ESL Supervised Wireless Smoke Alarms

C (U L) US **CSFM**
LISTED

NetworX: NX491NT
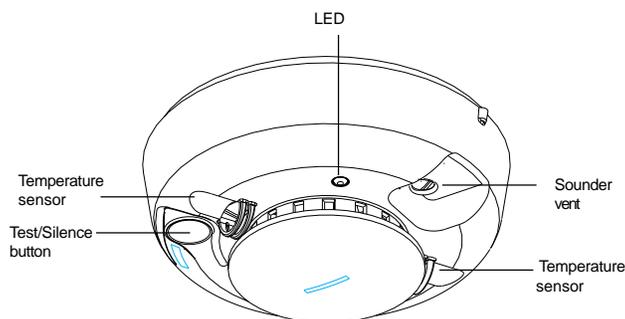
60-848-02-95

Installation Instructions

Figure 1. Alarm Features

Description

The ESL supervised smoke alarms are Learn Mode wireless sensors with 319.5 MHz transmitters that use photoelectric technology with a self contained sounder, a low battery annunciator, and a status LED. The smoke alarms are part of a residential security/fire alarm system and communicate with the system control panel.

The smoke alarms provide the following features:

Self-diagnostics. The smoke alarms monitor their own sensitivity and operational status.

Base tamper switch sends a tamper signal transmission to the control panel when the smoke alarms are removed from their mounting bases.

Integrated fixed 135°F temperature and rate-of-rise heat detector trips an alarm based on high temperature detected or rapidly rising temperature rate (15°F/minute minimum).

Transmitted Signal Outputs

The smoke alarms transmit the following signals to the control panel:

•Alarm	•Tamper	•Test
•Low battery	•Trouble	•Supervisory

Selecting a Location

Selecting a suitable location is critical to the operation of smoke alarms. This equipment should be installed in accordance with the National Fire Protection Association's (NFPA) Standard 72. See Figure 2.

A-8-1.2.1.a Where to Locate the Required Smoke Alarms in Existing Construction.
The major threat from fire in a family living unit occurs at night when everyone is asleep. The principal threat to persons in sleeping areas comes from fires in the remainder of the unit. Therefore, a smoke alarm(s) is best located between the bedroom areas and the rest of the unit. In units with only one bedroom area on one floor, the smoke alarm(s) should be located as shown in Figure 2 A.

In family living units with more than one bedroom area or with more than one floor, more than one smoke alarm is required, as shown in Figure 2 B.

In addition to smoke alarms outside of the sleeping areas, the installation of a smoke alarm on each additional story of the family living unit, including the basement, is required. These installations are shown in Figure 2 C. The living area smoke alarm should be installed in the living room or near the stairway to the upper level, or in both locations. The basement smoke alarm should be installed in close proximity to the stairway leading to the floor above. Where installed on an open-joisted ceiling, the alarm should be placed on the bottom of the joists. The alarm should be positioned relative to the stairway to intercept smoke coming from a fire in the basement before the smoke enters the stairway.
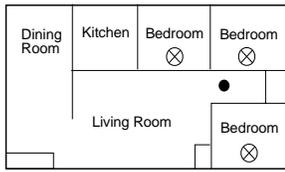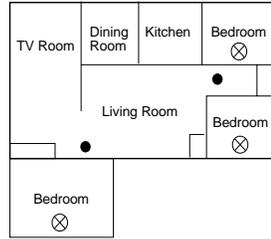
Figure 2 A. Alarm Placement
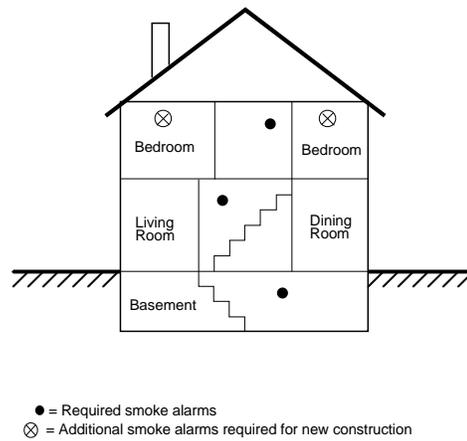

Figure 2 B. Alarm Placement

● = Required smoke alarms
⊗ = Additional smoke alarms required for new construction

Figure 2 C. Alarm Placement

A-8-1.2.1.b *Where to Locate the Required Smoke Alarms in New Construction.*
All of the smoke alarms specified in A-8-1.2.1.a for existing construction are required and, in addition, a smoke alarm is required in each bedroom.

