TCX1000 Programmable ROADM Quick Start Guide

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This document describes how to install and connect the Juniper Networks® TCX1000 Programmable reconfigurable optical add/drop multiplexer (ROADM).

Contents

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About This Quick Start Guide

This Quick Start Guide contains information you need to install and set up the Juniper Networks TCX1000-RDM20 Programmable ROADM. For complete installation instructions, see the *TCX1000 Programmable ROADM Hardware Guide* at https://www.juniper.net/documentation/.

WARNING: This Quick Start Guide contains a summary of safety warnings in "Safety Warnings Summary" on page 20. For a complete list of warnings for the TCX1000-RDM20, including translations, see the *TCX1000 Programmable ROADM Hardware Guide* at https://www.juniper.net/documentation/.

The TCX1000-RDM20 is a standalone 20-port reconfigurable optical add/drop multiplexer (ROADM) with removable AC or DC power supplies and cooling fans.

Step 1: Prepare Your Site for the TCX1000-RDM20

Before installing the TCX1000-RDM20, make sure your site meets all power, environmental, and clearance requirements. See the site preparation guidelines in the *TCX1000 Programmable ROADM Hardware Guide*.

NOTE: The TCX1000-RDM20 ships with two fan modules and two power supplies installed.

Ensure that you have the following parts and tools available to install, connect power to, and configure the TCX1000-RDM20:

- Eight self-tapping bolts to secure the chassis and mounting brackets to the rack (provided).
- Power cords with plugs appropriate for your geographical location (provided with the AC model).
- 19-in. front and rear mounting brackets (attached to the chassis).
- (Optional) 21-in. and 23-in. front and rear mounting brackets (provided).
- Grounding lug, nut, and washers (provided).
- Two ring lugs (Panduit PN14-8R-C) for DC power (provided).
- One fiber management bracket (provided).
- Optical supervisory channel (OSC) kit (included with the TCX1000-RDM20-AC and the TCX1000-RDM20-DC):
  - Small form-factor pluggable (SFP)—100BASE-FX Ethernet, 1511 nm, 43 dB reach.
  - Two 3-dB LC fixed optical attenuators.

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  - LC/UPC duplex fiber patchcord—30-cm length, 2-mm jacket.
- Electrostatic discharge (ESD) grounding strap (not provided).
- Screwdriver appropriate for the rack-mounting screws (not provided).
- Power cable or cables appropriate for your geographical location available to connect DC power to the TCX1000-RDM20-DC (not provided).
- Grounding cable (not provided).
- RJ-45 cable and RJ-45 to DB-9 serial port adapter (not provided).
- Management host, such as a PC laptop, with a serial port (not provided).

Step 2: Unpack the TCX1000-RDM20

For detailed instructions on how to unpack the box and verify the parts received, see the *TCX1000 Programmable ROADM Hardware Guide*.

Step 3: Mount the TCX1000-RDM20

To mount the TCX1000-RDM20 on four posts in a rack using the 19-in. mounting brackets:

NOTE: The 19-in. front and rear brackets are attached to the TCX1000-RDM20 when they are shipped. If you want to attach the 21-in. or 23-in. brackets, unscrew the 19-in. brackets from the chassis, and attach the 21-in. or 23-in. brackets by using the same screws.

NOTE: This procedure requires two persons. Do not attempt to do it alone.

1. Attach the ESD grounding strap to your bare wrist and to a site ESD point.

NOTE: Place the rack in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure. If you are mounting multiple units in the rack, mount the heaviest unit at the bottom and mount the others from bottom to top in order of decreasing weight. The TCX1000-RDM20 weighs 12.92 lb (5.86 kg).

2. Unscrew the 19-in. rear brackets from the chassis and set them aside, saving the screws.
3. Position the TCX1000-RDM20 so the FRUs are next to the hot aisle.
4. Have one person grasp both sides of the chassis, lift it, and position it in the rack so that the front bracket is aligned with the rack holes.

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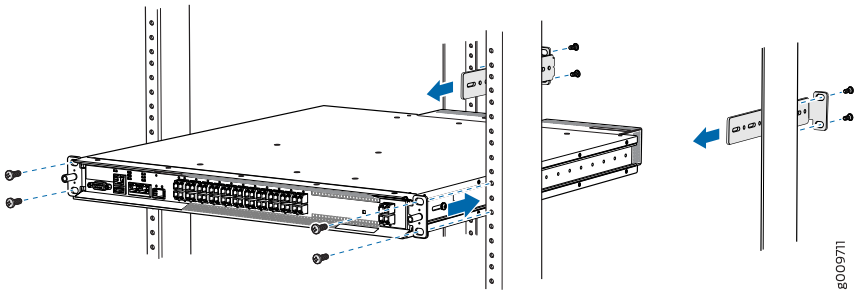
5. Have a second person secure the front of the chassis to the rack using four mounting screws (and cage nuts and washers if your rack requires them.) Tighten the screws. See Figure 1 on page 4.

