

# Battery Powered Carbon Monoxide Alarms Ei207/208 Series



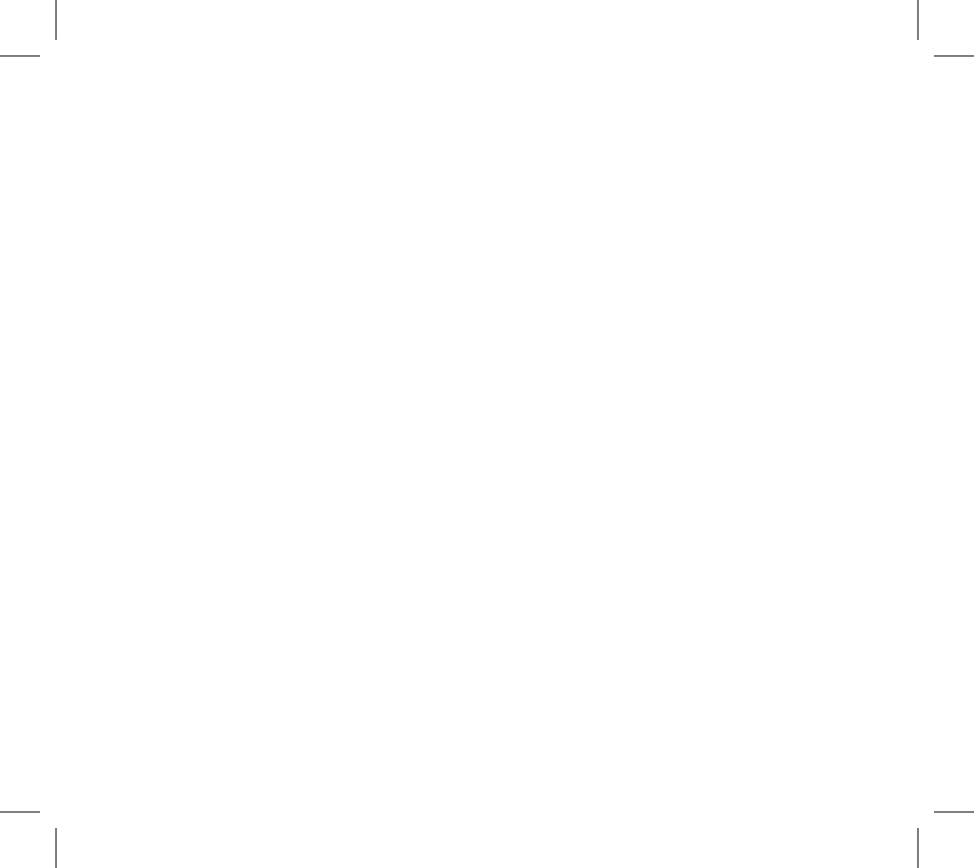
**Ei** Electronics®  
fire + gas detection

## Ei207 / Ei208 Carbon Monoxide Alarm Series

for use in Homes, Caravans, Motor Caravans and Boats

## Instructions

Read and retain carefully for as long as the product is being used. It contains vital information on the operation and installation of your Alarm. This booklet should be regarded as part of the product. If you are just installing the Alarm, this booklet must be given to the householder. This booklet is to be given to any subsequent user.



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The models listed below are designed for domestic premises, caravans, motor caravans & boats in accordance with EN 50291-1:2010+A1:2012 & EN 50291-2:2010



### Model Chart

#### Ei207 Series with Replaceable Batteries (2 x AAA)

Model	RF Capability	RF Module Supplied	LCD Display
Ei207	No	No	No
Ei207D	No	No	Yes

#### Ei208 Series with built-in Long Life Battery

Model	RF Capability	RF Module Supplied	LCD Display
Ei208	No	No	No
Ei208W	Yes	No	No
Ei208WRF	Yes	Yes	No
Ei208DW	Yes	No	Yes
Ei208DWRF	Yes	Yes	Yes

## 1. Read This First

- Congratulations on becoming the owner of an Ei Carbon Monoxide Alarm. This will help protect you and your household from the dangerous effects of Carbon Monoxide- the silent killer.
- The Carbon Monoxide Alarm (CO Alarm) is powered up by carefully rotating it onto the mounting plate which activates the on/off switch. The indicator lights will immediately flash in sequence to show they are working. (For the Display models, the LCD screen will briefly display all icons). Then wait 15 seconds after connecting the power before button testing.
- The Power light is not illuminated during standby. This light will flash green when the test button is pressed to indicate that power is present and Alarm is functioning.
- Install a CO Alarm in every room that contains a fuel burning appliance, particularly rooms where people spend a lot of time e.g. bedrooms, kitchens and sitting rooms.
- In rooms with an appliance, install (preferably) on the ceiling, (300mm from walls) and between 1m to 3m horizontally from appliance. In rooms remote from the appliance install at 'head height', where the light indicators can be seen.
- Test the Alarm weekly by pressing and holding the test button for a few seconds.
- Replace Alarm when the "REPLACE UNIT BY" date has been reached. Check the label on the side of the Alarm.
- Do not fit Alarm until all building work is completed to avoid contamination.

## 2. Carbon Monoxide – The Silent Killer

### 2.1 What is Carbon Monoxide ?

Many people are killed each year, and many more suffer ill health from Carbon Monoxide (CO) poisoning. CO is an invisible, odourless, tasteless and extremely toxic gas. It is produced by appliances and vehicles burning fuels, such as coal, oil, natural/bottled gas, paraffin, wood, petrol, diesel, charcoal etc. CO is absorbed by red blood cells in the lungs in preference to oxygen - this results in rapid damage to the heart and brain from oxygen starvation.

#### **High levels of CO in a house can be caused by:**

- Incorrectly or poorly installed fuel-burning appliances.
- Blocked or cracked chimneys/flues.
- Blocked vents or draught-proofing which makes areas with fuel burning appliances or fireplaces airtight.
- Engines of cars, lawnmowers etc. left running in confined spaces.
- Portable paraffin or gas heaters in badly ventilated rooms.

### 2.2 What happens when your CO Alarm detects Carbon Monoxide ?

When the Alarm detects potentially dangerous levels of CO, it flashes the red alarm light immediately and then sounds a loud alarm if the CO persists. Table B shows how the CO Alarm reacts to different levels of CO gas and exposure time. At higher levels of CO the Alarm turns on sooner. The rate of flashing of the red light indicates the level of CO. If your CO Alarm sounds follow the instructions in section 6. **NEVER IGNORE THE ALARM !**

## 2.3 Symptoms of Carbon Monoxide Poisoning

**Table A**

Concentration of CO in Air ▲ ppm	Inhalation Time (approx) and Symptoms Developed
35	The maximum allowable concentration for continuous exposure in any 8 hour period according to OSHA *.
150	Slight headache after 1.5 hours.
200	Slight headache, fatigue, dizziness, nausea after 2-3 hours.
400	Frontal headaches within 1-2 hours, life threatening after 3 hours, also maximum parts per million in flue gas (on an air free basis) according to US Environmental Protection Agency.
800	Dizziness, nausea and convulsions within 45 minutes. Unconsciousness within 2 hours. Death within 2-3 hours.
1,600	Headache, dizziness and nausea within 20 minutes. Death within 1 hour.
3,200	Headache, dizziness and nausea within 5-10 minutes. Death within 25-30 minutes.
6,400	Headache, dizziness and nausea within 1-2 minutes. Death within 10-15 minutes.
12,800	Death within 1-3 minutes.

