

# How to Plan and install an Intruder Alarm

## PART 1

### What is an intruder alarm?

An intruder alarm system monitors and detects unauthorised entry to properties – homes and businesses alike - and alert the property owner or authorised third parties to an intrusion. For electrical installers, the ability to offer customers the opportunity to have a protection system installed in their properties at the same time that other electrical work is carried out, can generate a lucrative additional revenue stream.

### Why bother with intruder alarms?

Although statistics\* show that burglary rates have been dropping, there are still a high percentage of properties that do not have adequate security measures in place. The best deterrent for burglars is an intruder alarm and it needn't cost the earth to install an effective intruder alarm. Ultimately, an alarm system gives property owners the peace of mind they desire to protect their homes, families, businesses and assets.

Only around 10% of residential properties in the India are protected by an intruder alarm system, so by introducing intruder alarm installation to your services, you could significantly grow your business and profits.

### Did you know?

Homes and businesses which do not employ any form of security measures are 10 times more likely to be burgled than those with simple security measures

- Homes and businesses with no burglar alarm are three times more likely to be broken into than those with alarms.
- Around 20% of all house burglaries are carried out without forced entry. A burglar may see an open window or other easy point of entry and take their chance.
- Visible burglar alarms make intruders think twice. They not only act as a deterrent, but will also provide a warning that an intrusion is taking place.

### What are the components of a burglar alarm?

The intruder system comprises detectors, control panels and communications devices.

Detectors identify and react to specific occurrences including movement, shock, vibration, smoke, heat, and flood.

Different types of detectors are available, each protecting different aspects of the property. These include:

- Passive infrared sensors (PIRs) detect people moving using infrared heat sensing.
- Dual Technology sensors use combined infrared and microwave sensing technologies to help reduce false alarms.
- Magnetic door contacts detect the opening and closing of doors and windows.
- Glass break sensors listen for the specific noise of breaking glass.
- Shock sensors detect attacks on doors and windows.
- Smoke sensors can be connected to the intruder alarm system to detect fire.

## **ANALYSIS**

The control panel is the brains of the system to which detectors are connected. It analyses and actions signals from detectors and is operated by a keypad. Keypads are sometimes integrated into the control panel e.g. Optima Compact or these can be remote with LED or LCD displays. LED keypads communicate alarm system status using LED indicators. LCD keypads use text displays to give a fuller picture of the alarm status including event logs, entry and exit times of users, and ultimately enable speedy identification of alarm sources. Control panels come in different shapes, sizes and complexities depending on the type and size of property to protect.

- Number of zones (areas) to protect
- Ability to set all or part of the system
- The number of Remote keypads it can accommodate
- Event memory log PA & Tamper inputs

## **ACTIVATION**

In the event of alarm activation, the keypads identify the problem & inform the occupants of the cause and location of the alert.

## **DETERRENTS**

Sounders and sirens use different tones and rhythms to communicate the type of alarm internally and/or externally. Externally mounted sounders and sirens are a good visual deterrent for potential intruders and quickly alert property owners and neighbours to an intrusion. The strobe helps to identify the house when an alarm has gone off.

## **ALERTS**

Communications devices such as speech dialler send pre-recorded voice messages by telephone when an alarm is triggered. These messages can be sent to the homeowner or nominated contacts either via land line or mobile phone. This is particularly useful for isolated properties and allows action to be taken when property owners are away from home.

## **Planning and laying out an intruder alarm**

### **Step 1: Conduct a site survey with your customer**

To ensure that you get the correct intruder alarm system for your customer, you need to carefully plan and design the system. This is achieved by conducting a short site survey in consultation with your customer. The following questions will help you identify exactly what your customer wants to protect, and will enable you to map out the system plan and identify the most suitable components.

#### **The site survey**

- Is the property isolated or in a built up area?
- What parts of the property have to be protected? Does the entire property or just part require to be protected? What areas does the customer want to protect to identify the number of zones required?
- How many entry doors exist at the property and that require protection?
- In addition to intruder protection, does the customer require fire protection?
- How many zones will be required?
- What type of keypad does the customer require (integral, LED or LCD)?

- Does the customer require additional keypads?
- Where will the control panel be located?
- Does the customer require the windows to be protected?
- How many rooms are to be protected with movement detectors?
- Does the customer have pets that will remain in the house when the system is set?
- What type of alert is required? (sounding/visual/remote phone communication)?
- Where will the external siren be located?
- Is a dummy siren also required?
- Is keyfob operation more suited to the household?

