

Anytronics : Anylight Outstations

PIR Outstation

1.0 Introduction

The Anylight PIR outstation is one of a range of remote outstations manufactured by Anytronics which are compatible with their Anylight interface cards normally fitted inside a dimming pack. The outstations communicate with the interface card over a simple two wire interface and generate the command codes accepted by these interface cards in order to control Channel levels and recall stored Preset scenes.

The PIR outstation is designed to sense room occupancy and to either switch Channels or Presets on for a set period when an occupant is sensed, or to turn selected Channels or Presets off a set period after occupants were last sensed.

The PIR outstation includes a light level sensor with a variable threshold to disable the switching on of Channels or Presets when light levels are above the set threshold level.

Key Features of PIR outstation

- Standard 110mm round hole ceiling fitting
- Channel / Preset addressing set on panel back
- PIR sensitivity adjustment
- LED mimic when PIR triggered
- Light threshold adjustment
- Communication with Anylight interface card over two wire interface
- Channel / Preset address ranges 1-64
- Outstation can be configured to provide a variety of operational modes
 - Channel 'Timed on' or 'Timed Off' commands
 - Preset 'Timed on' or 'Timed Off' commands
 - Walk Test mode

Anytronics Ltd
Units 5/6,
Hillside Industrial Estate
London Road
HORNDEAN
Hants
PO8 0BL
UK

Tel : +44 (0) 2392 599410

Fax : +44 (0) 2392 598723

Email : sales@anytronics.com

Web : www.anytronics.com

2.0 Installation

Placement

The outstation can be installed in a 110mm hole drilled in plasterboard ceilings. Note that the placement of the PIR outstation requires some thought because any direct sunlight falling on the unit will almost certainly trigger it. If objects immediately in the line of sight of the PIR are intermittently illuminated by direct sunlight, this may also lead to the unit being occasionally triggered. Incandescent lamps and radiators in the line of sight may also give rise to occasional false trigger events when changing temperature rapidly.

Connection

Only two low voltage data connections are required back to the A and B buss terminals on an Anylight interface card, and these connections can be made with either polarity. Multiple outstations may be wired in parallel across the A and B buss connections with either polarity. It is important to ensure that one A and one B connection is made from each outstation back to the interface card. Do not wire the outstations in series, or they will not work. A suitably wired outstation is shown in the photo overleaf.

Do not earth or make any other connection to these outstations.

Outstation Addressing

Each outstation can address a single Channel or Preset address from 1-64. The Channel or Preset address is set by using the Address bcd switch and switches 1, 2 of the adjacent four way DIL switch. There is potential confusion here between the outstation address setting on the bcd switch of 0-F and the resultant interpreted Channel or Preset addresses at the interface card of 1-16. To try to overcome this, a lookup table is shown below with address setting shown in the left column, and the resultant Channel or Preset addresses shown in the table.

rotary control address setting	Sw1 Off resultant address	Sw1 On resultant address	Sw1 Off resultant address	Sw1 On resultant address
0	1	17	33	49
1	2	18	34	50
2	3	19	35	51
3	4	20	36	52
4	5	21	37	53
5	6	22	38	54
6	7	23	39	55
7	8	24	40	56
8	9	25	41	57
9	10	26	42	58
A	11	27	43	59
B	12	28	44	60
C	13	29	45	61
D	14	30	46	62
E	15	31	47	63
F	16	32	48	64

Note the effect of positions 1 and 2 of the four way DIL switch beside the bcd address switch in adding 16 or 32 to the selected address.

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A further layer of address checking takes place at the interface card which might only have a valid Channel address range of 1-8, or 1-32. In this case, addresses are usually 'rolled over' so that an address of 9 is interpreted as an address of 1 in an eight Channel interface (Anylight 8). This rollover feature can be disabled at the interface card however (see installation instructions).

PIR sensitivity adjustment

The sensitivity of the PIR sensor can be adjusted using the labelled rotary Preset control on the edge of the PCB. A mid range position is usually a good starting position, allowing the range of detection to be investigated by using the walk test mode (see 3.1 below). The PIR sensitivity can be increased by turning the sensitivity control clockwise, and decreased by turning the control anticlockwise.

