Wireless PIR Detector Installation Handbook

Type: LGWP-15/40/HC

Issue 5.

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PRE-INSTALLATION NOTES

Unpacking.

On receipt, inspect the package and contents for signs of damage. If damage has occurred, advise the carrier and/or suppliers immediately. Inspect the contents to confirm that all items are present and undamaged. If any items are missing or damaged, contact the supplier immediately. It is advisable that the original carton is retained as this forms the safest transport container in the event that a unit has to be returned for any reason.

Servicing.

This unit should not require general servicing. Any repair work should only be undertaken by qualified service personnel.

Moisture.

Do not expose the internal electronics of this unit to moisture i.e. take care during installation or when changing batteries not to allow rain or damp into the product. When the product is sealed it is water resistant to IP67.

Box Contents.

1 x *GENESIS* wireless PIR detector
1 x 1/4 wave antenna
1 x sun shield
3x C cell alkaline batteries (May already befitted in detector)
4 x no 8 wall plugs
4 x no 8 2" screws
1 x 3 mm hexagonal key

INDEX

Introduction

The LGWP range of wireless Passive Infra Red Detectors (PIR) have been designed to meet the newest and most demanding requirements of the CCTV market. These detectors provide the versatility of wireless whilst meeting and surpassing the requirements needed for a BS8418 system.

Inside the PIR is a powerful microprocessor which uses a combination of fuzzy logic and look up tables to determine the validity of an activation. With this technology nuisance alarms are greatly reduced.

The PIR also contains a shock sensor and light sensor to enhance it's anti-tamper features which now include physical attack and anti-cloaking. A thermal sensor adjusts the parameters of the PIR in extremes of heat and cold to maintain optimum performance.
Currently four popular lens patterns are available to cover most situations. (See page 5).
A further two special lenses are planned for the near future.

The PIR continuously poles in to verify that it is operational. Every time it transmits it also sends other information such as battery condition as well as pulse count settings and software revision number.

How the system works.

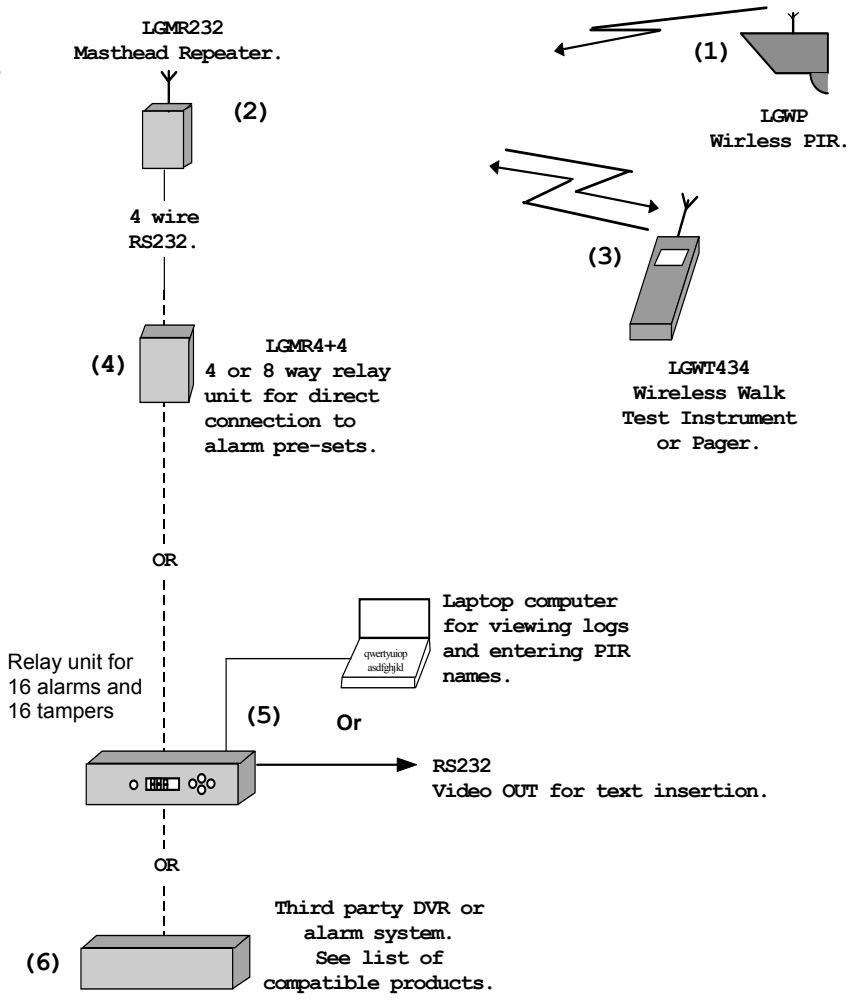
At the heart of the system there is a Masthead which receives the data transmitted by the PIR detectors. See Fig 1.

