



Datalog X-PRO User Manual

General Guidelines

Nov. 2018.



Technical Assistance

If you encounter a problem with your Datalog X PRO, review configuration information to verify that your selections are consistent with your application: input configurations; chosen limits; etc. If the problem persists after checking the above, you can get technical assistance on +1 (954) 828-2096, Monday thru Friday, 7:00 a.m. to 5:00 p.m. Eastern Standard Time. You can also write to info@3sense.tech.

Specialized personnel will discuss your application case.

Please have the following information available:

- All Configuration Information
- All Provided Manuals

Contact Information

To reach Datalog X PRO manufacturer, refer to:

Mail: info@3sense.tech
Phone: +1 (786) 584-7439
WhatsApp: +1 (786) 584-7439
Visit: www.3sense.tech



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1. Overview

The modular and IoT focused Datalog X PRO is designed for remote monitoring of multiple processes requiring high safety and measurement precision. In support of your automation needs, it is fitted to receive up to 3 sensors (each one, capable of sensing up to 4 analog or digital variables).

The system is delivered with a rechargeable Li-Ion Battery; necessary means to attach the Main Unit enclosure to where is recommended; and all purchased wireless communication modules and sensors. In accordance with the philosophy of the release, all complements referred above can be prescinded, and remote data transmission may be performed by different common wireless technologies. Customers are also offered memberships for the use of a platform for remote monitoring and configuration, supported by the manufacturer. More detail can be found ahead.

The device is delivered ready to mount. No external software or equipment is needed to start presenting your process behavior. Custom configuration and operating limits can be set in situ, only by authorized personnel, since all parameter adjustment is password protected.

1.1. Features

Datalog X PRO has been thought to easily monitor and deliver data about the evolution of the processes is embedded into. As such, it relies on a series of functionalities, tools and characteristics, set to offer the user the desired comfort.

Among these, it is worth to highlight the direct link that devices have to the 3Sense Monitoring System® through its inbuilt communication module: a platform accessible from any mobile computing device (computer, tablet, smartphone), abled for internet navigation.

This platform facilitates remote control and monitoring tasks, keeps graphic record of the variables of interest, indicates their maximum and minimum admissible limits, generates alarm events with visual indications, sends external warning messages through e-mail and Text Messages (SMS), and keeps historical record of the evolution of each registered variable, corrective actions and comments taken when alarms have occurred.

Relevant features include:

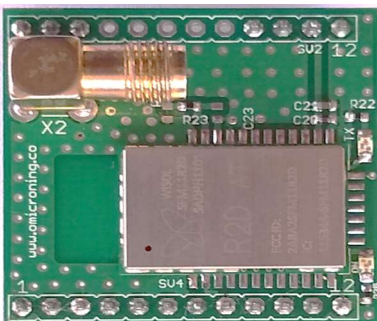
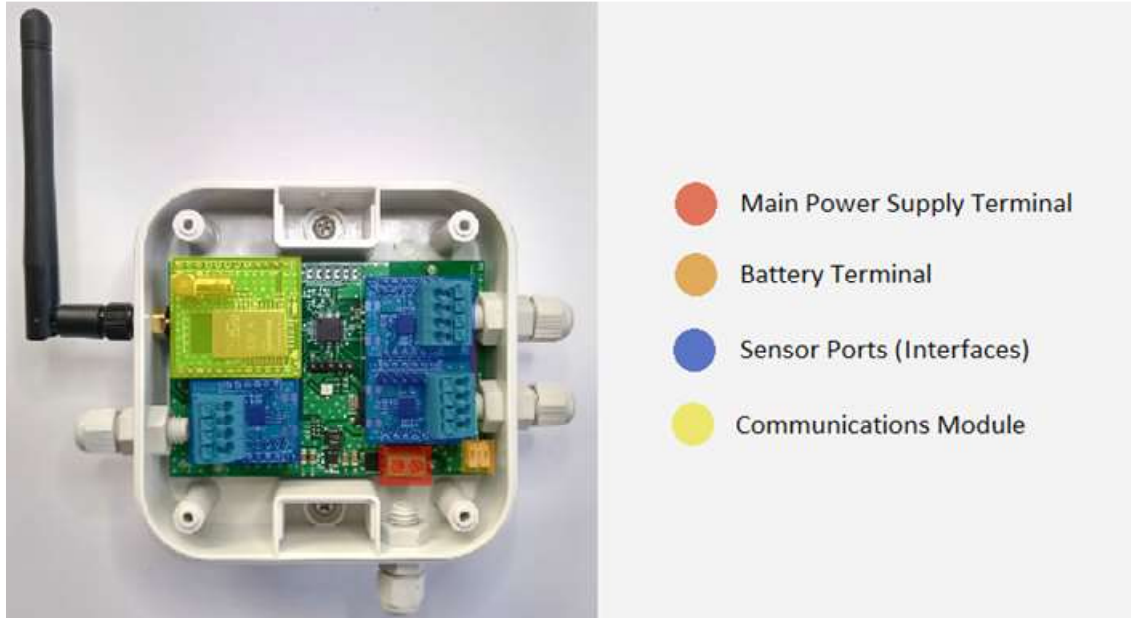
- Wi-Fi®, Sigfox® or 3G/4G modules for wireless transmission.
- Remote monitor; namely PC, Tablet or Smartphone.
- Historical data records on 3Sense Monitoring System®.
- Email, SMS, and Webhook notifications.
- Off-line temporary storage, in case of network connection failure.
- Parameters' configuration protected by password.

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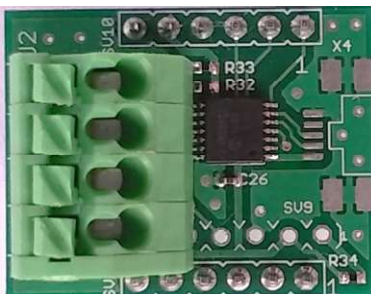
This device is part of 3Sense 4.0 product family

Nov. 2018

1.2 Datalog X PRO Insight: Modules



Sigfox communications module.



3. Sensor interfaces: These terminals allow binding of the multiple sensors distributed by the manufacturer. Every interface has an in-built light indicator to mark whether a sensor is properly operating or not.

Generic Sensor Interface.



