InTemp® CX500 Series Temperature Logger Manual

InTemp
Monitoring Solutions

(CX503 model shown)

InTemp CX500 series loggers measure temperature in transportation monitoring applications. These Bluetooth® Low Energy-enabled loggers are designed for wireless communication with a mobile device and can be configured to monitor temperatures in Cold Chain, CRT, and Frozen shipments. CX500 series loggers, the InTemp app, and InTempConnect® web-based software work together to form the InTemp temperature monitoring solution. Using the InTemp app on your phone or tablet, you can configure CX series loggers and then download them to share and view logger reports, which include logged data, excursions, and alarm information. Or you can use InTempConnect to configure and download CX series loggers via the CX Gateway. The InTempVerify™ app is also available to easily download loggers and automatically upload reports to InTempConnect. Once logged data is uploaded to InTempConnect, you can view logger configurations, build custom reports, monitor trip information, and more. The CX500 series logger is available in a single-use 90-day model (CX502) or a multiple-use 365-day model (CX503).

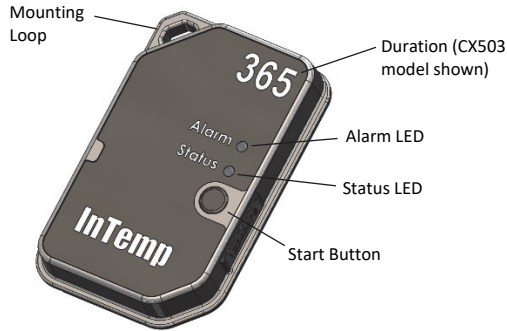## Specifications

InTemp CX500 Series Loggers

Models:

- CX502, 90-day logger, single use
- CX503, 365-day logger, multiple use

Required Items:

- InTemp app
- Device with iOS or Android™ and Bluetooth

Temperature Sensor

Range	-30° to 70°C (-22° to 158°F)
Accuracy	±1.0°C from -30° to -5°C (±1.8°F from -22° to 23°F)
	±0.5°C from -5° to 50°C (±0.9°F from 23° to 122°F)
	±1.0°C from 50° to 70°C (±1.8°F from 122° to 158°F)
Resolution	0.04°C (0.072°F)
Drift	<0.01°C (0.018°F) per year

Logger

Logger Operating Range	-30° to 70°C (-22° to 158°F)
Radio Power	1 mW (0 dBm)
Transmission Range	Approximately 30.5 m (100 ft) line-of-sight
Wireless Data Standard	Bluetooth Low Energy (Bluetooth Smart)
Type	CX502: Single use; CX503: Multiple Use
Duration	CX502: 90 days; CX503: Up to 1 year
Shelf Life	Up to 1 year
Logging Rate	1 second to 18 hours
Time Accuracy	±1 minute per month at 25°C (77°F)
Battery	CR2450 3V lithium, not replaceable. Battery for CX502 lasts for duration specified when logger is used within the 1-year shelf life. Battery life for the CX503 model is 1 year, typical with logging interval of 1 minute. Faster logging intervals, remaining connected with the InTemp app, excessive downloads, and paging may impact battery life.
Memory	14,000 measurements
Full Memory Download Time	Approximately 30 seconds; may take longer the farther the device is from the logger
Dimensions	6.9 x 4.5 x 1.1 cm (2.71 x 1.76 x 0.42 inches)
Weight	25.5 g (0.90 oz)
Environmental Rating	IP67
CE	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).
FC	See last page

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Logger Components and Operation

Mounting Loop: Use this to tie the logger to the materials being monitored.

Duration: This number indicates how many days the logger will last: 90 days for the CX502 model or 365 days for the CX503 model.

Alarm LED: This LED blinks red every 4 seconds when an alarm is tripped. Both this LED and the status LED will blink once when you press the start button to wake up the logger before configuring it. If you select Page Logger LED in the InTemp app, both LEDs will be illuminated for 4 seconds.

