INERTIA-I2000
EWIS Panel

INSTALLATION & COMMISSIONING MANUAL

Revision 5.00

Manufactured by:
NOTIFIER® by Honeywell

Approvals:
Australian Standard AS2220.1
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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% voltage drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper
grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not over tighten screw terminals. Over tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment.
FACP operation and reliability depend upon proper installation.

This equipment must be correctly programmed and installed to suit the specific application. Please ensure correct operational parameters are set prior to commissioning. If further details on programming options are required, please consult the programming manual or contact our helpful technical support personnel.

EMC WARNING:

This equipment may radiate radio frequency energy. It may also be affected by radio frequency energy and, if not installed and operated in accordance with the manufacturers instructions, may cause interference to radio communications. It has been tested and found to comply with the Class A radiated and conducted EMI requirements of AS/NZ 3548:1995 (including Amendments 1 & 2) as well as the EMI susceptibility requirements of Clause C3.5 in AS4428.0:1997.

Radio communication devices should not be used in the vicinity of fire panels or associated ancillary devices and systems.

Table of Contents

Section 1 About this Manual

1.1. Notes, Cautions and Warnings

This manual contains notes, cautions and warnings to alert the reader as follows:

NOTE: *Supplement information for a topic such as tips and references.*

CAUTION: *Information about procedures that could cause programming errors, runtime errors, or equipment damage.*

WARNING: *Indicates information about procedures that could cause irreversible equipment damage, irreversible loss of programming data or personal injury.*

1.2. Related Documentation

Title	*Document Number*
AS2220 : Emergency warning and intercommunication systems in buildings	

1.3. Glossary

BGA	Breakglass Alarm (Emergency Call Point)
DIP	Dual Inline Package
ECP	Emergency Control Panel
ECM	Emergency Communications Module
EWIS	Emergency Warning and Intercommunication System
FIP	Fire Indicator Panel
GP	General Purpose
IC	Integrated Circuit
MECP	Master Emergency Control Panel
PCB	Printed Circuit Board
SECP	Secondary Emergency Control Panel
WIP	Warden Intercommunication Point

Section 2 Operation

2.1. System Description

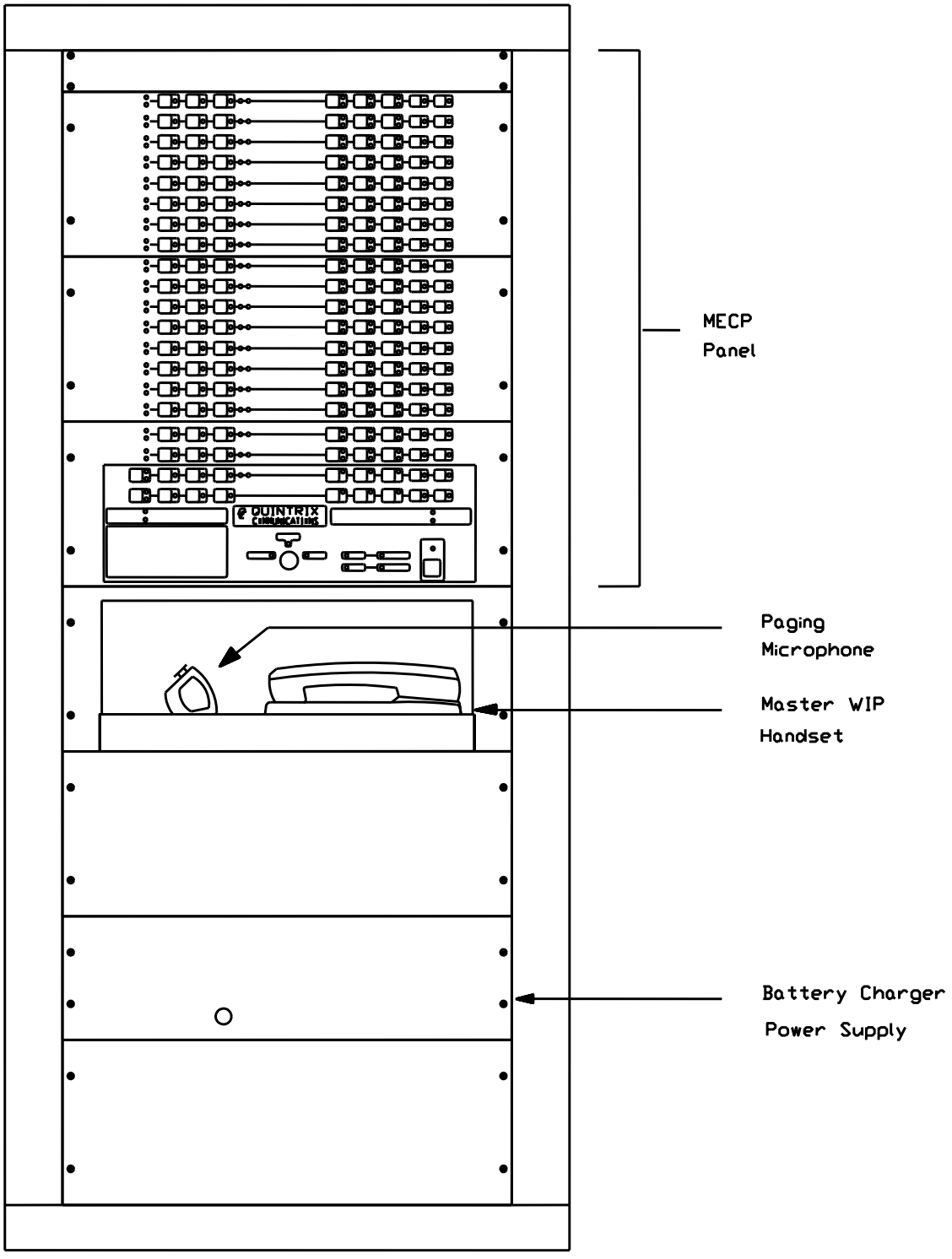


Figure 2-1: Typical I-2000 EWIS Panel

a. General

The purpose of an emergency warning and intercommunication system (EWIS)

is to enable the orderly evacuation of a building in the event of an emergency.

The **I2000** EWIS panel achieves this by providing the following facilities in an integrated and flexible system which complies with the Australian Standard AS2220.1:1989.

i) An Emergency Warning and Evacuation System

ii) An Intercommunication System

iii) Automatic Evacuation Mode.

b. Emergency Warning System

The Emergency Warning (Evacuation) System generates audible and/or visible signals to:

i) alert the occupants of an emergency situation

ii) instruct the occupants to evacuate the building.

The building is divided up into evacuation areas or zones, with at least one zone per floor of a building.

Zones may be selected independently, in groups, or all together for one of three independent warning signals.

These are, in increasing priority:

1) **ALERT** A pulsed on/off tone of 420Hz that rises in volume through six levels after its initial activation. This alerts the occupants to the existence of an emergency situation and that they should standby for the evacuation tone or verbal instructions. It also serves to alert the floor wardens to take up their designated positions and prepare for evacuation.

2) **EVACUATE** A pulsed ramping tone which is 0.5sec on, 0.5sec off repeated 3 times then 1.5secs off. After 4 bursts a digitally recorded voice message is spoken twice. This pattern repeats and is the instruction for the occupants to leave the building. In the manual mode of operation the voice message is not included in the evacuate tone.

3) **PAGING** Voice announcements can be made manually from the front panel mounted microphone.

Visible warning lights, used to supplement the audible tones, are coloured amber for alert and red for evacuate. They can be used in areas where the background noise level is high or when deaf or impaired hearing people may be present.

The EWS system includes equipment to monitor the wiring cables to speakers, visible warning lights, etc and will indicate when a fault condition is found.

The EWS system may also be used as a paging and/or background music system under non-emergency conditions. If an alarm or a mains power supply failure occurs then these functions are disabled until the cause is removed.

c. Intercommunication System

The intercommunications system allows the House Warden to communicate via telephone type handsets to Zone or Floor Wardens located at exit points on each floor or zone. The system comprises the master phone, zone selection switches and slave handsets on each zone of the building.

Facilities are provided on the ECP to monitor the status of all calls including the reception, origination and progress of all incoming and outgoing calls as well as fault monitoring of the WIP lines.

LED indicators mounted on the ECP display the operational status of each zone and, in conjunction with an internal fault sounder, are used to alert the operator to any abnormal conditions.

The **I2000** intercommunications system is available in 1 WIP per zone or 3 WIP per zone configurations. The keyboard/display units are different for these configurations and reflect the number of WIPs per zone on the keyboard. On 3 WIP/zone systems the 3 WIPs can be called, answered and fault monitored on an individual basis.

WARNING: *Do not manually operate the hook switch of any WIP or ECP phone while holding the earpiece close to your ear. Always replace the handset to operate the hook switch. Some makes/models/configurations of WIP phones use the earpiece to generate the ring sound and this may be uncomfortably loud if it is close to your ear.*

2.2. Operating Modes

The EWIS system can be operated in any one of three modes, AUTO, MANUAL or ISOLATE. The system is normally operated in the AUTO mode. In this mode the system is connected to the Fire Indicator Panel enabling automatic operation of the evacuation system in the event of a fire alarm. In addition, Break Glass Alarm (BGA) manual call points can also be connected to the EWIS system to initiate automatic operation in the event of an emergency alarm.

The system continually monitors the FIP and BGA inputs for an alarm signal. On detection of an alarm signal, the system will generate an ALERT tone for a pre-set time. When this time period has expired, it will automatically switch-over to a continuous EVACUATE tone interspersed with a digitised voice message, advising occupants to evacuate the building.

The system also provides a cascading feature for multi-storey buildings.

When the first zone changes to the evacuate tone, two zones above and one below are placed in the alert mode. After a second time delay, these zones are placed in evacuate and a further two zones above and 1 below are placed in alert. This process cascades through the building, with a repetition of the second time delay, until all zones are in evacuate. Both the "initial alarm zone ALERT ON delay" and the "cascade zone ALERT ON delay" are on-site programmable. The cascade strategy can be specifically configured, during manufacture, to meet the particular building or regulatory requirements.

In MANUAL mode the operator at the ECP has control of the system and can manually select the alert, evacuate or public address functions for each of the zones.

In ISOLATE mode the keyboard of the ECP is effectively isolated from the rest of the system so that operator training can be carried out without activating the various tones in each zone. The system is still operational in that field faults or FIP/BGA activations will be shown on their respective indicators on the keyboard.

a. Emergency Control Panels

The Master Emergency Control Panel (MECP) contains all the controls, status indicators, microphone and handset for the complete operation of the system.

The MECP is usually installed in a convenient, safe and quiet location to enable authorised personnel to control the system in the event of an emergency. This facility can be an integral part of the Main Equipment Rack or it can be remote. When installed remotely, the MECP is connected to the Main Equipment Rack by a serial data communication link.

Additional Secondary Emergency Control Panels (SECP) can be similarly connected to the Main Equipment Rack for increased operational flexibility. These units are assigned a lower priority to the MECP so that the MECP can always take manual control and override an SECP.

b. Main Equipment Rack

The Main Equipment Rack houses the electronic equipment necessary for the generation of the tones, flashing lights, WIP intercommunications, FIP/BGA inputs and other ancillary equipment.

The equipment is laid out in a modular fashion, allowing flexible configuration and system sizes of up to 100 zones to be achieved. The primary variation between systems of different sizes is the cabinet size, the number of modules fitted and the power supply capacity.

The system has an associated standby battery supply which is usually contained in the equipment cubicle. In the event of failure of the 240V mains electricity supply the EWIS system will automatically be powered from its standby battery.

AUTO / MANUAL / ISOLATE MODES

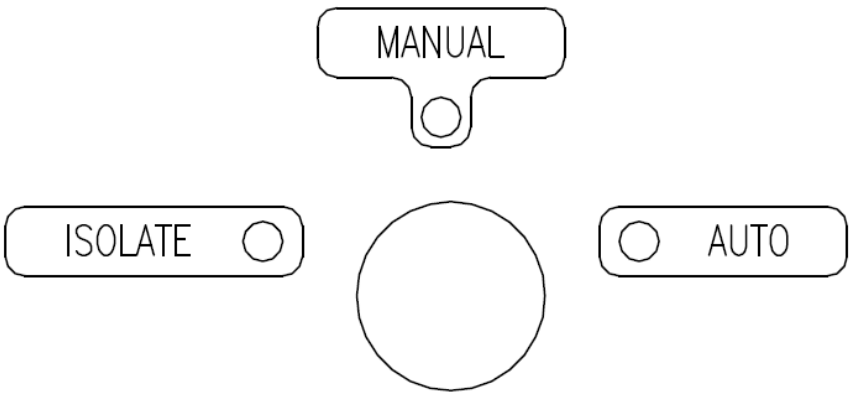


Figure 2-2: Auto/Manual/Isolate Keyswitch

2.3. General

The AUTO/MANUAL/ISOLATE keyswitch on the front of the ECP module allows the operational mode of the system to be set. The resulting mode is indicated on the LEDs next to each position of the keyswitch. As the LEDs are under software control it is possible for the LEDs not to follow the keyswitch.

For example, setting an SECP to manual may not result in the Manual mode being obtained. This would be because another SECP or MECP is already in MANUAL mode and thus has control of the system.

Switching an MECP to Manual will always result in Manual mode being obtained. Switching an SECP to Manual will only work if the MECP is in Auto mode. Only one SECP can be in Manual mode at a time, generally this will be the first SECP to be switched to Manual. If the MECP is switched from Manual to Auto and two or more SECPs are switched to manual, then one of the SECPs will switch to Manual mode.

If any ECP is in Manual, then its MANUAL LED will be steady, and the MANUAL LEDs at all other ECPs will flash with a flash-flash-pause cadence. The AUTO LEDs of these other ECPs will be steady.

2.4. Auto Mode

The AUTO mode is the standard operating position, whereby the Evacuation System is ready to carry out its principle function, i.e. automatic evacuation of the building in the event of alarm. The way in which the EWIS carries out the evacuation is dependent on the cascade sequence programmed during manufacture and the on-site programmed parameters.

Also while in AUTO mode control is allowed to be passed to any ECP that may be requesting Manual mode. If all ECPs are in AUTO then the controlling ECP will enable the automatic generation of alert and evacuate tones throughout the building if an alarm is detected. If any ECP is in MANUAL mode then the automatic cascade operation is overridden and the operator can manually select zone functions. Refer to Section 3.3 for the manual mode description.

NOTE: *After an alarm has occurred it is possible to switch an ECP to Manual, select or de-selected tones for various zones and then return to AUTO mode, whereupon the automatic cascade will continue from the new setting if there is still an active FIP or BGA input*

It is therefore important that all zone FIP, BGA, Alert and Evacuate indications are cleared before switching to AUTO unless the cascade function is to be continued.

2.5. Manual Mode

When the ECP is in the MANUAL mode, all buttons on the Evacuation System keyboard are enabled except for the PROGRAM button.

This stops the automatic cascading of the alert and evacuate tones and allows the operator to have manual control of the system. The various tones or functions can be selected for each or all of the zones as required.

Ensure all FIP and BGA alarm conditions and all zone alert and evacuate commands have been removed before switching to AUTO from the MANUAL mode.

2.6. Isolate Mode

Switching an ECP to ISOLATE will have a different effect depending on whether the ECP is the MECP or an SECP.

At the MECP the ISOLATE mode will cause the whole system to be isolated. I.e. alarms occurring on the FIP or BGA inputs will not cause zones to be placed into alert and evacuate, although the FIP and BGA LED indicators on the keyboard/display will continue to show the correct FIP/BGA status. Furthermore, the keyboard is isolated from the system, so that, for example, selecting a zone for evacuate will cause the zone EVACUATE LED to turn on but no evacuate tone will be generated in the zone. However if the MECP is switched to MANUAL with zones selected, then tones will start on those zones.

***NOTE:** If an MECP is powered down when it is in ISOLATE, the SECP will not take over control of the system.*

Placing an SECP into ISOLATE will not affect the automatic cascade operation of the system, it will only isolate the SECP keyboard from the system. Pressing keys will light the appropriate indicators but will not result in the tones being generated in the zones. The MECP will control the system while the SECP is in ISOLATE. If the MECP fails while the SECP is in ISOLATE, the SECP will not take over control.

Switching an SECP from MANUAL to ISOLATE will result in the MECP taking control and changing the mode of the system from MANUAL to AUTO (as the MECP must be in AUTO for the SECP to have been in MANUAL). Ensure all FIP and BGA alarm conditions and all zone alert and evacuate commands have been removed before switching an SECP from MANUAL to ISOLATE.

The ISOLATE mode is meant as a training position and is best performed at an SECP, if present. This is because the rest of the system will then still be operational and ready to act if an alarm is detected. Note that in this situation the isolated SECP indicators will show the result of the alarm and cascading functions.

When an SECP is switched out of ISOLATE all functions selected by the operator will be automatically cancelled, and the MECP will then transfer to the SECP the current status of the system. This may take a few seconds, and during this time the SECP will not go into the MANUAL mode even though the keyswitch may be in the MANUAL position.

2.7. Automatic Cascade Sequence

The Automatic cascade sequence can be enabled or disabled via the on-site programming mode described in Section 7.

When the cascade sequence is disabled the EWIS panel operates in an "all zone" mode following the detection of a FIP or BGA alarm. The EWIS panel will indicate the zone(s) in alarm by the appropriate FIP or BGA LED flashing, delay for the "delay before action", then place these zones in ALERT and delay for the duration of the "initial time-out" delay. Then all zones will be put in ALERT and the sequence will wait for the "subsequent time-out" delay before putting all zones into EVACUATE.

When the cascade sequence is enabled the system will automatically step through the zones as defined by the built-in evacuation sequence. This can be custom programmed for a particular system but the standard sequence works as follows.

Detection of alarm on a zone will place that zone into ALERT after the "delay before action" and then cause the system to wait for the "initial time-out" delay. The zone in ALERT will then change to EVACUATE and the two zones above and one below will be put into ALERT, followed by the "subsequent time-out" delay.

At the end of this second delay those zones in ALERT will be put into EVACUATE and a further two above and one below will be put into ALERT. This sequence repeats until all zones are in EVACUATE.

***NOTE:** the programmable time delays have different effects depending on whether cascade is enabled or disabled*

When switching from Manual to Auto there is a 5 second delay during which no cascade related functions will be carried out. After powering up in Auto there is a 30 second delay before any cascade functions begin.

2.8. Master Module Functions

a. Keyswitch

The AUTO/MANUAL/ISOLATE keyswitch selects the operational mode of the **Evacuation** system. Refer to Section 3 for a description of the operating modes and Section 4.4 for a description of the indications.

The WIP Phone system will function regardless of the keyswitch position.

For systems with SECPs shipped after November 1995, the WIP keyboard is always active. See the next section, 4.2.1 Operating LED.

b. System Indicators

OPERATING LED

There are two system LEDs for each of the Evacuation and Fire Phone systems, one labelled OPERATING and the other labelled FAULT. The green LED labelled OPERATING is used to indicate the operating status of the ECP. It flashes at 2Hz to indicate that the ECP is operating and that it has control of the system. When another ECP has control (e.g. at an SECP when the MECP is in MANUAL) then the LED will flash with a flash-flash-pause cadence.

Under normal conditions if only one ECP is in Manual it will have control of the system and any other ECPs will be in slave mode. If all ECPs are in Auto, the one which was last in Manual will have control of the system. An ECP will take control when it is switched to MANUAL and all other ECPs are in AUTO. If the MECP and an SECP are both switched to MANUAL, the MECP will take control. However, if any SECP is unable to communicate with the MECP it will attempt to take control of the system as it is possible the MECP has failed.

To be able to use the Evacuation System keyboard of an ECP the keyswitch must be switched to MANUAL or ISOLATE and the appropriate LED must be on. (Refer section 3.1)

For the Fire Phone System, changes were introduced in November 1995 with Version 2.xx of the software.

Verify that the Fire Phone Operating LED continues to flash continuously at 2Hz as control may be passed back to another SECP or MECP that is requesting Manual Control.

For ECM Networked Systems:

The EVACUATION SYSTEM OPERATING LED for flashes continuously if the ECP has manual or isolate control of any or all zones, otherwise it flashes with a flash-flash-pause cadence.

The FIRE PHONE SYSTEM OPERATING LED will flash continuously when there is no call in progress, or when there is a call between that ECP phone and a WIP connected to that panel. The LED will flash with a flash-flash-pause cadence when there is a call between a WIP connected to that panel and a remote ECP phone, indicating that the call has been initiated or answered at a remote ECP.

If the OPERATING LED is permanently off, permanently on or flashing at a rate or cadence different to that described above then a fault exists with the ECP module.

FAULT LED

The yellow FAULT LED for each of the Evacuation and Fire Phone Systems indicates when there is a system fault present. A system fault is when a module or piece of equipment required by the system is faulty or not responding to communications from the controlling ECP module. This type of fault is different to a zone fault which is only present on the wiring of a particular zone.

If only some zones are affected by the module failure, then those zones are also put into fault. So it is necessary to check the Evacuation System Fault LED and the Fire Phone System Fault LED to see if the zone fault indication is caused by a zone fault or module failure. Refer to Section 6 for further information on system faults.

c. Common Indicators / Switches

MAINS LED (green) is on when mains power is applied to the system and the battery charger is operating correctly.

If the mains supply (or charger) develops a fault then the MAINS LED will turn off and the CHARGER FAIL LED will flash. If the system has one or more SECPs then the CHARGER FAIL LED will flash with a flash-flash-pause cadence if there is a mains or charger failure at another ECP.

BATTERY LED (green) is on when the battery is operating within its correct voltage range. If the battery voltage drops below the minimum operating voltage then the BATTERY LOW LED will flash with the SYSTEM FAULT LED to indicate that the battery voltage is too low for the system to work properly.

SYSTEM FAULT LED will flash and the beeper alarm will sound whenever a new fault or alarm condition is detected. There will also be another flashing FAULT or ALARM LED that shows the cause of the beeping.

When the fault or alarm is acknowledged, by pressing the SILENCE button, all the flashing LEDs will go steady and the pulsing audible sound will cease.

If a CPU watchdog failure occurs or CPU power is lost, then the SYSTEM FAULT LED and beeper will be on continuously. By pressing the SILENCE button the audible alarm will be silenced but the LED will stay continuously on.

The fault (and alarm) indications are latching so it is possible to determine the cause of intermittent conditions. To clear the latched fault and alarm indications press and hold the SILENCE button in for 2 seconds. For those faults and alarms that have cleared the LED will turn off but any still present will have the appropriate LED remain on. It will be necessary to fix the fault or alarm before the indication can be cleared.

The beeper will sound a short, quiet pulse every time a valid key is pressed to provide audible feedback that the key was recognised. If no sound is heard when pressing a key it means that the key is invalid at that point in time.

The beeper will generate a loud, pulsating sound whenever a new alarm or fault is detected and requires acknowledgement.

The beeper will generate a loud, continuous sound if either of the CPUs on the ECP module fail.

d. Auto/Manual/Isolate LEDs

Non-Networked Systems

The AUTO, MANUAL, and ISOLATE LEDs normally indicate the position of the keyswitch, with the following exceptions -

The MANUAL LED may be flashing with a flash-flash-pause cadence. This indicates another ECP has Manual control of the system.

At an SECP the keyswitch may be in the Manual position, but the AUTO LED may be on and the Manual LED flashing. This indicates that the MECP or another SECP is switched to Manual, over-riding this SECP.

At an SECP switched to Manual or Auto, the ISOLATE LED may be on. This indicates that the MECP (and hence the whole system) is switched to Isolate.

ECM Networked Systems

For ECM Networked Systems the AUTO, MANUAL, and ISOLATE LEDs on the ECP display in various combinations to indicate various conditions:

AUTO Some or all zones are in AUTO.

Steady MANUAL All zones are under manual control at this ECP.

Steady ISOLATE All zones are in ISOLATE and under the control of this ECP.

Continuous flash MANUAL Some zones are under manual control at this ECP.

Continuous flash ISOLATE Some zones are in ISOLATE and under the control of this ECP.

Flash-flash-pause MANUAL Some zones are in manual control of another ECP.

Flash-flash-pause ISOLATE Some zones are in ISOLATE and under the control of another ECP.

It is possible for there to be more than one LED on at a time. For example if this ECP is in AUTO but some zones are under manual control at another ECP, the AUTO LED will be steady and the MANUAL LED will be flashing with a flash-flash-pause cadence.

2.9. Zone Function Keys

The ECP must be in the MANUAL or ISOLATE modes for the Evacuation keyboard to work. The ECP keyboard contains function selection keys for each zone and also "All Zone" and programmable "Group" keys.

The "All Zone" keys cause all zones to be selected (or de-selected) for the appropriate function while the Group keys only work on the programmed group of zones.

All keys act with a toggle action, i.e. if the appropriate LED is off then pressing the key will select the function and turn the LED on. Similarly, if the LED is on, pressing the key will de-select the function and turn the LED off. This toggle action works on the ALL and GROUP keys as well so that a combination of single, group and all-zone functions will produce a variety of zone selections.

For example, pressing the ALL ALERT key (with the ALL ALERT LED off) will turn all zones to Alert and turn on the ALL ALERT and GROUP ALERT LEDs. Pressing individual zone ALERT keys will turn off the Alert tone to those zones while pressing the GROUP ALERT will turn off the programmed group of zones. Pressing the GROUP ALERT again will turn the group back to alert as the group had been turned off.

Each key press should result in a short audible beep being heard. If no beep is heard then this may be due to the key being invalid at the that point in time (e.g. during programming), or the system is still trying to process the last key press, or the ECP is in Auto mode. Therefore if keys are pressed in quick succession, it may be noticed that the second key press has no effect or is not beeped until sometime after pressing. This is sometimes evident on large systems and in particular with the All and Group functions.

The Evacuation System Alert, Evacuate and PA Speech functions have an increasing prioritisation. I.e. the Evacuate tone will be generated for the zone if both the ALERT and EVACUATE LEDs are on. Similarly, if PA SPEECH is on and the Microphone PTT switch is pressed in, then speech will override any alert and evacuate tones selected.

On an ECM networked system the Alert, Evac and/or PA indicators for a zone will flash if that zone is mapped to multiple zones at another ECP, and the Alert, Evac/PA function is on for some but not all of the mapped zones. Do not confuse this with Zone Isolate function (not available on ECM networked systems) where Alert/Evac and PA will flash continuously on an isolated zone.

