INSTALLATION INSTRUCTIONS BEAMBAR 4

INTRODUCTION

The Beambar 4 is a short range active infra red sensor. It consists of four synchronised beams separated from each other by approximately 75mm. Maximum guaranteed range of the system is 4 metres. Two sets of clean normally (non-alarm) closed contacts are provided. One set opens if any single beam is interrupted and is intended for performance monitoring (Environmental Output). The second set, intended for alarm signalling, opens when two adjacent beams are interrupted.

Additional Beambars may be integrated in order to extend the system virtually without limit.

Connections between the receiver and the control unit is via a seven core cable and between adjacent control units via a six core cable.

Four LEDs are provided which give an indication of the status of each beam. These may be disabled by moving a shorting link.

A mounting bracket is provided which will permit accurate lining up of the beams. Alternatively the beams may be directly mounted onto the wall.

OPERATION

While the Beambar 4 uses the basic principle of active infra red beams, many of its operational mechanics differ significantly. Unlike a conventional active infra red beam, alarms are generated at the transmitter rather than the receiver. The transmitter controls the sequencing of the receiver and controls the operation of subsequent slave units. Therefore the transmitter has many more features than a conventional infra red transmitter and is more accurately labelled as a controller. All future references to the transmitter will use the term controller.

The controller and receiver are mounted in similar style housings. They can be easily distinguished externally in that the controller has clear coloured optics while the receiver has dark coloured optics.

There are no concentrating optics in the Beambar, which is one of the reasons it has such a short range. This has the advantage that the angle of view of the optical components is very wide and hence over shorter distances alignment of the beams is not critical. The beamwidth however is very narrow and very small objects have the potential of interrupting a beam. Alarms are therefore only generated when two adjacent beams are interrupted.

The Beambar 4 uses a system of time division multiplexing. This means that each infra red beam is activated for a short period in turn. The pattern of activations is carefully chosen so that it is possible to stack additional units alongside each other in order to produce a complete screen of any height. However in order to achieve synchronisation between the various units it is necessary to pass information between them. The base unit which initiates the synchronisation is called the master and must be situated at the end of the stack of units. The master instructs the next unit (the slave) when to activate it beams and receives information on the status of the slave beams. The master is now able to interpret the slaves information and integrate that information with the status of its own beams. Thus the whole stack can function as a single unit with the master operating its relays if alarms or interrupted beams are detected on slave units.

The wiring information which follows allows for all interconnections including power and tamper. There is no need to use separate power connections for either receiver or slave units as these are fed from the master controller.

There are two available relays. One is intended to function as an engineering tool in order to give a warning of deteriorating performance if a single beam is interrupted. The second relay will signal when two adjacent beams are interrupted. Note that if two or more Beambars are stacked, the upper and lower beams of adjacent units are paired together.

Although generally alarms or warnings are generated when beams are broken, they may also be generated when interference is detected. As described above the Beambar works by sequentially activating the beams. Thus there are periods when no beams are active. The Beambar processor uses this period to monitor the status of the beams. If it detects that beams are declaring themselves to be active while they should be inactive, the processor will interpret this as tampering with the beams and initiate an alarm or warning. Note that the same rules as beam interrupted alarms apply to this form of alarm.

As the range of any infra red device may vary over time it is possible that false alarms could be generated if the unit is operating at the extreme of range and some degradation of performance takes place. To overcome this possibility the Beambar has a range reduction circuit. On the receiver a switch senses when the top has been removed and reduces the range by about 5%. Thus during the setting up procedure the top of the receiver must be left

off. When the installation is completed and the top replaced the range should increase slightly which will take into account and system degradation over periods between inspections.

INSTALLATION

Note: If the separation between the transmitter and receiver is greater than 2 metres it is recommended that the adjustable bracket is used.

FIXING

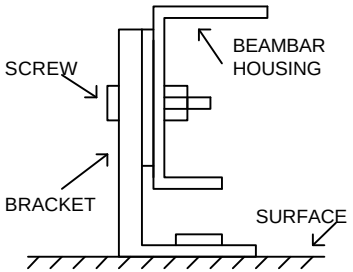
The housing may be fixed directly on to the mounting surface using the knockouts provided on the rear of the box or the mounting bracket may be used for more accurate alignment.

DIRECT MOUNTING

The Beambar may be directly mounted onto a all or other surface by removing the rear knockouts and fixing with a pair of number 6 wood screws. If this form of fixing is used then the beams will run parallel to the mounting surface. Some adjustment is possible by sliding the unit across the screws.

FIXED BRACKET

The beambar may be fixed so that the beams run perpendicularly away from the mounting surface using the supplied brackets in conjunction with the rear knockouts.



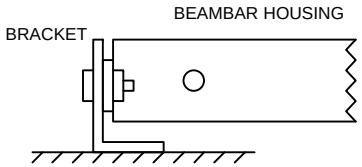
1 Remove the two rear knockouts.