A-8-1.2.1.c *Are More Smoke Alarms Desirable?*

The required number of smoke alarms might not provide reliable early warning protection for those areas separated by a door from the areas protected by the required smoke alarms. For this reason, it is recommended that the householder consider the use of additional smoke alarms for those areas for increased protection. The additional areas include the basement, bedrooms, dining room, furnace room, utility room, and hallways not protected by the required smoke alarms. The installation of smoke alarms in kitchens, attics (finished or unfinished), or garages is not normally recommended, as these locations occasionally experience conditions that can result in improper operation.

Since regulations pertaining to smoke alarm/detector installation vary from state to state, contact the authority having jurisdiction (AHJ). Where public safety is primary, the AHJ may be a federal, state, local, or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor or health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the AHJ. In some cases, the property owner or their designated agent assumes the role of the AHJ. At government installations, the commanding officer or department official may be the AHJ.

General Guidelines

- Before mounting alarms, program (learn) them into panel memory and perform a sensor test from the alarm's intended location, to ensure good RF communication to the panel.
- Locate the alarm in environmentally controlled areas where the temperature range is between 40° and 100° F (4.4° and 37.8° C) and the humidity is between 0 and 90% noncondensing.
- Locate alarms away from ventilation sources that can prevent smoke from reaching the alarm.
- Locate ceiling mounted alarms in the center of the room or hallway, at least 4 inches (10cm) away from any walls or partitions.
- Locate wall mounted alarms so the top of the alarm is 4 to 12 inches (10 to 31cm) below the ceiling.
- In rooms with sloped, peaked, or gabled ceilings, locate alarms 3 feet (.9 meters) down or away from the highest point of the ceiling.
- When mounting to suspended ceiling tile, the tile must be secured with the appropriate fastener to prevent tile removal.

Note: *Do not mount the alarm to the metal runners of suspended ceiling grids. The metal runners can draw the magnet's field away from the alarm's reed switch, causing a false tamper alarm.*

Locations to Avoid

Do not install smoke alarms:

- in or near areas where combustion particles are normally present such as in kitchens, garages, near furnaces, hot water heaters, or gas space heaters.
- on the ceiling in rooms next to kitchens where there is no transom between the kitchen and such rooms.
- in damp or very humid areas or next to bathrooms with showers. Locate detectors at least 5 feet (1.5 meters) away from bathrooms.
- in very cold or very hot areas.
- in dusty, dirty, or insect infested areas.

- near fresh air inlets or returns or excessively drafty areas. Heating/air conditioning vents, fans, and fresh air intakes can drive smoke away from smoke alarms.
- in dead air spaces at the top of peaked ceilings or in corners where walls and ceiling meet. Dead air may prevent smoke from reaching a smoke alarm.
- near fluorescent light fixtures. Locate smoke alarms at least 10 feet (3 meters) away from these fixtures.

Limitations

Smoke alarms may not work under all conditions. Smoke alarms cannot provide total protection of life or property and are not a substitute for insurance. All alarms are subject to possible compromise or failure-to-warn for a variety of reasons. For example:

- This smoke alarm will not operate and an alarm will not sound if its batteries are dead, removed, or not installed correctly.
- Radio signals transmitted by this smoke alarm may be blocked or reflected by metal objects. Adjacent devices or systems using radio frequency signals may interfere with the operation of this alarm. Test the system weekly to ensure signals are transmitted and received properly.
- Closed or partially closed doors and distance can block or reduce the alarm sound from this alarm. This alarm is not designed for the hearing impaired.
- Smoke alarms cannot detect smoke inside chimneys, walls, roofs, or smoke blocked by a closed door.
- Smoke alarms may not detect smoke on other levels of the building.
- Smoke alarms may not warn in time when fires are caused by smoking in bed, explosions, improper storage of flammables, overloaded electrical circuits, or other hazardous conditions.

Programming

This section describes the basic steps for programming (learning) the alarm into panel memory. For complete programming instructions, refer to the specific panel installation instructions.