Threshold light level adjustment

The light level threshold can be set using the labelled rotary Preset potentiometer on the edge of the PCB. Note that this threshold setting is only effective in operational modes 3.2, 3.3, 3.6, 3.7 below, and then only if the set period is not zero for an immediate effect. In these modes, if the ambient light level at the PIR is above the set threshold, nothing will happen when the PIR is triggered, except that the PIR mimic LED will flash on.

To ensure that the PIR outstation is always enabled, turn the threshold Preset fully clockwise. This sets the threshold light level at a very high value which the ambient light level will never reach, so that the outstation is always enabled.

This enabling threshold can be set to lower and lower levels by turning the Preset control anti-clockwise. To set the threshold light level at the current ambient light level, first switch DIL switch 3 to the on (ie 'Test') position, and the threshold control fully clockwise, then connect the two wire interface to power up the unit. Allow half a minute for the PIR to settle, and then trigger the PIR. When the PIR has been triggered the yellow LED on the outstation back should be lit. Turn the threshold control anti-clockwise until the LED goes out, then very slowly back clockwise until it just comes on again. [Note that the integrating light level measurement has at least a one second response time, so the LED will only respond slowly to changes in light level or to the threshold adjustments.]

When the LED is lit, the PIR will be enabled at the current light level.

Set DIL switch 3 'Test' to off once this adjustment is completed.

3.0 Operational Modes

The mode of operation of the outstation is selected by a combination of DIL switch settings on DIL switch 4 beside the address bcd switch and on the two DIL switches marked x and y beside the time period bcd switch.

DIL switch 4 selects between Channel or Preset operation. If this switch is off, the outstation will control an individual Channel. If this switch is set to on, the outstation will control a Preset which may consist of any number of controlled Channels.

The smaller two way DIL switch labelled with positions y and x control the type of Channel or Preset operation provided when the PIR is triggered.

Sw 4	Sw y	Sw x	Outstation function	Threshold	Section
Off	Off	Off	Channel Walk Test Mode	No	3.1
Off	On	Off	Channel Timed On /Off	Yes	3.2
Off	Off	On	Channel Timed Up/Down	Yes	3.3
Off	On	On	Channel Timed Off	No	3.4
On	Off	Off	Preset Walk Test Mode	No	3.5
On	On	Off	Preset Timed In/Off	Yes	3.6
On	Off	On	Preset Timed In/Out	Yes	3.7
On	On	On	Preset Timed Off	No	3.8

Commands described in sections 3.2-3.4 and 3.6-3.8 provide for action over a timed period. The timed period for the sent command is set by the right hand bcd rotary control thus :-

Setting	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Period (Min)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Timing periods (lasting from 0 (immediate action) to 15 minutes) start from when the outstation sends the command to the Anylight interface card. Timing periods work on a Channel by Channel basis and may be extended by the arrival of fresh Timed On period commands for a Channel, or cancelled by manual commands arriving from other outstations. Manually commanded step changes in level during timing periods do not affect operation (so the user can adjust the Channel level), and Channels will still obey the stored timer command and switch off at the end of the timing period. Manually commanded up/down/on/off changes in Channel level will cancel any timing period on that Channel.

3.1 Channel Walk Test

The Channel walk test mode allows the range and sensitivity of the PIR detection system to be investigated and adjusted. Set the sensitivity control on the outstation to its mid position, and select the Channel to be used for walk tests. Note that this mode of operation will not be disabled by high ambient light levels, as the set threshold is not used to enable or disable operation in this mode. Every time the PIR is triggered, the selected Channel will be brought on for 15 seconds, then switched off. The 15 second period can be extended by fresh PIR trigger events.

The PIR sensitivity control can be adjusted to increase (clockwise) or decrease the PIR sensing range. By carefully masking areas of the PIR lens with tape, it is possible to disable occupancy detection in selected areas around the outstation, and this walk test mode allows testing and adjustment of such masking.

3.2 Channel Timed On/Off Period

In this mode when the PIR is triggered and the ambient light level is below the set threshold, the addressed Channel is turned full on for the specified period after memorising the initial Channel level. Further PIR trigger events will extend the 'On' period. When the timer period expires, the Channel is turned Off.

