



InTemp CX405 RTD Dry Ice Logger

Included Items:

- Two AAA 1.5 V alkaline batteries
- Battery door and screw
- NIST Certificate of Calibration

Required Items:

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

The InTemp CX405 RTD dry ice logger is designed for Cold Chain monitoring and has a built-in external probe that can measure temperatures as low as -95°C (-139°F). This Bluetooth® Low Energy-enabled logger is designed for wireless communication with a mobile device. Using the InTemp app, you can easily configure the logger, perform daily logger checks, download reports, and monitor tripped alarms. Or, you can use InTempConnect® to configure and download CX series loggers via the CX5000 Gateway. The InTempVerify™ app is also available to easily download loggers and automatically upload reports to InTempConnect. (Note: InTempVerify is for downloading and continuing loggers only. It cannot configure, start, or restart the loggers.) Use the LCD screen on the logger to check the current temperature, logging status, battery usage, and more. Once data is uploaded to InTempConnect, you can track logger configurations and automatically upload logger data to build custom reports for further analysis.

Specifications

External Temperature Probe

Range	-95° to 50°C (-139° to 122°F)
Accuracy	±1.5°C from -95° to -40°C (±2.7°F from -139° to -40°F) ±1.0°C from -40° to -10°C (±1.8°F from -40° to 14°F) ±0.5°C from -10° to 50°C (±0.9°F from -14° to 122°F)
Resolution	0.05°C at 25°C (0.09°F at 77°F)
Drift	<0.1°C (0.18°F) per year
NIST Calibration	Two-point NIST calibration, probe only
Cable Length	1.5 m (4.92 ft)
Probe Dimensions	Food-grade stainless steel probe with blunt tip, 31.75 mm (1.25 inches) long, 4.78 mm (0.188 inches) diameter

Ambient Temperature Sensor

Range	-30° to 70°C (-22° to 158°F)
Accuracy	±0.5°C from -15° to 70°C (±0.9°F from 5° to 158°F) ±1.0°C from -30° to -15°C (±1.8°F from -22° to 5°F)
Resolution	0.024°C at 25°C (0.04°F at 77°F)
Drift	<0.1°C (0.18°F) per year

Logger

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)
Logger Operating Range	-30° to 70°C (-22° to 158°F), 0 to 95% RH (non-condensing)
Logging Rate	1 second to 18 hours
Time Accuracy	±1 minute per month at 25°C (77°F)
Battery Type	Two AAA 1.5 V alkaline or lithium batteries, user replaceable
Battery Life	1 year, typical with logging interval of 1 minute. Faster logging intervals, remaining connected with the app, excessive report generation, numerous audible alarms, and paging all impact battery life.
Memory	128 KB (75,245 total measurements or 37,622 probe & internal paired measurements)
Full Memory Download Time	Approximately 60 seconds; may take longer the farther the device is from the logger
LCD	LCD is visible from 0° to 50°C (32° to 122°F); the LCD may react slowly or go blank in temperatures outside this range
Dimensions	9.4 x 4.5 x 2.59 cm (3.7 x 1.77 x 1.02 inches)
Weight	90.2 g (3.18 oz)
Environmental Rating	IP54



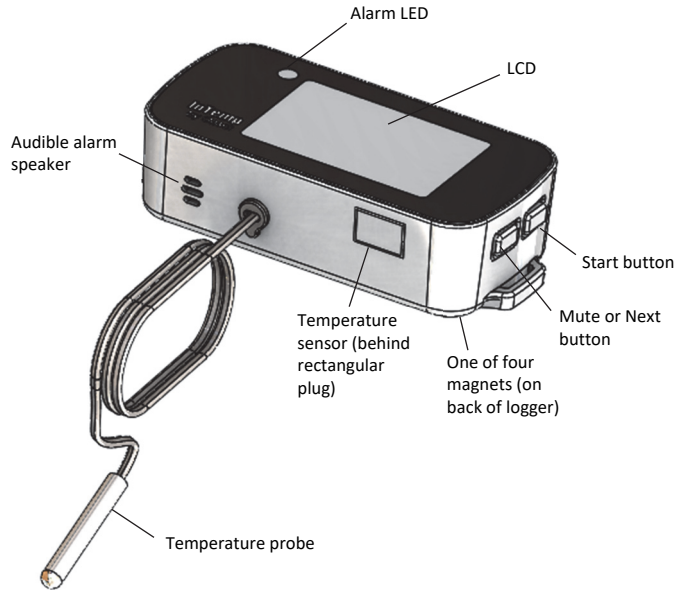
The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).



See last page

Passed RTCA DO160G, part 21H

Logger Components and Operation



Start Button: Press this button for 1 second to start the logger when it is configured to start “on button push.”