▲ ppm = parts per million

\*OSHA Occupational Safety & Health Association

## 2.4 Pre-Alarm

When the Alarm detects over 43 ppm CO the red light flashes in accordance with Table B. This helps locate CO leaks as the CO Alarm gives an indication straight away.

(Without this feature the CO level would need to be at 43 ppm CO for typically 72 minutes for an alarm sound to be given). Note the Pre-Alarm signal may be triggered by CO coming for example, from cooking with gas, from car engines or from nearby barbecues. This is usually not a concern, unless the pre-alarm signal persists until the Alarm sounds and the CO source is unknown.

The display models will display CO concentrations greater than 10ppm in accordance with Table B.

**NOTE:** The CO Alarm may sound if cigarette smoke is blown into it, or aerosols are released nearby.

## 2.5 CO Alarm Memory

The CO Alarm memory is an important feature of the CO Alarm where even if the house is unoccupied during an alarm condition it warns the homeowner that the CO Alarm has previously detected CO gas and been in alarm. The memory feature has two operation modes:










- memory indication for 24 hour period after alarm.
- memory recall on demand

**24 hour memory indicators:** After alarm, the RED light will flash at different rates every minute (approx) depending on the level of CO detected - see Table C.

**Memory recall on demand:** To review the memory status after initial 24 hours, press and hold the test button, the red led will flash in accordance to Table C. Display models will show the peak level of CO measured.



**Table B: CO Alarm Response**

	<b>Red Light</b> (Pre Alarm)	<b>Display Icon</b> (before horn sounds)	<b>Display Icon</b> (after horn sounds)	<b>Sounder</b> (Alarm)
<b>CO Gas Level</b>				
0 < ppm < 10 ppm	Off*	Blank	Blank	Off
10 < ppm < 30 ppm	Off*	PPM level (flash) on - 4 seconds, off - 12 seconds	PPM level (flash) on - 4 seconds, off - 12 seconds	Off
30 < ppm < 43 ppm	Off*	PPM level	PPM level	Off
43 < ppm < 80 ppm	1 flash every 2 secs	 <b>060</b> PPM	  <b>060</b> PPM	on within 60-90 mins (typ 72 mins)
80 < ppm < 150 ppm	2 flashes every 2 secs	 <b>100</b> PPM	  <b>100</b> PPM	on within 10-40 mins (typ 18 mins)
> 150 ppm	4 flashes every 2 secs	 <b>150</b> PPM	  <b>150</b> PPM	on within 2 mins (typ 40 secs)

\* unless it has alarmed previously (see CO Alarm Memory below)

ppm values shown in table are for example purposes only

**Table C: CO Alarm Memory Indicators**

CO Gas Level	Red Light Response	
	24 Hours	On Demand (Button Press)
ppm > 43 ppm	2 flashes every minute (approx)	2 flashes
ppm > 80 ppm	4 flashes every minute (approx)	4 flashes
ppm > 150 ppm	8 flashes every minute (approx)	8 flashes

**Reset Memory:** Hold down the test button until the red light stops and the green light starts flashing. Cover the horn with a cloth to muffle the alarm during this time. Please note that the memory will also be reset when the CO Alarm is switched off.

### 3. Where to place CO Alarms

3.1 Ideally a Carbon Monoxide Alarm should be installed in:

- Every room containing a fuel burning appliance, and
- Remote rooms where occupants spend a considerable amount of time
- Every bedroom

However if the number of Carbon Monoxide Alarms to be fitted is limited, the following points should be considered when deciding where best to fit the alarm(s)

- If there is an appliance in a room where people sleep, place a CO Alarm in this room
- Locate a CO Alarm in a room containing a flueless or open-flued appliance, and
- Locate an Alarm in a room where the occupant(s) spend most of their time (e.g. sitting room)

- In a bedsit, the CO Alarm should be placed as far away from the cooking appliance as possible, but near to where the person sleeps
- If the appliance is in a room not normally used, such as a boiler room, the CO Alarm should be placed just outside the room so that the Alarm will be heard more easily.

### **3.2 Unsuitable Locations**

Do not place the CO Alarm in any of the following areas.

- (1) In the immediate vicinity of a cooking appliance (keep it at least 1 metre horizontally from it).
- (2) Outside the building.
- (3) In an enclosed space (e.g. in or below a cupboard).
- (4) In a damp or humid area.
- (5) Directly above a sink or cooker.
- (6) Next to a door, window, air vent or anywhere that it would be affected by draughts.
- (7) Next to an extractor fan.
- (8) Over heat sources such as radiators or hot air vents.
- (9) Where it would be obstructed, e.g. by curtains or furniture.
- (10) In an area where the temperature could drop below  $-10^{\circ}\text{C}$  or rise above  $40^{\circ}\text{C}$ .
- (11) Where dirt or dust could block the sensor.
- (12) Where it could be easily knocked or damaged, or where it could be accidentally turned off or removed.

(13) In a bathroom or other areas where the CO Alarm may be exposed to water splashes, dripping or condensation (e.g. above an electric kettle).

(14) Near paint, thinners, solvent fumes or air fresheners.

### **3.3 If locating the CO Alarm in a room with a fuel burning appliance (see figure 1)**

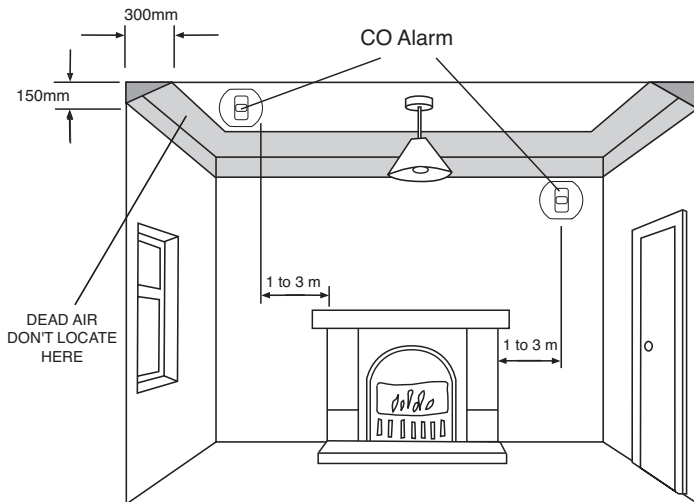
- If it is mounted on a wall, it should be located at a height greater than the height of any door or window but still be at least 150mm from the ceiling.
- If it is mounted on the ceiling it should be at least 300mm from any wall or light fitting.
- The CO Alarm should be a horizontal distance of between 1m and 3m from the potential CO source.
- If there is a partition in the room, the CO Alarm should be located on the same side of the partition as the potential source.
- In rooms with sloped ceilings, the CO Alarm should be located at the high side of the room (see figure 2).

### **3.4 If locating the CO Alarm in a bedroom or in rooms remote from a fuel burning appliance (see figure 3)**

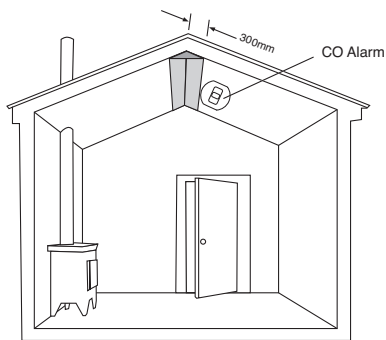
- Mount the CO Alarm relatively close to the breathing zone of the occupants.

