

# Installation Note

## 270 Loop Coupler Mk2

IN003

These notes are to help you install your 270 Loop Coupler. It will drive either a single transmit loop, a combined transmit and receive loop or separate transmit receive loops. Refer to your System Hardware handbook for details of the different configurations possible.

### Mounting

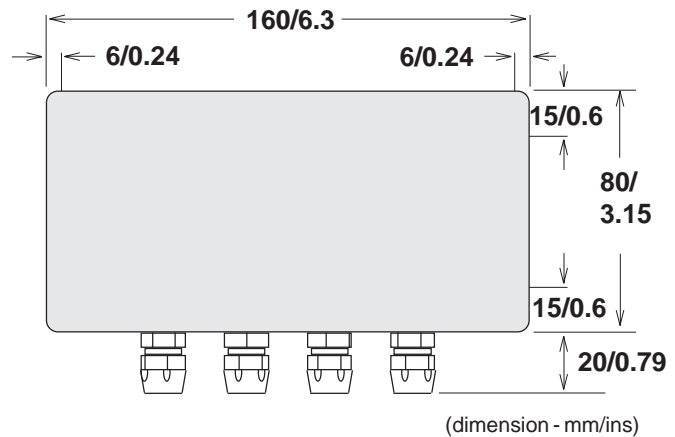
The Loop Coupler may be mounted in any convenient position, but it must not be more than 10 metres (30 feet) cable length from the loop antenna. It should not be buried or subjected to immersion in water although it is completely weatherproof.

Remove the lid by undoing the four screws in the corners. The mounting holes are located at the bottom of the cavities in the corners of the box. Place the unit on the wall and mark the mounting hole positions. The dimensions are shown on the right.

You may wish to attach the cables before mounting the unit on the wall.

### Cables

Cables should be passed through the cable glands before being terminated. Only the two cores of shielded twisted pair cable should be connected; the shield should be cut back and left unconnected. After connecting the cables to the terminal block, make sure that they are clear of SWA, SWB and the 0V and MON pins as you will need access to these when setting up. After terminating, the cable glands should be tightened to provide strain relief and weatherproofing. Note: if corrosion of the terminals due to the ingress of moisture may be a problem, cover the terminals with silicone grease or petroleum jelly.



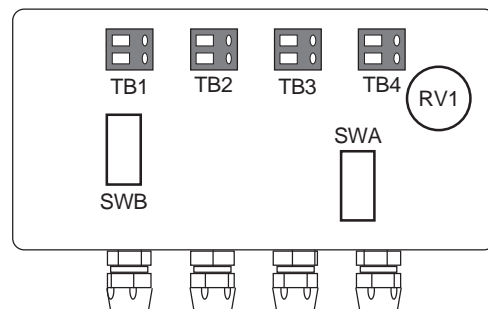
### Connecting

**TB1** - loop lead-outs for either single transmit or combined transmit/receive loop.

**TB2** - loop lead-outs for either a separate receive loop or discrete 250 Rx antenna(s). Switches 4 and 5 on SWA must be open if TB2 is connected.

**TB3** - receive feeder cable returning to the reader. The shield of the twisted pair is not connected.

**TB4** - transmit feeder cable from the reader. The shield of the twisted pair is not connected.



(The polarity of each of the above connections does not matter.)

Both transmit and receive feeders from the reader should be individually shielded twisted pair cable: up to 200m (600ft) long using a cable with 0.38mm<sup>2</sup> conductors (22AWG), e.g. Belden 8723.

The loop antenna leadouts should be as short as possible (always less than 10 metres (30 feet)) and must be twisted with at least 15 twists per foot.

## **Separating Transmit and Receive**

When using a separate Rx loop antenna connected to TB2 you must open switches 4 and 5 on SWA (move them to the OFF position).

## **Tuning and Matching**

Set a multimeter to a range capable of handling 20VDC and connect the negative probe to the 0V pin and the positive to the MON pin in the Loop Coupler. Power up the Reader and turn RV1 on the Loop Coupler fully clockwise. Adjust the capacitance value using switches SWB 1 to 8 in the Loop Coupler until the voltage is maximum. It may be necessary to choose a lower voltage range on the multimeter in some installations. Capacitors are in circuit when the switch is in the ON position. The approximate capacitance values are marked on the board (in nanofarads) beside each switch. If an analogue meter is used, the voltage change associated with the smallest capacitors will be hard to see, but it is important to get the highest possible voltage.

**Warning:** the maximum voltage should not be allowed to exceed 60VDC. Voltages in excess of 60VDC can damage the Loop Coupler.

To find the capacitor setting for maximum field, take the following steps:

1. Find the largest single value by trial and error leaving all other switches OFF. This will be either a little too great or a little too small.
2. Leaving this switch ON, find the next largest value which increases the voltage. If all other values decrease the voltage then the first value was a little too great. Switch it OFF and switch ON the next lower value.
3. Repeat the last step until the highest voltage is achieved.
4. Select the best setting of switches 6, 7 and 8 on SWA.

**Note:** only one of the switches 6, 7 and 8 must be closed (ON) at one time - try each switch in the closed position with the other two open and again check for the highest voltage. If a different switch is selected, slight retuning may be required.

## **Testing the Loop and Adjusting the Reading Range**

Check the extent of the transmit field of the loop using a Field Meter or 922 Test Card. Reduce the transmit level of the loop if you wish using RV1 on the Loop Coupler. If the loop is being used for receiving, check the receive performance using a known valid card or tag, or the 922 Test Card, before replacing the lid of the Loop Coupler. If the receive performance is not as

good as expected, try connecting the attenuator circuit in the Loop Coupler as described below.

### **Connecting the Attenuator**

The attenuator circuit in the Loop Coupler is shorted out by switches 2 and 3 of SWA. To connect the attenuator, open switches 2 and 3 on SWA (move them to the OFF position). Test the system to see if the receive range is improved. If further attenuation is required, close switch 1 on SWA (leaving 2 and 3 OFF).