2 Mark then fix the two brackets using number 6 wood screws to the mounting surface.

3 Using two of the screws and nuts provided fix the Beambar housing to the brackets.

ADJUSTABLE BRACKET

The Beambar may be more accurately mounted using the adjustable bracket.



1 Complete the holes started in the sides of the housing.

2 Mark then fix the two brackets using number 6 wood screws to the mounting surface.

3 Using two of the sets of screws, washers and nuts provided fix the Beambar housing to the brackets. The screw and first plain washer should fit outer most, followed by the bracket, lock washer, housing, plain washer and nut.

4. Adjust the position of the units for correct alignment and tighten the nuts / screws holding the brackets to the housing.

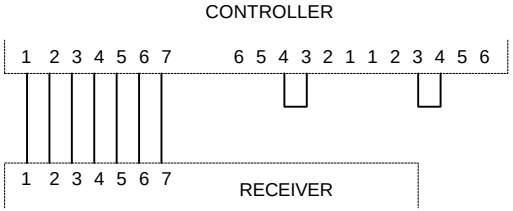
CONTROL UNIT TERMAL BLOCKS

SINGLE UNIT WIRING

1. Cable between Receiver terminal block(marked 'TO RX') on the Control unit to the terminal block on the receive unit. (pin 1 connects to pin 1, pin2 to pin 2 etc.)

2. Connect power to power terminals on input terminal block.

3. Connect Tamper, Environmental and Alarm outputs as required.



SINGLE UNIT WIRING

4. Link pins 3 and 4 on the slave expansion terminal block (tamper continuity)

5. Link pins 3 and 4 on the master expansion terminal block (tamper continuity)

DOUBLE UNITS

There are two basic methods of interconnecting multiple units. The first method is straight forward but does require a 7 core cable between each controller and each receiver. The second method requires a 7 core cable between the master controller and the master receiver plus one additional core for each receiver. Also there will be some interconnections between receivers.

METHOD 1

1. Cable between Receiver terminal block(marked 'TO RX') on each of the Control units to the terminal block on the corresponding receive unit. (pin 1 connects to pin 1, pin2 to pin 2 etc.)

2. Cable between slave expansion terminal block on the master unit and master expansion terminal block on the slave unit (again connect pin 1 to pin 1 etc.).

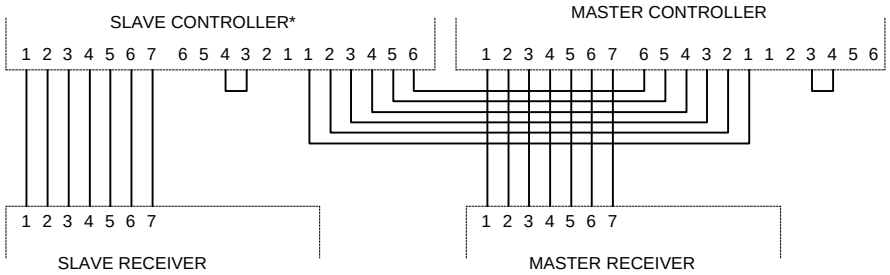
3. Connect power to power terminals on input terminal block.

4. Connect Tamper, Environmental and Alarm outputs as required on the master unit.

5. Link pins 3 and 4 on slave expansion terminal block of the slave control unit (tamper continuity).

6. Link the tamper terminals on the input terminal block of the slave unit(tamper continuity).

7. Link the tamper terminals on the input terminal block of the master unit (tamper continuity).



*CONNECT TAMP TERMINALS ON INPUT BLOCK OF SLAVE

INTER-CONNECTIONS FOR MASTER / SLAVE - METHOD 1

METHOD 2

1. Cable between Receiver terminal block (marked 'TO RX') on the master Control unit to the terminal block on the corresponding receive unit. (pin 1 connects to pin 1, pin2 to pin 2 etc.) Note that pin 4 connects to pin 4 on the slave receiver and pin 4 on the master receiver connects to pin 3 on the slave receiver.

2. Cable between slave expansion terminal block on the master unit and master expansion terminal block on the slave unit (again connect pin 1 to pin 1 etc.).

3. Common pins 1, 2, 5 and 6 between the receivers.

4. Connect pin 7 on the Receiver terminal block (marked 'TO RX') on the master Control unit to pin 7 on the slave receiver.

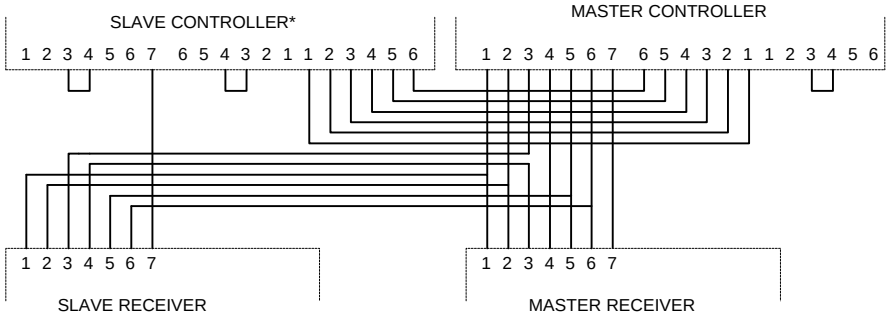
5. Connect power to power terminals on input terminal block.

