

## Installer Guidance: Connecting the Emizon TCD into an Alarm Panel

The Emizon TCD has an on-board Ethernet adapter which is configured for automatic negotiation of speed, duplex and polarity, and obtains an IP address automatically from the customer network using the DHCP service. This means that for most installations, the connection of a CAT5 cable from the customer network to the Emizon TCD is all that is required to establish the Emizon TCD on the network.



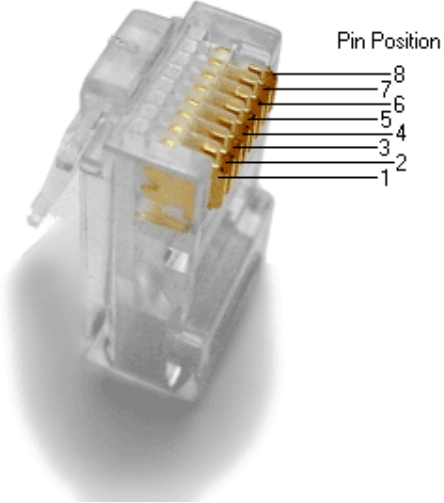







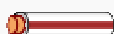
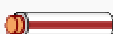


Standard CAT5 network cable must be used where cables are to be terminated between the TCD and customer network point or router. RJ45 crimp connectors and a crimping tool are advisable, as is a CAT5 network cable tester (e.g. [http://www.cdlmicro.co.uk/html/show\\_product.php/pid/90](http://www.cdlmicro.co.uk/html/show_product.php/pid/90) or similar) to test the integrity of the cable once terminated.

### Step by Step Instructions

1. Install the TCD in the desired location and connect power (nominal 12V DC).
2. If using a standard CAT5 patch cable between the TCD and customer network, go to step 7.
3. Run the CAT5 network cable between the TCD in the panel and the customer network point or router taking care not to damage or crush the cable. Leave sufficient slack at either end to enable termination (and enough to redo the termination if the first attempt fails).
4. Terminate both ends with a RJ45 Ethernet crimp connector using one of the standard wiring codes shown in Appendix A and the method shown in Appendix B. Note that it is not important which of the two methods T568A or T568B are used, but both ends must be terminated to the same code.
5. Once all terminations are complete, test the cable using a CAT5 tester. If the test fails, cut off one connector (if you suspect one, cut off that one) and re-terminate. If the test still fails, repeat for the other end. If the connection still fails, check the cable carefully for damage.
6. Connect the cable to both the customer network and Emizon TCD and check for a green LED (may be flickering) on the TCD next to the Ethernet adapter, and a corresponding indication at the customer network where applicable. If the Ethernet activity LED does not indicate a connection, check power to the TCD (power on LED in the centre of the TCD) and to the customer network equipment. If power is ok, recheck the cable and terminations.
7. Connect the GSM aerial and position in a good signal strength area.
8. After a short time, the GSM activity LED on the TCD should change from flashing once every second to once every three seconds- indicating that the GSM service has registered ok. Once registered move to step 11
9. If GSM registration does not occur within a reasonable time, check the aerial connection and that the aerial is not screened by metallic objects or near interferences such as fluorescent lighting or magnetic devices such motors etc.

10. If no registration is obtained, a high-gain or extension aerial maybe required. Check for Signal strength by tapping the TCD MODE button for 1/2 seconds and looking for the GR 0x GS yy indications, where the 0x indicated the registration status (1 or 5 is good) and yy indicates the signal strength (0 to 31, usually 13 or above is OK).
11. If the TCD can obtain an IP address automatically, this will occur after step 7, and the TCD will be ready to connect to the Emizon service.
12. If the TCD is to be assigned a static IP address, contact Emizon with the details on the Customer IT Survey Form; IP address, network mask and gateway address. These details will be configured to the TCD via the GSM connection.
13. Press and hold both MODE and SET buttons for 10 seconds until the display indicates UF nn indicating that a firmware update is in progress. The nn numbers will steadily increase from 00 to 99 as updates are applied. An indication of FE 52 indicates a failure of the update process and is normally caused by a failure to connect via the internet, so if this happens recheck the Ethernet connections and ensure that the TCD has outbound TCP access to the internet via the customer network and is not blocked by firewall or other access control technology (See Appendix C).
14. The update process can take up to 5 minutes depending on the firmware versions to be updated and the TCD may reboot itself automatically during the process. When the update is completed, the TCD will indicate RR xx to show that updates were made, and the TCD should then be powered off and powered on. Once the TCD has restarted, please repeat the process from step 15 until the display reads UC – indicating that updates are complete. Normally one and sometimes two updates are required before the UC – indication is given.
15. Connect the remaining wiring and interfaces to the TCD ready for commissioning.
16. To activate the TCD, contact your Alarm Receiving Centre and ask them to associate and activate your TCD quoting the serial number on the plastic cover (in the format 0X-NNNNNN-C).
17. The ARC will then enter commands into the Emizon system to bind your Emizon TCD to the Emizon installation identity and start the process of activation.
18. Once the ARC have done their bit, press the SET button (right hand button) for about 5 seconds. The TCD will then start the process of activation, and the two path LEDs should flicker and then remain solid to indicate the two paths are in full communications with the Emizon network and ARC.
19. Once activation is complete, confirm with the ARC that they have received the fully activated indication, and then proceed with the site commissioning tests.
20. If alarm input pin configuration requires changing, your wish to enable or disable the BSIA Form175 monitoring, or use the external panel interfaces, contact the Emizon Support Desk who will perform the changes on-line in real time.
21. Congratulations, your Emizon installation is completed.

