcast configuration.

1. In the **Physical Tree**, select the NG OTRX to display its details panel.



2. In the **RF Path Mapping** pane, select the proper simulcast configuration from the **Configuration** drop-down list or choose a diagram. The diagram describes how RF signal is distributed to the connected remote units (RF path mapping).

   When you select a configuration from the drop-down list, the diagram that corresponds to the selected configuration is highlighted. You can choose between eight different simulcast configurations.

   Note: Refer to the system design to select the appropriate configuration.

   Configuration 1 is the default factory configuration. If *Configuration 1* (default) is selected, the highlighted *Conf. 1* diagram shows that the signal from four different MIMO

2x2 cells will be simulcast by the NG OTRX transceivers (A, B, C, D) to four different pairs of remote units, connected to the NG OTRX optical ports (A1, A2, B1, B2, C1, C2, D1, D2).

Note: Changing the simulcast configuration has no impact on the RF link: no attenuation adjustment is needed.

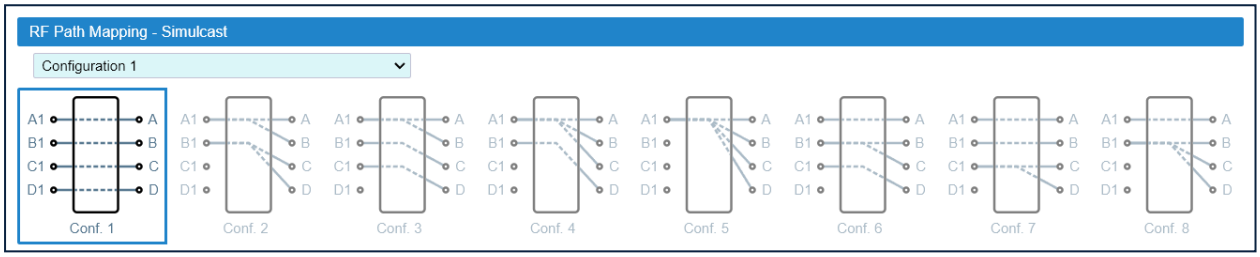
In the *JMA DAS Platform Master Unit Installation Guide*, refer to *Connecting the Next Generation Optical Transceiver to the Next Generation Remote Units* for details about remote units and NG OTRX (Next Generation Optical Transceiver) connection.

3. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to apply the selected configuration.

Selecting the Dual-band NG PtoP Secondary Simulcast Configuration

Note: Users logged in with the **admins**, **superusers,** or **users** role can select the dual-band NG PtoP Secondary simulcast configuration.

1. In the **Physical Tree**, select the dual-band Next Generation Secondary Point-to-Point Component (NG PtoP Secondary) to display its details panel.
2. In the **RF Path Mapping - Simulcast** pane, select the proper simulcast configuration from the **Configuration** drop-down list or choose a diagram. The diagram describes how RF signals are distributed.



Configuration 1 is the default factory configuration. When you select a configuration from the drop-down list, the diagram that corresponds to the selected configuration is highlighted. You can choose between eight different simulcast configurations.

Note:

- Refer to the system design to select the appropriate configuration.
- Changing the simulcast configuration has no impact on the RF link: no attenuation adjustment is needed.

3. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to apply the selected configuration.

Adjusting the Next Generation Point-to-Point Link RF Gain

Note: Users logged in with the **admins**, **superusers,** or **users** role can adjust the Point-to-Point link RF gain.

For each RF path (A, B, C, D), the overall RF gain of the Point-to-Point link is 0dB at default attenuation settings. The following table details the Next Generation Point-to-Point link default attenuation settings:

Next Generation Point-to-Point Component	Default Downlink Attenuation for each RF Path, MIMO1 layer	Default Downlink Attenuation for each RF Path, MIMO2 layer	Default Uplink Attenuation for each RF Path, MIMO1 layer	Default Uplink Attenuation for each RF Path, MIMO2 layer
NG PtoP Master	0dB (Attenuation Tx1)	0dB (Attenuation Tx2)	0dB (Attenuation Rx1)	0dB (Attenuation Rx2)
NG PtoP Secondary	14dB (Attenuation Rx1)	14dB (Attenuation Rx2)	7dB (Attenuation Tx1)	7dB (Attenuation Tx2)

If required by the system design, you can increase the Point-to-Point link RF gain as follows:

1. In the **Physical Tree**, select the Next Generation Secondary Point-to-Point Component (NG PtoP Secondary).

   The following figure shows a detail of the NG PtoP Secondary panel with default RF attenuation settings:

2. To increase the downlink RF gain for a specific RF path, reduce the *Attenuation Rx1* and *Attenuation Rx2* in the appropriate **RF Path** pane (RF Path A, RF Path B, RF Path C, RF Path D).
3. To increase the uplink RF gain for a specific RF path, reduce the *Attenuation Tx1* and *Attenuation Tx2* in the appropriate **RF Path** pane (RF Path A, RF Path B, RF Path C, RF Path D).
4. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Adjusting the Point-to-Point Link RF Gain

Note: Users logged in with the **admins**, **superusers,** or **users** role can adjust the Point-to-Point link RF gain.

- TTRUPTP Master (TTRUPTPMx-S) connected to a TTRUPTP Secondary **with** built-in splitter/combiner (TTRUPTPSx-S)

  In this application, the overall RF gain of the Point-to-Point link is 0dB at default attenuation setting. The following table details the default attenuation settings for the Point-to-Point link:

Point-to-Point Component	Default Downlink Attenuation	Default Uplink Attenuation
TTRUPTPMx-S	0dB (Att TX)	5dB (Att In=0dB, Att Out=5dB)
TTRUPTPSx-S	0dB (Att In=0dB, Att Out=0dB)	10dB (Att TX)

  If required by the system design, you can adjust default attenuations to increase the Point-to-Point link RF gain.

- TTRUPTP Master (TTRUPTPMx-S) connected to a TTRUPTP Secondary **without** built-in splitter/combiner (TTRUPTPSx-S-1)

  In this application, the overall RF gain of the Point-to-Point link is 7dB at default attenuation setting. The following table details the default attenuation settings for the Point-to-Point link:

Point-to-Point Component	Default Downlink Attenuation	Default Uplink Attenuation
TTRUPTPMx-S	0dB (Att TX)	5dB (Att In=0dB, Att Out=5dB)
TTRUPTPSx-S-1	0dB (Att In=0dB, Att Out=0dB)	10dB (Att TX)

  If RF gain is not required for the system, you can set the Point-to-Point link RF gain to 0dB as follows:

  1. In the **Physical Tree**, select the Master Point-to-Point Component (TTRUPTP Master) to display its details panel. In the **Receiver** pane, set the receiver uplink attenuation to 7dB (*Att In*, *Att Out*).
  2. In the **Physical Tree**, select the Secondary Point-to-Point Component (TTRUPTP Secondary without 4-way Splitter/Combiner, TTRUPTPSx-S-1) to display its details panel. In the **Receiver** pane, set the receiver uplink attenuation to 7dB (*Att In*, *Att Out*).

Setting External Alarms and Relays

Note: Users logged in with the **admins**, **superusers,** or **users** role can set external alarms and relays.

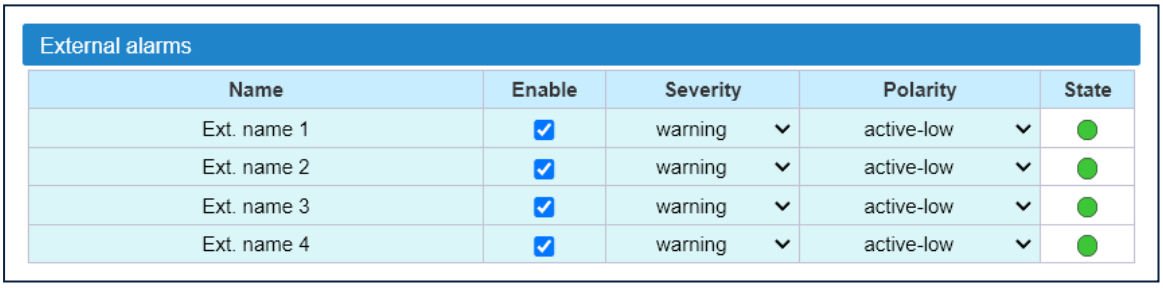
External Alarms

Alarms generated by external devices can be connected to the external alarms input connector (EXT IN), available on the following DAS components:

- Supervision module (**TSPV**)
- Alarm Board
- Remote units (**RU**)
- Next Generation remote units (**NG RU** and **NG SDRU**)

Configure and enable monitoring of external alarms as follows:

1. In the **Physical Tree**, select the DAS component to display its details panel.
2. In the **External alarms** table, assign names, severity (*Critical, Major, Minor, Warning*), and polarity (*active-high* or *active-low*) to the alarms.



3. Select the **Enable** check box to enable monitoring of configured external alarms.
4. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save all the changes in the page.

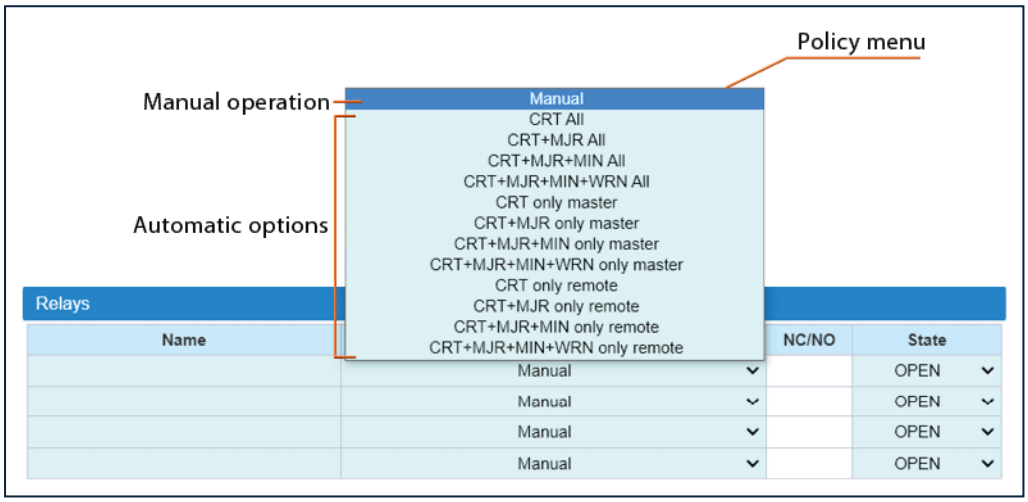
Relays

The EXT OUT connector is available on the following DAS components:

- Supervision module (TSPV)
- Remote units (RU)

Configure the logic of the relays in the **Relays** pane, available on the supervision module (TSPV) and remote units detail panels.

Supervision Module (TSPV)



1. In the **Physical Tree**, select the supervision module to display its details panel.
2. In the **Relays** pane, assign a descriptive name to the relay.
3. From the **Policy** menu, select either the *Manual* or an automatic mode.

- *Manual*: The relay is switched manually by the operator.
    a. Select the relay status, *Open* or *Closed*.

- Automatic mode: The relay is triggered automatically by alarms occurring in the DAS.

  a Select one automatic option from the list of predefined triggering alarm events:

  When the *CRT+MJR+MIN+WRN All* option is selected, alarms are not filtered: the relay is triggered when an alarm arises in any component of the DAS.

  The other predefined triggering events filter alarms by device type and alarm severity:

  Alarm severity filter:

  CRT+MJR+MIN (Critical + Major + Minor) – The relay is triggered when an alarm with a severity level equal to, or higher than Minor arises.

  CRT+MJR (Critical + Major) – The relay is triggered when an alarm with a severity level equal to, or higher than Major arises.

  CRT (Critical) – The relay is triggered when an alarm with a severity level equal to Critical arises.

  Device type filter:

  only master – The relay is triggered when an alarm arises in any component of the master unit.

  only remote – The relay is triggered when an alarm arises in a remote unit.

  b Set the relay status (NC/NO):

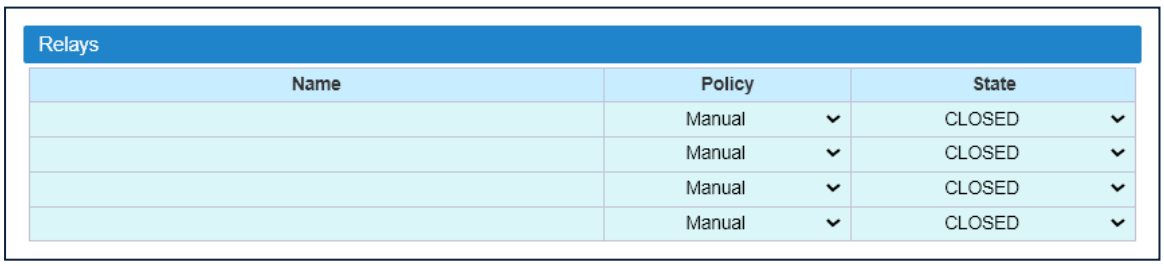
  NO: the relay closes when the alarm condition selected in the Policy menu occurs.

  NC: the relay opens when the alarm condition selected in the Policy menu occurs.

4. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Note: The policy and relay state are applied after the relay is triggered by an alarm.

Remote Units



You can manually switch the external outputs of remote units as follows:

1. In the **Physical Tree**, select the remote unit to display its details panel.
2. In the **Relays** pane, assign a descriptive name to the relay.
3. From the **State** drop-down list, select *Open* or *Closed*.
4. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save all the changes in the page.

Editing Parameters

Note: Users logged in with the **admins**, **superusers,** or **users** role can set operating parameters.

Editing Parameters Individually for Each Component

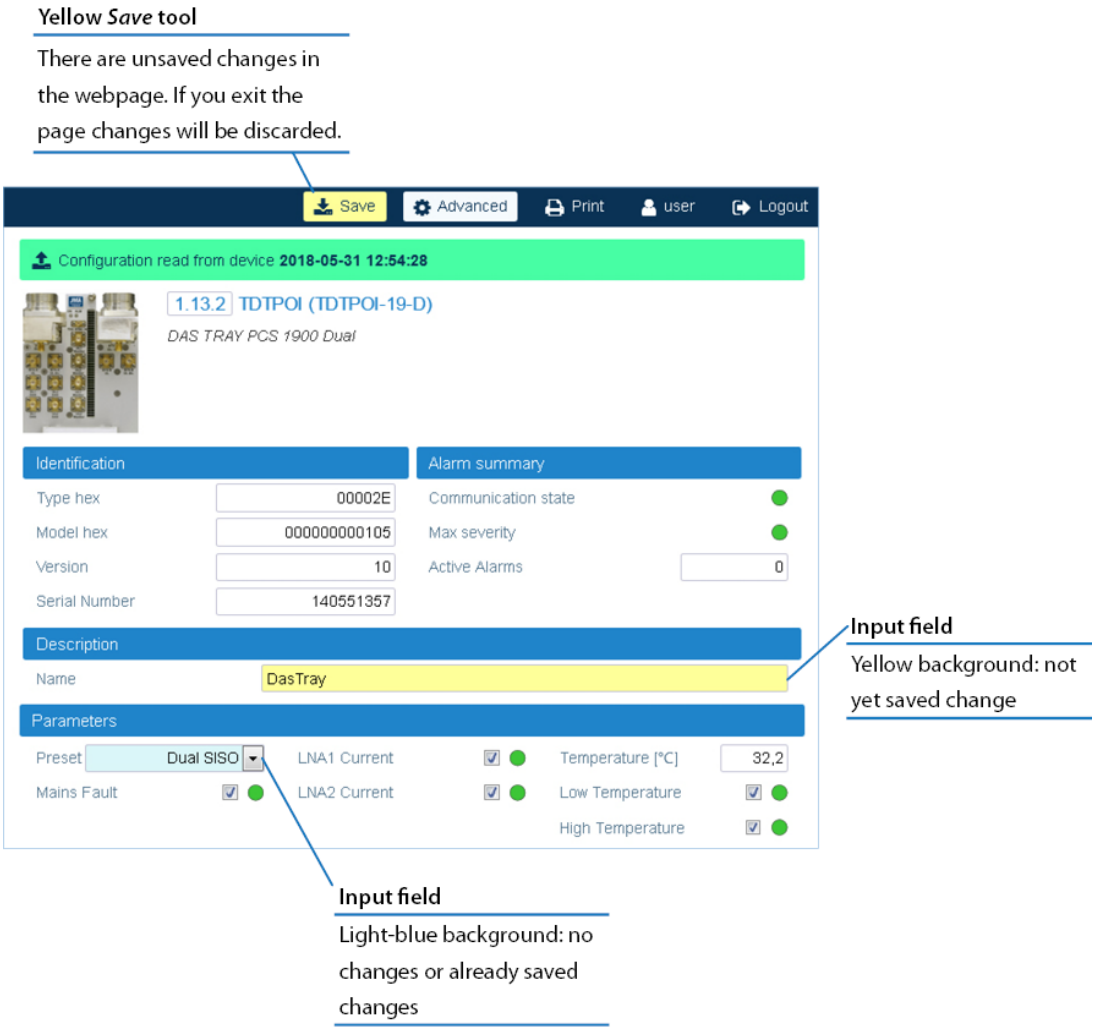
1. In the **Physical Tree**, select the component to display its details panel.

   Note: Fields that can be edited by users have a light-blue background.

2. Modify parameters.

   When changes to editable fields are detected, both the field background and the **Save** tool turn yellow.

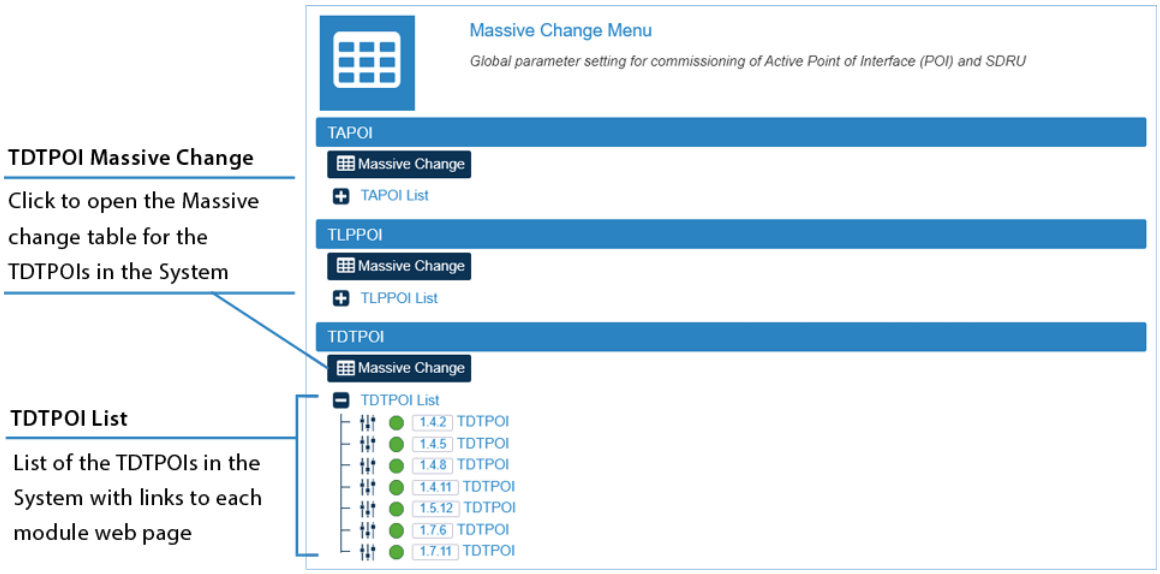
3. Click the yellow **Save** tool or press the **Enter** key on your keyboard to save changes.



Editing Parameters with the Massive Change Menu

You can set the parameters for the RF commissioning of points of interface (POIs) and remote units either individually, in each component panel (see "Editing Parameters Individually for Each Component" on the previous page), or globally, accessing the Massive Change Menu.

1. In the **Settings** menu, select **Massive Change Menu**. In the **Massive Change Menu** panel, active POIs and remote units are grouped by type. A **Massive Change** button is available for each component type.

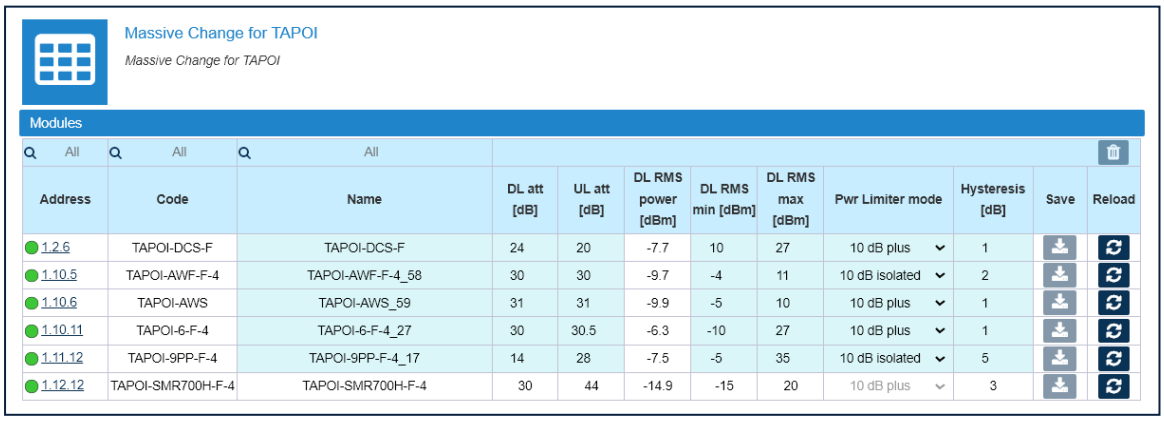


2. Select the **Massive Change** button to display the massive change table for all the components of the same type.

   Note: A pop-up, indicating the progress of the loading process, may display.

   If the process completes successfully, the pop-up closes, and the massive change table is displayed.

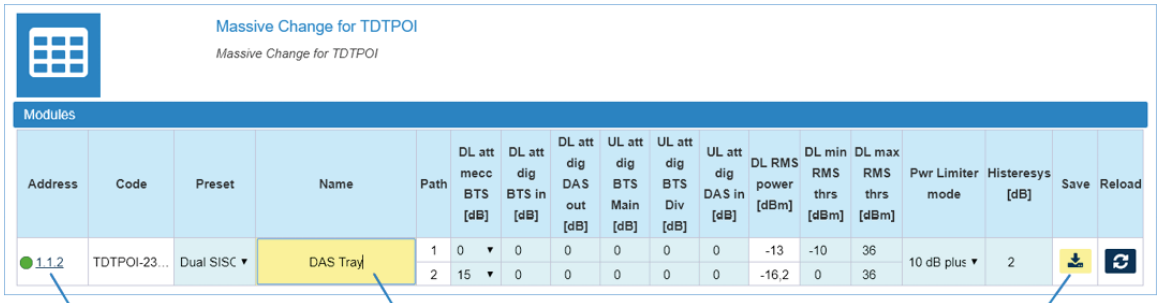
   If the pop-up reports errors, click **Ok**. The massive change table is displayed, but changes to the components listed in the pop-up are disabled. Click the **Reload** button to reload information and enable changes.



Address	Code	Name	DL att [dB]	UL att [dB]	DL RMS power [dBm]	DL RMS min [dBm]	DL RMS max [dBm]	Pwr Limiter mode	Hysteresis [dB]	Save	Reload
1.2.6	TAPOI-DCS-F	TAPOI-DCS-F	24	20	-7.7	10	27	10 dB plus	1		
1.10.5	TAPOI-AWF-F-4	TAPOI-AWF-F-4_58	30	30	-9.7	-4	11	10 dB isolated	2		
1.10.6	TAPOI-AWS	TAPOI-AWS_59	31	31	-9.9	-5	10	10 dB plus	1		
1.10.11	TAPOI-6-F-4	TAPOI-6-F-4_27	30	30.5	-6.3	-10	27	10 dB plus	1		
1.11.12	TAPOI-9PP-F-4	TAPOI-9PP-F-4_17	14	28	-7.5	-5	35	10 dB isolated	5		
1.12.12	TAPOI-SMR700H-F-4	TAPOI-SMR700H-F-4	30	44	-14.9	-15	20	10 dB plus	3		

3. Set configuration and parameters for each component.
4. Click the yellow save icon to save all changes for the module or place the cursor in any position in the row and press the **Enter** key on your keyboard.

NOTE: Changes must be saved for each module. A save icon is available for each row.



Address

Component position in the DAS and link to the component web page

Modified setting

Yellow background: not yet saved changes

Yellow *Save* icon

There are unsaved changes to the module settings. If you exit the page changes will be ignored. Click the icon to save changes

Creating and Managing Inventory Lists

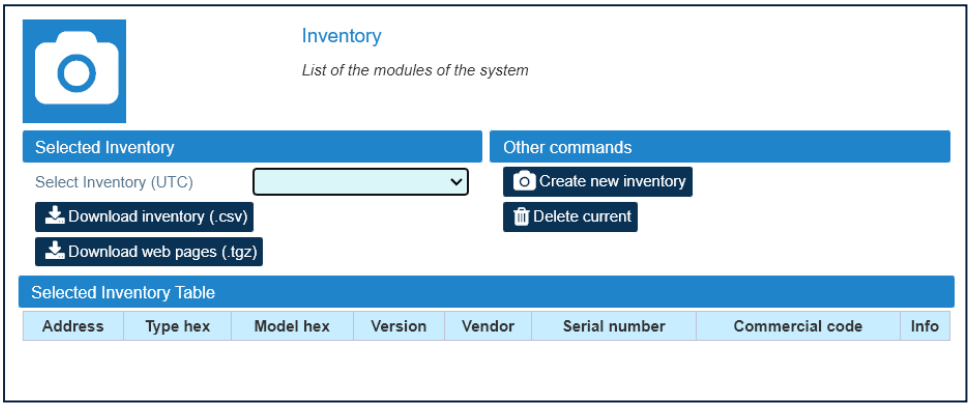
Users logged in with the **admins** or **superusers** role can create inventory lists to store the current DAS configuration.

Prior to changing the DAS configuration and settings, JMA strongly recommends that you create a new inventory to back up the current configuration. See "Loading Device Configuration from Inventory" on page 59.

Note: Existing inventory lists are cleared when a new **Discovery full** is accepted. See "Discovering the DAS Components" on page 39.

Creating an Inventory List of the DAS Current Configuration

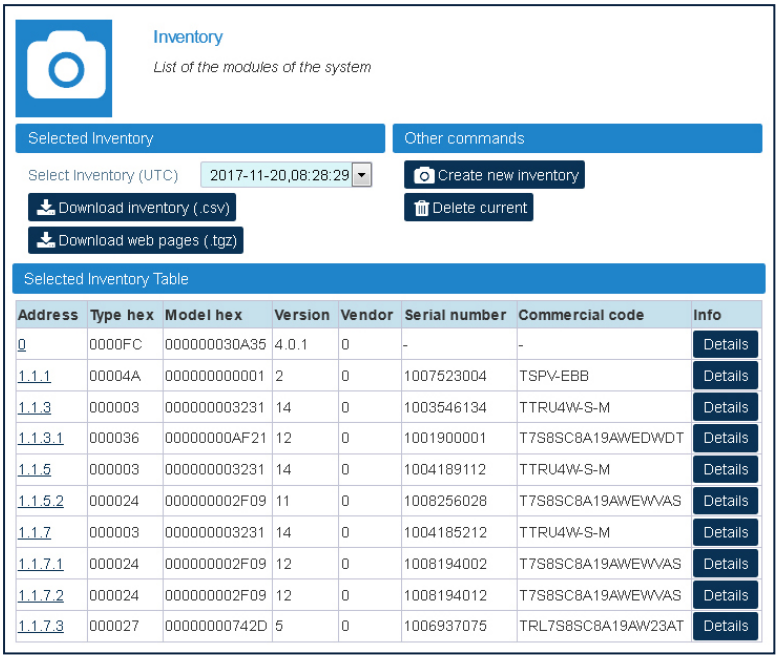
1. In the **Settings** menu, select **Inventory**.
2. In the **Other Commands** pane, click **Create new inventory**.



Note: Inventory tasks, or web pages download, made by a user are shared with the other connected users, whose activity will stall until the operation is complete.

Selecting an Inventory List

1. In the **Settings** menu, select **Inventory**.
2. In the **Selected Inventory** pane, select a list from the **Select Inventory (UTC)** drop-down list. The selected inventory list displays in the **Selected Inventory Table**.