Each time a PIR **(1)** detects movement it transmits data to a masthead **(2)**. This masthead then does two things. Firstly it re-transmits the data and attaches a text string to it which can be received by either a Pager (LGP434) or Walk Test Instrument (LGWT434). **(3)**. These devices will display the ID number and name of the PIR such as "Main Gate" etc.
The walk test unit shows additional information such as the PIR's battery status, pulse count setting and software version as well as the signal strength at the masthead.

The second thing that the masthead does is to pass data via an RS232 link to an alarm system such as the LGMRU4x4 **(4)** Luminite relay unit configurable as 4 alarm & 4 tamper relay outputs or 8 alarm outputs without tampers. Alternatively the LGRU64 **(5)** relay control unit with up to 64 alarm relay outputs and a further 64 tamper relay outputs may be connected in the same way. This control unit keeps a log of events and provides text for video insertion.
Alternatively, the masthead may be connected directly to some popular DVR/ transmission systems **(6)** thus illuminating complex and costly wiring.

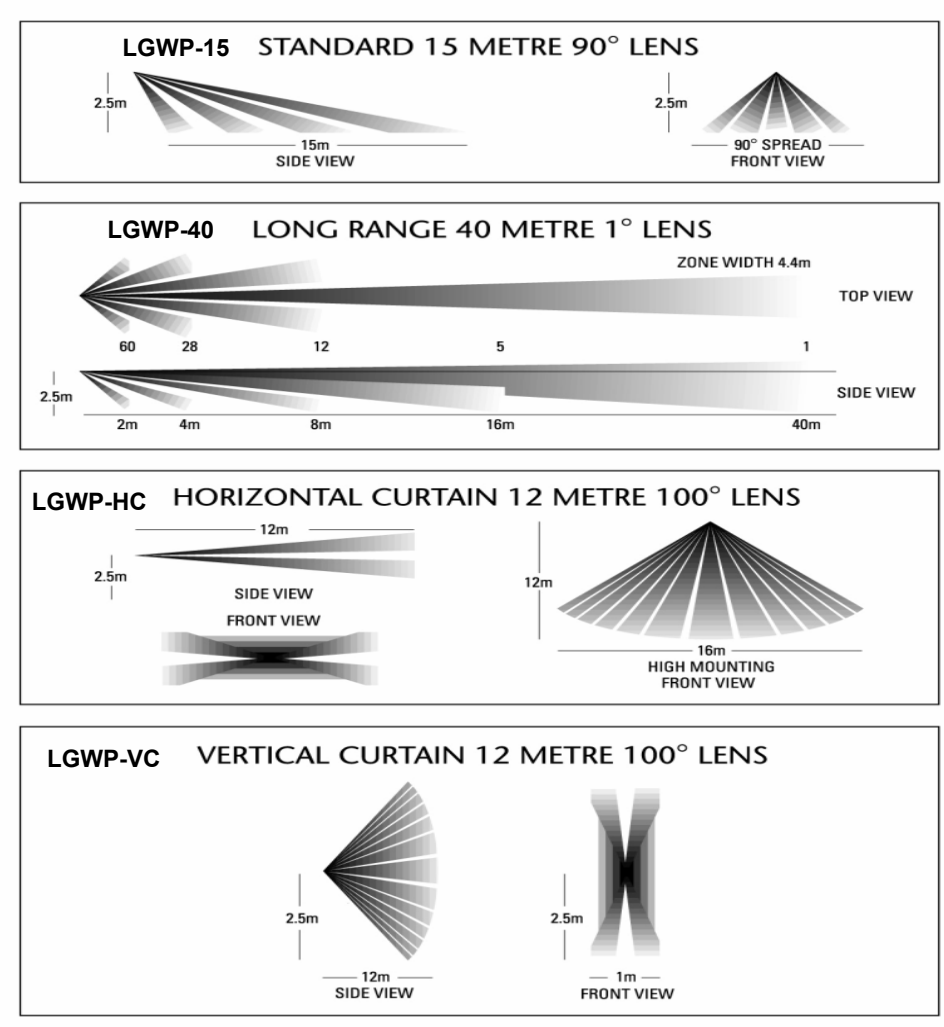
Transmission from the detector to the masthead transceiver exceeds 1km line of sight but may be extended to tens of kilometres by using repeaters.
A masthead unit can simply be converted to become a repeater by just a switch change.
The PIR detectors CALL IN every 60-80 seconds with an IM'E STILL HERE message. The LGRU64 and some third party products will give an alert if any of the PIR's logged on the system go missing.

