CT-X

Advanced Leakage Tagger

User's Guide

Notice

Every effort was made to ensure that the information in this manual was accurate at the time of printing. However, information is subject to change without notice, and VIAVI reserves the right to provide an addendum to this manual with information not available at the time that this manual was created.

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Federal Communications Commission (FCC) notice

This 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 frequency energy and, if not installed and used in accordance with the instruction manual, may 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.

Any changes or modifications not expressly approved by VIAVI could void the user's authority to operate the equipment.

EU WEEE directive

This product should not be disposed of as unsorted municipal waste and should be collected separately and disposed of according to your national regulations.

VIAVI has established a take-back process in compliance with the EU Waste Electrical and Electronic Equipment (WEEE) Directive, 2012/19/EU.

Instructions for returning waste equipment to VIAVI can be found in the WEEE section of the VIAVI Standards and Policies web page.

If you have questions concerning disposal of your equipment, contact the VIAVI WEEE Program Management team at **WEEE.EMEA@ViaviSolutions.com**.

EU REACH

Article 33 of EU REACH regulation (EC) No 1907/2006 requires article suppliers to provide information if a listed Substance of Very High Concern (SVHC) is present in an article above a certain threshold.

For information on the presence of REACH SVHCs in VIAVI products, see the **Hazardous Substance Control** section of the VIAVI Standards and Policies web page.

EU CE marking directives (LV, EMC, RoHS)

This product conforms with all applicable CE marking directives. For details, please see the EU Declaration of Conformity included in the shipping package.

China RoHS

China RoHS documentation is included in the shipping package and available on StrataSync.

California Proposition 65

California Proposition 65, officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986, was enacted in November 1986 with the aim of protecting individuals in the state of California and the state's drinking water and environment from excessive exposure to chemicals known to the state to cause cancer, birth defects or other reproductive harm.

For the VIAVI position statement on the use of Proposition 65 chemicals in VIAVI products, see the **Hazardous Substance Control** section of the VIAVI Standards and Policies web page.

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About this Guide

Thank you for purchasing the CT-X. This guide provides setup and operating instructions to get you up and running as soon as possible.

Purpose and scope

The purpose of this guide is to help you successfully use the product features and capabilities. Additionally, this guide provides a complete description of the VIAVI warranty, services, and repair information.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the product effectively and efficiently. We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication concepts and terminology.

Technical assistance

If you require technical assistance, call 1-844-GO-VIAVI / 1.844.468.4284.

Outside US: +1-855-275-5378

Email: **Trilithic.support@viavisolutions.com**

For the latest TAC information, visit
https://support.viavisolutions.com/welcome

Safety and compliance information

Safety information is contained in a separate guide and is provided in printed format with the product.

For information about CE compliance, see the Declaration of Conformity. A copy of the declaration is included in the shipping package.

Conventions

This guide uses typographical and symbols conventions as described in the following tables.

Typographical conventions

Description	Example
User interface actions	On the Status bar, click **Start**.
Buttons or switches that you press on a unit	Press the **ON** switch.
Code and output messages	All results okay
Text you must type exactly as shown	Type: ***a:\set.exe*** in the dialog box
Variables	Type the new ***hostname***.
Book references	Refer to ***Newton's Telecom Dictionary***
A vertical bar | means "or": only one option can appear in a single command.	platform [a|b|e]
Square brackets [ ] indicate an optional argument.	login [platform name]
Slanted brackets < > group required arguments.	<password>

Keyboard and menu conventions

Description	Example
A plus sign + indicates simultaneous keystrokes.	Press **Ctrl+s**
A comma indicates consecutive key strokes.	Press **Alt+f,s**
A slanted bracket indicates choosing a submenu from menu.	On the menu bar, click **Start > Program Files**.

Symbol conventions

This symbol indicates a note that includes important supplemental information or tips related to the main text.

This symbol represents a general hazard. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See the *"Safety definitions" on page 10* for more information.

This symbol represents an alert. It indicates that there is an action that must be performed in order to protect equipment and data or to avoid software damage and service interruption.

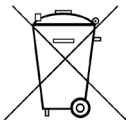
This symbol represents hazardous voltages. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See the *"Safety definitions" on page 10* for more information.

This symbol represents a risk of explosion. It may be associated with either a DANGER, WARNING, CAUTION or ALERT message. See the *"Safety definitions" on page 10* for more information.

This symbol represents a risk of a hot surface. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See the *"Safety definitions" on page 10* for more information.

Symbol conventions (continued)

This symbol represents a risk associated with fiber optic lasers. It may be associated with either a DANGER, WARNING, CAUTION or ALERT message. See the ***Safety Definitions*** below for more information.



This symbol, located on the equipment, battery, or the packaging indicates that the equipment or battery must not be disposed of in a land-fill site or as municipal waste, and should be disposed of according to your national regulations.

Safety definitions

Term	Description
DANGER	Indicates a potentially hazardous situation that, if not avoided, will result in death or serious injury. It may be associated with either a general hazard, high voltage, or other symbol.
WARNING	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It may be associated with either a general hazard, high voltage, or other symbol.
CAUTION	Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury and/or damage to equipment. It may be associated with either a general hazard, high voltage, or risk of explosion symbol. When applied to software actions, indicates a situation that, if not avoided, could result in loss of data or a disruption of software operation.
ALERT	Indicates that there is an action that must be performed in order to protect equipment and data or to avoid software damage and service interruption.

Precautions

WARNING:

Pursuant to FCC 15.21 of the FCC rules, changes not expressly approved by VIAVI might cause harmful interference and void the FCC authorization to operate this product.

CAUTION:

Do not use the instrument in any manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Periodic calibration

To maintain system accuracy and peak functionality, VIAVI recommends the CT-X is recalibrated every 2 years. Return the unit to VIAVI or a VIAVI authorized repair center for recalibration.

What ships with the CT-X?

When you unpack the CT-X, the following items are included as standard.

- CT-X Advanced Leakage Tagger
- Power cable
- Installation Guide
- Safety information sheet

Preparation for use

This section explains how to start using the CT-X. When you unpack your instrument, do the following:

- Inspect the unit for damage. If the instrument is damaged, put it back in the box and contact VIAVI customer service (see *"Technical assistance" on page 7*).
- If undamaged, save the box and packing materials in case you need to ship the instrument in the future.
- Remove the protective film from the LCD. This film is in place to protect the LCD during shipment.

Before using the CT-X for the first time, do the following:

- Turn the unit on and verify it is operating properly by navigating through a few menus.

NOTE:

For additional information about CT-X options and services, contact your local VIAVI representative or visit www.viavisolutions.com.

1

Quick Tour

This chapter provides an overview of the unit, status indicators, connectors, and user interface, including the following:

- "About the CT-X" on page 14
- "Features" on page 14
- "A guided tour of your CT-X" on page 15
- "Navigating the menus" on page 17

About the CT-X

With the ability to generate up to 4 simultaneous tagged carriers to fit anywhere in the channel lineup, the CT-X provides unprecedented leakage detection coverage.

The CT-X generates a revolutionary new tag signal used in conjunction with the Seeker X detector to find leaks that other systems miss. The improved leakage sensitivity and positive leak detection allows more thorough and accurate coverage of your plant in driveout testing and much more efficient find and fix processes for techs in the field.

The CT-X also generates Seeker D-compatible tags which allow the CT-X to work with the Seeker X, Seeker D, and Seeker D Lite detectors. This allows operators to utilize the new Seeker X and existing detectors using a single CT-X transmitter.

When several CATV systems operate in the same area, it is often difficult to determine which system is the source of a detected leak. The CT-X is designed to deal with the problem of leakage identification in overbuilt situations.

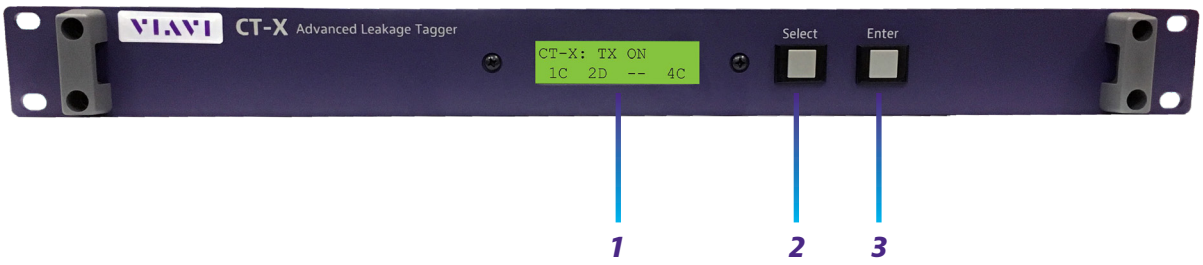
Whether using the push-button front panel or web interface, the CT-X is very simple and quick to install where RF signals reside in the headend. The CT-X is simply installed in a rack location near the combiner and requires only 1RU of rack space.