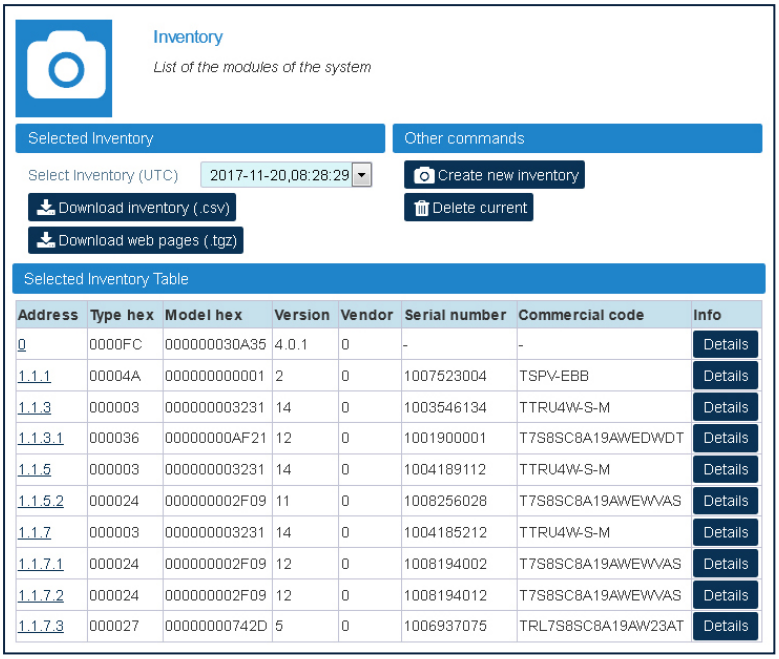
Address	Type hex	Model hex	Version	Vendor	Serial number	Commercial code	Info
0	0000FC	000000030A35	4.0.1	0	-	-	Details
1.1.1	00004A	000000000001	2	0	1007523004	TSPV-EBB	Details
1.1.3	000003	000000003231	14	0	1003546134	TTRU4W-S-M	Details
1.1.3.1	000036	00000000AF21	12	0	1001900001	T7S8SC8A19AWEDWDT	Details
1.1.5	000003	000000003231	14	0	1004189112	TTRU4W-S-M	Details
1.1.5.2	000024	000000002F09	11	0	1008256028	T7S8SC8A19AWEWVAS	Details
1.1.7	000003	000000003231	14	0	1004185212	TTRU4W-S-M	Details
1.1.7.1	000024	000000002F09	12	0	1008194002	T7S8SC8A19AWEWVAS	Details
1.1.7.2	000024	000000002F09	12	0	1008194012	T7S8SC8A19AWEWVAS	Details
1.1.7.3	000027	00000000742D	5	0	1006937075	TRL7S8SC8A19AW23AT	Details

After an inventory is selected:

- You can click **Download inventory (.csv)** to download the selected inventory list in csv (Comma Separated Value) format.
- You can click **Download Web Pages (.tgz)** to download a compressed file (.tgz format), containing the selected inventory list web pages. Extract files to a folder to browse offline web pages.
- In the green bar at the top of each device main panel, the **Inventory** button is available for authorized users to restore the device configuration from the selected inventory list. See "Loading Device Configuration from Inventory" on page 59.

Downloading Inventory Lists (csv Format)

1. When different inventory lists are available, select an inventory list from the **Select Inventory (UTC)** drop-down list. The selected inventory displays in the **Selected Inventory Table**.



2. Click **Download inventory (.csv)** to download the selected inventory list in csv (Comma Separated Value) format.

Downloading Inventory Lists (Web Pages)

1. When different inventory lists are available, select an inventory list from the **Select Inventory (UTC)** drop-down list. The selected inventory displays in the **Selected Inventory Table**.
2. Click **Download Web Pages (.tgz)** to download a compressed file (.tgz format), containing the selected Inventory list web pages.
3. Extract files to a folder to browse offline web pages.

Loading Device Configuration from Inventory

In the green bar at the top of each device main panel, the **Inventory** button allows users with **admins** or **superusers** role permissions to restore the device configuration from a previously generated inventory list, as follows:

1. In the **Physical Tree**, select the device.

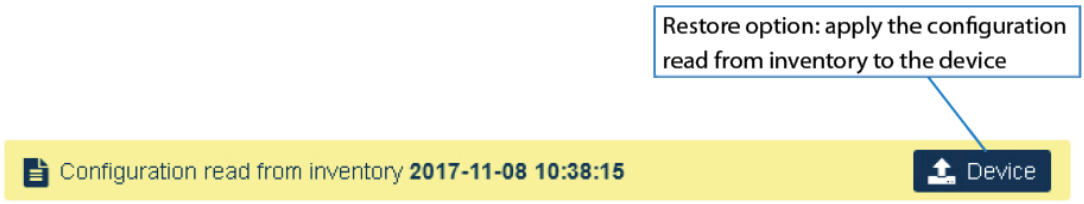
   A colored bar displays at the top of the main panel. A green bar indicates that the configuration of the component is read from the device.

   If a previously generated inventory is selected, an **Inventory** button is available to load the device configuration from the selected Inventory.

   Note: For details on generating and selecting inventory lists, refer to "Creating and Managing Inventory Lists" on page 56.

2. Click the **Inventory** button to upload the device configuration from the selected inventory list.

   The green bar turns yellow to indicate that the configuration of the component, displayed on the main panel, is read from the inventory list.



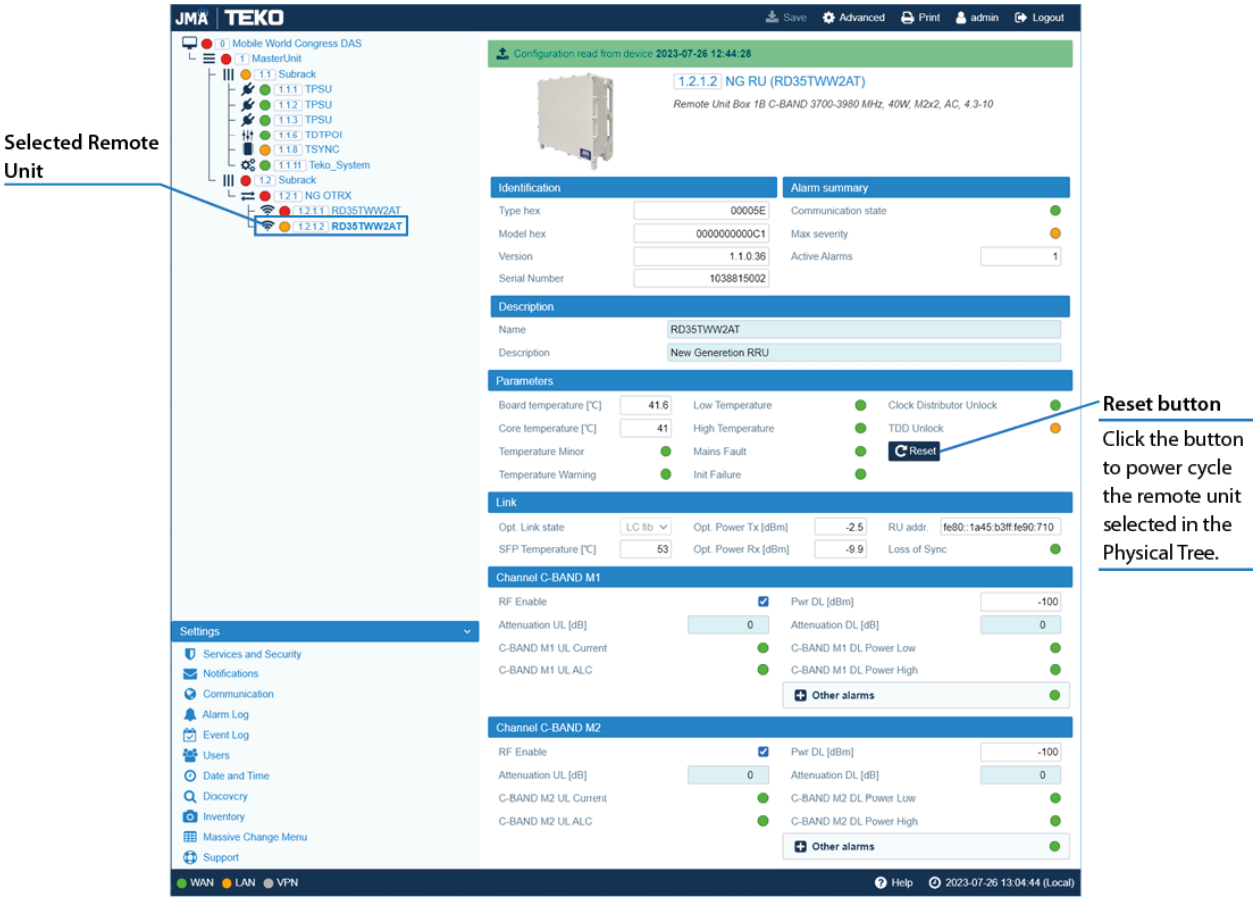
   Note: When different Inventory lists are available, the configuration is uploaded from the list selected in the **Select Inventory (UTC)** drop-down list on the **Inventory** panel.

3. Click the **Device** button to apply the configuration read from the selected inventory (restore option).

Power Cycling a Remote Unit

Note: Users logged in with the **admins**, **superusers,** or **users** role can power cycle remote units.

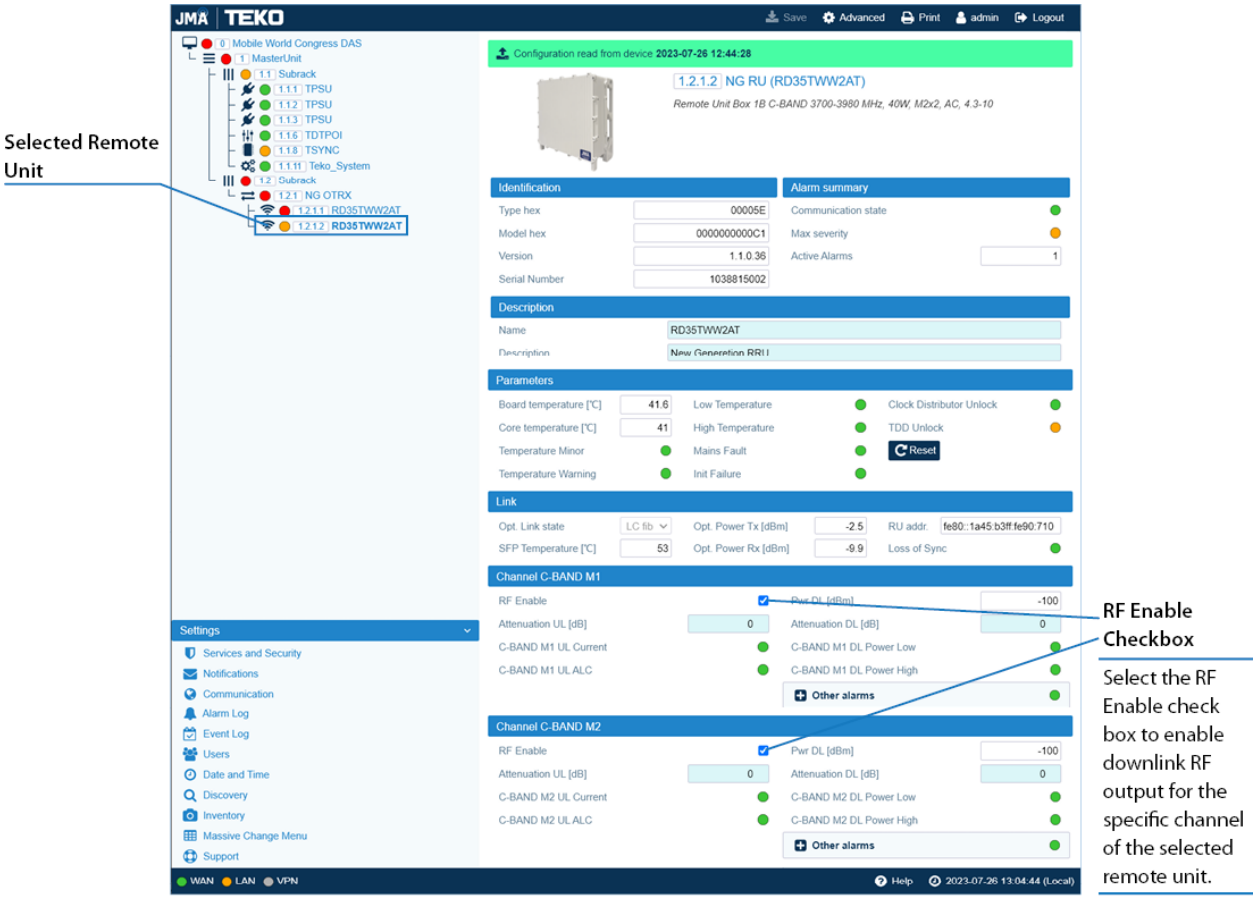
1. In the **Physical Tree**, select the remote unit to display its details panel.
2. Click the **Reset** button to power cycle the unit.



Enabling or Disabling RF for the Remote Unit Downlink Path

Note: Users logged in with the **admins**, **superusers,** or **users** role can enable or disable RF.

1. In the **Physical Tree**, select the remote unit to display its details panel.
2. In the channel pane, select the **RF Enable** check box to enable downlink RF output for the channel.



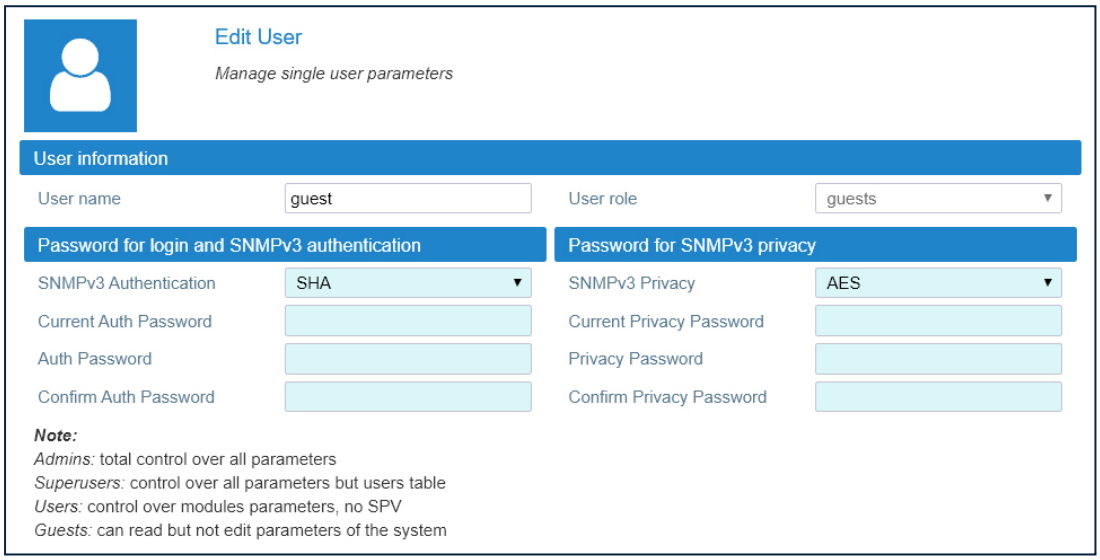
3. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Managing Accounts

This section describes how to manage your own account (all users) and create and edit other user accounts (users logged in with the **admins** user role).

Changing Your Password and Username

1. In the **Toolbar**, click the user name of the account currently logged in to open the **Edit User** panel.



2. In the **User Information** pane, change your user name.
3. In the **Password for login and SNMPv3 authentication** pane, change your password to access the application. See "Password Requirements" below. Change your own *Password for login and SNMPv3 authentication* and *Password for SNMPv3 privacy*.

Password Requirements

Passwords must be at least eight characters long and must contain characters from the following categories:

- lowercase letters (a through z)
- uppercase letters (A through Z)
- base 10 digits (0 through 9)

The user's input validation feature warns users if invalid characters are entered and details what input is expected for the field.

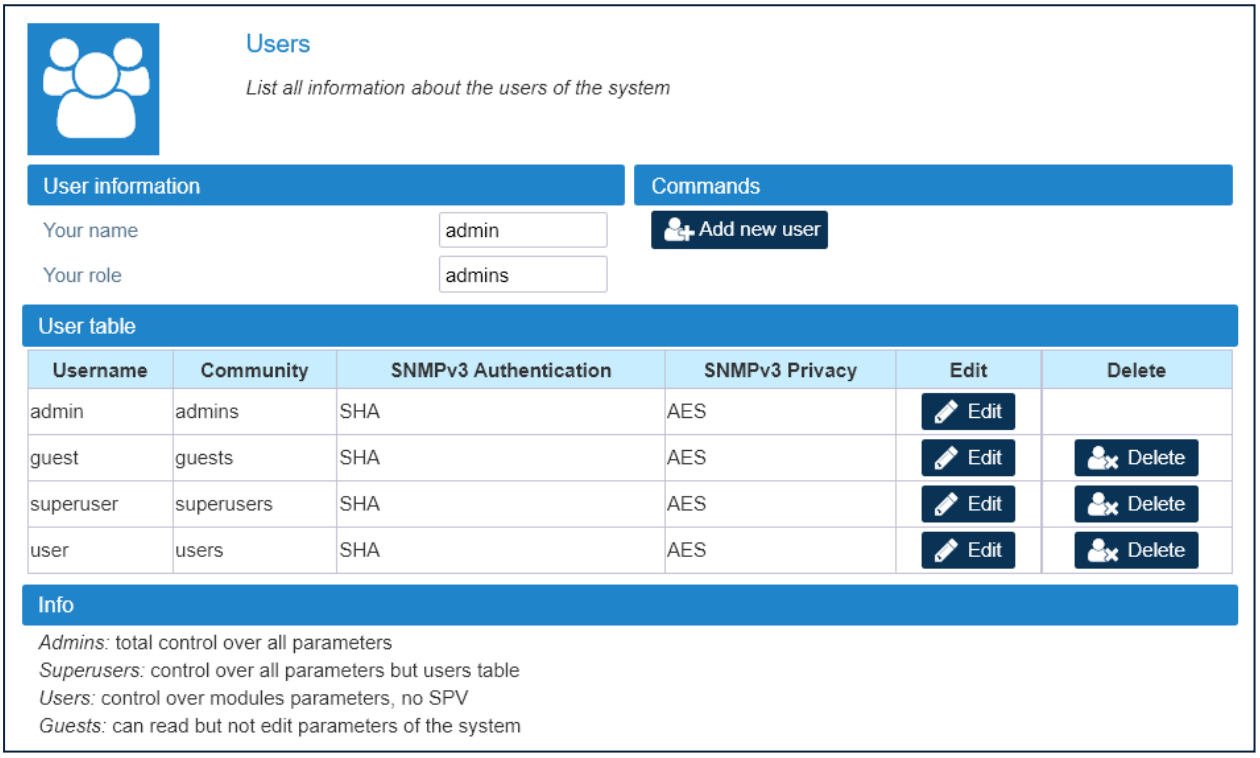
Managing Users

Users with **admins** role permissions can manage their own account and other user accounts.

Editing and Deleting Existing Accounts

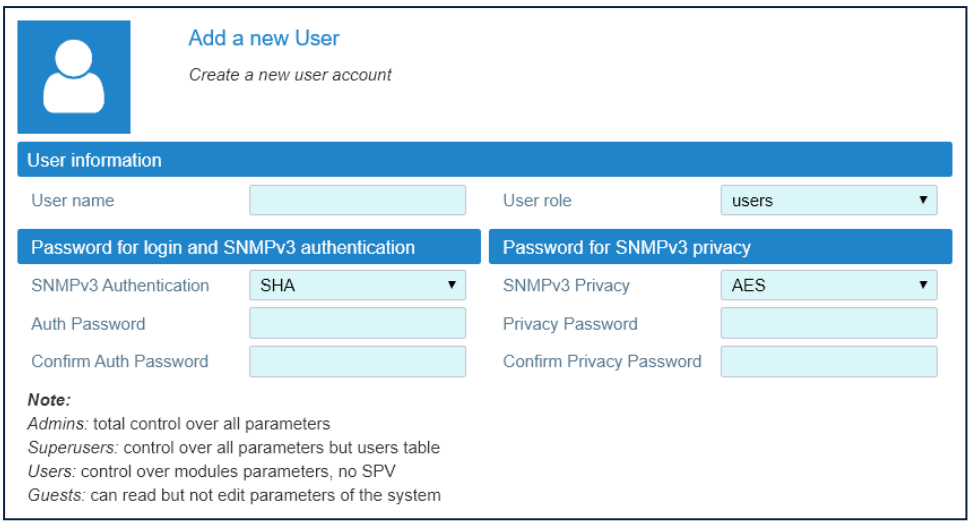
1. In the **Settings** menu, select **Users** to open the **Users** panel.
2. In the **User table**, click **Edit** to edit accounts.
3. Click **Delete** to delete accounts.

NOTE: At least one account with administrative permissions (admins role) must be present and cannot be deleted.



Adding a New User

1. In the **Settings** menu, select **Users** to open the **Users** panel.
2. In the **Commands** pane, click **Add new user**.
3. Enter the new user name in the **User name** field.



4. Select a role for the new user from the **User role** drop-down list.

The following table lists the capabilities associated with each role and the factory-set username and password for each role:

User Role (Community)	Factory-set Username and Password	Capabilities
admins	User name: admin Password: Password1	Total control over all parameters.
superusers	User name: superuser Password: Password1	Control over all parameters except users table.
users	User name: user Password: Password1	Control over modules parameters, no supervision (SPV).
guests	User name: guest Password: Password1	Can read but not edit parameters of the system (read-only user).

5. Enter the user's password for login and SNMPv3 authorization twice, both in the **Auth Password** field and in the **Confirm Auth Password** field.

Password Requirements

Passwords must be at least eight characters long and must contain characters from the following categories:

- lowercase letters (a through z)
- uppercase letters (A through Z)
- base 10 digits (0 through 9)

The user’s input validation feature warns users if invalid characters are entered and details what input is expected for the field.

Setting the Network Configuration

This section describes how to:

- Set the supervision module remote communication interfaces. See "Setting the Supervision Module Communication Interface for Remote Management" below.
- Test the network connection. See "Testing the Network Connection" on page 68.
- Set the network security. See "Setting the Network Security" on page 69.
- Set the date and time of the system. See "Setting the System Date and Time" on page 71.

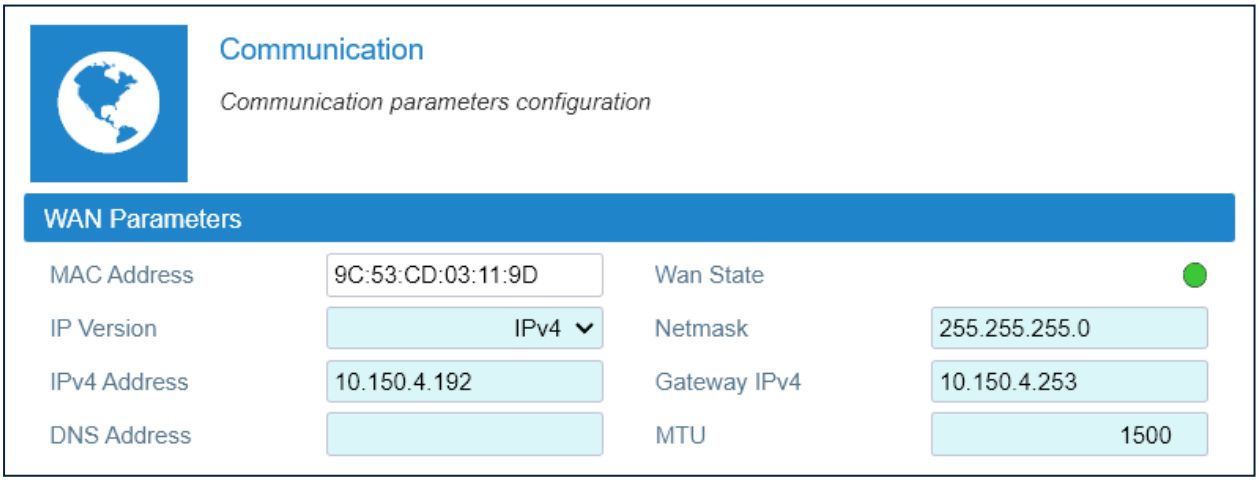
Setting the Supervision Module Communication Interface for Remote Management

Note: The following configuration options are available for users logged in with the **admins** or **superusers** role.

Setting the WAN Interface

1. Contact the Network Administrator to get the parameters for the configuration of the supervision module WAN interface.
2. In the **Settings** menu, select **Communication**.
3. In the **WAN Parameters** pane, select the IP (Internet Protocol) version, IPv4 or IPv6, from the *IP version* drop-down list.

   Note: To avoid connection issues, JMA strongly recommends to switch from IPv4 to IPv6, or vice versa, only when connected locally to the supervision module LAN port.



4. Enter the information provided by the Network Administrator to configure the connection.
5. Set the WAN *MTU*, Maximum Transmission Unit size, if necessary.
6. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save all the changes in the page and allow redirection to the new IP address.

7. Connect the Wide Area Network (WAN) to the supervision module WAN port, to allow the remote management of the DAS.

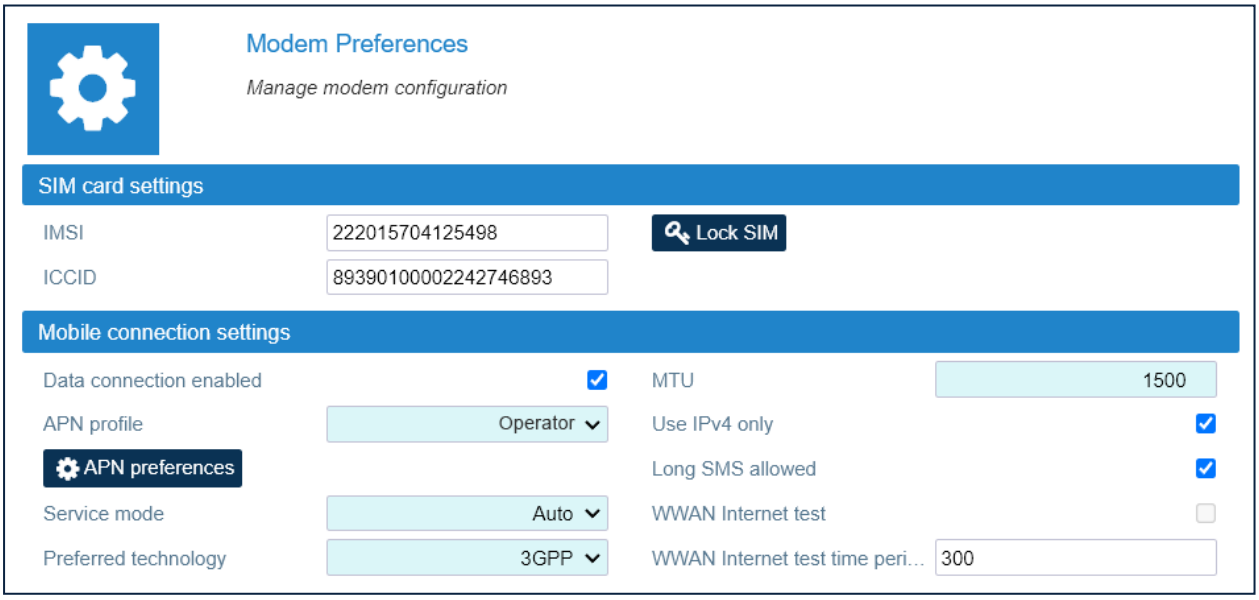
Caution: Never connect the Wide Area Network to the LAN port. The DHCP server, running on the LAN port, may cause connectivity issues in the Wide Area Network.

Setting the Wireless WAN Interface (Modem)

1. In the **Settings** menu, select **Communication**.
2. In the **Modem Parameters** pane, select the **Modem preferences** button to access the modem configuration parameters.

Note: To reboot the modem and restart the WWAN connection, click the **Modem commands** button. A simple terminal for sending AT commands to the modem is also available.

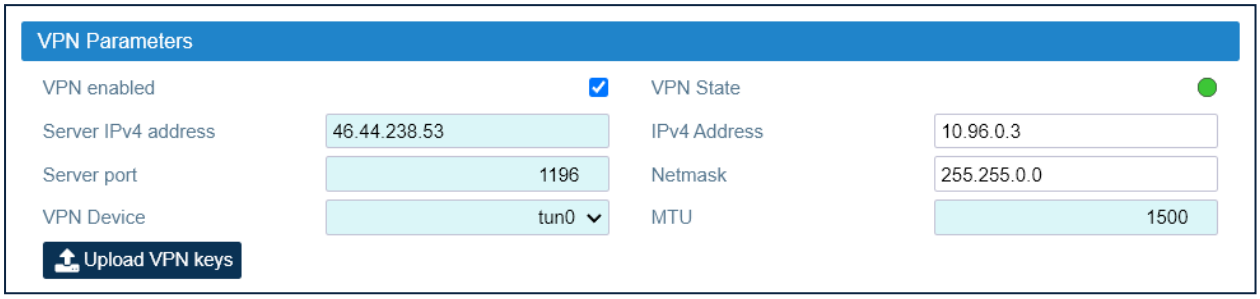
3. Configure the wireless connection and APN preferences.



4. Select the **Data connection enabled** check box to enable the wireless connection.
5. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Setting the VPN

The VPN Client available on the supervision module allows a secure access to the DAS over unsecured networks (such as the Internet).