Fig 1.



Lens Patterns.

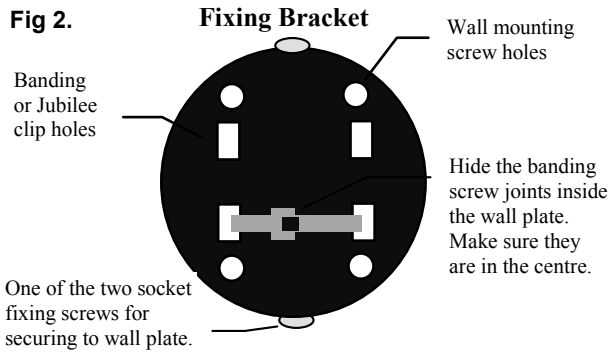
The LGWP detector is available currently in four detection patterns.
15m x 90deg. 40m x 1deg. 12m vertical curtain. 12m horizontal curtain. (See diagrams). These lenses are not interchangeable and the correct lens type must be decided before installation. A further two special lenses are planned for the near future.



Positioning.

The correct height for the PIR is 2 to 2.5 metres above the ground. Careful consideration when positioning the detector will greatly reduce nuisance alarms.
The detector requires a clear view of the area to be covered. Make sure that nothing can move or flutter in front of the detector and avoid facing reflective surfaces. The fixing of the detector must be solid and not sway. Avoid situations where the detector can over shoot the detection area.

Fig 2.



Fixing.

Undo the two socket screws from the wall plate and remove the black fixing bracket. For WALL MOUNTING use the four screws and wall plugs provided.
For POST MOUNTING use banding or Jubilee clips.
When it is secure, the wall plate may be hung back on the bracket and the two socket screws re-fitted.

Connecting the batteries.

Unscrew the two rear socket screws and remove the whole front of the detector to expose the rear battery compartment. If changing the batteries, fit two 1.5 volt Alkaline C cell's. Always use high power long life types. Observe polarity as shown.

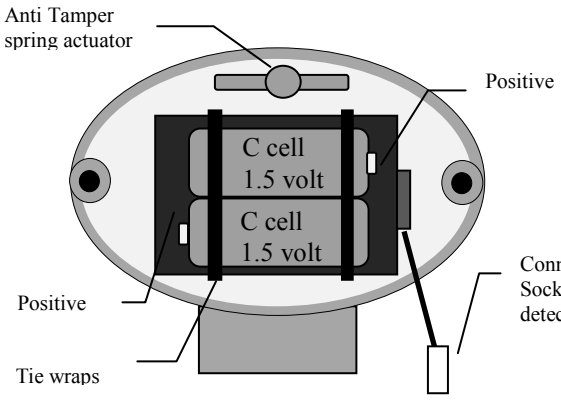


Fig 3.

Set the CODE and FUNCTION switches as described later and connect the Flying Socket to the circuit board. Re-fit the PIR to the rear half. Insert the two screws and tighten.

Code & Function switches explained.

There are three elements to the coding used on this system.

SITE codes **UNIT codes** **SUB NET codes**

SITE codes.

These separates one site from another. The site is the area covered by all the PIR's on the system. It can be made very far reaching by deploying repeaters. The Masthead and all PIR's as well as any other devises used on the system such as Repeaters, Walk Test Instruments and Pagers must all be set to the same site code. You can have 32 sites all within radio reception range that will not interact with one another if they each have a different Site Code.

UNIT codes.

These codes identify each individual PIR detector on the site. There are 64 unit codes which are the maximum number of PIR's per site. More PIR's can be fitted to a site but another system with a different site code must be installed to accommodate them.