Features

- Find more leaks faster and eliminate false detects with revolutionary new tag
- Enable complete channel lineup flexibility from 130-1220 MHz with full-band frequency agility
- Provide full spectrum coverage with up to 4 tags in 1RU chassis
- Non-interfering tag technology does not impact services
- Integrated web interface enables remote setup and simplified administration

A guided tour of your CT-X

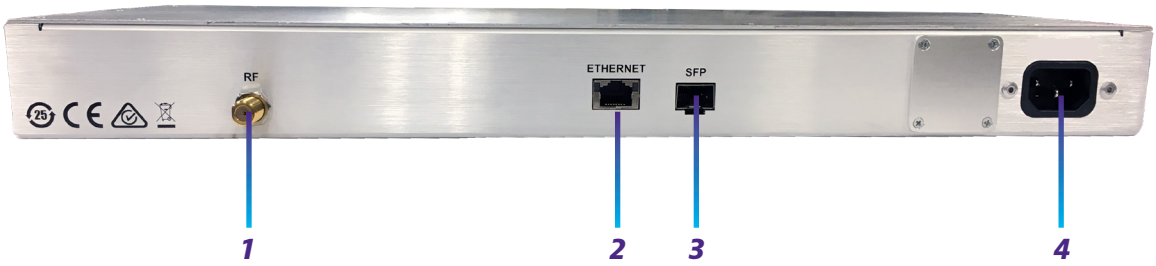
Front view



1. **Display screen** – Displays the setup and operational status. Most of the setup can be adjusted here using the front panel.
2. **Select** – Scrolls through the main menus, scrolls through the options in the submenus, and adjusts settings.
3. **Enter** – Enters the menus/submenus and selects options to adjust settings

Rear view

AC power model



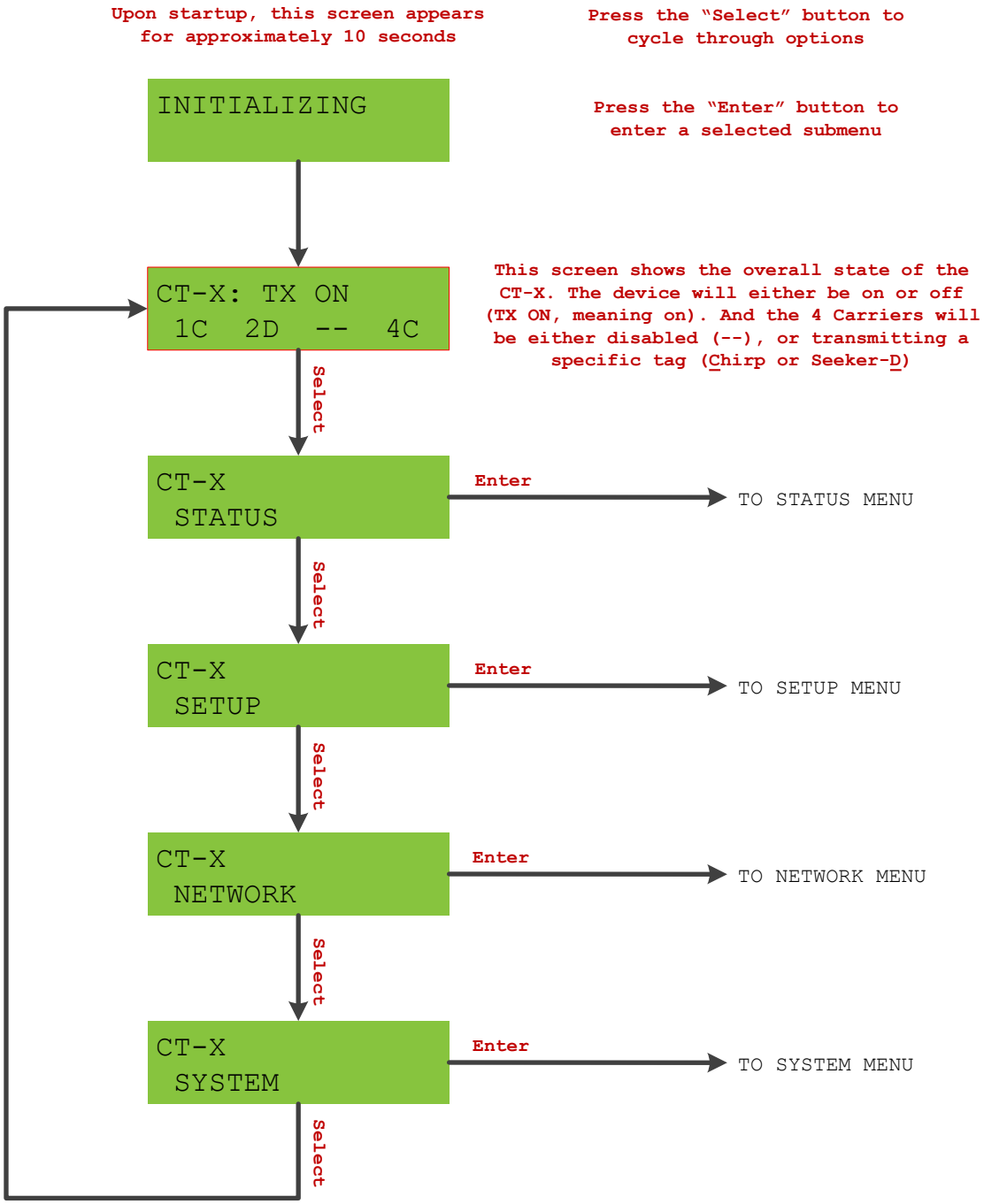
1. **RF output**
2. **Ethernet** – Used to remotely configure the unit and update firmware through your network
3. **SFP** – SFP optical port
4. **AC power input**

DC power model

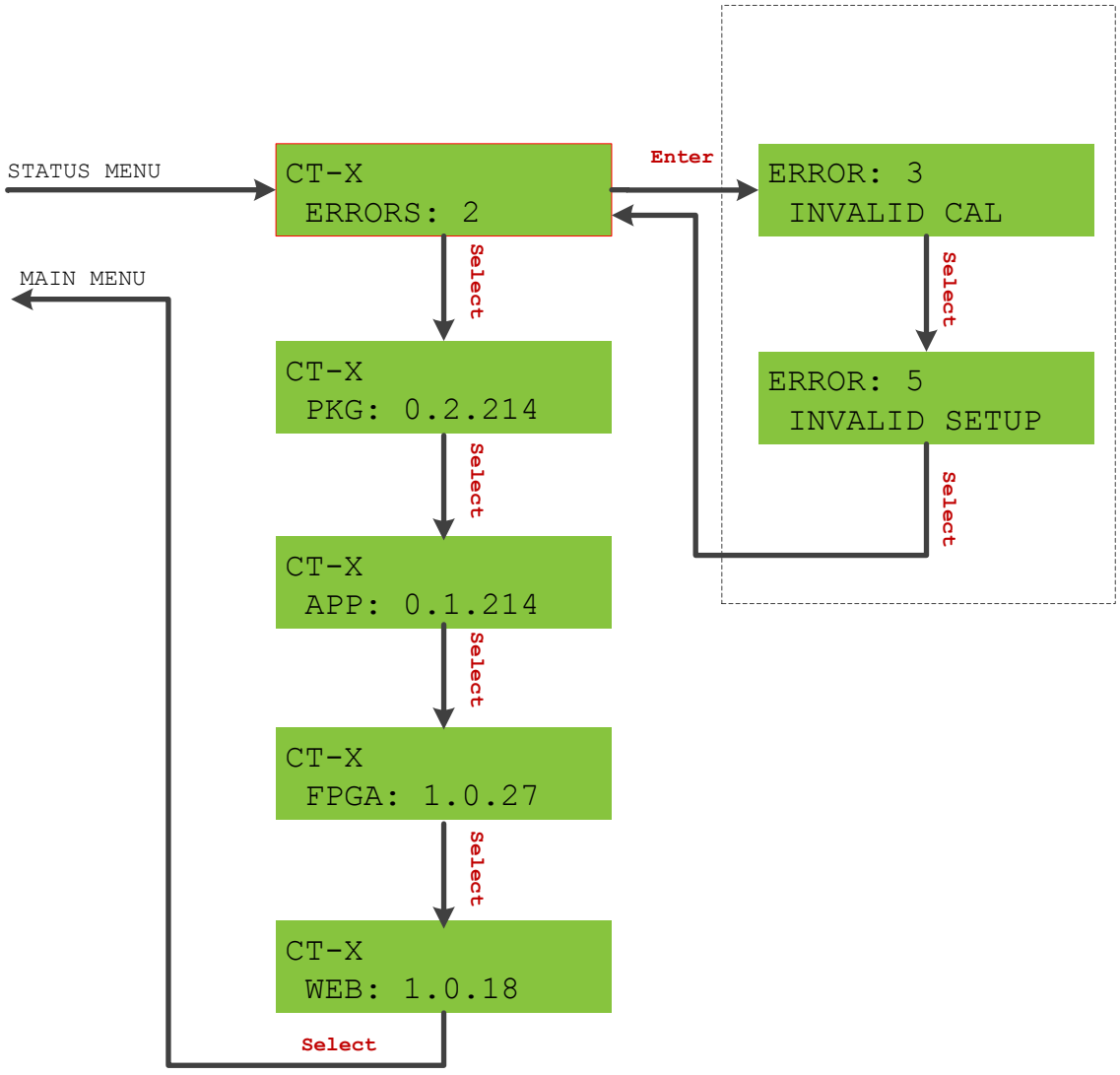
Navigating the menus

The following sections show how to navigate the menus on the CT-X.