1. In the **Settings** menu, select **Communication**.
2. Select the **VPN Device** type (Tap or Tun).
3. Enter the VPN server IPv4 address and port.
4. Set the VPN MTU, Maximum Transmission Unit size, if necessary.
5. Upload VPN keys (Certification Authority, Client Certificate, Client Key), if needed.
6. Select the **VPN enabled** check box to enable the VPN connection.
7. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save all the changes in the page and apply the new VPN settings.
8. Check that the **VPN State** icon turns green within a few seconds.

Note: The IP Address allocated by the VPN Server to the VPN Client is displayed in the IPv4 Address field.

Testing the Network Connection

Note: The following configuration options are available for users logged in with the **admins** or **superusers** role.

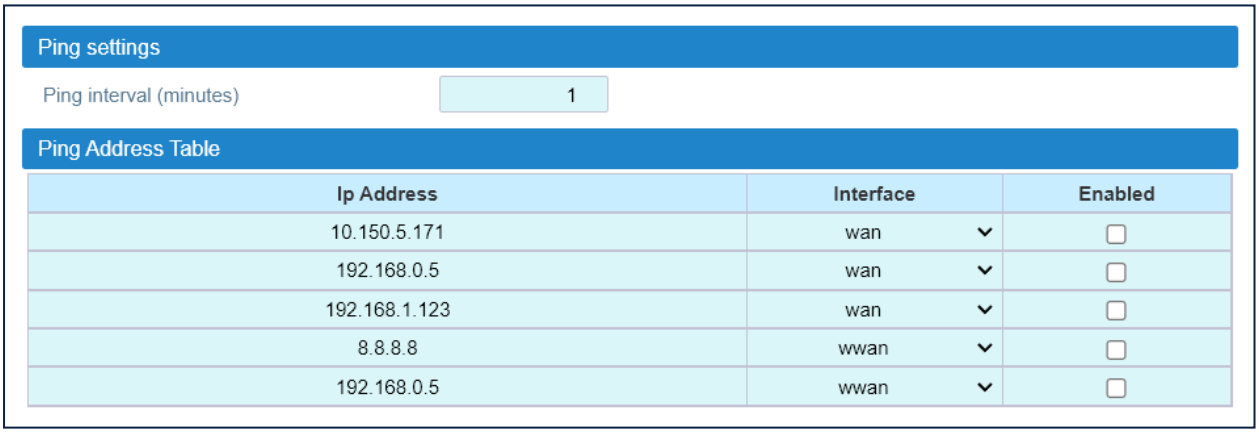
You can set up to five IP Addresses to periodically test the network connection as follows:

1. In the **Settings** menu, select **Communication**.
2. In the **Ping settings** pane, set the **Ping interval** between ping attempts.

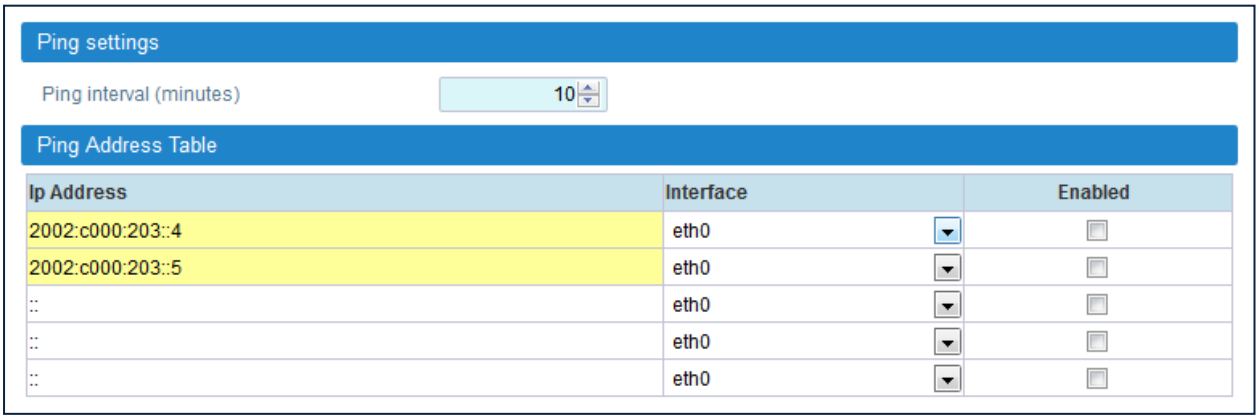
   Note: The ping interval is set as a global ping configuration option.
3. In the **Ping Address Table**, select the connection to be tested from the **Interface** drop-down list.
4. Set the **IP Address** for the network connectivity test.
5. Select the **Enabled** check box.
6. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Note: JMA recommends that you set at least one IP address always available because if the ping test fails, the network interface will be restarted.

An example of the **Ping Address Table** with configured IPv4 addresses is shown in the following figure:



An example of the **Ping Address Table** with configured IPv6 addresses is shown in the following figure:



Setting the Network Security

Note: The following configuration options are available for users logged in with the **admins** or **superusers** role.

1. In the **Settings** menu, select **Services and Security**.
2. Enable or disable network services to set the appropriate security level for the supervision module communication interfaces.

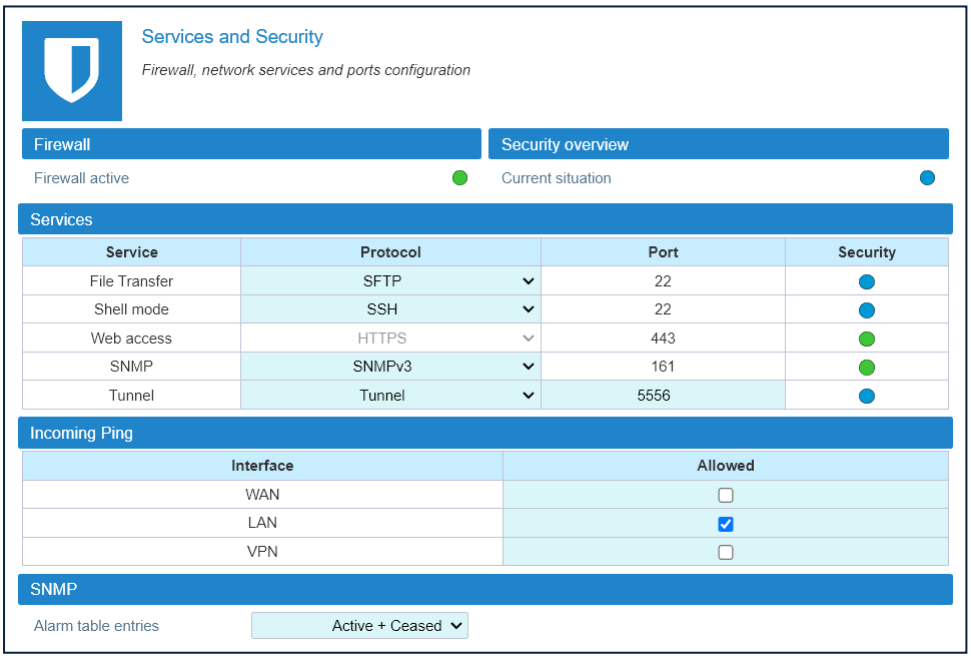
   In the **Services** table, colored icons indicate the security level of each service:

   - Orange: unsafe service.
   - Cyan: safe but not necessary service.
   - Green: safe service.

   In the **Security overview** pane, the color-coded icon provides an at-a-glance view of the network security status.
3. Enable or disable incoming ping for the supervision module communication interfaces.
4. Click the yellow **Save** tool or press the **Enter** key on your keyboard to save all the changes in the page.

Setting a Secure Network

1. For a secure network, configure services as shown in the following figure:



2. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Note:

If the *Tunnel* is disabled (OFF), the DAS cannot be managed via JMA OMC nor can Software Defined Remote Units (SDRUs) feature configuration and licensing be performed via the SDRU Panel.

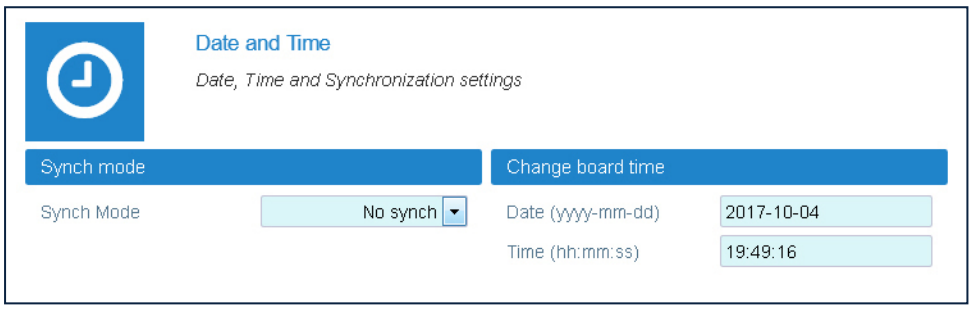
The web server accepts only Secure HTTP (HTTPS) connections: make sure to use port 443 to communicate with the supervision module.

Setting the System Date and Time

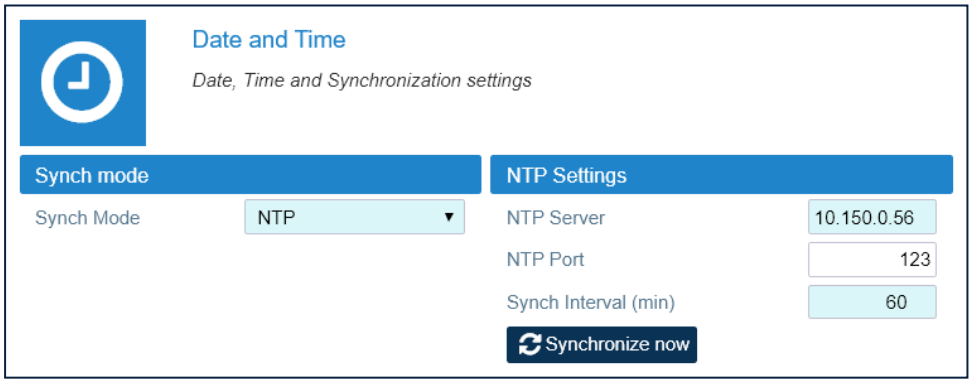
Note: The following configuration options are available for users logged in with the **admins** or **superusers** role.

1. In the **Settings** menu, select **Date and Time**.
2. From the **Synch Mode** drop-down list, select the synchronization mode:
   a. Select *No synch* to manually set the DAS date and time.

   In the **Change board time** pane, enter the board date and time in Local Time Standard.



   b. Select *NTP* to enable and configure the automatic clock synchronization service.
   - Enter the NTP Server IP address in the **NTP Server** field.
   - In the **Synch Interval** field, set the time interval (minutes) between automatic time synchronization.
   - Click **Synchronize now** to check the NTP Server availability.



3. Click the yellow **Save** tool in the toolbar or press the **Enter** key on your keyboard to save changes.

Appendix - Description of the Main Panels of the DAS Components

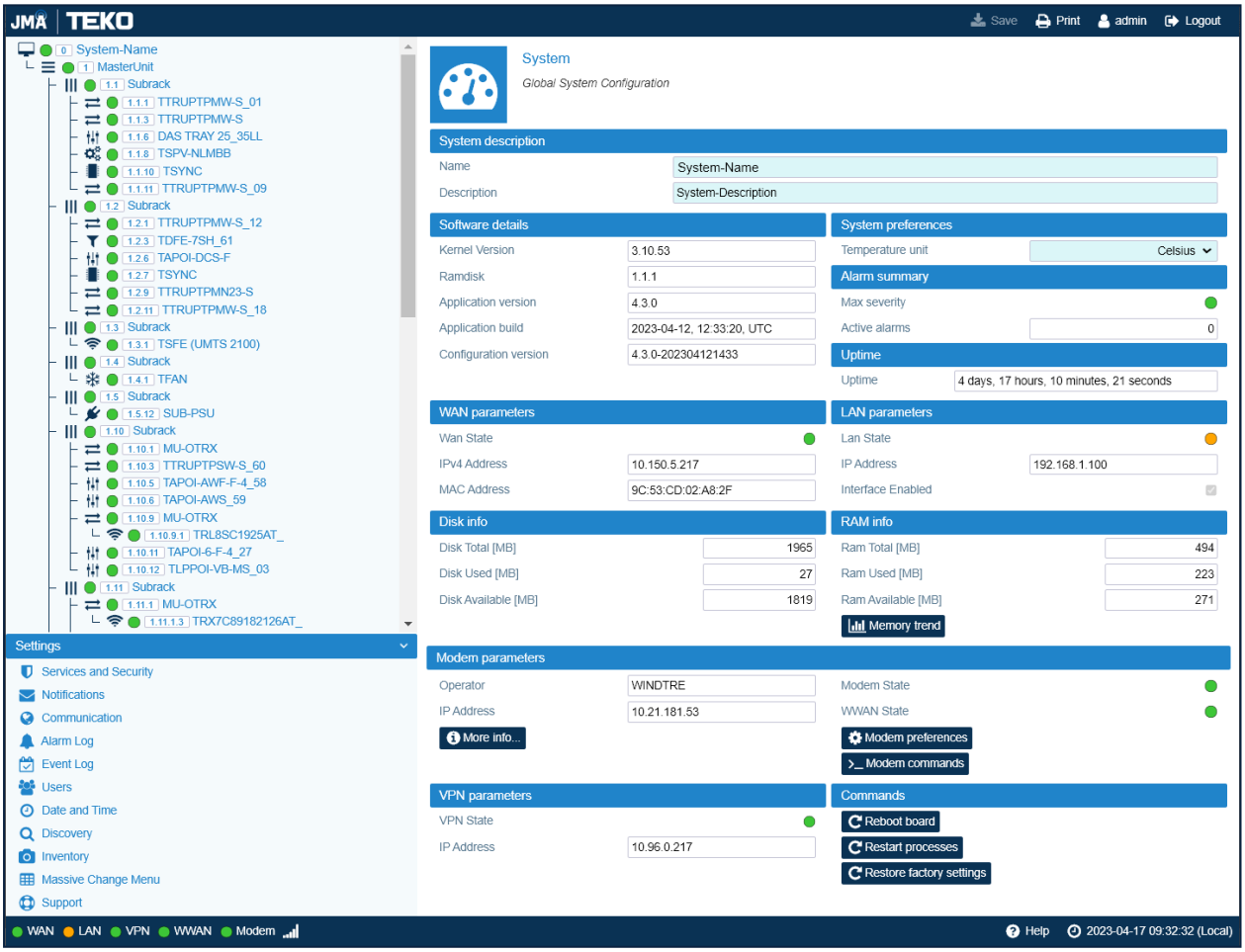
This section describes the main panels of the different components that can be managed by the DAS supervision module.

When you select a node from the **Physical Tree**, the main panel provides detailed information about the selected component. When you select the root node, the **System** panel provides information about the supervision module and the entire managed system.

In main panels, users are allowed to set preferences and operating parameters based on the capabilities associated with their role. Refer to the User Capabilities Table on page 8 for details.

System Panel

The **System** panel includes all the DAS components managed by the supervision module.



The **System** panel includes the following information:

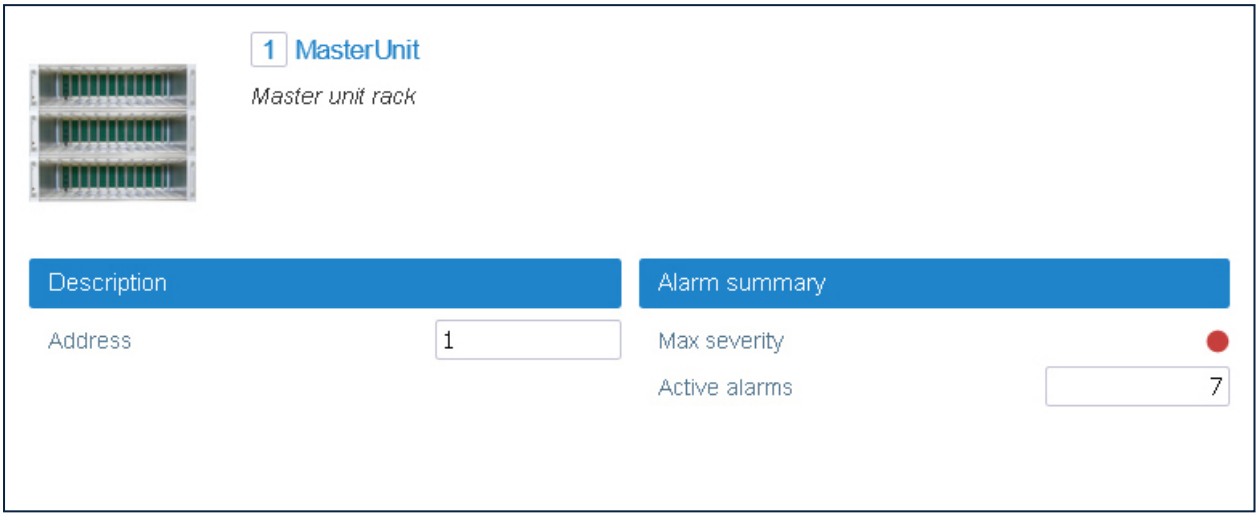
- **System Name and Description** – Users with **admins** or **superusers** role permissions can modify the system name and description. See "Modifying the System Name and Description" on page 43.

- **Software Details** – Kernel Version, Ramdisk, Application version and build, Configuration version.
- **Uptime** – Amount of the Supervision module (TSPV) uptime.
- **Disk and RAM Info** – Supervision module (TSPV) hard disk and RAM details.
- **System preferences** – Users with the **admins** or **superusers** role permissions can set temperatures to display either in Fahrenheit or Celsius.
- **WAN parameters** – Status and settings of the Ethernet WAN (Wide Area Network) Interface.
- **LAN parameters** – Status and settings of the Ethernet LAN (Local Area Network) Interface.
- **Modem parameters** – Modem and WWAN (Wireless Wide Area Network) status and settings. The **Modem preferences** button is available for all users to view the mobile connection settings and for users with **admins** or **superusers** role permissions to configure the wireless connection. The **Modem commands** button is available for users with **admins** or **superusers** permissions to reboot the modem and restart the WWAN connection.
- **VPN Parameters** – Status and settings of the VPN connection.
- **Alarm Summary** – Summary of the system current alarm status, detailing the maximum severity level (color-coded icon) and the total number of alarms currently active in all managed components.

The **Reboot board**, **Restart processes**, and **Restore factory settings** buttons are available for users with the **admins** or **superusers** role permissions.

Master Unit Panel

The **Master Unit** is a container for all the DAS components managed by the supervision module.



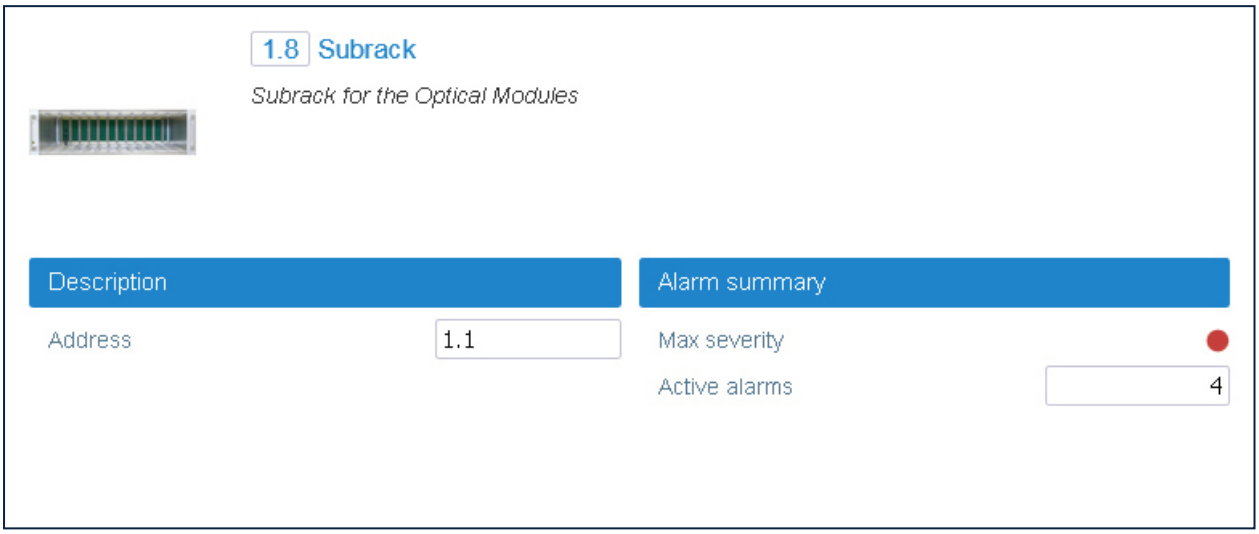
The **Master Unit** panel provides the following information:

- **Description**
  - *Address* – Position of the master unit in the DAS.
- **Alarm Summary**

  The **Alarm Summary** pane of the **Master Unit** panel provides the same information available in the **Alarm Summary** pane of the **System** panel:
  - *Max severity* – Maximum severity of the alarms active in the DAS.
  - *Active alarms* – Number of the alarms active in the DAS.

Subrack Panel

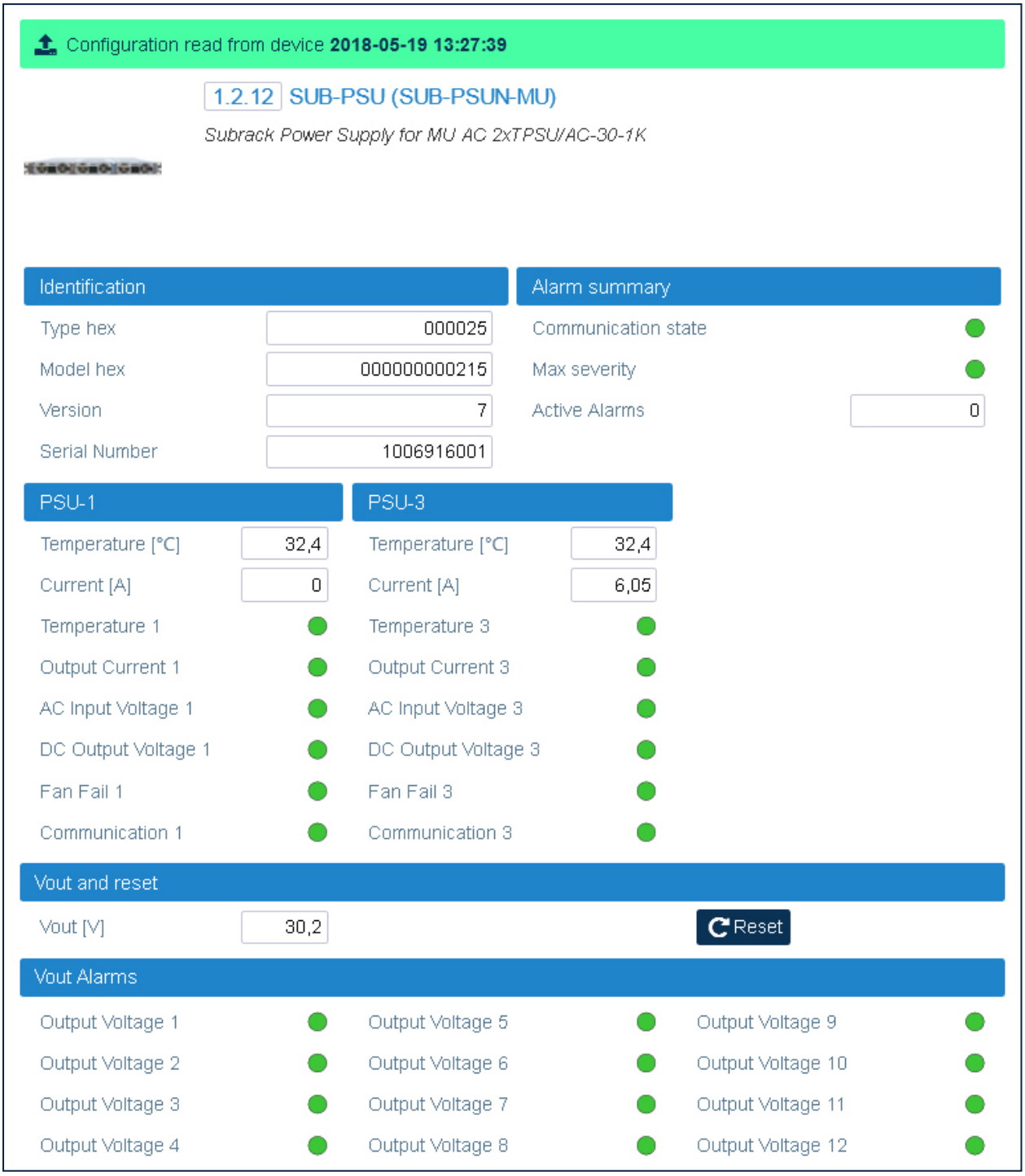
The **Subrack** is a container for the components, both sub-racks and modules, managed by the DAS supervision module. A panel is available for each active sub-rack equipped in the DAS.



The **Subrack** panel provides the following information:

- **Description**
  - *Address* – Position of the sub-rack in the DAS.
- **Alarm Summary**
  - *Max severity* – Maximum severity of the alarms active for the sub-rack.
  - *Active alarms* – Number of the alarms active for the sub-rack.

SUB-PSU Panel



The **SUB-PSU** panel provides the following information about the rack-mount power supply unit:

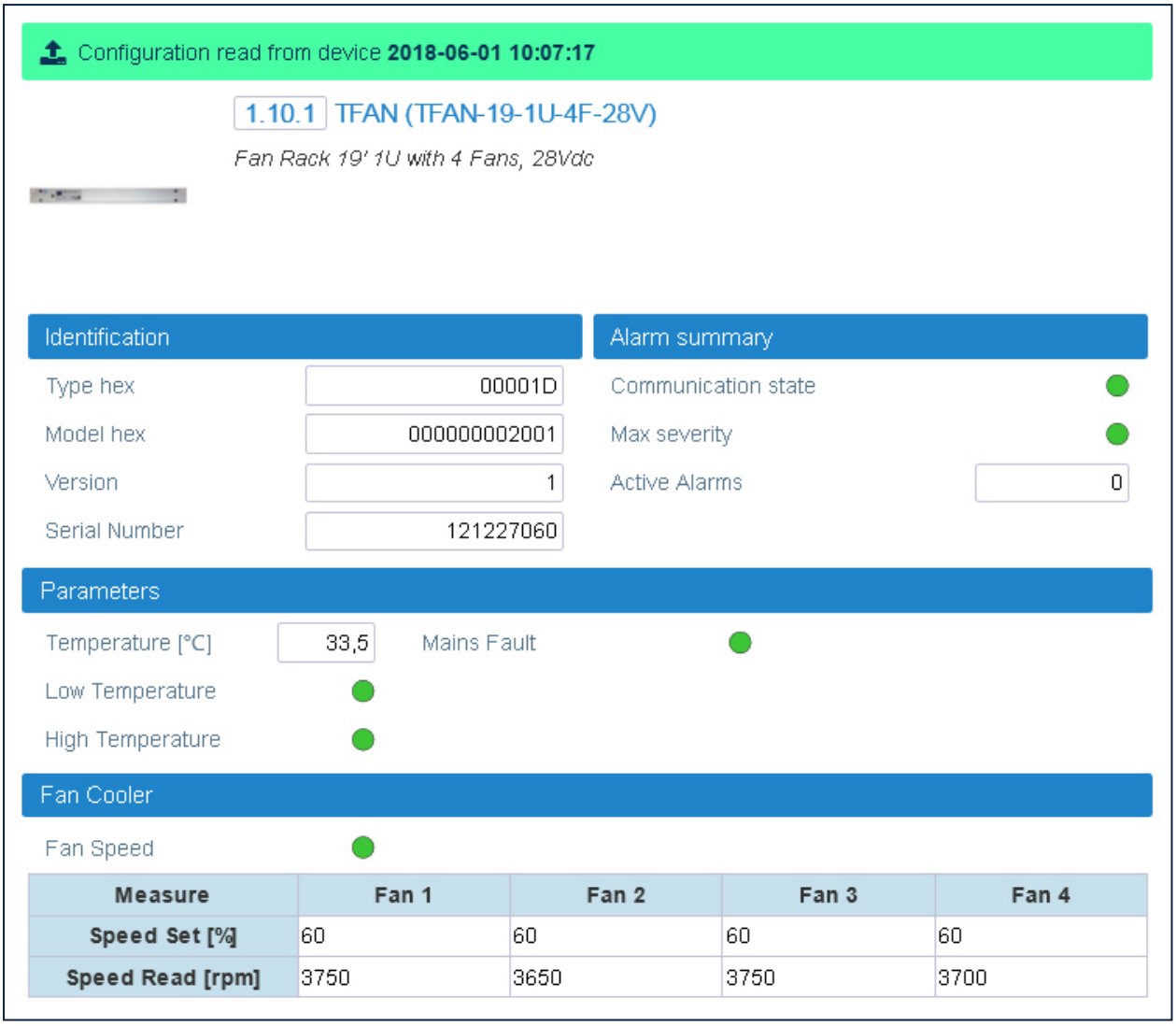
- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)

- Version
- Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **PSU-1, PSU-2, PSU-3** – Detected *Temperature* and *Current*, and status of the alarms of each power supply module equipped inside the SUB-PSU sub-rack.
- **Vout and reset** – Equipment output voltage (*Vout*) and *Reset* button.