SUB NET codes.

(Only applicable if repeaters are used)

These separate the site up into sections. All PIR's and repeaters on the site are set to the same site code but will only communicate with a masthead or repeater which has the same sub net code. Distant PIR's will need to rout through one or more repeaters. Those PIR's must send the receiving sub net code that has been set on the nearest repeater. That repeater then sends a transmitting sub net code to the next repeater or masthead. Repeaters have a separate receiving and a transmitting sub net code. Pagers and Walk Test Instruments will respond to all unit & sub net codes and will receive from anywhere over the site.
Up to seven repeaters and one masthead may be deployed on any one site.
Some examples are shown on the following page. The first is the most common scenario where all PIR's communicate directly with the masthead without repeaters.

In this typical example we have set a Sub Net code of 1, a Site Code of 2 and a Unit Code of 2.
Sub Net 1 is always used when the PIR's are communicating directly with the Masthead without repeaters.

For a better understanding of repeaters and Sub Net Codes see the operating instructions for the LGMRU232.

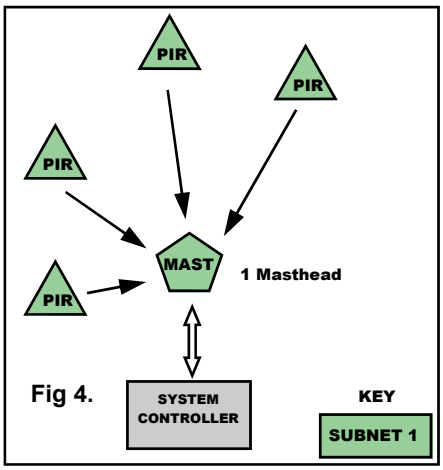
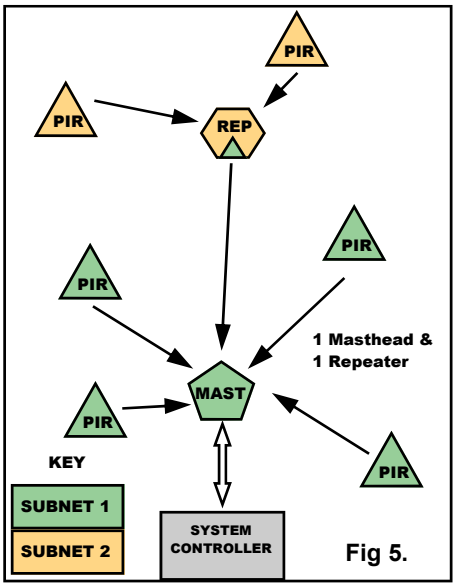
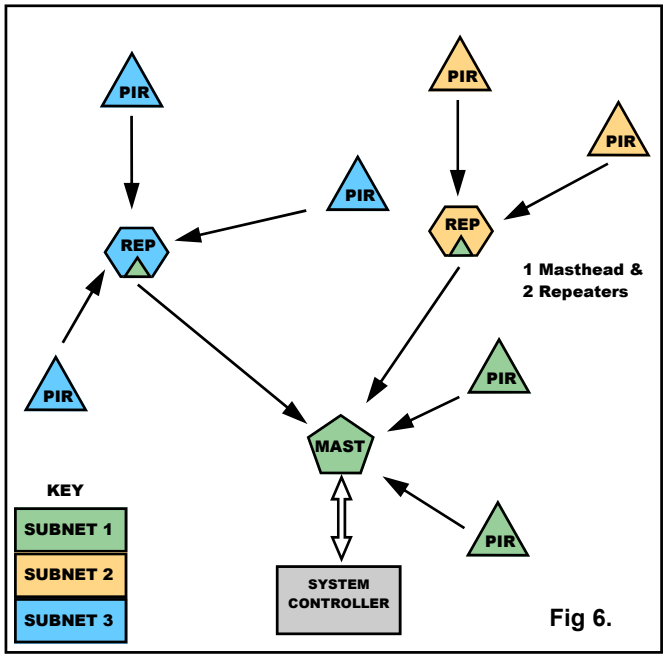


Fig 4 shows PIR's communicating directly with the Masthead. All Sub Nets are 1.