Figure 1: Installing the TCX1000-RDM20 on a Rack



6. Continue to support the chassis while sliding the rear brackets into the channel of the side-mounting rails and securing the brackets to the rack. Use the four mounting screws (and cage nuts and washers if your rack requires them) to attach each bracket to the rack. Tighten the screws.

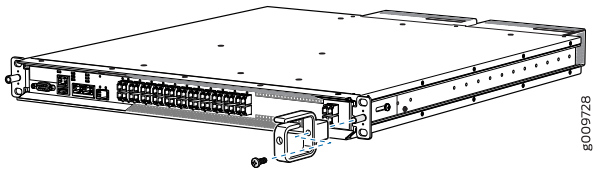
NOTE: **The rear bracket is long enough to allow for various bracket depths.**

7. Ensure that the chassis is level by verifying that all the screws on the front of the rack are aligned with the screws at the back of the rack.

8. Secure the rear bracket to the chassis using the saved screws from Step 2.

9. Install the fiber management clip on the front of the chassis, on the right or left hand side, as required. See Figure 2 on page 4.

Figure 2: Installing the Fiber Management Clip on the TCX1000-RDM20



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Step 4: Connect the TCX1000-RDM20 Grounding Cable

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the chassis to earth ground before you connect it to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the TCX1000-RDM20 chassis to connect to the earth ground.

NOTE: An AC-powered TCX1000-RDM20 gains additional grounding when you plug the power supply in the device into a grounded AC power outlet by using an AC power cord appropriate for your geographical location.

CAUTION: Before you connect power to the TCX1000-RDM20, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the TCX1000-RDM20 (for example, by causing a short circuit).

NOTE: Mount the TCX1000-RDM20 in the rack or cabinet before attaching the grounding lug to the TCX1000-RDM20.

Ensure that you have the following parts and tools available:

NOTE: The grounding point is located on the back of the TCX1000-RDM20 and is a #10-32 threaded stud.

- Grounding lug—Panduit LCA10-10F-L (provided) that accommodates 14-10 AWG standard wire (not provided).
- Two #10 external tooth lock washers and one #10 hex nut (provided).
- Screwdriver appropriate for the screws (not provided).
- Electrostatic discharge (ESD) grounding wrist strap (not provided).

You ground the TCX1000-RDM20 by attaching a grounding cable to the chassis. See the *TCX1000-RDM20 Chassis Grounding Cable and Lug Specifications* in the *TCX1000 Programmable ROADM Hardware Guide*.

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To connect a grounding cable to the TCX1000-RDM20:

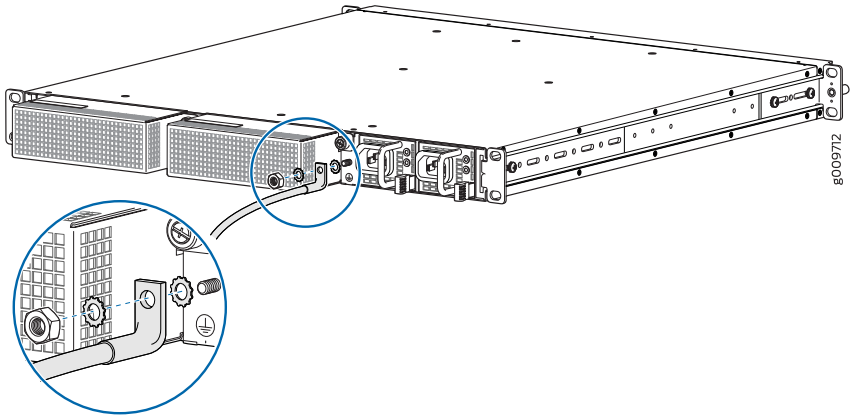
1. Attach an ESD grounding strap to your bare wrist, and connect the strap to an approved site ESD grounding point. See the instructions for your site.

2. Connect one end of the grounding cable to a proper site earth ground, such as the rack in which the TCX1000-RDM20 is mounted.

3. Strip the appropriate length of wire for the ground lug type used, and verify that a licensed electrician has attached the cable lug provided with the TCX1000-RDM20 to the grounding cable.

4. Attach the grounding lug, lock washers, and hex nut as shown in Figure 3 on page 6.

Figure 3: Connecting a Grounding Cable to the TCX1000-RDM20



5. Dress the grounding cable and ensure that it does not touch or block access to other device components and that it does not drape where people could trip over it.

Step 5: Connect the TCX1000-RDM20 to a Management Console

You can configure and manage the TCX1000-RDM20 by using a dedicated console. Use the console port to connect the device directly to a management console, such as a laptop, or a console server.