## Appendix A CAT5 Cable Wiring Schemes

T568A and T568B Wiring						
Pin	T568A Pair	T568B Pair	Wire	T568A Color	T568B Color	Pins on plug face (socket is reversed)
1	3	2	tip	 white/green stripe	 white/orange stripe	
2	3	2	ring	 green solid	 orange solid	
3	2	3	tip	 white/orange stripe	 white/green stripe	
4	1	1	ring	 blue solid	 blue solid	
5	1	1	tip	 white/blue stripe	 white/blue stripe	
6	2	3	ring	 orange solid	 green solid	
7	4	4	tip	 white/brown stripe	 white/brown stripe	
8	4	4	ring	 brown solid	 brown solid	

## Appendix B Terminating CAT5 cables.

### How to wire fixed Ethernet Cables:

1. Lay the cable for the full length in place, from TCD to network, allowing for corners etc. and leave some excess.
2. Cut the wire to length at one end leaving enough length to work and for rework, but not too much excess.
3. Route the cable in the final position, feeding through holes in the control panel case as necessary.
4. Strip off about 2 inches of the cable sheath.
5. Untwist the pairs back to the sheath (but not beyond)
6. Align the individual wires according to the wiring code to be used (T568A/T568B) as above
7. Trim the wires to an even length, about  $\frac{1}{2}$ " to  $\frac{3}{4}$ " from the sheath.
8. Insert the wires into the RJ45 crimp connector, ensuring that the alignment is maintained
9. Push the wires fully home into the RJ45 crimp connector, the sheath should engage by about  $\frac{1}{2}$ " in the connector.
10. Crimp the connector using the appropriate crimping tool in a smooth but firm movement
11. Verify that the wires ended up in the right order, extend to the end of the connector and visibly make good contact with the metal conductors in the RJ45 plug
12. Repeat the above steps for the second RJ45 jack.

If a CAT5 cable tester is available, use it to verify the integrity of the new cable. If the test is successful, job done, otherwise look closely at either end and look for wires in the wrong order or not fully terminated and if so, cut that end off and redo that end, retesting each time.



## **Appendix C Internet Access, firewalls and network security**

### ***TCP/IP Outbound Access Only***

The Emizon TCD requires that outbound TCP access to internet addresses using IP ports in the range 18000-18049 inclusive (17000-17049 if a Castle MSX or SmartCom module) is available. No connections will be made or attempted inbound by the Emizon service or TCD, so there is no requirement to open inbound “holes” in the firewall for the Emizon service.

### ***Access Rules for outbound TCP/IP Access***

The TCD is a network agile device, and will connect to one a number of different Emizon servers (IP Addresses) around the internet always using ports in the defined range. As network conditions change in the internet, the TCD may move a connection from one Emizon server to another, and this is done automatically. This mechanism provides a high level of resilience to network problems or malicious intent, resulting in a high reliability and availability service. Emizon may add or remove Emizon servers at any time, based on network conditions and available connectivity, and the communication of the new server lists to the TCD is performed automatically. For this reason, it is not desirable to restrict the destination IP address range to which the TCD can connect, as additional Emizon server points or presence may be added or existing servers removed. If restriction of access to the outbound port range 18000-18049 is essential, then it is better to use MAC address access filtering in the firewall / router so that only the TCD has access to those outbound TCP/IP port ranges. The MAC address of the TCD is printed on the plastic cover for this purpose.

### ***IP Address Assignment***

Most networks will assign IP addresses automatically to devices connected to the network using the Dynamic Host Control Protocol (DHCP) which is standard in virtually every router. Where this is used, the TCD can acquire an IP address automatically requiring no configuration prior to use. Where it is necessary to assign the same IP address to the TCD (fixed or static IP address) this can be done either by configuring the DHCP service to always assign the same IP address to the TCD, usually using the MAC address information printed on the TCD cover, or where DHCP services are not available, this can be configured by the Emizon Support Desk over the TCD GSM connection. If this option is required, please obtain the desired 1) IP Address, 2) Network Mask and 3) Gateway Address from the customer IT contact and contact the Emizon Support Desk for remote IP configuration.