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INTRODUCTION

This document describes the methods to be employed when installing and connecting equipment associated with the PROTEC EVC40 Disabled Refuge / Fire Telephone System.

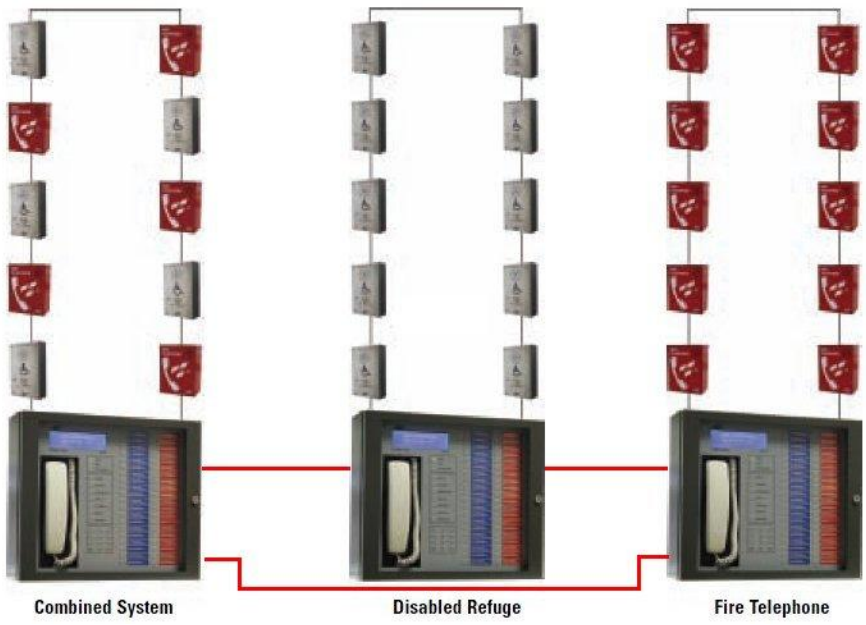
1.1 The EVC40 System

The EVC40 is a fire telephone and disabled refuge emergency voice communication system fully compliant to BS5839 Part 9.

This has been designed to cater for the existing fire telephone market, stadium steward's telephone and also offers a solution to the requirements of the Equality Act. It features a bespoke two-wire audio and data bus to minimise the wiring requirements, whilst maintaining full addressability and monitoring.

Each outstation is setup using its address switch and the panel communicates with each device by this Address Number. As well as audio the outstations communicate digital data so the panel is able to control and track any changes at the device and initiate all necessary actions.

The system is capable of driving up to 40 outstations per panel, and 4 panels can be networked together to give a total of 160 outstations.



CABLING

All cable (both outstation loop and the control loop) must be 2 core, screened, soft skinned, enhanced grade fire rated cable.

All loops must be wired in a separate pair.

As with any audio system it is of paramount importance that strict earthing protocols are followed to avoid producing earth loops.

An earth loop occurs when the ground potential between two pieces of equipment is not identical. Audio-frequency earth loop problems are typically in the millivolt range, so there does not have to be much interference to cause problems in audio systems.

Earth loops are the most common cause of AC line frequency hum in sound systems and make the system sensitive to interference from mains wiring which can lead to erratic operation of the equipment or even cause damage.

To minimise this the cable screen must be continuous over its full length and not earthed at any point over its run.

Soft skinned cable is recommended, the use of any hard skinned cable is to be avoided as this is difficult to keep separate from earth.

Outstation loops up to 2km maximum use 2.5mm cable. 1km max use 1.5mm^2 cable. Note that if the run is greater than 1km the whole run must be in 2.5mm^2 cable.

Up to 4 panels can be connected together. Up to 500m is allowed between panels and panel to panel connection is wired in 1.5mm^2 cable.

All external wiring associated with the system must conform to the current I.E.E Regulations and cabling must conform to the relevant BS specifications. ECA recommended Cable Separation for Electromagnetic Compatibility in Buildings, must be followed.

All cabling must be fully phased. Identify and mark ends of cables ready for the commissioning stage.

Although no connections are to be made to the panel until the commissioning stage it is important that cables are left long enough to connect directly to the relevant terminals. To ensure that cable tails are left with sufficient length all cable tails must be a minimum of 500mm. See Section 5 for terminal locations.