The TCX1000-RDM20 has a console port (labeled **SERIAL**) with a DB-9 connector.

Ensure that you have an RJ-45 to DB-9 rollover cable available.

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NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to the TCX1000-RDM20, use a combination of the RJ-45 cable and RJ-45 to DB-9 adapter and a USB to DB-9 male adapter.

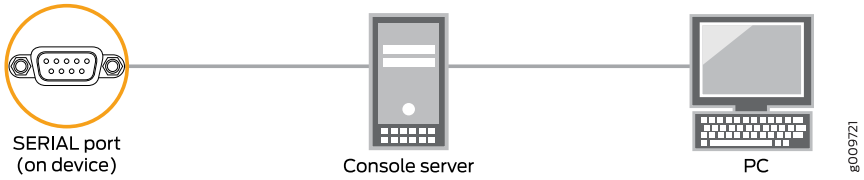
To connect the TCX1000-RDM20 to a management console:

1. Connect one end of the RJ-45 to DB-9 rollover cable to the console port (labeled **SERIAL**). See Figure 4 on page 7 and Figure 5 on page 7.

2. Connect the other end of the cable directly to a management console or console server.

Figure 4: Connecting the TCX1000-RDM20 Directly to a Management Console

Figure 5: Connecting the TCX1000-RDM20 to a Management Console Through a Console Server



Step 6: Power On the TCX1000-RDM20

NOTE: The TCX1000-RDM20 is supplied with two factory-installed power supplies, either AC or DC.

NOTE: We recommend the fuse or circuit protector value rated at 10 A for both the TCX1000-RDM20-AC and the TCX1000-RDM20-DC.

- Connecting AC Power to the TCX1000-RDM20 on page 8
- Connecting DC Power to the TCX1000-RDM20 on page 9

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Connecting AC Power to the TCX1000-RDM20

To connect AC power to a TCX1000-RDM20:

1. Prevent ESD damage to your equipment by attaching an ESD grounding strap to your bare wrist, and then connecting the strap to an approved site ESD grounding point.

2. Ensure that the power supplies are fully inserted in the chassis and the latches are secure.

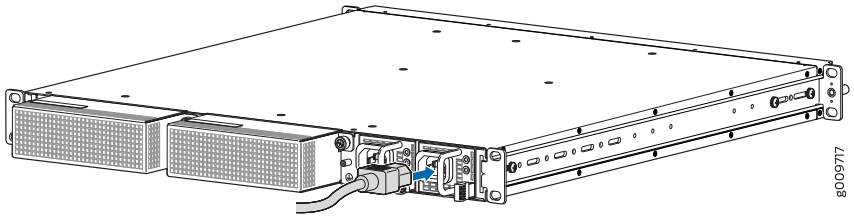
3. Insert the coupler end of the power cord into the AC power cord inlet on the AC power supply faceplate for each power supply.

4. If the AC power source outlet has a power switch, set it to the off (**O**) position.

NOTE: **The TCX1000-RDM20 powers on as soon as power is provided to the power supply.**

5. Insert the power cord plug into an AC power source outlet for each power supply. See Figure 6 on page 8.

Figure 6: Connecting an AC Power Cord to an AC Power Supply in a TCX1000-RDM20



6. If the AC power source outlet has a power switch, set it to the on (**|**) position.

7. Verify that the LEDs on each power supply are lit green. If any are lit yellow, remove power from the power supply, and replace the power supply (see *Installing a Power Supply in a TCX1000-RDM20* in the *TCX1000 Programmable ROADM Hardware Guide*). Do not remove the power supply until you have a replacement power supply ready; power supplies must be installed in the TCX1000-RDM20 to ensure proper airflow.

CAUTION: **Replace a failed power supply with a new power supply within five minutes of removal to prevent chassis overheating.**

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NOTE: Each power supply must be connected to a dedicated power source outlet. We recommend connecting each power supply to a different power source for redundancy purposes.

Connecting DC Power to the TCX1000-RDM20

WARNING: DC-powered TCX1000-RDM20 models are intended for installation only in a restricted access location.

Before you begin connecting DC power to the TCX1000-RDM20:

- Read *General Electrical Safety Guidelines and Warnings* and *TCX1000-RDM20 DC Power Electrical Safety Guidelines* in the *TCX1000 Programmable ROADM Hardware Guide*.
- Ensure that you have taken the necessary precautions to prevent electrostatic discharge (ESD) damage (see *Prevention of Electrostatic Discharge Damage* in the *TCX1000 Programmable ROADM Hardware Guide*).
- Ensure that you have connected the TCX1000-RDM20 chassis to earth ground.