With networked systems, there are times when Alert/Evac/PA for some zones will not be able to be controlled because those zones are under control by a higher priority ECP. Operating ALL or GROUP functions will not affect these zones, and the zone keys themselves will not be able to be operated. However the zones which are controllable will operate as usual. In these cases (some zones uncontrollable) the Manual or Isolate LED will be flashing continuously indicating only partly manual or partly isolated. However the WIP controls will always be active for all zones.

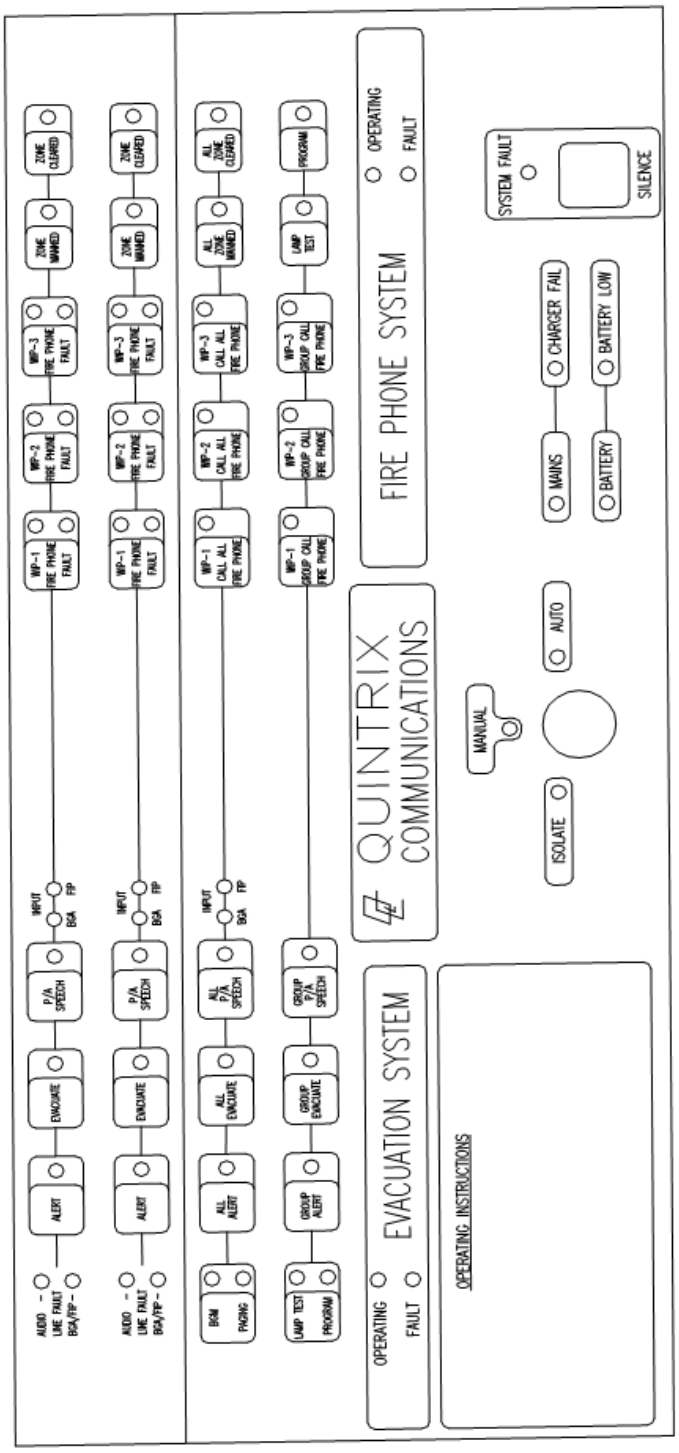
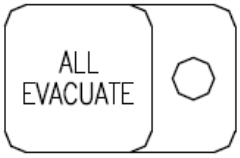


Figure 2-3: Master Keyboard/Display Module

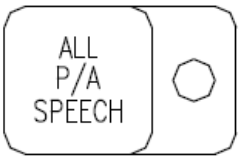
a. All, Group & Program Keys

The Master Keyboard/Display Module incorporates the ALL, GROUP and PROGRAM key features along with the keys for the first two zones.

When ALL ALERT is pressed all zones will be placed in the alert mode and the ALL ALERT LED will be turned on. Each zone ALERT LED will turn on as well to indicate it is in the alert mode.
If this key is pressed when the ALL ALERT LED is already on, then the function will be reversed and all zones in alert will be turned off.

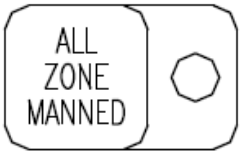


When ALL EVACUATE is pressed all zones will be placed in the evacuate mode and the ALL EVACUATE LED will be turned on. Each zone EVACUATE LED will turn on to indicate it is in the evacuate mode.
If this key is pressed when the ALL EVACUATE LED is already on, then the function will be reversed and all zones in evacuate will be turned off.



When ALL PA SPEECH is pressed all zones will be placed in the PA SPEECH mode and the ALL PA SPEECH LED will be turned on. Each zone PA SPEECH LED will turn on to indicate it is in the PA SPEECH mode.
When the "press-to-talk" (PTT) button is pressed on the front panel microphone then speech will be directed to the zones and any alert or evacuate tones will be overridden.
Releasing the PTT button will revert the zones to the next highest function selected.
If this key is pressed when the ALL PA SPEECH LED is already on, then the function will be reversed and all zones in PA SPEECH will be turned off.

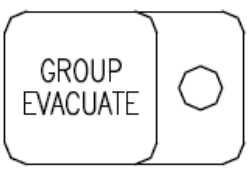
When WIP CALL ALL key is pressed, all WIP phones in every zone will ring simultaneously and every WIP LED (except GROUP LED) will flash continuously. As each WIP is answered its LED will change to steady. The operator can talk to all answered WIP phones but will hear nothing back. Pressing the key again will cancel the all call. If any WIP phones remain off hook the LED will start flashing as they are then calling the ECP.



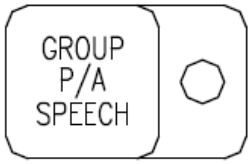
When ALL ZONE MANNED is pressed the ZONE MANNED LED for all zones will turn on. This is basically a log indicator and has no control over system operation. It provides helpful information to the operator. Pressing again will turn off all ZONE MANNED LEDs.

When ALL ZONE CLEARED is pressed the ZONE CLEARED LED for all zones will turn on. This is basically a log indicator and has no control over system operation. It provides helpful information to the operator. Pressing again will turn off all ZONE CLEARED LEDs.

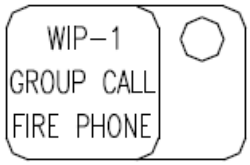
When GROUP ALERT is pressed all zones in the programmed group will be placed in the alert mode, their ALERT LED will turn on, and the GROUP ALERT LED will be turned on.
If this key is pressed when the GROUP ALERT LED is already on, then the function will be reversed and all zones in the group in alert will be turned off.



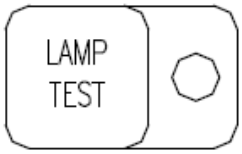
When GROUP EVACUATE is pressed all zones in the programmed group will be placed in the evacuate mode, their EVACUATE LED will turn on, and the GROUP EVACUATE LED will be turned on.
If this key is pressed when the GROUP EVACUATE LED is already on, then the function will be reversed and all zones in the group in evacuate will be turned off.



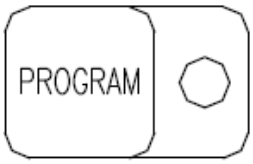
When GROUP PA SPEECH is pressed all zones in the programmed group will be placed in the PA SPEECH mode, their PA SPEECH LED will turn on, and the GROUP PA SPEECH LED will be turned on.
When the "press-to-talk" (PTT) button is pressed on the front panel microphone then speech will be directed to these zones and any alert or evacuate tones will be overridden.
Releasing the PTT button will revert the zones to the next highest function selected.
If this key is pressed when the GROUP PA SPEECH LED is already on, then the function will be reversed and all zones in the group in PA SPEECH will be turned off.



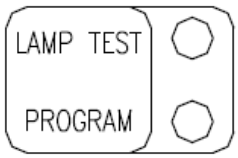
When the WIP GROUP CALL key is pressed no action will occur as this function is currently not implemented.



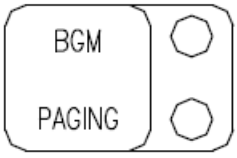
While LAMP TEST is pressed in all indicators for the Fire Phone System will be turned on and the fault buzzer will pulse.



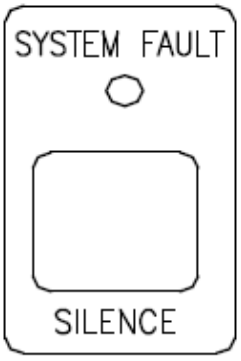
When the PROGRAM key is pressed no action will occur as this function is currently not implemented.



While the LAMP TEST/PROGRAM key is pressed in on the Evacuation System all indicators on the Evacuation System will be turned on and the fault buzzer will sound.



The BGM/PAGING key is used in programming mode and in fault analysis.



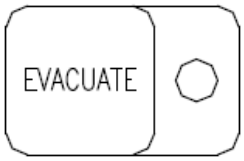
When SILENCE is pressed the buzzer will be turned off if it is on and any flashing alarm or fault indicators will become steady. If it is pressed in and held for two seconds then any latched alarm or fault indicators will be cleared. The LED will remain on for any alarm or fault still present.
The alarm or fault must be rectified before the LED can be turned off. Refer to Section 6 for more details on the alarm and fault indications.

Figure 2-4: 3 WIP per Zone Keyboard Display

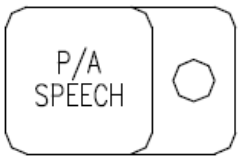
b. Individual Zone Keys

The Master Keyboard module contains the first two zones and further zones are provided by the addition of 8 zone Keyboard/Display Expansion modules.

When ALERT is pressed the alert tone will be generated in the particular zone. Pressing the key again will turn off the alert tone.

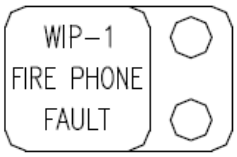


When EVACUATE is pressed the evacuate tone will be generated in the particular zone. Pressing the key again will turn off the evacuate tone.



When PA SPEECH is pressed PA SPEECH will be generated in the particular zone if the press-to-talk (PTT) button is held down on the front panel microphone. Pressing the key again will turn off the PA SPEECH.

The Evacuation System Alert, Evacuate and PA Speech functions have an increasing prioritisation. I.e. the Evacuate tone will be generated for the zone if both the ALERT and EVACUATE LEDs are on. Similarly, if PA SPEECH is on and the Microphone PTT switch is pressed in, then speech will override any alert and evacuate tones selected.)



When the WIP button is pressed it can be used to call or answer a remote WIP phone on the associated zone.

To Call A WIP: Press the button for the relevant WIP. The associated LED will flash and the remote WIP phone will ring until the WIP is answered (LED goes steady). The voice connection is then automatically established. If the WIP button is pressed while voice connection is present then the remote fire phone will change to a calling status and the associated LED will return to flashing (this will mimic a hold facility). If the remote fire phone is placed back on hook the connection is broken and the LED indicator will turn off (automatic cancellation).

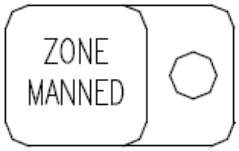
To Answer: When the remote fire phone is lifted off hook a confidence tone is heard in the earpiece, the ECP is signalled and indicates the WIP by flashing the WIP LED and ringing the Master phone if it is not already in use. When the WIP button is pressed a voice connection with the remote WIP is established and the LED changes to steady. If the button is pressed again then the remote fire phone will return to the calling status and the LED will flash indicating the phone is off-hook. If the remote fire phone is put back on hook at any time then communication is disconnected and the LED will turn off (automatic cancellation).
At the remote fire phone a confidence tone will be heard whenever the phone is off-hook and the talk mode is not established at the ECP.

Notes

1. It is possible to call and talk to a number of WIPs at the same time. However, as each additional WIP is selected for talk mode then the quality of the voice connection may be degraded.

2. It is not possible to call or answer a WIP while the FAULT LED is flashing or on. The fault must be rectified and cleared before a call can be made or answered.

WARNING: *Do not manually operate the hook switch of any WIP or ECP phone while holding the earpiece close to your ear. Always replace the handset to operate the hook switch. Some makes/models/configurations of WIP phones use the earpiece to generate the ring sound and this may be uncomfortably loud if it is close to your ear.*



When ZONE MANNED is pressed it will toggle the LED on or off as appropriate. This is a log indicator and has no effect on system operation. The operator can use it to record when the zone is manned or not.

The LED can also be turned on from a pushbutton on the WIP line. It can only be turned off by pressing ZONE MANNED when the LED is on.

When ZONE CLEARED is pressed it will toggle the LED on or off as appropriate. This is a log indicator and has no effect on system operation. The operator can use it to record when a zone has been cleared.

2.10. Fault / Alarm Indicators

Both the Evacuation and Fire Phone systems have built-in fault monitoring to detect faults on the zone wiring or the failure of an essential module within the EWIS system. Fault indication is given for the following faults:

1. Audio/Visual output line fault or amplifier failure
2. FIB/BGA line fault
3. WIP line fault
4. Mains/Charger fault
5. Battery Fault (circuit breaker tripped or low voltage)
6. Evacuation System CPU watchdog fault
7. Fire Phone CPU watchdog fault
8. Power supply failure on ECP module
9. Cable fault between ECPs and/or remote equipment racks
10. Loss of communications with or failure of a necessary module in the Evacuation or Fire Phone System. This includes SECP units if part of the system.

When a fault is detected the associated LED is set flashing and the fault buzzer sounds. The SILENCE button can be pressed momentarily to silence the fault buzzer and turn all flashing indicators to steady. The flashing indication will also change to steady and the buzzer automatically silence if the fault goes away. However, the flashing LED and buzzer will restart if the fault recurs, even if it has previously been silenced.

Fault indications are latched so that the cause of transient faults can be determined. To clear the latched fault indications it is necessary to rectify the fault condition and then press and hold the SILENCE button for two seconds.

When a FIP or BGA alarm is detected the buzzer and LED operate in the same way as a fault i.e. they flash (or beep), and require silencing and clearing once the alarm condition has been removed. Note

that in a system with any SECPs, when a second ECP is powered up the system will copy the current status, including latched faults, from the ECP which was already running. Be sure not to interpret these latched faults as current faults.

a. Line Fault Indicators

Audio Line Fault

This indicates a fault in the audio output stages of the zone amplifier or a short or open circuit on the speaker or strobe light wiring. If the fault is a strobe line fault then the Strobe Master Module within the equipment rack will have its red fault LED flashing. (For systems with the STRM9502 strobe relay module, its Red LED will be flashing if the fault is still present, or steady if the fault has returned to normal. In the latter case, the red LED can be extinguished by switching the MECP to ISOLATE and back to MANUAL or AUTO.)

If many audio line fault LEDs are on and the Evacuation System FAULT LED is also on then the fault is probably due to failure of the EMUX9002 or STRM9502 modules for these zones.

FIP/BGA Line Fault

This indicates a fault on the wiring for the FIP or BGA inputs or failure of the FIP/BGA module if the FIP or BGA ALARM LEDS on the "ALL" zone and the Evacuation System FAULT LED are also on.

WIP Phone Line Fault

This indicates a fault on the wiring for the WIP line or failure of the appropriate WIPS9004 module if the master module Fire Phone FAULT LED is also on.

b. System Fault Indicators

Loss of communication with, or failure of, one of the essential modules in the EWIS, or failure of an essential cable connecting an SECP or remote equipment rack to the MECP, will result in flashing of the EVACUATION SYSTEM FAULT LED and/or WIP SYSTEM FAULT LED. If the fault is a module fault and only some zones are affected then the fault LEDs for those zones will also flash.

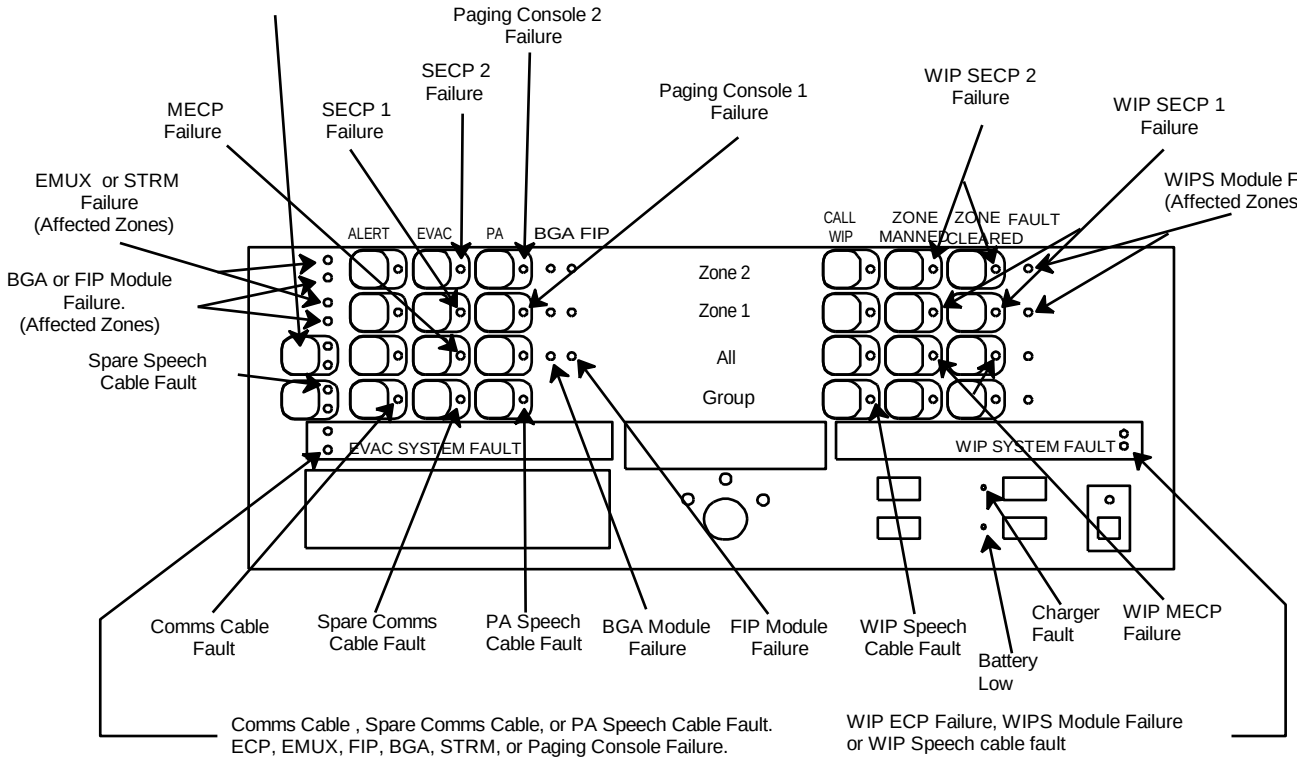
The way in which system faults are shown differs between the various software versions. Refer to the appropriate following sections.

Version 2.xx/4.xx Software System Faults

Figure 6.1 shows the system fault indications for systems with version 2.xx/4.xx software, i.e. for systems with an SECP, remote equipment, or a Paging Console shipped after November 1995.

Note that it is necessary to switch to manual and press and hold the BGM key to display the faults shown on those LEDs which are normally used for other purposes (Alert, Evacuate, PA, Zone Manned and Zone Cleared).

"Module failure" as used in the diagram includes failure of the module and/or a cable failure which prevents communication with the module. Note that sometimes a module failure will also cause a communications cable failure to be indicated, if that module is used to switch communications cables, e.g. any ECP or a remote FIP module. A module failure is indicated if a module cannot be communicated with over both communication cables. A communications cable failure is indicated if a module can be communicated with over one bus but not the other. The PA Speech, WIP Speech, and Spare Speech cables are monitored a little differently - an ECP at one end of the cable checks for the presence of an End Of Line device at the other end of the cable.



Note : The System Fault LEDs, the affected zone fault LEDs, and Charger Fault and Battery Low fault LEDs do not need BGM/PAGING to be pressed and held. When BGM/PAGING is pressed and held the remaining LEDs FLASH when the fault is present or latched.

Figure 2-5: I-2000 version 2.xx/4.xx System Fault Display

ECM Networked Systems

In an ECM networked system, the fault LEDs on the ECP function in a similar manner to those for non networked software, with some additions. Refer to Figure 6-2 for more details.

All these faults are displayed as flashing indications for current or latched faults. Further more detailed diagnostic facilities are available to a service technician using a laptop connected to the ECM module.

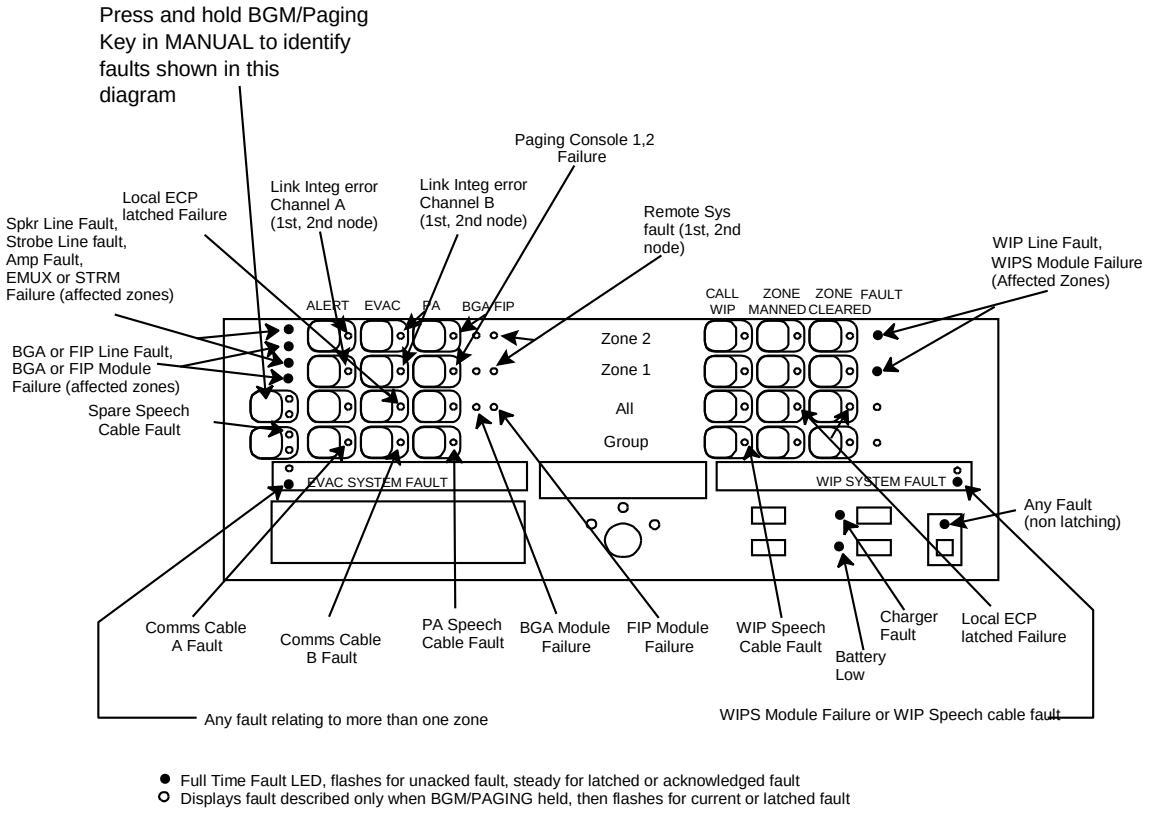


Figure 2-6: I-2000 ECM network System Fault Display

c. Acknowledging Faults/Alarms

To acknowledge faults or alarms and silence the buzzer, press the SILENCE button briefly. The flashing fault or alarm LEDs will become steady and the pulsing audio alarm will be silenced. At an ECP which is not in control, this will silence the buzzer only briefly, to acknowledge the fault or alarm the ECP must be switched to MANUAL.

d. Clearing Latched Faults/Alarms

To clear latched fault or alarm indicators once the fault or alarm condition has been rectified, press and hold the SILENCE key for a 2 second period, with the keyswitch in the MANUAL or ISOLATE position. The SYSTEM FAULT LED, the zone FAULT LEDS, and the zone FIP/BGA ALARM LEDs should turn off.

If any faults or alarms have not been rectified then the LED will remain on indicating the fault or alarm is still present.

e. Isolated Zones

Zones that have been isolated by the service person will be shown with the ALERT, EVACUATE and PA SPEECH LEDs all flashing together. When a zone is isolated, FIP/BGA inputs will still indicate

but will not generate any fault or alarm conditions, manual controls will not work and the automatic cascade will not generate ALERT and EVACUATE tones for that zone. However the automatic cascade will illuminate the ALERT LED and/or the EVACUATE LED for isolated zones as they are stepped over. This does not result in tones being sent to those zones. These LEDs can be reset from the keyboard when the system is switched to MANUAL.

f. System Fault LED

The SYSTEM FAULT LED above the SILENCE button will flash and the beeper will sound when a fault or alarm occurs on either the EVACUATION SYSTEM or the WIP SYSTEM. When the fault or alarm is acknowledged by briefly pressing SILENCE, the beeper will stop and the LED will change to steady.

If a fault or alarm is transient, then when it goes away the beeper will stop and the LED will go out even though other acknowledged or latched faults may remain. If other unacknowledged faults remain, the beeper will continue sounding and the LED will continue flashing.

This LED will also go out on completion of a LAMP TEST, unless unacknowledged faults remain present.

Section 3 Cabinet Installation

3.1. Equipment Handling Procedure

Basic precautions should be observed at all times when working with any electronic circuits.

- Ensure you are earthed (e.g., with a wrist strap connected to the panel gearplate, or one hand touching the gearplate) before touching any components or connections.
- Never plug or unplug any cables when power is applied.
- Never plug or unplug cards from a rack when power is applied.
- Remove power from any module before making any changes to the module

3.2. Checking System after Transit

After unpacking a newly received system, it should be carefully checked, and anything that has moved during transit should be corrected.

Check the following (and correct if necessary)

- All plug-in ICs are fully plugged into their sockets.
- All plug-in cards are fully plugged into the card cage.
- All ribbon cable plugs are fully plugged into their sockets.
- DIN rail modules are firmly clipped to the DIN rail.

3.3. Cabinet Mounting

The important aspects of mounting the cabinet are :

- To allow easy access for wiring.
- To allow easy access for operation. AS1670.4 (Figure 2.1) requires at least 600mm of clear space either side of the control panel and 1000mm of clear space in front of it.
- To ensure the controls are mounted as per AS1670.4 section 2.1.1 (f), i.e., between 750mm and 1850mm from floor level.