Whatever position is chosen make sure it is possible to view the three light indicators, when in the vicinity of the Alarm.

**WARNING:** Do not use the CO Alarm on an intermittent basis, or as a portable detector for the leakage of combustion products from fuel burning appliances or chimneys.

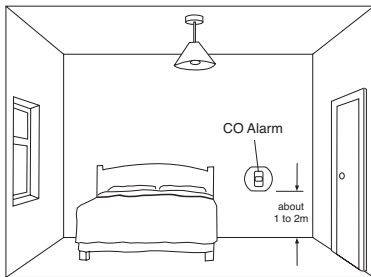


**Figure 1**  
Location in room with a fuel burning appliance



**Figure 2**

Location in rooms with sloped ceilings, the CO alarm should be located at the high side of the room



**Figure 3**

Location in bedrooms & other rooms remote from the appliance (i.e. at breathing level)

### **3a. Additional information on where to place CO Alarms in recreational vehicles**

#### **Caravans and boats**

Caravans and boats may have additional risks of carbon monoxide ingress through air vents due to the nearby presence of other vehicles, engines, generators or barbecues, however this does not change the basic guidance on location of the Alarm. Caravans and boats should be fitted with an Alarm in the

same room as any combustion appliance(s), located in accordance with section 3. If the caravan or boat has a single living space which incorporates the sleeping accommodation, it can be considered to be equivalent to a bedsit, and a single Alarm is sufficient. However, any sleeping accommodation which is in a separate room from the combustion appliance(s) should also contain an Alarm, located in accordance with 3.4.

### **Choosing locations in caravans and boats**

It is not always possible to find an optimum location for an Alarm, for example, a small caravan or boat may not have suitable vertical surfaces available. Nevertheless, when fitting an apparatus in such situations, the two most important considerations when selecting an appropriate location are:

- not mounting the apparatus directly above a source of heat or steam; and
- mounting the apparatus at a distance of 1m - 3m from the nearest edge of the potential source.

### **Interfering Substances**

- The apparatus should not be exposed to excessive amounts of fumes from petrol, diesel, solvents, greases, alcohols and organic cleaning fluids.
- The apparatus may respond to brief exhaust gas emissions e.g. during initial start-up of an appliance or engine.
- Hydrogen acts as an interferent and may give rise to alarms. Hydrogen can arise from some battery charging activities and also the curing of concrete under certain circumstances.

## Testing with CO

It is recommended that at least once per year that the apparatus is tested with Carbon Monoxide, particularly in recreational vehicles.

## 4. Installation

**Warning:** The Installation of this CO Alarm should not be used as a substitute for proper installation, use and maintenance of fuel burning appliances including appropriate ventilation and exhaust systems.

### 4.1 Installation Procedure

1. Select a location complying with the advice in 'Where to place CO Alarms' section.
2. Remove the mounting plate from the packaging/ Alarm.
3. Place the mounting plate on the ceiling/wall exactly where you want to mount the Alarm. With a pencil, mark the location of the two screw holes.
4. Taking care to avoid any electrical wiring in the ceiling, drill holes using a 5.0mm drill bit through the centre of the marked locations. Push the plastic screw anchors provided into the drilled holes. Screw the mounting plate to the ceiling/wall. If wall mounting the CO Alarm, the panel pin may be used as an alternative to the screws, provided it is suitable for the mounting surface.

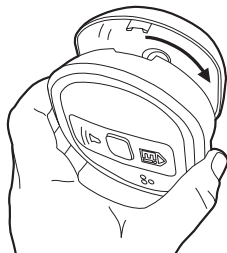
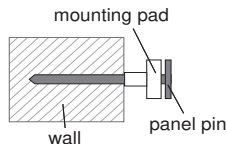


Figure 4



Alternative Mounting pin

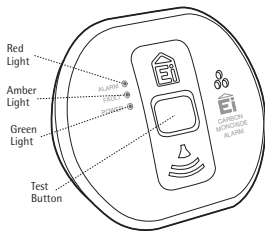


5. Alternatively, if desired, the CO Alarm will also free stand on a flat surface with the mounting plate attached.

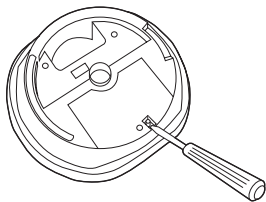
6. If using the RadioLINK interconnection, ensure the RF module is fitted correctly into the base of the Alarm. For further advice on the RadioLINK installation, see booklet **“RadioLINK Module for Battery Powered Carbon Monoxide Alarms”**.

7. Carefully line up the Alarm on the base, gently press home & twist on – see figure 4. (This connects the batteries). The red, amber & green lights will immediately flash in sequence to show they are working. In addition, the icons on the LCD display on the Display models will briefly light up.

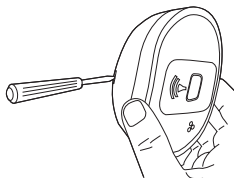
8. Press the Test button (after 15 seconds) to ensure that the Alarm works (see figure 5).



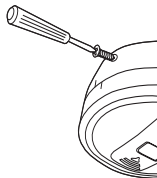
**Figure 5**



**Figure 6a**



**Figure 6b**



**Figure 7**

9. The Power light is not illuminated during standby. This light will flash green when the test button is pressed to indicate that power is present and Alarm is functioning.
10. Install all the other Alarms similarly.

#### **4.2 How to Tamperproof the Alarm**





The Alarm can be made resistant to unauthorised removal. Break off the small pillar on the base as shown in figure 6a. To remove the Alarm from the ceiling it is now necessary to use a small screwdriver (see figure 6b), to release the catch (push catch towards the ceiling) and then twist off the Alarm. If necessary it is possible to further secure or tamperproof the Alarm by using a No.2 or No.4 (2 to 3mm diameter - not supplied) self tapping screw 6 to 8mm long to firmly lock the Alarm and its mounting plate together (see figure 7).

## **5. Monitoring, Testing & Maintenance**

### **Monitoring**

The CO Alarm self checks vital functions to ensure that it is operating correctly.

1. Low battery fault – the battery voltage is measured and compared against a low voltage threshold.
2. Sensor Fault – the sensor is checked for electrical continuity and open circuit.
3. End of Life fault (EOL) – The Alarm is programmed to check when the useful life of the Alarm has been exceeded.

Table D: Monitoring & Testing Summary						
Status Result	Red LED (Alarm)	Amber LED (Fault)	Green LED (Power)	Sounder	LCD Display	Action
Standby	No visual or audible indication if unit is OK					
Unit OK ( Button Test)	Off	Off	On	On		
Low Battery	Off	1 Flash	Off	1 Beep		See Note
Sensor Fault	Off	2 Flashes	Off	2 Beeps		Replace Alarm
End of Life (EOL)	Off	3 Flashes	Off	3 Beeps		Replace Alarm

Note \* - For Ei208 models replace the Alarm - For Ei207 models (see low battery instructions)

### Low Battery:

When the battery is starting to be depleted the CO Alarm will beep and the Amber LED will flash every minute.

The low battery beeps can be suppressed for 24 hours by pressing the button.

(It is recommended that this is done until either replacement batteries or a replacement CO Alarm is available so as to maintain protection against CO leaks).

If it is a CO Alarm with a built in battery (i.e. from the Ei208 series) replace the entire CO Alarm.