4. **Battery:** 3.7 V Lithium-Ion Battery. Powers the monitoring and transmission system when main supply is off.

2. Mounting Guidelines

To properly mount the system, please consider the instructions and suggestions given in the following chapters. Plan all wiring before installing Datalog X PRO. Also consider the cabinet space, hardware dimensions and rated environmental conditions. Use good wiring practices to minimize problems that may occur due to electrical interference.

NOTE: Prevent metal fragments and pieces of wire from dropping inside the enclosure of any Datalog X PRO Main Unit. If necessary, place a cover over the components during installation and wiring. Ingress of such fragments and chips may cause a fire hazard, damage or malfunction of the device.

Main Unit enclosure is a standard network ASA plastic box, with brackets for pole mounting, or covered perforations for wall mounting; its details are listed in 2.2.1. Every device is already programmed before delivery with all its functionalities, so it's ready to mount.

Consider clearing a square area, of 25cm at each side, in the plane in which Datalog X PRO needs to be installed. Mount the system near the center of said clear space, so to leave enough margin to comfortably install its peripherals.

2.1. Environmental Considerations

Device's Main Unit and sensors are suited to be used outdoor, since their cases and probes are offered with IP67 protection, or higher: as such, they're waterproof and dust-proof, as well as UV resistant. Environmental limits set for its operation are as follow:

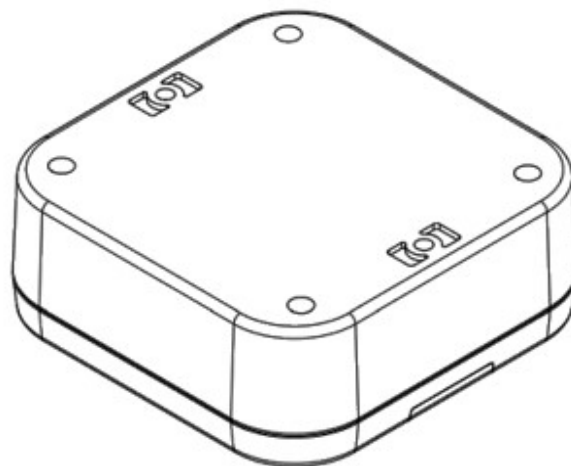
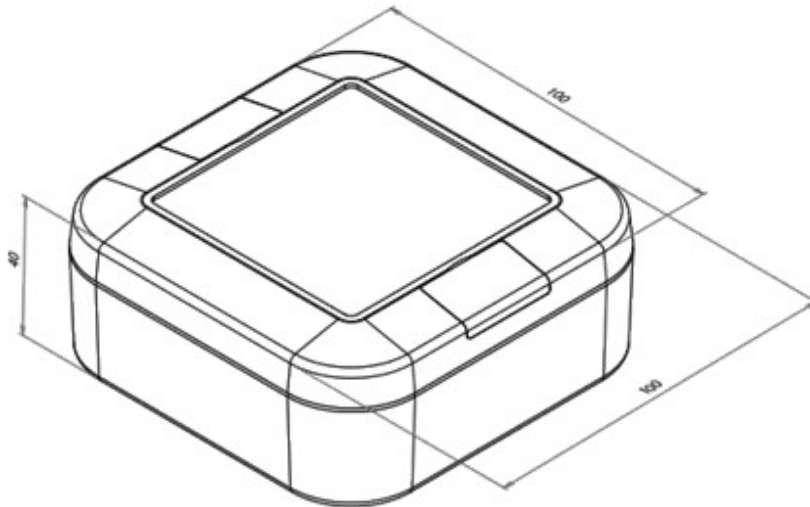
- 50°F (20°C) < Ambient Temperature < 113°F (45°C),
- Relative Humidity (RH) Up to 100%.

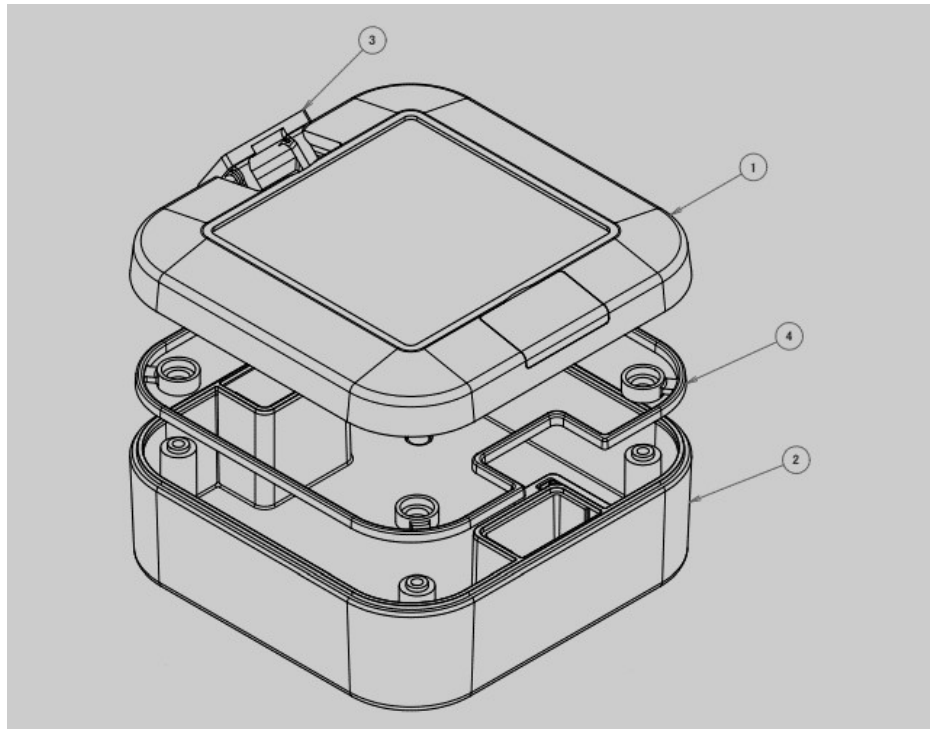
NOTE: Locate Datalog X PRO and all related control components away from AC power/motor wiring and sources of direct heat output such as transformers, heaters, large capacity resistors, or shock and vibration sources. Avoid using the device in areas where chemicals or flammable gases are present to minimize any risk of ignition.