1. Separate the alarm from the mounting base by turning the alarm counter clockwise about 15 degrees. The alarm should snap off of the mounting base.
2. Slide the battery cover away from the alarm to unsnap it and lift it off. See Figure 3.
3. Observing polarity, insert the two lithium batteries (included) into the battery compartment and replace the battery cover.
4. Attach the alarm to the mounting base by lining up the alignment tab (see Figure 4) on the alarm with the alignemnt arrow on the mounting base, then put the alarm on the base and turn it clockwise about 15 degrees. The alarm should snap into place.
5. Put the panel into installer programming mode (refer to your panel installation instructions)and proceed to learning/enrolling sensors.
6. When prompted by the panel to learn/enroll the sensor, trip the alarm tamper by separating the alarm from the mounting base (see Step 1).
7. Attach the alarm to the mounting base (see Step 4).
8. Exit from installer programming mode.

Verify Programming and Alarm-to-Panel RF Communication

Before mounting, verify that the desired alarm location provides good RF communication to the panel.

1. Put the panel into Dealer Sensor Test mode (refer to the specific panel installation instructions).
2. Take the alarm to the desired mounting location.
3. Press and hold the alarm test/silence button for 4 seconds. The alarm transmits a test signal.
4. Listen for the appropriate response from system sirens to determine signal integrity from the alarm to the panel (refer to the specific panel installation instructions).
5. Exit from Dealer Sensor Test mode.

Mounting

Mount the alarm with the appropriate fasteners. Mounting hardware is included (screws and anchors), however you may need different hardware depending on the installation.

1. Separate the alarm from the mounting base by turning the alarm counter clockwise about 15 degrees. The alarm should snap off of the mounting base.
2. Place the mounting base on the mounting surface at the desired location and mark the mounting holes using a pencil.
3. Secure the mounting base to the surface using the appropriate hardware.
4. Attach the alarm to the mounting base by lining up the alignemnt tab on the alarm with the alignment arrow on the mounting base, then put the alarm on the base and turn it clockwise about 15 degrees. The alarm should snap into place.
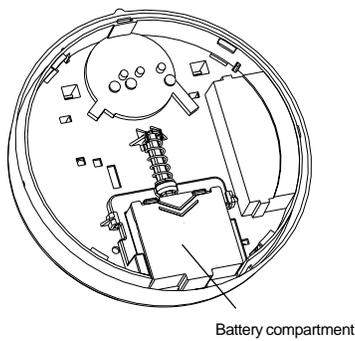
Alignment tab   Alignment arrow

Battery compartment
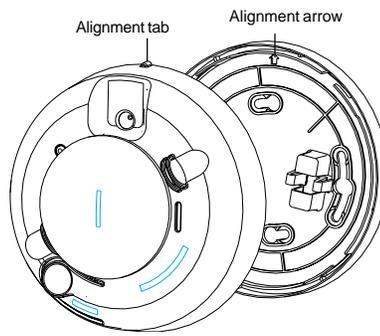
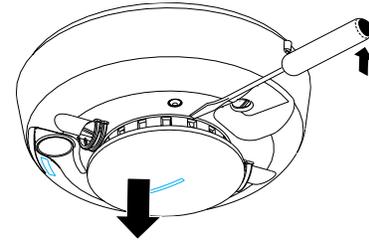Figure 3. Battery Compartment   Figure 4. Alarm-to-base Alignment   Figure 5. Removing Alarm Cap

Testing

There are three ways to test the alarm: sensor test, smoke test, and sensitivity test.

Sensor Test

The system and sensor test verifies good communication between the alarm and receiver/panel. The sensor test should be performed weekly.
1.   Put the panel into Sensor Test mode (refer to the specific panel installation instructions).
2.   Press and hold the alarm test/silence button for 4 seconds. The alarm transmits a test signal.*
3.   Listen for the appropriate response from system sirens (refer to the specific panel installation instructions).
4.   After testing all alarms, exit from Sensor Test mode.
     *Holding the test button for 20 seconds will cause the alarm to send a signal through to a central station.

Smoke Test

The smoke test verifies that the alarm activates when detecting smoke, that the transmitted signal is received by the receiver/panel, and that the panel reports the alarm to the central monitoring station. The smoke test should be performed annually.

1.   Contact the central monitoring station to alert them you are testing the system and *they should not dispatch authorities*.
2.   Activate the alarm using one of the following two methods:

     Method 1 Hold a smoldering punk or cotton wick close to the alarm and direct the smoke into the smoke entry openings for about 20 seconds.