6. Connect Tamper, Environmental and Alarm outputs as required on the master unit.

7. Link pins 3 and 4 on slave expansion terminal block of the slave control unit (tamper continuity).

8. Link the tamper terminals on the input terminal block of the slave unit(tamper continuity).

9. Link the tamper terminals on the input terminal block of the master unit (tamper continuity).



*CONNECT TAMP TERMINALS ON INPUT BLOCK OF SLAVE

INTER-CONNECTIONS FOR MASTER / SLAVE - METHOD 2

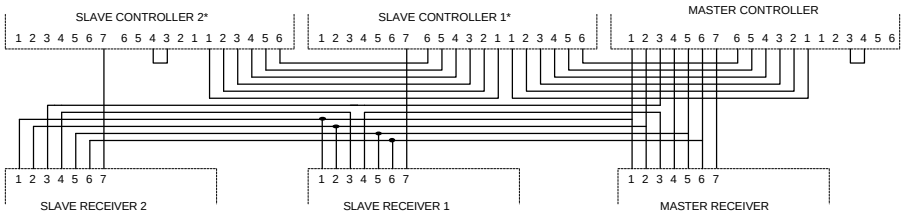
DO NOT CONNECT POWER TO THE SLAVE UNIT. This is already supplied via the interconnections. If a separate supply is used synchronisation between the master and slave may be lost.

All alarm reporting will be via the master relay contacts. If independent reporting is desired then do not connect Pin 1 on master / slave and use the contacts on the input terminal block of the slave unit.

MULTIPLE UNITS

The method of interconnecting multiple units is a extension of double units. Method 1 merely requires additional cables between each controller and each receiver plus additional cables between control units. Each slave unit becomes a 'master' to the following slave.

Method 2 is slightly more involved. Pin 4 of the master Receive terminal block is now connected to the last slave receiver with pin 3 of the last receiver being connected to the next slave receiver pin4 and so on.

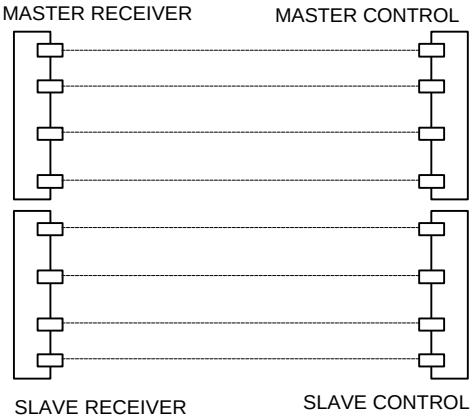


*CONNECT TAMP TERMINALS ON INPUT BLOCK OF SLAVES

INTER-CONNECTIONS FOR MASTER WITH MULTIPLE SLAVES - METHOD 2

SITING

The diagram shows the general arrangement for siting two units. If additional slave units are to be employed then the third control unit should be mounted adjacent to the second control unit, the fourth next to the third etc.



It is very important to note the relative positions of the master and slave unit. An alarm is generated only if two adjacent beams are interrupted. In the case shown in the diagram, the bottom beam of the master unit is paired with the top beam of the slave unit, thus an alarm is generated if both beams are interrupted. Conversely if the bottom beam of the slave unit and the top beam of the master unit are broken then no alarm is generated. Therefore if the master and slave units are transposed correct pairing of beams is not accomplished.

SETTING UP

Four LEDs are provided on board the control unit which show the status of each beam. The lower LED shows the status of the bottom beam, the second LED shows the status of the second beam and so on. The LEDs illuminate while the corresponding beam is interrupted and are extinguished when the beam is continuous. They may be disabled by moving the link from the ON position to the OFF position.

Positioning of the beams is not critical over short distances because of their wide angle of view. However the wider the separation becomes the more critical the positioning becomes. It is recommended that for the wider separations (2 metres or more) the following procedure be adopted.

1. Wire the control and receive units together as detailed earlier and apply power.

2. Fix the receive unit in position and adjust the position of the control unit until a good signal is accomplished. If necessary readjust the position of the receiver.

3. Now fix the two units in their permanent positions.

When adjusting the positions of the beams it is advisable to find the peak signal. this will reduce the possibility of false alarms if the beams are partially interrupted by a build up of dust or dirt. The method of finding the maximum signal is as follows:

1. With the receive unit fixed in place move the control unit until only one LED is illuminated.

2. Now adjust the position of the control unit until all the LEDs are extinguished and note this position.

3. Carry on moving the control unit until a LED is again illuminated and once more note the position.

4. The position of maximum signal will lie half way between the two positions.

5. The procedure should be repeated for horizontal, vertical and rotational alignments. Note that the greater the distances between the noted positions, the stronger will be the signal.

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