Main menu



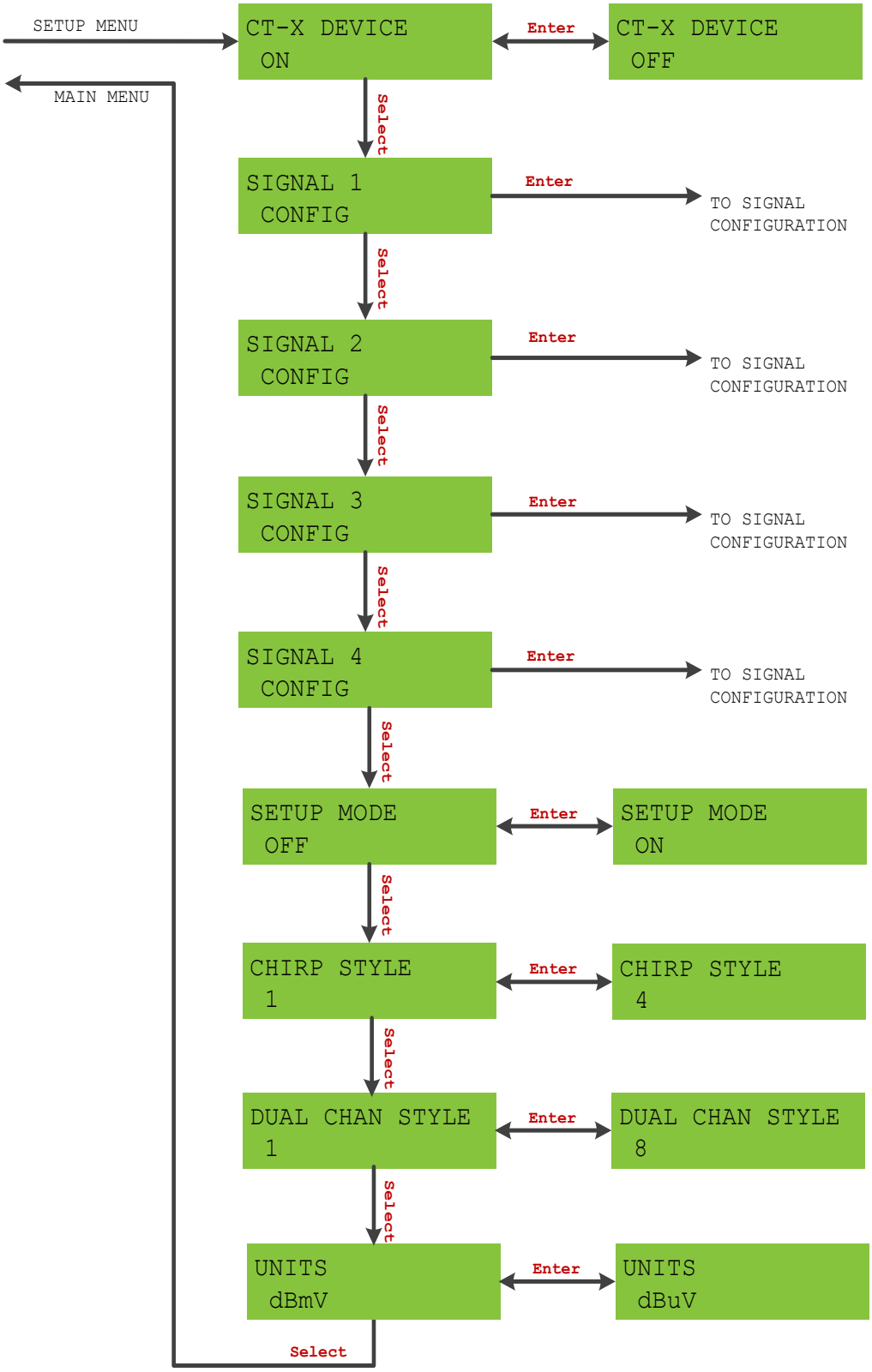
Status menu



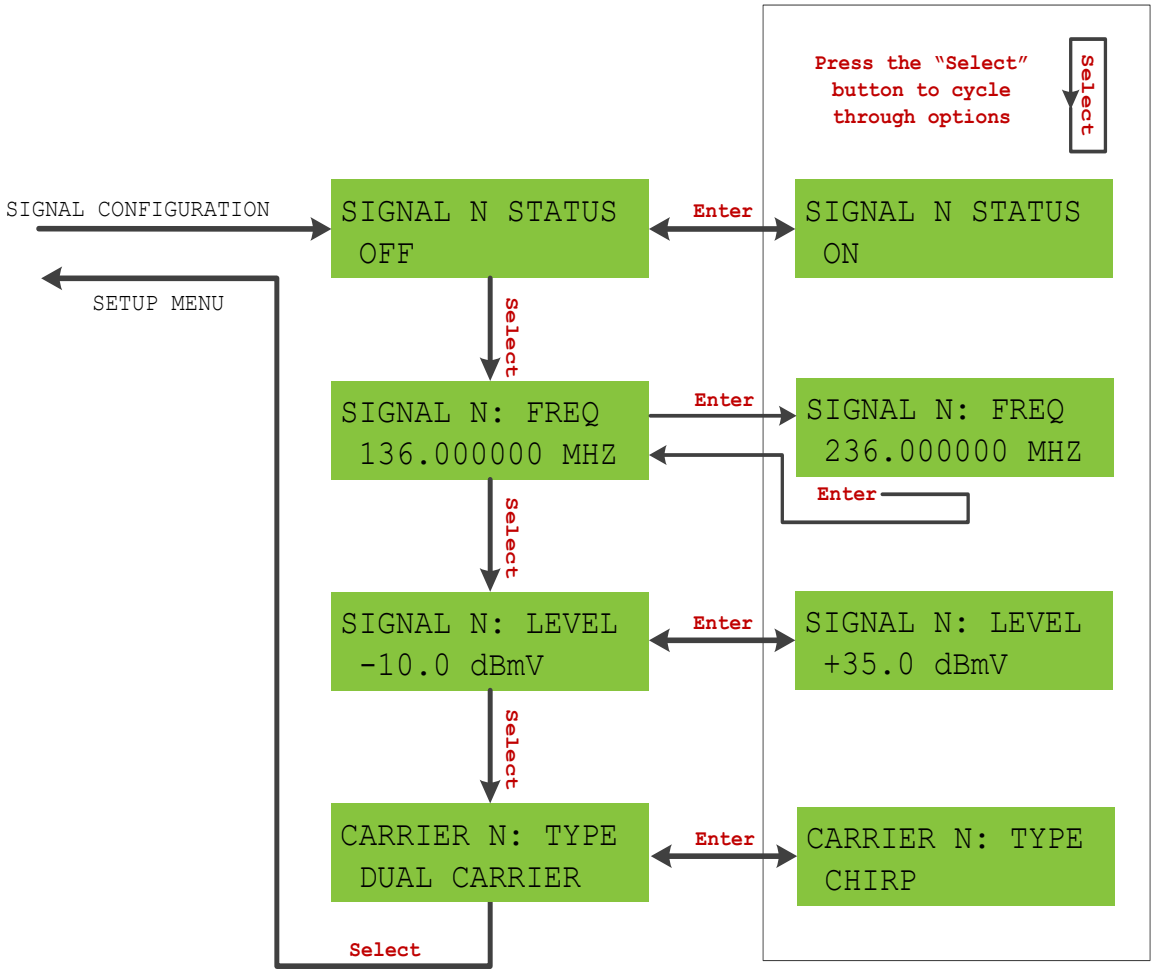
NOTE:

To change a setting in the menus, select ENTER to edit a setting, use SELECT to toggle the setting, and then press ENTER to confirm and exit.

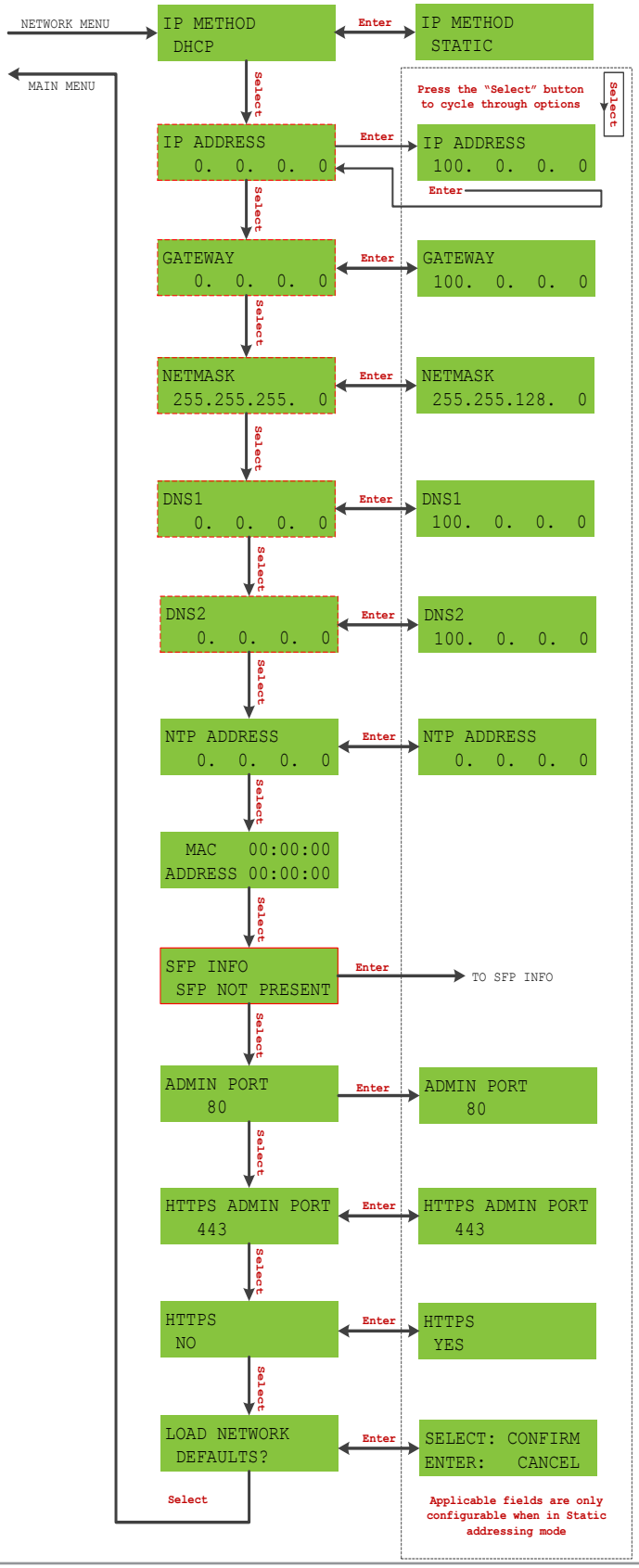
Setup menu


SETUP MENU
CT-X DEVICE ON
Enter
CT-X DEVICE OFF
MAIN MENU
Select
SIGNAL 1 CONFIG
Enter
TO SIGNAL CONFIGURATION
Select
SIGNAL 2 CONFIG
Enter
TO SIGNAL CONFIGURATION
Select
SIGNAL 3 CONFIG
Enter
TO SIGNAL CONFIGURATION
Select
SIGNAL 4 CONFIG
Enter
TO SIGNAL CONFIGURATION
Select
SETUP MODE OFF
Enter
SETUP MODE ON
Select
CHIRP STYLE 1
Enter
CHIRP STYLE 4
Select
DUAL CHAN STYLE 1
Enter
DUAL CHAN STYLE 8
Select
UNITS dBmV
Enter
UNITS dBuV
Select