     Method 2 Use ESL Smoke! in a can® and follow the directions on the can.

     Once activated, the transmitter LED turns on, the built-in sounder emits a temporal 3 pattern, and the alarm transmits an alarm signal. The panel then processes the alarm signal and reports the alarm condition to the central station.
3.   Press the alarm test/silence button to stop the built-in sounder. The alarm automatically resets when smoke is no longer present and the LED should turn off and return to normal operation (one flash every 8 seconds).
4.   Contact the central monitoring to verify they received the alarm report.
5.   Be sure to alert the central monitoring station when you are finished testing.

Sensitivity Test

Use this test to check alarm sensitivity.

1.   Press and hold the alarm test/silence button for two seconds, then release it. The alarm transmits a test signal, then performs a self-test that causes the LED to flash 1 to 9 times.
2.   Count the number of LED flashes, then use the following table to determine if any action is necessary.

Flashes	Indication	Action
0 -1	Unserviceable hardware fault.	Reset unit and rerun sensitivity test. If the error persists, replace the unit.
2 3	Alarm is becoming insensitive.	Clean the unit. Reset the unit and rerun sensitivity test. If the error persists, replace the unit.
4 5 6 7	Alarm is within normal sensitivity range.	N/A
8 9	Alarm is becoming too sensitive.	Verify the smoke chamber is snapped down securely. Clean the unit and replace the smoke chamber.

Troubleshooting

The following describes how the alarm indicates a fault condition. Correct fault conditions as soon as possible.

- The LED stops working (no flashing or turning on) if the alarm sensitivity is not within the normal range, or if an unserviceable hardware fault is detected.
- The alarm stops transmitting supervisory signals if the alarm has an unserviceable hardware fault or is not sensitive enough, causing the panel to indicate the detector is in a supervisory condition. However, the alarm can still transmit alarm signals.
- The alarm transmits a trouble (CleanMe) signal when the alarm is too sensitive. Panels supporting this feature identify the trouble as "Partial Obscurity" on system touchpad displays.

When to Replace the Batteries

When the battery voltage gets low, the alarm transmits a low battery signal for the panel to receive. The panel activates trouble beeps through system sirens and identifies the alarm with the low battery on system touchpad displays. If the batteries are not replaced within seven days, the alarm's built-in sounder emits a short beep or chirp every 45 seconds. Alarm chirps can be silenced for 24 hours by pressing the alarm's test/silence button. Batteries should be replaced as soon as possible (see "Specifications" for battery list).

Replacing the Batteries

Use only 3V lithium batteries listed in *Specifications* in the alarm.

1. Remove the alarm from the mounting base.
2. Slide the battery compartment cover away from the alarm to unsnap it and lift it off. See Figure 3.
3. Remove the batteries and dispose of them properly.
4. Observing correct polarity, insert two new 3V lithium batteries into the battery compartment and replace the cover.
5. Reattach the alarm to the mounting base.
6. Test the system.

Cleaning the Alarm

Clean the alarm cover with a dry or damp (water) cloth as needed to keep it free from dust and dirt.

When necessary, clean the alarm interior and **replace** the optical chamber (part #211) as follows:

1. Disconnect the alarm notification appliances.
2. Remove the alarm from its mounting base.
3. Remove the batteries. See *Replacing the Batteries.*
4. Slide a flat-blade screwdriver in the slot on the alarm cap and gently push the handle down to pry the alarm cap up and off. See Figure 5.
5. Squeeze the field replaceable optical chamber where indicated and pull it up and away from the optical base and discard. See Figure 6.
6. Blow out or use a soft-bristled brush to remove all dust and dirt from the optical base.
7. Line the new field replaceable optical chamber up with the optical base and snap into place both sides of the optical chamber.
8. Replace the alarm cap as follows:

    -Line the alarm cap up with the smoke alarm.