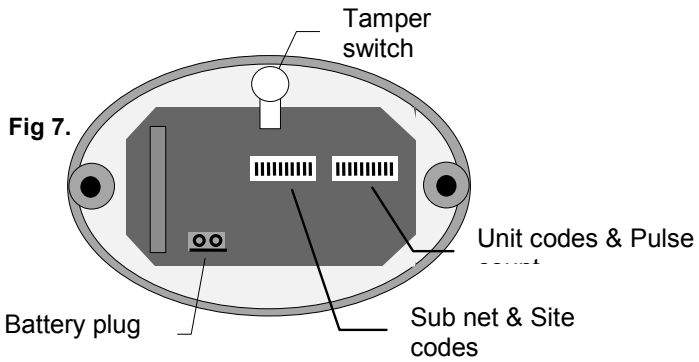


Fig's 5 & 6 show examples where one or more repeaters are used and how the Sub Net Codes separate the system.

SWITCH SETTING TABLES

The two banks of 8 way switches shown in the diagram are used to set the transmission codes and also the PIR pulse counting. Use a very small screw driver or pointed tool to change the settings. The following tables show △&▼ as **UP = △** **DOWN = ▼**

Fig 7.



Switch functions.

The product is supplied with all switches in the UP △ position.
This equates to:

Sub net	1
Site code	1
Unit code	1
Pulse count	1

UP = △
DOWN = ▼

SUB NET CODES	SWITCHES	1	2	3
	1	△	△	△
	2	△	△	▼
	3	△	▼	△
	4	△	▼	▼
	5	▼	△	△
	6	▼	△	▼
	7	▼	▼	△
	8	▼	▼	▼

Site codes.

All the detectors on the system must have the same site code. The masthead and any repeaters must also have the same site code. If a pager is to be used or when using the walk test instrument, set the same site code for them. There are 32 site codes to choose from. (1-32) It is good practice to use a different site code for each new installation.

SITE CODES	SWITCHES	4	5	6	7	8
	1	△	△	△	△	△
	2	△	△	△	△	▼
	3	△	△	△	▼	△
	4	△	△	△	▼	▼
	5	△	△	▼	△	△
	6	△	△	▼	△	▼
	7	△	△	▼	▼	△
	8	△	△	▼	▼	▼
	9	△	▼	△	△	△
	10	△	▼	△	△	▼
	11	△	▼	△	▼	△
	12	△	▼	△	▼	▼
	13	△	▼	▼	△	△
	14	△	▼	▼	△	▼
	15	△	▼	▼	▼	△
	16	△	▼	▼	▼	▼
	17	▼	△	△	△	△
	18	▼	△	△	△	▼
	19	▼	△	△	▼	△
	20	▼	△	△	▼	▼
	21	▼	△	▼	△	△
	22	▼	△	▼	△	▼
	23	▼	△	▼	▼	△
	24	▼	△	▼	▼	▼
	25	▼	▼	△	△	△
	26	▼	▼	△	△	▼
	27	▼	▼	△	▼	△
	28	▼	▼	△	▼	▼
	29	▼	▼	▼	△	△
	30	▼	▼	▼	△	▼
	31	▼	▼	▼	▼	△
	32	▼	▼	▼	▼	▼

Unit codes.

Start with unit code 1 for the first detector on the system and increase in increments of one for each additional detector. There are 64 unit codes. (1-64)

UNIT CODES	SWITCHES	1	2	3	4	5	6
	1	△	△	△	△	△	△
	2	△	△	△	△	△	▼
	3	△	△	△	△	▼	△
	4	△	△	△	△	▼	▼
	5	△	△	△	▼	△	△
	6	△	△	△	▼	△	▼
	7	△	△	△	▼	▼	△
	8	△	△	△	▼	▼	▼
	9	△	△	▼	△	△	△
	10	△	△	▼	△	△	▼
	11	△	△	▼	△	▼	△
	12	△	△	▼	△	▼	▼
	13	△	△	▼	▼	△	△
	14	△	△	▼	▼	△	▼
	15	△	△	▼	▼	▼	△
	16	△	△	▼	▼	▼	▼
	17	△	▼	△	△	△	△
	18	△	▼	△	△	△	▼
	19	△	▼	△	△	▼	△
	20	△	▼	△	△	▼	▼
	21	△	▼	△	▼	△	△
	22	△	▼	△	▼	△	▼
	23	△	▼	△	▼	▼	△
	24	△	▼	△	▼	▼	▼
	25	△	▼	▼	△	△	△
	26	△	▼	▼	△	△	▼
	27	△	▼	▼	△	▼	△
	28	△	▼	▼	△	▼	▼
	29	△	▼	▼	▼	△	△
	30	△	▼	▼	▼	△	▼
	31	△	▼	▼	▼	▼	△
	32	△	▼	▼	▼	▼	▼
	33	▼	△	△	△	△	△
	34	▼	△	△	△	△	▼
	35	▼	△	△	△	▼	△
	36	▼	△	△	△	▼	▼
	37	▼	△	△	▼	△	△
	38	▼	△	△	▼	△	▼
	39	▼	△	△	▼	▼	△
	40	▼	△	△	▼	▼	▼
	41	▼	△	▼	△	△	△
	42	▼	△	▼	△	△	▼
	43	▼	△	▼	△	▼	△
	44	▼	△	▼	△	▼	▼