  CAUTION: Before you connect power to the TCX1000-RDM20, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the ROADM (for example, by causing a short circuit).

  NOTE: To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the chassis to earth ground before you connect it to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the TCX1000-RDM20 chassis to connect to the earth ground (see *Connecting the TCX1000-RDM20 Grounding Cable* in the *TCX1000 Programmable ROADM Hardware Guide*).

  CAUTION: You must ensure that power connections maintain the proper polarity. The power source cables might be labeled (+) and (–) to indicate their polarity. There is no standard color coding for DC power cables. The color coding used by the external DC power source at your site determines the color coding for the leads on the power cables that attach to the terminals on each power supply.

- Ensure that you have the following parts and tools available:
  - ESD grounding strap.

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- Power cable or cables appropriate for your geographical location available to connect DC power to the TCX1000-RDM20.

NOTE: **Each power supply must be connected to a dedicated power source outlet. We recommend connecting each power supply to a different power source for redundancy purposes.**

To connect DC power to a TCX1000-RDM20:

1. Prevent ESD damage to your equipment by attaching an ESD grounding strap to your bare wrist, and then connecting the strap to an approved site ESD grounding point.

2. Ensure that the power supplies are fully inserted in the chassis and the latches are secure.

3. Ensure that the power source is turned off, the voltage across the DC power source cable leads is 0 V, and there is no chance that the cable leads might become active during installation.

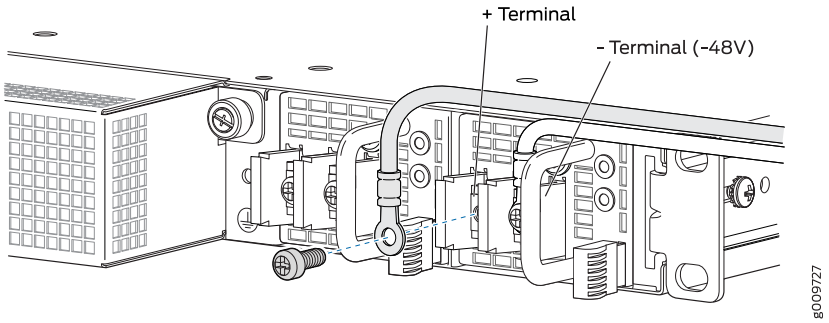
4. Remove the plastic cover from the terminal block on the power supply. Remove the terminal block screws.

5. Identify the positive and negative feed positions, as marked on the power supply.

6. Strip each of the wires coming out from the DC-input power source by 8-9 mm. Do not strip more than required, because doing so can leave the wire exposed from the DC connector after installation. The cable must be terminated with the supplied ring lug (Panduit PN14-8R-C).

7. Insert the lug into the terminal block. See Figure 7 on page 10.

Figure 7: Attaching the Lug and Cable



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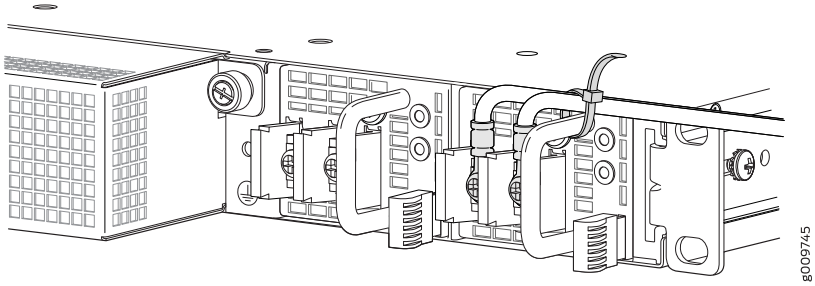
8. Use a ratcheting torque screwdriver to apply a torque of 1.53 nm to each of the terminal block screws. See Figure 7 on page 10.

9. Use a tie-wrap to secures the cables. See Figure 8 on page 11.

Figure 8: Connecting the DC Power



10. Repeat Step 4 through Step 9 for each power supply you are connecting to power.

WARNING: Ensure that the power cables do not block access to device components or drape where people can trip on them.

11. Replace the plastic cover.

12. Close the input circuit breaker.

NOTE: We recommend that the 48-VDC facility DC source be equipped with a circuit protector rated as required by local code. For the voltage range, see the *TCX1000 Programmable ROADM Hardware Guide* at https://www.juniper.net/documentation/.

NOTE: The TCX1000-RDM20 powers on as soon you connect the power.

13. Verify that the LEDs on each power supply are lit green.

    If the LEDs are lit yellow, remove power from the power supply, and replace the power supply (see *Removing a Power Supply from a TCX1000-RDM20* in the *TCX1000 Programmable ROADM Hardware Guide*). Do not remove the power supply until you have a replacement power supply ready; the power supplies must be installed in the TCX1000-RDM20 to ensure proper airflow.