If the period is set to 0 the Channel switches Off immediately and clears the Channel timer regardless of the light level threshold setting.

3.3 Channel Timed Up/Down Period

This option duplicates the action of Channel switches with memory, but for a specified period only. Note that it will only operate if the ambient light level is below the set threshold value. If the addressed Channel's level is initially zero when the PIR is first triggered, the addressed Channel's level ramps up to the Channel's memorised level for the commanded period and then returns to zero.

If the addressed Channel's level is initially above zero when the PIR is first triggered, the addressed Channel's level rises to full on for the commanded period and then returns to the original level.

Further PIR trigger events during the timer period extend the period, but don't alter the levels further, so that when the timer period expires the Channel always returns to its initial level.

If the Channel timer is not running, a Period command of 0 restores the memorised Channel levels. If the Channel timer is already running, a Period command of 0 will clear the Channel Timer and restore Channel levels to zero if the timer is running from a command of sections 3.2, 3.4, 3.6 or 3.8, or will return the Channel to its original value if from a command in section 3.3 or 3.7.

3.4 Conditional Timed Off Channel Period

This feature is specifically designed to automatically switch off Channels which have previously been switched on. Channels which are on will be turned off a set period after the last PIR trigger event. In this way room lights which have been switched on manually can be relied on to go out a set period after the last occupant is detected.

The Channel level must be above zero at the time the PIR is triggered for this command to be accepted. Receipt of the command does not immediately affect the Channel level (unless the selected timer period is zero), but when the timer period expires the Channel is turned Off. The timer period will be extended by further PIR trigger events.

A period command of 0 immediately switches off the Channel and clears the timer.

3.5 Preset walk test

Just flashes the red PIR LED when the PIR is triggered.

3.6 Preset Timed In/Off Period

In this mode when the PIR is triggered and the ambient light level is below the set threshold, Channels included in the addressed Preset quickly fade to the memorised Preset levels and remain there for the specified period. Further PIR trigger events will extend this period. All Channels included in the Preset are switched off at the end of the timer period, regardless of their starting state.

A period command of 0 immediately switches off all Channels included in the Preset and clears their timers.

3.7 Preset Timed In/Out Period

Note that this mode will only operate if the ambient light level is below the set threshold value. Whatever the current Channel level, if it is included in the addressed Preset and no timer is running on that Channel, when the PIR trigger event occurs, the Channel ramps to the Preset level for the specified period, then returns to the original level. The period will be extended by fresh PIR trigger events.

A period command of 0 does nothing to Channels included in the Preset whose Timers are not running. For included Channels whose Timers are running, values saved for

the end of the timer period are output and the Channel timers cleared. (ie if timer running from command in sections 3.2, 3.4, 3.6 or 3.8 Channels are extinguished. If running from command in section 3.3 or 3.7, they return to their initial levels.)

3.8 Preset Conditional Timed Off Period

This feature is specifically designed to automatically switch off a number of Channels which may have previously been switched on. Channels which are included in the addressed Preset and which are on will be turned off a set period after the last PIR trigger event. In this way a number of Channels which have been switched on manually can be relied on to go out a set period after the last occupant is detected by the PIR.

The individual Channel levels must be above zero at the time the PIR is triggered for this command to be accepted. Receipt of the command does not immediately affect the included Channel levels (unless the selected timer period is zero), but when the timer period expires the included Channels are turned Off. The timer period will be extended by further PIR trigger events.

A period command of 0 immediately switches off the Channels included in the addressed Preset and clears their timers.

4.0 Checking outstation operation

Set all the DIL switches to off, the Timer period to 1 and the bcd address switch for a Channel powering lights which are visible from the outstation. Assuming that the outstation is correctly wired and that the Channel address is correctly set, you should be able to bring on the lights on the addressed Channel for 15 seconds at a time by triggering the PIR.

After studying the tables on page 3, change the DIL switch settings to produce the function you require and test its operation. Note that operation may be inhibited by the setting of the light level threshold potentiometer (eg if set fully anti-clockwise, modes 3.2, 3.3, 3.5 and 3.6 will not function)

Suggestions for troubleshooting Anylight installations are included in the Anylight interface installation notes.