

# InTemp® CX500 Series Temperature Logger (CX501, CX502, CX503) Manual



(CX501 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. Using the InTemp app, you can easily configure the logger with one of three preset configurations or you can set up a custom configuration for other applications. The logger has a built-in alarm to alert you to excursions. Logger reports can be quickly downloaded to your phone or tablet and automatically uploaded to your InTempConnect™ account, where you can analyze and export data as needed. The logger is available in a single-use 15- or 90-day model (CX501 and CX502) or a multiple-use 365-day model (CX503).

## InTemp CX500 Series Loggers

### Models:

- CX501, 15-day logger, single use
- CX502, 90-day logger, single use
- CX503, 365-day logger, multiple use

### Required Items:

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

## Specifications

Temperature Sensor	CX501	CX502	CX503
<b>Sensor Range</b>	-10° to 70°C (14° to 158°F)	-30° to 70°C (-22° to 158°F)	-30° to 70°C (-22° to 158°F)
<b>Accuracy</b>	±1.0°C from -10° to -5°C (±1.8°F from 14° 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)	±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)	±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)
<b>Resolution</b>	0.04°C (0.072°F)		
<b>Drift</b>	<0.01°C (0.018°F) per year		
<b>Response Time</b>	5 minutes typical to 90% in open air moving 1 m/s, unmounted	6 minutes typical to 90% in open air moving 1 m/s, unmounted	6 minutes typical to 90% in open air moving 1 m/s, unmounted

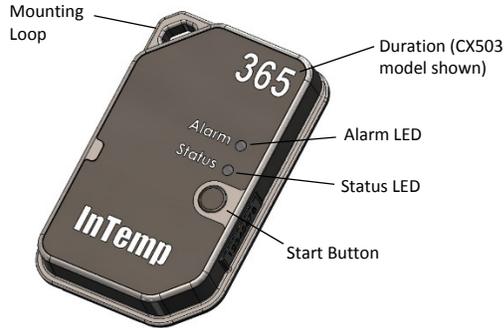
### Logger

<b>Logger Operating Range</b>	-10° to 70°C (-14° to 158°F)	-30° to 70°C (-22° to 158°F)	-30° to 70°C (-22° to 158°F)
<b>Radio Power</b>	1 mW (0 dBm)		
<b>Transmission Range</b>	Approximately 30.5 m (100 ft) line-of-sight		
<b>Wireless Data Standard</b>	Bluetooth Low Energy (Bluetooth Smart)		
<b>Type</b>	Single use	Single use	Multiple Use
<b>Duration</b>	15 days	90 days	Up to 1 year
<b>Shelf Life</b>	Up to 1 year		
<b>Logging Rate</b>	1 second to 18 hours		
<b>Time Accuracy</b>	±1 minute per month at 25°C (77°F)		
<b>Battery</b>	CR2032 (CX501) or CR2450 (CX502 and CX503) 3V lithium, not replaceable. Battery for CX501 and 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.		
<b>Memory</b>	8,800 measurements	14,000 measurements	14,000 measurements
<b>Full Memory Download Time</b>	Approximately 30 seconds; may take longer the farther the device is from the logger		
<b>Dimensions</b>	6.9 x 4.5 x 1.1 cm (2.71 x 1.76 x 0.42 inches)		

## Specifications (continued)

<b>Weight</b>	22.1 g (0.78 oz)	25.5 g (0.90 oz)	25.5 g (0.90 oz)
<b>Environmental Rating</b>	IP67		
	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).		
	See last page		
Passed RTCA DO160G, part 21H			

## 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: 15, 90, or 365 days for the CX501, CX502, and CX503 models respectively.

**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. 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” (see *Configuring and Starting the Logger*). 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 where you can monitor CX500 series logger deployments 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. You also have the option to use the logger with the InTemp app only.