Unit codes continued.

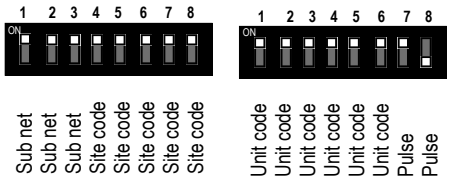
UNIT CODES	SWITCHES 1	2	3	4	5	6
45	▼	△	▼	▼	△	△
46	▼	△	▼	▼	△	▼
47	▼	△	▼	▼	▼	△
48	▼	△	▼	▼	▼	▼
49	▼	▼	△	△	△	△
50	▼	▼	△	△	△	▼
51	▼	▼	△	△	▼	△
52	▼	▼	△	△	▼	▼
53	▼	▼	△	▼	△	△
54	▼	▼	△	▼	△	▼
55	▼	▼	△	▼	▼	△
56	▼	▼	△	▼	▼	▼
57	▼	▼	▼	△	△	△
58	▼	▼	▼	△	△	▼
59	▼	▼	▼	△	▼	△
60	▼	▼	▼	△	▼	▼
61	▼	▼	▼	▼	△	△
62	▼	▼	▼	▼	△	▼
63	▼	▼	▼	▼	▼	△
64	▼	▼	▼	▼	▼	▼

Pulse count.

This sets the sensitivity of the detector. Single pulse is the most sensitive setting and four pulses the least. The normal setting is one but in certain conditions where perhaps there is a lot of wild life, more pulses may be required. See table.

PULSE COUNT	SWITCHES 7	8
1	△	△
2	△	▼
3	▼	△
4	▼	▼

UP = △
DOWN = ▼



This example shows a setting of pulse count two.

Angle Adjustment.

For left and right movement, slacken the socket screw under the pivot as shown using the 3 mm key provided. For up/down movement, slacken the two socket screws either side of the pivot as shown in Fig 8.

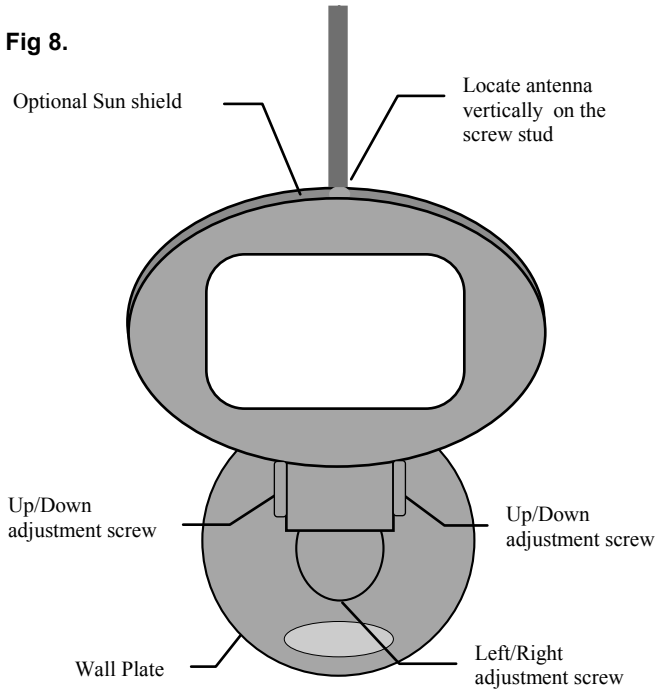
Antenna connection.

Fit the antenna on the screw stud and tighten the dome nut to secure it. (Do not over tighten). If a sun shield is required, fit this first.