  Note: The *Reset* button is available for users logged in with the **admins**, **superusers,** or **users** role to reset the whole Master Unit. **The supervision module will be unavailable while the reset is in progress.**
- **Vout Alarms –** Alarm status of each Vdc output.

TFAN Panel

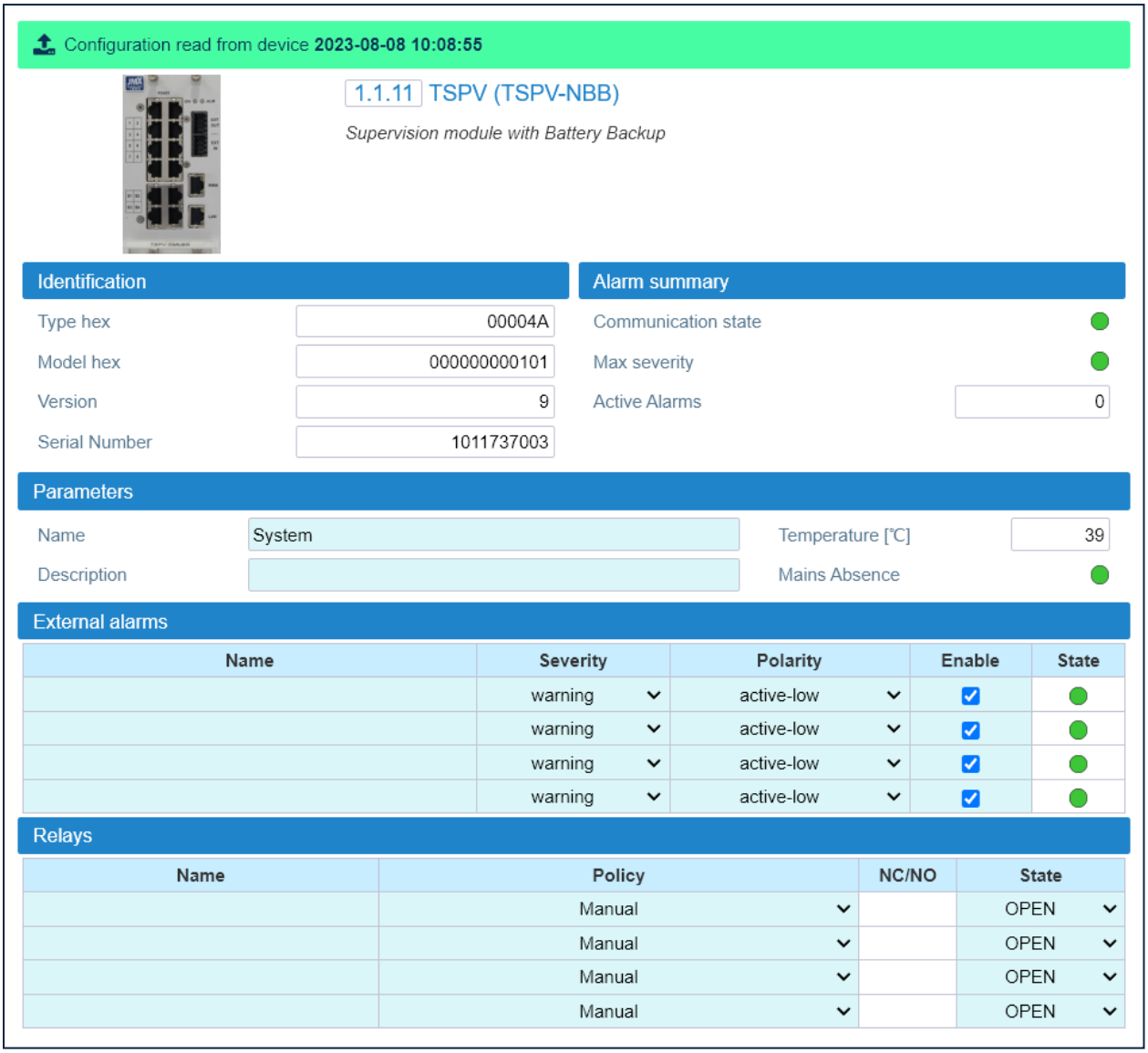


The **TFAN** panel includes the following information about the forced-air cooling unit:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms

- **Parameters**
  - Detected *Temperature*,
  - Status of the *Low Temperature, High Temperature,* and *Mains Fault* alarms.
- **Fan**
  - Status of the *Fan Speed* alarm.
  - *Speed Set [%]* – Rotational speed set for each fan.
  - *Speed Read [rpm]* – Actual fan rotation speed (revolutions per minute) of each fan.

TSPV Panel



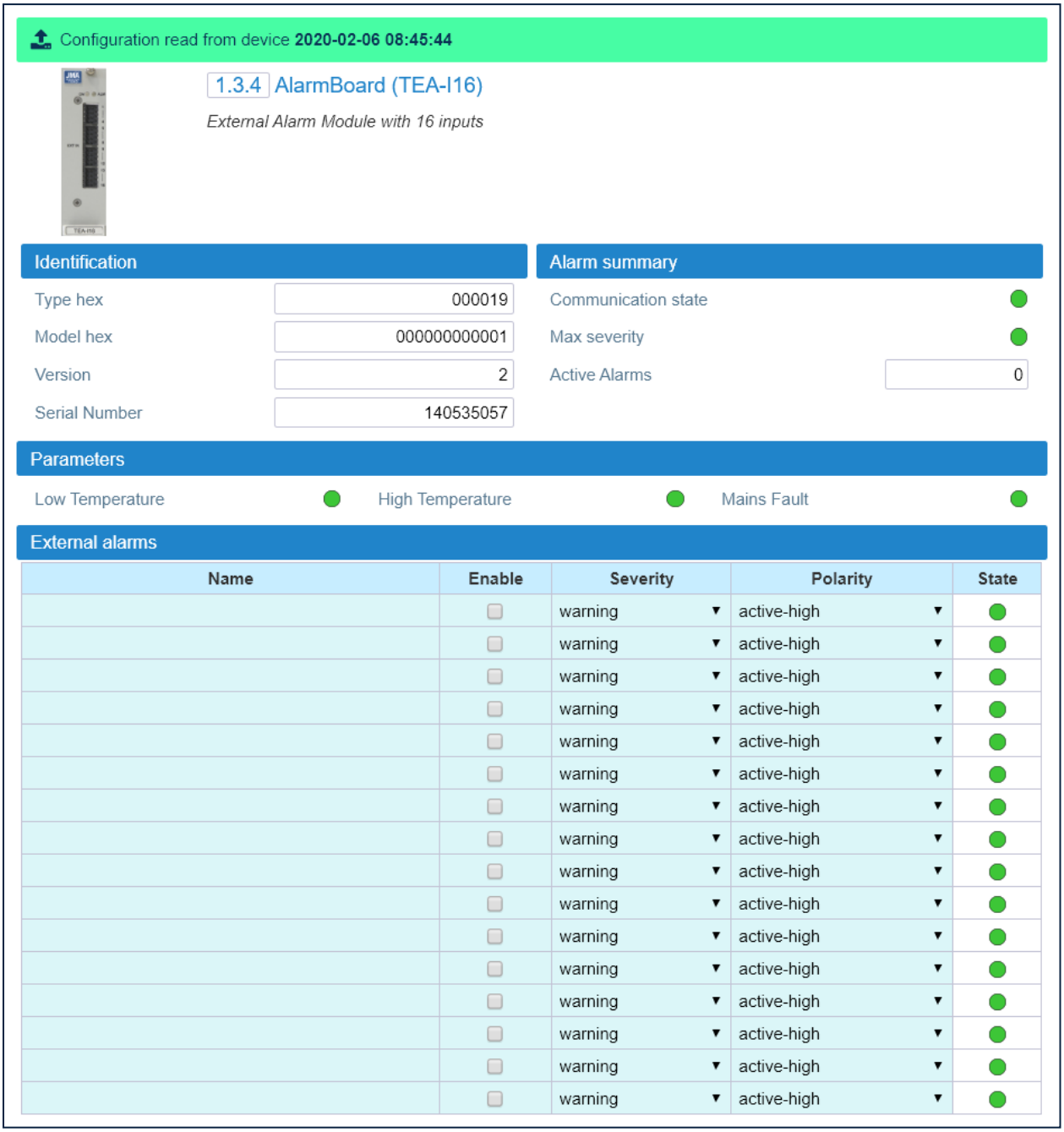
The **TSPV** panel includes the following information about the system supervision module:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms

- **Parameters**
  - Supervision module *Name* and *Description*. Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.
  - Detected *Temperature*.
  - Status of the *Mains absence* alarm.

    Note: The *Mains absence* alarm is available only when the Supervision module is equipped with the battery backup option.
- **External Alarms –** Alarm status of the external devices connected to the supervision module EXT IN input. Users logged in with the **admins**, **superusers,** or **users** role can enable or disable each external alarm, and set the external alarm name, severity, and polarity. See "Setting External Alarms and Relays" on page 50.
- **Relays** – External outputs name and logic. Users logged in with the **admins**, **superusers,** or **users** role can switch external outputs either manually or automatically. See "Relays" on page 51.

Alarm Board Panel



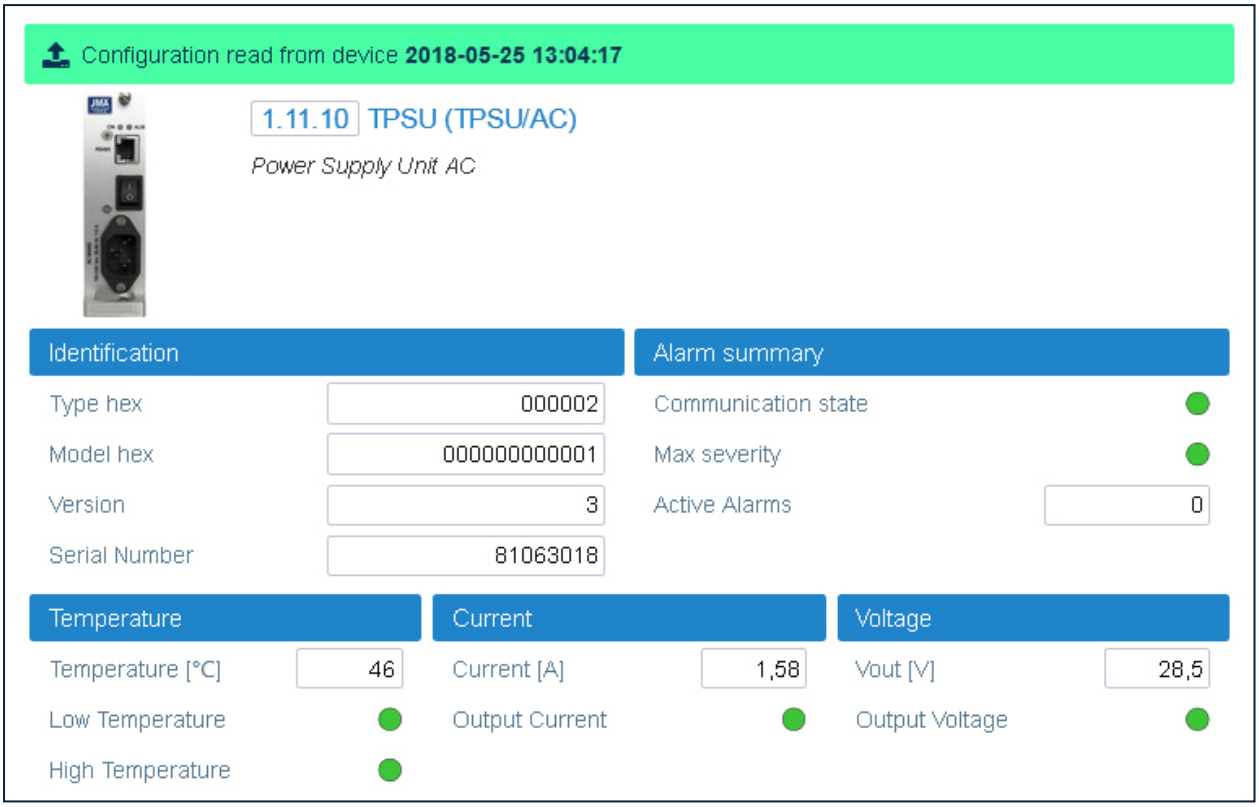
The **Alarm Board** panel includes the following information about the optional module that can be equipped in the DAS system to increase the number of supported external alarms:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Parameters**

  Status of the *Low Temperature, High Temperature*, and *Mains Fault* alarms.
- **External Alarms –** Alarm status of the external devices connected to the alarm board **EXT IN** input. Users logged in with the **admins**, **superusers,** or **users** role can enable or disable each external alarm, and set the external alarm name, severity, and polarity. See "Setting External Alarms and Relays" on page 50.

TPSU Panel

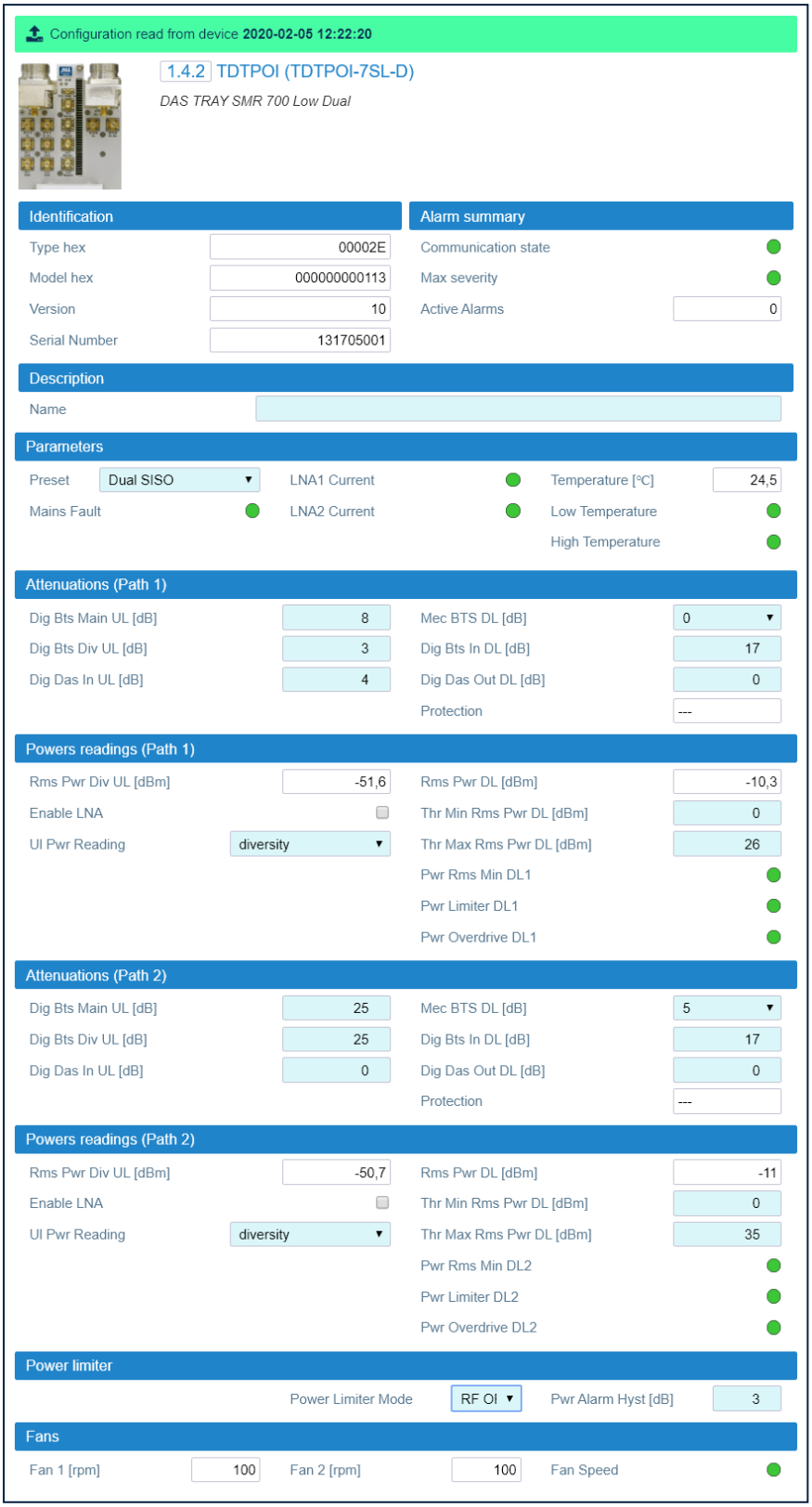


The **TPSU** panel includes the following information about the power supply module (TPSU/AC or TPSU/48):

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Temperature**
  - Detected *Temperature*.
  - Status of the *Low Temperature* and *High Temperature* alarms.
- **Current**
  - Detected Output *Current.*
  - Status of the *Output Current* alarm.

- **Voltage**
  - Detected Output Voltage (*Vout*).
  - Status of the *Output Voltage* alarm.

TDTPOI Panel



The **TDTPOI** panel includes the following information about the selected DAS Tray Point of Interface:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – TDTPOI *Name*.

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the TDTPOI. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - *Preset* **–** The *Preset* drop-down list shows the selected TDTPOI operation mode.

    When multiple options are available, users with the **admins**, **superusers,** or **users** role can select the TDTPOI proper operation mode: *Dual SISO, UMTS Div, GSM Div*, or *MIMO 2x2*. Refer to the *JMA DAS Platform Local Commissioning User Guide, RF Commissioning of Points of Interface and Remote Units* section.
  - Detected *Temperature*.
  - Status of the *Mains Fault*, *LNA1 Current* and *LNA2 Current*, *Low Temperature*, and *High Temperature* alarms.
- **Attenuations Path 1 –** Downlink and Uplink attenuations for path 1. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.
- **Powers Readings Path 1**
  - Detected Downlink rms Power (*Rms Pwr DL*), detected Uplink rms Power (*Rms Pwr Main UL* or, when the *UL Pwr Reading* menu is available and *diversity* is selected, *Rms Pwr Div UL*).
  - *Enable LNA* check box.
  - *Thr Min Rms Pwr DL* and *Thr Max Rms Pwr DL* – Minimum and maximum rms input power thresholds. Users logged in with the **admins**, **superusers,** or **users** role can set the thresholds.
  - Status of the *Pwr Rms Min DL 1*, *Pwr Limiter DL 1*, and *Pwr Overdrive DL 1* alarms.
- **Attenuations Path 2 –** Downlink and Uplink attenuations for path 2. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.

- **Powers Readings Path 2**
  - Detected Downlink rms Power (Rms Pwr DL), detected Uplink rms Power (*Rms Pwr Main UL* or, when the *UL Pwr Reading* menu is available and *diversity* is selected, *Rms Pwr Div UL*).
  - *Enable LNA* check box.
  - *Thr Min Rms Pwr DL* and *Thr Max Rms Pwr DL* – Minimum and maximum rms input power thresholds. Users logged in with the **admins**, **superusers,** or **users** role can set the thresholds.
  - Status of the *Pwr Rms Min DL* 2, *Pwr Limiter DL 2*, and *Pwr Overdrive DL 2* alarms.
- **Power Limiter**

  The power limiter protects the module from high RF input power.
  - *Power Limiter Mode* – Users logged in with the **admins**, **superusers,** or **users** role can select the power limiter mode.

    The following options are available in the **Pwr Limiter mode** drop-down list:
    - *RF OFF*: If the Power Limiter Mode is set to *RF OFF*, when the rms downlink input power exceeds the user-set maximum input signal threshold for the path (1 or 2), the Pwr Limiter DL (1 or 2) alarm is triggered and the path is switched off, until the alarm condition ceases (auto power-on).
    - *10dB plus*: If the Power Limiter Mode is set to *10dB plus*, when the rms downlink input power exceeds the user-set maximum input signal threshold for the path (1 or 2), the Pwr Limiter DL (1 or 2) alarm is triggered and the path input power is reduced by 10dB, until the alarm condition ceases.

      Note: When the rms downlink input power (path 1 or 2) exceeds either the user-defined maximum input signal threshold +10dB, or the allowed Absolute Maximum Input Power, the path (1 or 2) is switched off by the overdrive protection and the Pwr Overdrive DL (1 or 2) alarm is triggered.

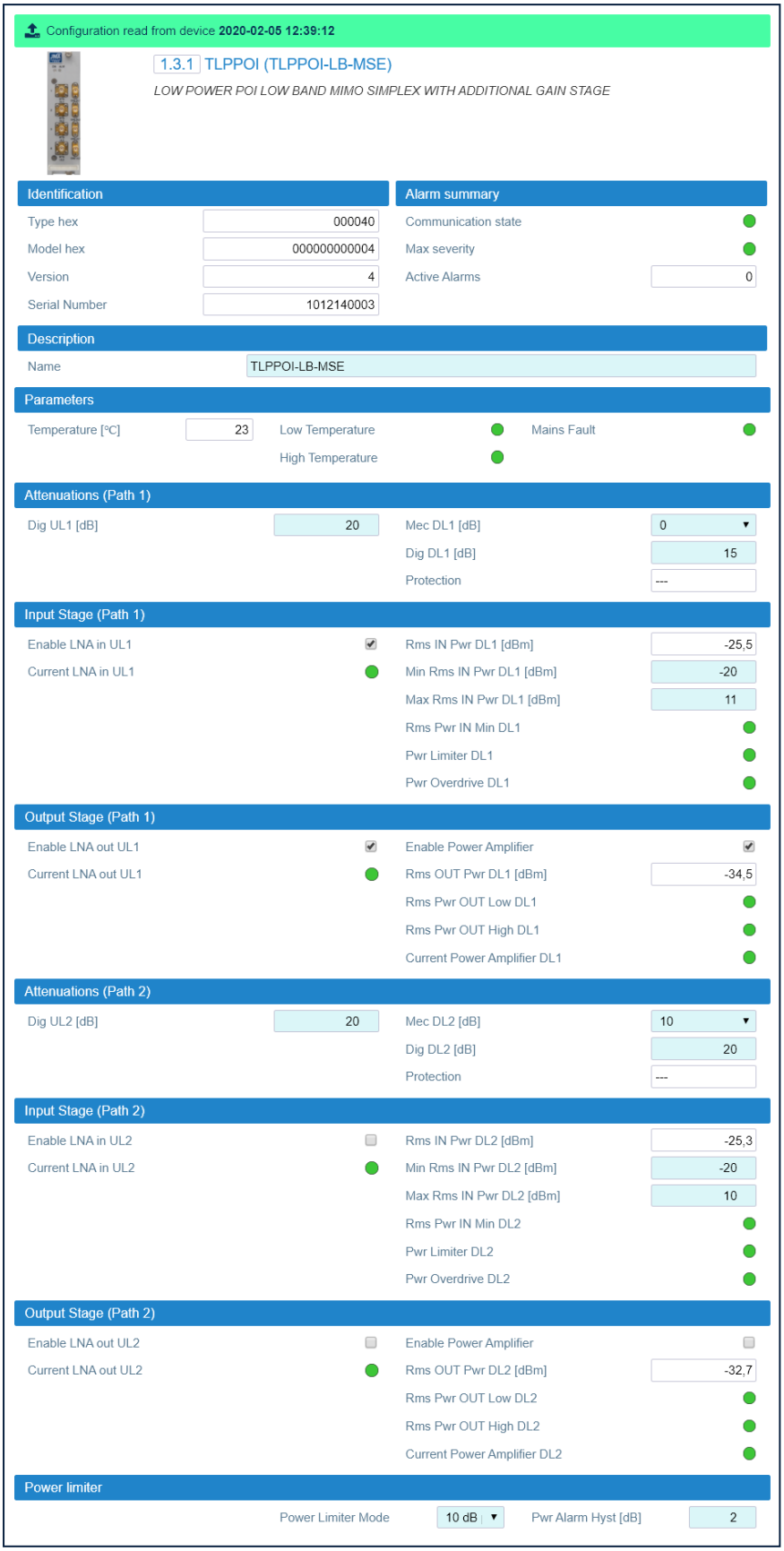
      The overdrive alarm needs to be cleared: when the alarm ceases, click the **Clear Overdrive** button to reset the path.

      The path is restored @ max attenuations (Mec DL and Dig DL) and the re-commissioning of the path is required.
  - *Pwr Alarm Hyst* – Users logged in with the **admins**, **superusers,** or **users** role can set the Power Alarm Hysteresis to avoid repeated power alarm reports.

    If the detected input power exceeds the maximum input power threshold set for the path, the power limiter alarm is triggered. The alarm is cleared when:
    DL RMS power = DL max RMS thrs - Pwr Alarm Hyst
- **Fans**
  - Actual fan rotation speed (rpm, revolutions per minute).

    Note: If the fan rotation speed is 100, the fan is not spinning.
  - Status of the *Fan Speed* alarm.

TLPPOI Panel



The **TLPPOI** panel includes the following information about the selected Low Power Point of Interface:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** - TLPPOI Name.

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the TLPPOI. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - Detected *Temperature*.
  - Status of the *Mains Fault*, *Low Temperature*, and *High Temperature* alarms.
- **Attenuations (Path 1) -** Downlink and uplink attenuations for path 1. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.
- **Input Stage (Path 1)**
  - *Enable LNA in UL*1 check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning TLPPOI* for details.
  - *Rms IN Pwr DL1* – Detected downlink rms input power.
  - *Min Rms IN Pwr DL1* and *Max Rms IN Pwr DL1* – Minimum and maximum rms input power thresholds. Users logged in with the **admins**, **superusers,** or **users** role can set the thresholds.
  - Status of the *Current LNA in UL1, Rms Pwr IN Min DL1, Pwr Limiter DL1,* and *Pwr Overdrive DL1* alarms.
- **Output Stage (Path 1)**
  - *Enable LNA out UL*1 check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning TLPPOI* for details.
  - *Enable Power Amplifier* check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning TLPPOI* for details.
  - *Rms OUT Pwr DL1* – Detected downlink rms input power.
  - Status of the *Current LNA out UL1, Rms Pwr OUT Low DL1, Rms Pwr OUT High DL1,* and *Current Power Amplifier DL1* alarms.

- **Attenuations (Path 2) -** Downlink and uplink attenuations for path 2. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.
- **Input Stage (Path 2)**
  - *Enable LNA in UL2* check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning TLPPOI* for details.
  - *Rms IN Pwr DL2* – Downlink rms input power reading.
  - *Min Rms IN Pwr DL2* and *Max Rms IN Pwr DL2* – Minimum and maximum rms input power thresholds. Users logged in with the **admins**, **superusers,** or **users** role can set the thresholds.
  - Status of the *Current LNA in UL2, Rms Pwr IN Min DL2, Pwr Limiter DL2,* and *Pwr Overdrive DL2* alarms.
- **Output Stage (Path 2)**
  - *Enable LNA out UL*2 check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning TLPPOI* for details.
  - *Enable Power Amplifier* check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning TLPPOI* for details.
  - *Rms OUT Pwr DL2* - Downlink rms input power reading.
  - Status of the *Current LNA out UL2, Rms Pwr OUT Low DL2, Rms Pwr OUT High DL2,* and *Current Power Amplifier DL*2 alarms.
- **Power Limiter**

  The power limiter protects the module from high RF input power.
  - *Power Limiter Mode* – Users logged in with the **admins**, **superusers,** or **users** role can select the power limiter mode.

    The following options are available in the **Pwr Limiter Mode** drop-down list:
    - *RF OFF*. If the Power Limiter Mode is set to *RF OFF*, when the rms downlink input power exceeds the user-set maximum input signal threshold (*Max Rms IN Pwr DL*) for the path (1 or 2), the *Pwr Limiter DL* (1 or 2) alarm is triggered and the path is switched off, until the alarm condition ceases (auto power-on).
    - *10dB plus*. If the Power Limiter Mode is set to *10dB plus*:
      - When the rms downlink input power exceeds the user-set maximum input signal threshold (*Max Rms IN Pwr DL*) for the path (1 or 2), the Pwr Limiter DL (1 or 2) alarm is triggered and the path input power is reduced by 10dB, until the alarm condition ceases.

- When the rms downlink input power (path 1 or 2) exceeds either the user-defined maximum input signal threshold (*Max Rms Power DL*) +10dB, or the allowed Absolute Maximum Input Power, the path (1 or 2) is switched off by the overdrive protection and the *Pwr Overdrive DL* (1 or 2) alarm is triggered.

  Note: The overdrive alarm needs to be cleared: when the alarm ceases, click the **Clear Overdrive** button to reset the path. The path is restored @ max attenuations (*Mec DL* and *Dig DL*) and the re-commissioning of the path is required.

- *Pwr Alarm Hyst* – Users logged in with the **admins**, **superusers,** or **users** role can set the Power Alarm Hysteresis to avoid repeated power alarm reports.