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CAUTION: Replace a failed power supply with a new power supply within five minutes of removal to prevent chassis overheating.

Step 7: Install the OSC SFP

To install and connect the OSC SFP to the OSC 0:

NOTE: All fiber-optic cable connectors should be inspected and cleaned prior to performing any optical connections, see the *TCX1000 Programmable ROADM Hardware Guide* for instructions.

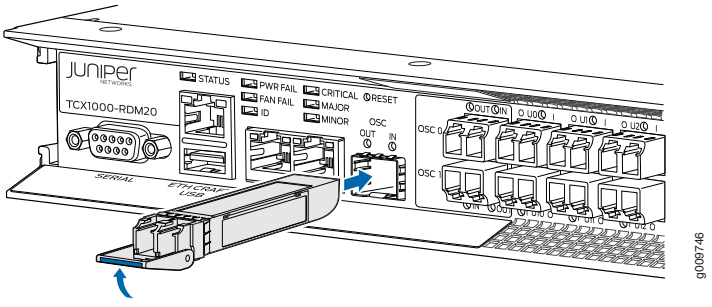
1. Prevent ESD damage to your equipment by attaching an ESD grounding strap to your bare wrist, and then connecting the strap to an approved site ESD grounding point.

2. Verify that the OSC SFP transceiver is covered by a rubber safety cap. If it is not, cover the transceiver with a safety cap.

3. Carefully align the transceiver with the slots in the component. The connectors should face the component. See Figure 9 on page 12.

4. Slide the transceiver until the connector is seated in the component slot. If you are unable to fully insert the transceiver, make sure the connector is facing the right way. Close the ejector handle of the transceiver.

Figure 9: Installing the OSC SFP



WARNING: Do not look directly into a fiber-optic connector or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

5. Remove the rubber safety cap from the transceiver.

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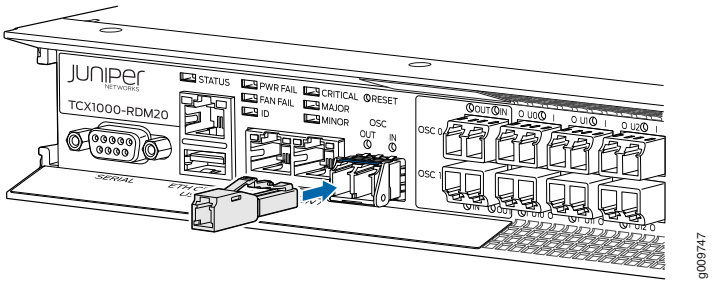
6. (Optional) Remove the dust plugs from the 3-dB LC fixed optical attenuators and install the optical attenuators in both the OSC OUT and IN ports. See Figure 10 on page 13.

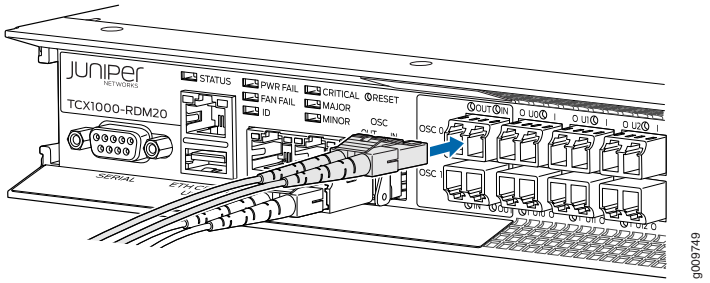
NOTE: Optical attenuators need to be installed if the expected span loss is less than 15 dB.

Figure 10: Installing the Attenuators



7. Connect the primary (1511 nm) OSC channel. Remove the dust plug from the other end of optical attenuators and use the supplied LC duplex fiber patch cord to connect SFP Rx port to the OSC 0 OUT port and the SFP Tx port to the OSC 0 IN port. See Figure 11 on page 13.

Figure 11: Connecting the Ports



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Step 8 Making a Craft Ethernet Port CLI Connection

Craft Ethernet communications with NETCONF equipment have these requirements:

- A SSH client must be used.
- TCP port 22 must be open.
- Password authentication is required.

The craft Ethernet port has a fixed IP address (169.254.0.1) and is isolated from the DCN ports. It is not user configurable. The craft Ethernet port can be used for local management connections and to configure the node's IP address from its default settings through a CLI connection.

The TCX1000-RDM20 IP address is hosted by the DCN 0 and DCN 1 Ethernet ports.

To set the IP address for DCN 0 and DCN 1 Ethernet ports:

1. Establish an SSH connection, using port 22, between the craft Ethernet port and the management platform.
2. Launch a suitable SSH client interface (PuTTY is used in the example below).
3. Select **Session** from the connection category list. The Basic connection options display.
4. Enter the fixed IP address of the craft Ethernet port: **169.254.0.1**.
5. Select **SSH** as the connection type.
6. Click **Open**.
7. Enter a valid user ID and password. A connection with the node is established.