2.2. Dimensions

2.2.1. Main Unit Enclosure

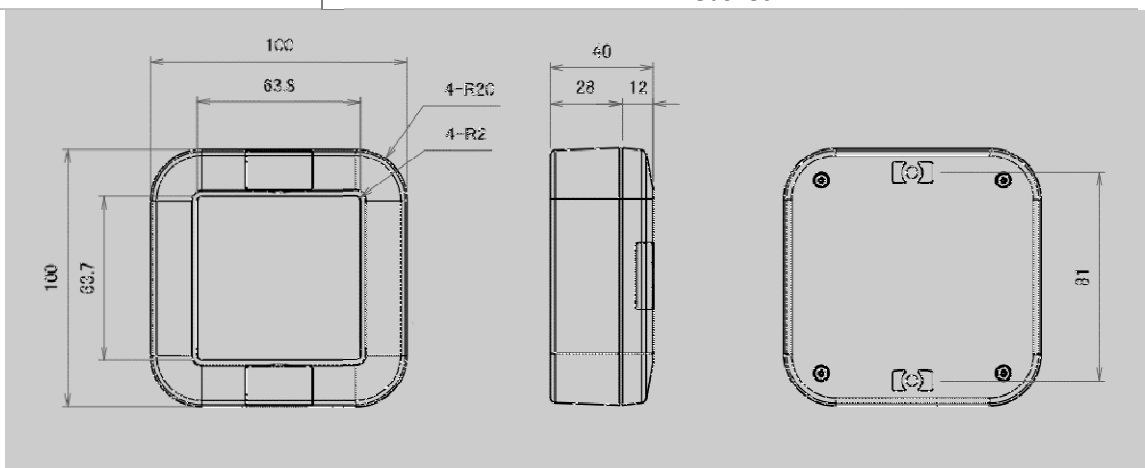
The main unit enclosure is a standard network ASA squared plastic box. Its dimensions are indicated by the following schemes:





MAIN UNIT ENCLOSURE COMPONENTS

1	Top cover
2	Bottom base
3	Blind lids
4	Gasket



Dimensions in mm. Enclosure molded from resistant ASA material. For further information concerning this enclosure, visit: goo.gl/Xapdsw

Weight: 150g, without accessories.

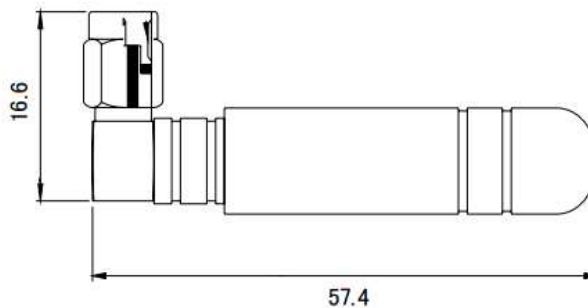
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2.2.2. Antenna

The system uses an external helical antenna to reinforce the transmissions of its telecommunications module. This peripheral component requires the most amount of clear space. Its dimensions are shown in the following diagram:



Dimensions in mm. For further information, concerning this component, please visit: <https://www.sparkfun.com/datasheets/Cellular%20Modules/GSM%20Antenna-850-1900.pdf>

2.3. Mounting Indications

2.3.1. Main Unit

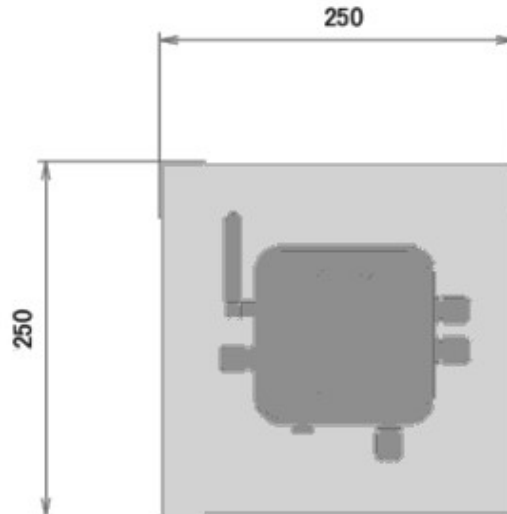
To secure main unit enclosure on a wall:

1. Find the mounting holes covered by the blind lids at opposite borders of the main unit enclosure. They might be easier to locate after reviewing section 2.2.1.
2. Prepare the surface on which the main unit will be placed, taking into account the distance between the holes previously found.
3. Use M3 screws (and nuts, washers, or plastic anchors, if needed) to fix the system to where is required.

To mount main unit on a pole:

1. Find the mounting holes covered by the blind lids at opposite borders of the main unit enclosure. This might be easier after reviewing the previous section.
2. Attach the pole mounting bracket accessories that come with the delivery to the main unit, using the screws provided by the manufacturer.
3. Finally, fasten the Main Unit to its pole using proper mounting straps.

Remember that, since Datalog X PRO is delivered with sensors and accessories attached, it is recommended to leave enough space around the main unit to let it hold comfortably its peripherals; as shown in the diagram below (dimensions in mm):



The system should be installed with all peripherals attached, to mount the assembly as a single block. It is strongly recommended to install the antenna so that its axis is vertical with respect to the ground, as this favors the range of the signals transmitted by the device.

An early version of the assembly, mounted on a pole, is exposed below:



Early version of Datalog X PRO mounted on a pole.



3. Electrical Installation Foreword

Consider implementing safeguards independent to Datalog X PRO when designing the wiring and grounding plans for your application. This helps to assure optimum system operation, provides additional electrical noise protection for your application and the Datalog X PRO, and prevents any malfunction on the process to be managed due to unexpected operating failures, to which any electronic system is susceptible.

3.1. Power Requirements

Among other hardware and firmware precautions, Datalog X PRO is protected against power interruptions through its battery; which also protects monitoring and storage of data.

If the battery is not used, the operations listed above would be compromised after electrical interruptions. Battery can provide power for up to 60 days, depending on the implemented sensors.

Electrical Ratings:

- **Rated main input voltage:** 6 to 24 VDC.
- **Max. Electric Current:** 0.5 A.