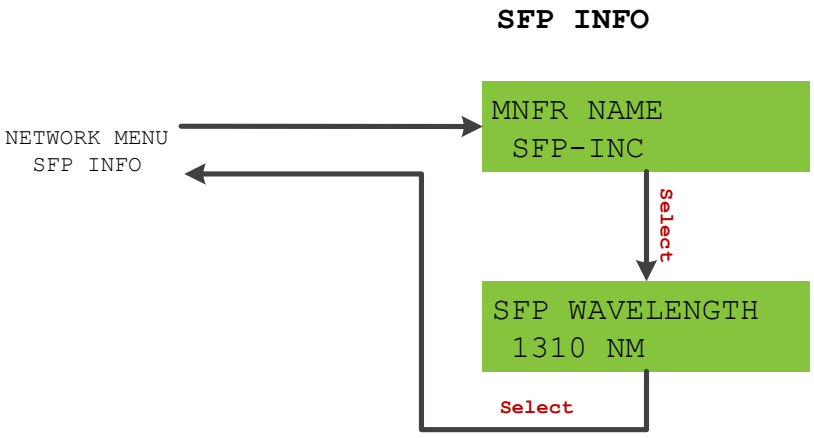
Signal configuration



Network menu

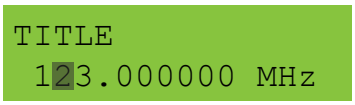


SFP info



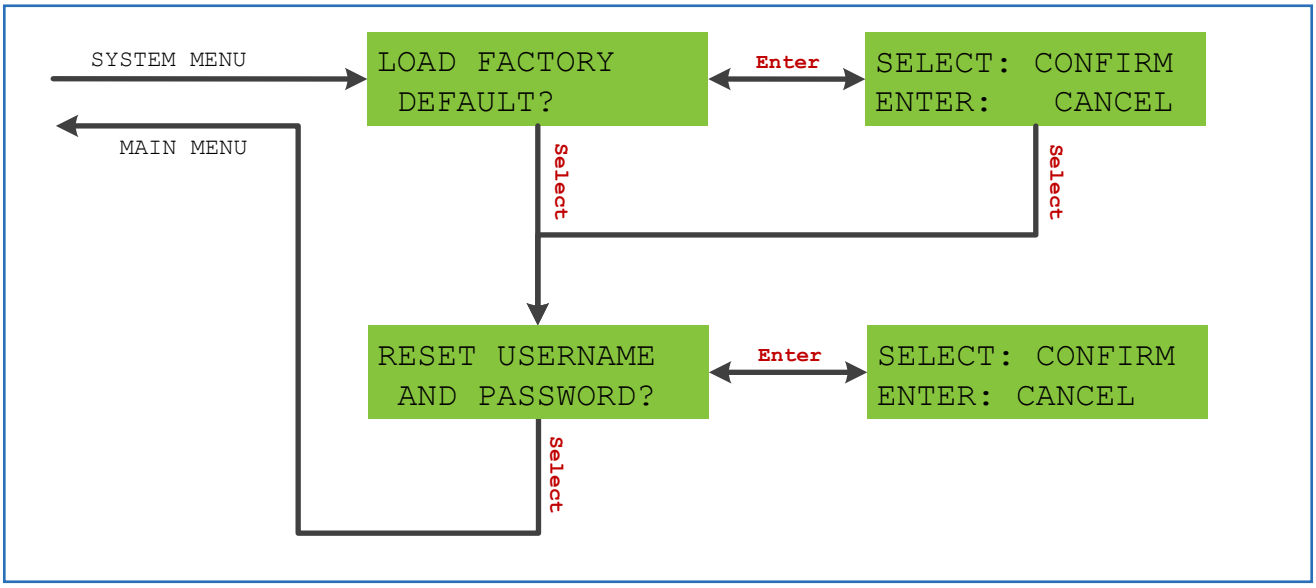
General notes

A value being edited will flash. “Select” will change the value and “Enter” will accept the value.



Some information will be periodically refreshed on-screen due to changes.
(ex. IP address is pulled while looking at the IP address screen)
These “live update” pieces will be outlined in red, as shown below

System menu


SYSTEM MENU
LOAD FACTORY DEFAULT?
Enter
SELECT: CONFIRM ENTER: CANCEL
MAIN MENU
Select
Select
RESET USERNAME AND PASSWORD?
Enter
SELECT: CONFIRM ENTER: CANCEL
Select

2

Setting up Your CT-X

This chapter provides an overview of how to configure and operate the unit, including the following:

- "CT-X setup" on page 26
- "Setting up your CT-X" on page 29
- "Remotely configuring your CT-X" on page 36

CT-X setup

The CT-X injects a proprietary modulated or dual CW carrier tag across the entire downstream bandwidth in up to 4 locations (up to 4 signature tags with the proprietary modulated signal and 8 with the dual CW tag).

Each frequency can be independently enabled, which provides the ability to monitor any of the signals simultaneously or each one individually. These carriers are injected between channels in the guard band so as not to cause interference to the adjacent channels.

As an example, when using a standard SCTE channel lineup and you have a mix of Seeker Ds and Seeker Xs, we recommend two of the four leakage carriers be injected into the system at 138 MHz and 612 MHz, which is the guard band between the channels that reside on either side of those two frequencies.

Ideally, you want a good mix of low, mid, high, and ultra high frequencies to provide good coverage across the start and stop frequencies of your channel lineup.

In all cases, the two carriers should be injected in the guard band between QAMs or analog carriers based on which type of channel resides at each frequency.

Overview

Over the next few pages, we'll cover each of the following steps:

- Locating positions for signals between channels
- Measuring metrics of adjacent channels prior to injecting signals
- Injecting signals at recommended offset from adjacent channels
- Measuring metrics of adjacent channels to assure an acceptable MER
- Adjusting signals as needed to remove any impairment on signals
- Recording final signal offsets for use in Seeker configuration

Required equipment

You'll need the following equipment to configure the CT-X for your plant:

- Instrument capable of channel performance measurements, such as:
  - Digital channel power
  - MER
  - BER
- Spectrum analyzer for level measurements, equipped with DTV analyzer:
  - BW of 1220 MHz
  - RBW of 10 kHz minimum, 30 Hz preferred

Locating positions for signals

When determining signal locations in the spectrum, you should take the following into consideration:

- Is the frequency being considered already in use by any local broadcasters (or other off-air signal sources such as LTE cellular, etc.)?

  If yes, it is best to avoid these regions as the meter will either not see the signal of the CT-X, or sensitivity will be compromised. Generally, the further away from such signals the better.

- Signals must be inserted directly between channels, not anywhere in their bandwidth
- Will Seeker D meters be using the CT-X signals?

  If yes, a signal location(s) is needed in their usable frequency range (135–139 MHz and/or 610.5–615 MHz)

- Will an OFDM channel be used for leakage detection?

  If yes, note the following: PLC location in MHz, subchannel spacing in KHz, and cyclic prefix in µs for use in setting up the Seeker X meter.

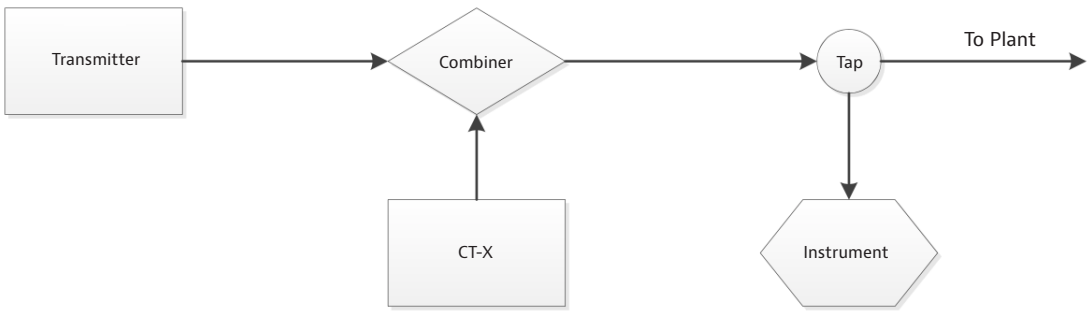
  No CT-X settings are required for DOCSIS 3.1 OFDM leakage measurements.

- Spread remaining signals across the spectrum used by the channel plan to assure good coverage and eliminate ingress near the most important channels in the lineup

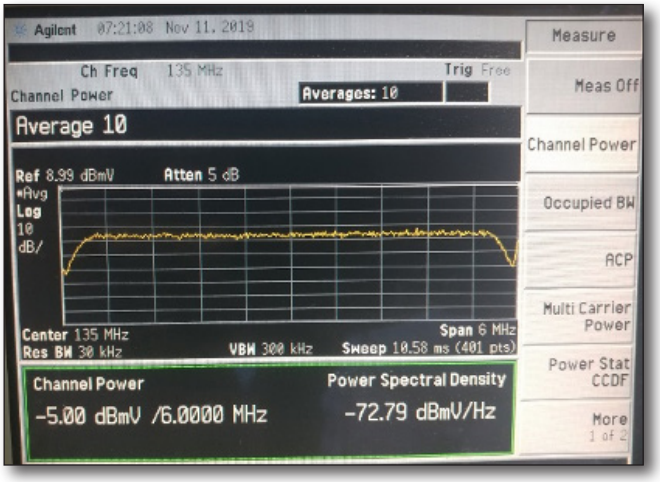
Measuring metrics of adjacent channels

A signal is meant to be transmitted at a high enough level to be detectable but low enough that it does not interfere with the signals on one or both sides of the carrier. These two opposing requirements create an optimal level for the signal to be transmitted at. This process is on a per-signal basis, so each signal will need to go through this process.

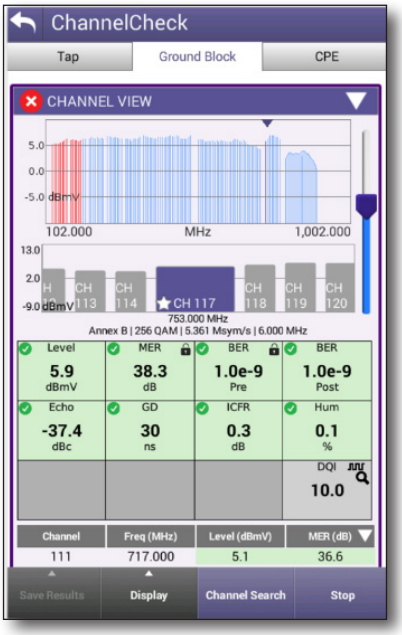
To find the optimal level, we will first need the adjacent power level of channels on either side. Use the instrument to measure these metrics. Note that the channels should be measured after the plant is combined with the output of the CT-X:



All measurements taken will have an unknown amount of loss between the transmitters (plant and CT-X) and the instrument, so all adjustments will be made to balance the two signal sources relative to each other.