In general 18U, 21U and 28U Cabinets will need to be wall mounted to achieve the control heights. 40U cabinets can be floor mounted, but if more than 34 display zones are fitted to a 40U cabinet it may need to be fitted on a plinth.

3.4. Mains Wiring

Mains power must be permanently wired by an electrician to the GPO outlet inside the I2000 cabinet. It must be ensured that the cabinet is earthed. If the installation is to comply with AS2220.2 (rather than AS1670.4) no other load may be connected to the circuit, and the circuit must be separately fused and labelled.

3.5. Inter-Cabinet Connections

If the system comprises more than one cabinet (at the same location), then some of the factory fitted wiring between the cabinets will need to be restored at installation.

- Connect the 26 way ribbon cable supplied between all the SIGNALS IN connectors on the backplanes of all the cardcages.
- If only one power supply is fitted, connect the backplane power in the second cabinet to the unused heavy red and black cables from the power supply in the first cabinet.
- If two or more power supplies are fitted it is recommended that you wire the power supplies and batteries as shown in Battery Wiring.
- If there are FIB8910 input modules or STRM9502 output modules in the second cabinet, their power and comms connections will need to be daisy chained off power and comms terminals on a similar module in the first cabinet. Refer to drawing 699-177 at the end of Drawings.
- If there are keyboard/display modules in the second cabinet, connect the 20 way ribbon cables supplied from the connectors on each side of the bottom of the lowest display module in the second cabinet to the connectors on each side of the top of the highest display module in the first cabinet.

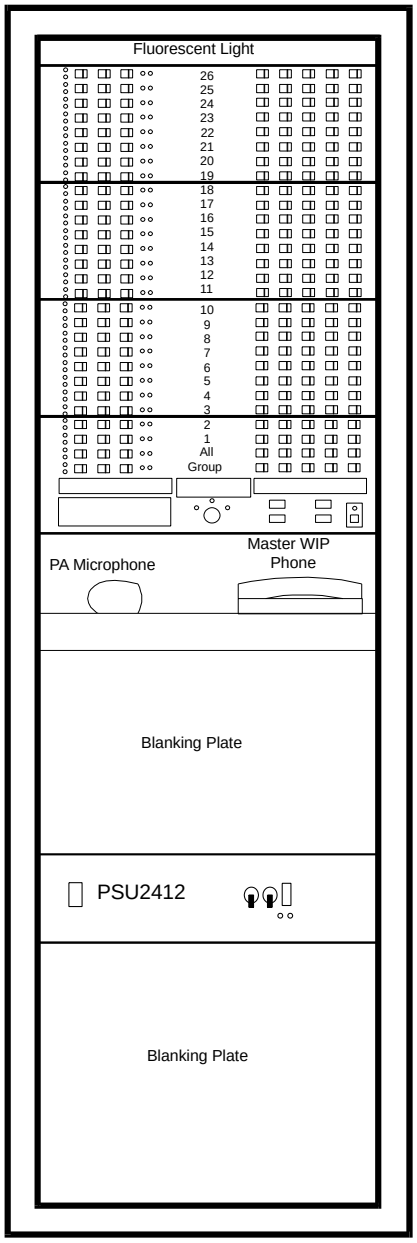
Section 4 Panel Configuration

4.1. General

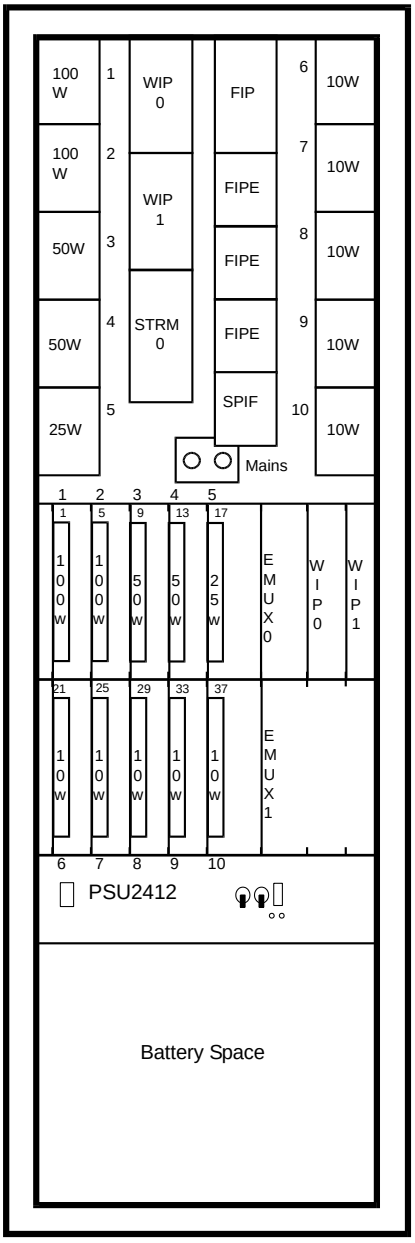
The cabinet layout will depend on the particular system's configuration, and depending on the number of modules of various types required, the modules will be located differently.

4.2. Typical Cabinet Layout

Note that the transformer modules are numbered down the left side of the cabinet, then down the right side.. Each amplifier module has four amplifier numbers assigned to it, regardless of the actual number of amplifiers on the module. See Amplifier Numbering for more details on amplifier numbering.



Exterior



Interior

Larger numbers beside modules are module numbers.
Smaller numbers are circuit or amplifier numbers.

Figure 4-1: Typical Cabinet Layout

4.3. System Design

a. Configuration Printout (Common ECP/ECM)

Although the panel inputs and outputs will be identified with labels attached during manufacture, subsequent reconfiguration may override that information. It is very important to retain the printout of the system configuration. This is supplied with each new system and with any re-configured software.

A typical example of a configuration printout is made up of the following tables shown below. On a typical printout some table rows may be missing, or complete tables missing, when they are programmed entirely to default values.

Only basic information is given here about how to decode the printout.

Zone Table

Zone Number	Zone Name	WIP1 Label	WIP2 Label	WIP3 Label	Amps	Watts	Strobes	FIPs	BGAs	WIP1	WIP2	WIP3	S/B Amp	Not all or group	Combined with next
1	Basement	Bm North	Bm South	Bm West	4	10	1	1	W1,W2, W3	1	2	3		No	No
	Ground Floor	G North	G South	G West	5,38	100,10	2,3,4	2	F26,W4	4	5	6		No	No
3	1st Floor	1 North	1 South	1 West	9	50	5	3	W7,W8, W9	7	8	9		No	No
4	2nd Floor	2 North	2 South	2 West	13	10	6		W10,W11,W12	10	11	12		No	No
5	3rd Floor	3 North	3 South	3 West	17	25	7		W13,W14,W15	13	14	15		No	No

The zone table lists the equipment assigned to each zone. A zone is a building zone that (usually) is controlled by a single row of controls and indicators on the MECP control panel, where the bottom row is zone 1, the next row above is zone 2 etc. However if there are more than 3 addressable WIPs in a building zone, several consecutive rows of WIP controls on the ECP may relate to the building zone. The zone numbering in the I2000 configuration printouts is always 1 number per display row.

Note the Zone Name and WIP labels are only for reference and printing labels. They are not used by the I2000 software.

Using the above table as an example, Zone 2 controls amplifier 5 (100W) and 38 (10W), and strobe circuits 2, 3, and 4. The zone 2 FIP input comes from FIP module circuit 2. Zone 2 BGA inputs come from FIP module circuit 26 and WIP circuit 4. WIP circuits 4, 5, and 6 are assigned to the three buttons on zone 2. Note that WIP circuit 4 is both a WIP connection and a BGA input, so it must be a 2-wire WIP/BGA circuit.

WIP circuits used for BGA and/or FIP inputs are listed as Wxx (where xx is the WIP circuit number) under the headings BGAs or FIPs.

High level RZDU inputs will be listed as Hxx (where xx is the Fire Panel zone number). FIP module inputs used as BGA inputs are listed as Fxx where xx is the FIP module circuit number.

In the BGAs column, numbers listed by themselves are circuits on a BGA input module. In the FIPs column, numbers listed by themselves are circuits on a FIP input module.

Misc

General

System Name	SO 73358 MATER HOSPITAL
System Control	ECP
Firmware Version	V6.09
Display zones	8
WIP Different	No
WIP ECP zones	8
First ECP zones	
SECPs	0
One WIP per zone	No
Has SPIF	No
Shutdown if flat battery	No

FIP/BGA/GP Inputs

Ignore FIP I/P Faults	No
N/C FIP Module I/Ps	No
Ignore BGA I/P Faults	No
N/C BGA Module I/Ps	No
No Cascade from BGA	No
HLL isolated at FIP gives fault	No
Number of inputs on FIP modules	
Number of inputs on BGA modules	
Number of inputs on GP modules/Paging Consoles	
Use GP numbering (not paging console)	No
Fault Relay Output	Light O/P

Audio Outputs

Paging zones different to evac zones	No
Music uses paging zones (not evac zones)	No
Music zones different to evac zones	No
PABX Highest Priority	No
PABX Higher Priority than tones	No
Music Higher Priority than tones	No
Music activates amp relays	No
PABX Uses PA bus	No
Digitised messages in Manual	Yes
Programmed 'music' messages go to all zones	No

Charger Fault

No Music shutdown if charger fault	No
No PABX shutdown if charger fault	No
Remote charger fault input	None
Remote charger fault FIP input num	0

Simplex HLL

Simplex HLL pseudozone base	

Paging Console WIP Controller

Master WIP cct	

The next three tables describe the system's response to alarm inputs. Alternatively this response may be defined in scripts.

Global Alarm Action

Common Response (This describes the initial response to alarm that is independent of the alarm zone)

Global alarm response	None / as per zonal alarm action / as per script
Zonal alarm action starts	Before Initial Delay

Cascade Table (This, in conjunction with the cascade table, describes the subsequent response to alarm when cascade is enabled on site)

Cascade table Alert:Evac applies to	Alert / Evac, site setting

Cascade Disabled Response (This describes the subsequent response to alarm when cascade is disabled on site)

Action at end of initial delay	All Alert if alert set on site, else All Evac
Action at end of subsequent delay	All Evac

Zonal Alarm Action (Describes the initial alarm action that is dependent on the original zone)

Alarm Zone	Alarm sets zones	Alarm sets state
1	1, 2, 3	Evac
2	1, 2, 3, 4	Evac
3	2, 3, 4, 5	Evac
4	3, 4, 5, 6	Evac

Cascade

This describes the subsequent alarm action that is dependent on existing zone status. Alert:Evac cascades to zones is dependent only on the original zone status. What it applies to is set in "Global Alarm Action". Then there are two more advanced actions available that may be conditional on further statuses.

Zone	Alert :Evac cascades to zones	Evac After Alert	Cond 1 Enabled	Cond 1 Any/All	Cond 1 zones	Cond 1 zones in state	Cond 1 sets zones	Cond 1 sets zones to state	Cond 2 Enabled	Cond 2 Any/All	Cond 2 zones	Cond 2 zones in state	Cond 2 sets zones	Cond 2 sets zones to state
1	2	No	Never	Any of		Evac		Evac	Never	Any of		Alarm		Alert
2	3	No	If this zone Evac	Any of	10	Evac	1	Evac	Never	Any of		Alarm		Alert
3	4	No	If this zone Evac	Any of	10	Evac	2	Evac	Never	Any of		Alarm		Alert
4	5	No	If this zone Evac	Any of	10	Evac	3	Evac	Never	Any of		Alarm		Alert
5	6	No	If this zone Evac	Any of	10	Evac	4	Evac	Never	Any of		Alarm		Alert
6	7	No	If this zone Evac	Any of	10	Evac	5	Evac	Never	Any of		Alarm		Alert
7	8	No	If this zone Evac	Any of	10	Evac	6	Evac	Never	Any of		Alarm		Alert
8	9	No	If this zone Evac	Any of	10	Evac	7	Evac	Never	Any of		Alarm		Alert
9	10	No	If this zone Evac	Any of	10	Evac	8	Evac	Never	Any of		Alarm		Alert
10	9	No	Never	Any of		Evac		Evac	Never	Any of		Alarm		Alert

Next in the printout are up to four free-format scripts. The contents of these is described under General Script Interpretation and Non-ECM Script Inputs and Outputs or ECM Script Inputs and Outputs.

Main Script

This script is run "continuously" and is used for controlling things that are not a result of an alarm input.

The next three scripts are an alternative way of specifying the system's response to an alarm.

Alarm Script

This script is run continuously once an alarm occurs. It is used for setting outputs that happen immediately an alarm occurs.

Cascade Script

This script is run at the end of each timeout, when cascade is enabled on-site. It is used to set the new zone state at the end of each timeout.

Cascade Disabled Script

This script is run at the end of each timeout, when cascade is disabled on-site. It is used to set the new zone state at the end of each timeout.

Paging Zones

This can be used to make paging zones contain different sets of amplifiers to Evacuation zones, and to define what paging console input activates each paging zone. (Alternatively the paging console inputs activating paging zones can be programmed in the Main Script).

Paging Zone Number	Paging Console Input	Alt PC Input	Amps
1			4
2			5,38
3			9
4			13
5			17

b. Configuration Printout (ECM)

A system controlled by ECM(s) (usually networked) has further information listed and described below.

Zones Table

Panel link FIP inputs are displayed as for example H3/100, for SID 3, zone 100.

Network / Advanced

Network

Protocol	IFS
SID	247
Fibre	No

Audio Busses

Audio Bus Segment	1
Arbitrate Audio Bus swap	No

Joined Audio Busses

Control Audio Bus join	No
Joined Audio Bus Segment	0
Arbitrate Joined Audio Bus swap	No
External Audio Bus join	No
Bus swap is global	Yes

Advanced

Effect of Alert and Evac	Tones
PTT input used for	PTT
No cascade disabled option	Yes
No speaker line monitoring	No

Digitised Speech Generation

Play Messages twice	No
Prepend Message 15	No
External Speech generation	No

Special WIP Keys / Display

WIP All / Group keys special usage	No
WIP2 Call All Operation	Toggle
WIP2 Call All Mirrors zone/wip	
WIP3 Call All Operation	Toggle
WIP3 Call All Mirrors zone/wip	
WIP1 Group Call Operation	Toggle
WIP1 Group Call Mirrors zone/wip	
WIP2 Group Call Operation	Toggle
WIP2 Group Call Mirrors zone/wip	
WIP3 Group Call Operation	Toggle
WIP3 Group Call Mirrors zone/wip	

Historical

Microvacs	0
SPIF Type	Normal

Printer Messages

Message 1 On	
Message 1 Off	
Message 2 On	
Message 2 Off	
Message 3 On	
Message 3 Off	
Message 4 On	
Message 4 Off	
Message 5 On	
Message 5 Off	

Customisations

Performance Mode	
Master wip won't ring if remote manual	Yes
WIPs still ring after 1 answered	No
SROM for each EMUX	
EMUX Special Setup	
Intercom local, remote	

Remote SIDs

This describes the properties of remote panels on the network, and whether the panel listed will accept/display All-Call, Ack and Reset, and System Fault from each remote panel.

SID Number	Panel ID	Panel Description	Audio Segments to reach	Accept All Call	Accept Ack and Reset	Accept System Fault
249	QE3410	Colour Graphics	1	No	Yes	Yes
64	QE2335	Building 64	1	No	Yes	Yes
13	QE2308	Building 13E	1	No	Yes	Yes
131	QE2309	Building 13C	1	No	Yes	Yes
132	QE2310	Building 13D	1	No	Yes	Yes
133	QE2311	Building 13F	1	No	Yes	Yes

Remote Zone Mapping
This describes the "group" each local zone is in, and what zones at other panels each local zone maps to. The group is used in the next table, Control Priority.

Local Zone	Zone Name	Local Group	Zones at SID 249	Zones at SID 64	Zones at SID 13
99	Building 64	2	99	1	
100	Building 64	2	100	2	
101	Building 64	2	101	3	
102	Building 64	2	102		
103	Building 64	2	103		
104	Building 64	2	104		
105	Building 13E	3	105		1
106	Building 13E	3	106		2
107	Building 13E	3	107		3
108	Building 13E	3	108		4

Control Priority
This describes each of the groups defined above. The “arbitrating SID” arbitrates manual control or isolate according to the SID priority list, and takes automatic control if no manual control or isolate is requested. The arbitrating SID for a zone should be the zone where the amplifiers are, and the zones should be arranged into groups so that this is the case.

Group	Arbitration and Auto Control here	SID priority	Arbitrating SID	Modbus Group	Ignore ECP Keyswitch	Alarm doesn't start cascade here	Remote amps at SIDs
0	Yes	247, 249		0	No	No	
1	No		249.1	1	No	No	
2	No		64	2	No	No	
3	No		13	3	No	No	
4	No		131	4	No	No	
5	No		132	5	No	No	
6	No		133	6	No	No	

c. General Script Interpretation

Overview

The following information about the I2000 script language is given so that you can understand some of the simpler logic equations in the scripts, e.g., for fault outputs and other relay outputs. It is not meant to be a complete reference or a tutorial for the I2000 script language.

Operators. The following are the operators in order of priority (highest first)

(..) Forces evaluation of the enclosed sub-expression at higher priority. May be nested - innermost brackets are evaluated first.

~ Negates the variable or bracketed expression to its right

& Logical AND of the variables or bracketed expressions to its left and right

| Logical OR of the variables or bracketed expressions to its left and right

= sets output if result of expression is true (1)

clears output if result of expression is false (0)

|= sets output if result of expression is true (1), does nothing if the expression is false. X|=expr is equivalent to X=X|expr.

&= clears output if result of expression is false (0), does nothing if the expression is true. X&=expr is equivalent to X=X&expr.

Multiple Outputs in one statement. This is best described by example -

An : evaluate expression for all values of n from 1 to MAX_ZONE, assign to An

An5-30 : evaluate expression for all values of n from 5 to 30, assign to An

V1n1-30 : evaluate expression for all values of n from 1 to 30, assign to V1

This latter could be used for example to find if any zone from 5 to 25 was in alert -

V1=0

V1n5-25|=An

IF statements

If the expression after the IF is true, statements between IF and ELSE are executed and statements between ELSE and ENDIF are not executed. If the expression is false statements between IF and ELSE are not executed and statements between ELSE and ENDIF are executed.

The ELSE statement is optional. If it is not present it is considered to be immediately before the ENDIF.

These statements may be nested to any level. ELSE and ENDIF statements relate to the most recent IF statement which has not already been matched.

d. Non-ECN Script Inputs and Outputs

Destinations (the items on the LHS of assignments)

Ax	Alert for zone x x is constant or 'n'
Ex	Evacuate for zone x
Px	PA for zone x
Mx	Music for zone x
Gx	PABX for zone x
Vx	user variable x (Reset to 0 in Manual or Isolate)
Ux	another user variable x, not reset to 0 in manual or isolate
Qx	Alert for Zone x if Alert Cascade is enabled, other Evacuate for Zone x
SAx	Speech msg x to be spliced with alert tones
SEx	Speech msg x to be spliced with evac tones

SMx Speech msg x to be played once to music zones (or all zones see Misc options) (Note to play the message again, 0 must be assigned before 1 is assigned again)

SCx Speech msg x to be played continuously to music zones (or all zones see Misc options)

Kx When 1 is assigned, increments counter x. When 0 is assigned, resets counter x.

RF1 FIP Relay 1

RF2 FIP Relay 2

RB1 BGA Relay 1

RB2 BGA Relay 2

RG1 GP Relay 1 (Also Paging Console active LED)

RG2 GP Relay 2

MA Select manual if keyswitch in auto for switch based "SECP"

IS Select isolate if keyswitch in auto for switch based "SECP"

PT Select PTT on for switch based "SECP"

SI Silence buzzer (actioned on true going edge of SI)

RES Reset latched faults & alarms (actioned on true going edge of RES)

LI Fluorescent light output on ECP

TA - TZ are timers, for example

TA30=1 (re)start timer TA for 30 secs,TA30=0 no effect

TC0=1 terminate timer TC immediately (run for 0 secs)

Timers must use = form of assignment (NOT |= or &=). They are retriggerable and the timer will be restarted every time the statement is executed.

Script INPUTS (items which may appear on the rhs of assignments)

Ax Alert for zone x x is constant or n, n+const, n-const

Bx BGA input x (Not necessarily assigned to a zone)

Ex Evacuate for zone x

Fx FIP input x (Not necessarily assigned to a zone)

Hx High level link (RZDU) FIP zone x (Not necessarily assigned to an EWIS zone)

Ix GP input x

Kx>y The value of counter x is higher than (const) y

Kx<y The value of counter x is lower than (const) y

Kx=y The value of counter x is equal to (const) y

Px PA for zone x

Qx Alert for Zone x if Alert Cascade is enabled, other Evacuate for Zone x

Ux Another set of user variables, not cleared in MANUAL.

Vx Set of user variables, cleared in MANUAL.

Wx WIP cct x off hook, or switch input is closed

WBx BGA is active on two wire WIP/BGA, switch input is closed, or 4 state switch input has 1200 ohms connected

WQx WIP cct x switch input is closed, or 4 state switch input has 600 ohms connected. Presence of WQx also signifies that cct x operates as a “quick” switch input.

Zx FIP or BGA alarm for zone x in AUTO only. Latching in AUTO.

AM	Any alarm input in AUTO only. Latching in AUTO. (for non-latching use FA|BA)
AU	Auto
BA	Any BGA alarm input
BZ	Unacked fault/alarm (buzzer operating)
CF	Charger fault including a remote charger fault if one is configured
EC	"Evacuate Cascade" – The Cascade Alert Phase has been disabled on-site.
FA	Any FIP alarm input
FL	Any Evac Fault (see also WIP fault below)
IS	Isolate
KA	Keyboard Auto
LF	Any evac line fault
MF	Any Module fault
MA	Manual
RES	Faults have been reset by pressing mute for 2 seconds Note RES is returned as true once only.
T	Press to talk
TA - TZ	Timer A - Z running
WF	Wip Fault
WM	Wip Master Ringing for longer than timeout
ZA	Any zone active (Alert/Evac/PA+PTT/PABX

The user variables Vx are all cleared in MANUAL, but the variables Ux are not.

Default Relay Programming

The default programming for FIP, BGA, and GP relays (if you program none of them) is

RF1=ZA

RF2=FL|FA|BA

RB1=FL

RB2=FA|BA

RG1=ZA

RG2=IS|MA

If you program any relay, there are no defaults and you must program all the relays you need.

e. ECM Script Inputs and Outputs

Script Inputs

AM	latched alarm
AUg	auto for group g
An	alert zone n
As/n	alert sid s zone n
BA	any BGA alarm
BZx	BGA zone x active
BZLx	BGA zone x latched or acked

Bn	BGA alarm circuit n
CF	charger fault
CLg	control currently local for group g
CLg,s	control for group g currently at SID s
Cn	modbus bgm zone n
Dn	modbus pabx zone n
EBn	EMUX n busy (still playing "once" messages) (If no "n", any EMUX)
ET	ECM PTT Input active
En	evac zone n
Es/n	evac sid s zone n
ESF	external (doubletalk) speech generator fault
ES	external speech generator is playing speech
FA	any fip alarm
FL	any fault excluding WIP line faults and Charger faults
FZx	FIP zone x active
FZLx	FIP zone x latched or acked
Fn	fip alarm circuit n
Gn	pabx zone n
Hs/n	high level input sid s zone n (RZDU = sid 0)
JP	join the other pa bus segment
JW	join the other wip bus segment
ISg	isolate group g
In	gp / paging input n
ICn	paging input n has changed due to keypress
(returned TRUE only once for each keypress on paging console.	
Requires paging console V1.10+)	
Kx>y	The value of counter x is higher than (const) y
Kx<y	The value of counter x is lower than (const) y
Kx=y	The value of counter x is equal to (const) y
LF	"line" fault - any zone fault
MAg	manual group g
MF	module fault
Mn	music zone n
NFn	node fail for SID n
PBU	PA Bus used
PBF	PA Bus fault
PHR	Phone is ringing
PHC	Phone has call tone
Pn	pa zone n

Ps/n	pa zone n at sid s
PIn	parallel input n (1..16). Use of this also sets the pins direction to an input.
PT	local ptt
PTn	ptt for group n
STAn	strobe alert circuit n
STEn	strobe evac circuit n
SWB	WIP / PA busses have swapped due to fault
SWKn	special wip key n //1=ALL_CALL2, 2=ALL_CALL3, 3=GROUP1, 4=GROUP2, 5=GROUP3
TA..TZ	timers a-z
Tx>y	timer x (1..200) has been running for more than y secs
Tx<y	timer x (1..200) has been running for less than y secs
T	ptt from local ECP or colour graphics
Tx	ptt for group x
Un	U variable n
Us/n	U variable n at sid S
Vn	V variable n
Vs/n	V variable n at sid S
WBU	Wip Bus used
WBF	Wip Bus fault
WF	wip line fault
WC0	any wip connected on 1st SPIF
WC1	any wip connected on 2nd SPIF
WMR0	wip master ringing due to wip on 1st SPIF group
WMR1	wip master ringing due to wip on 2nd SPIF group
WA	wip auto answer mode selected
Wx.y	WIP zone x column y (y = 1,2, or 3)"off hook"
WRx.y	WIP zone x column y (y = 1,2, or 3)"ringing" (Being called or calling)
WAx.y	WIP zone x column y (y = 1,2, or 3) active "off hook" OR "ringing"
Wn	wip circuit n off hook, or closed
Xn	X zone set zone n
ZA	any zone active (alert/evac/pa&ptt/pabx
ZCx	zone x cleared
ZMx	zone x manned
Zn	zone n has latched alarm
Zn<x	This is less than the nth time cascade script has been run with zone n in alarm
Zn=x	This is the nth time cascade script has been run with zone n in alarm
Zn>x	This is greater than the nth time cascade script has been run with zone n in alarm

Script Outputs

AM	force alarm processing to begin even though no alarm in a zone at this node.

An alert zone n

Cn modbus music zone n

CI use initial timeout

CM force connect microphone

CTx=1 within cascade script, change timeout to NEXT to x secs

DC disable slave wip confidence tone

DR disable master wip ring

Dn modbus pabx zone n

En evac zone n

ES set to 1 to start external (doubletalk) speech generator. It will reset by itself when finished.

Gn pabx zone n

ISg request isolate for group g

Kx When 1 is assigned, increments counter x. When 0 is assigned, resets counter x.