To begin using the loggers with InTempConnect and the InTemp app:

1. Go to [www.intempconnect.com](http://www.intempconnect.com) and follow the prompts to set up an administrator account. You’ll receive an email to activate the account.
2. Log into [www.intempconnect.com](http://www.intempconnect.com) and add users to your account. Click Settings and then the Users tab. Click Add and enter the email address and first and last name of the user. **Note:** If your organization is already using InTempConnect, contact your administrator to receive a user name and password for the account.
3. New users will receive an email to activate their user accounts.
4. Download the InTemp app from the App Store® or Google Play™.
5. Open the app and enable Bluetooth in the device settings if prompted.
6. Log in with your InTempConnect user credentials. **Note:** Your device must be able to connect to the internet.
7. Configure the logger as described in the next section.

**Important:** Loggers configured by an InTempConnect user will then only be able to be accessed by InTempConnect users associated with the same account. See *Passkey Protection* for more details.

To begin using the loggers with the InTemp app only:

1. Download the InTemp app from the App Store.
2. Open the app and enable Bluetooth in the device settings if prompted.
3. Create a local user account. Enter your email address, first and last name, and a password. You can also enter a company name, add notes and select a profile photo. Tap Save when done entering your user settings and log into the account when prompted.
4. Configure the logger as described in the next section.

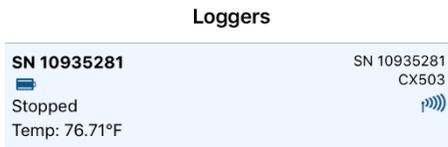
## Configuring and Starting the Logger

Use the InTemp app to configure the logger.

**Important:** CX501 and CX502 loggers cannot be restarted once logging begins. Do not continue with these steps until you are ready to use these loggers.

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

- From the Loggers screen in the InTemp app, find the logger in the list and tap it to connect to it.



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.
  - 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.
- Once connected, tap Configure. Swipe left and right to select one of the preset logger configurations (Cold Chain, CRT, and Frozen). Type a name for this logger deployment and tap Start to load the selected configuration to the logger. **Note:** To set up a custom configuration, tap the Settings icon and tap CX500 Logger Configurations.
  - Deploy the logger to the location where you will be monitoring the temperature. Press the button on the logger when you want logging to begin (or if you chose a custom configuration, logging will begin based on the settings you selected).

If the logger was configured with alarm settings, an alarm will trip when the temperature reading is outside the range specified in the logger configuration. 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*). See [www.intempconnect.com/help](http://www.intempconnect.com/help) for more details on configuring the logger.

## Passkey Protection

The logger is protected by an encrypted passkey automatically generated by the InTemp app for InTempConnect users and optionally available for local users who are using the 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 app, which will display an invalid passkey message.

### Local Users

If you are not using InTempConnect and instead logging into the app as a local 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:

- Tap the Loggers icon and connect to the logger.
- Tap Set Logger Passkey.
- Type a passkey up to 10 characters.
- Tap Save.
- 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 the Logger

You can download the logger and generate reports that include logged data and alarm information. Reports can be shared immediately upon download or accessed later in the app. If you are using InTempConnect, the reports are automatically uploaded to your InTempConnect account.

To download the logger:

- Tap the Loggers icon and connect to the logger.
- Tap Download.
- Choose a download option:
  - Download & Continue. The logger will continue logging once the download is complete.
  - Download & Restart (CX503 models only). The logger will start a new deployment using the same configuration once the download is complete.
  - Download & Stop. The logger will stop logging once the download is complete.

**Important:** CX501 and CX502 loggers cannot be restarted. If you want a CX501 or CX502 logger to continue logging after the download is complete, select Download & Continue.

A report of the download is generated and is also uploaded to InTempConnect if you are logged in to the app with your InTempConnect user credentials.

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 at a later time. Tap the Reports icon to access previously downloaded reports. See [www.intempconnect.com/help](http://www.intempconnect.com/help) for details on working with reports in both the 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 app during deployment.
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. <b>Note:</b> Although the reading may return to a normal range, the alarm indicator will not clear in the 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 CR2032 (CX501) or CR2450 (CX502 and CX503) non-replaceable lithium battery. Battery life 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.