Battery Ratings:

- **Rated Voltage:** 3.7 VDC.
- **Power Rating:** 2200 mAh.
- **Type:** LiPoly.

4. Normal Operating Mode and Alternative Device States

Once energized by the rated power supply, the system will automatically enter Normal Operating Mode, which can be recognized by checking the LED on the top cover of main unit's enclosure (LED Indicator, from now on); if it flashes blue sporadically (almost, once a minute), the device reports no issue. If, on the contrary, after powering the device no activity is shown, refer to section 4.1.3, since the device could be on Sleep/Off Mode.

LED Indicator will flash green only to show that the device is configuring its Communications Module, or sending data.

From Normal Op. Mode, users can take the device to several alternative states using the magnet provided with the delivery (or any similar neodymium magnet). Access to these is performed

after briefly, and on several occasions, bringing together such magnet to the farthest edge of the main unit from its protruding antenna, between the two cable glands, as shown in the following image:

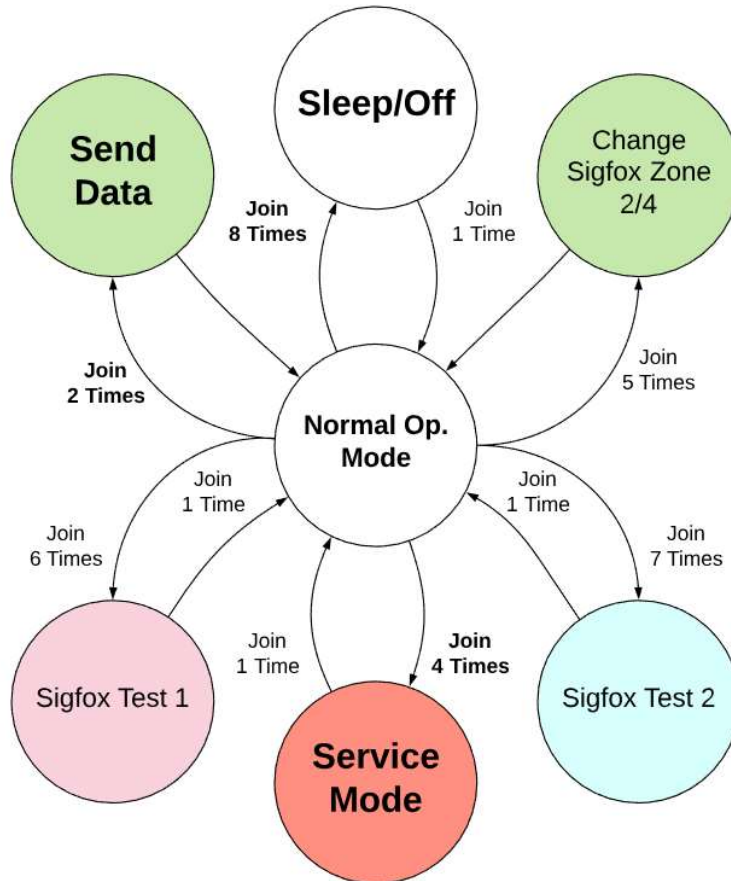


Datalog X-PRO config Magnet

4.1. Alternative Device States

While in Normal Operating Mode, as long as a magnet is placed near the main unit, as described before, the LED Indicator will shine red.

Depending on the number of times the magnet is briefly brought close the main unit, users can reach one of the alternative states indicated below:



4.1.1. Service Mode

Datalog X PRO must be configured to specify necessary resources to allow the appropriate wireless transmission of data, besides particularities related to each sensor to be used. Service Mode allows this setting. **This mode can be accessed after briefly placing a magnet near the main unit 4 times.**

After approaching the magnet as indicated, the visual indicator will light violet 4 times to indicate that the device is about to enter the Service Mode. Remember that LED Indicator will flash green only to show that the device is configuring its Communications Module, or sending data.

Once the device has entered this mode, the LED indicator will flash red every second.

After accessing Service Mode, the in-built Wi-Fi® module generates a local Wi-Fi® network (whose SSID is the prefix “DatalogXPRO_”, followed by Wifi Chip’s factory MAC; for example, “DatalogXPRO_0b534f0d10ec”, and its password is “3sense12345”), to which any device suited for internet navigation (such as a smartphone, or a PC) can connect.

Only after engaging to said network, a page identified with the IP address: **192.168.4.1** (whose interface is shown below), can be displayed:

DATALOG X-PRO CONFIG.

Configure WiFi

Wireless Mod.Setting

Sensors Setting

More Info

Reset Device

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This screen, **nominated from now on as Home Page**, directs to forms where the device administrator can specify parameters relative to the wireless communication networks to which the device being configured will be connected, especially referring to the areas in which it will operate, as well as parameters related to the sensors used, and each measured variable, among others.

To quit this mode, briefly place a magnet near the main unit 1 time.

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4.1.2. Send Data

The configured publication time (Normal or Alarm Publication Time) for each sensor will naturally limit the data transmissions executed by Datalog X PRO. However, **the device may be forced to send its readings after briefly placing a magnet near the main unit 2 times.**

LED Indicator will flash green only to show that the device is configuring its Communications Module, or sending data.

4.1.3. Sleep/Off

The device can access Sleep/Off mode after **briefly placing a magnet near the main unit 8 times.** In this state, the device stops reading and sending data; which minimizes battery consumption.

After approaching the magnet as indicated, the visual indicator will light violet 8 times to indicate that the device is about to Sleep/Off. Remember that LED Indicator will flash green only to show that the device is configuring its Communications Module, or sending data.

To quit this mode, briefly place a magnet near the main unit 1 time.

4.1.4. Change Sigfox Zone 2/4

Datalog X PRO is only able to transmit in zones 2 or 4 of Sigfox network. Therefore, if the user wants to configure the zone in which the device operates, he should **briefly place a magnet near the main unit 5 times.** After this, the device will respond with its LED Indicator.

If the LED Indicator flashes 4 times, the device is being set to work in zone 4 of the network; on the other hand, if such LED lights twice, it is to show that the device will be configured to operate in zone 2 of the network.

Remember that LED Indicator will flash green only to show that the device is configuring its Communications Module, or sending data.