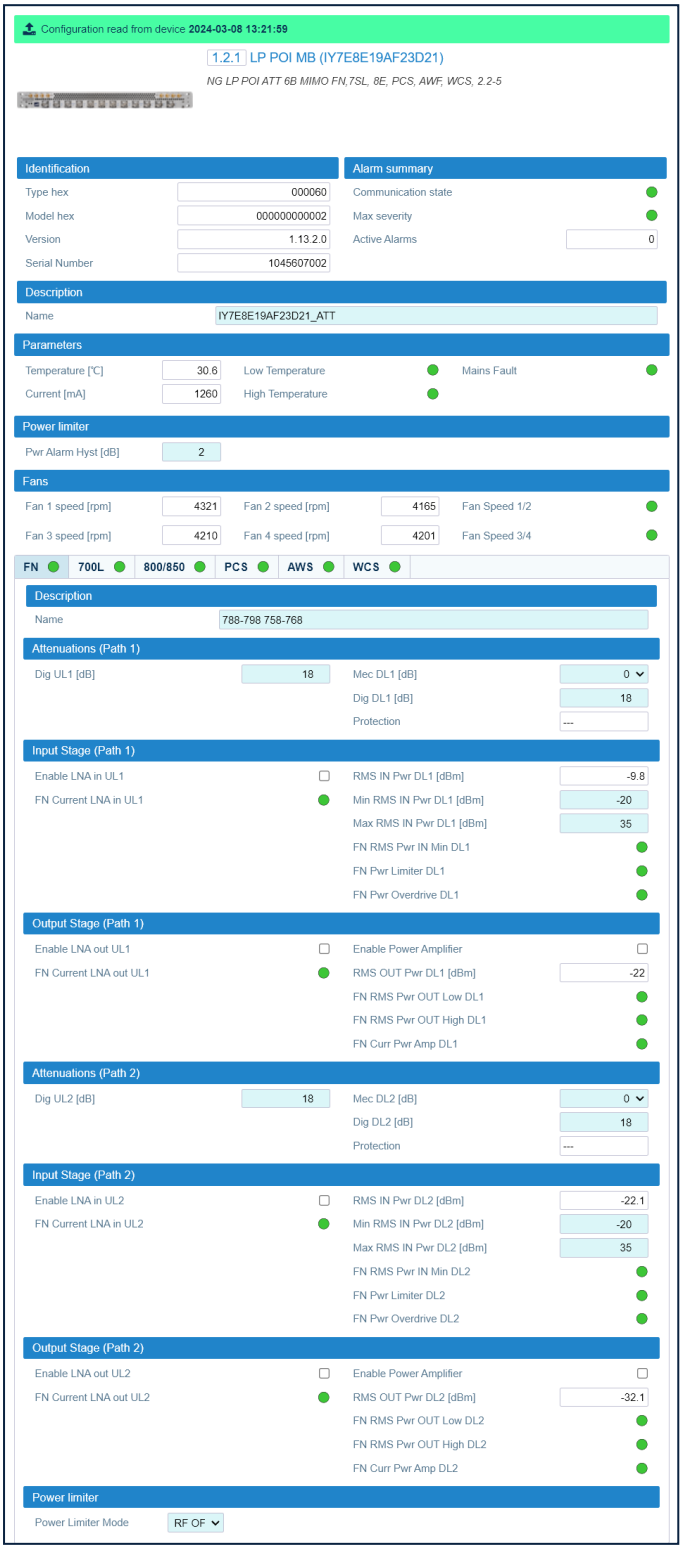
  If the detected input power exceeds the maximum input power threshold set for the path, the power limiter alarm is triggered. The alarm is cleared when:
  Rms IN Pwr DL = Max Rms IN Pwr DL - Pwr Alarm Hyst.

LP POI MB Panel

A panel is available for each model of next generation Multi-band Points of Interface equipped in the DAS.

The following figures show the **LP POI MB** panels.

Model **IY7E8E19AF23D21**:



Model **IY7E8E19AFD21**:

The **LP POI MB** panel includes the following information about the selected Multi-band Point of Interface:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)

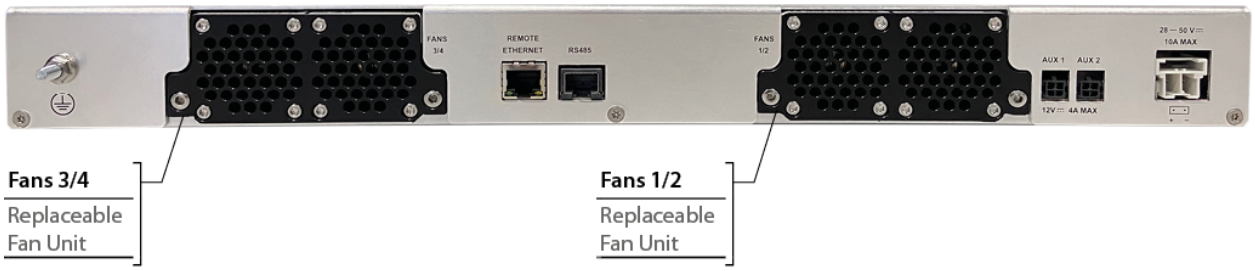
- Version
- Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – LP POI MB Name.

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the LP POI MB. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - Detected *Temperature* and *Current*.
  - Status of the *Mains Fault*, *Low Temperature*, and *High Temperature* alarms.
- **Power limiter** – The power limiter protects the module from high RF input power.
  - *Pwr Alarm Hyst* – Users logged in with the **admins**, **superusers,** or **users** role can set the Power Alarm Hysteresis to avoid repeated power alarm reports.

    Note: The Power Alarm Hysteresis is set as a global configuration option, the *Power Limiter Mode* is set for each band. See Power Limiter Mode on page 97.
- **Fans**

  Note: The Multi-band Point of Interface is equipped with two replaceable fan units, which are labeled as *Fans 1/2* and *Fans 3/4* on the equipment rear panel:



  - *Fan Speed 1/2* – Status of the Fan Speed alarm for the fan unit identified as *Fans 1/2* on the equipment rear panel.
  - *Fan Speed 3/4* – Status of the Fan Speed alarm for the fan unit identified as *Fans 3/4* on the equipment rear panel.
  - *Fan 1 speed* – Actual rotation speed of fan 1 (rpm, revolutions per minute).
  - *Fan 2 speed* – Actual rotation speed of fan 2 (rpm, revolutions per minute).
  - *Fan 3 speed* – Actual rotation speed of fan 3 (rpm, revolutions per minute).
  - *Fan 4 speed* – Actual rotation speed of fan 4 (rpm, revolutions per minute).

- **Operating band tabs**

  Select a band tab to display the following information about the selected band:

  - **Description** – Band Name.

    Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the band. See "Assigning Names to the DAS Components" on page 44.

  - **Attenuations (Path 1) -** Mechanical downlink attenuation (*Mec DL1*), digital downlink attenuation (*Dig DL1*), and digital uplink attenuation (*Dig UL1*) for path 1. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.

  - **Input Stage (Path 1)**

    - *Enable LNA in UL*1 check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning LP POI MB* for details.
    - *Rms IN Pwr DL1* – Detected downlink rms input power.
    - *Min Rms IN Pwr DL1* and *Max Rms IN Pwr DL1* – Minimum and maximum rms input power thresholds. Users logged in with the **admins**, **superusers,** or **users** role can set the thresholds.
    - Status of the *<band ID> Current LNA in UL1, <band ID> Rms Pwr IN Min DL1, <band ID> Pwr Limiter DL1,* and *<band ID> Pwr Overdrive DL1* alarms.

    Output Stage (Path 1)

    - *Enable LNA out UL*1 check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning LP POI MB* for details.
    - *Enable Power Amplifier* check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning LP POI MB* for details.
    - *Rms OUT Pwr DL1* – Detected downlink rms input power.
    - Status of the *<band ID> Current LNA out UL1, <band ID> Rms Pwr OUT Low DL1, <band ID> Rms Pwr OUT High DL1,* and *<band ID> Curr Pwr Amp DL1* alarms.

  - **Attenuations (Path 2)** – Mechanical downlink attenuation (*Mec DL2*), digital downlink attenuation (*Dig DL2*), and digital uplink attenuation (*Dig UL2*) for path 2. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.

  - **Input Stage (Path 2)**

    - *Enable LNA in UL2* check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning LP POI MB* for details.
    - *Rms IN Pwr DL2* – Downlink rms input power reading.
    - *Min Rms IN Pwr DL2* and *Max Rms IN Pwr DL2* – Minimum and maximum rms input power thresholds. Users logged in with the **admins**, **superusers,** or **users** role can set the thresholds.
    - Status of the *<band ID> Current LNA in UL2, <band ID> Rms Pwr IN Min DL2, <band ID> Pwr Limiter DL2,* and *<band ID> Pwr Overdrive DL2* alarms.

- **Output Stage (Path 2)**
  - *Enable LNA out UL*2 check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning LP POI MB* for details.
  - *Enable Power Amplifier* check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning LP POI MB* for details.
  - *Rms OUT Pwr DL2* - Downlink rms input power reading.
  - Status of the *<band ID> Current LNA out UL2, <band ID> Rms Pwr OUT Low DL2, <band ID> Rms Pwr OUT High DL2,* and *<band ID> Curr Pwr Amp DL*2 alarms.
- **Power limiter**

  The power limiter protects the **LP POI MB** from high RF input power.
  - *Power Limiter Mode* – Users logged in with the **admins**, **superusers,** or **users** role can select the power limiter mode.

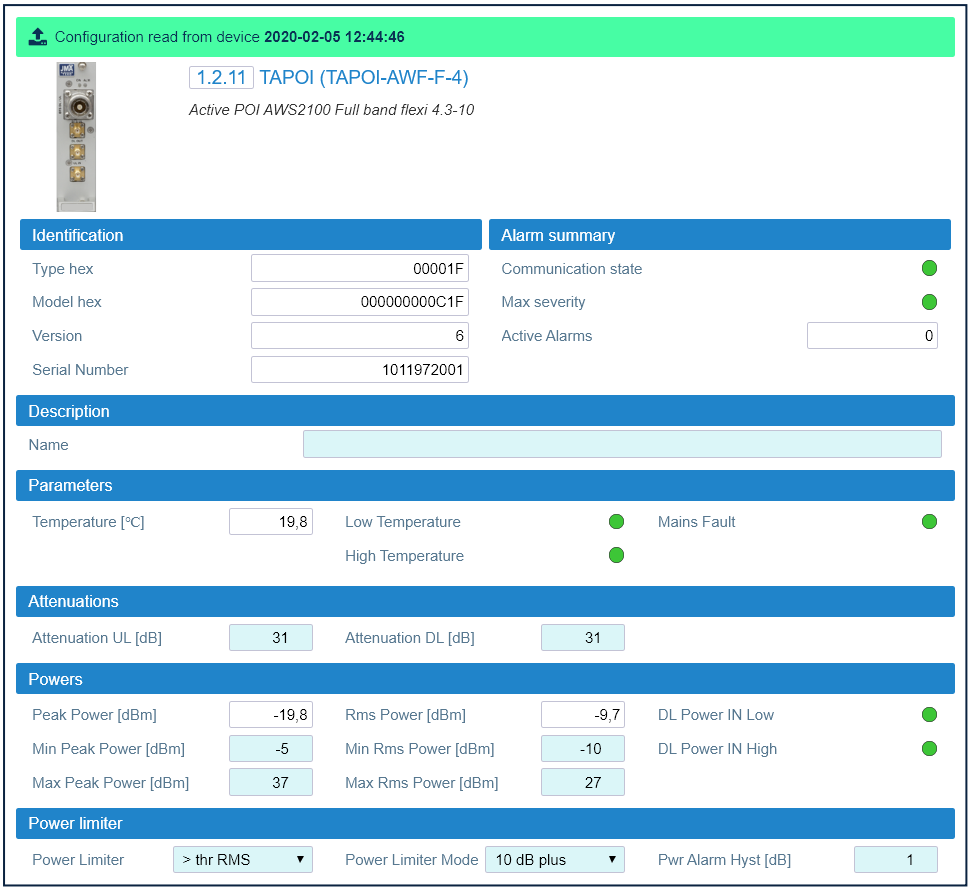
    The following options are available in the **Pwr Limiter Mode** drop-down list:
    - *RF OFF*. If the Power Limiter Mode is set to *RF OFF*, when the rms downlink input power exceeds the user-set maximum input signal threshold (*Max Rms IN Pwr DL*) for the path (1 or 2), the *Pwr Limiter DL* (1 or 2) alarm is triggered and the path is switched off, until the alarm condition ceases (auto power-on).
    - *10dB plus*. If the Power Limiter Mode is set to *10dB plus*:
      - When the rms downlink input power exceeds the user-set maximum input signal threshold (*Max Rms IN Pwr DL*) for the path (1 or 2), the Pwr Limiter DL (1 or 2) alarm is triggered and the path input power is reduced by 10dB, until the alarm condition ceases.
      - When the rms downlink input power (path 1 or 2) exceeds either the user-defined maximum input signal threshold (*Max Rms Power DL*) +10dB, or the allowed Absolute Maximum Input Power, the path (1 or 2) is switched off by the overdrive protection and the *Pwr Overdrive DL* (1 or 2) alarm is triggered.

        Note: The overdrive alarm needs to be cleared: when the alarm ceases, click the **Clear Overdrive** button to reset the path. The path is restored @ max attenuations (*Mec DL* and *Dig DL*) and the re-commissioning of the path is required.

  If the detected input power exceeds the maximum input power threshold set for the path, the power limiter alarm is triggered. The alarm is cleared when:
  Rms IN Pwr DL = Max Rms IN Pwr DL - Pwr Alarm Hyst.

  Note: The *Power Limiter Mode* is set for each band, the *Power Alarm Hysteresis* is set as a global configuration option. See Pwr Alarm Hyst on page 95.

TAPOI Panel



The **TAPOI** panel includes the following information about the selected Active Point of Interface:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – TAPOI *Name*.

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the TAPOI. See "Assigning Names to the DAS Components" on page 44.

- **Parameters**
  - Detected *Temperature*.
  - Status of the *Mains Fault*, *Low Temperature*, and *High Temperature* alarms.
- **Attenuations –** Downlink and Uplink attenuations. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.

  Note: Refer to the following table for the relationship between the maximum input power and the minimum downlink attenuation to be set for the module.

Maximum input power	Minimum attenuation setting (DL Att)
26dBm	1dB
27dBm	2dB
28dBm	3dB
29dBm	4dB
30dBm	5dB
31dBm	6dB
32dBm	7dB
33dBm	8dB

- **Powers**
  - Detected *Peak power* and *Rms power*.
  - *Min Peak Power* and *Min Rms Power*: minimum power thresholds for Peak and Rms detectors.
  - *Max Peak Power* and *Max Rms Power*: maximum input power thresholds for Peak and rms detectors. Users logged in with the **admins**, **superusers,** or **users** role can set the thresholds.
- **Power limiter**

  The power limiter protects the module from high RF input power.
  - *Power Limiter* – Power limiter threshold. Users logged in with the **admins**, **superusers,** or **users** role can select the Power limiter threshold. The following options are available: peak (*>thr Peak*), rms (*>thr RMS rms*) or both (*>thr Peak/>thr RMS rms*).
  - *Power Limiter Mode* – Users logged in with the **admins**, **superusers,** or **users** role can select the power limiter mode.

    The following options are available in the **Pwr Limiter mode** drop-down list:
    - *Disabled*: The power limiter is disabled.
    - *10dB isolated*: When the Power Limiter Mode is set to *10dB isolated* and the downlink input signal exceeds the user-set maximum input signal threshold (*Max Peak Power* or *Max Rms Power*, depending on the threshold set in the Power Limiter drop-down list), the module enters auto power-off.
    - *10dB plus*: When the Power Limiter Mode is set to *10dB plus* and the downlink input signal exceeds the user-set maximum input signal threshold, the signal is 10dB attenuated.

- *Pwr Alarm Hyst* – The Power Alarm Hysteresis can be set to avoid repeated power alarm reports.

  If the input power exceeds the maximum input power threshold set for the path, the power limiter alarm is triggered. The alarm is cleared when:
  Rms IN Pwr DL = DL Rms Pwr = DL RMS max - Pwr Alarm Hyst.

TCPRIPOI Panel

Configuration read from device **2020-02-05 12:49:10**

1.2.8 TCPRIPOI (TCPRIPOI-AWE-M)

CPRI Point Of Interface, Band 4+10+66 AWS2100 Extended, MIMO

Identification		Alarm summary	
Type hex	00003E	Communication state	
Model hex	000000000026	Max severity	
Version	6	Active Alarms	1
Serial Number	1005178018		

Description	
Name	
Name System	System-Name

Powers before attenuations			
Rms Pwr DL Ch1[dBm]	-28,6	Rms Pwr DL Ch2[dBm]	-27,1
Ch1 Pwr Out DL Low		Ch2 Pwr Out DL Low	
Ch1 Pwr Out DL High		Ch2 Pwr Out DL High	
Ch1 ALC On UL		Ch2 ALC On UL	
Ch1 ALC On DL		Ch2 ALC On DL	

Attenuations			
Att UL Ch1 [dB]	20	Att DL Ch1 [dB]	25
Att UL Ch2 [dB]	25	Att DL Ch2 [dB]	25

PreAmp			
PreAmp UL Ch1	☑	PreAmp UL Ch2	☐

Parameters					
Temperature [°C]	30,8	Low Temperature		Cur 28V [mA]	1264
Lock Synt UL		High Temperature		Mains Fault	

Currents			
Cur 28V 1 Ch1 [mA]	64	Cur 28V 1 Ch2 [mA]	62
Cur 28V 2 Ch1 [mA]	42	Cur 28V 2 Ch2 [mA]	43

CPRI Description			
Mapped carrier number	0	CPRI Hw Revision	357 - 1
		CPRI Sw Version	2

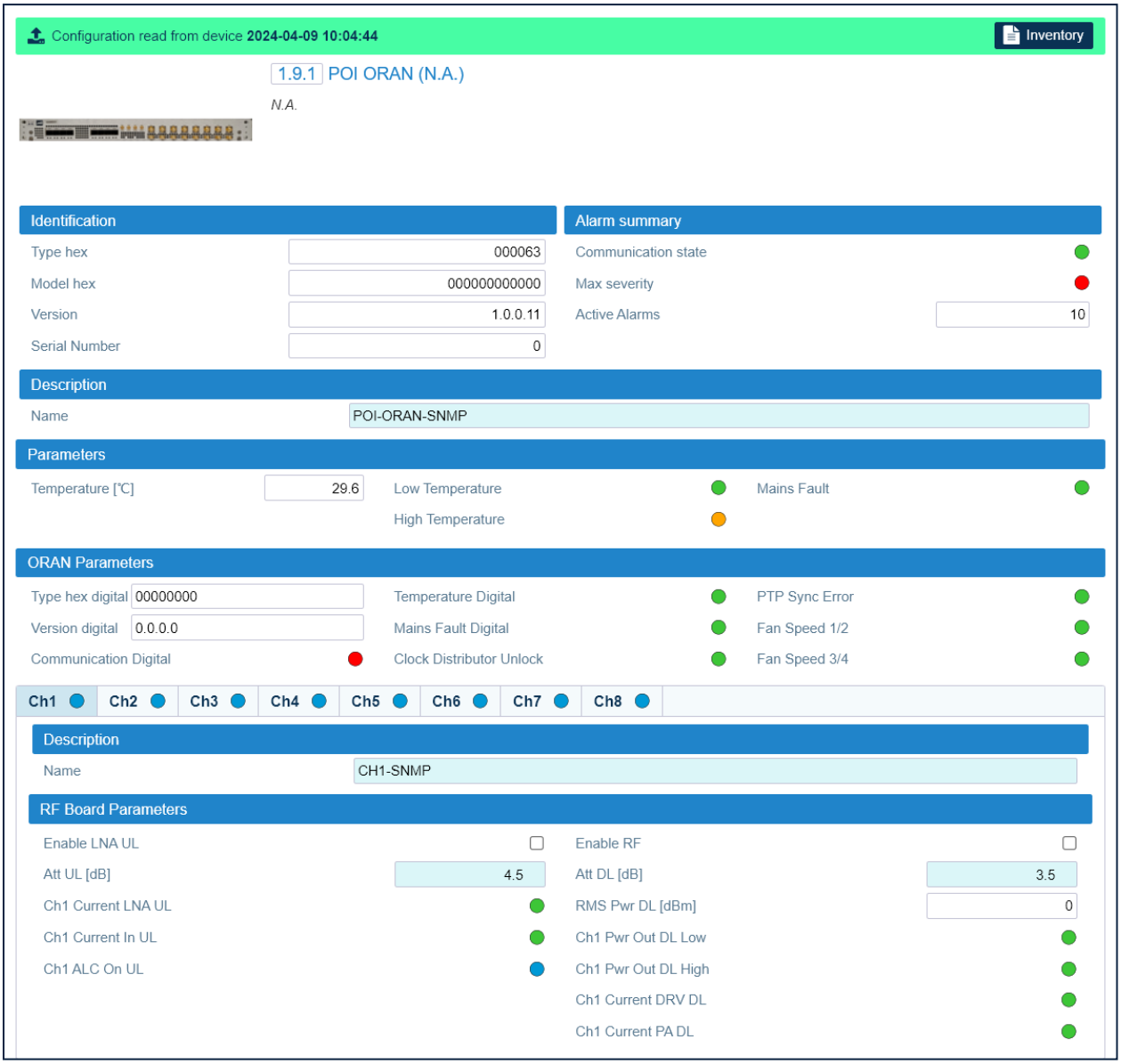
CPRI Papr DL			
Papr DL Ch1 [dB]	9,2	Papr DL Ch2 [dB]	9,2

CPRI alarms			
Communication CPRI		Ch2 ADC OverflowCPRI	
Ch1 ADC OverflowCPRI		Ch2 DAC Protect CPRI	
Ch1 DAC Protect CPRI		Mains Fault CPRI	
ClkDistrUnlockCPRI		Lock Synt DL CPRI	
Temperature CPRI			

The **TCPRIPOI** panel includes the following information about the selected CPRI Point of Interface:

- **Identification**
  - Type hex (RF board type, hexadecimal notation)
  - Model hex (RF board model, hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description**
  - *Name* – DAS-side name assigned to the TCPRIPOI. Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the TCPRIPOI. See "Assigning Names to the DAS Components" on page 44.
  - *Name System* – Name of the system (DAS) the TCPRIPOI belongs to.
- **Powers before attenuations**
- **Attenuations**
- **PreAmp**
- **Parameters**
  - Detected *Temperature* and current *(Curr 28V).*
  - Status of the *Low Temperature, High Temperature, Mains Fault, Lock Synt UL* alarms.
- Currents
  - Detected currents *(Curr 28V).*
- **CPRI Description:**
  - Mapped carrier number: number of carriers assigned to the TCPRIPOI.
  - *CPRI Hw Revision* and *CPRI Sw Version*.
- **CPRI Papr DL**
- **CPRI alarms**

POI ORAN Panel



The **POI ORAN** panel includes the following information about the selected next generation O-RAN Point of Interface:

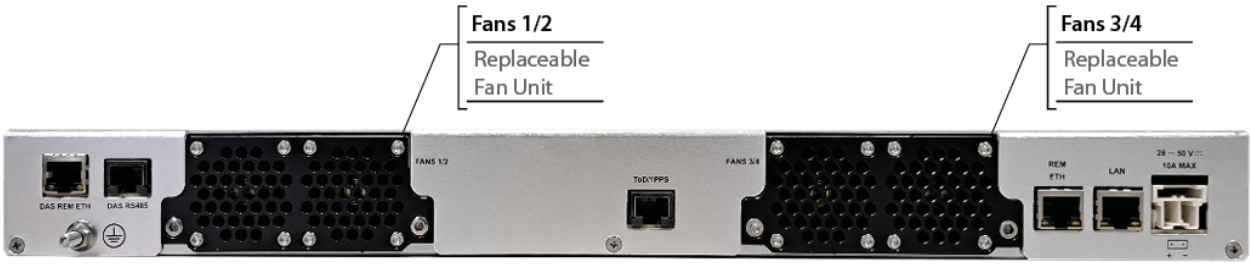
- **Identification**
  - Type hex (RF board type, hexadecimal notation)
  - Model hex (RF board model, hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms

- **Description** – **POI ORAN** *Name*.

  DAS-side name assigned to the POI ORAN. Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the POI ORAN. See "Assigning Names to the DAS Components" on page 44.

- **Parameters**
  - Detected *Temperature*.
  - Status of the *Mains Fault*, *Low Temperature*, and *High Temperature* alarms.
- **ORAN Parameters**
  - *Type hex digital* – Type assigned to the digital board, hexadecimal notation.
  - *Version digital* – Version of the digital board.
  - Status of the following alarms: *Communication Digital*, *Temperature Digital*, *Mains Fault Digital, Clock Distributor Unlock, PTP Sync Error, Fan Speed 1/2, Fan Speed 3/4.*

  Note: The O-RAN Point of Interface is equipped with two replaceable fan units, which are labeled as *Fans 1/2* and *Fans 3/4* on the equipment rear panel:



  The *Fan Speed 1/2* alarm on the **POI ORAN** panel refers to the fan unit identified as *Fans 1/2* on the equipment rear panel.

  The *Fan Speed 3/4* alarm on the **POI ORAN** panel refers to the fan unit identified as *Fans 3/4* on the equipment rear panel.

- **Channel tabs (Ch1 to Ch8)**

  Select a channel tab to display the following information about the selected channel:

  - **Description** – Channel Name.

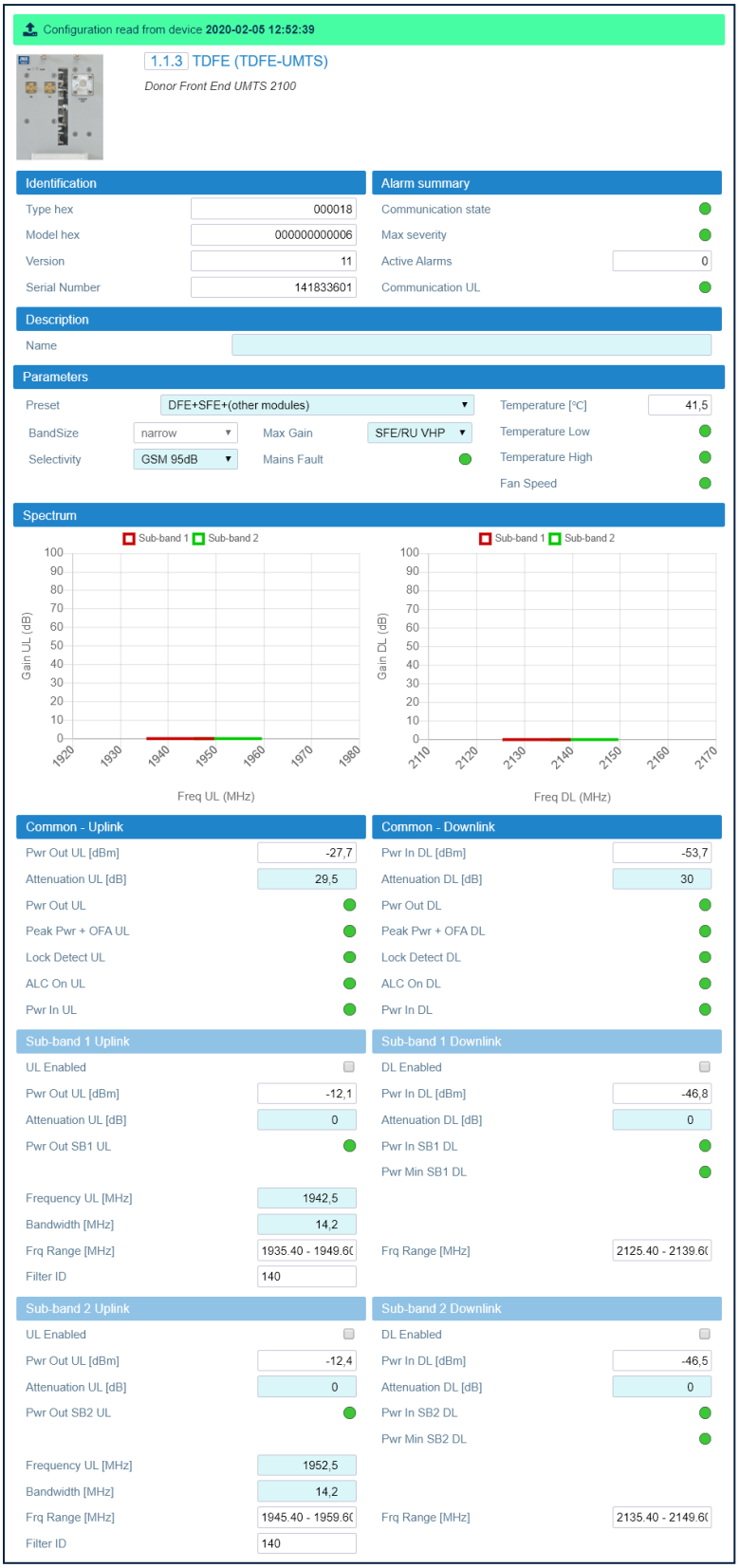
    Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the channel. See "Assigning Names to the DAS Components" on page 44.