2.1 Cabling requirements summary

1. All loops must be wired in a separate 2 core, screened, soft skinned, enhanced grade fire rated cable.
2. The cable screen must be continuous over its full length and must not earthed at any point along its entire run.

Outstation Loops Cable
Up to 2km use 2.5mm^2 cable.
Less than 1km total 1.5mm^2 use cable.

Control Loops
Maximum 500m between panels wired in 1.5mm^2 cable

The installer must mark up on the ‘as fitted’ drawings the panel number (if more than one) and address of each device.

INSTALLATION PROCEDURE

3.1 Panels

The panel is supplied complete and fully assembled in one box. The box also contains an installation template showing mounting hole & cable entry positions with spirit level and plumb bob references.

1) Unpacking.
Remove the installation template from the packaging - leaving the panel in the box for protection.
2) Preparing The Mounting Position.
Use the installation template together with a spirit level etc. to mark, drill and plug the 3 mounting holes in the desired position.
3) Removal Of The Door.
Remove the panel from the packaging. Use the key supplied to unlock the outer door, remove the door by extracting the hinge pins and place the door back in the box for protection.
4) Removal Of The Inner Door.
Unscrew the 3 fixings on the metal inner door at the lock side of the door. Open the inner door and disconnect the earthing point on the door and the wide ribbon cable that connects the main board on the door to the back of the enclosure. Close the door and extract the 2 remaining hinge pins. Carefully remove the inner door from the unit including all circuit boards fitted to it and place it back in the box for protection.
5) Removal Of The Battery Clamp And Gear-Tray.
Remove the two screws holding the battery clamp (if supplied) and carefully withdraw the clamp ensuring that it cannot short out the battery terminals. Remove the 2 screws from the bottom of the gear-tray (in the back of the enclosure) and loosen the two at the top (key-hole fixings). Disconnect the earth connection from the gear-tray to the enclosure. Remove the gear-tray from the enclosure including the attached circuit boards.
6) Preparing and Fixing The Unit.
Using the installation template, mark out suitable positions for cable entry on the back of the enclosure **i.e. not behind the gear-tray**. Cut out the cable entry positions and mount the enclosure at the position prepared in (2) feeding cables through into the box.
7) Re-Fitting The Gear-Tray And Battery Clamp.
Re-fit the gear tray (re-fit is reversal of 5). Ensure that the earth removed in (5) is re-connected **DO NOT CONNECT ANY NON-EARTH TERMINALS**. Refit the battery clamp (refit is reversal of 5) ensuring that the clamp cannot touch the battery terminals. **DO NOT CONNECT THE BATTERIES**
8) Re-fitting the Inner Door
Re-fit the inner door (re-fit is reversal of 4) **ENSURE THAT ALL EARTHING POINTS ARE RE-CONNECTED**.
9) Re-Fitting The Door
Re-fit the outer door by offering the door up to the hinges and inserting the 2 hinge pins.

3.2 Outstations

Carefully remove the front cover of the refuge outstation or inner plate of the fire telephone and disconnect the 14 way ribbon cable and earth cable from the assembly. Mark the backbox fixings on the wall, then remove the backbox from the drilling area and drill the fixing holes. Mount the backbox on the wall and remove all debris from the backbox.

For the IP65 fire rated telephone, the box mounting holes must be sealed after installation to maintain the IP rating.

Do not terminate any cable at this time.

The ribbon connector on the terminal board can be plugged into the TEST socket on the terminal board to allow continuity through for testing the cabling.

CABLE TEST

Before connecting external cables to any field device, tests must be carried out using a 500V DC insulation tester (Megger). The readings between each cable core, and each core and screen must be greater than 10M ohms (record the readings). Equipment connected to the cabling during insulation tests could be damaged with the high voltages produced. Great care must be taken after insulation tests to discharge the cables, since charged cable may damage electronic equipment upon connection.