NOTE: **The default user ID is superuser and the default password is Sup%9User.**

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Step 9: Perform the Initial Configuration

An IP address is required to manage the TCX1000-RDM20 nodes. TCX1000-RDM20 nodes are DHCP-enabled by default; they automatically acquire an IP address from the DHCP server when the unit is connected to the LAN. This IP address persists as long as the node is connected to the LAN. To determine this DHCP assigned address; you can query the DHCP server with the equipment's MAC address or you can query the equipment by using a CLI session.

NOTE: NOTE: You must configure each TCX1000-RDM20 with a unique static IP address. DHCP should be disabled.

Before opening a CLI session, set the following parameter values on the management console or console server:

- Baud rate—115,200
- Flow control—None
- Data—8
- Parity—None
- Stop bits—1

Once you have connected to the serial port (see *Connect the TCX1000-RDM20 to a Management Console*), enter these commands from the CLI to configure the IP address for the DCN 0 and DCN 1 ports:

1. Enter the user ID: **superuser**
2. Enter the password: **<password>**

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To set a static IP address on the TCX1000-RDM20 from the CLI:

NOTE: NOTE: You must configure each TCX1000-RDM20 with a unique static IP address. DHCP should be disabled.

NOTE: You can enter a **?** at any time for help.

NOTE: If you want to use IPv4 communication, use step 1 to step 4, if you want to use IPv6 communication, use step 5 and step 6.

1. Enter the **ip-service show** command to determine the existing IP address and the DHCP status of the TCX1000-RDM20. See the following sample output.

```
user@host# ip-service show
CMD_STATUS 0 OK
CMD_RESPONSE 22
config
        hostname:  host
        ipv4
                address: 198.51.100.3
                netmask: 255.255.255.0
                gateway: 0.0.0.0
                dhcp enabled: true
        ipv6
                address: ::
                prefix: 128
                gateway: ::
                enabled: true
state
        hostname:  host
        mac-address: 00:00:5E:00:53:da
        ipv4
                address: 0.0.0.0
                netmask: 0.0.0.0
                gateway: 0.0.0.0
                dhcp enabled: true
        ipv6
                link-local address: 2001:db8:0:1:2a0:a502:0:1da
                link-local prefix: 64
                address: ::
                prefix: 0
                gateway: ::
                enabled: true
STATUS 0 OK
```

2. Enter the **ip-service config ipv4 enable-dhcp false** command to disable DHCP (if currently enabled).

```
user@host# ip-service config ipv4 enable-dhcp false
```


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```
CMD_STATUS 0 OK
CMD_RESPONSE 2
A restart is required for IP configuration changes to take effect.
STATUS 0 OK
```

3. Enter the **ip-service config ipv4 address *IP address netmask*** command to set a static IPv4 address.

   ```
   user@host#ip-service config ipv4 address 198.51.100.2 255.255.255.0
   CMD_STATUS 0 OK
   CMD_RESPONSE 2
   A restart is required for IP configuration changes to take effect.
   STATUS 0 OK
   ```

4. Enter the **ip-service config ipv4 gateway *gateway-address*** command to set the IPv4 gateway address.

   See the following sample output to set the IPv4 address:

   ```
   user@host#ip-service config ipv4 gateway 198.51.100.1
   CMD_STATUS 0 OK
   CMD_RESPONSE 2
   A restart is required for IP configuration changes to take effect.
   STATUS 0 OK
   ```

5. Enter the **ip-service config ipv6 address *IPv6 address prefix*** command to set a static IPv6 address.

   See the following sample output to set the IPv6 address:

   ```
   user@host#ip-service config ipv6 address 2001.db8::1 32
   CMD_STATUS 0 OK
   CMD_RESPONSE 2
   A restart is required for IP configuration changes to take effect.
   STATUS 0 OK
   ```

6. Enter the **ip-service config ipv6 gateway *gateway-address*** command to set the IPv6 gateway address.

   See the following sample output to set the IPv6 gateway address:

   ```
   user@host#ip-service config ipv6 gateway 2001.db8::2
   CMD_STATUS 0 OK
   CMD_RESPONSE 2
   A restart is required for IP configuration changes to take effect.
   STATUS 0 OK
   ```

7. Enter the **restart warm** command to apply the changes by initiating a warm restart of the TCX1000-RDM20.

   ```
   user@host#restart warm
   ```

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NOTE: If you want to enable OSC forwarding, you can follow the steps in the *Enabling OSC Forwarding on the TCX1000-RDM20* and then apply the **restart warm** command.

The session closes and the TCX1000-RDM20 reboots. The TCX1000-RDM20 now has a static IP address.

8. Use the proNX Optical Director to provision, monitor, and activate services on a TCX1000-RDM20 optical network. See the *proNX Optical Director Installation Guide* at https://www.juniper.net/documentation/ for instructions on how to install the proNX Optical Director software on supported servers.

NOTE: The proNX Optical Director uses the CLI username and password to log in via NETCONF.

Step 10: Enabling OSC Forwarding on the TCX1000-RDM20

The TCX1000-RDM20 is capable of providing connectivity to a remote site through the Optical supervisory channel (OSC). OSC forwarding must be enabled when the TCX1000-RDM20 is connected to a remote site without DCN access or is connected to a TCX1000-ILA. See the *TCX Series Optical Transport System Feature Guide* at https://www.juniper.net/documentation/en_US/release-independent/tcx/information-products/pathway-pages/tcx1000-index.html for detailed information on network requirements, rules and restrictions, and configuration examples.

After you have completed assigning the IP address, you can enable OSC. OSC forwarding is disabled by default.

See Table 1 on page 18 for when you must enable or disable OSC on the TCX1000-RDM20:

Table 1: OSC Forwarding Conditions

Enable OSC Forwarding If	Do not enable OSC Forwarding If
The TCX1000-RDM20 line port is connected to a TCX1000-ILA.	The TCX1000-RDM20 line port is connected to a TCX1000-RDM20 that is on a different IP subnet.
The TCX1000-RDM20 line port is connected to a TCX1000-RDM20 without DCN access.	

To enable OSC forwarding on the TCX1000-RDM20 from the CLI:

1. Enter the user ID:**superuser**.

2. Enter the password: **<password>**.

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3. Check the status of the OSC forwarding by entering the **sfp show osc_sfp_port port 1** command. The sample output below shows that OSC forwarding is disabled.