### **Battery Replacement (For Ei207 Models Only):**

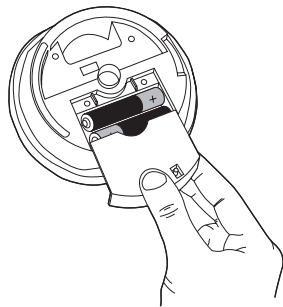
Check the 'Replace by' label on the side wall - if it has been exceeded replace the entire CO Alarm. If the Replace by' label on the side wall has not been exceeded, remove the Alarm from the mounting plate, remove the battery cover (see figure 8) and replace the batteries. Use only the following Alkaline AAA size batteries: Duracell, Panasonic, or Energizer.

Insert the new batteries with the orientation shown on the base. Replace the battery cover and replace the Alarm back on its mounting plate (this action automatically switches on the batteries). Button test the Alarm (after 15 seconds) to check the batteries are installed correctly and that they are not depleted.

The batteries in the Ei207 series should be replaced before the "best before" date printed on the batteries is exceeded. (The batteries will usually last over 5 years in standby under normal conditions. The life will be reduced if the unit regularly goes into alarm or if it is exposed to excessive temperatures for long periods).

### **Sensor Fault:**

If a sensor fault has been detected the Alarm will beep and flash the amber light 2 times every minute. The remedy for this failure is to replace the Alarm.



**Figure 8**

**End of Life:**

When the sensor has reached its End of Life the Alarm will beep and flash the amber light 3 times every minute. The remedy for this failure is to replace the Alarm.

**AudioLINK:**

AudioLINK is an added feature available in the Ei208 series only. This feature allows an authorised person to download information from the Alarm through the use of a mobile App. For more information on using this feature, please refer to the relevant section on [www.eielectronics.com](http://www.eielectronics.com).

## Testing

Frequent testing of the Alarm is a requirement to ensure its power is present and the Alarm is functioning. Guidelines and best practices for testing are as follows:

1. After the system is installed.
2. Once weekly thereafter.
3. After prolonged absence from the dwelling (e.g. after holiday period).
4. After repair or servicing of any of the systems elements or household electrical works.

To test the Alarm press and the hold the test button. The Alarm will respond with one of the following status conditions:

1. The Green LED will flash and the horn will sound to indicate the Alarm is powered and operating correctly.
2. If there is a fault condition the amber LED will flash and the horn will beep in accordance to Table D.

3. If the memory has been set the Red light will flash and the horn will give a full alarm sound (see section 2 - 'CO Alarm Memory').

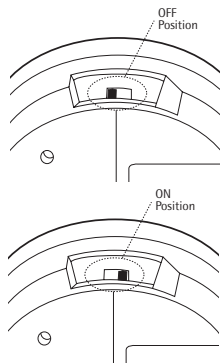
### Quick Test with Carbon Monoxide:

The Carbon Monoxide Alarm checks for CO gas every 4 seconds and when exposed to the CO gas, the red light will flash (as per Table B) to confirm that it is detecting the CO gas.

The Alarm can be tested with carbon monoxide gas by using one of the kits that comes with the gas either in a glass phial or aerosol can. Follow the instructions on the kit.

If a test gas kit is not readily available it is also possible to gas test the Alarm using a joss stick or cigarette smoke. To do this remove the Alarm from its base and slide the power switch to the ON position (see figure 9). Fill a suitable size plastic bag with smoke from the joss stick or cigarette.

Insert the Alarm into the smoke filled bag and seal it closed. Within seconds, the red light will begin to flash (as per Table B) to confirm that the Alarm has detected the CO gas in the bag.



**Figure 9**

To check the Alarm sound, momentarily press the test button and within seconds the horn will sound briefly. Slide the power switch to the OFF position and replace the Alarm on its mounting plate.

## **Maintenance**

### **Silencing (Hush)**

When the Alarm sounds, after sensing CO, pressing the test/hush button will immediately stop the horn (the red light will continue to flash). If CO is still present the red light and the horn will turn on again after about 4 minutes. The CO Alarm can only be silenced once during a CO incident. At levels > 150ppm CO the CO Alarm cannot be silenced.

### **Cleaning the Alarm:**

Clean the outside case by occasionally wiping with a clean damp cloth. Do not use any cleaning agents, bleaches, detergents or polishes, including those in aerosol cans. Avoid spraying air fresheners, hair spray, paint or other aerosols near the CO Alarm. Do not place air fresheners near the CO Alarm.

## 6. What to do when the Alarm sounds

- (1) Open the doors and windows to ventilate the area (see note).
- (2) Turn off all fuel appliances where possible and stop using them. (The Alarm can be silenced immediately by pushing the test/hush button provided the CO level <150ppm).
- (3) Evacuate the property leaving the doors and windows open.
- (4) Get medical help immediately for anyone suffering the effects of Carbon Monoxide poisoning (headache, nausea), and advise that Carbon Monoxide poisoning is suspected.
- (5) Ring your gas or other fuel supplier on their emergency number. Keep the number in a prominent place.
- (6) Do not re-enter the property until the Alarm has stopped. (If the Alarm has been silenced by pressing the test/hush button, wait at least 5 minutes so the Alarm can check that the CO has cleared).
- (7) Do not use the fuel appliances again until they have been checked by a registered installer or equivalent expert.

Note: When ventilation is provided by leaving the window and doors open, the CO build up may have dissipated by the time help arrives and the Alarm may have stopped sounding. Although your problem may appear temporarily solved it is crucial that the source of the CO is determined and appropriate repairs made.



## 7. How to Protect your Family

Follow these guidelines to reduce the risk of Carbon Monoxide poisoning.

(1) Know and look out for tell-tale signs that Carbon Monoxide may be present.

These include:-

- The CO Alarm warning of abnormal levels.
- Staining, sooting or discolouration on or around appliances.
- A pilot light frequently going out.
- A strange smell when an appliance is operating.
- A naked gas flame which is yellow or orange, instead of the normal blue.
- Family members (including pets) exhibiting the “flu-like” symptoms of CO poisoning described above. If any of these signs are present get the appliance checked out by an expert before further use. If family members are ill get medical help.

(2) Choose all appliances and vehicles which burn fossil fuels such as coal, oil, natural/bottled gas, paraffin, wood, petrol, diesel, charcoal etc. with care and have them professionally installed and regularly maintained.

(3) These appliances must “breathe in” air to burn the fuel properly. Know where the air comes from and ensure vents/air bricks etc. remain unobstructed (particularly after building work).

(4) The appliances must also “breathe out” the waste gases (including the CO) – usually through a flue or chimney. Ensure chimneys and flues are not blocked or leaking, and get them checked every year. Check for excessive rust or cracks on appliances and pipe work.

- (5) Never leave your car, motor bike or lawnmower engine running in the garage with the garage door closed. Never leave the door from the house to the garage open if the car is running.
- (6) Never adjust your own gas pilot lights.
- (7) Never use a gas cooker or a barbecue for home heating.
- (8) Children should be warned of the dangers of CO poisoning and instructed never to touch, or interfere with the CO Alarm. Do not allow small children to press the test/hush button as they could be subjected to excessive noise when the CO Alarm sounds.
- (9) Leaving windows or doors slightly open (even a few inches) will significantly reduce the risk of high levels of CO occurring. The high levels of draught-proofing in modern houses reduces ventilation and can allow dangerous gases to build up.
- (10) Install CO Alarms in all the areas recommended in this booklet.
- (11) Recognise that CO poisoning may be the cause when family members suffer from “flu-like” symptoms when at home but feel better when they are away for extended periods.