CONNECTION

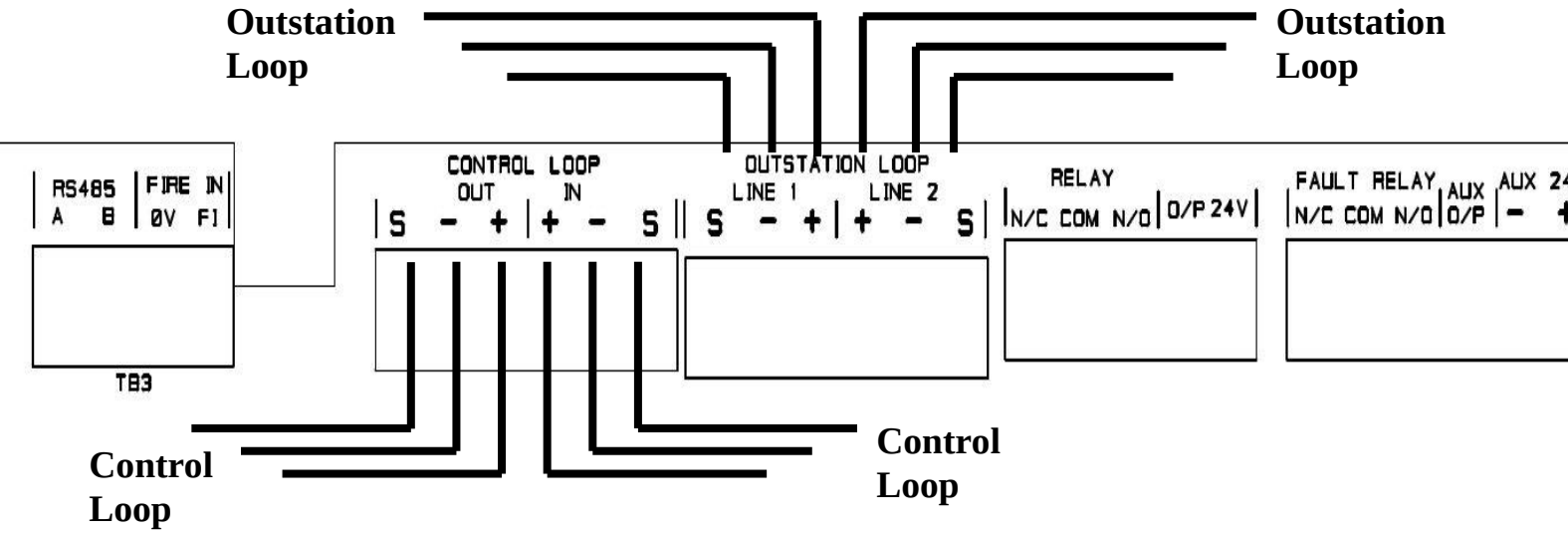
5.1 Panels

Wiring details are supplied for reference only.

5.2 Outstation and Control Loops

DO NOT MAKE ANY CONNECTIONS TO THE CONTROL PANEL.

The outstation loop location in the panel as shown.



The control loop positioned as shown.

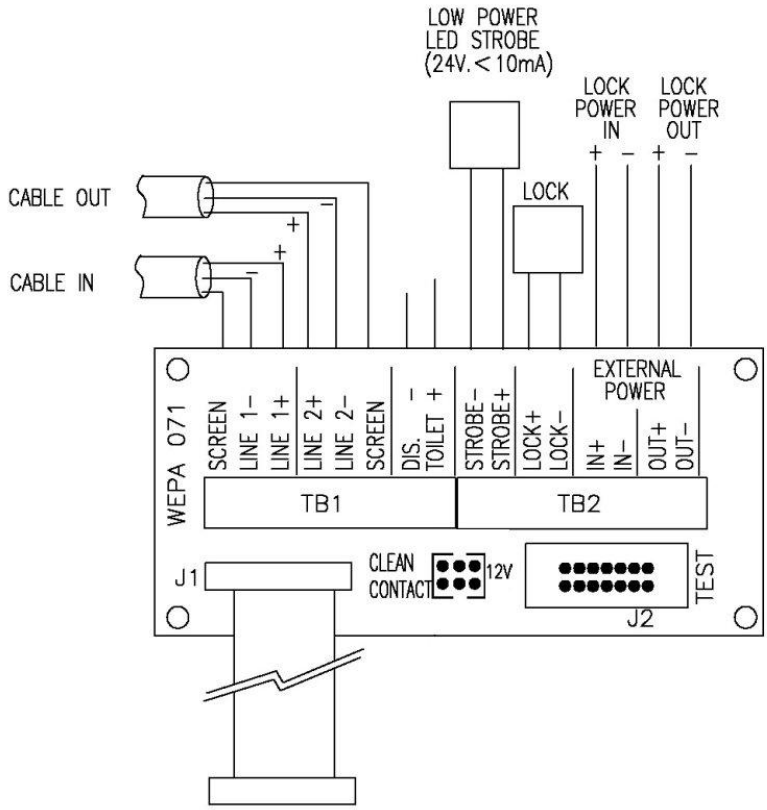
Route the power cables to the power supply unit.