Status LED: This LED blinks green every 4 seconds when the logger is logging. If the logger is waiting to start logging (because it was configured to start "On button push," "On button push with fixed delay," or with a delayed start), it will blink green every 8 seconds.

Start Button: Press this button for 1 second to wake up the logger to begin using it. Once the logger is awake, press this button for 1 second to move it to the top of the loggers list in the InTemp app. Press this button for 4 seconds to start the logger when it is configured to start "On button push" or "On button push with fixed delay." Both the Alarm and Status LEDs will blink four times when you press the start button to begin logging. You can also press this button to stop the logger when it is configured to "Stop on button push."

Getting Started

InTempConnect is web-based software that allows you to monitor CX500 series logger configurations and view downloaded data online. Using the InTemp app, you can configure the logger with your phone or tablet and then download reports, which are saved in the app and automatically uploaded to InTempConnect. The CX Gateway is also available to automatically configure and download loggers and upload data to InTempConnect. Or anyone can download a logger using the InTempVerify app if the loggers are enabled to be used with InTempVerify. See www.intempconnect.com/help for details on both the gateway and InTempVerify. If you do not need to access logged data via the cloud based InTempConnect software, then you also have the option to use the logger with the InTemp app only.

Follow these steps to begin using the loggers with InTempConnect and the InTemp app.

1. **Administrators: Set up an InTempConnect account**. Follow all steps if you are a new administrator.

   All others: If you already have an account and roles assigned, follow steps c and d.

If you are using the logger with the InTemp app only, skip to step 2.

   a. Go to intempconnect.com and follow the prompts to set up an administrator account. You'll receive an email to activate the account.

   b. Log into intempconnect.com and add roles for the users you will be adding to the account. Select Roles from the System Setup menu. Click Add Role, enter a description, select the privileges for the role and click Save.

   c. Select Users from the System Setup menu to add users to your account. Click Add User and enter the email address and first and last name of the user. Select the roles for the user and click Save.

   d. New users will receive an email to activate their user accounts.

2. **Download the InTemp app and log in.**

   a. Download InTemp to a phone or tablet from the App Store® or Google Play™.

   b. Open the app and enable Bluetooth in the device settings if prompted.

   c. **InTempConnect users:** Log in with your InTempConnect account email and password from the InTempConnect User screen.

   InTemp app only users: Swipe left to the Standalone User screen and tap Create Account. Fill in the fields to create an account and then log in from the Standalone User screen.

3. **Configure the logger.**

   > **Important:** CX502 loggers cannot be restarted once logging begins. Do not continue with these steps until you are ready to use these loggers.

   InTempConnect users: Configuring the logger requires privileges. Administrators or those with the required privileges can also set up custom profiles and trip information fields. This should be done before completing these steps. If you plan to use the logger with the InTempVerify app, then you must create a logger profile with InTempVerify Enabled turned on. See www.intempconnect.com/help for details.

   Note: You can create, edit, and delete logger profiles in the In Temp app. All changes you make in the app are reflected in your InTempConnect account.

   InTemp App only users: The logger includes preset profiles. To set up a custom profile, tap the Settings icon and tap CX500 Logger before completing these steps.

   a. Press the button on the logger to wake it up.

   b. Tap the Devices icon in the app. Find the logger in the list and tap it to connect to it. If you are working with multiple loggers, press the button on the logger again to bring it to the top of the list.

   If you are having trouble connecting:

   - Make sure the logger is within range of your mobile device. The range for successful wireless communication is approximately 30.5 m (100 ft) with full line-of-sight.