```
user@host# sfp show osc_sfp_port port 1
CMD_STATUS 0 OK
CMD_STATUS 0 OK
CMD_RESPONSE 7
sfp port Auto Neg:   Enabled: false
sfp port speed:   SPEED_100_MB
sfp port duplex mode:   FULL
sfp port link state:   LINK_UP
sfp port mac_address:   00:01:9c:ee:a1:4b
sfp stp group:   NONE
STATUS 0 OK
```

4. Enter the **sfp config osc_sfp_port stp-group 1 2** command to enable remote communication and to enable OSC forwarding.

```
user@host# sfp config osc_sfp_port stp-group 1 2
CMD_STATUS 0 OK
CMD_RESPONSE 1
STATUS 0 OK


Command: SfpConfigOsc_sfp_portStp_group() has been entered successfully.
```

5. Verify the OSC forwarding is enabled by using the **sfp show osc_sfp_port port 1** command.

```
user@host# sfp show osc_sfp_port port 1
CMD_STATUS 0 OK
CMD_RESPONSE 7
sfp port Auto Neg:   Enabled: false
sfp port speed:   SPEED_100_MB
sfp port duplex mode:   FULL
sfp port link state:   LINK_UP
sfp port mac_address:   00:01:9c:ee:a1:4b
sfp stp group:   DEFAULT_LAN
STATUS 0 OK


Command: SfpShowOsc_sfp_portPort() has been entered successfully.
```

6. Enter the **restart warm** command to apply the changes by initiating a warm restart of the TCX1000-RDM20.

```
user@host#restart warm
CMD_STATUS 0 OK
CMD_RESPONSE 1
STATUS 0 OK

CRestartMgrIf::command3RestartRequestType - rBankSelected=0, rType=2, rReason=2
CMD_RESPONSE 1
STATUS 0 OK
```

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```
Broadcast message from root@host (Fri Sep 28 09:32:00 2018):

The system is going down for reboot NOW!
```

The TCX1000-RDM20 reboots.

Safety Warnings Summary

This is a summary of safety warnings. For a complete list of warnings, including translations, see *TCX1000 Programmable ROADM Hardware Guide* at https://www.juniper.net/documentation/.

WARNING: Failure to observe these safety warnings can result in personal injury or death.

WARNING: The intrabuilding ports of the equipment or subassembly are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the Outside Plant (OSP) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

WARNING: For a device that has more than one power supply connection, you must ensure that all power connections are fully disconnected so that power to the device is completely removed.

CAUTION: Before removing or installing components of a TCX1000-RDM20, attach an ESD strap to an ESD point, and place the other end of the strap around your bare wrist. Failure to use an ESD strap could result in damage to the equipment.

- Permit only trained and qualified personnel to install or replace TCX1000-RDM20 components.
- Perform only the procedures described in this Quick Start Guide and the TCX1000 documentation. Other services must be performed only by authorized service personnel.