    -Insert the alarm cap into the smoke alarm and turn clockwise approximately 15 degrees. It should snap firmly into place.
9. Observing the proper polarity, put the batteries back in the alarm and replace the battery compartment cover.
10. Reattach the alarm to its mounting base.
11. Test the alarm sensitivity and reconnect all alarm notification appliances. See *Testing the Alarms Sensitivity.*
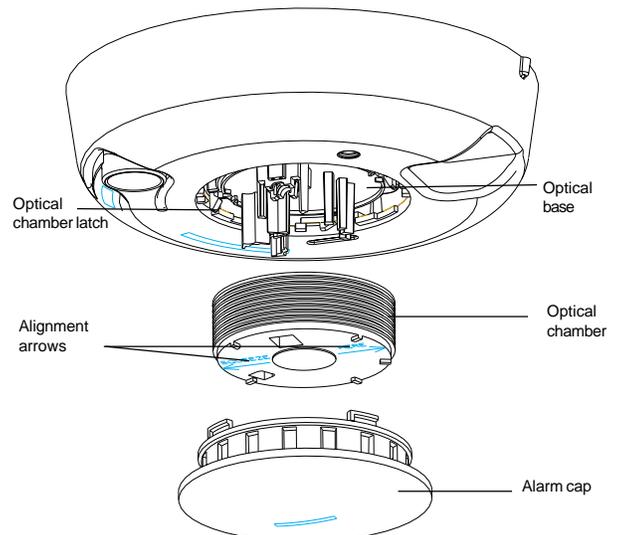
> **Important !**
> The control panel alarm and all auxiliary functions should be verified for a complete test of the system.

Optical chamber latch

Optical base

Alignment arrows

Optical chamber

Alarm cap

Figure 6. Alarm Parts

Maintaining the Alarms

The smoke alarms are designed for easy field service and maintenance. When installed and used properly, they require minimal maintenance.

The smoke alarms should be tested weekly. See *Testing*.

When an alarm requires maintenance, it extinguishes its LED and sends a signal to the control panel as described in the following table.

Signal	Action required
Trouble signal	Smoke alarm sensitivity range is too high and the alarm needs cleaning. See *Cleaning the Alarm.*
Low battery	Batteries in the alarm are low. Replace the batteries.

Fire Prevention and Escape

The purpose of an early warning smoke alarm is to detect the presence of fire in its early stages and sound an alarm giving the occupants time to exit the premises safely.

Avoid Fire Hazards

No detection device can protect life in all situations. Therefore, safeguards should be taken to avoid potentially dangerous situations as follows:

- **Do not** smoke in bed.
- **Do not** leave children home alone.
- **Never** clean with flammable liquids such as gasoline.
- Properly store materials. Use general good housekeeping techniques to keep your home neat and tidy. A cluttered basement, attic, or other storage area is an open invitation to fire.
- Use combustible materials and electrical appliances carefully and only for their intended uses. **Do not** overload electrical outlets
- **Do not** store explosive and/or fast burning materials in your home.
- Even after proper precautions have been taken, fires can start. **Be prepared**.

In Case of Fire

In the event of a fire, you should do the following:

- Leave immediately. Don't stop to pack or search for valuables.
- In heavy smoke, hold your breath and stay low, crawl if necessary. The clearest air is usually near the floor.
- If you have to go through a closed door, carefully feel the door and door knob to see if undue heat is present. If they seem cool, brace your foot against the bottom of the door with your hip against the door and one hand against the top edge. Open it slightly. If a rush of hot air is felt, slam the door quickly and latch it. Unvented fire tends to build up considerable pressure. Be sure all members of the household realize and understand this danger.
- Use your neighbor's phone or a street fire alarm box to call the fire department. The job of extinguishing the fire should be left to the professionals.

Be Prepared

Practice the following steps to prepare you and your family in the event of a fire:

- Perform fire drills regularly. Use them to assure recognition of an alarm signal.
- Draw a floor plan and show two exits from each room. It is important that children be instructed carefully, because they tend to hide in times of crisis.
- Establish one meeting place outside the home. Insist that everyone meet there during an alarm. This will eliminate the tragedy of someone reentering the house for a missing member who is actually safe.
- If you have children and/or physically challenged people residing in your household, use window decals to help emergency personnel identify the sleeping quarters of these individuals.

⚠ **WARNING**
Smoke alarms CANNOT provide warnings for fires resulting from explosions, smoking in bed or other furniture, ignition of flammable liquids, vapors and gases, children playing with matches or lighters.

Limited Warranty

ESL is a brand of GE Interlogix. The manufacturer warrants this smoke alarm (except batteries) to be free from defects in material and workmanship under conditions of normal use for a term of 3 years from the date of manufacture.

During the warranty period, if a GE Interlogix product or any of its components becomes defective, it will be repaired or replaced without charge.