- If your device can connect to the logger intermittently or loses its connection, move closer to the logger, within sight if possible.
- Change the orientation of your phone or tablet to ensure the antenna in your device is pointed toward the logger. Obstacles between the antenna in the device and the logger may result in intermittent connections.
- If the logger appears in the list, but you cannot connect to it, close the app, power down the mobile device, and then turn it back on. This forces the previous Bluetooth connection to close.

c. Once connected, tap Configure. Swipe left and right to select a logger profile. Type a name for the logger. Tap Start to load the selected profile to the logger. **InTempConnect users:** If trip information fields are set up, you will be prompted to enter additional information. Tap Start in the upper right corner when done.

4. **Deploy and start the logger.**

> **Important:** Reminder, CX502 loggers cannot be restarted once logging begins. Do not continue with these steps until you are ready to use these loggers.

a. Deploy the logger to the location where you will be monitoring the temperature.

b. Press the button on the logger when you want logging to begin (or if you chose a custom profile, logging begins based on the settings in the profile).

If the logger was configured with alarm settings, an alarm will trip when the temperature reading is outside the range specified in the logger profile. The logger alarm LED will blink every 4 seconds, an alarm icon appears in the app, and an Alarm Out of Range event is logged. You can review alarm information in the logger report (see *Downloading the Logger*). InTempConnect users can also receive notifications when an alarm is tripped. See www.intempconnect.com/help for more details on configuring the logger and monitoring alarms.

Passkey Protection

The logger is protected by an encrypted passkey automatically generated by the InTemp app for InTempConnect users and optionally available if you are using the InTemp app only. The passkey uses a proprietary encryption algorithm that changes with every connection.

InTempConnect Users

Only InTempConnect users belonging to the same InTempConnect account can connect to a logger once it is configured. When an InTempConnect user first configures a logger, it is locked with an encrypted passkey that is automatically generated by the InTemp app. After the logger is configured, only active users associated with that account will be able to connect to it. If a user belongs to a different account, that user will not be able to connect to the logger with the InTemp app, which will display an invalid passkey message. Administrators or users with the required privileges can also view the passkey from the device configuration page in InTempConnect and share them if needed. See www.intempconnect.com/help for more details. **Note:** This does not apply to InTempVerify. if the logger was configured

with a logger profile in which InTempVerify was enabled, then anyone can download the logger with the InTempVerify app.

InTemp App Only Users

If you are using the InTemp app only (not logging in as an InTempConnect user), you can create an encrypted passkey for the logger that will be required if another phone or tablet attempts to connect to it. This is recommended to ensure that a deployed logger is not mistakenly stopped or purposely altered by others.

To set a passkey:

1. Tap the Devices icon and connect to the logger.
2. Tap Set Logger Passkey.
3. Type a passkey up to 10 characters.
4. Tap Save.
5. Tap Disconnect.

Only the phone or tablet used to set the passkey can then connect to the logger without entering a passkey; all other mobile devices will be required to enter the passkey. For example, if you set the passkey for the logger with your tablet and then try to connect to the device later with your phone, you will be required to enter the passkey on the phone but not with your tablet. Similarly, if others attempt to connect to the logger with different devices, then they would also be required to enter the passkey. To reset a passkey, connect to the logger, tap Set Logger Passkey, and select Reset to Factory Default.

Downloading Data from the Logger

You can download data from the logger to a phone or tablet and generate reports that include logged data and alarm information. Reports can be shared immediately upon download or accessed later in the InTemp app.

InTempConnect users: Privileges are required to download, preview, and share reports in the InTemp app. Report data is automatically uploaded to InTempConnect when you download the logger. Log in to InTempConnect to build custom reports (requires privileges). In addition, InTempConnect users can also download CX loggers automatically on a regular basis using the CX Gateway. Or, if the logger was configured with a logger profile in which InTempVerify was enabled, then anyone can download the logger with the InTempVerify app. For details on the gateway and InTempVerify, see www.intempconnect/help.

To download the logger with the InTemp app:

1. Tap the Devices icon and connect to the logger.
2. Tap Download.
3. Choose a download option:

> **Important:** CX502 loggers cannot be restarted. If you want a CX502 logger to continue logging after the download is complete, select Download & Continue.