Mute or Next Button: Press this button for 1 second to mute a beeping alarm (see *Logger Alarms*) or to switch between the external probe and ambient internal sensor temperature readings. Press and hold this button for 3 seconds to clear the minimum and maximum values (see *Minimum and Maximum Values*). Press and hold this button and the Start button for 5 seconds to reset a passkey (InTemp app users only; see *Passkey Protections*).

Magnets: There are four magnets on the back of the logger (not shown in diagram) for mounting.

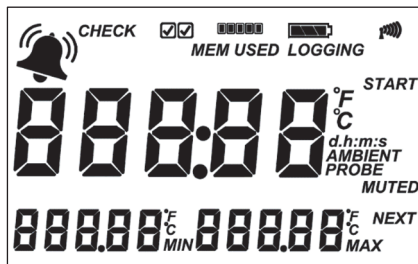
Temperature Sensor: This internal sensor measures ambient temperature.

Temperature Probe: This is the built-in external probe for measuring temperature.

Audible Alarm Speaker: This is the speaker for the audible alarm that beeps when an alarm is tripped.

Alarm LED: This LED blinks every 5 seconds when an alarm is tripped (see *Logger Alarms*).

LCD: This screen shows the latest temperature reading and other status information. The LCD screen refreshes at the same rate as the logging interval. The example shows all symbols illuminated on the LCD screen followed by a table with descriptions of each symbol.



LCD Symbol	Description
	An alarm has tripped because the temperature reading is outside the specified range. See <i>Logger Alarms</i> .

LCD Symbol	Description
CHECK <input type="checkbox"/> <input type="checkbox"/>	The logger has been configured to perform daily or twice daily checks (twice daily is shown in this example), but no checks have been performed yet.
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	The once daily or twice daily logger check (twice in this example) has been performed.
MEM USED	This indicates how much memory has been used for the current configuration. In this example, approximately 40 percent of the memory has been used.
	This shows the approximate battery power remaining.
LOGGING	The logger is currently logging.
	The logger is currently connected to a phone or tablet via Bluetooth. The more bars there are, the stronger the signal.
START	The logger is waiting to be started. Press and hold the Start button for 3 seconds to start the logger.
37.82 ^{°F} PROBE	This is an example of a temperature reading from the external probe.
68.45 ^{°F} AMBIENT	This is an example of a temperature reading from the internal sensor.
36.58 ^{°F} MIN	This is an example of a minimum temperature, which is the lowest probe temperature reading from the day within the current 24-hour period (midnight from one day to midnight the next day) if the logger was set to record logger checks (see <i>Performing Logger Checks</i>). To clear this value, press the Mute/Next button for 3 seconds. If the logger check setting is not enabled, the minimum reading represents the entire logging period and only resets when the logger is downloaded and restarted or stopped and reconfigured, or if you press the Mute/Next button for 3 seconds (see <i>Minimum and Maximum Values</i>).
40.23 ^{°F} MAX	This is an example of a maximum temperature, which is the highest probe temperature reading from the day within the current 24-hour period (midnight from one day to midnight the next day) if the logger was set to record logger checks (see <i>Performing Logger Checks</i>). To clear this value, press the Mute/Next button for 3 seconds. If the logger check setting is not enabled, the maximum reading represents the entire logging period and only resets when the logger is downloaded and restarted or stopped and reconfigured, or if you press the Mute/Next button for 3 seconds (see <i>Minimum and Maximum Values</i>).
MUTE or MUTED	MUTE indicates an alarm is beeping. Turn off the beeping alarm by pressing the Mute button. The LCD then changes to MUTED.
CH 1-P OFF	The audible alarm has been muted.
05:38 ^{mm}	The logger has been configured to start logging on a delay. The display will count down in days, hours, minutes, and seconds until logging begins. In this example, 5 minutes and 38 seconds remain until logging will begin.
LoAd	The profile settings are being loaded onto the logger.
Err	An error occurred while loading the profile settings onto the logger. Try reconfiguring the logger.

LCD Symbol	Description
HELLO	The logger was paged from the InTemp app.
STOP	The logger has been downloaded and stopped with the InTemp app or because the memory is full.
boot	The logger is being updated with new firmware.

Note: If the logger has stopped logging because the memory is full, the LCD screen will remain on with “STOP” displayed until the logger is downloaded to your mobile device. Once the logger has been downloaded, the LCD will turn off automatically after 2 hours. The LCD will turn back on the next time the logger connects with your device.

Getting Started

InTempConnect is web-based software where you can monitor 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 CX5000 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.