An alternative way to set the Sigfox Zone in which Datalog X PRO will operate can be found in section 4.3. 'Connect Datalog X PRO to Sigfox® or 3G/4G Wireless Networks'.

4.1.5. Develop Sigfox Radiation Tx Test (Sigfox Test 1):

Through the Normal Op. Mode, user can access different modes to test the transmission characteristics of Sigfox module that may come with the device, if ordered.

Through the Normal Op. Mode, user can access different modes to test the transmission characteristics of Sigfox module that may come with the device, if ordered.

To enter the mode in which a continuous wave is sent, at maximum power, in one of the frequencies enabled for the module (or Sigfox Test 1), briefly press Configuration Button 6 times.

The visual LED Indicator will light violet 6 times to show that the device is about to enter the Sigfox Test 1. Remember that LED Indicator will flash green only to show that the device is configuring its Communications Module.

Once the device has entered this mode, the LED indicator will flash violet every second.

To quit this mode, briefly press Configuration Button 1 time.

4.1.6. Developpe Sigfox RX radiated sensitivity (Sigfox Test 2):

Through the Normal Op. Mode, user can access different modes to test the recepci3n characteristics of Sigfox module.

To enter the mode in which a Datalog X-PRO is activated in infinite loop RX GFSK test mode (or Sigfox Test 2), briefly press Configuration Button 7 times.

The visual LED Indicator will light violet 7 times to show that the device is about to enter the Sigfox Test 2. Remember that LED Indicator will flash green only to show that the device is configuring its Communications Module.

Once the device has entered this mode, the LED indicator will flash turquoise every second.

To quit this mode, briefly press Configuration Button 1 time.

4.2. Connect Datalog X PRO to a Wi-Fi® network

To set the SSID of the network to which the device will be connected, its Password; as well as the URL and Port that will receive the transmitted data, proceed as follows:

- 1. On the Home Page, press the Configure Wi-Fi® button to be directed to a page where you can see a scan of Wi-Fi® networks detected by the device as available, 4 input fields, and two buttons (Save and Scan).**

The page that loads after selecting Sensor Settings, on Home Page, is presented in the following image:

3SENSE

OMICRON1	100%
ConsulsarSAS	94%
MARIAPRECIADO	40%
GUTIERREZ	36%
Agencia De Seguros	28%
HP-Print-16-LaserJet 1102	26%

OMICRON1
password
SERVER IP
SERVER PORT

save

[Scan](#)

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2. In the form at the bottom of the Configure Wi-Fi® page, **enter the credentials (SSID and password) of the network to which you want the Datalog X PRO to connect, as well as the Server IP (or URL endpoint) and Port that will receive the data** (ask Datalog X PRO manufacturer to know which URL and Port corresponds to 3Sense Monitoring and Control Platform, if you aim to use it), **and then press the Save button.**

If the entered credentials are invalid, the next page will appear:

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3SENSE

Credentials NOT Saved
Invalid SSID

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Otherwise, you will see:

3SENSE

Credentials Saved
Trying to connect your 3Sense to
network.
If it fails go to WiFi Config and try
again

[Back to Home](#)

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4.3. Connect Datalog X PRO to Sigfox® or 3G/4G Wireless Networks

Since Datalog X PRO can use 3G/4G or Sigfox® networks to transmit data, it is possible to configure the system to serve from any of the 2 technologies. **To configure wireless transmission features, stick to the following steps:**

1. **On the Home Page, press Wireless Mod. Setting** to be directed to a page with a form that allows to set network specifications, according to the technology of the Communications Module attached to the device.

- 1.1. **If Datalog X PRO uses a Sigfox® Communications Module, you'll find the next form:**

SIGFOX MODULE CONFIG.

Chip ID: CA345667

Sigfox Zone:

Run Test Mode:

Save

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It must be taken into account that, nowadays, Datalog X PRO is only enabled to transmit in zones 2 and 4 of the Sigfox network. This implies that in the form titled SIGFOX MODULE CONFIG., the user should only type 2 or 4 in the Sigfox Zone field.

On the form titled SIGFOX MODULE CONFIG., **in Run Test Mode field, assigning 1 would indicate the device to Run Test Mode; while 0 will indicate the opposite.**

Take into Account that **Running Test Mode with a Sigfox Communications Module will set the device to transmit data every minute; therefore, this mode should not be permanently maintained,** since exceeding the daily message limits established by Sigfox® implies higher costs for Datalog X PRO administrator.

To quit Test Mode, let Datalog X PRO rest for 15 min. and it will then automatically change to Normal Operation Mode.

1.2. Otherwise, If Datalog X PRO uses a 3G/4G Communications Module, you'll find:

3G/4G MODULE CONFIG.

Chip IMEI: 12323|24|234

Phone Number: 12323|24

Operator Code:

Save

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2. On either form, typewrite what needs to be modified, and then press the Save button.

4.4. Define Sensors and Variables Settings

To configure parameters relative to the connected sensors, follow the steps below:

1. **On Home Page, click on Sensor Settings** to be directed to a page with multiple buttons, which link to corresponding forms that allow to configure the sensor/interface on each port.
Each port is labeled with its respective number, near the corresponding cable gland, on the main unit enclosure.

The page that loads after selecting **Sensor Settings**, on Home Page, is presented below:

DATALOG X-PRO CONFIG.

Sensor Interface 1

Sensor Interface 2

Sensor Interface 3

Accelerometer Setting

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2. After clicking on a button, the page will be reloaded with a form (shown below); relative to the chosen Sensor/Interface, where its respective settings can be uploaded:

SENSOR INTERFACE CONFIG

INTERFACE CLASS: 'CL'

NUMBER OF CHILDS: 'HJ'

LONG: 'NB' Bytes

NORMAL T.PU[MIN]:

ALARM T.PU[MIN]:

Configure Childs

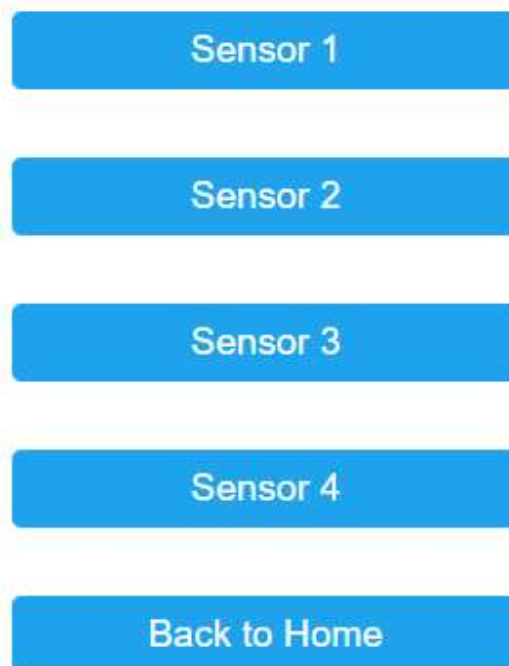
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Such form will display the Class relative to the chosen Sensor/Interface; the number of Childs/Variables it manages; the length (in bytes) of its readings; and 2 fields to set the desired normal Publication Time (T. PU), in minutes, for the configured Sensor/Interface; and the required Publication Time in case the read value of one of its Childs/Variables is found outside of its admissible range.

On such form, typewrite what needs to be modified, and then upload changes clicking any button. If **Configure Childs** is chosen, the page will reload to show links to forms which allow the setup of certain parameters, relative to the Childs/Variables abled for the Sensor/Interface under configuration, as shown:

SENSOR CHILD SELECTOR



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Selecting a Child/Variable on this page, will display a form similar to the one shown in the next image. **Depending on the Sensor/Interface Class, more or less Child/Variables could be selected here**, since different sensors have different sensing capabilities:



SENSOR CONFIGURATION

SENSOR TYPE: 'ST'

CURRENT READ: 'CR'

SAMPLE TIME:

OFFSET ADJUST:

LOW LIMIT:

HIGH LIMIT:

Save

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On either form, typewrite what needs to be modified, and then press the Save button.



4.5. Check Other Settings

If you wish to see the factory ID of the Communications Module that is being configured, its firmware version, its MAC, and its latest dynamic IP, follow the next steps:

1. **On Home Page, press the More Info** button to be directed to a list with all this data.

3SENSE

Chip ID: 14237262

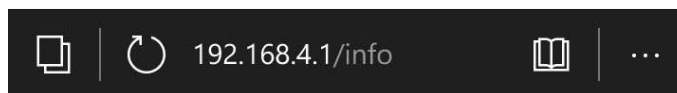
Last Dynamic IP:

Station MAC: 5C:CF:7F:D9:3E:4E

Software WiFi Version 3.0.1

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4.6. Quitting Service Mode

Finally, to quit Service Mode, let Datalog X PRO rest for 15 min. and it will then automatically change to Normal Operation Mode.

5. 3Sense Remote Monitoring and Control Platform

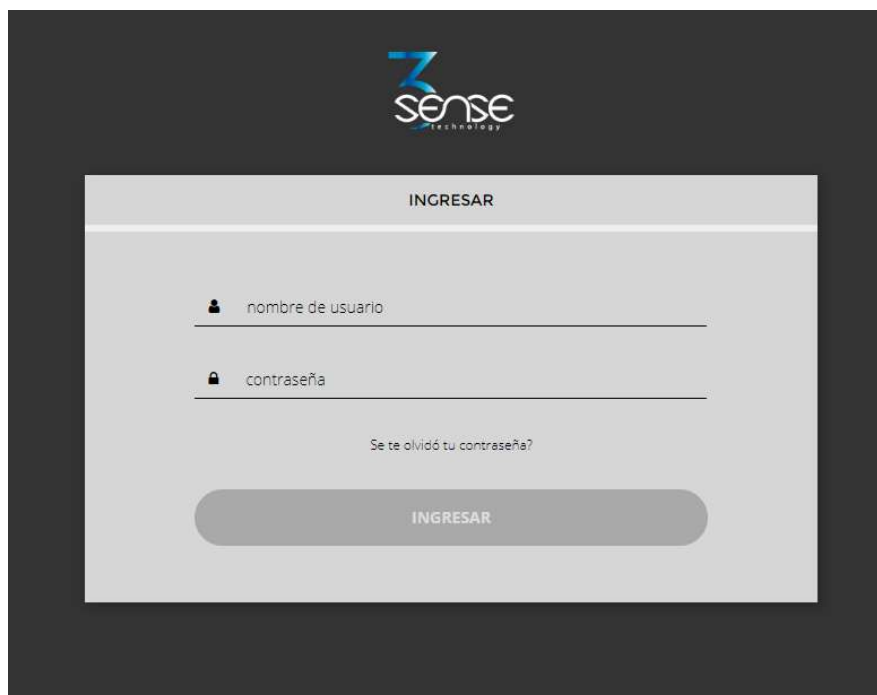
3Sense 4.0 devices, like Datalog X PRO, work in conjunction with Web Platform® WEB platform and Web Platform® APP.

Users can access Web Platform® platform, via WEB or APP, to perform, among other things:

- Remote monitoring and visualization of historical data records, in graphs and data tables, from up to 2 years.
- Alarm management for variables out of range, battery levels and main power supply fails.
- Add comments to alarm records.
- Set alarm limits, among other custom settings like sensors' names.
- Set alarm events such as e-mail or SMS notifications.

5.1. Access to Web Platform®

Using the credentials provided by the manufacturer, devices' administrators can log in at login.3sense.tech:



The screenshot shows a login interface for the 3Sense platform. At the top center is the 3sense technology logo. Below it, the word "INGRESAR" is displayed in a light gray box. The main login area contains two input fields: the first is labeled "nombre de usuario" with a user icon, and the second is labeled "contraseña" with a lock icon. Below these fields is a link that says "Se te olvidó tu contraseña?". At the bottom of the login area is a large, rounded "INGRESAR" button.

The platform uses some basic elements to organize the information it manages, and facilitate interaction with users. These are: **Dashboards, Devices and Events**.