- Download & Continue. The logger continues logging once the download is complete.
- Download & Restart (CX503 models only). The logger starts a new data set using the same profile once the download is complete. Note that if the logger was originally configured with a push button start, you must push the start button for logging to restart.

- Download & Stop. The logger stops logging once the download is complete.

To download multiple loggers with the InTemp app:

1. Tap Devices, then Bulk Download.

2. The screen changes to Bulk Download mode. This changes the way the screen behaves when you tap on a logger tile. Tap on a tile to select it for bulk download. You can select up to 20 loggers. Text at the bottom of the page updates to indicate how many loggers are selected.

3. Tap Download X Loggers to begin the download.

    - Download & Continue. The loggers continue logging once the download is complete.

    - Download & Restart (CX400, CX450, CX503, CX603, and CX703 models only). The logger starts a new configuration using the same profile once the download is complete. You will be prompted to enter trip information again (if applicable). Note that if the logger profile is set up to start with a button push, you must push the button on the logger for logging to restart.

    - Download & Stop. The logger stops logging once the download is complete. The downloads begin and run one after another. The screen displays the download queue.

4. Click Cancel to cancel the downloads and return to the Devices screen, not in Bulk Download mode.

5. The screen displays Done when all the loggers are downloaded.

A report of the download is generated and is also uploaded to InTempConnect if you are logged in to the InTemp app with your InTempConnect user credentials. If you are using the bulk download feature, one report per logger is generated.

In the app, tap Settings to change the default report type (Secure PDF or XLSX) and report sharing options. The report is also available in in both formats for sharing later. Tap the Reports icon to access previously downloaded reports. See www.intempconnect.com/help for details on working with reports in both the InTemp app and InTempConnect.

Logger Events

The logger records the following events to track logger operation and status. These events are listed in reports downloaded from the logger.

Event Name	Definition
Configured	The logger was configured by a user.
Connected	The logger was connected to the InTemp app.

Event Name	Definition
Started	The logger started logging.
Stopped	The logger stopped logging.
Downloaded	The logger was downloaded.
Alarm Out of Range/In Range	An alarm has occurred because the reading was outside the alarm limits or back within range. **Note:** Although the reading may return to a normal range, the alarm indicator will not clear in the InTemp app and the alarm LED will continue to blink.
Safe Shutdown	The battery level dropped below a safe operating voltage and performed a safe shutdown.

Deploying the Logger

Use the mounting loop on the logger to secure it to a shipment or other application you are monitoring. You can also remove the backing on the tape that is adhered to the top and bottom of the logger to mount it on a flat surface.

Protecting the Logger

Note: Static electricity may cause the logger to stop logging. The logger has been tested to 8 KV but avoid electrostatic discharge by grounding yourself to protect the logger. For more information, search for "static discharge" on onsetcomp.com.

Battery Information

The logger uses one CR2450 non-replaceable lithium battery. Battery life for the CX502 is not guaranteed past the 1-year logger shelf life. Battery life for the CX503 model is 1 year, typical with a logging interval of 1 minute. Expected battery life for the CX503 varies based on the ambient temperature where the logger is deployed and the frequency of connections, downloads, and paging. Deployments in extremely cold or hot temperatures or a logging interval faster than 1 minute can impact battery life. Estimates are not guaranteed due to uncertainties in initial battery conditions and operating environment.

⚠ **WARNING:** Do not cut open, incinerate, heat above 85°C (185°F), or recharge the lithium battery. The battery may explode if the logger is exposed to extreme heat or conditions that could damage or destroy the battery case. Do not dispose of the logger or battery in fire. Do not expose the contents of the battery to water. Dispose of the battery according to local regulations for lithium batteries.

Federal Communication Commission Interference Statement

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

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada Statements

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Avis de conformité pour l'Industrie Canada

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

To comply with FCC and Industry Canada RF radiation exposure limits for general population, the logger must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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