LI ECP fluorescent light output (requires ECP V3.19)

MAg request manual for group g

Mn music for zone n

MSn log (print) message n

PBU Force PA Bus to appear used

PBF Force PA Bus to appear faulty

Pn PA for zone n

PCn Controls LED n for paging console (V1.10+). For consoles other than first, add the number of for previous consoles to n

POn parallel output n (1..16)

PHR Force Phone to ring

PHC Force call tone in Phone

PJ force PA join to other buss segment

PX force PA external connection

RFn FIP relay n (relays 1,2 1st module, 3,4 2nd module etc)

RBn BGA relay n (relays 1,2 1st module, 3,4 2nd module etc)

RGn GP / Paging console relay n (relays 1,2 1st module, 3,4 2nd module etc)

RE restore saved alert/evac if 1 assigned

SAn enable msg n with alert tones if 1 assigned

SEn enable msg n with evac tones if 1 assigned

SMn play msg n once to Music zones if 1 assigned

SCn play msg n continuously to Music zones if 1 assigned

STAn strobe alert circuit n

STEn strobe evac circuit n

SV save current alert and evac state (for RE)

SWB swap WIP / PA busses due to fault

SWF show WIP faults on fault leds default TRUE. When false shows wip manned

SXAa=1 - Play msg a with alert tones to X zone set. To stop set zone set all false.

SXEa=1 - Play msg a with evac tones to X zone set. To stop set zone set all false.

SXOa=1 - Play msg a once to X zone set

SXRa=1 - Play msg a repeatedly to X zone set. To stop set zone set all false.

SXO0=1 - break once messages, wait for EMUX to be ready or 20secs

In all cases if the expression on the rhs evaluates to 0, the statement

has no effect.

In all these cases it is the X zone set at the time which counts -

the X zones can be changed between the above statements.

TAn(-TZn)=1 start timer A (-Z) running for n seconds

Tn=1	allow timer n (1..200) to run (increment)
Tn=0	reset timer n
Un	U variable n
Vn	V variable n
WA	enable WIP auto answer mode
WBU	Force Wip Bus to appear used
WBF	Force Wip Bus to appear faulty
WEx	WIP_ENABLE for modbus group x
WMAx	Wip manned for WIP circuit x
WX	Force WIP external connection
Xn	X zone set, zone n
ZS	enable zone faults/alarms to be simulated
ZBn	zone bga alarm simulation
ZFn	zone fip alarm simulation
ZAn	zone audio fault simulation
ZIn	zone input fault (fip/bga fault) simulation
ZWn	wip 1 off hook simulation
ZXn	wip 2 off hook simulation
ZYn	wip 3 off hook simulation
ZCn	zone cleared (use only for zone which has local arbitration)
ZMn	zone manned (use only for zone which has local arbitration)
ZTn	wip 1 fault simulation
ZUn	wip 2 fault simulation
ZVn	wip 3 fault simulation

f. Fault Output and other relay outputs

A fault output will be provided by default (if there is hardware available). This will use a FIP / BGA module relay output, a spare STRM output, or a relay connected to the ECP fluorescent light output if it is otherwise unused.

Other relay outputs will be provided if specified on the panel's configuration sheet.

Section 5 Transformer Modules

5.1. Panel Termination

The speaker line transformer modules, TRAN9705, TRAN9706, HTRN9308, and TRAN200 are located down the inner wall on each side of the cabinet(s) and contain the 100V line transformers and monitoring circuits, as well as providing termination points for speaker zone wiring. (Older transformer module types are TRAN8872 and TRAN9304.)

Speaker zone wiring must be terminated to the correct zone number designated by Tyco on the label on the speaker line transformer module at the time of manufacture. If subsequent modifications are made to the configuration you must consult the latest configuration printout to locate the correct output terminals to connect a given zone's speaker line(s).

If a zone has more than one amplifier assigned, all amplifiers must have separate cables to separate groups of speakers. It is not possible to parallel amplifier outputs.

Please note that the 26 way ribbon cables which run from the transformer modules to the Backplane have Pin 1 at one end connected to pin 26 at the other end. This is different to the 26 way cable which runs from the backplane to the signals interface module. Be careful not to mix these two cable types.

TRAN9304-2, TRAN9304-4, TRAN9705-2, TRAN9705-4, and TRAN9706-2 have relays fitted and can switch in one or more standby amplifiers to replace any faulty amplifier(s). TRAN9304-2 and TRAN9304-4 can only be used in systems with standby amplifiers. TRAN9705-2, TRAN9705-4, and TRAN9706-2 can be used in systems with or without standby amplifiers, with appropriate link settings. The HTRN9308 and TRAN200 always have standby relays fitted but do not require jumpers to select whether or not they are used.

5.2. Panel Termination

The diagrams below show the connection points for the speaker wiring on the different transformer modules.

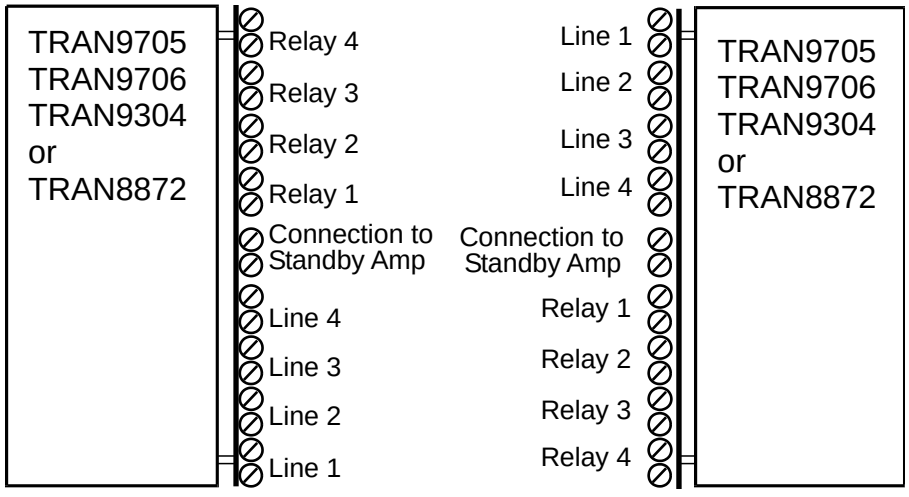
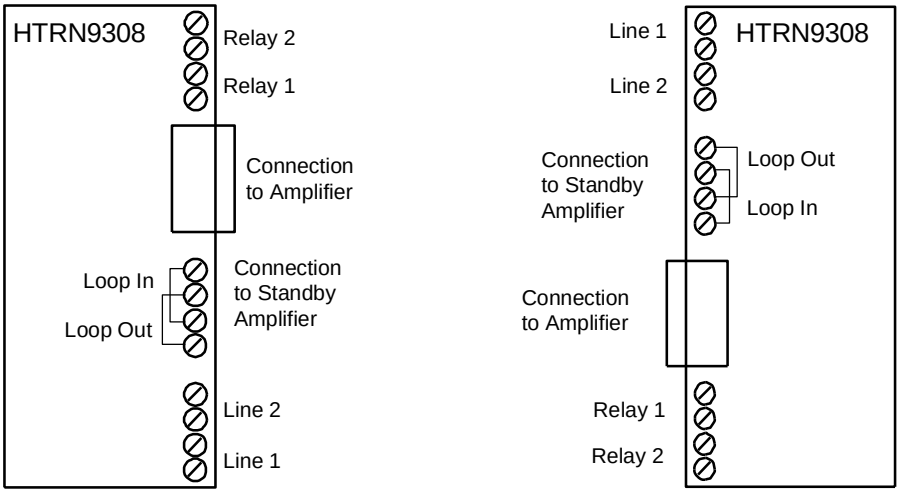


Figure 5-1: 10W and 25W Transformer



(Note for 100W Modules, use Line 1 and Relay 1)

Figure 5-2: 50W and 100W Transformer Modules (See also Music Switching Transformer Modules)

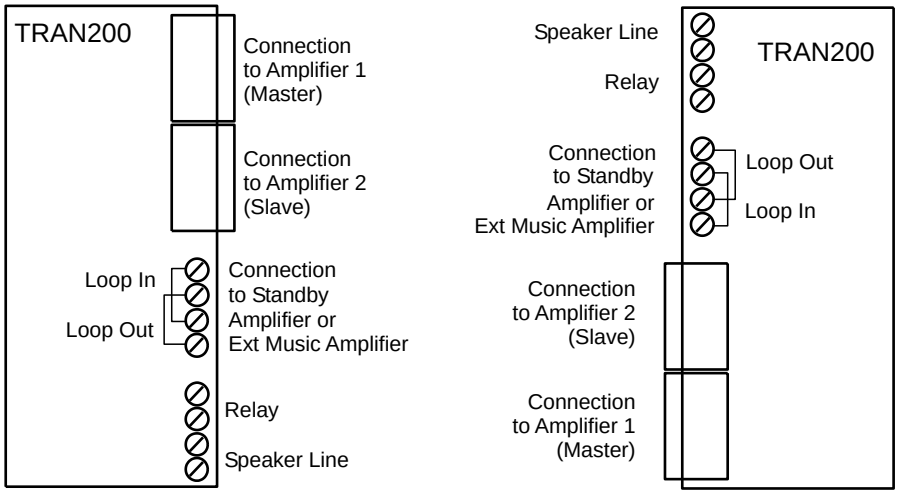


Figure 5-3: 200W transformer Module

The following table shows the signal outputs and relay outputs available on each model.

Model	Configuration	AMP Modules	Signal Outputs	Relay Outputs
TRAN8872-1 TRAN9304-1	4 * 10W	1 * EAMP	1,2,3,4	1,2,3,4
TRAN9304-2	4 * 10W with relays	1 * EAMP	1,2,3,4	None
TRAN8872-2 TRAN9304-3	2 * 25W	1 * EAMP	2,4	1,3
TRAN9304-4	2 * 25W with relays	1 * EAMP	2,4	1,3
TRAN9706-1 or TRAN9706-2 with LK1 - LK4 removed	4 * 10W	1 * EAMP	1,2,3,4	1,2,3,4
TRAN9706-2 with LK1 - LK4 inserted	4 * 10W with relays	1 * EAMP	1,2,3,4	None
TRAN9705-3 or TRAN9705-4 with links LK1 - LK2 removed	2 * 25W	1 * EAMP	1,2	1,2

TRAN9705-4 with links LK1 - LK2 inserted	2 * 25W with relays	1 * EAMP	1,2	1,2
TRAN9705-1 or TRAN9705-2 with links LK1 - LK2 removed	4 * 25W	2 * EAMP	1,2,3,4	1,2,3,4
TRAN9705-2 with links LK1 - LK2 inserted	4 * 25W with relays	2 * EAMP	1,2,3,4	1,2,3,4
HTRN9308-1	2 * 50W	1 * HAMP	1,2	1,2
HTRN9308-2	1 * 100W	1 * HAMP	1	1
TRAN200	1 * 200W	2 * AMP200	1	1

The connections to the Amplifier (and Standby Amplifier if any) will be wired in the factory. However if you are extending a system by adding more amplifiers, note the following required connections.

10W and 25W modules

Fit a 26 way ribbon cable (LM0047) between the connector on the backplane behind the related amplifier and the transformer module. If you are adding a 4 * 25W TRAN9705-1 or TRAN9705-2, you will need two ribbon cables if both amplifier modules are used, one for each amplifier module.

50W and 100W modules

Fit a 26 way ribbon cable (LM0047) between the connector on the backplane behind the related amplifier and the transformer module. Also wire the 4 pin removable plug on the amplifier to the similar plug on the related transformer module, pin 1 to pin 1, pin 2 to pin 2, pin 3 to pin 3 and pin 4 to pin 4. Use 2.5mm2 wire and keep the length as short as possible.

200W modules

Fit a 26 way ribbon cable (LM0047) between the connector on the backplane behind the “master” amplifier module and the 200W transformer module. Also wire the 4 pin removable plug on the ”master” amplifier module to the HAMP1 IN plug on the 200W transformer module, and the 4 pin removable plug on the ”slave” amplifier module to the HAMP2 IN plug on the 200W transformer module. Both these cables should be connected pin 1 to pin 1, pin 2 to pin 2, pin 3 to pin 3 and pin 4 to pin 4. Use 2.5mm2 wire and keep the length as short as possible.

5.3. Standby Amplifiers

If you are extending a system with standby amplifiers, note that the LINE OUTPUT of the standby amplifier transformer module loops through the STANDBY terminals of all other transformer modules. If there are multiple groups of amplifiers each with their own standby amplifier, the LINE OUTPUT of each standby amplifier transformer module connects to the STANDBY terminals of all transformer modules belonging to amplifiers in the same group. (The connector is labelled STBY/MUSIC on the TRAN200.)

5.4. Link Settings

On the TRAN9705-2, TRAN9705-4 and TRAN9706-2 there are links to select whether the system has standby amplifiers or not. Links LK1 and LK2 on the TRAN9705-2 and TRAN9705-4 and links LK1, LK2, LK3, and LK4 on the TRAN9706-2 must be inserted if the system has standby amplifiers and removed if the system has no standby amplifiers.

On the TRAN200, there are 3 links LK1, LK2, and LK3 which must all be installed in the S position unless the transformer module is used to switch in the output of an external "Music" power amplifier under non-emergency conditions. Refer to Music Switching Transformer Modules.

5.5. Amplifier Numbering

In order to find the termination point for a given amplifier it is necessary to relate the amplifier numbers shown on the configuration printout with the amplifiers and transformer modules in the panel. There are always 4 amplifier numbers per amplifier module. If the module is 4 * 10W, each amplifier has a single number. If the module is 2 * 25W, each 25W amplifier is given 2 successive numbers so that the two amplifiers make up a group of four numbers. If the module has 2 * 50W, the two amplifiers are given the first two numbers of a group of four, and the last two numbers in the group of four are unused. If the module has 1 * 100W, the amplifier is given the first number of a group of four, and the last three numbers in the group of four are unused. With a 200W amplifier the first amplifier number on the "master" amplifier module is used, with the remaining 3 numbers on the master module and all 4 numbers on the slave module being unused.

The amplifiers are numbered from left to right in each card cage, and the card cages are numbered from top to bottom within each cabinet. Thus there are 20 amplifier numbers for each card cage.

With most transformer modules, there are 4 amplifier numbers per module. However with the 4 * 25W TRAN9705 modules, there are two amplifier modules corresponding to it and there are eight amplifier numbers per transformer module. With the 200W transformer module, there are 8 corresponding amplifier numbers.

The transformer modules are arranged in order down the left side of the gear plate then down the right side. It is possible to locate a given amplifier number by counting down the left side of the cabinet, then down the right side, counting eight for each 4 * 25W transformer module and four for each other type of transformer module.

5.6. Cable Size, Type and Length

The speaker cable cross section required can be obtained from the following table for various loads. This table is calculated to keep voltage drops at about 5%.

Cable Length	10 Watt Load	25 Watt Load	50 Watt Load	100 Watt Load	200 Watt Load
100m	0.75 mm2	0.75 mm2	0.75 mm2	1 mm2	1.5 mm2
200m	0.75 mm2	0.75 mm2	1 mm2	1.5 mm2	4 mm2
300m	0.75 mm2	0.75 mm2	1.5 mm2	2.5 mm2	6 mm2
500m	0.75 mm2	1 mm2	2.5 mm2	4 mm2	10 mm2
700m	0.75 mm2	1.5 mm2	4 mm2	6 mm2	15 mm2
1000m	1 mm2	1.5 mm2	4 mm2	10 mm2	20 mm2

The inherit capacitance of speaker cables presents a load to the amplifier that must be considered, particularly for long cables and small amplifier sizes. The table below shows the maximum cable capacitance that each amplifier size can support, and the equivalent cable length for unshielded and shielded cable.

(The table is calculated to keep the capacitive load current with a full amplitude 3kHz signal at no more than 30% of the full load resistive current.)

Amplifier Rating	Maximum Cable capacitance	Maximum cable length with unshielded cable	Maximum cable length with shielded cable
10W	15nF	150m	50m
25W	40nF	400m	125m
50W	80nF	800m	250m
100W	150nF	1000m	500m
200W	300nF	1000m	1000m

Segregation (Australia)

As speaker wiring has a higher voltage than ELV, it is classed as LV communications wiring and to comply with AS/ACIF S009:2006 it must be segregated from ELV wiring (detector loops, communications wiring, etc). There is little benefit in having it shielded and therefore it should be unshielded so as to minimise capacitance. Note speaker wiring must also be segregated from mains wiring. Refer to AS/ACIF S009:2006 for more details of the segregation requirements.

Segregation (New Zealand)

As speaker wiring has a higher voltage than ELV, it must be double-insulated but may then be in the same conduit as ELV wiring. If there is detector loop or communications signal wiring in the same conduit, the speaker wiring should be shielded to minimise crosstalk from the communication signals to the speakers and vice versa. Otherwise, there is little benefit in having it shielded and therefore it should be unshielded so as to minimise capacitance.

Note - using shielded cable may require a higher amplifier rating than would otherwise be needed. Therefore it may be worthwhile to make the speaker wiring unshielded and segregate it from ELV wiring (i.e., spaced 100mm or more away and probably in a separate conduit).

5.7. Termination to Each Speaker

Speakers must be wired in a parallel connection across the 100V zone speaker line as indicated in the diagram below. The speakers must be designed for a 100 Volt line. This normally means the speakers will have transformers fitted. Usually these transformers have tappings to select different power ratings. You must select the tapping required to give the required sound level. The total load of all the speakers on a given amplifier must not exceed the amplifier's rating. For example if there are 50 speakers on a 50 watt amplifier, each one must be tapped at no more than 1 watt (or they may be tapped at a mixture of different ratings so that the total load is less than or equal to 50 watts).

Each speaker must have a Bi-polar capacitor fitted in series with the speaker as indicated in the diagram below. (Some speakers designed for EWIS systems come with capacitors already fitted). A suitable value is 1 - 5uF per watt of speaker power rating, e.g. for a speaker set to 0.5W a capacitor of 0.5uF to 2.5uF is required, while for a speaker of 10W a capacitor of 10uF to 50uF is suitable. Values up to 1uF may be obtainable in a polyester foil type, while for larger values Bi-polar Electrolytic types are required. The capacitor's voltage rating must be 10V or higher. It is possible to use a higher value capacitor for all speakers, e.g. 33uF, but if you do and there are a large number of low powered speakers on the circuit, the DC voltage on that circuit will be slow to stabilise and the panel may indicate a line fault shortly after power up. The fault will be able to be cleared when the voltage has stabilised after a few minutes.

A 56k ohm 1/4W end-of-line resistor must be placed across the 100V line at the end of the speaker line.

It is also possible to have two branches on the speaker lines, with each one terminated in 150k for 10W and 25W amplifiers, or 180k for 50W, 100W and 200W amplifiers. These values are higher than 2 * 56k to ensure that a fault is generated if only one branch is open circuit.

This wiring is shown in the diagram below.

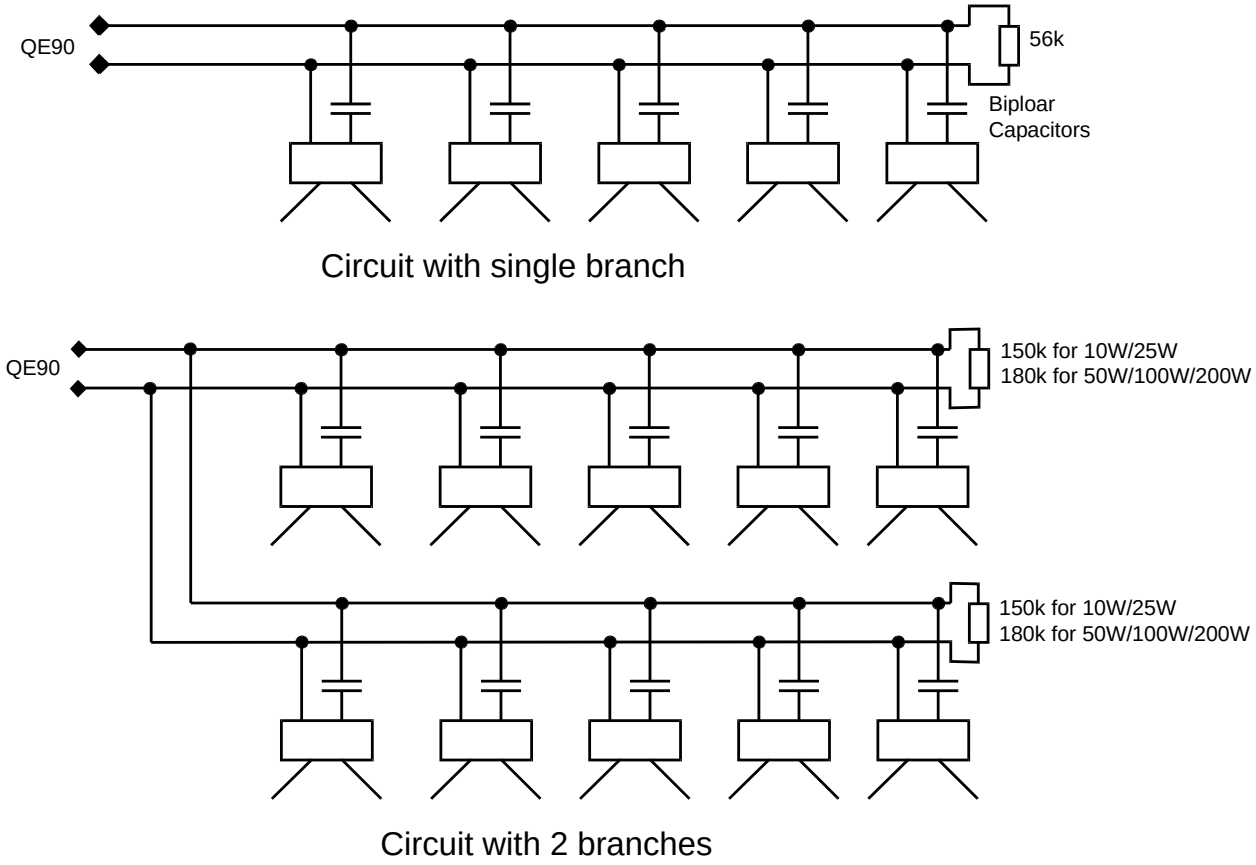


Figure 5-4: Speaker Wiring showing capacitors and End of Line Resistor

5.8. Checking Speaker Loadings

It is strongly recommended that you check the impedance of each speaker line once all the speaker taps have been set, and before connecting to the I2000. A suitable impedance meter is the TOA ZM-104. The minimum impedance measurement must be as follows -

Amplifier Size	**Minimum impedance**
10 Watts	1000 ohms
25 Watts	400 ohms
50 Watts	200 ohms
100 Watts	100 ohms
200 Watts	50 ohms

If the measured impedance is less than that specified above, you will need to reduce the power tapping on some speakers, or upgrade the amplifier power rating. Failure to observe these ratings can result in overheating and/or damage to the I2000.

5.9. Checking Speaker Wiring

A quick check can be made of the speaker wiring by measuring the DC resistance across the speaker lines at the MECP end. The resistance measured must be within 5% of 56 kΩ for a single branch

circuit, or within 5% of 75 kΩ for a two branch circuit on a 10W / 25W amplifier, or within 5% of 90 kΩ for a two branch circuit on a 50W / 100W / 200W amplifier. (This DC resistance has nothing to do with the AC impedance of the load discussed above.)

Note that due to the capacitors connecting to the speakers, the reading may be slow to stabilise. To perform this check, each speaker line must be removed from its respective I2000 termination point and a multimeter placed across the unconnected line.

Also check that both sides of the line are isolated from ground.

Alternatively once the system has been powered up, measure the DC voltage across the line. It should be 2.5V ± 0.1V. This voltage will be slow to stabilise immediately after power up or after removal of a fault.

NOTE - If you have two branches wired as shown, the DC voltage across the line should be 2.86V ± 0.1V for 10W and 25W amplifiers, and 3.08V ± 0.1V for 50W, 100W and 200W amplifiers.

5.10. Zone Relays

The zone relay termination points provide a switched 24V DC output for emergency override control of local zone background music volume controls when fitted, or for silencing external non emergency amplifiers.

This 24V output is normally energised and is switched off whenever the zone is emitting emergency tones or emergency public address or non-emergency paging. The zone relay output is wired to the override relay of the local volume control so that when the relay output switches off the relay de-energises and bypasses the local volume control. The diagram below shows how this can be arranged with an autotransformer type volume control. This arrangement preserves the line monitoring regardless of whether the control is in circuit or not.

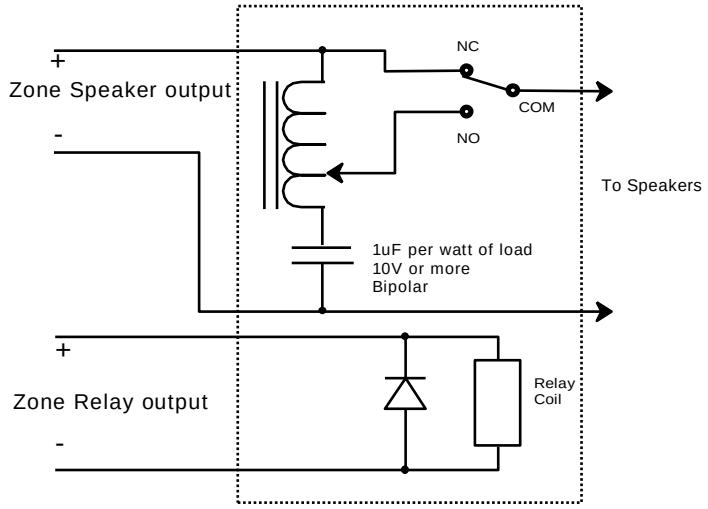


Figure 5-5: Override relay for music volume control

5.11. LEDs

The HTRN9308 modules have two red LEDs. Each LED, when ON, indicates that one of the amplifiers relating to that module has failed and that a standby amplifier is switched in to replace it. This will only occur on systems with one or more standby amplifiers configured.

The TRAN200 module has 1 red LED. This indicates that the circuit has a standby amplifier switched in due to amplifier failure, or if the module is set up to switch in an external “music” power amplifier under non-emergency conditions, the external amplifier is switched in.