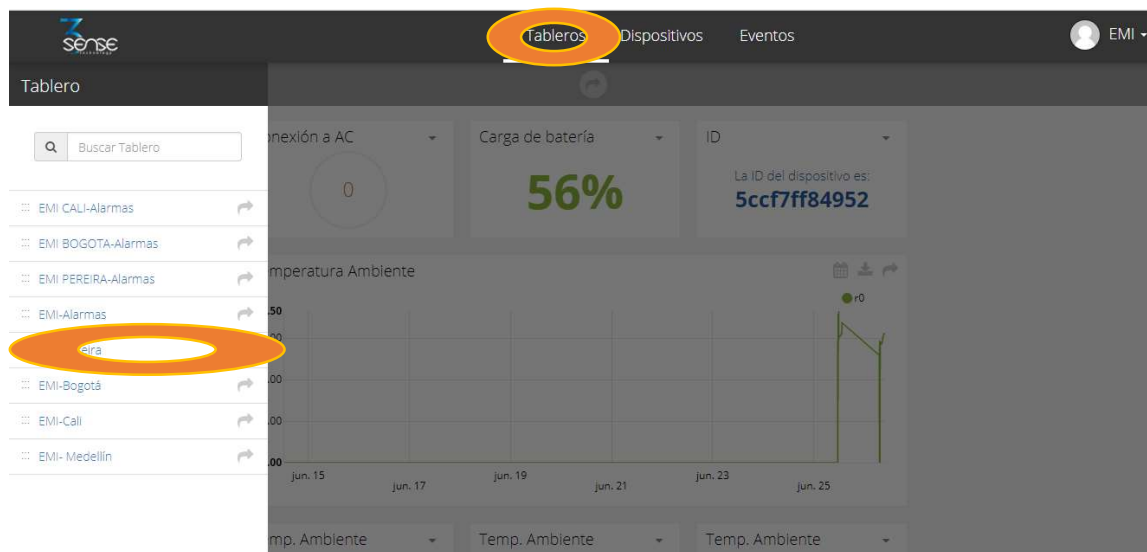
An introduction to the use of each of them will be offered in this guide.

5.2. Reviewing Historical Data

Dashboards are interfaces where relevant data is presented to the users. Web Platform® allows to create custom Dashboards to integrate any information desired (if using an account with permission to do so); however, by default it offers panels for remote monitoring of the data published by each device linked to the platform, and panels to display Alarms or Events that have recently occurred.

To review a Dashboard, initially follow what is indicated in 1.1, to access the platform.

Once inside, you can find the link to the section that includes all the Dashboards available to your account, by clicking on the icon. Then, you can select the Board of your interest:



After selecting a particular Dashboard, the user is able to see the information that corresponds to said panel in multiple graphs and visual elements:



To learn how to modify said elements and how to configure a Dashboard, refer to the recommended manufacturer's guide.

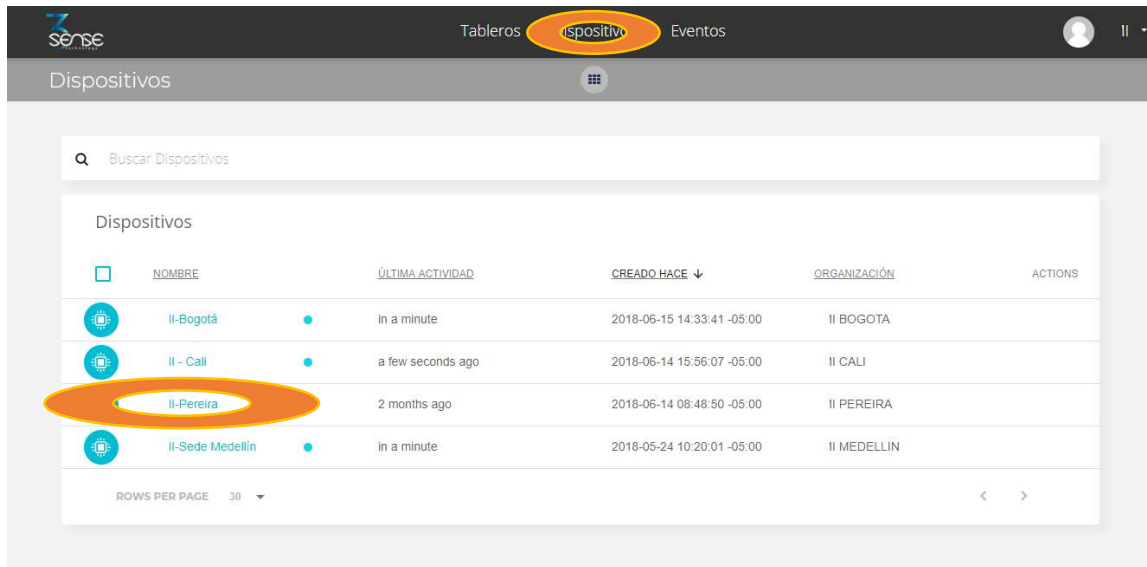
5.3. Reviewing Devices, their Variables, and Configuration

A Device, in Web Platform®, is a virtual representation of a physical device that takes data from sensors and transmits them through a particular network to the platform. Thus, each Device visible to an account receives the data of the physical equipment acquired by the administrator of said account.

The data received by a device is stored and organized in multiple variables.

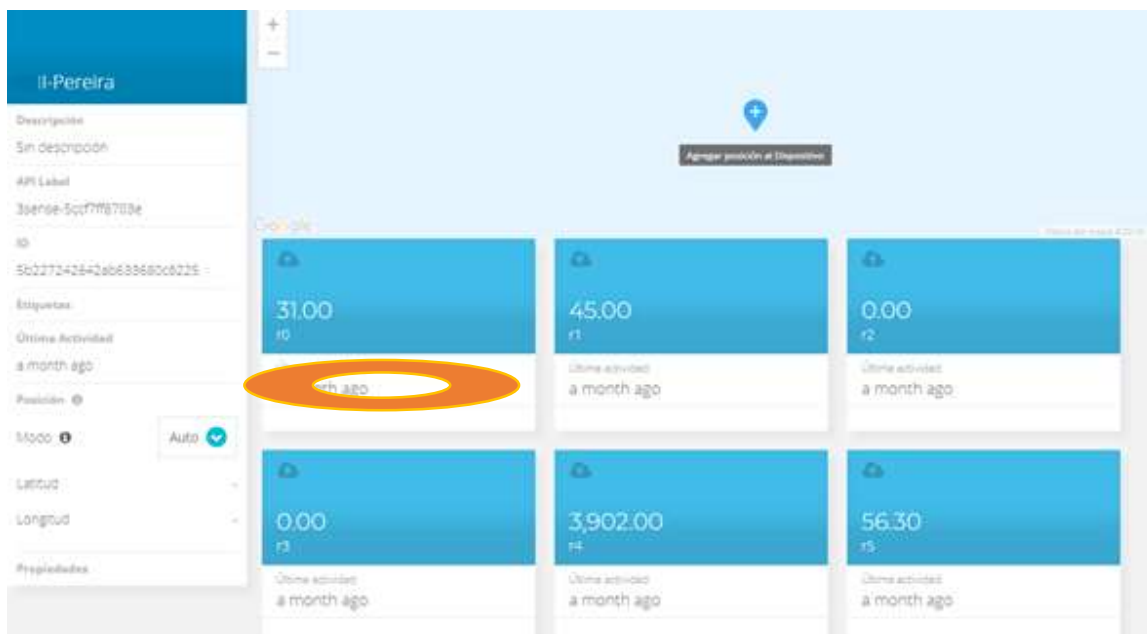
To review a specific Device, initially follow what is indicated in 1.1, to access the platform.