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

 - Go to www.intempconnect.com and follow the prompts to set up an administrator account. You'll receive an email to activate the account.
 - Log into www.intempconnect.com and add roles for the users you will be adding to the account. Click Settings and then Roles. Click Add Role, enter a description, select the privileges for the role and click Save.
 - Click Settings and then Users 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.
 - New users will receive an email to activate their user accounts.
- Set up the logger.** Insert two AAA batteries in the logger, observing polarity. Insert the battery door in the back of the logger making sure it is flush with the rest of the logger case. Use the included screw and a Phillips-head screwdriver to screw the battery door into place.
- Download the InTemp app and log in.**
 - Download InTemp to a phone or tablet from the App Store® or Google Play™.
 - Open the app and enable Bluetooth in the device settings if prompted.

- 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.

4. Configure the logger.

InTempConnect users: Configuring the logger requires privileges. The logger includes preset profiles. Administrators or those with the required privileges can also set up custom profiles (including setting up daily logger checks) and trip information fields. This should be done before configuring the logger. If you plan to use the logger with the InTempVerify app, then you must create a logger profile with InTempVerify enabled. See www.intempconnect.com/help for details.

InTemp app only users: The logger includes preset profiles. To set up a custom profile, tap the Settings icon and tap CX400 Logger. Also, if you need to perform daily logger checks, tap Record CX400 Logger Checks under Settings and select Once Daily or Twice Daily. This should be done before configuring the logger.

See www.intempconnect.com/help for details on setting up custom profiles in both the app and InTempConnect and on setting up trip information.

- Tap the Devices icon in the 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.
- 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.

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

- Deploy and start the logger.** Deploy the logger to the location where you will be monitoring the temperature. Logging will begin based on the settings in the profile selected. If the logger was configured to perform daily checks, connect to the logger and tap Perform (Morning, Afternoon, or Daily) Check every day.

Once logging begins, the logger will display the current temperature reading and the minimum and maximum readings within the current 24-hour period (midnight from one day to midnight the next day) if the logger was set to record logger checks (see *Performing Logger Checks*). Otherwise the minimum and maximum readings represent the entire logging period and only reset when the logger is downloaded and restarted or stopped and reconfigured (they will not reset if you download the logger and continue logging). These minimum and maximum values are also available in the logger reports (see *Downloading the Loggers*). Click Next to switch between external probe and ambient temperature readings. Minimum and maximum readings are only available for the external probe.

Logger Alarms

You can set up an alarm to trip on the logger when the temperature reading falls above or below a specified value or when the logger battery is low. Specific alarm settings are set in the logger profile that you create in either InTempConnect or in the app.

When a temperature alarm trips:

- The logger LED will blink every 5 seconds.
- The alarm icon will appear on the LCD and in the app.
- The logger will beep once every 15 seconds (unless audible alarms are disabled in the logger profile).
- An Alarm Tripped event is logged.

When a low battery alarm trips:

- The battery icon on the LCD will flash.
- The logger will quickly beep three times every 15 seconds.
- A Low Battery event is logged.

To mute a beeping alarm, press the Mute button on the logger. Once muted, you cannot turn the beeping back on. Note that if a temperature alarm is occurring at the same time as a low battery alarm, pressing the mute button will silence both alarms.

Download the logger to view details about a tripped alarm and to clear temperature alarm indicators in the app and on the LCD. Replace the batteries in the logger to clear a battery alarm. **Note:** Download the logger before replacing the batteries to ensure no data is lost.

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, simultaneously press both the top and bottom button on the logger for 5 seconds, or connect to the logger, tap Set Logger Passkey, and select Reset Passkey to Factory Default.

Downloading the Logger

You can download the logger to a phone or tablet and generate reports that include logged probe and ambient readings, events, user activity, alarm information, and more. 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 into InTempConnect to build custom reports (requires privileges). In addition, InTempConnect users can also download CX loggers automatically on a regular basis using the CX5000 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.com/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:
 - Download & Continue. The logger will continue logging once the download is complete.

- **Download & Restart.** The logger will start a new data set using the same profile once the download is complete.
- **Download & Stop.** The logger will stop logging once the download is complete.

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

In the app, tap Settings to change the default report type and report sharing options. The report is also available in Secure PDF, XLSX, and VFC CSV (if enabled) formats for sharing at a later time. 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.

Performing Logger Checks

If your monitoring application requires that you perform daily or twice daily checks of the logger, you can use the InTemp app to connect to the logger and perform a check.

To enable the perform check feature in the InTemp app (if you are not using InTempConnect):

1. Tap the Settings icon.
2. Under Record CX400 Logger Checks, select either Once Daily or Twice Daily. If you choose Twice Daily, a Perform Morning Check action will be listed in the Connected screen from 12:01 AM until 12:00 PM and then a Perform Afternoon Check action will be listed from 12:01 PM to 12:00 AM. If you choose Once Daily, an action will be listed in the Connected screen to Perform Daily Check.