Sun shield.

Fit the sun shield to improve performance in strong sun light. The sun shield also helps in keeping snow of the lens.
To fit the shield, place the tab over the screw stud and clip both sides of the shield down at the front.

Fig 8.



Preparation & Testing.

It is recommended that a Walk Test Instrument should be used to accurately test and set the detectors up. A Masthead MUST be fitted to enable a system to work as the Walk Test Instrument will not receive signals directly from the PIR detectors but only via a Masthead.

Preparation

Step 1. Install a Masthead transceiver in a suitable position where it can easily be connected to the DVR or alarm system. The Masthead should also be positioned where it will get the best radio reception from PIR detectors all around the site. An optional antenna with 5 metres of cable is available which will greatly improve radio reception. A temporary test may be made quickly just by connecting a 12 volt battery to it and resting it roughly in it's intended position. Decide on a SITE Code from one of the 32 codes available and set it on the Masthead. Set the SUB NET Code to 1. Switch the Masthead into echo mode. See Masthead installation and operating instructions for full details.

Step 2. Set the same SITE Code on the Walk Test Instrument by following the operating instructions provided with the instrument.
Make TEST Transmissions from all the positions where you want to site the PIR detectors and check the signal strength. If signal strength is weak, decide on a different position or install a repeater on the site. NB: In a majority of cases a repeater will not be necessary due to the exceptional transmission range from the PIR detectors to the Masthead. Bear in mind that the PIR will achieve a better signal strength at the Masthead than the hand held walk test instrument. Therefore if the walk test reading is marginal, then a PIR will probably be OK in this position.

Step 3. When all positions have been tested and approved the fitting of the detectors can take place.
Set the switches in the detector for the required Site code Unit code and Sub net code. For testing purposes set the pulse count to **1. (IMPORTANT)** The detector reads the switches only once when the battery is connected. If the switches are changed, the battery must be un-plugged and re-connected for the change to take place.
Plug the white battery connector on to the white two pin plug positioned on the left hand side of the board. See Fig 7 on page 8. Now fit the front lens housing to the rear battery section making sure not to trap the battery wires. Fit the two M5 16 mm screws and tighten.
Screw the wall bracket to the wall using the screws and plugs provided at a height of between 2 & 2.5 metres and hang the detector on it temporarily to make angle adjustments. See Fig 2 on page 5.

Testing

Step 4. Testing with a Walk test Instrument. Hang the detector on the wall bracket and walk about within the detection area using the Walk Test Instrument. The test instrument will display the unit code and bleep each time detection takes place. In filter mode it will ignore all other unit codes on the site and only respond to the detector under test. Other information will also be displayed such as signal strength and Tamper, Shock and Cloak alarms.
NB: The **Cloak detection** will only work during day light and is not instantaneous. To test this, ensure the detector has been in position for at least 5 minutes and then cover the lens with a bag. After a few minutes the detector will send a Cloak message .
Anti Tamper will indicate if the detector is opened.
To test the **Shock sensor,** strike the detector hard with something like the handle of a large screwdriver.
If a walk test instrument is not available then a Masthead can be utilised for a simple test.

Testing with a Masthead receiver. A sounder is available for the masthead receiver to facilitate walk testing. Model LGSOU12. Connect this sounder to the RS232 output of the Masthead in accordance with it's operating instructions. Set the masthead site code and sub net code to be the same as the detector. Connect a 12 volt battery to the masthead and proceed to walk about within the detection area. The sounder will alert each time detection occurs. This sounder will operate on any of the 64 unit codes.

Testing with a portable computer. The masthead outputs text from it's RS232 terminals. A computer may be connected to these terminals to view all the mastheads received information. An optional accessory data lead is also available.
The computer may also be used to input a name for each Unit code which will be transmitted to the walk test instrument.

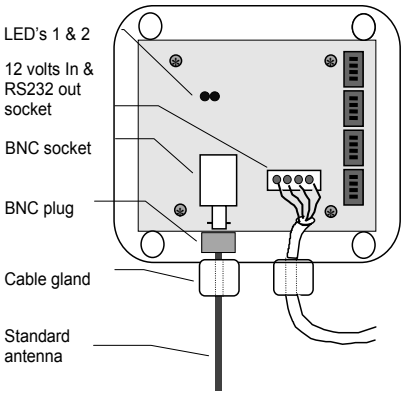
Step 5. Angle adjustment. There are three angle adjustment screws which must be slackened before the detector can be adjusted to the correct position. Once correct area coverage has been achieved, lock the angle adjustment screws tightly.
If a sun shield is required, fit this in place before fitting the antenna.