Once inside, you can find the link to the section that includes all the available Devices to your account and select the Device of your interest:



After selecting a particular Device, the user is able to see the information that corresponds to said Device in multiple panels and Variables.

Reviewing the Variables of a certain Device allows checking the update status and presence of each Variable. If it is suspected that one variable is not being updated properly, after entering the Device panel that should include it, its last activity period could be reviewed.



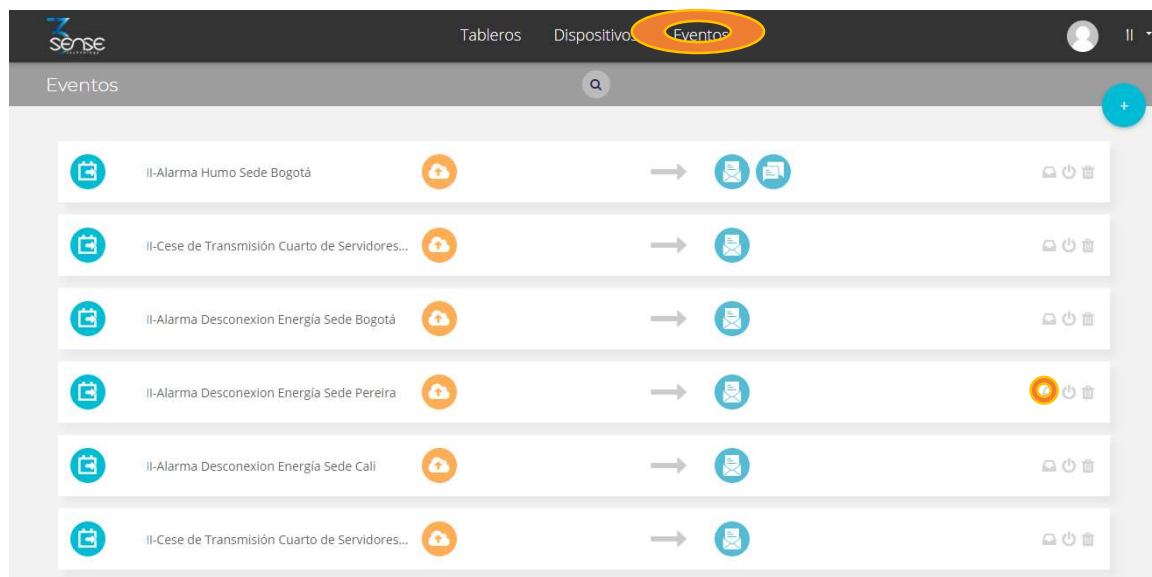
To learn how to modify the elements and configuration of a Device, refer to the manufacturer's guide provided for it.

5.4. Reviewing Alarms and Programmed Events

In Web Platform®, Events (or Incidents) are configurable conditions that activate the sending of alert messages via email, SMS messaging, Telegram messaging or Webhooks. Events that are in condition to send a message, can be reviewed in a Board associated with your account, in whose name the suffix -Alarms is included.

To review an Event, initially follow what is indicated in 1.1, to access the platform.

Once inside, you can find the link to the section that includes all Events available to your account and locate the Event of your interest:



To review the last activity of an Event, the icon associated with each event can be clicked. By doing so, you can view a table like the following:



To review the Dashboard with the recently activated Alarms, refer to section 1.2, and look for the Dashboard whose name contains the suffix -Alarms.

This Dashboard will contain a table like the following:

Incidentes							
Dispositivo	Variable	Activado	Reconocido	Resuelto	Mensaje	Comentarios	
II-Sede Medellin		Agosto 02 2018 - 08:55:06	-	-	II-ALARMA Temperatura Sede Medellin	Ver comentarios	
II-Sede Medellin		Agosto 01 2018 - 15:27:40	-	Agosto 01 2018 - 15:30:42	II-ALARMA Temperatura Sede Medellin	Ver comentarios	
II-Sede Medellin		Agosto 01 2018 - 11:00:28	-	Agosto 01 2018 - 15:26:42	II-ALARMA Temperatura Sede Medellin	Ver comentarios	
II-Sede Medellin		Julio 31 2018 - 12:04:02	-	Agosto 01 2018 - 10:47:27	II-ALARMA Temperatura Sede Medellin	Ver comentarios	
II-Sede Medellin		Junio 05 2018 - 01:36:58	-	Julio 31 2018 - 11:31:16	II-ALARMA Temperatura Sede Medellin	Ver comentarios	
II-Sede Medellin		Mayo 25 2018 - 11:57:34	-	Junio 05 2018 - 01:35:47	II-ALARMA Temperatura Sede Medellin	Ver comentarios	
II-Sede Medellin		Mayo 25 2018 -	-	Mayo 25 2018 -	II-ALARMA Temperatura Sede	Ver comentarios	

To learn how to modify the elements and configuration of a Device, refer to the manufacturer's guide, provided for it.

Remember that, if a certain explanation not clear, or you need more assistance, you can contact the 3Sense technical service department. Contact Information can be found at the beginning of this manual.