## 8. Technical Specification

**Power :** Two Alkaline AAA type batteries (replaceable) – Ei207 models.  
Powered for life lithium battery (non-replaceable) – Ei208 models.

**CO Sensitivity :** Meets BS EN 50291-1:2010+A1:2012 / BS EN 50291-2:2010.  
CO Alarm operates as per Table B.

**Product life :** 10 years

**Test/Hush Button :** Checks electronics and horn.

When the Alarm sounds, after sensing CO, pressing the test/hush button will immediately stop the horn (the red light will continue to flash). If CO is still present the red light and the horn will turn on again after about 4 minutes. The CO Alarm can only be silenced once during a CO incident. At >150ppm CO the CO Alarm cannot be silenced.

**Operating Temperature :** -10°C to 40°C.

**Humidity Range :** 15% to 95% R.H. (non-condensing).

**Audible Alarm :** 85dB(A) at 3m minimum.

**LCD Display:** Displays CO level above 10ppm (in steps of 5ppm).

**RF Interconnect :** RF Module required (see Model Chart on page 3).

**CO Alarm Memory:** Indicates if CO Alarm was previously in alarm.

**Dimensions (mm) :** 120 x 105 x 40.

**Weight (grams):** 185g (Ei207) 178g (Ei208).

## 9. Getting the CO Alarm Serviced

If your CO Alarm fails to work after you have carefully read all the instructions, checked the CO Alarm has been installed correctly, and ensured that it has good batteries connected, return it for repair or replacement. This should be where it was purchased, or alternatively return it in a padded box to “Customer Assistance and Information” at the nearest address given on the CO Alarm or in this leaflet. (Remove the Alarm from the mounting plate before shipping the product). State the nature of the fault, where the CO Alarm was purchased, and the date of purchase.

## 10. Guarantee

Ei Electronics guarantees Carbon Monoxide Alarms Ei207 models (excluding batteries) & Ei208 models for 5 years from date of purchase against any defects that are due to faulty materials or workmanship. These guarantees only apply to normal conditions of use and service, and do not include damage resulting from accident, neglect, misuse, unauthorised dismantling, or contamination howsoever caused. These guarantees exclude incidental and consequential damage. If the Carbon Monoxide Alarm should become defective within the guarantee period, it must be returned to where it was purchased or alternatively to Ei Electronics, carefully packaged, with the problem clearly stated (see '**Getting the CO Alarm Serviced**' section) along with proof of the date of purchase.

We shall at our discretion repair or replace the faulty CO Alarm.

Do not interfere with the Alarm or attempt to tamper with it. This will invalidate the guarantee, and may result in malfunction.

## 11. Limitations of CO Alarms

(1) The CO Alarm will not work without good batteries. If the batteries have been drained the Alarm will not give protection. Button test the Alarm weekly and on return from holidays and other long absences.

(2) Carbon Monoxide must enter the CO Alarm for it to be detected. There may be Carbon Monoxide in other areas of the house (e.g. downstairs, in a closed room etc) but not in the vicinity of the CO Alarm. Doors, air draughts and obstructions can prevent the CO reaching the Alarm. For these reasons we recommend CO Alarms are fitted both near and in bedrooms, particularly if bedroom doors are closed at night. Additionally install in rooms where members of the household spend much of their time, and in rooms with potential sources of CO gas.

(3) The CO Alarm may not be heard. The sound output is loud but it may not be heard behind a closed door or if it is too far away. RF interconnecting CO Alarms greatly improves the probability that they will be heard. The Alarm may not wake up somebody who has taken alcohol or drugs. The Alarm sound may be masked by other sounds such as T.V., stereo, traffic noise etc. Fitting CO Alarms on either side of closed doors will improve their chance of being heard. This CO Alarm is not designed for people with impaired hearing.

(4) CO Alarms don't last indefinitely. CO Alarms are sophisticated electronic devices with many parts. Although the Alarm and its component parts have undergone stringent tests, and are designed to be very reliable, it is possible that parts can fail. Therefore, you should test your CO Alarm weekly. The CO Alarm must be replaced when the "REPLACE UNIT BY" date has been reached. Check the label on the side of the Alarm.

(5) CO Alarms are not a substitute for life insurance. House-holders are responsible for their own insurance. The CO Alarm warns of increasing CO levels, but we do not guarantee that this will protect everyone from CO poisoning.

(6) CO Alarms are not suitable as early warning Smoke Alarms. Some fires produce Carbon Monoxide, but the response characteristics of these CO Alarms are such that they would not give sufficient warning of fire. Smoke Alarms must be fitted to give early warning of fire.

(7) The CO Alarm does not detect the presence of natural gas (methane), bottled gas (propane, butane) or other combustible gases. Fit combustion Gas Alarms to detect these. **Note:** Carbon Monoxide Alarms, with electrochemical sensors have a cross sensitivity to hydrogen. This means that they can alarm due to sensing hydrogen being produced by batteries being incorrectly charged such as on boats or with battery back-up systems such as those used with alternative energy systems. The CO Alarm will alarm with 500 ppm H<sub>2</sub> after between 10 and 40 minutes exposure.

**WARNING:** THIS CO ALARM IS DESIGNED TO PROTECT INDIVIDUALS FROM THE ACUTE EFFECTS OF CARBON MONOXIDE EXPOSURE. IT WILL NOT FULLY SAFEGUARD INDIVIDUALS WITH SPECIFIC MEDICAL CONDITIONS. IF IN DOUBT CONSULT A MEDICAL PRACTITIONER.

## 12. Troubleshooting

### **ALARM DOES NOT WORK WITH THE TEST BUTTON:**

- (1) Check the Alarm is secured correctly on the mounting plate.
- (2) Wait 15 seconds after connecting the power before button testing.
- (3) Hold button down firmly for at least 5 seconds.
- (4) Replace batteries (Ei207 models only).

### **ALARM SOUNDS FOR NO APPARENT REASON:**

Follow the detailed instructions in '**What to do when the alarm sounds**' section.

If there are still problems:

- (1) Ensure there are no fuel burning appliances in the vicinity which could be leaking CO gas (e.g. even from next door).
- (2) Ensure there are no fumes in the area (e.g. paint, thinners, hair spray, chemical cleaners, aerosol sprays, damp proofing done with and aqueous emulsion such as Aminofunctional siloxane and Alkylalkoxysilane).
- (3) Ensure there is no outdoor source of CO in the vicinity (e.g. a car with engine running, heavy traffic, heavy air pollution, barbecue fumes etc).
- (4) Ensure there is no source of hydrogen such as batteries being charged (e.g. on boats or in Uninterruptable Power Supplies (UPS)).
- (5) Ensure there is not excessive smoke or fumes from devices such as Egyptian shisha, hookah or hubbly bubbly pipes, especially those that use coal or charcoal to heat the tobacco.

(6) If the Alarm is fitted with an RF Module, ensure that there are no problems with the other RF interconnected Alarms and that all Alarms are housecoded correctly.

(7) Press the test/hush button to silence the Alarm.

If the CO Alarm continues to sound it is possibly defective and should be replaced (see '**Getting the CO Alarm Serviced**' section).