**Step 2: Map out the property and select products**

Using the information you have obtained during the site survey, map out property layout and select the most appropriate products for the installation.

**Step 3: Decide where to position the Intruder alarm system components**



YOU ARE NOW IN A POSITION WHERE YOU CAN START THE INSTALLATION OF THE INTRUDER ALARM SYSTEM.

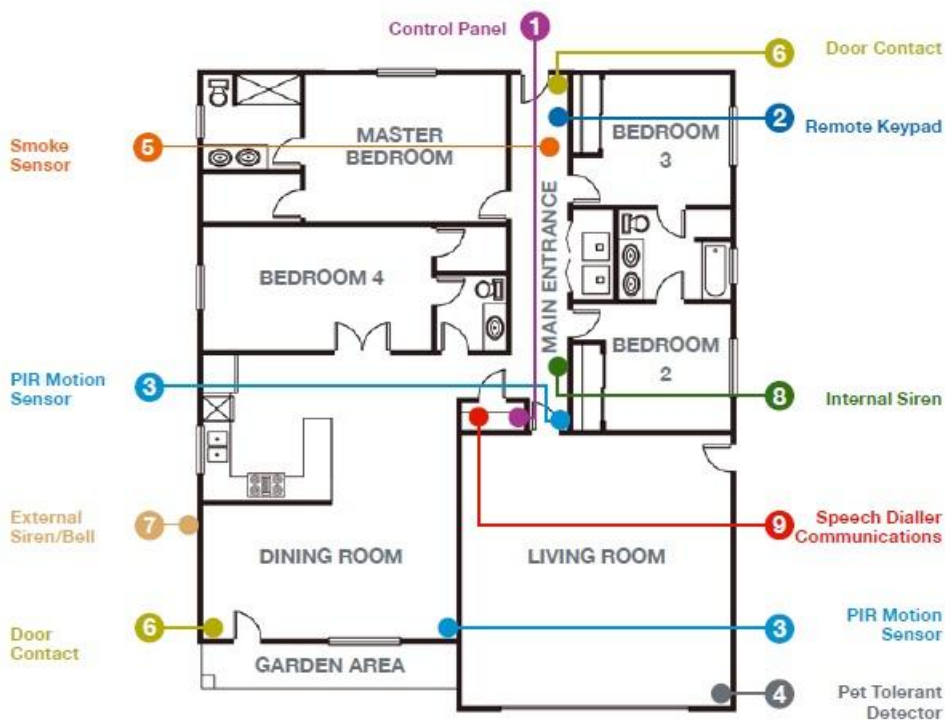
**PART 2**

The first part of this guide gave you intruder alarm basics, including the benefits of intruder alarms, main intruder alarm system components and how to plan and lay out an intruder alarm system.

Part two will help you to correctly position, install and commission the components of an intruder alarm system as well as giving you some visual hints and tips on best practice and how to avoid common pitfalls and mistakes.

### Positioning and Installing the Intruder Alarm System Components

- |                              |  |
|------------------------------|--|
| <b>1</b> Control Panels      | <b>5</b> PIR Motion Sensors            |
| <b>2</b> Smoke Sensors       | <b>6</b> Door Contacts                 |
| <b>3</b> Pet Immune Detector | <b>7</b> LCD or LED Keypads            |
| <b>4</b> PIR Motion Sensors  | <b>8</b> Internal Siren                |
|                              | <b>9</b> Speech Dialler Communications |



#### 1. Control Panels

##### POSITIONING

- For control panels with onboard keyboards should be installed near the main access point in a convenient location for mains electricity supply and for user operation.
- For control panels which are operated using remote keypads, the panel can be concealed inside a cupboard or loft space in a convenient location for mains electricity supply and it makes the cabling to the sounder much easier.

##### BEST PRACTICE

It is best to install the control panel first

#### HINTS AND TIPS

- Check the panel voltage to ensure that the control panel has power. REMEMBER to disconnect power before proceeding with the installation of peripherals
- Remember to link out any zones that you are not using, you need to use a wire link across the Unused zones
- The stand by battery can take several hours to charge up so it is a good idea to charge batteries before commencing the installation

### **2. Remote LCD Keypads**

#### POSITIONING

Mount in a convenient location which allows easy operation for the system users, typically close to the main door, back door and master bedroom.

#### HINTS AND TIPS

- Remember to check that the tamper spring on the keypads is closed
- It is recommended to use the tamper spring whenever the keypad is mounted against a wall so that it is triggered if an attempt is made to remove it.

