
DOCUMENT CONTROL NUMBER /

FIRERAY 2000 OPTICAL BEAM DETECTOR

COMMISSIONING INSTRUCTIONS

1. GENERAL INFORMATION

Each of the commissioning steps are fully described in the following paragraphs:

WARNING:

PERSONNEL MUST BE FAMILIAR WITH, AND COMPLY WITH, INSTRUCTIONS GIVEN IN PUBLICATION NO. 05A-03-S1 BEFORE ATTEMPTING TO COMMISSION THIS EQUIPMENT.

2.1 CHECKING THE INSTALLATION IS TO SPECIFICATION

Perform the following visual checks:

- a) Check that the Control Box and detector heads and other units have been fitted in the correct positions and in the approved manner.

1.1 EQUIPMENT REQUIRED

In order to successfully carry out the commissioning procedure, the following equipment is required:

- A high-voltage insulation tester (Megger)
- An LCR meter
- DC Voltmeter
- The Fireray Alignment aid
- Sufficient 2-core cable to reach from the Control Box to the Transmitter Head

Note:

- 1) *The line of sight between the transmitter and receiver MUST be between 0.3m and 0.6m away from the ceiling and parallel to the ceiling in the building in which they are mounted.*
- 2) *Ensure that there is no source of infrared (heat) near the detectors such as a heater, an incandescent light bulb or direct sunlight.*

Note: All instruments must be calibrated where appropriate.

- M5 nut spanner (detector brackets)

- b) Ensure that NO PCBs or other electrical devices have been wired into the circuit.
- c) Check for clean and tidy workmanship and for general acceptability.
- d) Check that the cables used meet the requirements of 05A-02-C1 and that the correct number of cores have been used.
- e) Check that, where specified, conduit meeting the requirements of 05A-02-C1 has been used.

2. COMMISSIONING PROCEDURE

The following steps must be carried out in order to commission the system:

- Checking the installation is to specification, and that all installation drawings are correct.
- Repeating the high-voltage insulation and low voltage continuity checks on all cables.

Note: It is ESSENTIAL that the installation be thoroughly checked before any equipment is connected.

- Connecting the cables
- Setting the transmitter range
- Beam alignment
- Smoke alarm tests

FIRERAY 2000

01B-05-C1

02 1/01

2.2 INSULATION AND CIRCUIT TESTS

CAUTION:

ENSURE THAT NO ADDRESSABLE DEVICES OR OTHER UNITS ARE CONNECTED ONTO THE CIRCUIT WHEN CARRYING OUT TESTS USING A HIGH-VOLTAGE INSULATION TESTER (SUCH AS A MEGGER).

Repeat the high-voltage insulation checks and the low-voltage resistance, inductance and capacitance checks performed by the installation engineer (see publication 01B-02-I1).

Check the values obtained against those already recorded. If there is any serious deviation, investigate, locate and repair (or renew, if necessary) any defective cable, or inform the electrical contractor, as appropriate.

Record the final values obtained and keep a copy of them.

2.3 WIRING

Connect the Receiver head, power supply and any related wiring to the to the Control Box as shown in Fig. 1.

Connect the Transmitter head, to either a separate dc supply, or to the Control Box power supply.

2.4 TRANSMITTER RANGE ADJUSTMENT

The transmitter range adjustment potentiometer is located beneath a grommet on the transmitter housing. Set the potentiometer according to the following table.

Range adjustment:

Fully counter clockwise: Greater than 30 metres

Ranges below 30 metres: see label

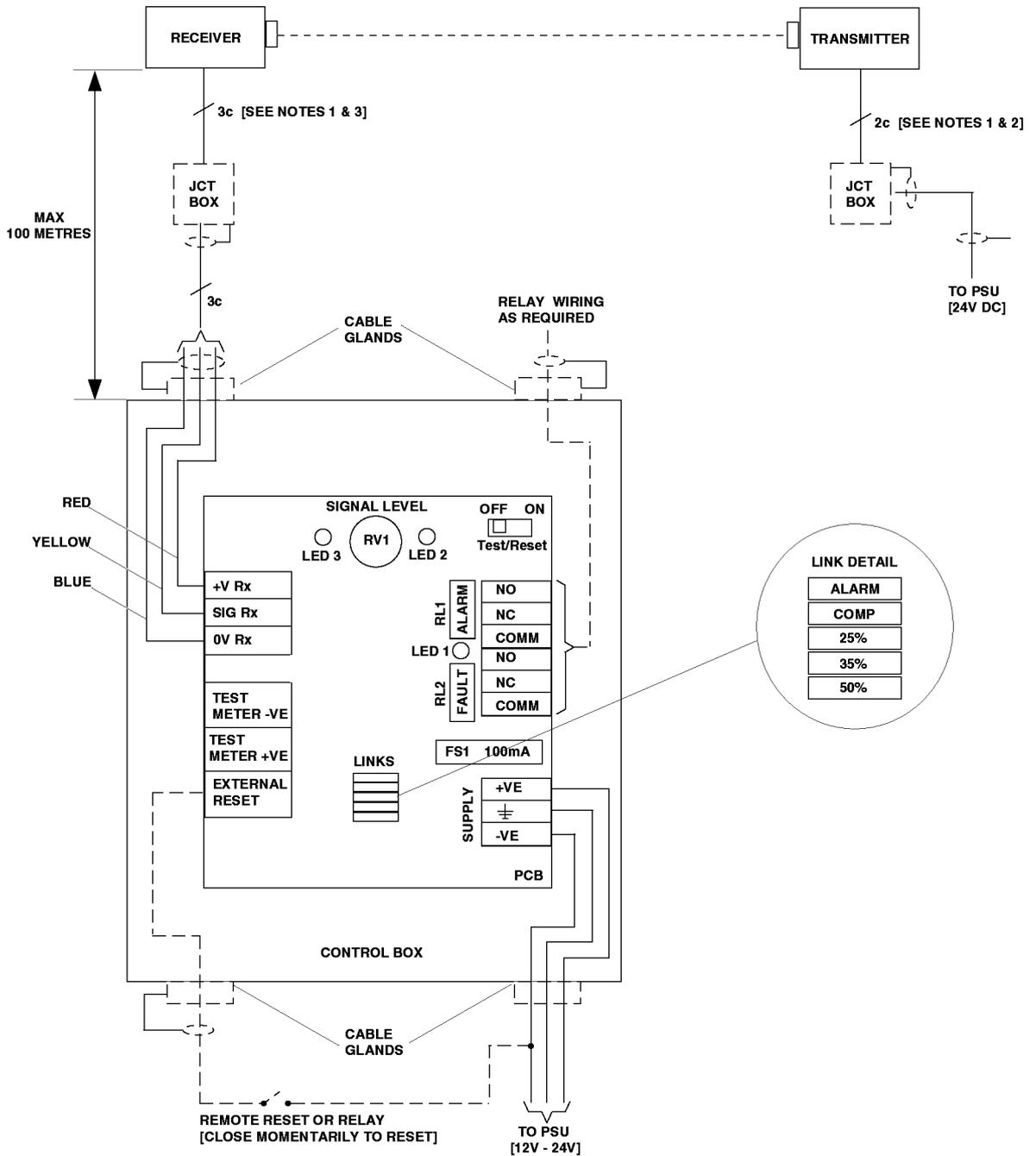
Fully clockwise: 10 metres

2.5 SETTING PCB LINKS

Set the links on the PCB to the positions required. See Table 1 below:

OPTION REQUIRED	LINK POSITION				
	ALARM	COMP	25%	35%	50%
ALARM Non-latching	OPEN	-	-	-	-
ALARM Latching	CLOSED	-	-	-	-
COMP - AGC compensation to signal FAULT and ALARM	OPEN	-	-	-	-
COMP - AGC compensation to signal FAULT and inhibit ALARM	CLOSED	-	-	-	-
25% Obscuration threshold	-	-	CLOSED	OPEN	OPEN
35% Obscuration threshold	-	-	OPEN	CLOSED	OPEN
50% Obscuration threshold	-	-	OPEN	OPEN	CLOSED

Table 1: Link Settings



NOTE 1: BOTH THE TRANSMITTER [TX] AND RECEIVER [RX] UNIT ARE SUPPLIED WITH 1 METRE [NOMINAL] OF FACTORY CONNECTED 4-CORE CABLE [UNSCREENED]. THE TX UNIT USES ONLY THE RED [+VE] AND BLUE [-VE]. THE RX UNIT USES THE RED [+VE], YELLOW [SIGNAL], AND BLUE [-VE]. ENSURE THAT THE CABLE LENGTH BETWEEN TX AND RX UNITS AND THEIR RESPECTIVE JUNCTION BOXES IS KEPT AS SHORT AS PRACTICABLE.

NOTE 2: FOR TRANSMITTER POWER USE A COMMON OR INDEPENDENT POWER SUPPLY, DEPENDING ON THE INSTALLATION AND THE LOCATION.

NOTE 3: THE MAXIMUM CABLE RUN BETWEEN THE RECEIVER UNIT AND THE CONTROL BOX IS 100 METRES.

Fig. 1 System Cabling Layout

FIRERAY 2000

01B-05-C1

02 1/01

2.6 ALIGNMENT

The detectors can be aligned by either using a dc voltmeter, which is positioned at the Transmitter head and connected via a 2-core cable to the Control Box or an Alignment Aid which can be substituted for the voltmeter.