### **WHAT TO DO IF THE ALARM BEEPS:**

The CO Alarm will beep and the amber light will flash to indicate a fault condition.

<b>CO Alarm Fault Chart</b>			
<b>Fault Condition</b>	<b>Fault Indication</b>	<b>Action</b>	
		<b>Ei207 Models</b>	<b>Ei208 Models</b>
Low Battery	1 beep with 1 amber flash	Replace Battery *	Replace Alarm
Faulty Sensor	2 beeps with 2 amber flashes	Replace Alarm	Replace Alarm
End of Life	3 beeps with 3 amber flashes	Replace Alarm	Replace Alarm
* Before replacing the battery, check the 'REPLACE UNIT BY' label on side of unit. If the date has been exceeded, replace the alarm not the battery.			



## 13. Display & Indicator Summary

<p><b>Button Test OK</b></p>  <p><b>000</b> PPM</p>	<p><b>Low Battery Warning</b></p> 	<p><b>Sensor Fault</b></p> 
<p><b>Ventilate Status</b></p>  <p><b>060</b> PPM</p>	<p><b>Evacuate Status</b></p>  <p><b>335</b> PPM</p>	<p><b>End of Life Status</b></p> 

## Ei207 & 208 Indicator Summary

Normal Operation	Red LED	Amber LED	Green LED	Sounder
Power Up	1 flash	1 flash	1 flash	
Standby	Off	Off	Off	Off
Button Test (Weekly)	Off	Off	1 flash (every sec)	On
Unit Sensing CO gas itself	Flashing (as per table B)	Off	Off	On
Alarms Activated via RF interconnect	Off	Off	Off	On
Fault Mode				
Low Battery Condition	Off	1 flash (every minute approx)	Off	1 beep with 1 amber flash
Sensor Fault Condition	Off	2 flashes (every minute approx)	Off	2 beeps with 2 amber flashes
End of Life Condition	Off	3 flashes (every minute approx)	Off	3 beeps with 3 amber flashes

## Ei207 & 208 Service Diagnostics

Ei207 & 208 Service Diagnostics					
Diagnostics Modes	Action	Red LED	Amber LED	Sounder	Action
<b>Fault Checks</b>					
Low battery	Press & hold button	Off	1 flash	1 beep with flash	See Note*
Faulty Sensor	Press & hold button	Off	2 flashes	2 beeps with flashes	Replace Alarm
End of Life (EOL)	Press & hold button	Off	3 flashes	3 beeps with flashes	Replace Alarm
Alarm Memory	Action	Red LED	Green LED	Sounder	LCD Display
Up to 24 hours after event		Flashes as per Table C	Off	Off	Off
Long Term Memory	Press & hold button	Flashes as per Table C	Off	On	CO ppm
Memory Erase	Keep button pressed after long term test	Flashes rapidly as per Table C	Wait for Green light then release button	On	CO ppm

Note\* - For Ei208 models replace the Alarm - For Ei207 models (see low battery instructions in section 5)

## 14. Contact Us

**Aico Ltd.** Mile End Business Park, Maesbury Rd, Oswestry,  
Shropshire SY10 8NN, U.K.

Tel: 0870 758 4000

[www.aico.co.uk](http://www.aico.co.uk)

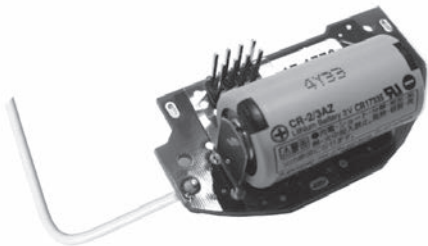
**Ei Electronics.** Shannon, Co Clare, Ireland. Tel: 061 471277

[www.eielectronics.com](http://www.eielectronics.com)

The crossed out wheelie bin symbol that is on your product indicates that this product should not be disposed of via the normal household waste stream. Proper disposal will prevent possible harm to the environment or to human health. When disposing of this product please separate it from other waste streams to ensure that it can be recycled in an environmentally sound manner. For more details on collection and proper disposal, please contact your local government office or the retailer where you purchased this product.



# RadioLINK<sup>+</sup> Module Ei200MRF for Battery Powered Carbon Monoxide Alarms Ei208W Series



**Ei200MRF Module**

(for use with Ei208W & Ei208DW Alarms only)

## Instructions

Read and retain carefully for as long as the product is being used. It contains vital information on the operation and installation of your Module. The leaflet should be regarded as part of the product.

If you are just installing this Module, the leaflet must be given to the householder. The leaflet is to be given to any subsequent user.

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## Introduction

The Ei200MRF RadioLINK+ Module is the next generation RF module designed to fit in the Ei208W & Ei208DW CO Alarms. The Ei200MRF RadioLINK+ Module is a direct replacement for the Ei200MRF RadioLINK Module, but now with added features.

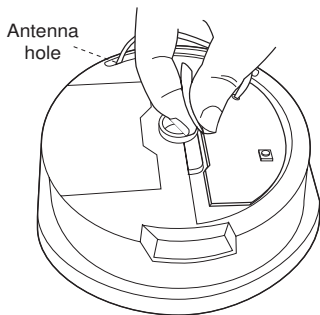
The primary function of the Ei200MRF is to interconnect all Ei Electronics Alarms in a system by the means of an RF signal i.e. when one Alarm senses Carbon Monoxide (CO), the Ei200MRF module fitted to the CO Alarm will transmit an RF signal that will activate the sounders in all the other Alarms in the system.

The Ei200MRF module is plugged into the rear of the base of an Ei208W/DW CO Alarm. RF communication through this module eliminates the need to install long interconnect wires between all the Alarms on different floors in different rooms. The Ei200MRF is powered from its own 3V Lithium battery.

The module also has “multiple repeater” transmission – this provides multiple signal paths to create a robust RF ‘mesh’ system and also increase the RF range.

## Installation and House Coding

To fit the Ei200MRF module, plug it into the base of the Alarm while being careful to align the pins and insert the flexible antenna into the antenna hole (See Fig 1). N.B. Ensure that the Ei200MRF is fully inserted.



**Figure 1**

Check to ensure all RF devices have been successfully House Coded. This can be done by counting the number of blue flashes on each RF Module. The number of flashes should correspond to the number of RF devices in the system. (i.e. 4 flashes if there are 4 RF devices in the system).

### House Coding the Unit

Power supply to the Ei200MRF will be confirmed by an initial flash of the red, blue and green LED on the cover (see Fig 2).

Press and hold the House Code button on the module until the blue light illuminates on the cover. (see Fig 2 & 3).

Immediately release the button, the blue light will flash rapidly and then stop. Now attach the Alarm to its mounting plate (see 'Installation' section in the Ei207/208 Series booklet).

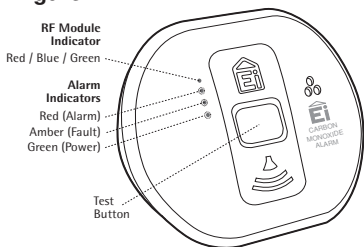
The flashing will repeat every 5 seconds thereafter. Repeat this procedure for all Alarms in the system and any RF accessories such as the Ei450 Alarm Controller.