  - **RF Board Parameters**
    - *Enable LNA UL* – Enable Uplink Low Noise Amplifier (LNA) check box. In the *JMA DAS Platform Local Commissioning User Guide*, refer to *Commissioning POI ORAN* for details.
    - *Enable RF* – RF enable check box
    - *Att UL* – Uplink attenuation.
    - *Att DL* – Downlink attenuation.

      Note: Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.

- RMS Pwr DL – Detected Downlink rms power.
- Status of the *Current LNA UL*, *Current In UL*, *ALC On UL*, *Pwr Out DL Low*, *Pwr Out DL High*, *Current DRV DL*, *Current PA DL* alarms.

TDFE Panel


Configuration read from device 2020-02-05 12:52:39
1.1.3 TDFE (TDFE-UMTS)
Donor Front End UMTS 2100
Identification
Type hex 000018
Model hex 000000000006
Version 11
Serial Number 141833601
Alarm summary
Communication state
Max severity
Active Alarms 0
Communication UL
Description
Name
Parameters
Preset DFE+SFE+(other modules)
BandSize narrow
Selectivity GSM 95dB
Max Gain SFE/RU VHP
Mains Fault
Temperature [°C] 41,5
Temperature Low
Temperature High
Fan Speed
Spectrum
Sub-band 1 Sub-band 2
Gain UL (dB)
Freq UL (MHz)
Gain DL (dB)
Freq DL (MHz)
Common - Uplink
Pwr Out UL [dBm] -27,7
Attenuation UL [dB] 29,5
Pwr Out UL
Peak Pwr + OFA UL
Lock Detect UL
ALC On UL
Pwr In UL
Common - Downlink
Pwr In DL [dBm] -53,7
Attenuation DL [dB] 30
Pwr Out DL
Peak Pwr + OFA DL
Lock Detect DL
ALC On DL
Pwr In DL
Sub-band 1 Uplink
UL Enabled
Pwr Out UL [dBm] -12,1
Attenuation UL [dB] 0
Pwr Out SB1 UL
Frequency UL [MHz] 1942,5
Bandwidth [MHz] 14,2
Frq Range [MHz] 1935.40 - 1949.60
Filter ID 140
Sub-band 1 Downlink
DL Enabled
Pwr In DL [dBm] -46,8
Attenuation DL [dB] 0
Pwr In SB1 DL
Pwr Min SB1 DL
Frq Range [MHz] 2125.40 - 2139.60
Sub-band 2 Uplink
UL Enabled
Pwr Out UL [dBm] -12,4
Attenuation UL [dB] 0
Pwr Out SB2 UL
Frequency UL [MHz] 1952,5
Bandwidth [MHz] 14,2
Frq Range [MHz] 1945.40 - 1959.60
Filter ID 140
Sub-band 2 Downlink
DL Enabled
Pwr In DL [dBm] -46,5
Attenuation DL [dB] 0
Pwr In SB2 DL
Pwr Min SB2 DL
Frq Range [MHz] 2135.40 - 2149.60

The **TDFE** panel includes the following information about the selected Digital Donor Front End:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
  - Status of the *Communication UL* alarm
- **Description –** TDFE *Name*.

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name to the TDFE. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - *Temperature* **–** Detected temperature.
  - Status of the *Mains Fault, Temperature Low, Temperature High,* and *Fan Speed* alarms.
  - *Preset* **–** List of presets for automatic gain setting. Users logged in with the **admins**, **superusers,** or **users** role can select the system hardware configuration to apply the corresponding automatic gain setting.
  - *Band size* **–** Wide (1 sub-band) or narrow (2 sub-bands),
  - *Max Gain* **–** Users logged in with the **admins**, **superusers,** or **users** role can select the SFE/RU output power to display the proper downlink diagram in the *Spectrum* panel,
  - *Selectivity* **–** The selectivity options allow users logged in with the **admins**, **superusers,** or **users** role to optimize the filter either for low delay (UMTS) or for high selectivity (GSM 95dB).
- **Spectrum –** Uplink and Downlink Frequency/Gain diagrams.
- **Common-Uplink**
  - *Pwr Out UL* **–** Detected Uplink Output Power.
  - *Attenuation UL* **–** Uplink attenuation. Users logged in with the **admins**, **superusers,** or **users** role can set the module uplink attenuation.
  - Status of the *Pwr Out UL, Peak Pwr + OFA UL, Lock Detect UL, ALC On UL, Pwr in UL* alarms.

- **Common-Downlink**
  - *Pwr In DL* **–** Detected downlink input power (measured on the whole band).
  - *Attenuation DL* **–** Downlink attenuation. Users logged in with the **admins**, **superusers,** or **users** role can set the module downlink attenuation.
  - Status of the *Pwr Out DL, Peak Pwr + OFA DL, Lock Detect DL, ALC On DL, Pwr in DL* alarms.
- **Sub-band <number> Uplink –** Main uplink parameters of each sub-band enhanced by the TDFE module.
  - *UL Enabled* check box **–** Users logged in with the **admins**, **superusers,** or **users** role can enable or disable the sub-band Uplink.
  - *Power Out UL* **–** Detected Uplink Output Power inside the filtered channel.
  - *Attenuation UL* **–** Uplink attenuation set for the sub-band. Users logged in with the **admins**, **superusers,** or **users** role can set the sub-band uplink attenuation.
  - Status of the *Pwr Out SB<number> UL* **–** Uplink output power out of range.
  - *Frequency UL* **–** Uplink frequency center.
  - *Bandwidth* **–** Uplink bandwidth.
  - *Frq Range* **–** uplink operating frequency range.
  - *Filter ID* number.
- **Sub-band <number> Downlink –** Main downlink parameters of each sub-band enhanced by the TDFE module.
  - *DL Enabled* check box **–** Users logged in with the **admins**, **superusers,** or **users** role can enable/disable the sub-band Downlink.
  - *Power In DL* **–** Downlink Input Power inside the filtered channel.
  - *Attenuation DL* **–** Downlink attenuation set for the sub-band. Users logged in with the **admins**, **superusers,** or **users** role can set the sub-band downlink attenuation.
  - Status of the sub-band *Pwr In SB<number> DL* (downlink input power out of range) and *Pwr Min SB<number> DL* (downlink input power too low) alarms.
  - *Frq range* **–** Sub-band downlink operating frequency range.

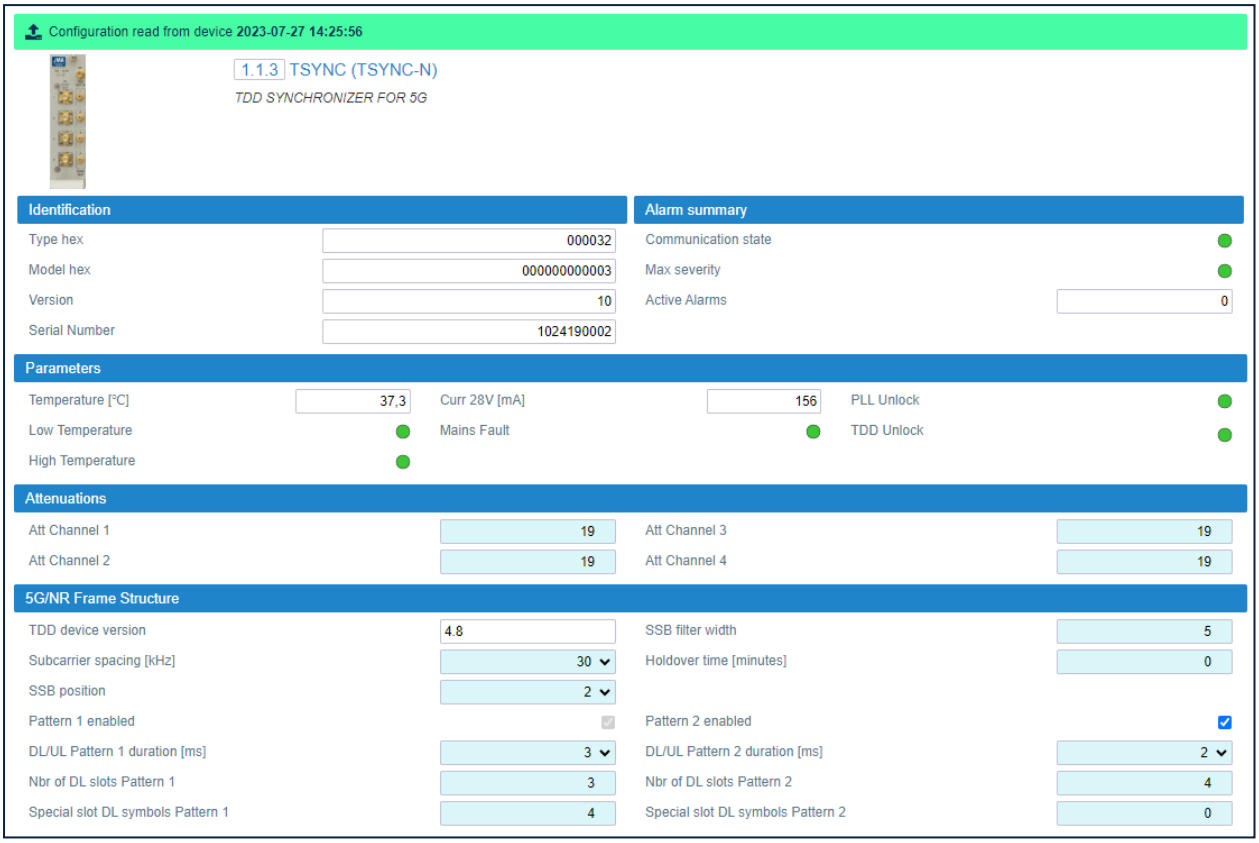
TSYNC Panel

The **TSYNC** panel includes the following information about the TDD sync module used in 4G Systems:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms

- **Parameters**
  - Detected *Temperature* and current *(Curr 28V).*
  - Status of the *Low Temperature, High Temperature, Mains Fault, PLL Unlock, TDD Comm, TDD Unlock* alarms.
- **Attenuations –** Attenuation set for each channel (factory-set attenuation=19dB). Users logged in with the **admins**, **superusers,** or **users** role can adjust each port attenuation to compensate for the TDD reference output signal path losses.
- **Inner Board**
  - *Configuration* **–** Users logged in with the **admins**, **superusers,** or **users** role can select the TDD downlink-uplink configuration (0-6), which defines subframes distribution between uplink and downlink and the switch-point periodicity.
  - *Special Frame* – Users logged in with the **admins**, **superusers,** or **users** role can select the subframe configuration (0-8), which defines the length of the Guard period, Downlink Pilot Time Slot, and Uplink Pilot Time Slot.

TSYNC-N Panel



The **TSYNC-N** panel includes the following information about the TDD sync module used in 5G Systems:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Parameters**
  - Detected *Temperature* and current *(Curr 28V).*
  - Status of the *Low Temperature, High Temperature, Mains Fault, PLL Unlock, TDD Unlock* alarms.
- **Attenuations –** Attenuation set for each channel (factory-set attenuation=26dB). Users logged in with the **admins**, **superusers,** or **users** role can adjust each port attenuation to compensate for the TDD reference output signal path losses.

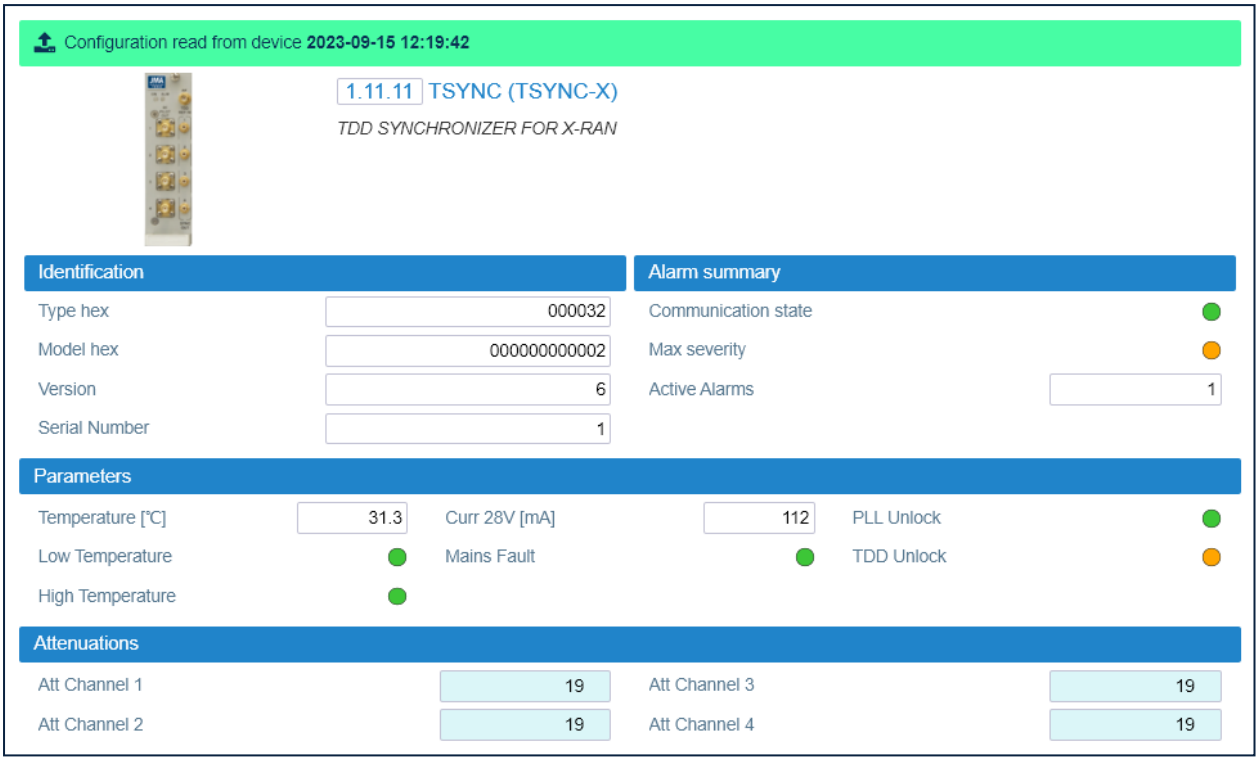
- **5G/NR Frame Structure**

  Users logged in with the **admins**, **superusers,** or **users** role can configure the TDD sync module frame structure.

  Note: The proper setting of the TDD sync module frame structure is crucial to optimal DAS performance in TDD networks.

  - *TDD device version*.
  - *Subcarrier spacing [kHz]* **–** 15kHz, 30kHz, or 60kHz.
  - **SSB Position –** Position in time of the SSB (Synchronization Signal Block) Carrier. Only one SSB Position per Pattern1+Pattern2 is supported.
  - **Pattern 1 –** Synchronization pattern enabled by default.
  - **Pattern 2 –** Additional synchronization pattern (Pattern 2).
  - **DL/UL Pattern 1 duration[ms]**, **DL/UL Pattern 2 duration [ms]**.
  - **Nbr of DL slots Pattern 1**, **Nbr of DL slots Pattern 2 –**Number of downlink slots per pattern
    Note: Each slot is made of 14 symbols in the time domain.
  - **Special slot DL symbols Pattern 1**, **Special slot DL symbols Pattern 2 –** Number of DL symbols defined in the Special Slot Format. Refer to ETSI TS 38.213 Release 15, Table 11.1.1-1 for details.
  - **Holdover time [minutes] –** Time for which the TSYNC-N module will remain in a sync status even if the signal from the BS is absent.
    Note: At least 10 minutes of past lock are required.
  - **SSB filter width –** The Standard 3GPP indicates that the SSB (Synchronization Signal Block) spans across four OFDM symbols in the time domain (default SSB filter width=4). If the CSI-RS (Channel State Information Reference Signal) period and position are the same as the SSB, by using a Spectrum Analyzer in the time domain, you will see a CSI-RS symbol close to the SSB, which is interpreted as the fifth symbol. So, for SSB period and CSI-RS period equal to 20ms, you must set the SSB filter width to 5. If you see more symbols close to the SSB, you must set higher values.

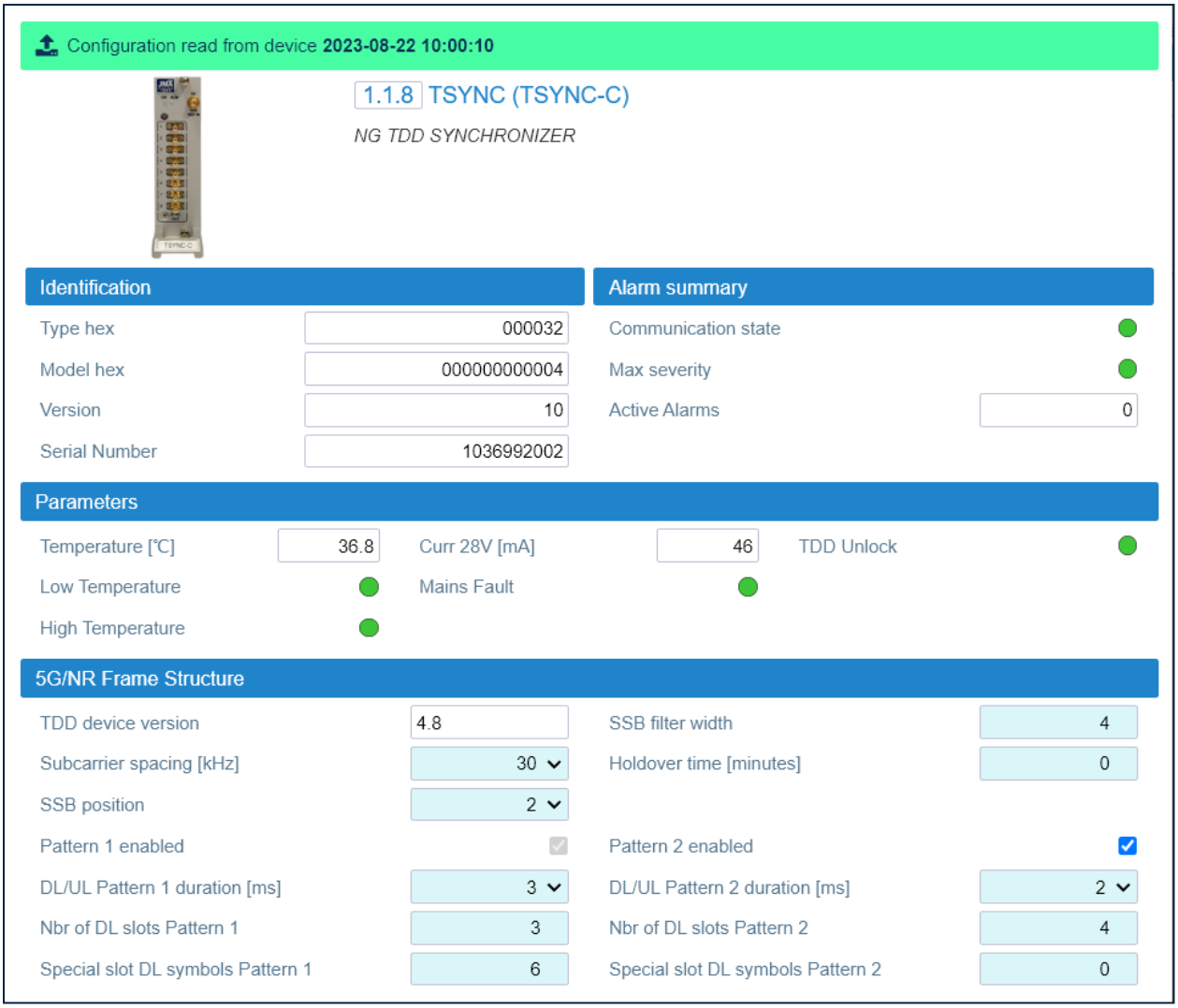
TSYNC-X Panel



The **TSYNC-X** panel includes the following information about the TDD sync module that is used when the DAS is connected to the JMA XRAN System:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Parameters**
  - Detected *Temperature* and current *(Curr 28V).*
  - Status of the *Low Temperature, High Temperature, Mains Fault, PLL Unlock, TDD Unlock* alarms.
- **Attenuations –** Attenuation set for each channel (factory-set attenuation=19dB). Users logged in with the **admins**, **superusers,** or **users** role can adjust each port attenuation to compensate for the TDD reference output signal path losses.

TSYNC-C Panel



The **TSYNC-C** panel includes the following information about the next generation TDD sync module:

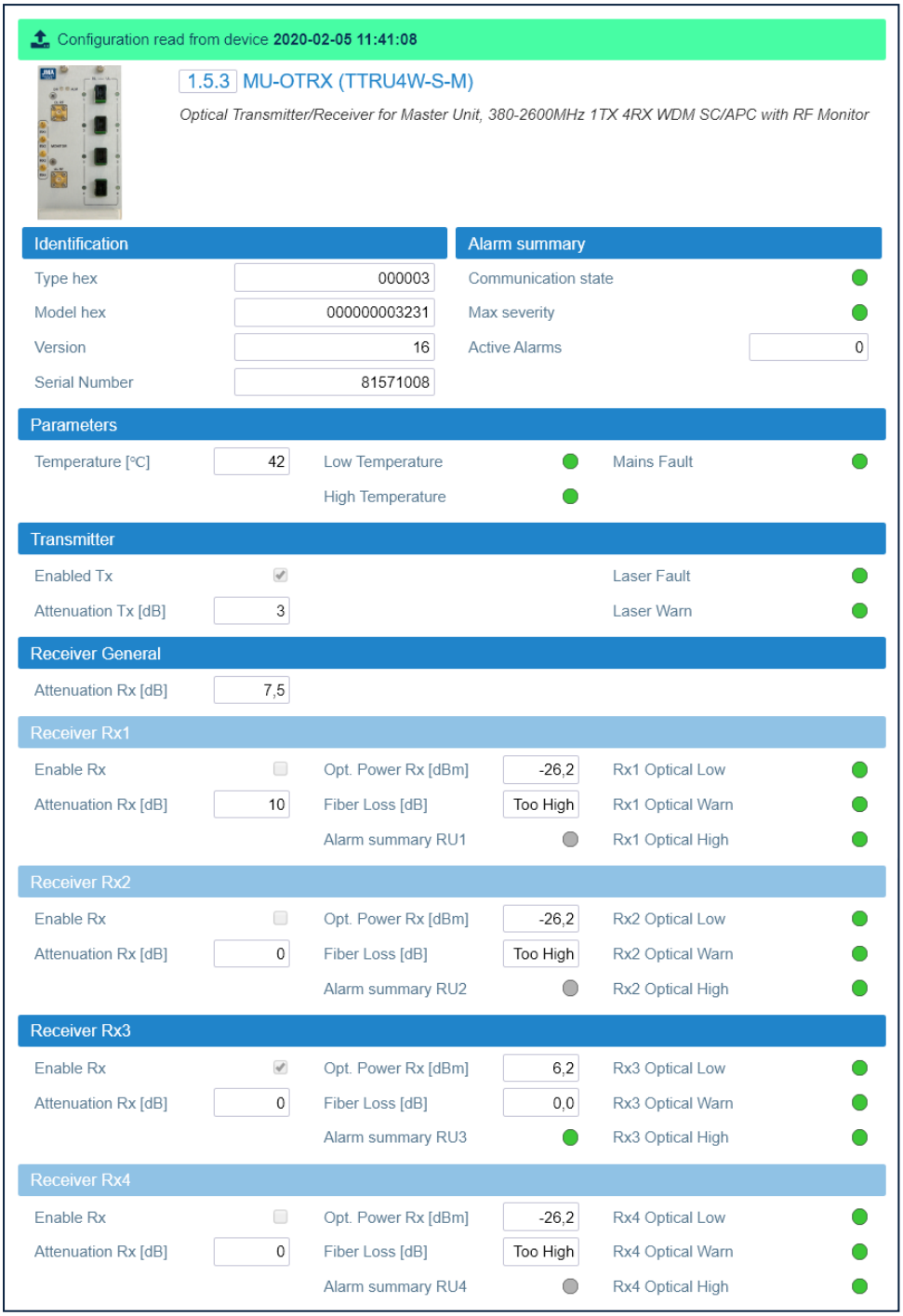
- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms

- **Parameters**
  - Detected *Temperature* and current *(Curr 28V).*
  - Status of the *Low Temperature, High Temperature, Mains Fault, TDD Unlock* alarms.
- **5G/NR Frame Structure**

  Users logged in with the **admins**, **superusers,** or **users** role can configure the TDD sync module frame structure.

  Note: The proper setting of the TDD sync module frame structure is crucial to optimal DAS performance in TDD networks.
  - *TDD device version*.
  - *Subcarrier spacing [kHz]* **–** 15kHz, 30kHz, or 60kHz.
  - **SSB Position –** Position in time of the SSB (Synchronization Signal Block) Carrier. Only one SSB Position per Pattern1+Pattern2 is supported.
  - **Pattern 1 –** Synchronization pattern enabled by default.
  - **Pattern 2 –** Additional synchronization pattern (Pattern 2).
  - **DL/UL Pattern 1 duration [ms]**, **DL/UL Pattern 2 duration [ms]**.
  - **Nbr of DL slots Pattern 1**, **Nbr of DL slots Pattern 2 –** Number of downlink slots per pattern
    Note: Each slot is made of 14 symbols in the time domain.
  - **Special slot DL symbols Pattern 1**, **Special slot DL symbols Pattern 2 –** Number of DL symbols defined in the Special Slot Format. Refer to ETSI TS 38.213 Release 15, Table 11.1.1-1 for details.
  - **Holdover time [minutes] –** Time for which the TSYNC-C module will remain in a sync status even if the signal from the BS is absent.
    Note: At least 10 minutes of past lock are required.
  - **SSB filter width –** The Standard 3GPP indicates that the SSB (Synchronization Signal Block) spans across four OFDM symbols in the time domain (default SSB filter width=4). If the CSI-RS (Channel State Information Reference Signal) period and position are the same as the SSB, by using a Spectrum Analyzer in the time domain, you will see a CSI-RS symbol close to the SSB, which is interpreted as the fifth symbol. So, for SSB period and CSI-RS period equal to 20ms, you must set the SSB filter width to 5. If you see more symbols close to the SSB, you must set higher values.

MU-OTRX Panel



The **MU-OTRX** panel includes the following information about the selected plug-in optical module:

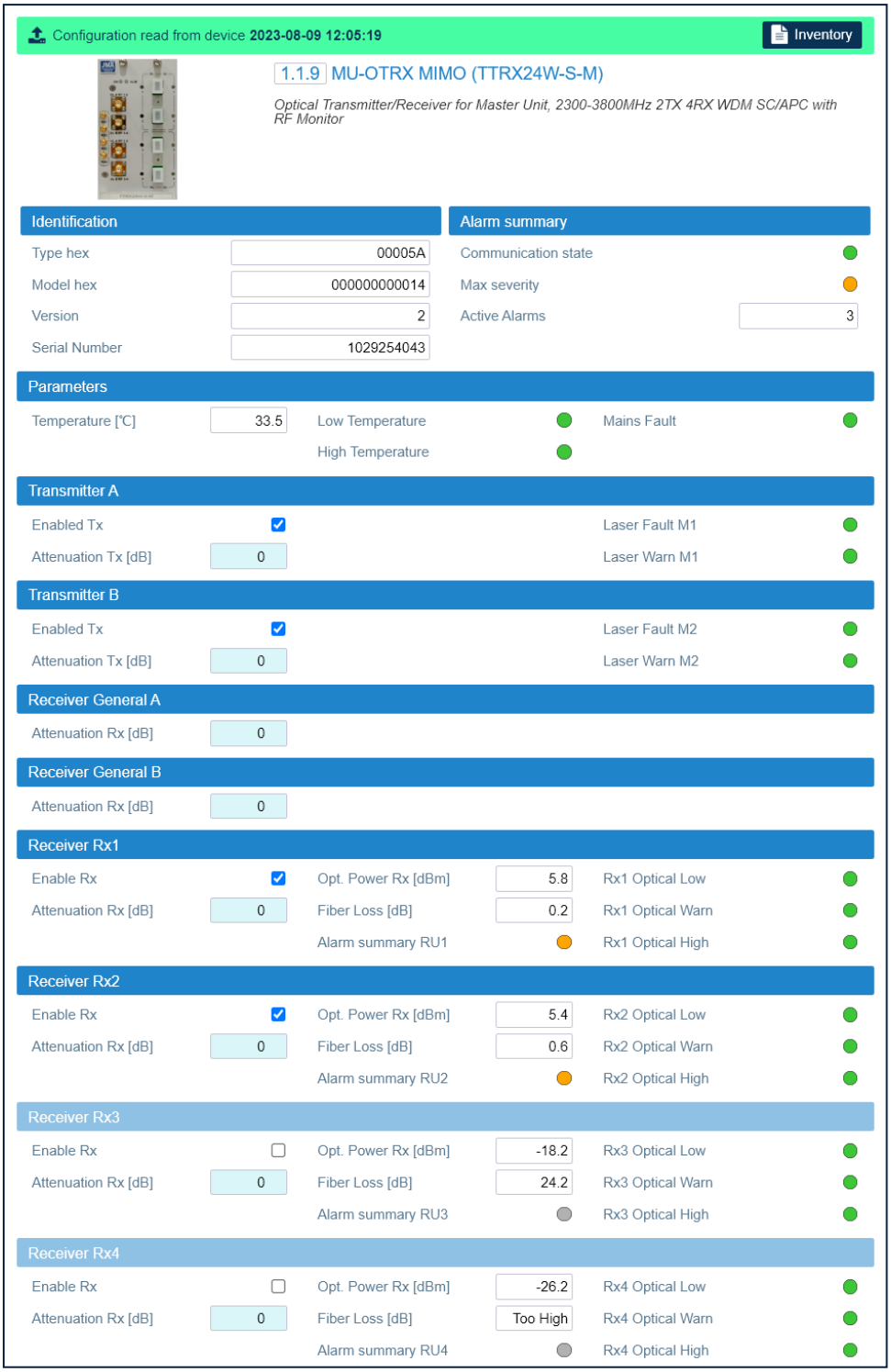
- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Parameters**
  - Detected *Temperature*.
  - Status of the *Low Temperature, High Temperature,* and *Mains Fault* alarms.
- **Transmitter**
  - *Enabled TX* – Optical transmitter enable check box.
  - *Attenuation Tx [dB]* – Optical transmitter attenuation.
  - Status of the *Laser Fault* and *Laser Warn* alarms.
- **Receiver General**
  - *Attenuation Rx [dB]* – Common receiver attenuation.
- **Receiver Rx 1**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX1 Optical Low, RX1 Optical Warn,* and *RX1 Optical High* alarms.
  - *Alarm summary RU1* – Maximum severity of the alarms active for the remote unit connected to the receiver 1.
- **Receiver Rx 2**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX2 Optical Low, RX2 Optical Warn, and RX2 Optical High* alarms.
  - *Alarm summary RU2* – Maximum severity of the alarms active for the remote unit connected to the receiver 2.
- **Receiver Rx 3**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX3 Optical Low, RX3 Optical Warn,* and *RX3 Optical High* alarms.