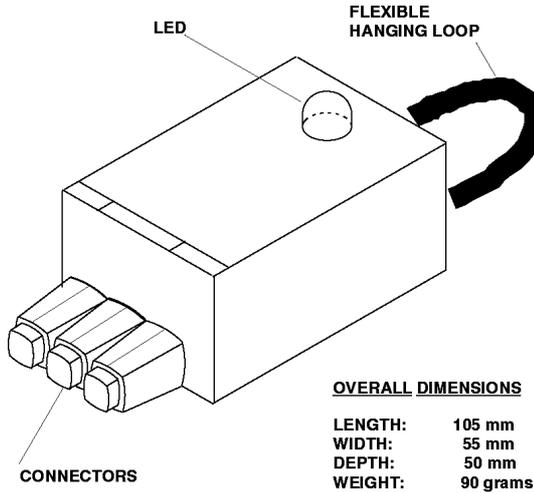


Fig. 2 Alignment Aid

The Alignment Aid (Fig. 2) is lighter and more robust than a meter and provides a convenient method of aligning the detector heads. The display LED flashes at a faster rate when correct alignment is achieved

Align the detector heads as follows:

- Switch on the 24V dc. Supply to the Control Box and the Transmitter/Detector.
- Ensure the Test/Reset Switch on the Control Box is set to OFF.
- Set the Test/Reset Switch to ON.
- Check the Signal Level control RV1 in the Control Box is set to the mid-way position.
- The High Gain (LED 3) and Low Gain (LED 2) may both be lit.

Note: At this stage other LEDs in the Control Box may be lit. This is due to the beams not being aligned exactly.

- Connect the Alignment Aid or dc voltmeter as shown in Fig 1 using 2-core cable.

- Adjust the Transmitter head horizontally and vertically so that the receiver detects the beam in the round glass area such that either:
 - the Alignment Aid LED flashes at a high rate - adjust for the fastest flashing rate.
 - Or if using a voltmeter, adjust for a maximum reading. (A no-signal reading is approximately 2.6 volts).
- When this has been done fully tighten the screws holding the receiver and transmitter to the ceiling brackets. Ensure that all fixings are firmly tightened. Re-check the alignment aid for faster flashing of the light (to check the Beam Detector Set is working correctly).
- At the Control Box adjust RV1 until the High Gain (LED 2) just goes off.
- Switch off the power and disconnect the Alignment Aid or voltmeter.
- Set the Test/Reset switch to the off position. Wait at least 45 seconds before performing any tests.

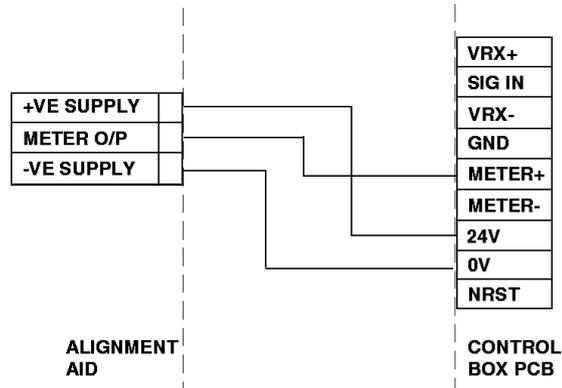


Fig. 3 Connection of Alignment Aid

When the detector heads are fitted for retro-reflective operation the alignment procedure is as for normal operation but with an additional test as follows:

When the system is aligned and in operating mode block off the reflector at the reflector end. The detector should go into fault condition. If the detector does not go into fault condition, then it is possible that the signal is being returned, not by the retro-reflector, but by some other reflecting surface.

3. TESTING THE BEAM DETECTOR SET

The following tests must be carried out after the first installation, after any maintenance, or after every fire or fault alarm to ensure fail-safe operation of the Beam Detector Set.

Supplied inside the Control Box is an acetate test card (filter) with black markings on it which is used to provide obscuration of the beam during tests.

Note: After the tests have been performed this acetate card should be held with the system log book and not inside the Control Box.

Note: After the tests have been performed the recorded values should be held with the system log book and not inside the Control Box.

CB/jm

12th January 2001

3.1 SMOKE ALARM TEST

Proceed as follows:

- a) Hold the test filter in the beam path.
- b) After approximately 9 seconds,
 - i) the Fire Relay contact operates, (the relay contacts will click once as it operates).
 - ii) the Fire alarm LED (red) on the front panel will light.
- c) Remove the test filter, the alarm will reset in approximately 4 seconds (unless in latching mode).
- d) Reset the Beam Detector Set either by:
 - i) Moving the Test/Reset switch to OFF, then ON, and then OFF, or
 - ii) Disconnecting the power for 2 seconds, or
 - iii) Taking the External Reset terminal to 0 volts for 1 second.
- e) The Beam Detector Set is now reset and armed.

3.2 FAULT ALARM TEST

Proceed as follows:

- a) Totally obscure the beam with an opaque object such as a piece of card.
- b) After about 10 seconds check that Fault LED (LED1) lights, and the fault relay contacts change state.
- c) Remove the Test Card obscuring the beam.
- d) Check that the Beam Detector Set resets itself automatically within 4 seconds.
- e) Secure the front cover, the Beam Detector Set is now reset and armed.