To enable the perform check feature if you are using InTempConnect, an administrator or user with the required privileges must create a new profile for a CX400 logger and set the Daily Checks to Once Daily or Twice Daily. For details on managing profiles, see www.intempconnect.com/help.

Note: Changes to the Record CX400 Logger Checks setting will take effect the next time the logger is configured. Also, when this setting is enabled, the minimum and maximum values displayed on the logger LCD represent the minimum and maximum readings within the current 24-hour periods and will reset every 24 hours. Otherwise, if this setting is not enabled, the minimum and maximum values represent the entire logging period and only reset when the logger is downloaded and restarted or stopped and reconfigured (they will not reset if you download the logger and continue logging).

To perform a check:

1. Tap the Devices icon and connect to the logger.
2. Tap Perform (Morning, Afternoon, or Daily) Check.

Once a check is completed, it is recorded as a logged user action along with the user email and the location, and is available for view in reports. The action is also listed as performed in the Connected screen and a checkmark will illuminate on the logger LCD.

You can also set up a notification to display on your phone or tablet to remind you to perform a check. Use the Reminders option under Settings in the InTemp app.

Minimum and Maximum Values

The logger LCD displays the minimum and maximum temperature readings. If the setting to perform logger checks is enabled (see *Performing Logger Checks*), then these values represent the minimum and maximum readings within the current 24-hour period and will reset every 24 hours for the entire logging period. If the logger check setting has not been enabled, then these values represent the entire logging period and will automatically reset when the logger is downloaded and restarted or stopped and reconfigured.

You can also clear these values as needed while the logger is logging by pressing the Mute/Next button for 3 seconds until HOLD disappears on the LCD. Dashes (--) will then appear on the LCD for the minimum and maximum values until the next logging interval. The values will then continue to be updated for the remaining logging period or until they are cleared again. **Note:** This clears the data on the screen only. Actual logger and reporting data will not be cleared with this reset.

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
Started	The logger started logging.
Stopped	The logger stopped logging.
Downloaded	The logger was downloaded.
Probe Alarm Tripped/Cleared	A probe temperature alarm has tripped or cleared because the reading was outside the alarm limits or back within range.
Performed/Missed Check	The user performed or missed the daily, morning, or afternoon logger check.
Safe Shutdown	The battery level dropped below 1.85 V; the logger performs a safe shutdown.

Deploying the Logger

Use the four magnets on the back of the logger case to mount it to a magnetic surface.

The external probe cable has a protective sheath. Move the sheath as needed to position it where the cable will be protected during shipments from inadvertent cuts.

Protecting the Logger

The logger is designed for indoor use and can be permanently damaged by corrosion if it gets wet. Protect it from condensation. If the logger gets wet, remove the battery immediately and dry the circuit board.

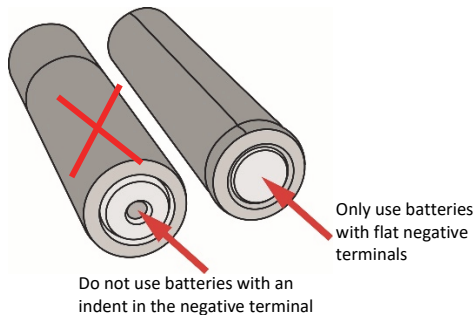
Note: Static electricity may cause the logger to stop logging.

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 requires two user-replaceable AAA 1.5 V alkaline or optional lithium batteries for operation at the extreme ends of the logger operating range. Expected battery life varies based on the ambient temperature where the logger is deployed, the frequency of connecting to the phone or tablet and downloading reports, the duration of audible alarms, and battery performance. New batteries typically last 1 year with logging intervals greater than 1 minute. 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.

Note: Make sure the batteries installed have flat negative terminals. There should be no indent in the bottom of the batteries. Batteries with indents in the negative terminals may become loose and prevent proper operation.



To install or replace the batteries:

1. Download the logger before replacing the batteries to ensure no data is lost.
2. If the battery door is already installed on the back of the logger, use a Phillips-head screwdriver to remove it.
3. Remove any old batteries.
4. Insert two new batteries observing polarity.
5. Screw the battery door into place.

⚠ WARNING: Do not cut open, incinerate, heat above 85°C (185°F), or recharge lithium batteries. The batteries 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 batteries in fire. Do not expose the contents of the batteries to water. Dispose of the batteries 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.

Pour se conformer aux limites d'exposition aux rayonnements RF de la FCC et d'Industrie Canada pour la population générale, l'enregistreur doit être installé de manière à fournir une distance de séparation d'au moins 20 cm de toutes les personnes et ne doit pas être colocalisé ou fonctionner avec une autre antenne ou un autre émetteur.