- *Alarm summary RU3* – Maximum severity of the alarms active for the remote unit connected to the receiver 3.

- **Receiver Rx 4**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX4 Optical Low, RX4 Optical Warn,* and *RX4 Optical High* alarms.
  - *Alarm summary RU4* – Maximum severity of the alarms active for the remote unit connected to the receiver 4.

MU-OTRX MIMO Panel



The **MU-OTRX MIMO** panel includes the following information about the selected plug-in MIMO optical module:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)

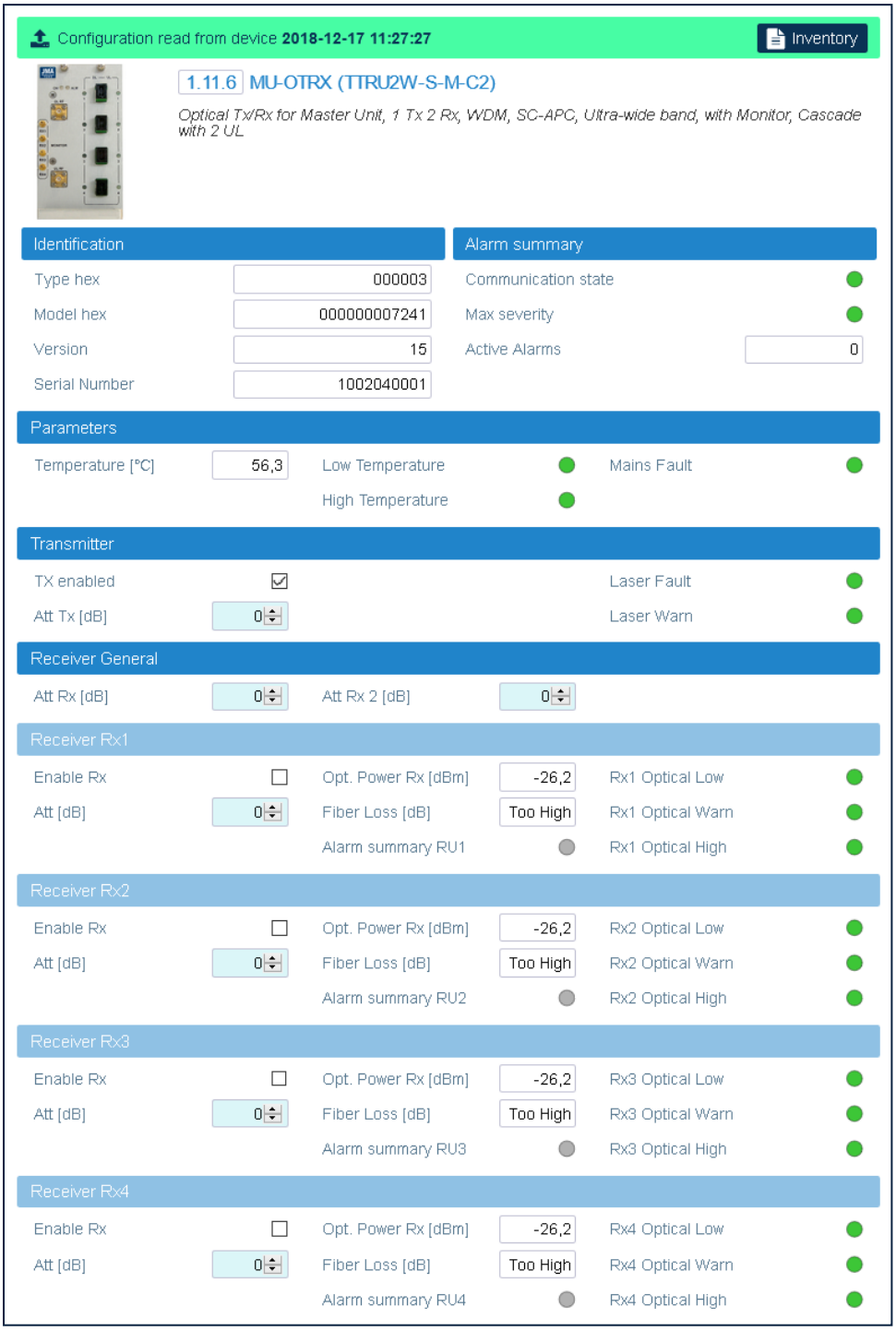
- Version
- Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Parameters**
  - Detected *Temperature*.
  - Status of the *Low Temperature, High Temperature,* and *Mains Fault* alarms.
- **Transmitter A**
  - *Enabled TX* – Optical transmitter enable check box.
  - *Attenuation Tx [dB]* – Optical transmitter attenuation.
  - Status of the *Laser Fault M1* and *Laser Warn M1* alarms.
- **Transmitter B**
  - *Enabled TX* – Optical transmitter enable check box.
  - *Attenuation Tx [dB]* – Optical transmitter attenuation.
  - Status of the *Laser Fault M2* and *Laser Warn M2* alarms.
- **Receiver General A**
  - *Attenuation Rx [dB]* – Common receiver attenuation.
- **Receiver General B**
  - *Attenuation Rx [dB]* – Common receiver attenuation.
- **Receiver Rx 1**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX1 Optical Low, RX1 Optical Warn,* and *RX1 Optical High* alarms.
  - *Alarm summary RU1* – Maximum severity of the alarms active for the remote unit connected to the receiver 1.
- **Receiver Rx 2**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX2 Optical Low, RX2 Optical Warn, and RX2 Optical High* alarms.

- *Alarm summary RU2* – Maximum severity of the alarms active for the remote unit connected to the receiver 2.

- **Receiver Rx 3**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX3 Optical Low, RX3 Optical Warn,* and *RX3 Optical High* alarms.
  - *Alarm summary RU3* – Maximum severity of the alarms active for the remote unit connected to the receiver 3.
- **Receiver Rx 4**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX4 Optical Low, RX4 Optical Warn,* and *RX4 Optical High* alarms.
  - *Alarm summary RU4* – Maximum severity of the alarms active for the remote unit connected to the receiver 4.

MU-OTRX (TTRU2W-S-M-C2) Panel



The **MU-OTRX (TTRU2W-S-M-C2)** panel includes the following information about the selected plug-in optical module for DAS designs delivering seven or nine bands on a single fiber:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)

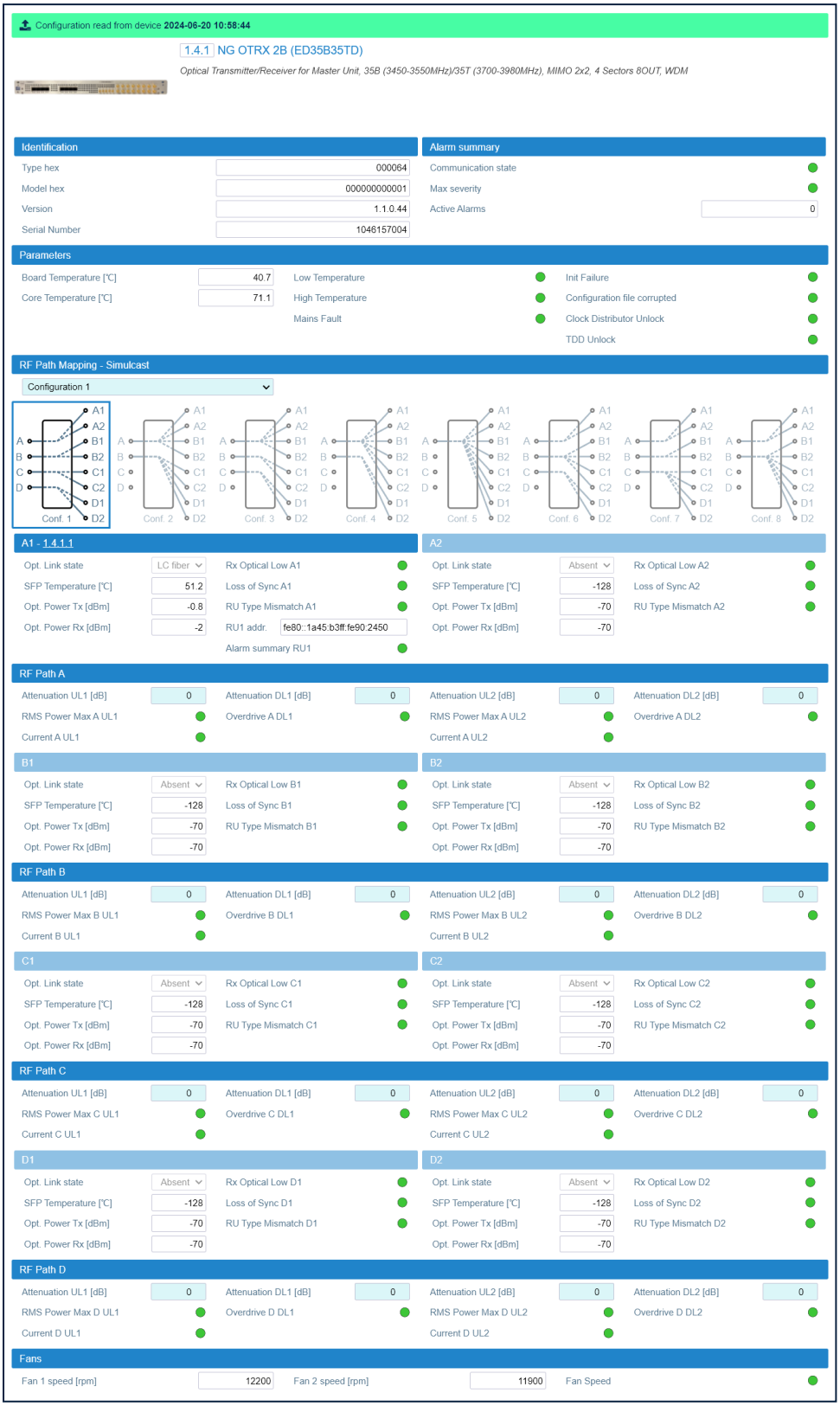
- Version
- Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Parameters**
  - Detected *Temperature*.
  - Status of the *Low Temperature, High Temperature,* and *Mains Fault* alarms.
- **Transmitter**
  - *Enabled TX* – Optical transmitter enable check box.
  - *Attenuation Tx [dB]* – Optical transmitter attenuation.
  - Status of the *Laser Fault* and *Laser Warn* alarms.
- **Receiver General**
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Attenuation Rx 2 [dB]* – Receiver 2 attenuation.
- **Receiver Rx 1**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX1 Optical Low, RX1 Optical Warn,* and *RX1 Optical High* alarms.
  - *Alarm summary RU1* – Maximum severity of the alarms active for the remote unit connected to the receiver 1.
- **Receiver Rx 2**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - Status of the *RX2 Optical Low, RX2 Optical Warn, and RX2 Optical High* alarms.
  - *Alarm summary RU2* – Maximum severity of the alarms active for the remote unit connected to the receiver 2.
- **Receiver Rx 3**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.

- *Opt. power Rx [dBm]* – Received optical power.
- *Fiber Loss [dB].*
- Status of the *RX3 Optical Low, RX3 Optical Warn,* and *RX3 Optical High* alarms.
- *Alarm summary RU3* – Maximum severity of the alarms active for the remote unit connected to the receiver 3.

- **Receiver Rx 4**
  - *Enable Rx* check box – Optical receiver enable/disable check box.
  - *Attenuation Rx [dB]* – Receiver attenuation.
  - *Opt. power Rx [dBm]* – Received optical power.
  - *Fiber Loss [dB].*
  - *Alarm summary RU4* – Maximum severity of the alarms active for the remote unit connected to the receiver 4.

NG OTRX Panel



The **NG OTRX** panel includes the following information about the **next generation** MIMO 2x2 optical transceiver:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Parameters**
  - Detected *Board Temperature*.
  - Detected *Core Temperature*.
  - Status of the *Low Temperature, High Temperature, Mains Fault, TDD Unlock, Clock Distributor Unlock, Configuration file corrupted* (dual band models only), and *Init Failure* alarms.
- **RF Path Mapping - Simulcast**
  - *Configuration* drop-down list – Selected simulcast configuration. Users logged in with the **admins**, **superusers,** or **users** role can select how the RF signal from different MIMO 2x2 cells is distributed to the remote units connected to the NG OTRX optical ports (A1, A2, B1, B2, C1, C2, D1, D2). Eight different simulcast configurations are available. *Configuration 1* is the default factory configuration. See "Selecting the NG OTRX Simulcast Configuration" on page 45.
  - *Conf<number>* diagrams – The diagrams describe how the different simulcast configurations distribute the RF signal to the connected remote units. When you select a configuration from the drop-down list, the diagram that corresponds to the selected configuration is highlighted.
- ***<optical port label> - <position of the connected remote unit in the system (link to the remote unit panel)>***

  Note: When the port is connected to a remote unit, the address of the connected remote unit is displayed in the title of the pane, next to the optical port label. Click the address to open the connected remote unit panel.

  The **NG OTRX** optical ports are labeled and numbered as follows:
  - **A1** (port number 1), **A2** (port number 2)
  - **B1** (port number 3), **B2** (port number 4)

- **C1** (port number 5), **C2** (port number 6)
- **D1** (port number 7), **D2** (port number 8).

For each port the following information is provided:

- *Opt. Link state*:
  - *absent* – no fiber is connected to the optical port.
  - *LC fiber* – LC fiber connected to the optical port.
- *SFP Temperature*
- *Opt. Power Tx* – Transmitted optical power.
- *Opt. Power Rx* – Received optical power.
- Status of the *Rx Optical Low, Loss of Sync,* and *RU Type Mismatch* alarms.
- *RU<port number> addr.* – IPv6 Address of the connected remote unit.
- *Alarm summary RU<port number>* – Maximum severity of the alarms active for the remote unit connected to the optical port.

- **RF Path A, RF Path B, RF Path C, RF Path D**

  The **NG OTRX** RF paths are identified as A, B, C, D. For each RF path the following information is provided:

  - *Attenuation UL1 [dB], Attenuation DL1 [dB]* – Attenuations for the RF Path, MIMO1 layer.
  - *Attenuation UL2 [dB], Attenuation DL2 [dB]* – Attenuations for the RF Path, MIMO2 layer.
  - Status of the *RMS Power Max <path> UL1, Overdrive <path> DL1, Current <path> UL1, RMS Power Max <path> UL2, Overdrive <path> DL2, Current <path> UL2* alarms.

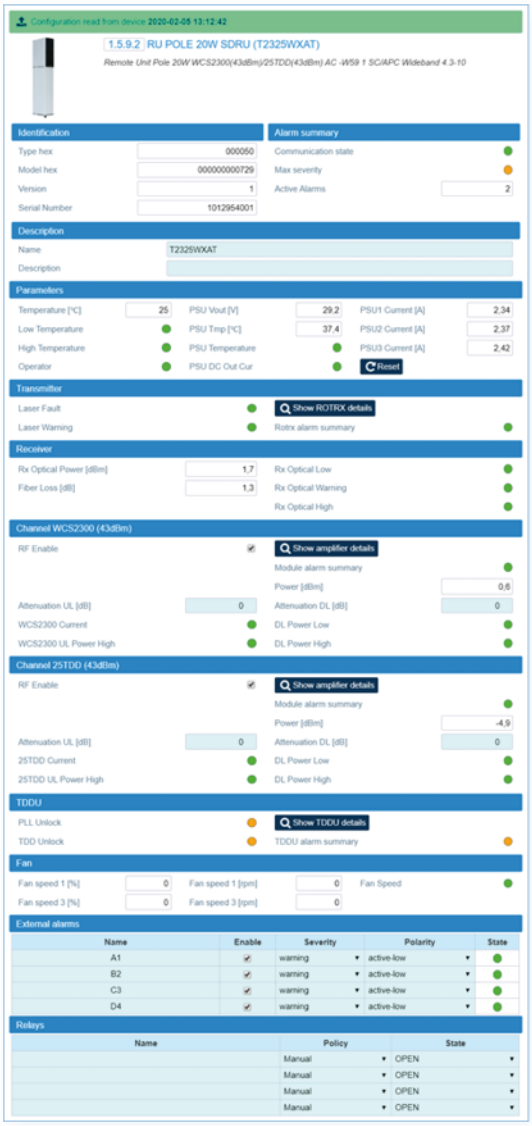
- **Fans**
  - *Fan 1 speed* – Actual rotation speed of fan 1 (rpm, revolutions per minute).
  - *Fan 2 speed* – Actual rotation speed of fan 2 (rpm, revolutions per minute).

    Note: If the fan rotation speed is 4300 rpm, the fan is not spinning.
  - Status of the *Fan Speed* alarm.

RU Panel

A panel is available for each remote unit (RU) equipped in the DAS. The panels vary based on the model of the remote unit.

Note: In the **Physical Tree**, remote units are contained within the connected MU-OTRX.



The **RU** panel includes the following information about the selected remote unit:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state

- Max severity – Maximum severity of active alarms
- Active Alarms – Number of active alarms

- **Description**

  Remote unit *Name* and *Description*.

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.

- **Parameters –** Remote unit operating parameters and alarm status.

  Note: The parameters and alarms displayed vary based on the model of the selected remote unit.

- **Transmitter (SISO remote units)**
  - Transmitter alarm status.
  - **Pole-mount and very-high-power (VHP) remote units**: A button is available to access the details of the optical module (ROTRX) equipped inside the remote unit.
- **Transmitter 1 (MIMO remote units, layer 1)**
  - Transmitter 1 alarm status.
  - **Pole-mount and very-high-power (VHP) remote units**: A button is available to access the details of the optical module (ROTRX) equipped inside the remote unit.
- **Transmitter 2 (MIMO remote units, layer 2) –** Transmitter 2 alarm status.
- **Receiver (SISO remote units)** – Receiver parameters and alarm status.
- **Receiver 1 (MIMO remote units, layer 1) –** Receiver 1 parameters and alarm status.
- **Receiver 2 (MIMO remote units, layer 2)** – Receiver 2 parameters and alarm status.
- **CW parameters (available for RUs models supporting the CW Test UL generation feature) –** CW parameters for continuous wave (CW) testing: *Frequency* drop-down list, *CW Test* button, and *CW Fault* alarm status icon.
- **Channel <band name> (SISO remote units)**

  One pane is available for each band enhanced by the remote unit. Each pane includes the *RF Enable* check box, which allows users logged in with the **admins**, **superusers,** or **users** role to enable and disable the downlink RF output for the channel. See "Enabling or Disabling RF for the Remote Unit Downlink Path" on page 61.

  Note: For pole-mount and very-high-power (VHP) remote units a button is available to access the details of the power amplifier equipped inside the remote unit.

- **Channel <band name> M1 (MIMO remote units, layer 1)**

  MIMO layer 1 parameters and alarm status.

  The *RF Enable* check box allows users logged in with the **admins**, **superusers,** or **users** role to enable and disable the downlink RF output for the MIMO layer. See "Enabling or Disabling RF for the Remote Unit Downlink Path" on page 61.

  Note: For pole-mount and very-high-power (VHP) remote units a button is available to access the details of the power amplifier equipped inside the remote unit.

- **Channel <band name> M2 (MIMO remote units, layer 2)**

  MIMO layer 2 parameters and alarm status.

  The *RF Enable* check box allows users logged in with the **admins**, **superusers,** or **users** role to enable and disable the downlink RF output for the MIMO layer. See "Enabling or Disabling RF for the Remote Unit Downlink Path" on page 61.

- **TDDU (available for TDD pole-mount and TDD very-high-power remote units only)**
  - Status of the *PLL Unlock* and *TDD Unlock* alarms.
  - TDDU alarm summary – Maximum severity of the alarms active for the TDD synchronizer equipped inside the remote unit.
  - Show TDDU details – Link to the TDD synchronizer panel.

- **Fan (if equipped):**
  - *Fan speed <fan number> [%]* – Rotational speed set for the fan.
  - *Fan speed <fan number> [rpm]* – Actual fan rotational speed (revolutions per minute).
  - Status of the *Fan Speed* alarm.

- **External Alarms –** Alarm status of the external devices connected to the remote unit. Users logged in with the **admins**, **superusers,** or **users** role can enable or disable each external alarm, and set the external alarm name, severity, and polarity. See "Setting External Alarms and Relays" on page 50.

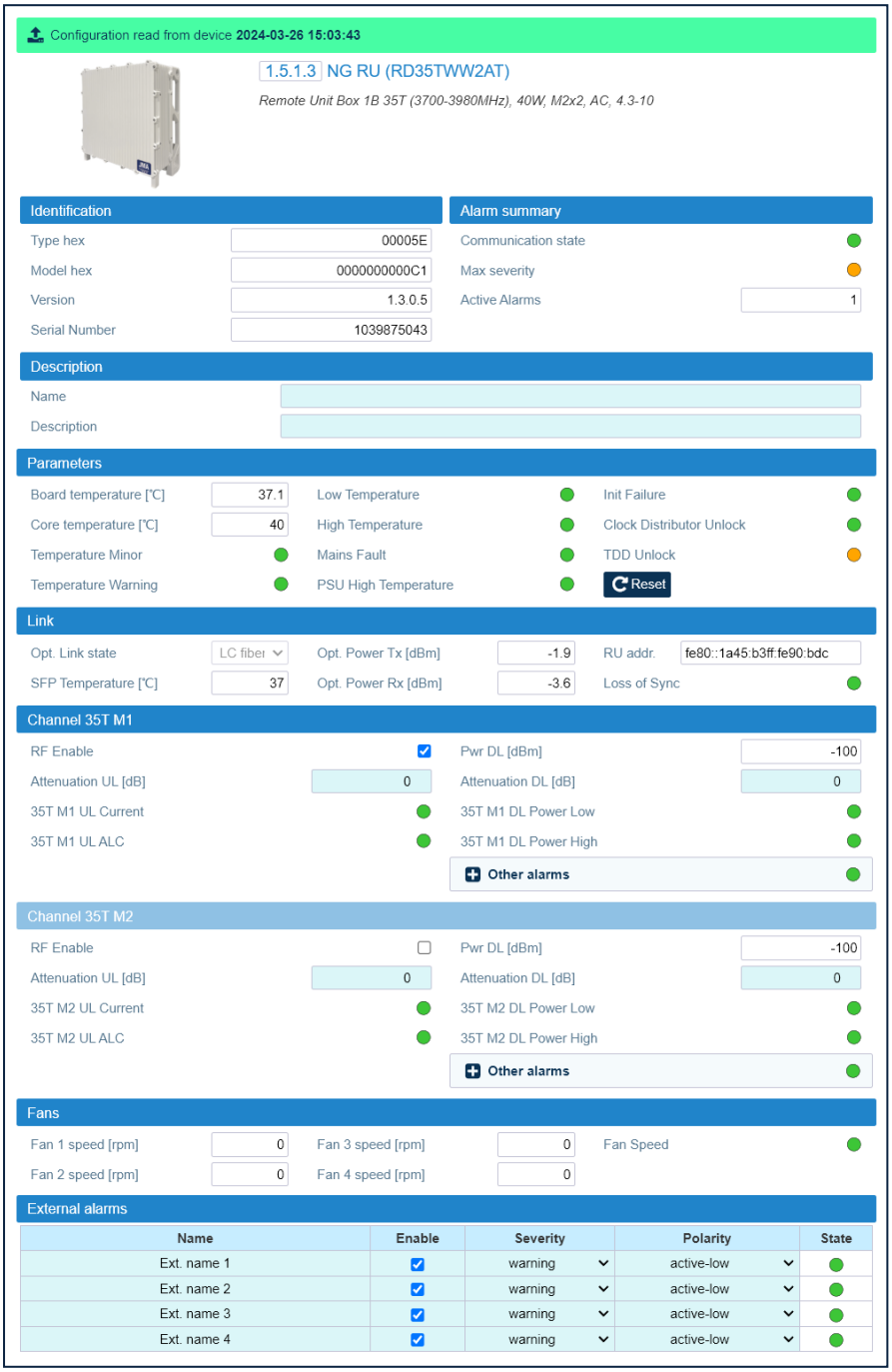
- **Relays –** External outputs name and logic. Users logged in with the **admins**, **superusers,** or **users** role can switch external outputs either manually or automatically. See "Relays" on page 51.

NG RU and NG SDRU Panels

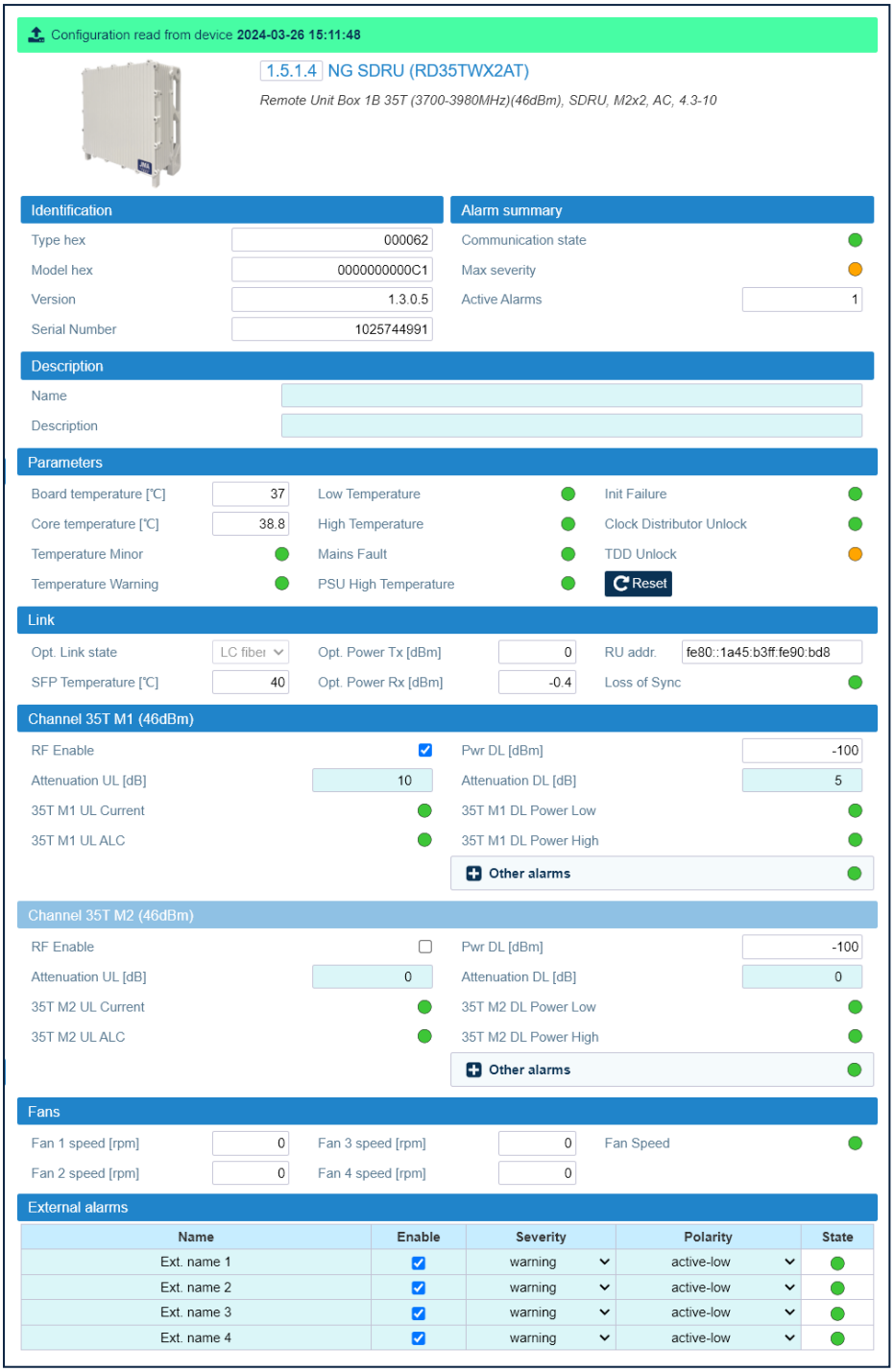
A panel is available for each next generation remote unit (NG RU or NG SDRU) equipped in the DAS.