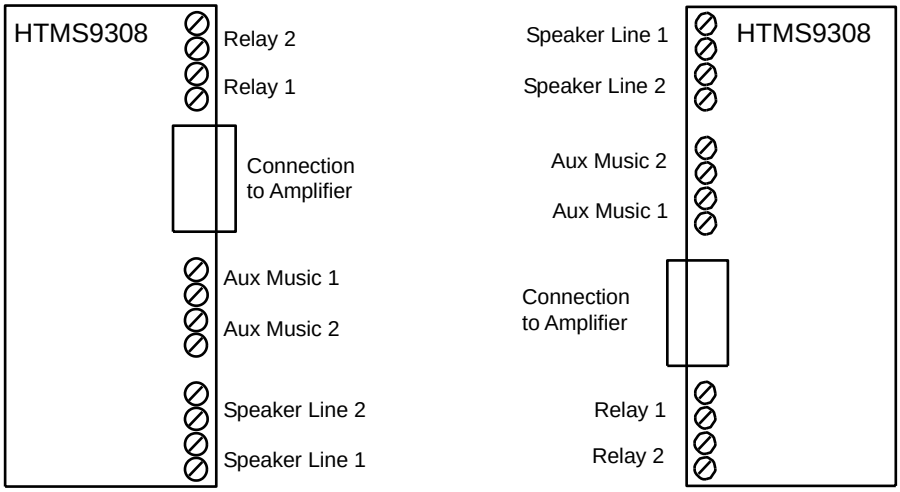
5.12. Music Switching Transformer Modules

Special models of transformer module (HTMS9408-1 and HTMS9408-2) are available for 50W and 100W amplifiers, which have the feature that a third party amplifier output may be connected to the terminals on the module labelled AUX MUSIC. These modules will route the third party amplifier to the speakers at all times except for when there are emergency tones being generated by the I2000. However these module will allow the I2000 to monitor the speaker lines regardless of which amplifier is "connected" to the speakers.

This module is wired up as a normal 50W / 100W module, except that the external amplifier is connected to the AUX MUSIC 1 terminal pair (if 100W) , or the AUX MUSIC 1 and 2 terminal pairs if 2 * 50W.

Standby Amplifiers cannot be used with these modules.

The 200W transformer module (TRAN200) can be configured to switch in the third party amplifier as above, by setting all three links LK1, LK2, and LK3 on the module to the "M" position. In this case a Standby Amplifier cannot be used for the circuit.



(Note for 100W Modules, use Line 1, Aux Music 1, and Relay 1)

Figure 5-6: Connection Points for 50W and 100W Music Transformer Modules

Section 6 Amplifiers

6.1. Amplifier Types

There are three kinds of amplifier modules

- EAMP9001 which can be configured as 4 * 10W or 2 * 25W (or now unused 1 * 50W)
- HAMP9308 which can be configured as 2 * 50W or 1 * 100W
- AMP200 which can be used in pairs as 1 * 200W per pair

All have a similar set of options which can be selected by links on the module.

6.2. Links

a. Power Selection

The number and power of the amplifiers are set with the links on the module.

EAMP9001		
Link	**Position**	**Description**
5	Fitted	4 * 10 Watt
	Removed	2 * 25 Watt
6	1-2	4 * 10 Watt
	3-4	2 * 25 Watt
7	Fitted	4 * 10 Watt
	Removed	2 * 25 Watt
8	1-2	4 * 10 Watt
	3-4	2 * 25 Watt
9	1-2	4 * 10 Watt OR 2 * 25 Watt
	3-4	Obsolete 1 * 50Watt

HAMP9308		
Link	**Position**	**Description**
3	50W+50W	2 * 50 Watt
	100W	1 * 100 Watt
5	Fitted	2 * 50 Watt
	Removed	1 * 100 Watt
8	Removed	2 * 50 Watt
	Fitted	1 * 100 Watt

b. AMP200 Master/Slave Selection and Interconnection

The AMP200 has three links LK12, LK13, and LK14 which must all be fitted in the M position on the master amplifier module, and in the S position on the slave amplifier module.

- All the remaining link settings apply to the master module only. (The remaining link settings on the slave module are immaterial.)
- Any local input must be connected to the master module.
- The ribbon cable to the transformer module (TRAN200) must come from the backplane connector behind the master module. The ribbon cable connection behind the slave module is not used.
- The volume control to be used is on the master module. The setting of the volume control on the slave module is immaterial.
- Only the master module is listed on the configuration listing.
- The slave module must be adjacent to the master module.
- The master module and slave module are connected with a four wire cable connecting to connector J4 on each module.

c. Default Input Selection

Each amplifier has a link to select the default input to be used when no other signal is selected, i.e. none of Alert Tone, Evacuate Tone, PA Speech, Non-emergency Paging (PABX) or Music are selected.

These are LK1 - 4 for the EAMP9001, LK1-2 for the HAMP9308 and LK1 for the AMP200.

The following are the options for each of these links.

Position	**Selection**
SILENCE	No Audio Signal
AUX – BUS	AUX input on the signals interface module. (Refer to Background Music Input Facility and to SECP and Remote Equipment Rack Interface.
Removed	Local Input connector on the amplifier module. (Refer to Local Inputs)

	Amps Affected				
Link	**4 * 10W**	**2 * 25W**	**2 * 50W**	**1 * 100W**	**1 * 200W**
1	Amp 1	Amps 1 + 2	Amp 1	Amp 1	Amp 1
2	Amp 2		Amp 2		
3	Amp 3	Amps 3 + 4			
4	Amp 4				

d. Amplifier Monitoring Disable

Links 10 and 11 on all types of amplifier module may be removed to disable the amplifier fault monitoring in the software (but not the speaker line supervision). If the monitoring is disabled, you can also turn off the test tone by removing LK5 and LK7 and resistors R2 and R30 on the EAMP9001, removing LK4 and LK5 on the HAMP9308, or removing LK4 on the AMP200. This is intended for very special purposes only, when it is done the system does not fully comply with AS2220.

e. Local Inputs

Each amplifier has its own local input which may be selected when no other signal is active. (See Default Input Selection above). These are terminated on the 6 way connectors on the inside edge of the module. Mating Connectors are available, Tyco part code CN0256 CONNECTOR,PHOENIX,6W,MSTB 1.5/6-ST,SNGL HT,FEMALE.

These inputs can be used for non-emergency Music or PA Signals from third party PA equipment, or non-emergency PA signals from the Tyco PA0688 Microphone Preamp module, when a number of different channels are required for different zones, groups of zones, or sub zones. To have different non-emergency signals fed to different parts of an Evacuation zone, it is necessary for that zone to have more than one amplifier configured.

As these inputs are unbalanced they should normally be connected with line isolating transformers. Refer to ALIM9706 on Amplifier Local Inputs and PA0688 Wiring.The signal required at these inputs is 300mV RMS.

The Pin connections are as follows-

Input Pin	**EAMP9001**		**HAMP9308**		**AMP200**
	4 * 10W	**2 * 25W**	**2 * 50W**	**1 * 100W**	**1 * 200W**
1(Bottom)	Input 1	Input 1	Input 2		
2	Ground	Ground	Ground	Ground	
3	Input 2				
4	Input 3	Input 2	Input 1	Input 1	Input 1
5	Ground	Ground	Ground	Ground	Ground
6 (Top)	Input 4				

f. Amplifier LEDs

EAMP9001 LEDs			
Led	Colour	Position	Indication when ON
D5	Red	Top	Power Available for amplifiers 1 and 2
D6	Red	Bottom	Power Available for amplifiers 3 and 4

HAMP9308 LEDs			
Led	**Colour**	**Position**	**Indication when ON**
LD1	Green	Top	Power Available for amplifier 1
LD2	Red	Top	Amplifier 1 switched off due to overload
LD3	Red	Bottom	Amplifier 2 switched off due to overload
LD4	Green	Bottom	Power Available for amplifier 2

AMP200 LEDs			
Led	**Colour**	**Position**	**Indication when ON**
LD1	Green	Top	Power Available
LD2	Red	Top	Amplifier switched off due to overload

The red LEDs on the HAMP9308 and AMP 200 indicate that the speaker load is greater than the amplifier's rating, or the output is short circuited, and the amplifier has briefly switched off to prevent damage. Both LEDs of the HAMP9308 will operate in unison in 1 * 100W mode, and the LEDs on both amplifier modules will operate in unison on the AMP200.

g. Amplifier Adjustments

All amplifier types have controls to adjust the power output. Note however in terms of efficiency and battery capacity that it is preferable to reduce the volume by adjusting the speaker taps to a lower setting and leaving the controls turned right up (fully clockwise), rather than by using the volume controls.

EAMP9002 Controls			
Control	**Location**	**Amps affected 4 * 10W**	**Amps affected 2 * 25W**
VR1	Top	1	1 & 2
VR2	Second Top	2	
VR3	Second Bottom	3	3 & 4
VR4	Bottom	4	

HAMP9308 Controls			
Control	**Location**	**Amps affected 2 * 50W**	**Amps affected 1 * 100W**
VR1	Top	1	1
VR2	Bottom	2	

AMP200 Control		
Control	**Location**	**Amps affected**
VR1	Top of Master	1

HAMP9308 and AMP200 sensitivity change

HAMP9308 Revision 9 and AMP200 Revision 3 had their sensitivity reduced slightly (compared with previous revisions) to match that of the EAMP9001. If you are replacing one of these amplifiers and the sensitivity would have changed, the Volume control(s) should be re-adjusted, not simply set to the same physical rotation position as the controls were on the old card. If this is not possible, rotate the control about 10% clockwise from the old position if changing to a lower sensitivity revision, or about 10% anticlockwise from the old position if changing to a higher sensitivity revision.

Section 7 WIP Phone Termination Modules

7.1. General

The **WTRM2000** WIP termination module is the latest module and is used for terminating up to 30 WIP phones with an optional BGA device at the phone connected across the same two wires. It may also be used for FIP and general purpose inputs. The WTRM2000 connects to a WIPS2000 module in the card cage.

The older **WTRM9007** WIP termination module is primarily used for terminating up to 30 WIP phones, but as of November 1997 it can also be used for terminating FIP, BGA, and general purpose switch inputs. The WTRM9007 connects to a WIPS9004 module in the card cage.

The **MWIP9903** terminates up to 8 circuits and is described in MWIP9903 8 Circuit WIP Module.

With appropriate software the WTRM9007 and MWIP9903 modules may be used for terminating a mixture of WIP phones and FIP and/or BGA inputs. This is used mainly in small systems where there are spare WIP circuits which would otherwise be unused. This feature also allows a collocated WIP phone and BGA device to share a 3 wire cable. Using WIP circuits in this manner requires WIPS9004 software version 1.50 or higher, and for a system with no ECMs, ECP software version 4.10 or higher, or for a system with ECMs, ECM software version 1.50 or higher.

The WTRM2000 / WTRM9007 WIP Phone Termination module is usually located on the left hand mounting rail inside the system. Depending upon the number of WIP phones required, up to 6 WIP termination modules may be fitted.

The WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.

Remote WIPs can be connected over derived signalling systems by using two **RWIF9803** modules (refer RWIP9803 Remote WIP Interface).

7.2. WTRM2000 Wiring

a. General

Each WTRM2000 termination module provides terminations for up to 30 WIP phones and/or switch circuits. Compatible types are Vigilant FP0938, Aiphone TBRC, Aiphone TB-SE RED T, Altronics A2095 Firephone, and Altronics A2096 Firephone. For new installations the Vigilant FP0938 is recommended as it is the only phone that complies with AS/ACIF S004.

The first termination module provides circuits 1 - 30, the second module circuits 31 - 60, and so on.

There may be 1, 3, or a variable number of WIPs per evacuation zone. The configuration printout supplied with the system has details of which circuits are assigned to which zones.

It is recommended that a 0.75mm2 shielded pair be used for each WIP circuit, however for short cable runs unshielded cables can be used with slightly higher susceptibility to induced hum and noise. The shields must be connected to the metal chassis at the MECP. Cables should be no longer than 1000m.

Refer to the diagram below which shows the wiring for a normal WIP circuit (with an optional zone manned pushbutton), a FIP circuit, a WIP and BGA sharing a 3 wire cable, a WIP and BGA sharing a 2 wire circuit, and a two wire circuit which provides 2 General Purpose inputs.

Note the FP0938 phone is polarity sensitive, while the other models are not.

The terminals labelled 0V will be wired in the factory. When expanding a system wire one of them to the 0V terminal on the Backplane.

Note that the 3 wire WIP / BGA circuit is wired with the – terminal common on the WTRM2000. (The + terminal is common on the WTRM9007.)

Note - AS2220.1 prohibits connecting more than one phone to a circuit as they then cannot be individually addressed. In any case it is recommended that you do not connect more than one phone to a circuit as there can be spurious fault indications when more than one phone is off-hook.

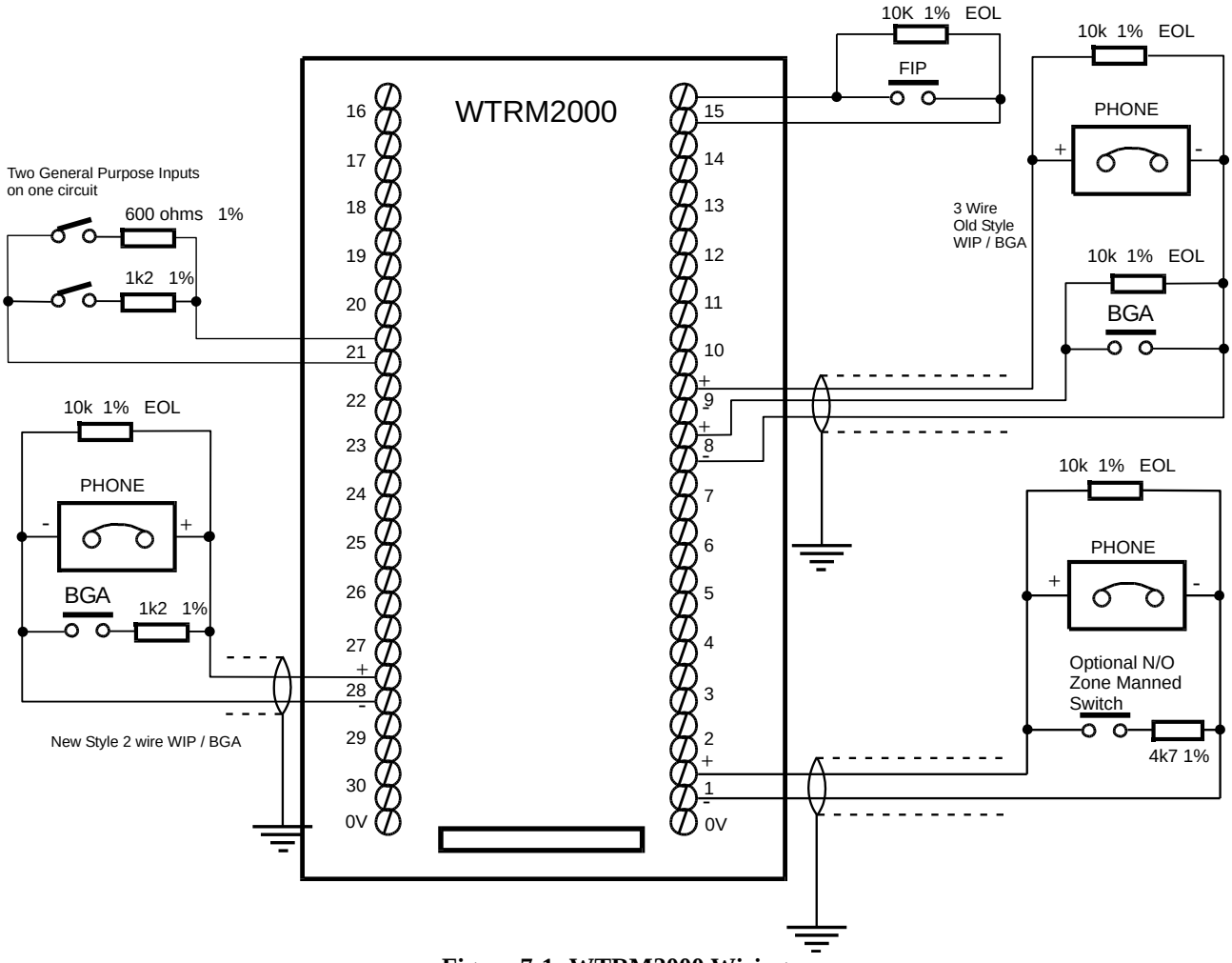


Figure 7-1: WTRM2000 Wiring

b. WTRM2000 End of Line Termination

When terminating the wiring to each remote device, the 10k ohm resistor fitted across each WIP terminal block must be removed and fitted across the line connection point at the remote phone or FIP/BGA switch. 1% resistors should be used in new installations (included on WTRM2000) (Tyco part number RR0045).

However the Vigilant FP0938 phone comes with an EOL resistor already fitted, so the resistor connected across the terminal block can be removed and discarded.

c. WTRM2000 Two Wire WIP/BGA Connection

With the WTRM2000 one normally open BGA device may be connected across the WIP circuit. A 1.2K 0.25W 1% resistor (Tyco part number RR0034) must be wired in series with the BGA. These resistors will be provided with I2000 systems with WTRM2000 modules.

A two wire BGA device may not be used with a zone manned pushbutton on the same circuit.

Two wire WIP / BGA functionality must be programmed into the I2000 by FireSense.

d. WTRM2000 Zone Manned Pushbutton

A pushbutton or switch can be fitted to a remote WIP phone so that when the switch is closed while the WIP is on hook, the appropriate ZONE MANNED indicator on the MECP front panel will light. Wiring of the switch is shown in WTRM2000 General. It requires a 4k7 ohm, 0.25W Watt resistor to be wired to one side of the switch such that when the pushbutton is operated, the 4k7 resistor is switched in parallel across the WIP line. 1% resistors (Tyco part number RR0041) should be used in new installations. Unlike the WTRM9007 which requires a pushbutton, a toggle switch may be used with the WTRM2000. However note that operation of the switch cannot be detected when the phone is off hook.

e. WTRM2000 General Purpose Input

A general purpose switch input may be wired like a FIP input. The 10k EOL resistor is optional.

On the WTRM2000 **two** general purpose input switches may be wired to a single circuit. One should be wired with a 600 ohm 1% resistor (2 x 1k2 Tyco part number RR0034 in parallel) in series and the other with a 1.2k 1% ohm resistor in series (Tyco part number RR0034).

The function of the inputs is determined by the software programmed into the I2000 by FireSense.

7.3. WTRM9007 Wiring

a. General

Each WTRM9007 termination module provides terminations for up to 30 WIP phones and/or switch circuits. Compatible types are Vigilant FP0938, Aiphone TBRC, Aiphone TB-SE RED T, Altronics A2095 Firephone, and Altronics A2096 Firephone. The first module provides circuits 1 - 30, the second module circuits 31 - 60, and so on.

There may be 1, 3, or a variable number of WIPs per evacuation zone. The configuration printout supplied with the system has details of which circuits are assigned to which zones.

It is recommended that a 0.75mm2 shielded pair be used for each WIP circuit, however for short cable runs unshielded cables can be used with slightly higher susceptibility to induced hum and noise. The shields must be connected to the metal chassis at the MECP.

Refer to the diagram below which shows the wiring for a normal WIP circuit (with an optional zone manned pushbutton), a FIP circuit, and a WIP and BGA sharing a 3 wire cable.

Note that the 3 wire WIP / BGA circuit is wired with the + terminal common on the WTRM9007 (and the - terminal common on the WTRM2000).

The terminals labelled +24V will be wired in the factory. When expanding a system wire one of them to the +24V terminal on the backplane. Note that although the connections on the Termination Modules are shown as + and -, both the compatible phones can be connected either way around.

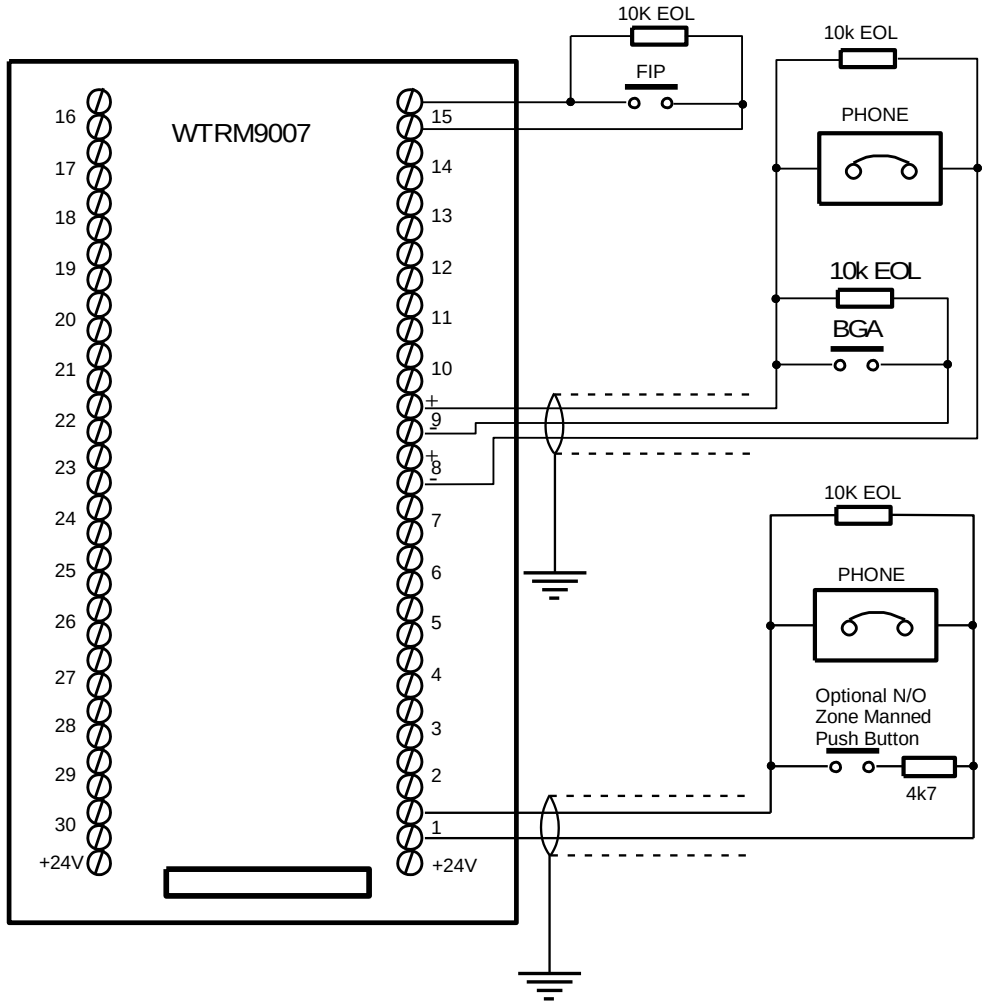


Figure 7-2: WTRM9007 Wiring

b. WIPS9007 End of Line Termination

When terminating the wiring to each remote phone, the 10k ohm resistor fitted across each WIP terminal block must be removed and fitted across the line connection point at the remote phone or FIP/BGA switch. 1% resistors should be used in new installations.

c. WIPS9007 Zone Manned Pushbutton

A pushbutton can be fitted to a remote WIP phone so that when it is pressed while the WIP is on hook, the appropriate ZONE MANNED indicator on the MECP front panel will light. Wiring of the pushbutton is shown in WTRN9007 General. It requires a 4k7 ohm, ¼ Watt resistor to be wired to one side of the switch such that when the pushbutton is operated, the 4k7 resistor is switched in parallel across the WIP line. 1% (Tyco part number RR0041) resistors should be used in new installations. It is not possible to use a toggle switch instead of a pushbutton, as when the switch is in the operated position it is not possible for the I2000 to detect when a WIP which has been off hook is placed on hook.

d. WIPS9007 General Purpose Input

A general purpose switch input may be wired like a FIP input. The 10k EOL resistor is optional. The function of the inputs is determined by the software programmed into the I2000 at the customers request.

7.4. Vigilant FP0938 Wiring

Refer to the sheet supplied with the FP0938 phone for full information. The following is only a summary.

Note that the IN terminals are internally connected to the OUT terminals. Two pairs are provided to make it easier to connect the EOL resistor, or loop onto an BGA.

Connect the line to the panel to the IN+ and IN- terminals. Note that these terminals are polarity sensitive. The + terminal on the phone must connect to the + terminal of the termination module.

The FP0938 will be supplied with an EOL resistor connected to the OUT+ and OUT- terminals, so it is not necessary to connect another EOL and the EOL resistor supplied connected to the WTRM module can be discarded.

If a connection to an BGA is required, the EOL resistor can be removed and the OUT terminals wired to a series combination of the BGA switch and a 1200 ohm resistor, with the EOL then connected in parallel.

If the ring is not loud enough (e.g. the phone has been installed in a cupboard), then an external speaker can be used to boost the ring volume, for example -

`ME0468 ME, I2000 WIP External Ring Speaker`

If the batch code of the FP0938 is higher than 0812000

- Route the cable to the FP0938 phone, cut off the two pin connector and strip a length of insulation, and screw the two wires to the SPKR terminals.

Otherwise (i.e. the batch code of the phone is less than 0812000)

- Route the cable to the inside of the FP0938 (you may need to drill a hole in the underside of the body). Plug the cable into the two pin plug of the PCB inside the FP0938, in place of the existing plug that goes to the internal speaker. Leave the existing internal speaker disconnected.

For wiring a Vigilant FP0938 to the ECP as a Master Phone, refer to Master Phone Termination.

7.5. Altronics A2095/A2096 Wiring

The A2095/A2096 WIP should normally have its two internal jumpers in their default positions (i.e. JP1 1-2 and JP2 1-2).

However, link JP1 may be moved to position 2-3 to change ringing from using the speaker mounted on the body to use the handset speaker. This results in a lower volume ring, but loads the line less and allows a WIP to be used when there is a second WIP on the same cable (which is not recommended in any case). **When using this option, the user should never hold the earpiece to their ear while holding down the "hook switch" on the phone body, as if the phone rings a very loud sound is emitted by the earpiece.**

The I2000 connection is made to the external screw terminals labelled 1 and 2 (either polarity). The external screw terminals labelled 3 and 4 are normally joined, but can be separated for a lower volume ring.

If, once the WIP has been installed the ring is not loud enough (e.g. it has been installed in a cupboard), then an external speaker can be used to boost the ring volume. Disconnect the wires labelled EXT-SP from the internal speaker and re-connect to the screw terminals S1 and S2 instead. The external speaker (>20Ω) should then be wired to these screw terminals and positioned to give adequate ring volume. Note this is not possible if more than one WIP is connected on the line.

7.6. WLED9307 WIP Flashing LED PCB

The WLED9307 PCB can be used to provide visual indication that a WIP phone is ringing. The LINE+ and LINE- terminals are connected across the WIP line (either way around) and a LED is connected to the LED+ and LED- terminals. The anode of the LED must be connected to the LED+ terminal. About 10mA will be passed through the LED when the phone is ringing. If you also want to stop the WIP from ringing, remove capacitor C6 from the circuit board inside the AIPHONE, or remove JP1 from the A2095.