Agilent E4402B Spectrum Analyzer – Channel power measurement



ONX-620 – Level & MER measurement

Note that any cable and equipment between the CT-X and your instrument will affect the absolute level you measure for the CT-X. In this case, we are concerned primarily with the relative level of the signal, so there will be an unknown offset that will need to be adjusted for. To set the level, you can do one of the following:

- Estimate the loss and factor into your calculated level at the instrument

  OR

- Transmit at a low level and measure the needed increase

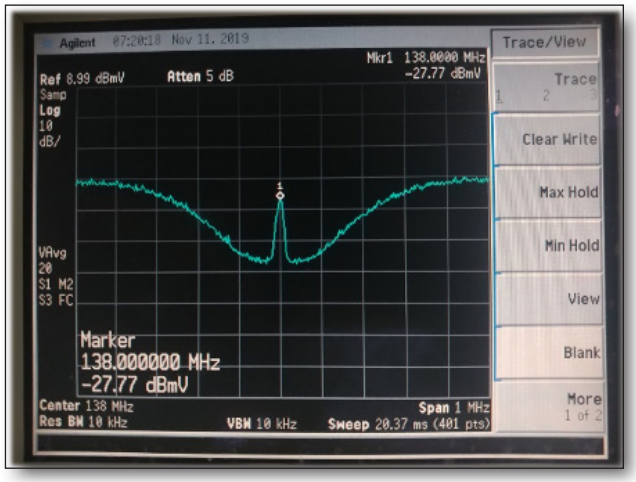
Setting up your CT-X

In this section, we'll configure the CT-X to transmit the signals at their appropriate frequencies and at recommended levels.

You can use a spectrum analyzer to iteratively set the levels of each signal at their appropriate levels.

To change a setting in the menus, select **ENTER** to edit a setting, use **SELECT** to toggle the setting, and then press **ENTER** to confirm and exit.

Once you have the network settings configured and have an IP address for your CT-X, you can set it up remotely. See *"Ethernet setup" on page 34* and *"Remotely configuring your CT-X" on page 36*.



Agilent E4402B SA – Tag level measurement

1. Connect a spectrum analyzer to the test port of the combiner that the plant RF and the CT-X output are connected to.
2. From the front panel of the CT-X, navigate to the **CT-X SETUP** menu.
3. Select the **CT-4 DEVICE** menu, and enable the device by selecting **ON**.
4. Next, configure your signals. You can configure global or individual signals.
    - For global signals, navigate to the **SETUP MODE** menu and select **ON**. This turns all tags into CWs for ease of use with mid-grade spectrum analyzers.
    - For individual signals, navigate to the desired **SIGNAL # CONFIG** (1-4) menu. Select **ON** to enable the signal, then set the following in the submenus:

        Frequency – Frequency setting for tag. Exclusion zones apply

        Level – Output level. -10–35 dBmV or 50–85 dBµV

        Carrier Type – Dual CW or Chirp
5. Navigate to the **CHIRP STYLE** menu and choose the style (1-4).
6. Navigate to the **DUAL CHAN STYLE** menu and choose the channel style (1-8). This sets the spacing between each pair of dual carriers that matches the settings of the Seeker D or Seeker X leakage detectors in the field.
    - **1** – Sets the spacing to 156.25 Hz
    - **2** – Sets the spacing to 625 Hz
    - **3** – Sets the spacing to 312.5 Hz
    - **4** – Sets the spacing to 468.75 Hz
    - **5** – Sets the spacing to 781.25 Hz

- **6** – Sets the spacing to 937.5 Hz
- **7** – Sets the spacing to 1093.75 Hz
- **8** – Sets the spacing to 1250 Hz

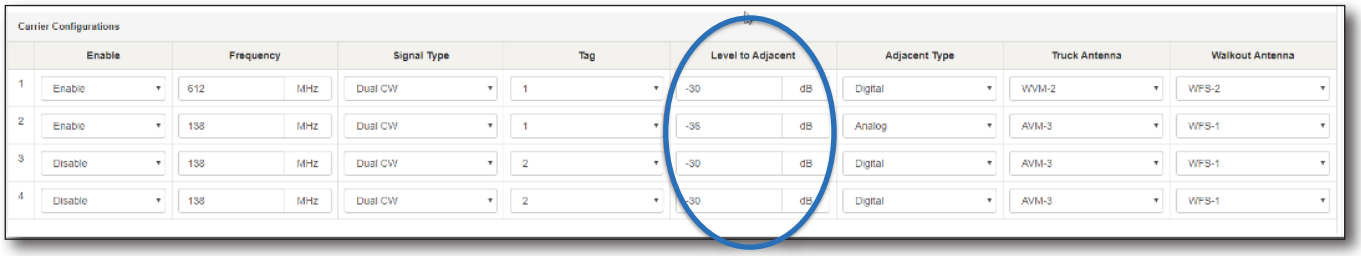
7. Navigate to the **UNITS** menu and select the units (dBmV or dBµV).
8. Repeat these steps as necessary until all the signals are configured.

Measuring adjacent channels

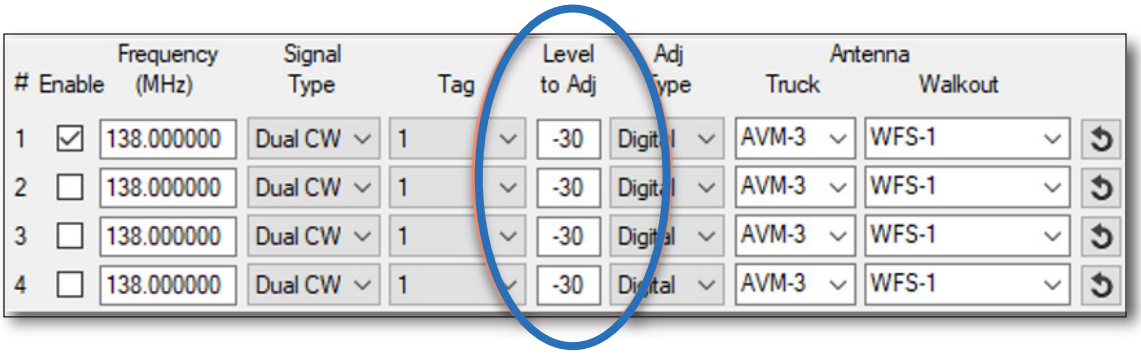
To ensure that the signals are not interfering with the channels nearest them, repeat the measurement of the adjacent channels MER and compare to the original measurements.

NOTE:

These values must be rounded up to the nearest whole dB and will be entered into either of the setup venues for the Seeker X).



StrataSync – Level to adjacent



Seeker Setup – Level to adjacent

Example tag setup

Choosing signal locations

There is a large quantity of Seeker D units deployed already, so we will put a dual CW tag at 138 MHz to support that group. There is also an OFDM channel from 810 to 906 MHz and that's the highest frequency the plant generates, so we will put 3 Chirp tags at the following frequencies:

- 384 MHz
- 540 MHz
- 750 MHz

NOTE:

The Seeker X is only capable of measuring 4 frequencies at a time during drive out monitoring.

If 2 Seeker D frequencies and the OFDM PLC is used, only one of the above frequencies would be useable, so you may only want to set up 3 total frequencies in addition to the OFDM.

Otherwise, you can set them all up and rotate your monitoring frequencies over time.

NOTE:

When choosing signal locations, make sure there are no high-power broadcasts that will be effectively "on top" of your desired signal location.

This could result in either compromised sensitivity or the inability to see leakage at these frequencies, altogether.

Measuring adjacent channels

The channels adjacent to the soon-to-be-enabled signals were measured and the data is reflected below.

	Left channel			Signal	Right channel		
ID	Power (dBmV)	MER (dB)	Freq (MHz)	Freq (MHz)	Power (dBmV)	MER (dB)	Freq (MHz)
1	25.4	34.9	135	138	25.9	35.1	141
2	26.0	34.9	381	384	---	---	---
3	26.2	---	531	540	---	---	---
4	---	---	---	750	25.3	38.4	753

1) Signals 2 and 4 only had one adjacent channel. That channel will be used for proving no interference.

2) Signal 3 had no adjacent channels, so we will use the closest channel but skip the interference check.

NOTE:

If a signal is set up without any adjacent signals, and at a later time additional signals are placed into the channel lineup that become adjacent, it will be necessary to re-run the MER measurement as if it were there to begin with.

Injecting signals

Based off the cable length, tap, and rated combiner loss, we expect there to be around 16 dB of loss between the CT-X and where we are measuring. From this, the following parameters are calculated:

- Desired level measured at instrument for each signal
- Expected level setting at CT-X to achieve the above

Sig ID	Tag type	Sig offset (dBc)	Adj chan lvl (dBmV)	Sig level (dBmV)	Sys loss (dB)	Sig level setting (dBmV)
1	Dual CW	-30	25.4	**-4.6**	16	**11.4**
2	Chirp	-24	26	**2**	16	**18**
3	Chirp	-24	26.2	**2.2**	16	**18.2**
4	Chirp	-24	25.3	**1.3**	16	**17.3**

The CT-X was configured to transmit in Setup mode and the output was configured as chosen above. Once the configuration was applied, the level of each signal was measured and compared to the values we wanted to see:

Sig ID	Tag type	Desired level (dBmV)	Measured level (dBmV)	Error (dB)	Old setting (dBmV)	New setting (dBmV)
1	Dual CW	-4.6	-4	-0.6	11.4	**10.8**
2	Chirp	2	2.5	-0.5	18	**17.5**
3	Chirp	2.2	2.6	-0.4	18.2	**17.8**
4	Chirp	1.3	1.6	-0.3	17.3	**17**

The levels were slightly off, so we calculated the error and adjusted the CT-X to compensate for the difference. Upon remeasuring, the signals were at the desired level.