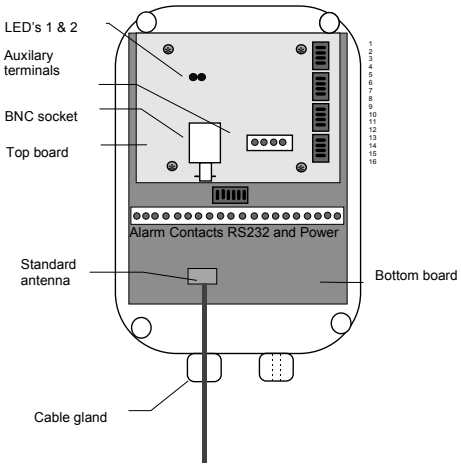
Step 6. Finish. Lift the detector off the wall bracket and dismantle again. Disconnect the batteries. Set the Pulse Count switches to one count. A higher number may be required for sites where loose materials are allowed to blow about or where strong sun light can reflect directly into the detector lens. Higher pulse count settings will reduce the effective detection range.
Re-assemble the detector and hang it back on the wall bracket. It will not have changed position because the angle adjust screws have been locked.
Fit the two M5 16 mm screws to the top and bottom of the wall plate and tighten.

Types of Receivers

Masthead LGMT434

This transceiver can be used on it's own for a simple pager system or can interface directly with some third party DVR's and alarm systems. It will also connect to the dedicated LGRU16 relay control unit to provide up to 16 relay alarm outputs together with 16 Tamper relay outputs. Four of these units will provide the maximum of 64 relay outputs.





Masthead Relay Unit LGMRU4x4

The masthead relay unit does everything that a masthead unit can do but also provides 4 alarm and tamper relay outputs. This model is primarily intended to connect directly to a dome camera's pre-set inputs but may also be used to connect to DVR's and alarm systems where a smaller number of relay outputs are required.
A switch change converts the product to an 8 alarm output without tampers if required. Expansion cards are available to increase the number of alarm outputs up to a maximum of 32.

LGWP Wireless PIR Detector Specification.

Lens types	15 metre x 90deg 40 metre x 1deg Horizontal curtain 12 metre 90 deg Vertical curtain 12 metre 90 deg
Alarms	Detection / Anti Tamper / Anti Cloaking / Shock Temperature sensor compensates for extreme conditions
Batteries	3 x 1.5 volt alkaline C cells
Battery life	2 years approximately. (Depending on number of activations)
RF output	434.525Mhz 10m/w
RF range	1-2 Km line of sight
Encoding	Rolling code
Call In	Every 60-80 seconds
IP rating	67
Enclosure	3 mm polycarbonate (except for fresnel lens)

Luminite *Genesis* **product range**

Wireless products

Wireless PIR's	15m x 90 deg	LGWP1520
Wireless PIR's	40m x 1 deg	LGWP4004
Wireless PIR's	12m Horizontal curtain	LGWP12HC
Masthead/Repeater		LGMT434
Masthead Relay Unit		LGMRU4x4
Relay Expansion Module		LGREM4x4
Walk Test Instrument		LGWT434
16 way relay unit		LGRU16
Relay module		LGRM8
16 way DM interface unit		LGDM16
16 way relay unit with end of line resistor		LGRU16ELR 3 versions
Relay module with end of line resistor		LGRM8ELR 3 versions
Optional antenna		AE434
Transmitter module		LGTX434
Portable KeyPoint		LGKP
Static KeyPoint		LGKS

Hard wired products

Wired PIR detectors (RS485)15m x 90 deg	LGRS1520
Wired PIR detectors (RS485)40m x 1 deg	LGRS4004
Wired PIR detectors (RS485)12m horizontal	LGRS12HC
RS485-RS232 Adapter	LGA485

LUMINITE ELECTRONICS LTD
2a BELLEVUE ROAD, FRIERN BARNET, LONDON, N11 3ER
Tel: 0044 (0) 208 368 7887 Fax: 0044 (0) 208 368 3952
Web: www.luminite.co.uk email: sales@luminite.co.uk