Out-of-warranty units will be repaired at the discretion of the manufacturer or, if not, a card will be forwarded to the customer suggesting a replacement unit and the cost of that unit.

This warranty does not apply to units which have been subject to abuse, misuse, negligence or accident, or to which any modifications, alterations or repairs have been made or attempted.

This warranty is extended only to the original purchaser of the smoke alarm and may be enforced only by such person. During the warranty period, if the alarm or any warranted components thereof becomes defective, it will be replaced or repaired without charge at the manufacturer's discretion if returned in accordance with the following instructions:

Obtain a Return Authorization Number by calling 1-800-777-4841 or 1-800-777-1415, then carefully pack it in a well padded and insulated carton and return, postal charges prepaid to:

Customer Service RMA#
GE Interlogix
2266 Second Street North
North St. Paul, MN 55109

A note should be included advising the nature of the malfunction. Care must be exercised in the proper packing of alarms returned under this warranty as Interlogix will not be responsible for warranty repairs to equipment damaged because of improper packing.

The above warranty is in lieu of all other express warranties, and implied warranties of merchantability and fitness for a particular purpose are limited in duration for a period of THREE years from the date of manufacture. Under no circumstances shall manufacturer be liable to the purchaser or any other person for incidental or consequential damages of any nature, including without limitation damages for personal injury or damages to property, and however occasioned, whether alleged as resulting from breach of warranty by manufacturer, the negligence of manufacturer or otherwise. Manufacturer's liability will in no event exceed the purchase price of the product. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you. Unless a longer period is required by applicable law, any action against manufacturer in connection with this smoke alarm must be commenced within one year after the cause of action has occurred.

No agent, employee or representative of the Manufacturer nor any other person is authorized to modify this warranty in any respect. Repair or replacement as stated above is the exclusive remedy of the purchase hereunder. This warranty gives you specific legal rights and you also have other rights which vary from state to state.

FCC Compliance

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.

 (2) This device must accept any interference received, including interference that may cause undesired operation.

FCC ID: B4Z-773A-SMOKE

Specifications

Voltage	3VDC
Typical average standby current	35µA
Typical test current	2mA
Typical alarm current	70mA
Battery type	Duracell® 3V lithium 123, Panasonic® lithium CR123A, Sanyo® lithium CR123A
Low battery threshold	2.70V causes low battery signal
Sounder	85dBa at 10' temporal pattern
Low battery beep rate	1 every 45 sec. ± 2 sec.
Sensitivity	2.2% ± 1.3%/ft.
Operating temperature	40°-100°F (4.4°-37.8°C)
Operating humidity range	0-95% non-condensing
RFI Immunity	20V/m minimum; 0-1000MHz
Color	white
Alarm dimensions	5.6" x 2.4" (14.2cm x 6.1cm)
Base dimensions	5.4" x 0.46" (13.7cm x 1.17cm)
Drift compensation adjustment	0.5%/ft. max.
Heat detector specifications:	
Rate-of-rise	15°F/min>105°F (8.3°C/min>40.6°C)
Fixed	135°F ± 5°F (57.2°C ± 2.8°C)
RF frequency	319.5 MHz
Transmitter ID	Pre-programmed, 1 Million codes
Modulation type	AM
Signal format	PWM
Signal output types	alarm, tamper, test, low battery, trouble, supervisory
Listings	UL217, C-UL US, CSFM, FCC

For use with the following panels:

NetworX: NX4, NX6, NX8, NX8E

GE Interlogix: Commander 2000 and custom versions with sofware versions 4.1 and later, CareTaker Plus and custom versions with software versions 3.1 and later, UltraGard and custom versions, Concord, Concord Express, Simon, Advent

Product Ordering

Model	Description
NX-491NT 60-848-02-95	ESL wireless smoke alarm, two 3V lithium batteries, 85dBa sounder, thermal, base tamper, UL217 Listed, 319.5mHz transmitter
Accessories	
SM-200	Smoke! in a can® (canned smoke) for functional testing of smoke alarms
SMEXT-1	Extension tube for Smoke! in a can®
211	Field replaceable optical chambers (set of 10)
60-933	6 pack 3V lithium batteries

Patents: 4,855,713 & 4,864,636 & 5,686,885 & 5,686,896 & 6,396,405

GE Interlogix

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ESL Wireless Smoke Alarms