Note: In the **Physical Tree**, Next Generation Remote Units (NG RU) and Next Generation Software Defined Remote Units (NG SDRU) are contained within the connected NG OTRX.

The following figure shows an example of the **NG RU** panel:



The following figure shows an example of the **NG SDRU** panel:



The **NG RU** and **NG SDRU** panels include the following information about the selected next generation remote unit:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – Remote unit *Name* and *Description*

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - Detected *Board Temperature*.
  - Detected *Core Temperature*.
  - Status of the *Temperature Minor, Temperature Warning, Low Temperature, High Temperature, Mains Fault, PSU High Temperature, Init Failure, Configuration file corrupted* (dual band units only)*, Clock Distributor Unlock* and *TDD Unlock* alarms.
  - *Reset* – The reset button is available for all users to power cycle the unit.
- **Link**
  - *Opt. Link state*:
    - *absent* – No fiber is connected to the optical port.
    - *LC fiber* – LC fiber connected to the optical port.
  - Detected *SFP Temperature*
  - *Opt. Power Tx* – Transmitted optical power.
  - *Opt. Power Rx* – Received optical power.
  - *RU addr.* – IPv6 Address of the remote unit.
  - Status of the *Loss of Sync* alarm.
- **Channel <band name> M1 (<*licensed output power*>, NG SDRU panel only)** – MIMO layer 1 parameters and alarm status.
  - *RF Enable* – The *RF Enable* check box allows users logged in with the **admins**, **superusers,** or **users** role to enable and disable downlink RF output for the MIMO layer. See "Enabling or Disabling RF for the Remote Unit Downlink Path" on page 61.
  - *Pwr DL* – Detected downlink output power.
  - *Attenuation UL* and *Attenuation DL* – Attenuations set for the MIMO1 layer. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.
- **Channel <band name> M2 (<*licensed output power*>, NG SDRU panel only)** – MIMO layer 2 parameters and alarm status.
  - *RF Enable* – The *RF Enable* check box allows users logged in with the **admins**, **superusers,** or **users** role to enable and disable downlink RF output for the MIMO layer. See "Enabling or Disabling RF for the Remote Unit Downlink Path" on page 61.

- *Pwr DL* – Detected downlink output power.
- *Attenuation UL* and *Attenuation DL* – Attenuations set for the MIMO1 layer. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations.

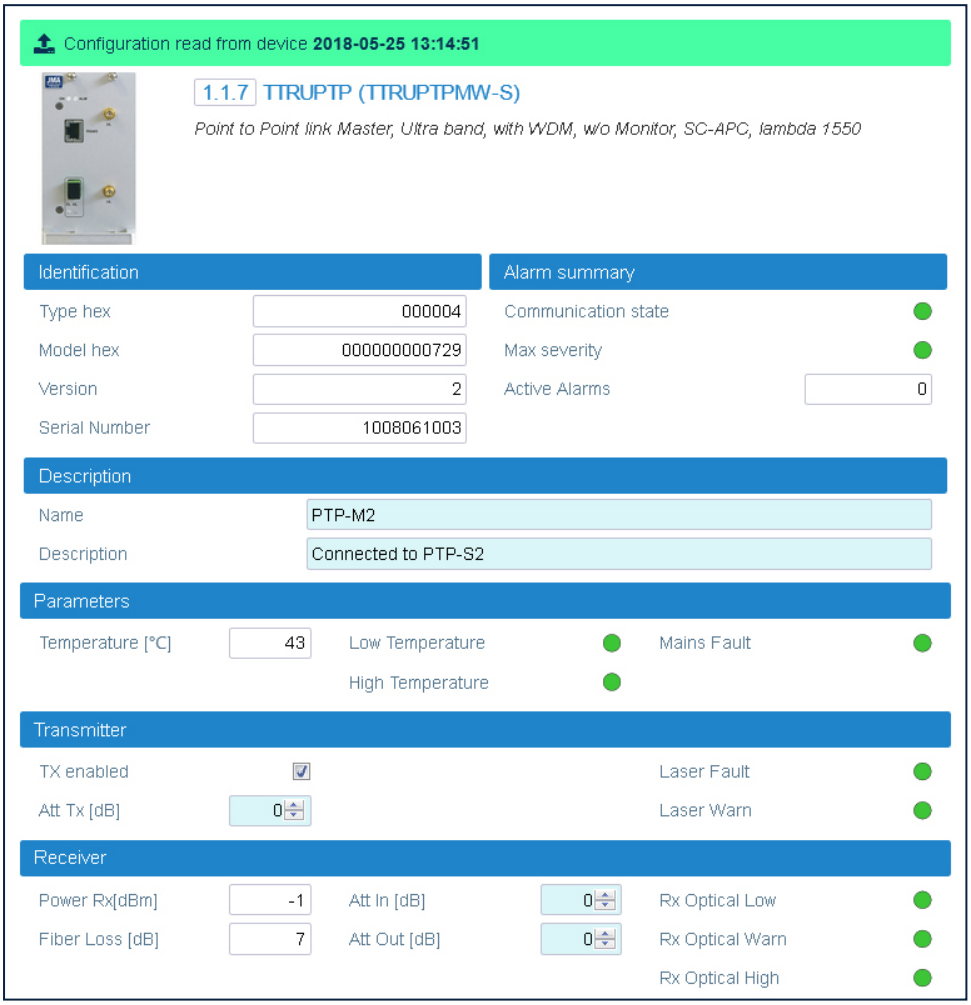
Note: The operating bands and output power of Software Defined Remote Units (SDRU) are tied to license keys, which can be managed remotely using the *JMA Wireless SDRU Panel* software. No channel panes are available on the **NG SDRU** panel until licenses are activated using the SDRU Panel software. If not all the expected channels and output power levels are available, verify the activation of purchased features. Refer to the *JMA DAS Platform SDRU Panel User Guide* for details.

- **Fans (remote units with forced-air cooling only)**
  - *Fan speed <fan number> [rpm]* – Actual fan rotational speed (revolutions per minute).
  - Status of the *Fan Speed* alarm.
- **External Alarms** – Alarm status of the external devices connected to the remote unit. Users logged in with the **admins**, **superusers,** or **users** role can enable or disable each external alarm, and set the external alarm name, severity, and polarity. See "Setting External Alarms and Relays" on page 50.

Point to Point Link

Two TTRUPTP panels are available for the management of each optical Point-to-Point link: Point-to-Point link master and secondary panels.

TTRUPTP Master Panel



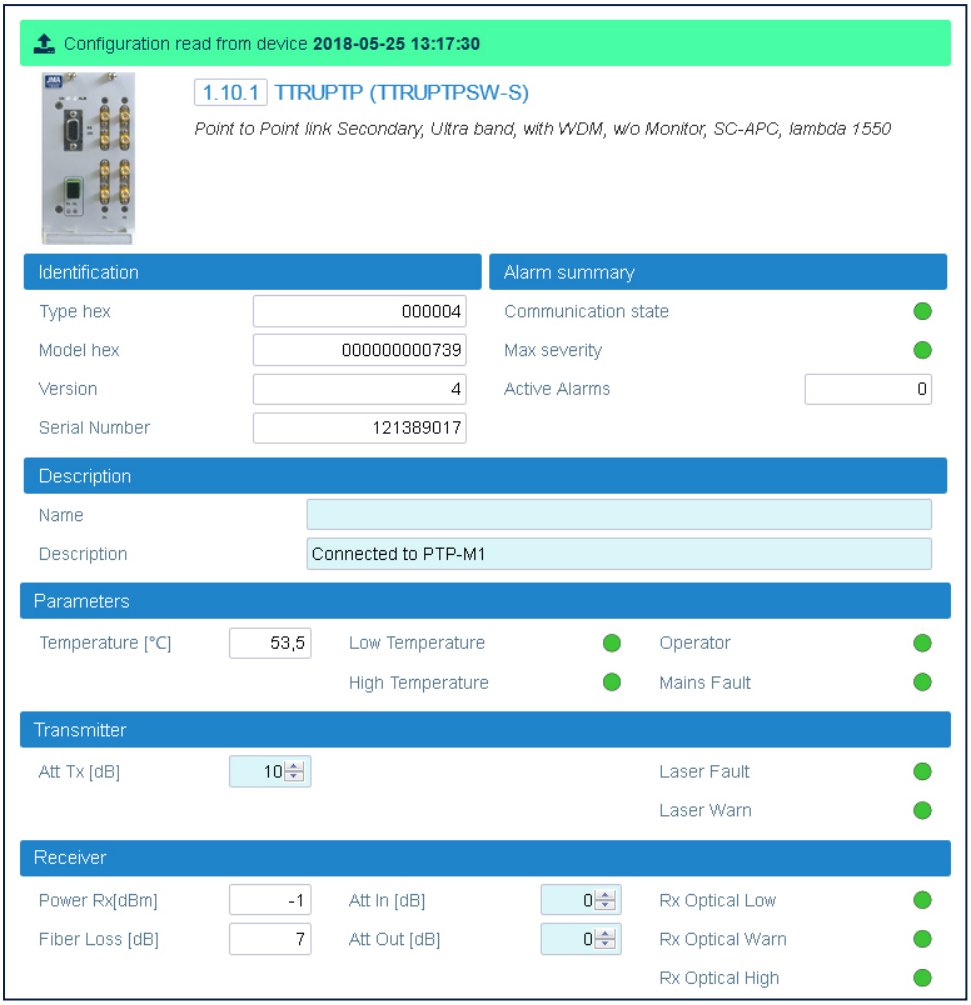
The **TTRUPTP Master** panel includes the following information about the master Point-to-Point module:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms

- **Description** – TTRUPTP Master *Name* and *Description*.

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - Detected *Temperature*.
  - Status of the *Low Temperature, High Temperature, Mains Fault* alarms.
- **Transmitter**
  - *Tx enabled* – Transmitter enable/disable check box. Users logged in with the **admins**, **superusers,** or **users** role can enable or disable the Optical Transmitter.
  - *Att Tx* – Optical Transmitter downlink attenuation. Users logged in with the **admins**, **superusers,** or **users** role can set the transmitter attenuation. See "Adjusting the Point-to-Point Link RF Gain" on page 49.
  - Status of the *Laser Fault* and *Laser Warn* alarms.
- **Receiver**
  - *Power Rx* – Received optical power.
  - *Fiber Loss.*
  - *Att In* and *Att Out* – Receiver uplink attenuation (In/Out). Users logged in with the **admins**, **superusers,** or **users** role can set the receiver attenuation. See "Adjusting the Point-to-Point Link RF Gain" on page 49.
  - Status of the *Rx Optical Low*, *Rx Optical Warn*, *Rx Optical High* alarms.

TTRUPTP Secondary Panel



The **TTRUPTP Secondary** panel includes the following information about the secondary Point-to-Point module:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – TTRUPTP Secondary *Name* and *Description*

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.

- **Parameters**
  - Detected *Temperature*.
  - Status of the *Low Temperature, High Temperature, Operator,* and *Mains Fault* alarms.
- **Transmitter**
  - *Att Tx* – Optical Transmitter downlink attenuation. Users logged in with the **admins**, **superusers,** or **users** role can set the transmitter attenuation. See "Adjusting the Point-to-Point Link RF Gain" on page 49.
  - Status of the *Laser Fault* and *Laser Warn* alarms.
- **Receiver**
  - *Power Rx* – Received optical power.
  - *Fiber Loss.*
  - *Att In* and *Att Out:* Receiver uplink attenuation (In/Out). Users logged in with the **admins**, **superusers,** or **users** role can set the receiver attenuation. See "Adjusting the Point-to-Point Link RF Gain" on page 49.
  - Status of the *Rx Optical Low*, *Rx Optical Warn*, *Rx Optical High* alarms.

TTRUPTP Secondary without 4-way Splitter/Combiner Panel

The **TTRUPTP Secondary without 4-way splitter/combiner** panel includes the following information about the secondary Point-to-Point module, without four-way splitter/combiner module:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – TTRUPTP Secondary without 4-way splitter/combiner *Name* and *Description*

Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.

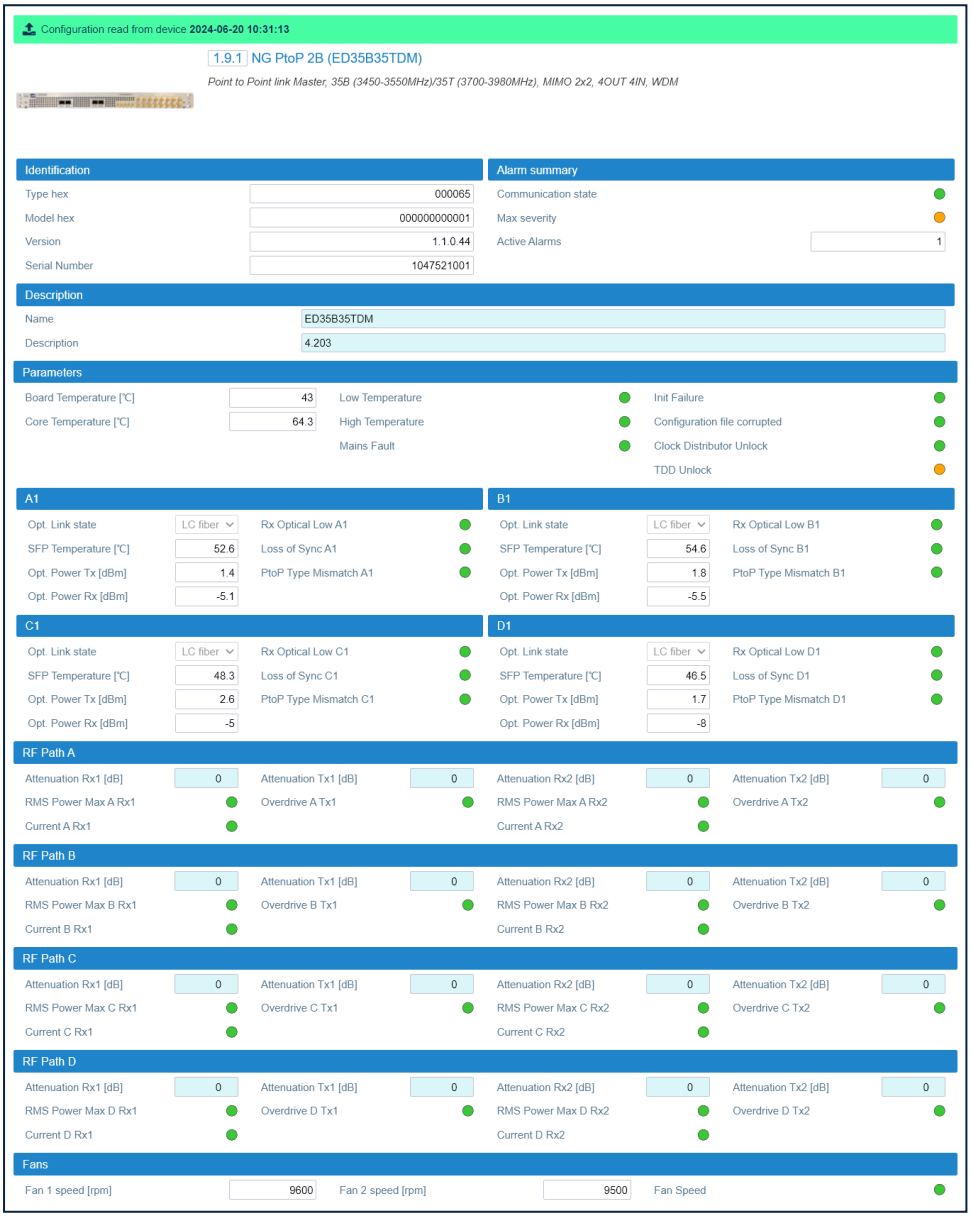
- **Parameters**
  - Detected *Temperature*.
  - Status of the *Low Temperature, High Temperature, Operator,* and *Mains Fault* alarms.
- **Transmitter**
  - *Att Tx* – Optical Transmitter downlink attenuation. Users logged in with the **admins**, **superusers,** or **users** role can set the transmitter attenuation. See "Adjusting the Point-to-Point Link RF Gain" on page 49.
  - Status of the *Laser Fault* and *Laser Warn* alarms.
- **Receiver**
  - *Power Rx* – Received optical power.
  - *Fiber Loss.*
  - *Att In* and *Att Out:* Receiver uplink attenuation (In/Out). Users logged in with the **admins**, **superusers,** or **users** role can set the receiver attenuation. See "Adjusting the Point-to-Point Link RF Gain" on page 49.
  - Status of the *Rx Optical Low*, *Rx Optical Warn*, *Rx Optical High* alarms.

Next Generation Point to Point Link

Two panels are available for the management of each next generation optical Point-to-Point link: NG PtoP Master and NG PtoP Secondary.

Note: When the DAS includes next generation point-to-point links, the DAS components installed at the master unit location and the DAS components installed at the remote location are managed by two separate supervision modules. You need to connect to the supervision modules separately to gain access to the NG PtoP Master and NG PtoP Secondary panels.

NG PtoP Master



The **NG PtoP Master** panel includes the following information about the selected next generation master Point-to-Point component:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number
- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – NG PtoP Master *Name* and *Description*

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - Detected *Board Temperature*.
  - Detected *Core Temperature*.
  - Status of the *Low Temperature, High Temperature, Mains Fault, Init Failure, Configuration file corrupted* (dual band models only), *Clock Distributor Unlock,* and *TDD Unlock* alarms.
- **<optical port label>**

  The **NG PtoP Master** optical ports are labeled **A1**, **B1**, **C1**, and **D1**.

  For each port the following information is provided:
  - *Opt. Link state*:
    - absent: no fiber is connected to the optical port.
    - LC fiber: LC fiber is connected to the optical port.
  - *SFP Temperature*
  - *Opt. Power Tx* – Transmitted optical power.
  - *Opt. Power Rx* – Received optical power.
  - Status of the *Rx Optical Low, Loss of Sync,* and *PtoP Type Mismatch* alarms.
- **RF Path A, RF Path B, RF Path C, RF Path D**

  The **PtoP Master** RF paths are identified as A, B, C, D. For each RF path the following information is provided:
  - *Attenuation Rx1 [dB], Attenuation Tx1 [dB]* – Attenuations for the RF Path, MIMO1 layer. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations. See "Adjusting the Next Generation Point-to-Point Link RF Gain" on

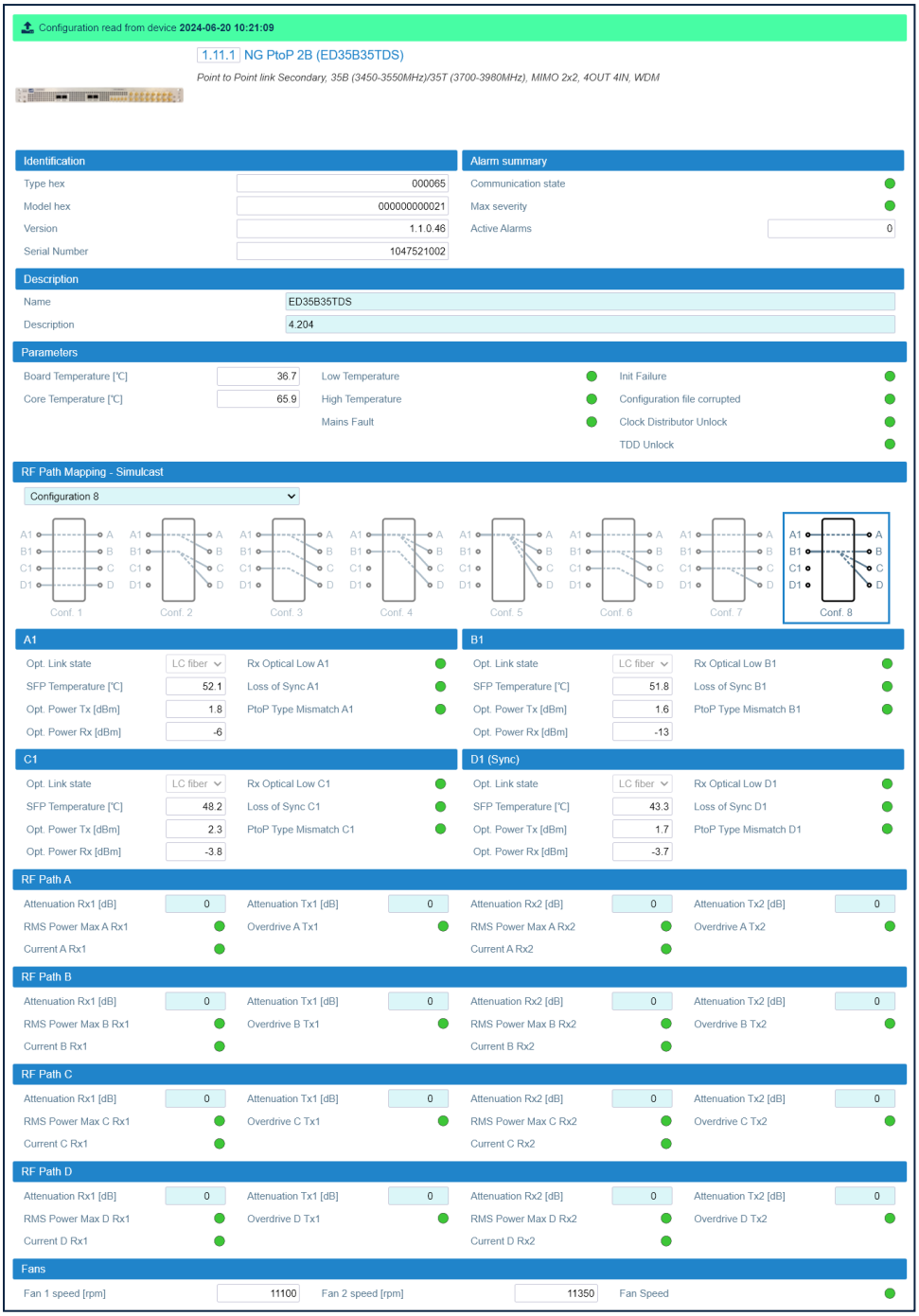
page 48.

- *Attenuation Rx2 [dB], Attenuation Tx2 [dB]* – Attenuations for the RF Path, MIMO2 layer. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations. See "Adjusting the Next Generation Point-to-Point Link RF Gain" on page 48.
- Status of the *RMS Power Max <RF path> Rx1, Overdrive <RF path> Tx1, Current <RF path> Rx1, RMS Power Max <RF path> Rx2, Overdrive <RF path> Tx2, Current <RF path> Rx2* alarms.

- **Fans**
  - *Fan 1 speed* – Actual rotation speed of fan 1 (rpm, revolutions per minute).
  - *Fan 2 speed* – Actual rotation speed of fan 2 (rpm, revolutions per minute).

    Note: If the fan rotation speed is 4300 rpm, the fan is not spinning.
  - Status of the *Fan Speed* alarm.

NG PtoP Secondary



The **NG PtoP Secondary** panel includes the following information about the next generation secondary Point to Point component:

- **Identification**
  - Type hex (hexadecimal notation)
  - Model hex (hexadecimal notation)
  - Version
  - Serial Number

- **Alarm Summary**
  - Communication state
  - Max severity – Maximum severity of active alarms
  - Active Alarms – Number of active alarms
- **Description** – NG PtoP Secondary *Name* and *Description*

  Users logged in with the **admins**, **superusers,** or **users** role can assign a name and add a description. See "Assigning Names to the DAS Components" on page 44.
- **Parameters**
  - Detected *Board Temperature*.
  - Detected *Core Temperature*.
  - Status of the *Low Temperature, High Temperature, Mains Fault, Init Failure, Configuration file corrupted* (dual band models only), *Clock Distributor Unlock*, and *TDD Unlock* alarms.
- **RF Path Mapping - Simulcast (dual band units only)**
  - *Configuration* drop-down list – Selected simulcast configuration. Users logged in with the **admins**, **superusers,** or **users** role can select how RF signals are distributed. Eight different simulcast configurations are available. *Configuration 1* is the default factory configuration. See "Selecting the Dual-band NG PtoP Secondary Simulcast Configuration" on page 47.
  - *Conf<number>* diagrams – The diagrams describe how the different simulcast configurations distribute the RF signals. When you select a configuration from the drop-down list, the diagram that corresponds to the selected configuration is highlighted.
- **<optical port label>**

  The **NG PtoP Secondary** optical ports are labeled **A1**, **B1**, **C1**, and **D1**.

  For each port the following information is provided:
  - *Opt. Link state*:
    - absent: no fiber is connected to the optical port.
    - LC fiber: LC fiber is connected to the optical port.
  - *SFP Temperature*
  - *Opt. Power Tx* – Transmitted optical power.
  - *Opt. Power Rx* – Received optical power.
  - Status of the *Rx Optical Low, Loss of Sync,* and *PtoP Type Mismatch* alarms.

  Note: The **(Sync)** indication, which is displayed next to one of the optical ports, identifies the CPRI link on which the NG PtoP Secondary derives the synchronization.

- **RF Path A, RF Path B, RF Path C, RF Path D**

  The **PtoP Secondary** RF paths are identified as A, B, C, D. For each RF path the following information is provided:

  - *Attenuation Rx1 [dB], Attenuation Tx1 [dB]* – Attenuations for the RF Path, MIMO1 layer. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations. See "Adjusting the Next Generation Point-to-Point Link RF Gain" on page 48.
  - *Attenuation Rx2 [dB], Attenuation Tx2 [dB]* – Attenuations for the RF Path, MIMO2 layer. Users logged in with the **admins**, **superusers,** or **users** role can set attenuations. See "Adjusting the Next Generation Point-to-Point Link RF Gain" on page 48.
  - Status of the *RMS Power Max <RF path> Rx1, Overdrive <RF path> Tx1, Current <RF path> Rx1, RMS Power Max <RF path> Rx2, Overdrive <RF path> Tx2, Current <RF path> Rx2* alarms.

- **Fans**
  - *Fan 1 speed* – Actual rotation speed of fan 1 (rpm, revolutions per minute).
  - *Fan 2 speed* – Actual rotation speed of fan 2 (rpm, revolutions per minute).

    Note: If the fan rotation speed is 4300 rpm, the fan is not spinning.
  - Status of the *Fan Speed* alarm.

Getting Help: Technical Support Contact Information

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  techsupport@jmawireless.com
- JMA Italy - BTC
  +39 051 6946811
  VAS-techsupport@jmawireless.com

Abbreviations

AGC
Automatic Gain Control

APN
Access Point Name

BS
Base Station

CPRI
Common Public Radio Interface

CSI-RS
Channel State Information Reference Signal

csv
Comma Separated Value

DAS
Distributed Antenna System

DHCP
Dynamic Host Configuration Protocol

DL
Downlink

EU
European Union

FQDN
Fully Qualified Domain Name

HTTP
Hypertext Transport Protocol (http://)

HTTPS
secure Hypertext Transport Protocol (https://)

IPv4
Internet Protocol version 4

IPv6
Internet Protocol version 6

ITE
Information Technology Equipment

LAN
Local Area Network

LMT
Local Maintenance Terminal

MIMO
Multiple Input, Multiple Output

MU
Master Unit

NEM
Network Element Manager

NG
Next Generation

NTP
Network Time Protocol

O-RAN
Open Radio Access Network

PDU
Power Distribution Unit

PSU
Power Supply Unit

PTP
Precision Time Protocol

RAL
Restricted Access Location

RF
Radio Frequency

RU
Remote Unit

SDRU
Software Defined Remote Unit

SISO
Single Input, Single Output

SMS
Short Message Service

SNMP
Simple Network Management Protocol

SSB
Synchronization Signal Block

Syslog
System Logging Protocol

TCP
Transmission Control Protocol

TDD
Time Division Duplex

TDFE
Digital Donor Front End

UDP
User Datagram Protocol

UK
United Kingdom

UL
Uplink

UPS
Uninterruptible Power Supply

UTC
Universal Time Coordinated

VPN

Virtual Private Network

WAN

Wide Area Network

WDM

Wavelength Division Multiplexing

WWAN

Wireless Wide Area Network