7.7. WIP System Expansion

If you are expanding an existing system and adding a new WTRM module and WIPS module, note the following

- The WIPS module will need its jumpers set as described in WIP Slave Module.
- Connect the WIP 1 OUT or WIP 2 OUT connector on the backplane adjacent to the new WIPS module to the WTRM module with the 34 way ribbon cable provided.
- With a WTRM9007 module, connect +24V from the screw terminals on the backplane near the WIPS module to a +24V terminal on the WTRM module.
- With a WTRM2000 module, connect 0V from the screw terminals on the backplane near the WIPS module to a 0V terminal on the WTRM module. If you have an older backplane with no 0V terminals near the WIPS module, use the 0V power terminal on the backplane.

Within a panel, or even a within a card cage, WIPS9004 / WTRM9007 module pairs may be mixed with WIPS2000 / WTRM2000 module pairs. **However the WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.**

7.8. RWIF9803 Remote WIP Interface

a. General Description

The wiring to a field WIP is normally via a single copper cable pair. However where the WIP must be remotely located, or a derived signalling system is used, then two Remote WIP Interface Modules (RWIF9803) can be used to convert the I-2000's WIP circuit to a suitable format for signalling over the derived circuit.

The RWIF9803 modules can be fitted to any WIP circuit without reprogramming the I2000 or its configuration, unless the Master WIP redirection feature is to be used.

The connection to the Remote WIP is supervised by the I2000 only as far as the ECP end RWIF9803 module. To check the rest of the connection, lift the Remote WIP - check for confidence tone, and call the remote WIP from the I2000 - ringing should be heard.

The RWIF9803 is available as either a stand-off mountable circuit board (PA0821) or a DIN Rail mounted module (PA0621).

b. Wiring Arrangement

Two RWIF9803 modules are required for each remote WIP, one at each end of the connection. Link settings configure the RWIF for operation at each end.

The module at the I2000 end converts the I2000's WIP connection into 2 outputs and 1 input - the outputs are a 2-wire full duplex audio path and a contact closure to indicate ringing, and the input is to receive the WIP on/off hook status.

The module at the remote end has the opposite connections to the master - one contact closure input to control the ring generation to the WIP and a 2-wire full duplex input for the audio, while a contact closure output indicates WIP off-hook.

At the remote end a 24Vdc power supply is required to power the module.

The diagram below shows the wiring arrangement of the RWIF. For the connection between the two RWIF modules three circuits are required:

Audio A 2 wire full duplex (bi-directional) audio path with unity gain.

Ring A contact closure input from the I2000 end should cause a contact closure output at the remote end.

Off Hook A contact closure input at the remote end should cause a contact closure output at the I2000 end.

The audio connections should be made using screened cable, and the connection between the RING and RING IN terminals should be kept short (<15m).

Even though 3 circuits are described, it is sometimes possible for these to be combined into 2 physical cable pairs - "E + M signalling" is a typical way this can be achieved. Refer to the technical details for the derived system you are using to determine the particular wiring arrangement necessary.

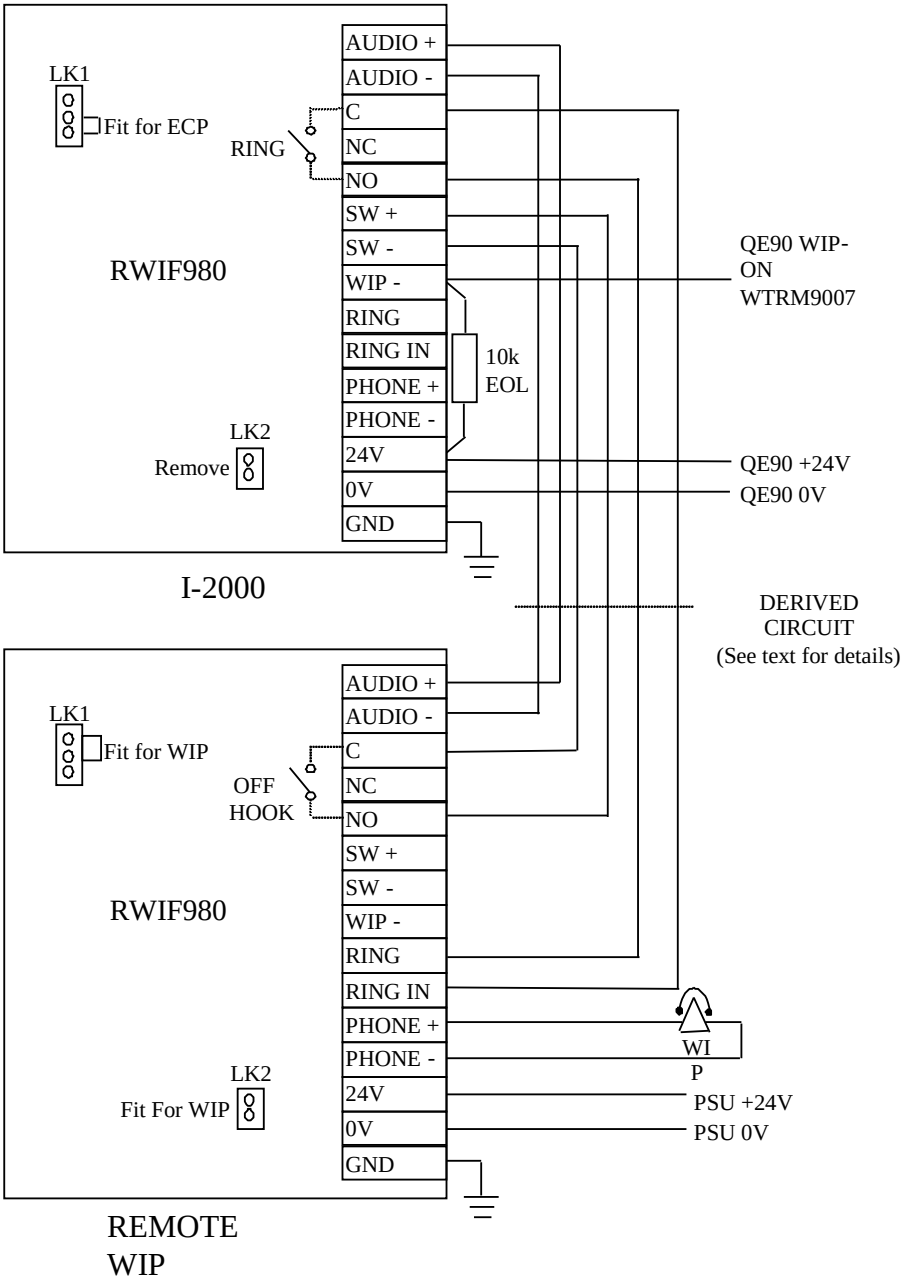


Figure 7-3: Wiring RWIF9803 Modules for Remote WIP on I-2000

c. Link Settings

The mode of operation of the RWIF9803 is configurable for where it is placed in the WIP circuit. The link settings are shown below:

Operation Mode	Lk1	Lk2
WIP End	1-2	Fitted
ECP End	2-3	Not Fitted

d. Indicators

The RWIF9803 has a single 3mm red LED which is used to indicate when the relay is energised.

The function of the relay depends on the link settings. At the I2000 end the relay is activated when the RWIF9803 detects ring voltages from the I2000. At the WIP end the relay is activated when the WIP is lifted off-hook.

7.9. MWIP9903 8-Circuit WIP Module

a. General

The MWIP9903 is an 8 circuit WIP module that was used in small I2000 systems where there are fewer than 8 WIP circuits plus FIP, BGA, and GP inputs. It is now obsolete. The information in WTRM9007 Wiring, Vigilant FP0938 Wiring, Altronics A2095/A2096 Wiring, and WLED9307 WIP Flashing LED Board also generally applies to the MWIP9903 module.

Refer to the diagram below for details of wiring to the MWIP9903 module.

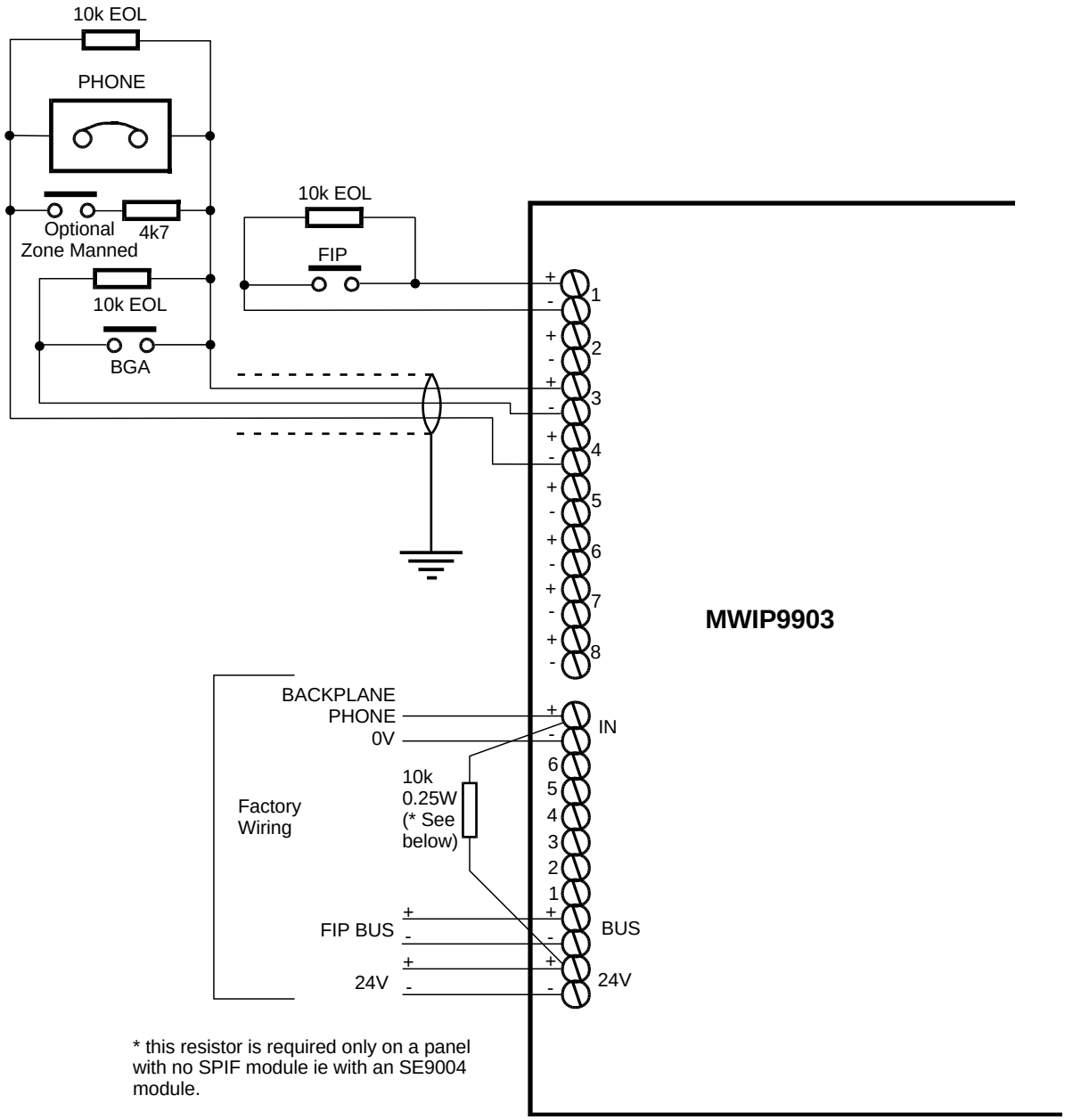


Figure 7-4: MWIP9903 Wiring

b. LED Indicators

Six LED Indicators are located on the MWIP9903 module and their functions are as follows:

LED	NORMAL STATUS	CONDITION INDICATED
+24V	ILLUMINATED	+24V SUPPLY OK
+12V	ILLUMINATED	+12V SUPPLY OK
+12VREF	ILLUMINATED	+12V REFERENCE SUPPLY OK
RUN	ILLUMINATED	MICROPROCESSOR RUNNING OK
COMMS	PULSING	COMMS OK, MODULE RESPONDING
FAULT	OFF	WHEN ON, A LINE FAULT EXISTS

c. DIP Switches 1 Settings

Switch 1 is normally OFF in a I2000 system. The 8 circuits are then individually addressable by the MECP. When switch 1 is ON, the circuits will be arranged into sets, with circuits 1-3 as one set, circuits 4 and 5 as another set, and circuits 6-8 as the third set. Each of these 3 sets will behave as a single circuit to the MECP. This option could be used to have multiple WIPs per ECP control, with each WIP wired individually back to the MWIP9903 module.

Switch 2 must be ON in an I-2000 system.

Switch 3 must be ON to enable all 8 circuits. When OFF only circuits 1–3 will be enabled.

Switches 4–8 must be OFF.

d. DIP Switches 2 Settings

Note that in an I2000 system, each MWIP9903 will address the first 8 of each multiple of 30 circuits.

MODULE Address	WIP CIRCUITS	SW8	SW7	SW6	SW5	SW4	SW3	SW2	SW1
0	1-8	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
1	31-38	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
2	61-68	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
3	91-98	ON	ON	OFF	OFF	OFF	OFF	ON	ON
4	121-128	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
5	151-158	ON	ON	OFF	OFF	OFF	ON	OFF	ON
6	181-188	ON	ON	OFF	OFF	OFF	ON	ON	OFF

e. System Expansion

If a MWIP9903 board is to be added to a system, you will need to wire 24V DC Power, Comms, and the "Backplane Phone" circuit to the new module. Power is wired in RED (+24V) and BLACK (0V) 1.0mm

2 wire and Comms in YELLOW (+) and BLUE (–)1.0mm 2 wire.

POWER can be obtained from –

- The +24V / 0V terminals of another MWIP9903 module
- The +24V / 0V terminals of a FIB8910 module
- The +24V / 0V terminals of a STRM9502 module or STBM9008 module
- The two pin Molex connector on a flying lead of the PSU2403 or PSU308
- The +24V FIP and 0V screw terminals inside a PSU2406.

BUS +/– can be wired from

- The BUS +/– terminals of another MWIP9903 module
- The COMMS +/– terminals of a FIB8910 module
- The COMMS +/– terminals of a STRM9502 module or STBM9008 module
- The FIP BUS +/– terminals of a Signals Interface Module (SE9004 or SPIF9506 or SPIF9709).

The IN + / – terminals will need wiring to

- The IN + / – terminals of another MWIP9903 module
- The MASTER PHONE +/- terminals of a SE9004 module
- The BACKPLANE PHONE testpoint and 0V terminal of a SPIF9506 or SPIF9709 module.

Section 8 FIP/BGA/GP Input Modules

8.1. FIP / BGA / GP Inputs – General

The FIP input and expansion modules are usually located on the right hand mounting rail inside the cabinet.

These modules may be used for FIP inputs, BGA inputs, or General Purpose inputs. Although originally a separate FIB8910 module was necessary for each type of input, this is now rarely used. One FIB8910 module, with FIPE9004 expansion modules as necessary, can provide FIP inputs, BGA inputs, and GP inputs.

As from Nov 1997 WIP circuits can also be used to provide FIP / BGA /GP inputs - refer to WIP Phone Termination Modules for details.

The FIB8910 module provides up to 10 inputs. Additional inputs are provided by FIPE9004 expansion modules and sometimes additional FIB8910 modules. See 7.4.

A separate FIB8910 module for BGA inputs is now used only when there are too many inputs for one FIB8910 plus the 3 expansion modules, i.e., more than 58 inputs in total.

GP inputs are typically used to control zones for Music or Paging as an alternative to the Tyco FP0539 Paging Console.

FIP inputs may also be used for various input functions, e.g., to accept clean contact outputs from a time switch to invoke a different cascade sequence out of normal hours.

The connection for FIP or BGA inputs is for normally open contact closing for alarm. The line is terminated with an end of line zener diode, type BZT03-C10, to maintain line monitoring. The diode must be connected with the cathode (i.e. the end marked with a band) to the positive input. Refer to the diagram below.

The termination diodes factory fitted to each input must be relocated to the end of the line when terminating field wiring to the input. The termination diodes must remain on all inputs assigned to zones in the system configuration (refer configuration printout), even if there is no connection from the FIP or a BGA to those inputs.

Inputs programmed as GP inputs do not need the zener diode end of line.

Cables should have a wire gauge of at least 0.75mm2 and should not be longer than 1000m.

Refer to Widget Board for information on the “Widget Board” used to replace the microprocessor on the FIB8910 from late 2004.

8.2. RFIB9511 Remote Rack FIP / BGA Input Module

A related module is the RFIB9511 which is fitted to distributed equipment racks without ECPs. It provides FIP and/or BGA inputs as usual, and also controls the SPIF module fitted in the rack. The RFIB9511 does not have Relay Outputs. Refer to drawing 699-198 for details of the wiring between the RFIB and SPIF modules.

Issue E of the FIB8910 module (available January 1999) has a set of links so that it may be used as an RFIB module. This replaces the RFIB9511 product.

An RFIB9511 module, or a FIB8910 module set up as an RFIB, requires version 2.xx software. Version 1.xx or version 2.xx software may be used for a FIB8910 not set up as an RFIB.

8.3. Single FIP Input Connection

When there is a common alarm for all zones from the FIP, this output from the FIP must be terminated to Input 1 on the FIP input module and the system set up for no cascade and a zero initial delay. (See ECP on-site settings or ECM on-site settings.) This will result in all zones generating ALERT tones, and after a time delay EVACUATE tones, on receipt of a FIP alarm.

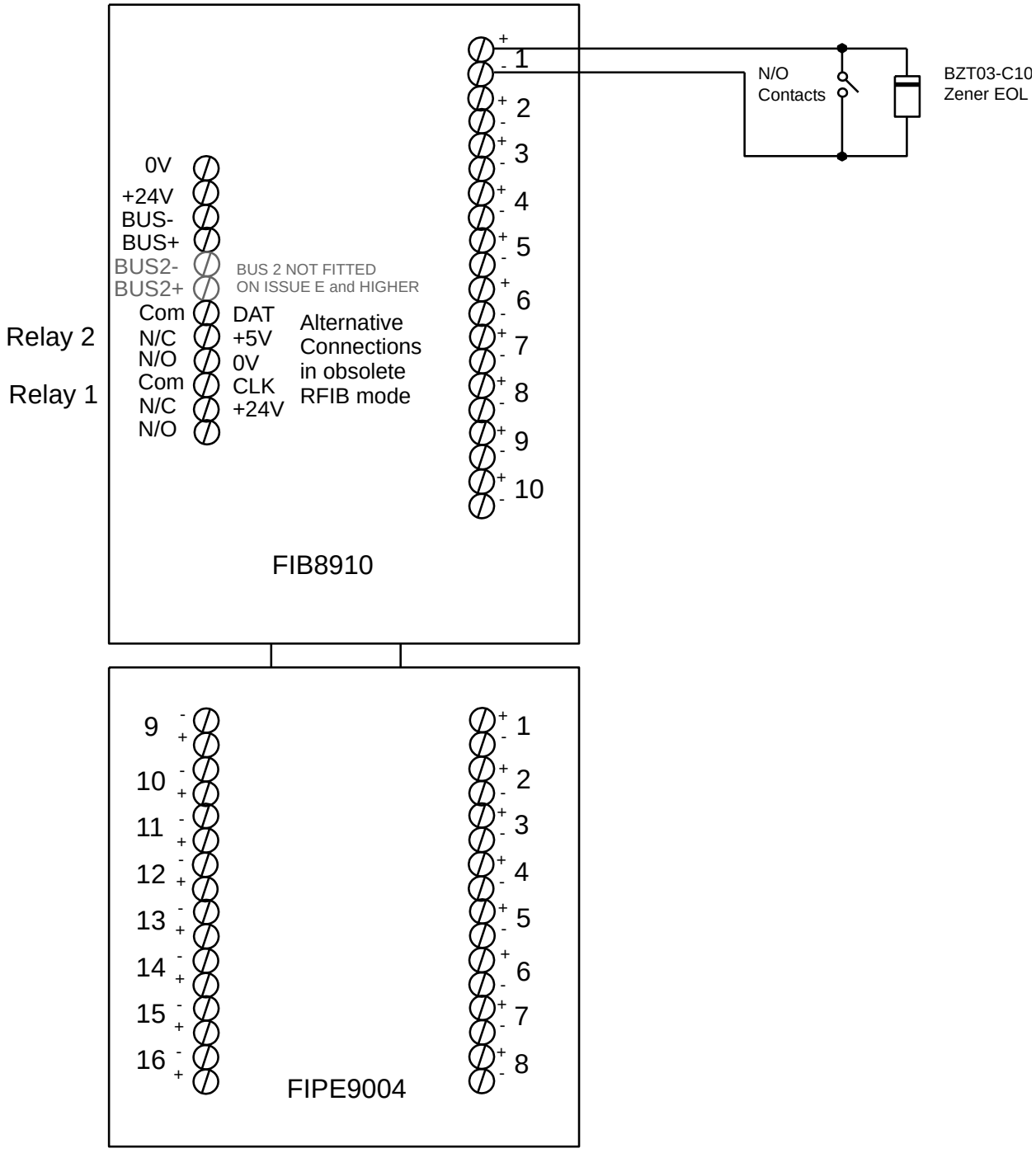


Figure 8-1: FIB8910, FIPE9004 Termination points and wiring

8.4. Multiple FIP & BGA Input Connections

For staged evacuation, individual outputs for each evacuation zone must be provided by the FIP and be terminated to their programmed inputs on the relevant FIP input module. If BGA inputs are used

they must also be terminated to their programmed inputs on the FIP input module or BGA input module if fitted.

This will allow for a cascading or spreading evacuation sequence to be implemented, usually starting with the initial zone on which the FIP alarm is detected or where the BGA is operated.

The first 10 inputs are on the first FIB8910 module, and the next 16 on the first FIPE9004 module, the next 16 on the second FIPE9004 module, and the next 16 on the third FIPE9004 module. If there are more than 58 inputs the sequence starts again with a second FIB8910 modules and possibly further FIPE9004 modules.

The inputs are normally assigned to zones on a one to one basis, but sometimes this will not be the case e.g. if some equipment is located remotely. The configuration printout supplied with the system shows the assignment of inputs to zones.

8.5. Switch & Link Settings

FIB8910 DIP Switches 8 – 5

Module Function	Switch 8	Switch 7	Switch 6	Switch 5
FIP Inputs Only, Or Combined FIP / BGA / GP inputs	OFF	ON	OFF	OFF
FIP Inputs Only, Or Combined FIP / BGA / GP inputs – **RFIB mode**	ON	ON	OFF	OFF
BGA Inputs Only	OFF	ON	OFF	ON
GP Inputs Only	OFF	ON	ON	ON

FIB8910 DIP Switches 4 – 1

Module Address	Switch 4	Switch 3	Switch 2	Switch 1
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF

FIB8910 (Issue E or later) Links

	Not RFIB mode	RFIB mode
LK1 - LK6	“FIB” position	“RFIB” position

Fit the links in the “FIB” position unless the module is being used in the RFIB mode in an equipment rack with no ECP or ECM, i.e. when connecting to the SPIF module to control the SPIF relays.

FIPE9004 Switches

FIPE9004	Input range	Module Switches
1st	11-26,68-83,126-141	1,2 On, Rest Off
2nd	27-42,84-99,142-157	3,4 On, Rest Off

3rd	43-58,100-116,158-174	5,6 On, Rest Off

8.6. Relays

There are two relays on each FIP or BGA module except the RFIB9511 and FIB8910 Issue E and later in RFIB mode. These relays are usually available for General Purpose Outputs (normally closed contacts which open for fault or alarm) for connection to external equipment. These and other functions of the relays are configured by the software in the ECP module. The functions are listed in the system's configuration printout, and can be changed by FireSense. An eprom change will be required.

Each relay is normally energised whenever the system is powered up and the programmed function is not true. The terminals are connected to the relays as shown in the diagram below. The two relays are wired similarly.

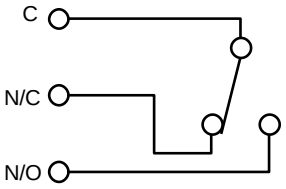


Figure 8-2: FIB8910, FIPE9004 Termination points and wiring

The Relay is shown in the energised position i.e. the position it will be in when the system is powered up and the programmed function is false. When the programmed condition is true or the system is powered down, the relay will be in the opposite position to that shown.

The relay functions which can be programmed can include (but are not limited to) the following, and logical combinations thereof -

- Any Alarm
- Any Fault
- FIP Alarm
- BGA Alarm
- Line Fault
- Module Fault
- Manual
- Isolate
- Any zone has tones or paging active
- Particular inputs or outputs active

If you require a relay to be normally de-energised this can also be programmed by FireSense at the customer's request. This will require an eprom change. (For example an "Alarm" relay which did not indicate an alarm in the powered down state.)

The relays are rated at 30V 1A.

8.7. LED's

The FIB8910 and RFIB9511 modules both have two LEDs, the functions of which are as follows –

LED	Colour	Normal State	Indication
LD1	Green	ON	+5V supply OK when on steady

LD2	Yellow	Flashing	Responding to Comms when flashing

8.8. System Expansion

When adding a FIB8910 module to expand an existing system you will need to wire 24V DC Power and Comms to the new module. Power is wired in RED (+24V) and BLACK (0V) 1.0mm 2 wire and Comms in YELLOW (+) and BLUE (–)1.0mm 2 wire. POWER can be obtained from –

- The +24V / 0V terminals of another FIB8910 module
- The +24V / 0V terminals of a STRM9502 module or STBM9008 module
- The two pin Molex connector on a flying lead of the PSU2403 or PSU308
- The +24V FIP and 0V screw terminals inside a PSU2406.

COMMS +/– can be wired from

- The COMMS +/– terminals of another FIB8910 module
- The COMMS +/– terminals of a STRM9502 module or STBM9008 module
- The FIP BUS +/– terminals of a Signals Interface Module (SE9004 or SPIF9506 or SPIF9709).

Section 9 Strobe / Relay Output Module

9.1. General

The STRM9502 Strobe Relay Driver Module provides two types of outputs –

(1) Powered & supervised outputs designed to drive strobe lights. Polarity reversal is used so that pairs of (possibly different coloured) strobes may be controlled, one for alert and the other for evacuate. Note – alert strobes may not be required by AS1670.4.