Remeasuring adjacent channels

To make sure we did not impair any adjacent channels, we will re-measure the adjacent channels to make sure nothing was impaired.

First however, we must disable Setup mode to put the CT-X in its final transmit mode.

Ethernet setup

The **CT-X NETWORK** menu is used to adjust the Ethernet settings of the CT-X and for configuration through the web interface.

To change a setting in the menus, select **ENTER** to edit a setting, use **SELECT** to toggle the setting, and then press **ENTER** to confirm and exit.

1. From the front panel of the CT-X, navigate to the **CT-X NETWORK** menu.
2. Select the **IP METHOD** menu and select **DHCP** or **STATIC**.
    - If **DHCP** is selected, you can continue navigating through the Ethernet settings screens to view the network information that is assigned by the DHCP server.
    - If **STATIC** is selected, you can adjust the following Ethernet settings:

        IP ADDRESS – Enter the IP address from this menu

        GATEWAY – Enter the gateway address from this menu

        NETMASK – Enter the netmask address from this menu

        DNS1 – Enter the primary DNS address from this menu

        DNS2 – Enter the secondary DNS address from this menu

        NTP ADDRESS – Enter the NTP address from this menu
3. Navigate to the **MAC ADDRESS** menu to view the MAC address.
4. For SFP setup, navigate to the **SFP INFO** menu and enter the manufacturer name and wavelength in the submenus.
5. Navigate to the **ADMIN PORT** menu and enter the desired admin port. The default is 80.
6. Navigate to the **HTTPS ADMIN PORT** menu and enter the desired admin port. The default is 443.
7. To enable HTTPS secure connections, navigate to the **HTTPS** menu and select **YES**.
8. Navigate to the **LOAD NETWORK DEFAULTS?** menu to restore the default Ethernet settings. Choose **SELECT** to confirm.

System menu

The **CT-X SYSTEM** menu is used to reset the CT-X unit to factory defaults and reset the user name and password.

To change a setting in the menus, select **ENTER** to edit a setting, use **SELECT** to toggle the setting, and then press **ENTER** to confirm and exit.

1. From the front panel of the CT-X, navigate to the **CT-X SYSTEM** menu.
2. To reset the CT-X settings to factory default, select **LOAD FACTORY DEFAULTS?** Choose **SELECT** to confirm.
3. To reset the user name and password, select **RESET USER NAME AND PASSWORD?** Choose **SELECT** to confirm. The password will be reset to “admin”.

Status menu

The **CT-X STATUS** menu allows you to see the application version information as well as any errors.

From the front panel of the CT-X, navigate to the **CT-X STATUS** menu, and view the status from the following submenus:

ERRORS – Shows any errors, invalid calibration or setup

PKG – Shows the package version number

APP – Shows the application version number

FPGA – Shows the FPGA version number

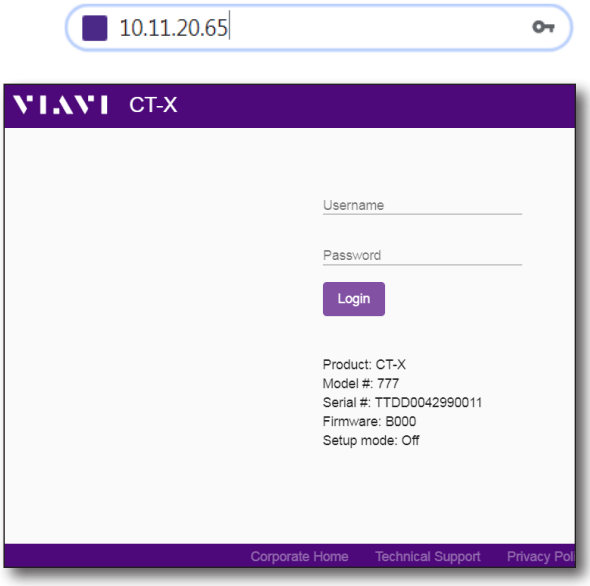
WEB – Shows the web interface version number

Remotely configuring your CT-X

Once you have your network set up through the front panel of the CT-X and you have an IP address, you can use the web interface to easily configure the unit remotely.

Logging in to the CT-X

First, use the front panel to find the IP address of your CT-X. Navigate to the **CT-X NETWORK** menu, then navigate to the **IP ADDRESS** menu and note the address.



Next, type the IP address into the browser on your computer and press return to bring up the CT-X web login screen.

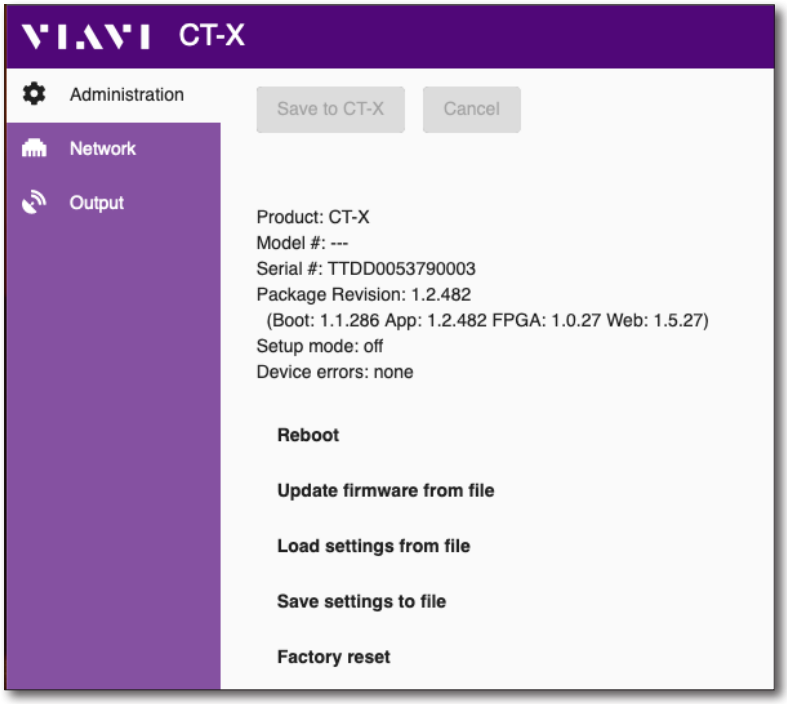
Enter your Username and Password, then select the **Login** button.

The default login for a new install is:

Username: admin

Password: admin

The CT-X **Admininstration menu** will be displayed.



CT-X Administration menu

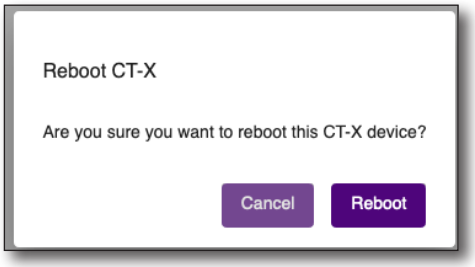
Administration menu

From the **Administration menu**, you can do several advanced admin features, including:

- Rebooting the unit
- Updating the firmware
- Loading settings from a file
- Saving settings to a file
- Resetting the unit to factory defaults

Rebooting the unit

Select **Reboot** to reboot the CT-X. A pop-up asks you to confirm, click **Reboot** again and the device will restart.



Updating the firmware

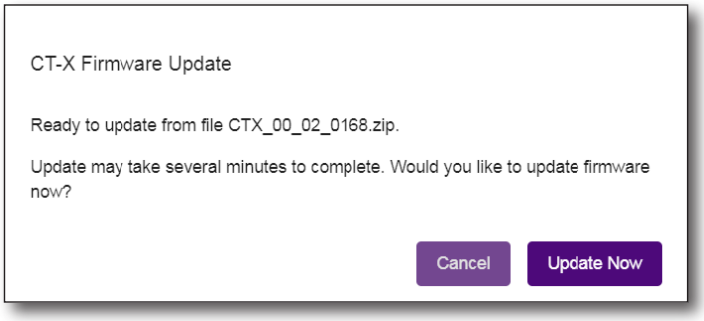
If you have a firmware file from VIAVI, you can update your unit.

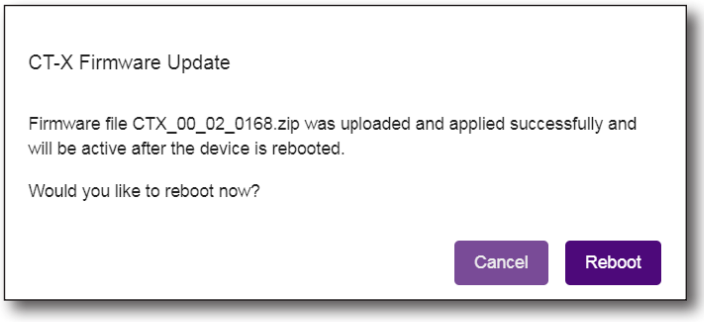
Select **Update firmware from file,** then select the firmware file on your computer.

Select **Update Now** from the pop-up. The update process could take several minutes.

When finished, a pop-up will confirm the update was successful and ask if you want to reboot the unit.

Select **Reboot** to confirm.