### **3. PIR Motion Sensors**

#### POSITIONING

- Install the sensor at a height of 2.3m-2.7m.
- Avoid direct or reflected sunlight remembering that the sun moves around during the year!
- Position the sensor away from windows and heating/ cooling devices such as radiators and fans.
- The sensor must have a clear line of sight to the protection area.

#### **How to avoid the common mistakes with installing PIRs**

- Where the PIR has a look down or "sneak" zone, ensure that this is not obstructed
- Pay attention to avoid blind spots when positioning sensors
- Always adjust the sensitivity of each sensor once it is mounted, taking into consideration the lighting, the proximity to radiators, windows, mirrors and other external influences.
- Tamper switches often cause problems. If you are using the tamper switch ensure that the tamper switch is closed. If you are not installing the tamper circuit (not advised) you need to ensure that the tamper circuit is linked out at the control panel.

#### HINTS AND TIPS

- If wall is not square you may need to alter the state of the plastic to make sure when mounting that you hear the tamper spring "click", closing the circuit
- Using the black jumper, you can easily set the red LED light to ON or OFF as indicated below. This is particularly useful in living rooms where the LED flashing on and off could be distracting
- Allow up to one minute for the PIR to calibrate itself

#### **4. Pet Tolerant Detectors**

##### POSITIONING

- Follow the instructions for positioning PIR motion sensors
- Select correct pet tolerant setting using the black jumper

#### **5. Smoke Sensors**

##### POSITIONING

- Place in or just outside bedrooms or in the hallway close to any sleeping area. The top of the stairs is also a good place

##### HINTS AND TIPS

- Do NOT place smoke sensors in kitchens or bathroom

#### **6. Door Contacts**

##### POSITIONING

- Mount the main part (part with connectors) on the fixed part of the door or window frame. Do not mount them further than 3" from the opening side of the door.
- Mount the magnet on the mobile part of the door or window so that it is adjacent to the main part.
- Ensure that the two parts are opposite each other and a small gap has been left.

##### HINTS AND TIPS

- Ensure that wires are hidden so that they cannot be damaged.
- Ensure that wires are hidden so that they cannot be Pleasenote that some Honeywell door contacts have two rather than five terminals
- If there are only two screws, a tamper loop will need to be created by twisting the cables then insulating them with electrical tape.
- Wrap the wire around the screw in a clockwise direction and tighten the screw for the best connection

#### **7. External Sirens & Bells**

##### POSITIONING

Install in a high location from which the strobe can be seen and the siren heard

##### HINTS AND TIPS

Ensure that the tamper is closed

#### **8. Internal Siren**

##### POSITIONING

Place in the centre of the home out of reach

## **9. Speech Dialler Communications**

### POSITIONING

- Locate where it can be easily operated by system users and in a convenient location for connection to the phone line.
- If possible, do not connect other telephone apparatus to the same line

### BEST PRACTICE

- Connect the speech dialler directly into the control panel
- Once wired in, test that the dialler dials through before programming the pre-recorded alert messages according to trigger cause (e.g. intruder, fire, flood)

### HOW TO AVOID THE COMMON MISTAKES WITH INSTALLING A SPEECH DIALLER

Ensure that the speech dialler is the first item on the telephone line i.e. the first "slave socket" to be connected to the master socket (where more than one apparatus is unavoidable). This allows the speech dialler to "snatch the line" or disconnect any other call should it be triggered

### **Installation Advice and Best Practice**

When installing an intruder alarm it is imperative that you follow the necessary Health and Safety requirements. Installation of the intruder alarm is straight forward provided that the installer is a qualified and experienced electrician.

### GENERAL HINTS AND TIPS

- Use multiple core alarm cable and decide at the outset which colours you will use – Convention suggests red is live (+12V) and black is negative (0 Volts).
- Remember to "tin" the wire.
- Do not over tighten the screw on the connector block as this can shear the wire.
- When using the global tamper circuit, this is a continuous loop through all zones (contacts, PIRs PA devices etc) so all tampers need to be wired

- 1) Do not work using live circuits
- 2) Run the wires to all the locations of the peripherals
- 3) Mount the control panel in the desired location
- 4) Mount the keypad on the wall in the location agreed with the customer
- 5) Wire up the peripherals (detectors, bell boxes, communication devices...etc)
- 6) Activate the power
- 7) Carry out a walk test and check the system is working

Once you have installed the Intruder alarm system and verified that all components of the system have power you need to commission the alarm.