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- Before installing the device, read the planning instructions in the *TCX1000 Programmable ROADM Hardware Guide* to make sure that the site meets power, environmental, and clearance requirements for the TCX1000-RDM20.
- For the cooling system to function properly, the airflow around the chassis must be unrestricted.
- Before connecting the device to a power source, read the installation instructions in the TCX1000-RDM20 documentation.
- If the rack or cabinet has stabilizing devices, install them in the rack before mounting or servicing the TCX1000-RDM20 in the rack or cabinet.
- Before installing or after removing an electrical component, always place it component-side up on a flat antistatic mat or in an electrostatic bag.
- Do not work on the TCX1000-RDM20 or connect or disconnect cables during electrical storms.
- Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or become welded to the terminals.
- Wire the DC power distribution unit by using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, +RTN to +RTN, and then –48 V to –48 V. When disconnecting power, the proper wiring sequence is –48 V to –48 V, +RTN to +RTN, and then ground to ground. Always connect the ground wire first and disconnect it last.

Power Cable Warning (Japanese)

The attached power cable is only for this product. Do not use this cable for another product. Contacting Juniper Networks For technical support, see *https://www.juniper.net/support/requesting-support.html*.

注意

附属の電源コードセットはこの製品専用です。
他の電気機器には使用しないでください。

TCX1000 Programmable ROADM Compliance Statements for NEBS

- The equipment is suitable for installation as part of the Common Bonding Network (CBN).
- The equipment is suitable for installation in Network Telecommunications Facilities.
- The battery return connection is to be treated as an isolated DC return (that is, DC-I), as defined in GR-1089-CORE.
- You must provision a readily accessible device outside of the equipment to disconnect power. The device must also be rated based on local electrical code practice.

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Compliance Statements for EMC Requirements

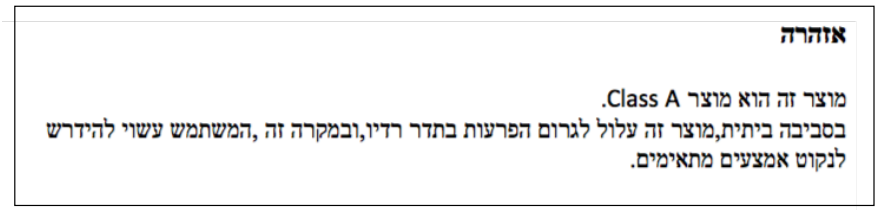
Canada

CAN ICES-3 (A)/NMB-3(A)

European Community

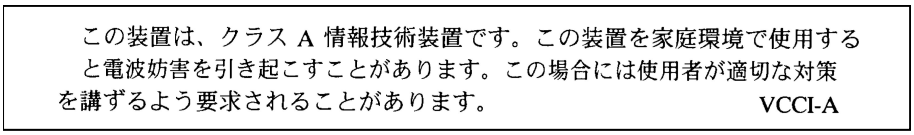
This is a Class A product. In a domestic environment, this product might cause radio interference in which case the user might be required to take adequate measures.

Israel



Translation from Hebrew—Warning: This product is Class A. In residential environments, the product might cause radio interference, and in such a situation, the user might be required to take adequate measures.

Japan



The preceding translates as follows:

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this product is used near a radio or television receiver in a domestic environment, it might cause radio interference. Install and use the equipment according to the instruction manual. VCCI-A.

United States

The hardware equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio

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frequency energy and, if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

TCX1000 Documentation and Release Notes

For a list of the complete TCX1000 series documentation including the release notes, see https://www.juniper.net/documentation/.

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at https://www.juniper.net/documentation/.

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service support contract, or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf.
- Product warranties—For product warranty information, visit https://www.juniper.net/support/warranty/.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: https://www.juniper.net/customers/support/
- Find product documentation: https://www.juniper.net/documentation/
- Find solutions and answer questions using our Knowledge Base: https://kb.juniper.net/
- Download the latest versions of software and review release notes: https://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: https://kb.juniper.net/InfoCenter/
- Join and participate in the Juniper Networks Community Forum: https://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: https://www.juniper.net/cm/

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To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://entitlementsearch.juniper.net/entitlementsearch/

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at https://www.juniper.net/cm/.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at https://www.juniper.net/support/requesting-support.html

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Revision History

December 2018—Updated revision. Updated the Perform the Initial Configuration section.

November 2018—Updated revision. Added Step 10 “Enabling OSC Forwarding on the TCX1000-RDM20”.

June 2018—Updated revision. Revised the sample output in the “Perform the Initial Configuration” section.

February 2018—Updated revision. Revised the Compliance statements for NEBS and Perform the Initial Configuration sections.

December 2017—Initial revision.

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