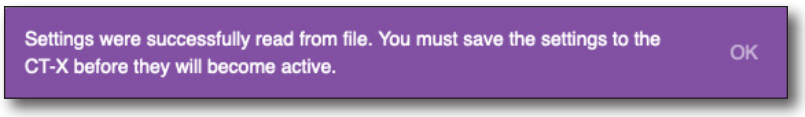


Loading settings

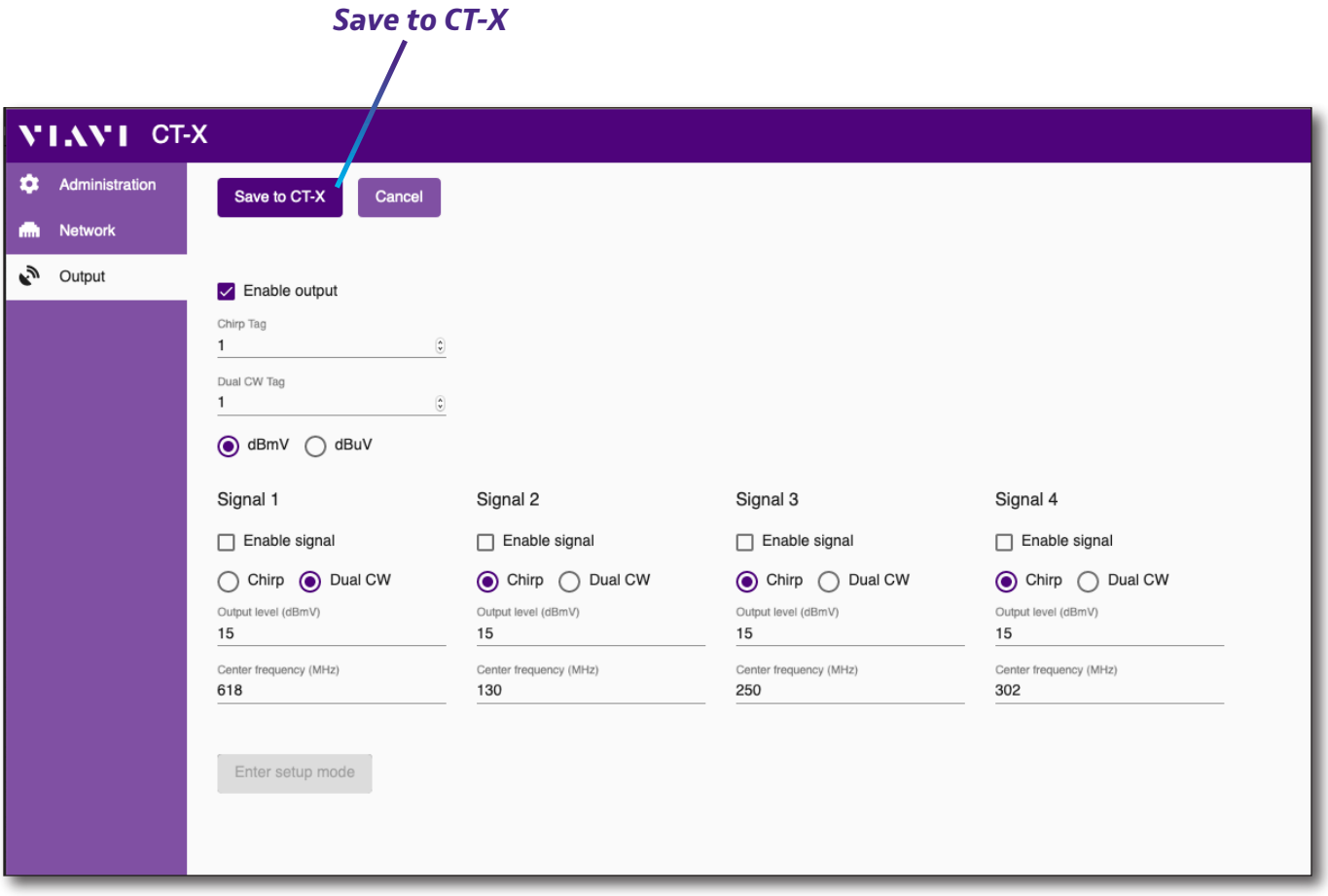
If you have a settings file from VIAVI or from another unit, you can load the settings to your CT-X.

Select **Load settings from file,** then select the settings file on your computer.

A pop-up confirms the settings were loaded and that you need to save the settings to the CT-X.



Select the **Output** tab to bring up the Output menu, then select the **Enable output** checkbox and click **Save to CT-X** at the top. The settings will be saved to the CT-X.



CT-X Output menu

NOTE:

Save to CT-X may be grayed out if the settings you are importing are the same as the current settings on the CT-X.

You only need to save if the settings are new.

Saving settings

You can copy the settings from one CT-X unit to another.

Select **Save settings to file,** then navigate where you want to save the file on your computer.

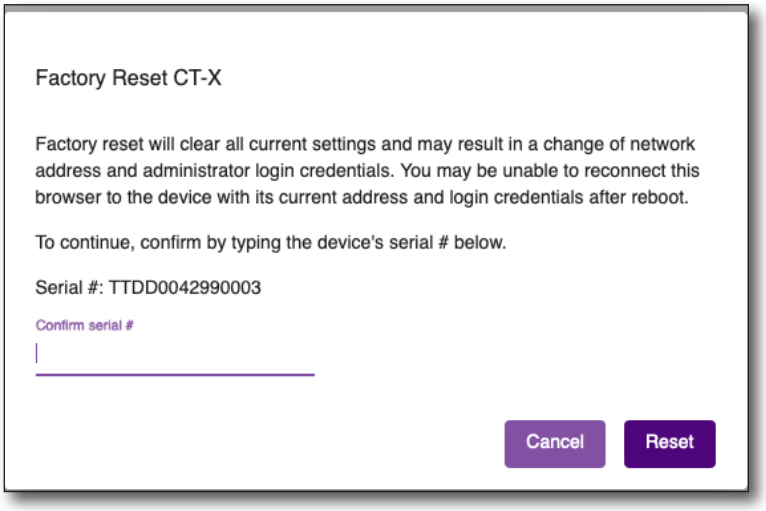
Resetting the factory defaults

You can reset the unit to factory defaults, including all currents settings, network address, and login information.

Select **Factory reset.** A pop-up asks you to confirm.

Please note the warning that you may not be able to connect to the unit through the browser once it is reset.

Enter the serial number of the unit and select **Reset**. The unit is reset to factory defaults.



Network menu

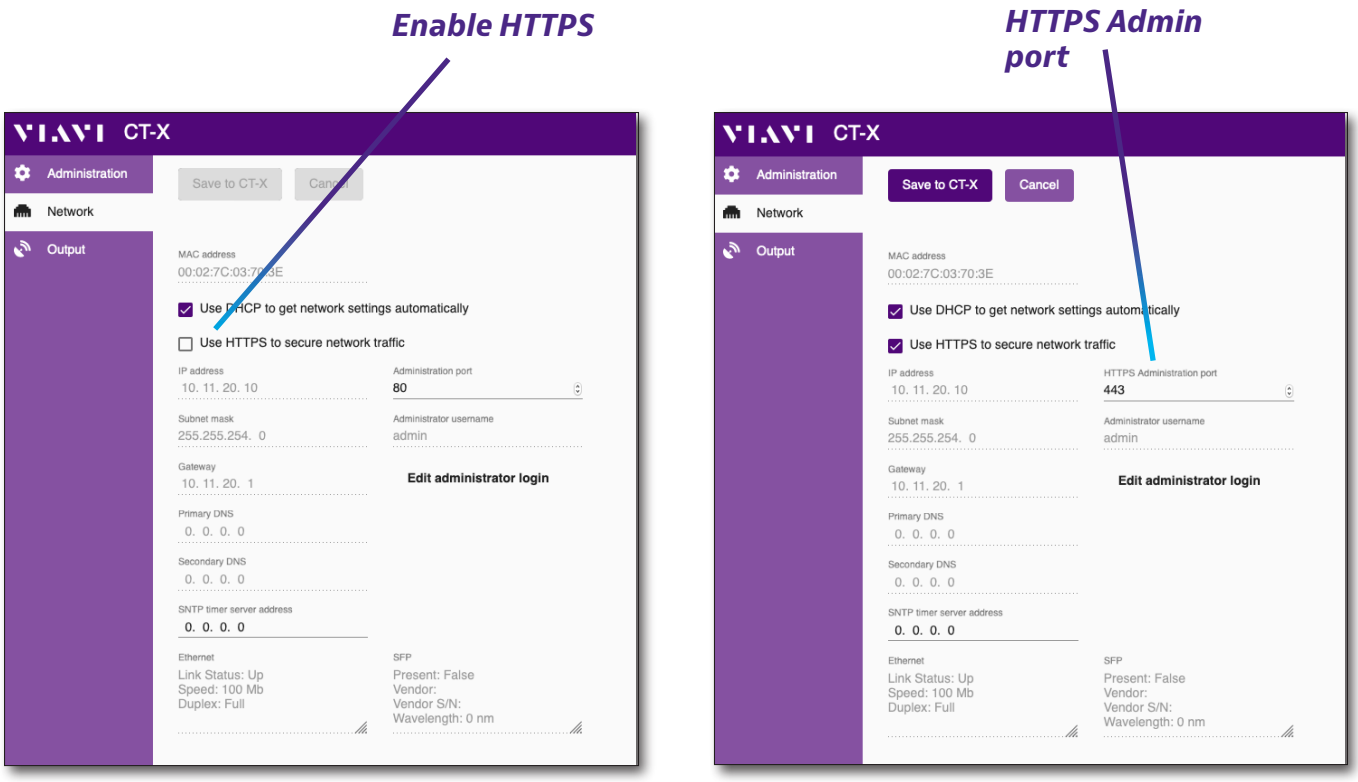
From the **Network** menu you can set up the Ethernet and SFP settings similarly to how you configure them from the front panel. You can also change the login information. See *"Ethernet setup" on page 34* for more information.

Select the **Network** tab to bring up the Network menu.

Using HTTPS to secure network traffic

Select **Use HTTPS to secure network traffic** and enter the port number in the **HTTPS Administration port** area. The default is 443.

When finished, click **Save to CT-X** at the top. The settings will be saved to the CT-X.