5.3 Outstations

All metal termination boxes and detector bases should be securely fastened to the mounting surface and earthed as required.

Connection details are shown below for information only.

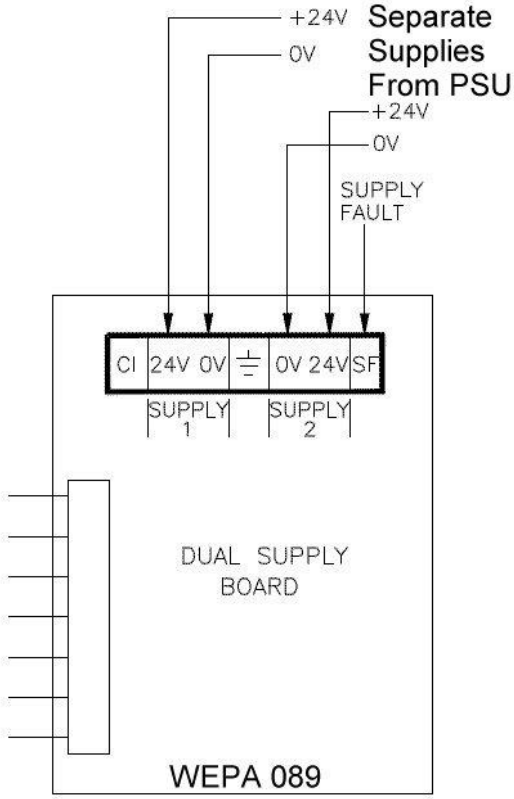
OUTSTATIONS MUST NOT BE CONNECTED AT THIS STAGE.



5.4 Power Supply Cabling (Remote Charger Only)

If the panel has an external charger it will require two separate +24V supplies. This is a requirement of En54. These two supplies must not be wired in the same fire rated cable. In addition there is a fault signal 'SF' from the charger to the panel. This signal can be combined with one of the +24V supplies into a 4-core fire rated cable.

The maximum length of cable between the charger and the panel will depend upon the volt drop along the cable. No more than 3A must be supplied to a panel and no more than two panels must be fed from the same charger.



COMMISSIONING REQUIREMENTS

Refer to the supplied copy of COMMISSIONING STANDARD TERMS for details of requirements before commissioning can take place.

Note: The Commissioning Application form must be completed and returned 14 days before a commissioning engineer can attend. Note that this can be done online at www.protec.co.uk/commissioning.htm.

EVC40 SPECIFICATION

Power Supply
230 AC / 24V DC operation (battery support for 24hrs standby and 3 hrs continuous use)

Integral Charger
3A switch mode, temperature compensated

Maximum Battery Size
2 x 12V 18Ah

Fault Indication
By lamp, buzzer and LCD display

LCD Display
240 x 64 bit graphical

Call Features
'All Call' facility to outstations with a loudspeaker, 'Group Call' to selected units

Microphone Frequency Response
250Hz to 4kHz +/- 3dB

IP Rating
Outstations protected to IP33 (indoor) & IP65 (external with separate enclosure)

Cable Type
2 Core, enhanced grade, fire rated cable for loops and network

Master Panel Dimensions
440(W) x 385(H) x 110(D)mm

Emergency Refuge Station Dimensions
Flush - 150(W) x 220(H) x 1.5(D)mm, Surface - 130(W) x 200(H) x 1.5(D)mm
Backbox - 130(W) x 200(H) x 50(D)mm

Fire Emergency Telephone Dimensions
180(W) x 260(H) x 95(D)mm

Maximum Loop Cable Length
2km max with 2.5mm$_2$cable, 1km max with 1.5mm$_2$cable

Temperature Range
0 to 40°C

Humidity Limit
85% Non-condensing

Maximum Loop Cable Capacitance
0.27µf

Maximum Loop Cable Resistance
15Ω per conductor