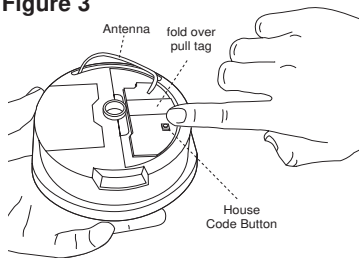
**N.B. We recommend, for ease of installation and RF communication, that up to 12 RF devices can be installed in any one RF coded system. Please contact us for further advise if additional RF devices are required.**

You can exit this mode by pressing the House Code button on one of the RF Alarms. Keep the button pressed until the blue light comes on solid and then release.

**Figure 2**



**Figure 3**



You can exit this mode by pressing the House Code button on one of the RF Alarms. Keep the button pressed until the blue light comes on solid and then release. Now re-affix the Alarm to its mounting plate.

The Alarm will now send a signal to all the other RF devices in the system to exit House Code. Alternatively, the RF Alarms will automatically exit the House Code mode after 30 minutes. (Note: Some RadioLINK devices do not support the on demand exit House Code feature. You may allow them to automatically exit House Code after the time period or if you wish, you can do it manually. Consult the individual RadioLINK device manual for further instructions).

To check the system, press the test button on any Alarm. After a few seconds all Alarms should now sound. All Alarms in the system should be checked similarly. **Caution:** Do not House Code another group (e.g. adjacent apartment) until the current House Code has been completed.

### **Factory Reset**

Sometimes in order to resolve an RF communication issue it may be necessary to reset (factory reset) and House Code the system again. To do so, press and hold the House Code button until you see a flashing blue light on the Alarm cover (approx. 7 seconds), release immediately. Repeat this procedure on all other Alarms.

## **Additional Features**

The Ei200MRF RadioLINK+ Module provides additional features not available with Ei Electronics RadioLINK products. The following features will only work with RadioLINK+ devices.

1. Remote House Coding (required if you want to add an Alarm to an installed system)
2. Monitoring
3. Data Extraction

\*Note these functions will not be available unless you have completed House Code Entry.

### **1. Remote House Coding**

If it is necessary to extend an RF system or you find that you want to add an extra Alarm to a system you can now do so quite simply via the 'Remote House Coding' feature. Firstly using a screwdriver, press and hold the House Code button of one of the previously installed Alarms until you see all colours flashing (red, blue, green).

Immediately release the button. This Alarm will now send an RF message to all the previously installed (compatible) devices to re-enter House Code mode. Similarly, install and put the new Alarm you wish to add to the system into House Code mode (see “Installation and House Coding” section). As before, allow sufficient time so that all Alarms are now house coded correctly (this can be confirmed by counting the number of flashes on each Alarm). You can then exit House Code mode manually or let it exit automatically after 30 minutes. **(N.B. for this feature to work all devices in the system must be RadioLINK+).**

## **2. Monitoring**

The Ei200MRF RadioLINK+ Module has the ability to “Monitor” the RF signal path and strength. This is an enhanced self-monitoring function that recognises system tampering or Alarm head removal. In monitoring mode each Alarm will check the presence of its strongest received RF signal. If the signal is missing then the Alarm will record a monitoring failure event. It will also signal the failure via a change in the indicator light pattern.

For more information on using this feature, please visit [www.eielectronics.com](http://www.eielectronics.com) and refer to the relevant section on the RadioLINK+ Monitoring feature.

## **3. Data Extraction**

The Ei200MRF RadioLINK+ Module allows for the extraction of information from an Ei Electronics Compatible Alarm, using an Ei Electronics download device. Once the system has been set up, information can be accessed securely from within or outside a property if access is an issue. The event log can contain very useful information about any recorded events in the history of the Alarm such as: CO Events, Alarm Head removals, Button Tests, and so on.

Event logs can be retrieved as many times as necessary.

For more information on using this feature, please visit [www.eielectronics.com](http://www.eielectronics.com) and refer to the relevant section on the RadioLINK+ Data Extraction feature.

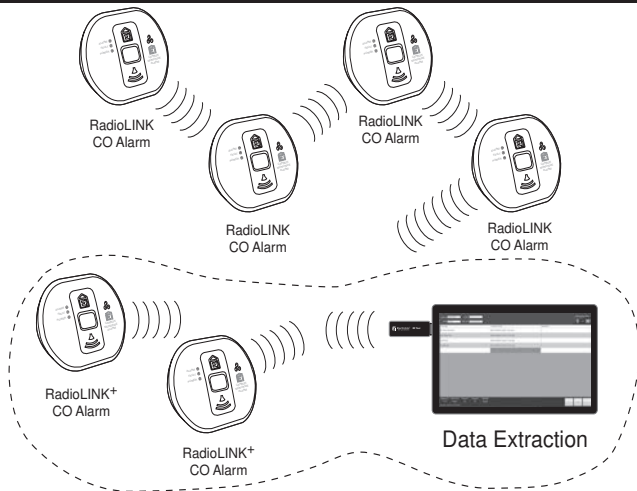
### Ei200MRF Indicator Summary

Ei200MRF Indicator Summary					
Normal Operation		Blue LED	Red LED	Green LED	Sounder
Power Up		1 flash	1 flash	1 flash	Off
Standby		Off	Off	Off	Off
Alarm		3.5 Sec flash followed by flash every 10 Sec	Off	Off	Full Sound
Head Removal		3.5 Sec flash every 6 mins for 4 hrs	Off	Off	Off
Low Battery		Flash every 60 Sec	Off	Off	1 Bleep with flash
Mode-Enter / Exit	Button Action	Blue LED	Red LED	Green LED	Sounder
House Code Enter	Press & Release on Solid Blue	Flashes briefly & stops	Off	Off	Off
In House code		(1 flash per unit) every 5 Sec *	Off	Off	Off
House code Exit	Press & Release on Solid Blue	3.5 Sec flash	Off	Off	Off
Factory Reset	Press & Release on Flashing Blue	Rapid flashing followed by single flash	Off	Off	Off
Remote House Coding	Press & Release on Multi- Colour Flashing	Rapid flashing followed by 3.5 Sec flash	Off	Off	Off

\* See 'Installation and House Coding' section for further details

## System Examples

### RF System (RadioLINK & RadioLINK<sup>+</sup>)



Note: Data Extraction only available on RadioLINK<sup>+</sup> Alarms

# RadioLINK+ System

RadioLINK+  
CO Alarm



RadioLINK+  
CO Alarm



RadioLINK+  
CO Alarm



RadioLINK+  
CO Alarm



RadioLINK+  
CO Alarm



Data Extraction

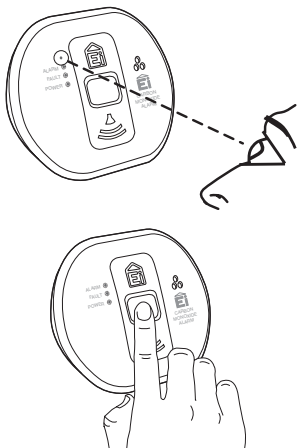
## Testing the System

Frequent testing of the system is a requirement to ensure its reliable operation. Guidelines and best practices for testing are as follows:

1. After the system is installed.
2. Regularly (monthly testing is recommended).
3. After prolonged absence from the dwelling (e.g. after holiday period).
4. After repair or servicing of any of the components.
5. After renovations to the house.

To test an individual Alarm press and hold the test button until the horn sounds. This ensures that the Alarm is powered and that the circuit is functioning correctly.