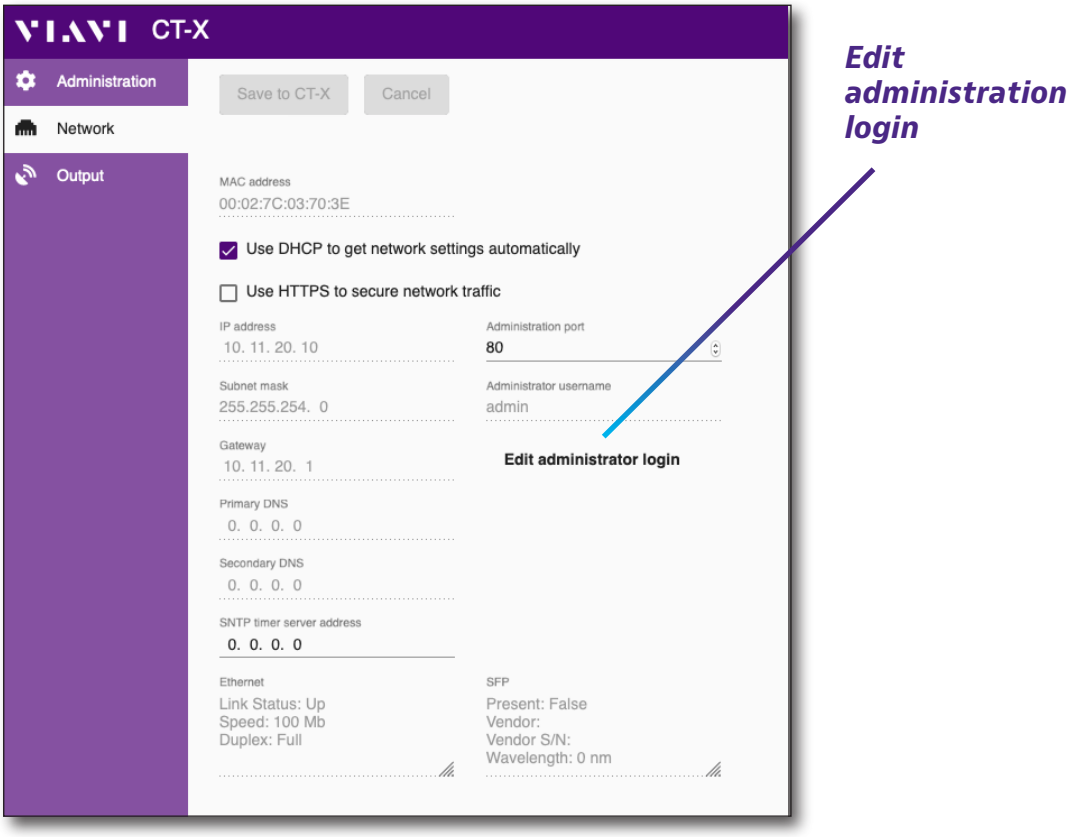


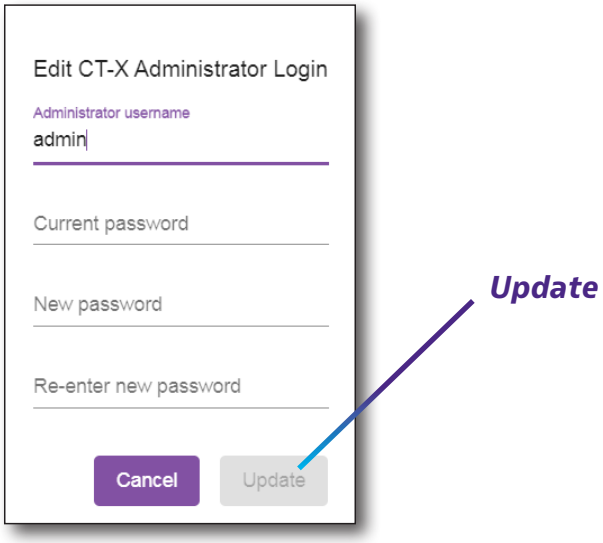
CT-X Network menu

Resetting the login information

Select **Edit administrator login** and enter the new user name and password.

When finished, select **Update** to confirm. You will need to log in again with the new password.



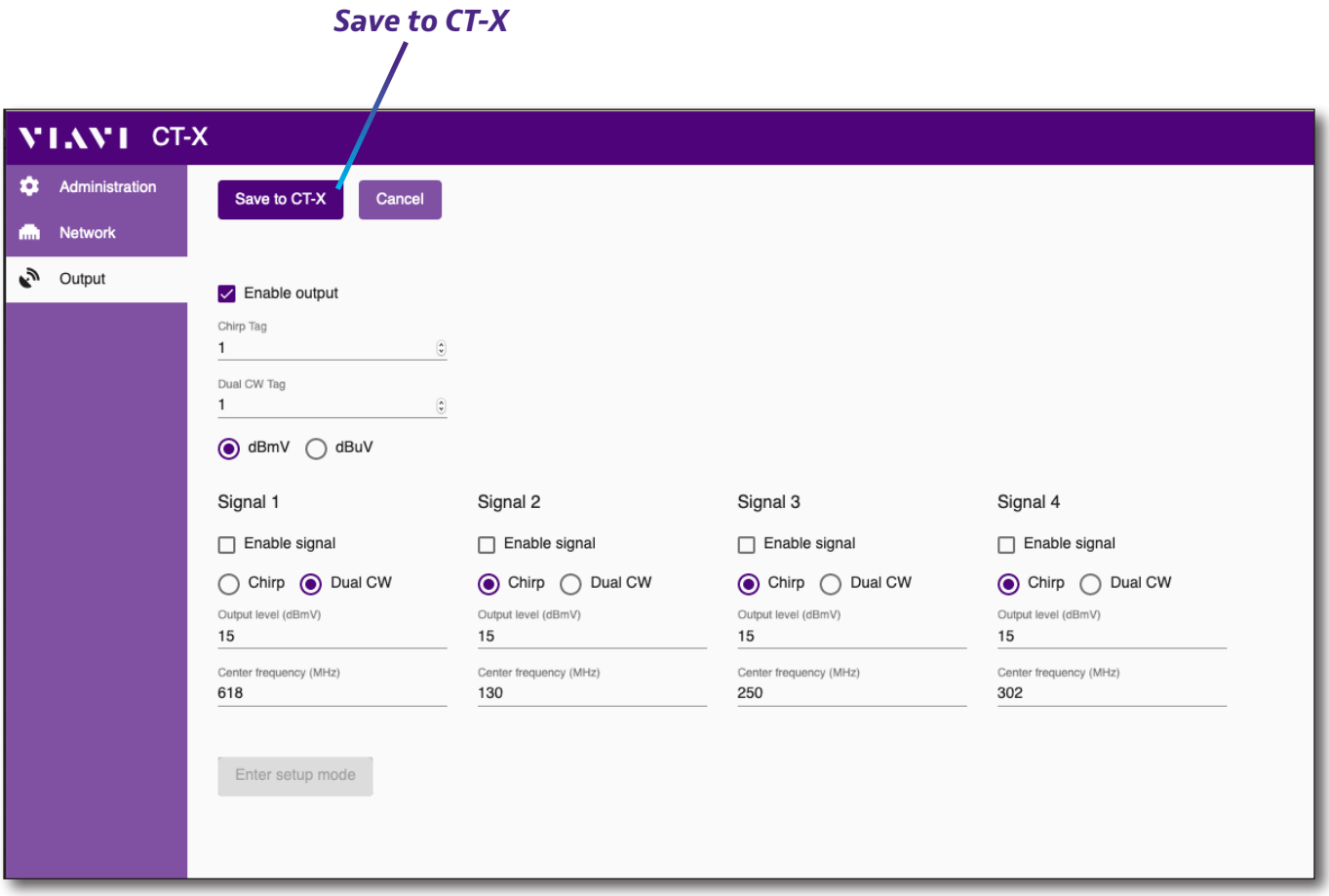


Output menu

From the **Output** menu you can easily configure the tags, similarly to how you configure them from the front panel. See *"Setting up your CT-X" on page 29* for more information.

Select the **Output** tab to bring up the Output menu. Adjust the settings as needed.

When finished, select the **Enable output** checkbox and click **Save to CT-X** at the top. The settings will be saved to the CT-X.



CT-X Output menu

3

Appendix

This appendix includes troubleshooting and supplemental information, including the following:

- “Specifications” on page 44
- “Error messages” on page 45
- “Limited warranty” on page 46
- “Technical assistance” on page 46
- “Additional information” on page 46

Specifications

Output Impedance	75 Ω (nominal)
Controls	Front panel select and enter buttons and HTML web interface
Display	Two-line LCD, 16 characters per line
Communication	10/100/1000 Base-T Ethernet, SFP/SFP+ interface
Power	AC: 90 to 250 VAC, 47-60 Hz, 0.75 A
	DC: -40 to -54 VDC, 1.7 A
Operating Temperature	32 to 104° F (0 to 40° C)
Storage Temperature	-4 to 140° F (-20 to 60° C)

CT-X Operation Mode	
Compatibility	Seeker X, Seeker D, and Seeker D Lite leakage detectors
Carrier Types	Chirp and dual CW digital leakage carriers
Tag Signatures	Chirp carrier: 4 unique signatures Dual CW carrier: 8 unique signatures
Carrier Frequency	130–1220 MHz
Carrier Output Level	-10.00 to 35.00 dBmV, ±0.5 dB
Spurious Outputs	Typically -65 dBc below digital carrier[1]
Output Return Loss	> 12 dB from 50 to 1220 MHz

[1] Assuming typical setting of -30 dB below digital carrier power

Error messages

You may see the following error messages in the Status menu.

Some errors may be corrected through a power cycle or a software update. All other errors will require returning the device to the factory for repair.

Error message	Description
LVL CAL	Calibration file for level is missing
VCTCXO CAL	Calibration file for vctcxo is missing
FPGA FILE ERR	FPGA file missing/unable to load
FPGA CONFIG ERR	FPGA failed to receive image
PLL LOCK ERR	PLL failed to lock
DAC LINK ERR	DAC JESD204B link failed to initialize
CAL EXPIRED	Calibration is out of date

Limited warranty

For the latest warranty information, visit

https://www.viavisolutions.com/literature/viavi-solutions-inc-general-terms-en.pdf

https://www.viavisolutions.com/en-us/literature/viavi-manufacturer-warranty-nse-products-en.pdf

Technical assistance

If you require technical assistance, call 1-844-GO-VIAVI / 1.844.468.4284.

For the latest TAC information, visit
http://www.viavisolutions.com/en/services-and-support/support/technical-assistance

Additional information

For more detailed information, contact us at **Trilithic.support@viavisolutions.com** for these additional documents.

CT-X Installation Guide

LAW Software User's Guide

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English

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