(2) General purpose unsupervised relay outputs (clean contacts).

The two types of outputs can be mixed on a module. It is necessary to distinguish between the two types of outputs by links on the module. These are identified on the silk-screen. Programming of which evacuation zones control which outputs, and whether each output is a strobe output or a general purpose output is done at the factory according to customer requirements. The details are listed on the configuration printout.

The operation of the powered and supervised outputs can be switched between

- Steady operation for both evacuate and alert (generally used for self-flashing strobes)
- ISO8201 T3 pattern for evacuate, steady output for alert
- 50/50 on/off duty cycle for both evacuate and alert

This selection applies to all outputs together, it is not possible to have one selection for some outputs and another selection for other outputs.

The module is also compatible with the older STBM9008 module and can be used as a direct replacement. It is compatible with STBT9008 strobe terminator modules which can be used in place of the diodes shown in the diagram below.

Refer to Widget Board for information on the "Widget Board" used to replace the microprocessor on the STRM9502 from late 2004.

When used with 4906-9103 and 4906-9104 "Multi-Candela" strobes, the module can be switched via the DIP switch settings to produce a T3 pattern complying with ISO 8201. This applies to only the Evacuate state. Alert strobe lights (if any) must be self-flashing strobes as before. Note - the Multi-Candela strobe light is white. Although AS2220 specified amber strobes for alert and red strobes for evacuate, AS1670.4 does not specify any colours.

9.2. Strobe Output Wiring

Strobe lights must be wired to the A and B terminals as shown in the diagram below.

The 2k7 resistor connected to each terminal pair when the system is shipped must be removed and connected to the end of the strobe line.

The maximum load on each output is 2.0 Amps. Higher loads than this could blow the fuses.

It is recommended that cables are no longer than 1000m.

The following table shows the cable sizes required to keep the voltage drop at approximately 10%, for various loads and cable lengths –

Cable Length	100mA Load	250mA Load	500mA Load	1A Load	2A Load
100m	0.75 mm2	0.75 mm2	1.5 mm2	2.5 mm2	6 mm2
200m	0.75 mm2	1.5 mm2	2.5 mm2	4 mm2	10 mm2
300m	1 mm2	2.5 mm2	4 mm2	6 mm2	16 mm2
500m	1.5 mm2	4 mm2	6 mm2	10 mm2	25 mm2
700m	2.5 mm2	4 mm2	6 mm2	16 mm2	25 mm2
1000m	2.5 mm2	6 mm2	10 mm2	25 mm2	40 mm2

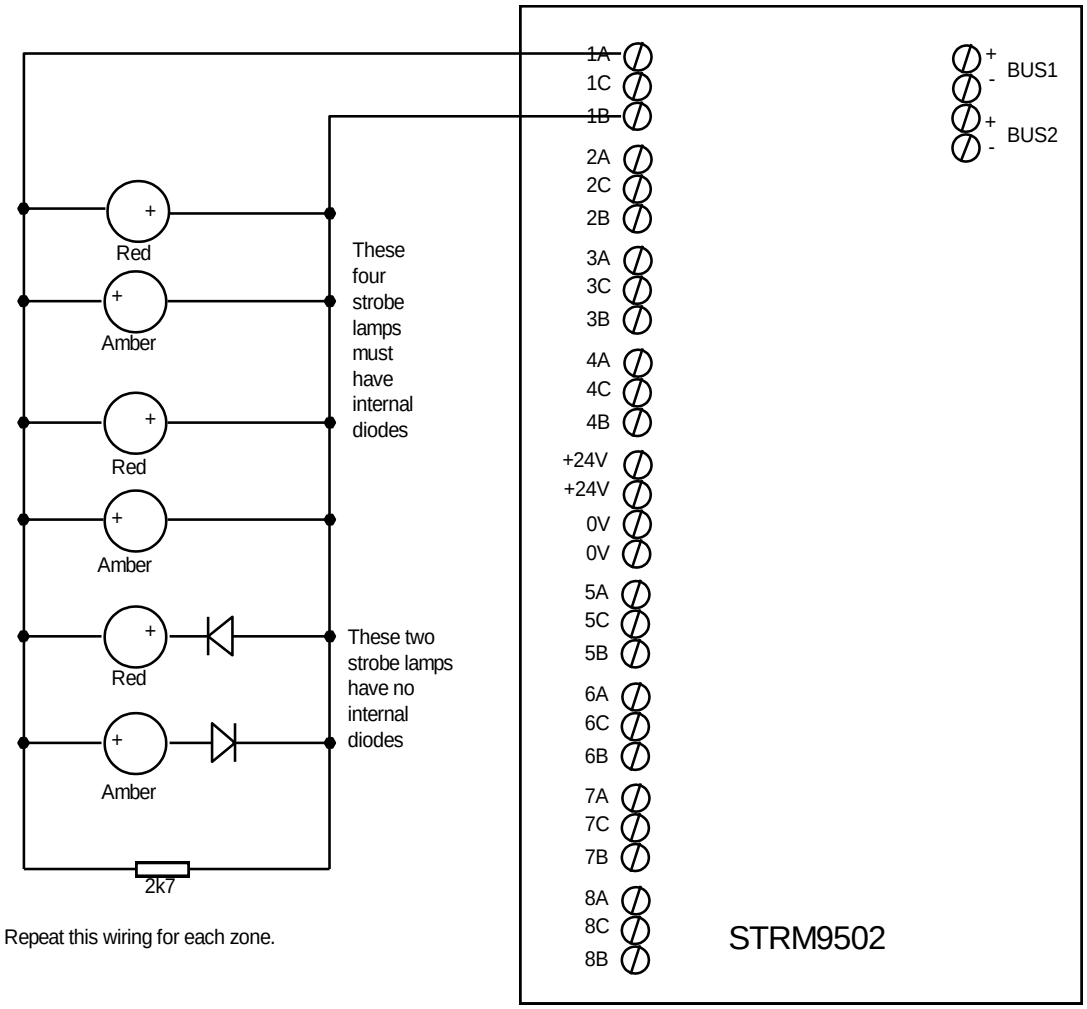


Figure 9-1: Strobe/Relay Driver Module and Strobe Light Connection

Note – a system complying with AS1670.4 will usually not use Alert strobes, and white Multi-Candela strobes will be used for Evacuate instead of Red strobes.

Many strobe lights (including the Multi-Candela Strobes) have internal diodes to prevent damage if they are connected around the wrong way. If the strobe lights you are using do have an internal diode connected in series with the supply, then you will not need the diodes shown in the diagram above, and you can just wire every strobe light directly across the output of the STRM9502. Wire the alert strobe light positive terminal to A, and the evacuate strobe light positive to B.

9.3. General Purpose Output Wiring

If you are using some or all of the outputs as general purpose relay outputs, each unused strobe output can provide two separate relay outputs (with a shared common connection). For example, if output 8 is used for general purpose relay outputs, there will be two relay contacts, one between 8A and 8C and the other between 8B and 8C. The programming of these outputs must be done by FireSense at the customer's request.

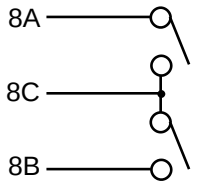


Figure 9-2: Internal Wiring of STRM9502 for pair of relay outputs

These relays are rated at 30V 1A, or 30V 2A for a resistive load.

9.4. Links and DIP Switch Settings

The link settings for each output are shown in the following table.

Strobe Output or GP output Pair	Links installed if strobe output	Links if GP output pair
1	1,9,17=2-3	1 removed, 9 removed, 17=1-2
2	2,10,18=2-3	2 removed, 10 removed, 18=1-2
3	3,11,19=2-3	3 removed, 11 removed, 19=1-2
4	4,12,20=2-3	4 removed, 12 removed, 20=1-2
5	5,13,21=2-3	5 removed, 13 removed, 21=1-2
6	6,14,22=2-3	6 removed, 14 removed, 22=1-2
7	7,15,23=2-3	7 removed, 15 removed, 23=1-2
8	8,16,24=2-3	8 removed, 16 removed, 24=1-2

DIP switch settings

DIP switches 5 – 8 are used to select the mode for powered (strobe) outputs. Voltage-free GP relay outputs are unaffected by these DIP switches.

DIP Switch				Output Pattern	Usage	Minimum STRM Software Version
5	6	7	8			
OFF	ON	ON	OFF	Dual polarity, steady voltage for both evacuate and alert signals.	Standard self-flashing strobes.	1.00
OFF	ON	ON	ON	Dual polarity, ISO 8201 T3 pattern for evacuate signal, steady voltage for alert signal.	Multi-Candela strobes for evacuate, standard self-flashing strobes for alert.	1.70
ON	ON	ON	ON	Dual Polarity, continuous flash (not T3) for both evacuate and alert signals. 450mS on, 450 ms off.	Incandescent or LED lights for both evacuate and alert.	1.49
Other Combinations				Do not use		

DIP Switches 1 – 4 select the card address as before.

Strobe Module address	Switch 4	Switch 3	Switch 2	Switch 1
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

9.5. Strobe Circuit Commissioning

Note that the strobe line is monitored at a voltage of 0.2 volts. The module will not attempt to put voltage on a line which is in fault (i.e. is shorted or open or does not have a 2k7 resistor connected.) If a short circuit occurs when an output is ON the fuse for the particular output on the module could blow. After repairing the short circuit, the fuse must be replaced by a 20mm x 5mm 2 Amp standard fuse (NOT slow blow).

9.6. LED’s

LED	Colour	Normal State	Indication when ON
LD1	Green	ON	Microprocessor running when on steady
LD2	Yellow	Flicking	Responding to Comms when flicking on
LD3	Green	ON	+5V supply OK
LD4	Red	OFF	Flashing – current line fault Steady – latched line fault

If a fault was present but all strobe outputs are now normal, the Red LED will be steady. This feature is designed to assist in determining if an "Audio fault” indication on the ECP is/was an amplifier fault/speaker line fault or a strobe line fault. To extinguish the steady red LED, switch the ECP to Isolate and back to Manual or Auto (all software versions) or press and hold SILENCE for 2 seconds (ECP Version 2.0 and later).

9.7. System Expansion

When adding a STRM9502 module to expand an existing system you will need to wire 24V DC Power and Comms to the new module.

Power is wired in RED (+24V) and BLACK (0V) wire from –

- An unused or lightly used AMP RACK output of the power supply. In the case where the total strobe load exceeds 25A with the PSU308, 4A with the PSU2403, or 10A with the PSU2406 this is the only allowable source.
- The +24V / 0V terminals of another STRM9502 module or STBM9008 module
- The +24V / 0V terminals of a FIB8910 module
- The two pin Molex connector on a flying lead of the PSU2403 or PSU308
- The +24V FIP and 0V screw terminals inside a PSU2406.

The wire used should be at least 1.0mm 2 per 10 amps of strobe load. Ensure that this thickness continues right back to the power supply.

Comms can be wired in YELLOW (+) and BLUE (–)1.0mm 2 wire from

- The COMMS terminals of another STRM9508 module or STBM9008 module
- The COMMS terminals of a FIB8910 module
- The FIP BUS terminals of a Signals Interface Module (SE9004 or SPIF9506 or SPIF9709).

WARNING: *Polarity is important for both Power and Comms.*

Section 10 Background Music Input Facility

10.1. Single Channel Music Input

This chapter refers to the “signals interface module”. This module will be the SE9004 on a basic I2000 system, the MEXP9103 on an older I2000 with a SECP, or the SPIF9506/SPIF9709 on a newer I2000 with an SECP or remote equipment rack.

Where a single channel of background music is required, the outputs from the background music source must be terminated to the "MUSIC" terminals on the signal interface module. Minimum line level required is 300mV RMS for full power output.

Zones can be setup for background music by using the facility described in ECP on-site settings. In a system with ECM modules, the background music zones are setup with a laptop/terminal as described in ECM On-site settings.

10.2. Multiple Channel Music Input

If multiple channels of music are required for various zones the following methods may be used to achieve this -

- One or more channels can be fed to the local inputs of individual amplifiers, as described in Amplifiers. These inputs are selected using the links on the amplifier module and NOT selecting background music for the corresponding zones in on-site setup.
- Another channel can be fed to the AUX input of the signals interface module. This input is selected using the links on the amplifier module and NOT selecting background music for the corresponding zones in on-site setup.

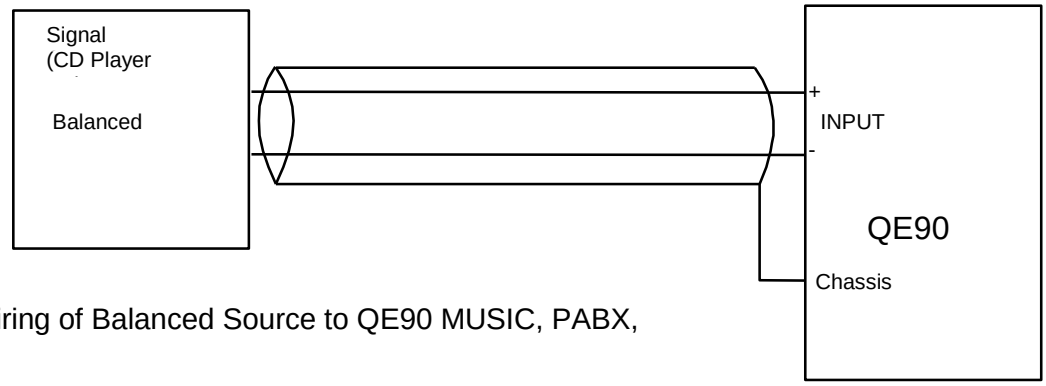
If there are no Paging Consoles and no other dynamic control of which zones have the PABX input activated, another music or Paging channel can be fed to the PABX input on the signals interface module. The zones for this input must be selected for paging in on-site setup as described in ECP on-site settings, or in a system with ECM modules, the paging zones are selected with a laptop/terminal as described in ECM On-site settings.

10.3. Non-emergency Zones

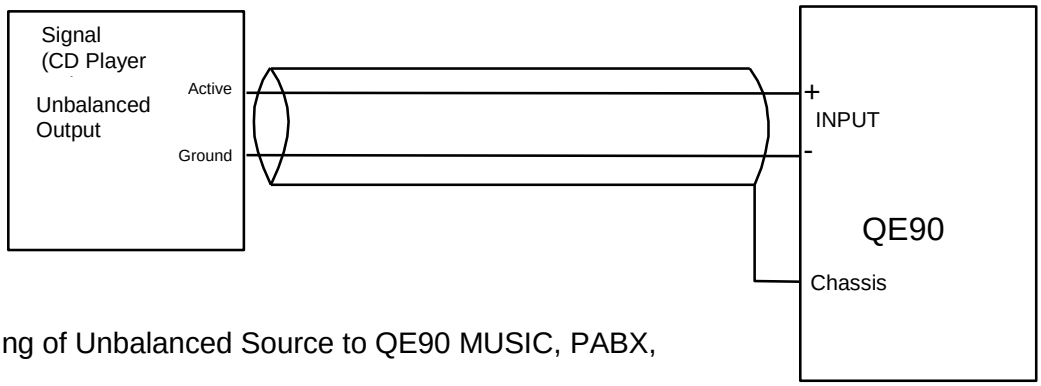
The zones for the PABX input and optionally the MUSIC input may contain different sets of amplifiers from the evacuation zones. Thus a building may be split up in different ways for Emergency and Non-emergency functions. This facility will be programmed by FireSense according to customer requirements.

The system can be configured by FireSense so that the zones which are fed from the MUSIC and/or PABX inputs on the signals interface module can be controlled by switch inputs to the I2000, or by a Paging Console, thereby providing a “run time” assignment of one or two channels of music to various zones.

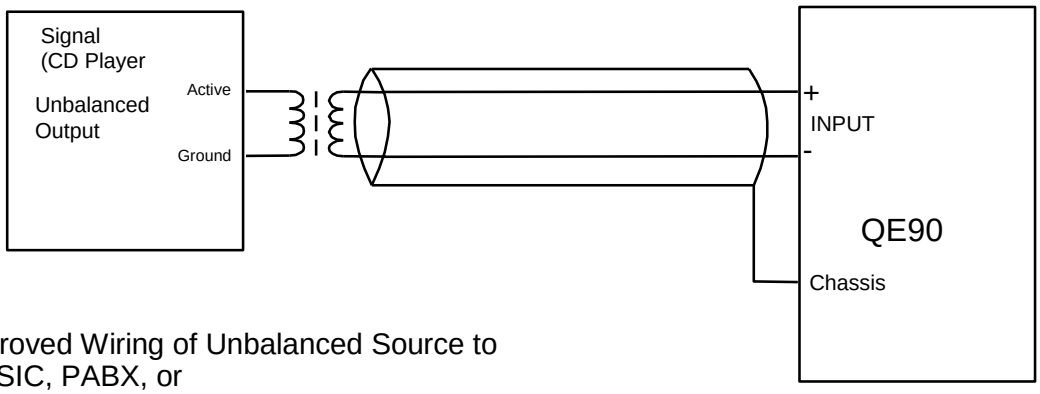
The MUSIC, AUX, and PABX inputs are balanced inputs and must be wired as shown in the diagram below. An audio line isolating transformer may be used to obtain a balanced output from the source, if it is unbalanced. The ALIM9706 module may be used for this. This will reduce noise induced into the cables.



Wiring of Balanced Source to QE90 MUSIC, PABX,



Wiring of Unbalanced Source to QE90 MUSIC, PABX,



Improved Wiring of Unbalanced Source to MUSIC, PABX, or

Figure 10-1: Wiring to I-2000 Music, PABX and AUX inputs

10.4. Music Input from Single Stereo Source

The stereo output from a source such as a CD Player may be fed into the mono BGM input of a I2000 using the wiring as given in the drawing below.

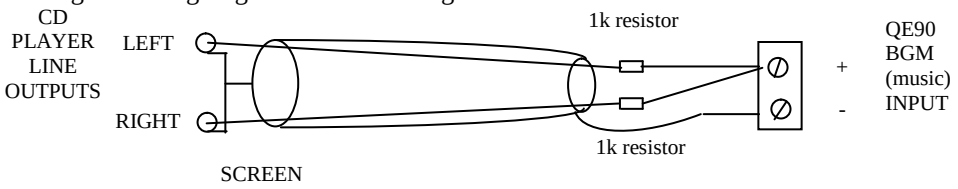


Figure 10-2: Suggested Wiring For Connection of Stereo CD Player to I2000 Music Input

Section 11 Paging Console

11.1. Paging Console Wiring

One or more FP0539 Paging Consoles may be used with an I2000 system. Each console gives selective zone paging to up to 30 zones. These zones do not need to be the same as evacuation zones. Programming of any combinations of amplifiers into paging zones has to be done by FireSense. Refer to the configuration printout for details of the current configuration.

If the system has more than 30 paging zones, then more than one Paging Console can be used at the same location to address the zones. Only one microphone is required.

The diagrams below show how to connect various systems. The top of the Paging Console is removed to obtain access to the terminations.

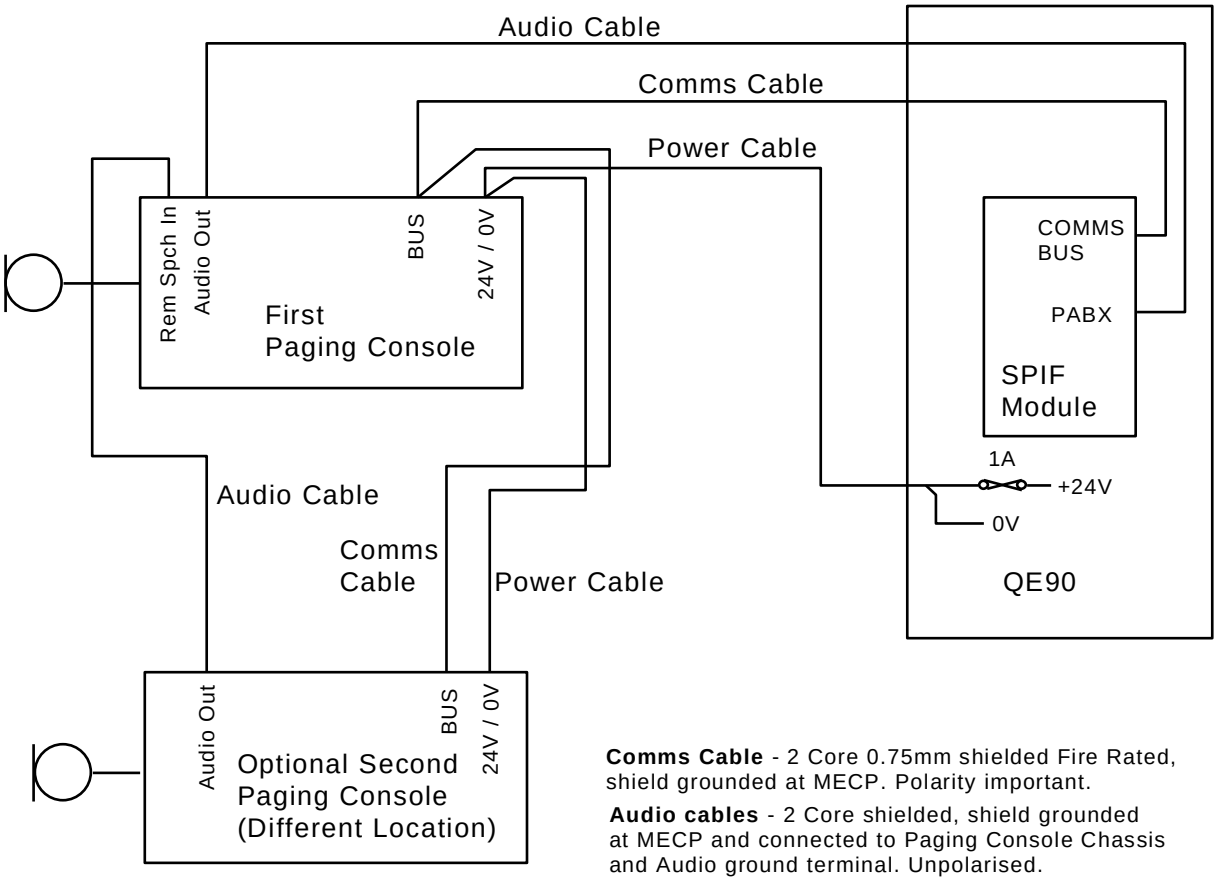
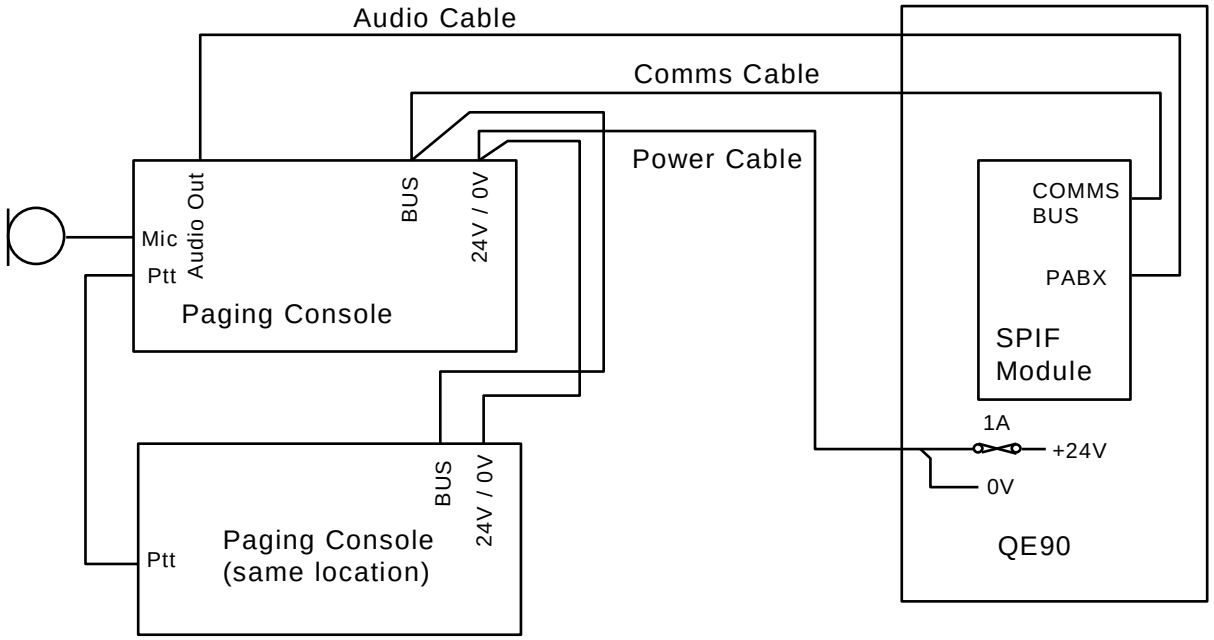


Figure 11-1: Paging Console Wiring - Less than 30 Paging Zones



Comms Cable - 2 Core 0.75mm shielded Fire Rated, shield grounded at MECP. Polarity important.

Audio cables - 2 Core shielded, shield grounded at MECP and connected to Paging Console Chassis and Audio ground terminal. Unpolarised.

Power Cable - 2 core 0.75mm. Polarity important

Figure 11-2: Paging Console Wiring - Less than 30 Paging Zones

It is also possible to have multiple paging consoles at multiple locations where there are over 30 paging zones. The wiring can be obtained by combining the above two diagrams.

Note that if the system has amplifiers in more than one location (e.g. remote equipment racks), it is necessary to connect the audio output of the Paging Console to the PABX input at each location with amplifiers that require the paging function. The COMMS BUS of the Paging Console can be connected to COMMS BUS of any SPIF module. It must not be connected to COMMS BKUP.

The DIP switches on the paging consoles must be set as follows

Paging Console Address	SW 8	SW 7	SW 6	SW 5	SW 4	SW 3	SW 2	SW 1
0	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
1	OFF	ON	ON	ON	OFF	OFF	OFF	ON
2	OFF	ON	ON	ON	OFF	OFF	ON	OFF
3	OFF	ON	ON	ON	OFF	OFF	ON	ON
4	OFF	ON	ON	ON	OFF	ON	OFF	OFF
5	OFF	ON	ON	ON	OFF	ON	OFF	ON
6	OFF	ON	ON	ON	OFF	ON	ON	OFF
7	OFF	ON	ON	ON	OFF	ON	ON	ON
8	OFF	ON	ON	ON	ON	OFF	OFF	OFF

9	OFF	ON	ON	ON	ON	OFF	OFF	ON

11.2. Paging Console Settings

Many aspects of the paging console operation can be setup on-site, including

- Which buttons require PTT for the button to have any effect in the I2000.
- Which buttons are controlled by each Group key.
- Whether the ALL key is latching or non-latching.
- Which buttons are used for WIP controls.
- Which buttons have no effect on the corresponding LEDs (i.e. the LEDs are used only for indication from the I-2000).