To test the RadioLINK<sup>+</sup> system, press and hold the test button on one of the Alarms. The blue LED from the Ei200MRF will illuminate for approximately 3.5 seconds. Continue to hold the test button until all the Alarms in the system are sounding. This will take a few seconds depending on the number of Alarms and their locations in the system, e.g. a system with 12 Alarms may take up to 45 seconds for all to sound. Release the test button when the test is completed.



The local Alarm will stop sounding but you will hear the other Alarms still sounding in the distance.

### **Module Battery Check**

It is important to ensure that the batteries on both the Alarm and the module itself are in full working order. Depending on the Alarm that the Ei200MRF is inserted to, there will be slightly different indicators for low battery on the Alarm itself (see table below).

Press the test button on one Alarm and check that all the Alarms sound. In addition check that the blue LED on the Alarm is not flashing with a beep every 60 seconds. (Note: A blue LED flashing along with a beep every 60 seconds indicates a low battery condition. If this is the case then the module should be replaced). If the Alarm beeps once every 60 seconds and the amber LED flashes it indicates that the Alarm itself has a low battery. In this case you should replace the Alarm.

### **Beeping in RF System**

One of the features of Ei RadioLINK & RadioLINK<sup>+</sup> systems is that if there is a fault either in the Alarm itself, or in the RF module fitted, a beep will be transmitted around the system every 4 hours. Depending on the Alarm type, the beep may just be a short beep or it may be a 2 second alarm. If your RF system is demonstrating this, you have a fault either in 1 of your Alarms or in 1 of the RF modules fitted.

In order to find the problem unit, please visually check each Alarm. The fault will be indicated on the Alarm through a combination of beeps or flashes within a 60 second period. (see individual Alarm booklet for indicators).

N.B. When replacing Alarms or modules, please remember to housecode and test the system again.



## **End of Life (EOL) Check**

Check the 'replace by date' label on all Ei200MRF modules and attached Alarms. If the date has been exceeded then the device should be replaced.

## **Interconnected Carbon Monoxide Alarms & Smoke/Heat Alarms**

### **Identifying source of Alarm**

Ei Electronics Carbon Monoxide Alarms and Smoke/Heat Alarms can be interconnected via RadioLINK or RadioLINK+ so that one device sensing danger will cause all the other Alarms to sound.

When a system sounds, check to see which device has its red light flashing rapidly - this is the source of the alarm.

If it is a Carbon Monoxide Alarm, ventilate the residence and follow the instructions in the Carbon Monoxide Alarm manual.

If it is a Smoke/Heat Alarm, evacuate the residence and follow the instructions in the Smoke/Heat Alarm manual.

For added convenience we recommend that an Ei450 Alarm Controller is used with these systems. When there is an alarm, an icon on the Ei450 Alarm Controller shows if it is a CO or Fire incident and can be remotely controlled accordingly.

## RadioLINK<sup>+</sup> Troubleshooting

It is important that all Alarms in your system communicate with each other. The number of walls, ceilings and metal objects in the signal path will reduce the strength of the RadioLINK<sup>+</sup> signals between the Alarms. Accordingly, one or more CO/Smoke/Heat Alarms may have difficulties in communicating to all the other Alarms in the system.

If, when checking the RadioLINK<sup>+</sup> interconnection, some of the Alarms do not respond to the button test, then you will need to either:

(i) Position another RadioLINK<sup>+</sup> Alarm to act as a 'repeater' between the Alarms which are not communicating and so shorten the path and/or by-pass an obstacle which is blocking the signal. When the new Alarm is fitted, House Code all Alarms again, as described above.

(ii) rotate / re-locate the Alarms (e.g. move them away from metal surfaces or wiring).

After making these changes to the RF signal path, the RadioLINK<sup>+</sup> signals may still not be reaching all the Alarms in your system, even though they have already been House Coded successfully. (see Section on "Limitations of Radio Communications").

It is important to check that all Alarms are communicating in their final installed positions. If Alarms are rotated and/or re-sited, we would recommend that all the Alarms are returned to the factory settings and then House Coded again in their final positions (see above). The RadioLINK<sup>+</sup> interconnection should then be checked again by button testing all units.

(Note: The RadioLINK+ module can be returned to the original factory settings by pressing and holding the House Code switch until the blue light flashes and then releasing. This will take about 7 seconds. This clears the House Codes that have been learnt).

## Technical Specifications

<b>Supply Voltage:</b>	3V internal lithium battery (non-replaceable)
<b>RF Range:</b>	A minimum of 100 metres in free space
<b>RF Visual Indicator:</b>	Blue light flashes continuously for 0.5 to 3.5 seconds while transmitting RF signal
<b>RF Frequency:</b>	868.499MHz (1% duty cycle)
<b>Max RF Power:</b>	+10dBm
<b>Dimensions:</b>	57mm length x 30mm depth x 18mm height
<b>Temperature Range:</b>	0° to 40°C
<b>Humidity Range:</b>	15% to 95% Relative Humidity (non-condensing)
<b>Interconnect *:</b>	Up to 12 RadioLINK+ or RadioLINK modules
<b>Optional Accessories:</b>	<ul style="list-style-type: none"><li>- Ei407 Manual Call Point</li><li>- Ei428 Relay Module</li><li>- Ei414 Fire / CO Alarm Interface</li><li>- Ei450 RadioLINK Alarm Controller</li></ul>
<b>Approvals:</b>	RF performance to EN 300 220-1 in accordance with EN 300 220-2 EMC performance to EN 301 489-1 in accordance with EN 301 489-3

\* We recommend, for ease of installation and RF communication, that up to 12 RF devices can be installed in any one RF coded system. Please contact us for further advice if additional RF devices are required.

## Guarantee

Ei Electronics guarantees this RF RadioLINK<sup>+</sup> Module for five years from date of purchase against any defects that are due to faulty materials or workmanship. This guarantee only applies to normal conditions of use and service, and does not include damage resulting from accident, neglect, misuse, unauthorised dismantling, or contamination howsoever caused. This guarantee excludes incidental and consequential damage. If this RF RadioLINK<sup>+</sup> Module should become defective within the guarantee period, it must be returned to Ei Electronics, with proof of purchase, carefully packaged, with the problem clearly stated. We shall at our discretion repair or replace the faulty unit.

Do not interfere with the Alarm or attempt to tamper with it. This will invalidate the guarantee, but more importantly may expose the user to shock or fire hazards. This guarantee is in addition to your statutory rights as a consumer.

## Limitations of Radio Communications

Ei Electronics radio communication systems are very reliable and are tested to high standards. However, due to their low transmitting power and limited range (required by regulatory bodies) there are some limitations to be considered:


- (i) Receivers may be blocked by radio signals occurring on or near their operating frequencies, regardless of the House Coding.
- (ii) Alarms with RadioLINK<sup>+</sup> modules should be tested regularly, at least weekly. This is to determine whether there are sources of interference preventing communication, that the radio paths have not been disrupted by moving furniture or renovations, and if so, to give a warning of these and other faults.



Hereby, Ei Electronics declares that this Ei200MRF RadioLINK+ Module is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. The Declaration of Conformity may be consulted at [www.eielectronics.com/compliance](http://www.eielectronics.com/compliance)

The crossed out wheellie bin symbol that is on your product indicates that this product should not be disposed of via the normal household waste stream. Proper disposal will prevent possible harm to the environment or to human health. When disposing of this product please separate it from other waste streams to ensure that it can be recycled in an environmentally sound manner. For more details on collection and proper disposal, please contact your local government office or the retailer where you purchased this product.





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