Many of these settings must match the configuration of the I2000. Paging consoles supplied as part of systems will be already suitably programmed. If you are replacing a paging console, refer to the panel's configuration printout for notes on how the paging console must be set up.

Section 12 Batteries & Power Supplies

12.1. Battery Requirements and Wiring

The I2000 requires 24 Volt sealed lead acid batteries. Normally 2 x 12 Volt batteries will be connected in series to give 24V. In many cases it may be useful to connect four or more batteries in series/parallel as four smaller batteries will often fit in the cabinet better than two larger batteries.

The recommended battery capacity can be calculated as described in the Technical Manual (LT9002) or by FireSense Technical Support. The Technical manual assumes all amplifiers are loaded to their rating, if your system has less loading you may allow for this and choose smaller batteries.

12.2. Battery Arrangements – Deep Cabinets

The following diagrams show typical battery configurations and wiring for various sized systems.

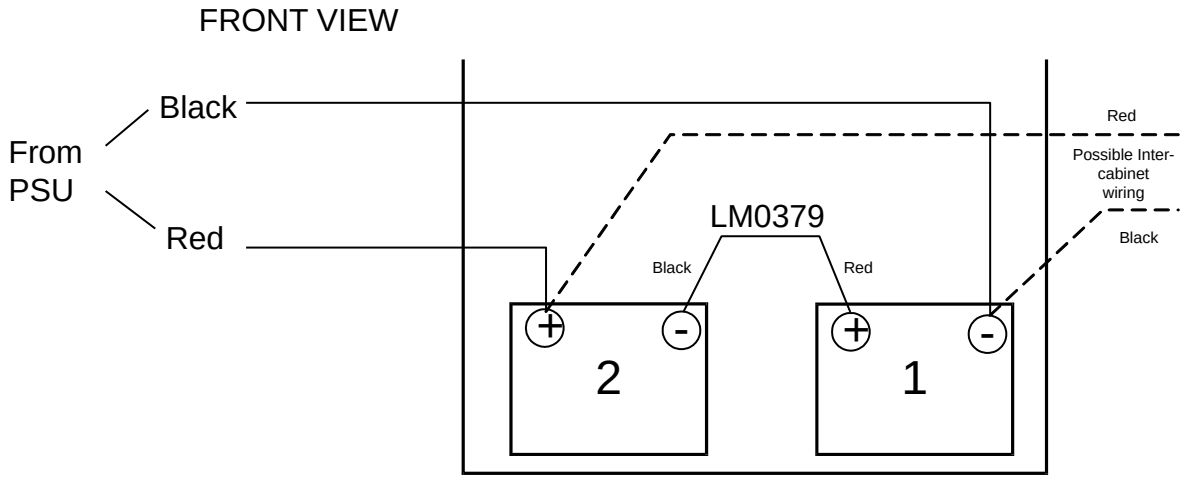


Figure 12-1: 2 * 40AH Batteries (40AH) - Requires 4U of Battery space

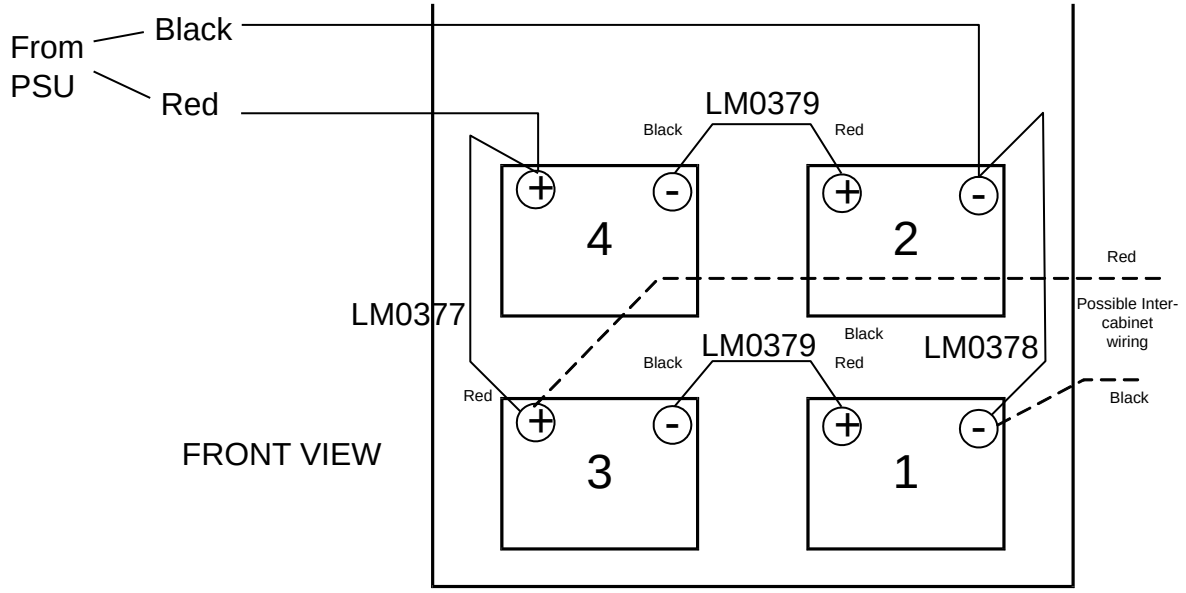


Figure 12-2: 4 * 40AH Batteries (80AH) - Requires 7U of Battery space

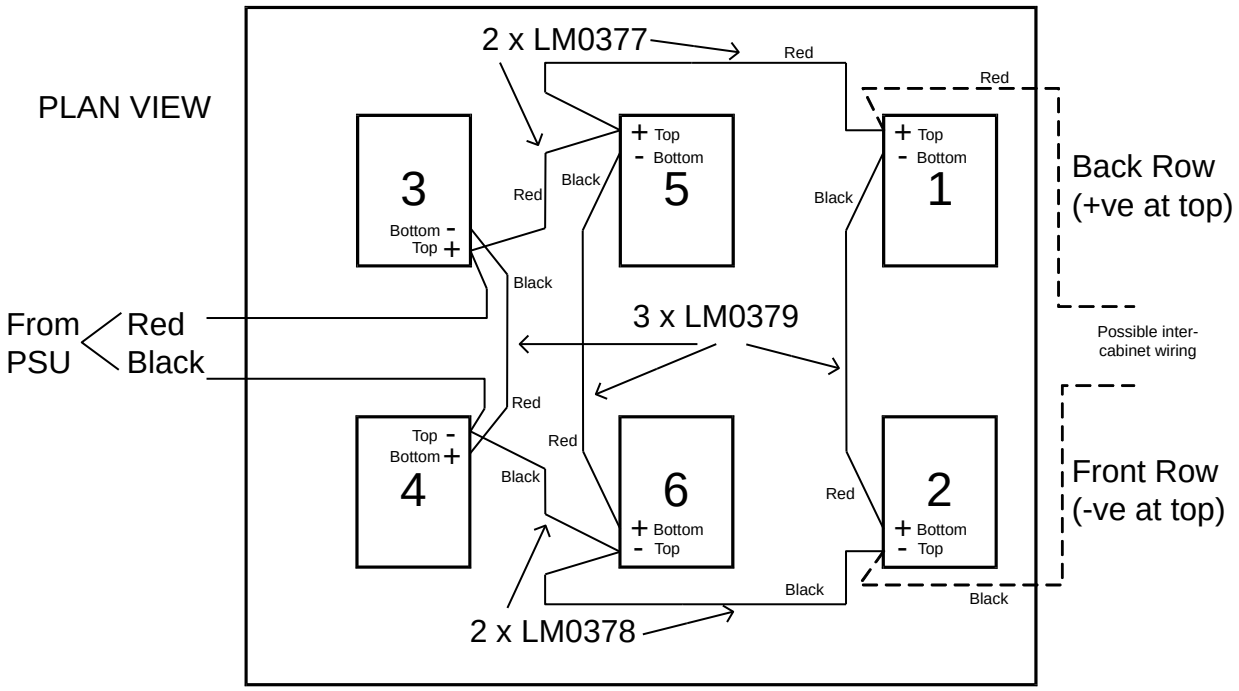


Figure 12-3: 6 * 33AH Batteries (99AH) - Requires 5U of Battery space

WARNING: ***Before connecting charger cables to the batteries ensure the voltage Does not exceed 27.6 Volts***
(2 batteries in series) failure to do so can end with catastrophic results.

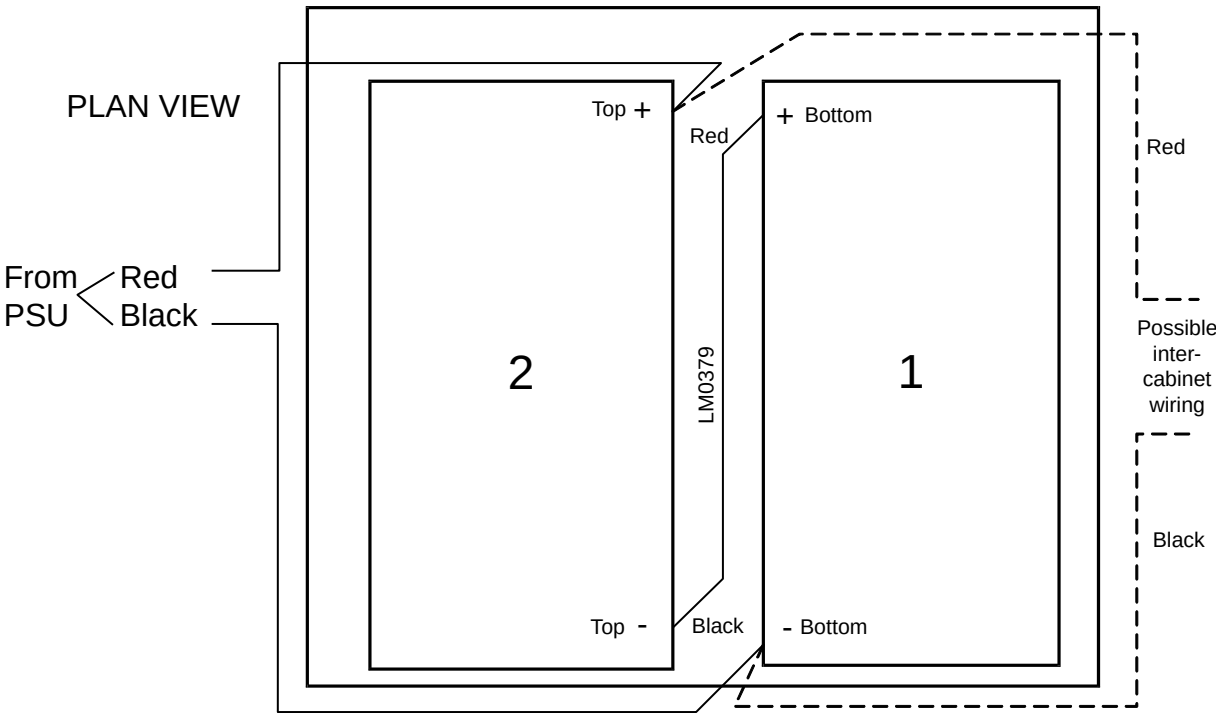


Figure 12-4: 2 * 75AH Batteries (75AH) - Requires 4U of Battery space

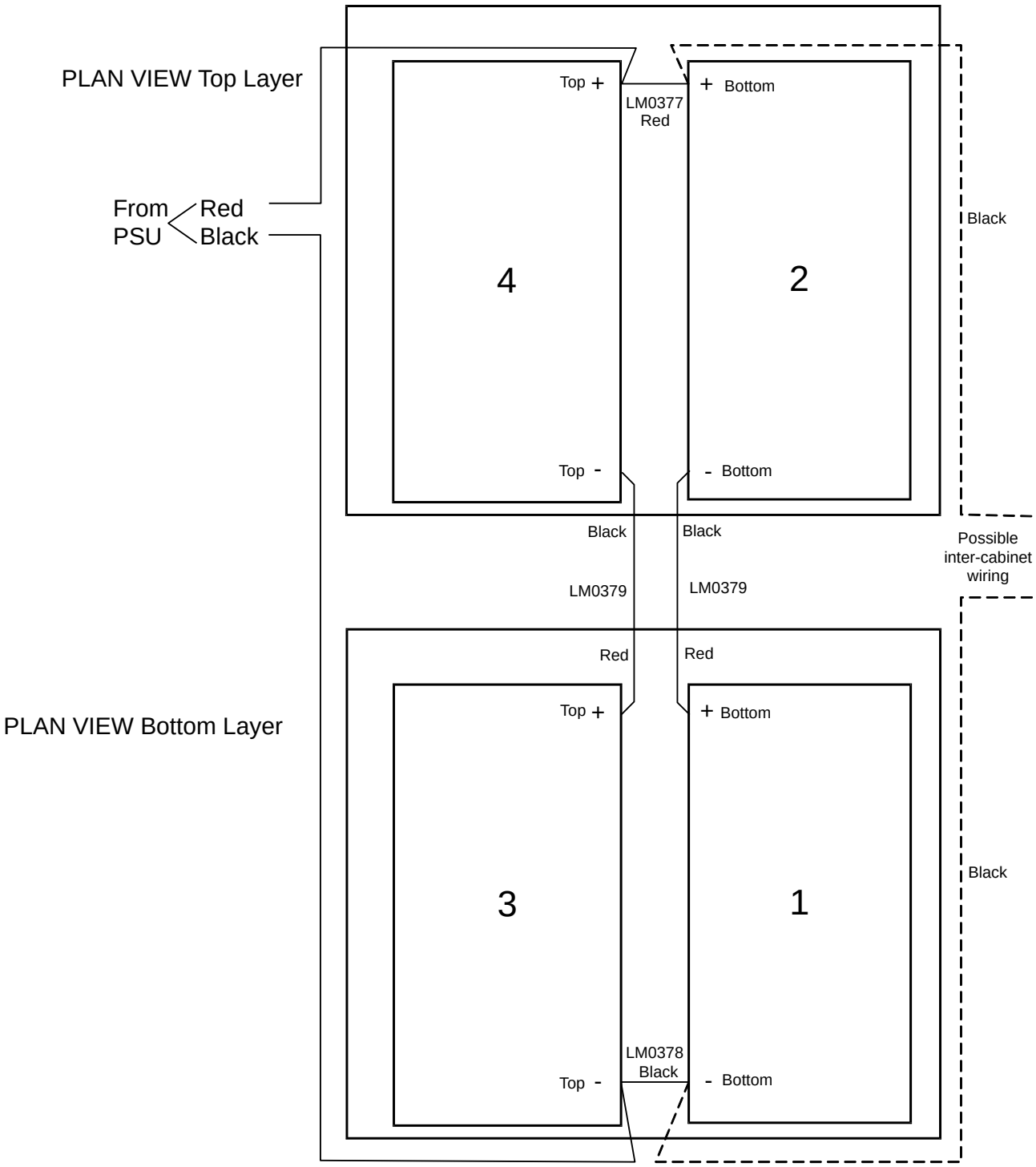


Figure 12-5: 4 * 75AH Batteries (150AH) - Requires 7U of Battery space

WARNING: ***Before connecting charger cables to the batteries ensure the voltage Does not exceed 27.6 Volts***
(2 batteries in series) failure to do so can end with catastrophic results.

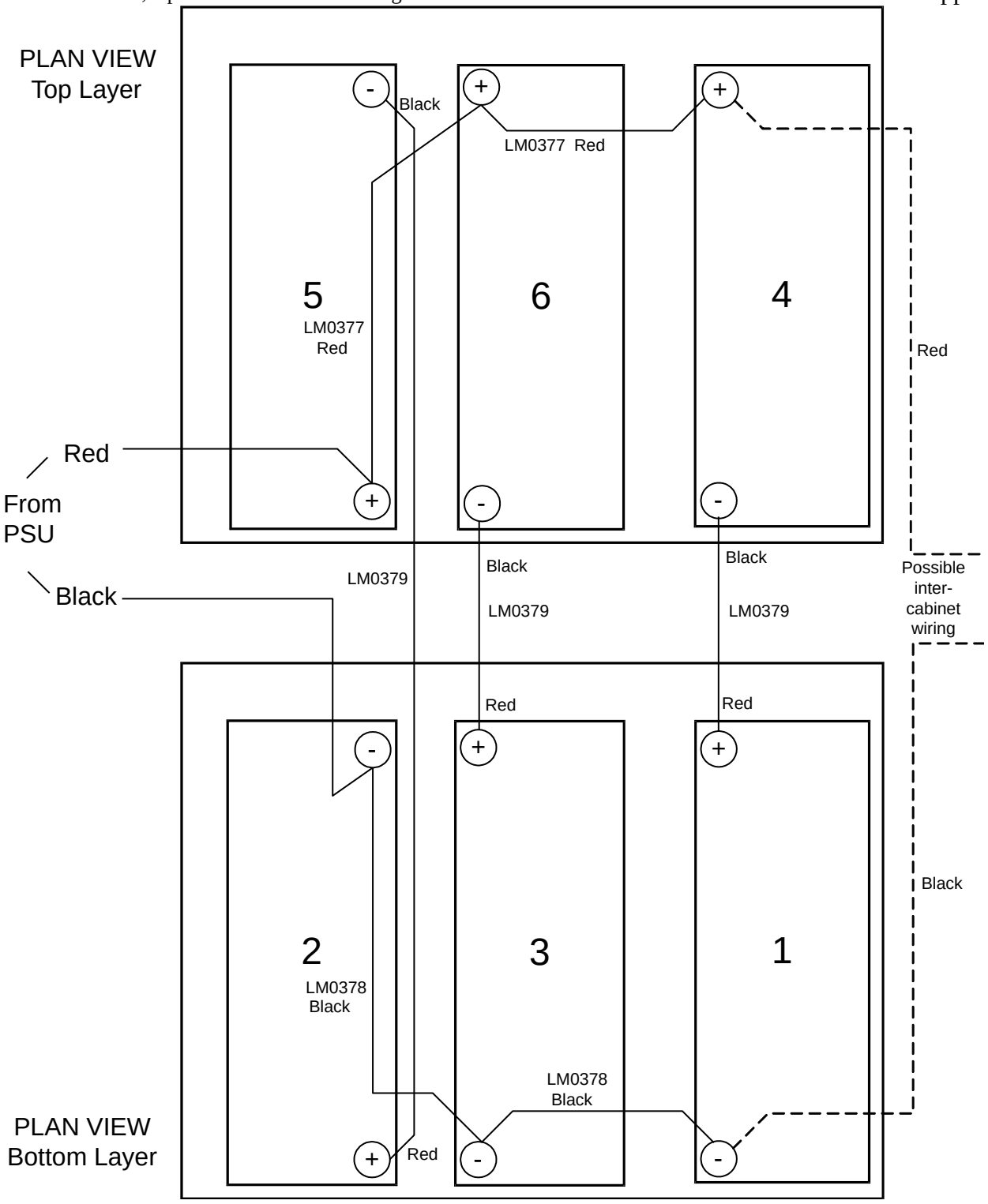


Figure 12-6: 6 * 75AH Batteries (225AH) - Requires 10U of Battery space

WARNING: ***Before connecting charger cables to the batteries ensure the voltage Does not exceed 27.6 Volts***
(2 batteries in series) failure to do so can end with catastrophic results.

12.3. Battery Arrangements – Shallow Cabinets

In shallow cabinets (typically used for SECPs), a bracket or brackets will be provided on which to fit 2 (or more) 18AH batteries.

12.4. Battery Wiring

The batteries are connected to the heavy red and black cables from the charger(s). In a large system with more than one charger, it is recommended that the chargers are connected in parallel, as shown in the diagram below.

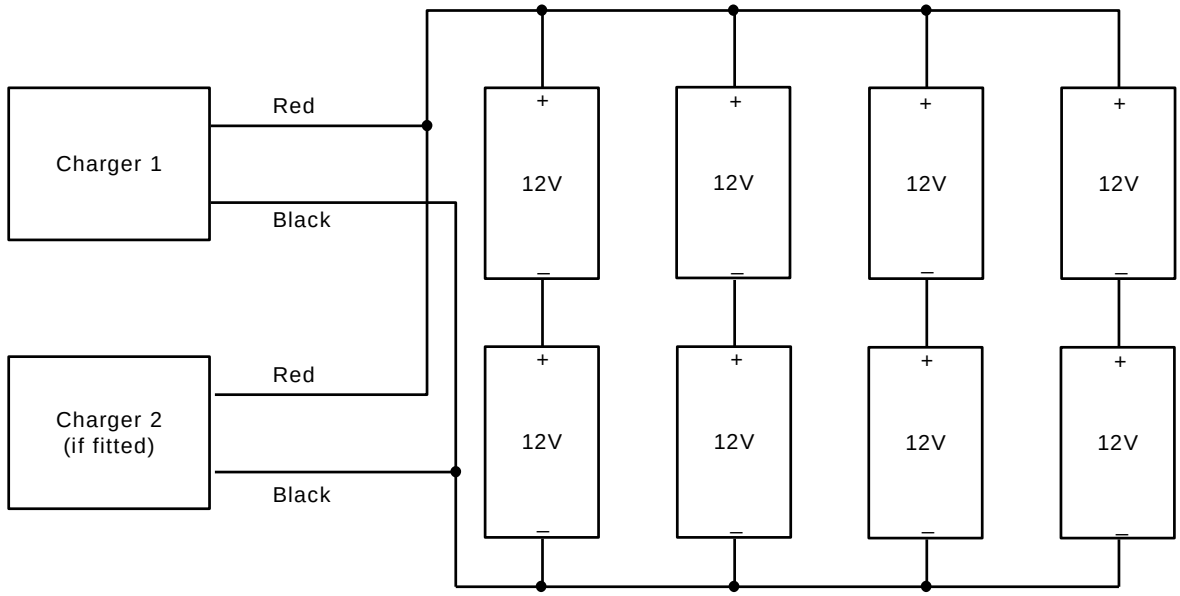


Figure 12-7: Battery Connections

NOTE: *The Capacity of batteries connected in series MUST be the same for both batteries*

12.5. Power Supplies

The following power supply models are currently in use –

- ME0330 24V 6A PSU2406 Brick
- ME0331 24V 6A PSU2406 2U Rack Mounting
- ME0333 24V 12A PSU2412 2U Rack Mounting

The following power supply models have been used previously –

- ME0211 24V 12A PSU308 3U Rack Mounting
- ME0212 24V 3A PSU2403 2U Rack Mounting
- ME0210 SECP Power Supply 5U rack Mounting
- ME0201 Original I2000 Power Supply.

For details of these older supplies please call FireSense Technical Support

When multiple power supplies are fitted in a cabinet, the AMP RACK outputs of the supplies connect individually to the amp racks in the panel. However the battery connections of all the supplies are wired in parallel. Refer to Battery Requirements and Wiring for further details of how the power supplies should be wired to the batteries.

12.6. PSU2406 and PSU2412

a. Replacing older supply with PSU2406 or PSU2412

The ME0331 can be used to replace an ME0212 in the field, or to replace an ME0211 in the case where 6 amps is sufficient for the system. The ME0333 can always be used to replace an ME0211. The ME0331 and ME0333 have a lead with a 6 pin Phoenix connector which connects directly to the ECP module. If the system has one or more FIP, STRM, or ECM modules, the 24V supply for these modules can be obtained from the +24V FIP and 0V screw terminals in the PSU. It will be necessary to remove the cover of the ME0331 or ME0333 to gain access to these terminals. With the ME0211 and ME0212 this supply could be obtained from a flying lead terminated with a Molex connector.

NOTE: *continuous rating of the PSU2406 is 5A and the PSU2412 is 10A. However , these units will safely drive 6A and 12A respectively for a short period e.g when recharging battering*

b. Links

Link	Function
1	Fit to disable self timed “Battery Disconnected” and “Battery Low Capacity” tests.
2	**Fit to select NZ mode -** Charger High, Charger Low, Mains Fail do not activate the general fault output. Self timed battery tests every 24 hours after 72 hours with no externally initiated tests. Battery Low capacity is non-latching. **Remove to select Australian mode -** All fault conditions contribute to general fault output. Self timed battery tests every hour until failure then every half hour. Battery Low capacity is latching.
3	Fitted in PSU2412, removed in PSU2406

NOTE: *I2000 systems currently shipping have Link 1 fitted to disable automatic testing of Battery Disconnected and Battery Low Capacity, as these faults if discovered will cause a misleading “mains fail” indication on the ECP module. A later version of ECP module may be able to show these conditions as “battery fail”, in which case Link 1 can be removed to enable Battery Disconnected and Battery Low Capacity testing. These tests are primarily to comply with AS4428.5, which is not yet required for EWIS systems.*

c. Battery Testing

“Battery Disconnected” (when enabled by link 1 being removed) is checked at least every 30 seconds. In the case of an extremely flat battery or one which is of insufficient capacity for the load, “Battery Disconnected” may be indicated even though the battery **is** connected.

“Battery Low Capacity” is checked automatically as described in the table above (when enabled by link 1 being removed). It is also checked when the “battery test” terminals are shorted regardless of link 1. A latched “Battery Low Capacity” fault can be updated by shorting the “Battery Test” terminals for at least 1 second, or by briefly selecting NZ mode by inserting link 2.

d. Adjustments

To adjust the float voltage ensure that the load is minimal, eg by disconnecting the battery and load, and adjust VR1. This voltage should be set to the battery manufacturer's recommended float voltage at the current temperature. The factory set voltage is 27.3V at 20°C.

To adjust the battery low threshold, disconnect the battery and load and wait until the output voltage stabilises if it is changing, then short the BATTERY TEST terminals, and adjust VR2 so that the output voltage is 0.5V less than the threshold you want. For example for a threshold of 24.0V, set the output voltage to 23.5V. Note – for compliance with AS4428.5 and NSZ4512 the threshold voltage should be set to the 50% discharge point assuming an end point of 19V, with a load equal to the alarm load. You will need discharge graphs from the battery manufacturer to determine this voltage. The factory set battery low threshold is 24.2V.

e. LED's

LED	Colour	Function	Indications
1	Green	Operating / Current	This will flash at about 1.2 Hz. The amount of current the power supply is delivering is indicated by the duty cycle of the flashes - about 10% for 0 amps up to about 80% for the rated current of the supply.
2	Yellow	Fault	When a fault is present, this will flash seven times then pause, repeatedly. Each flash will be short if a particular fault is not present, or long if the fault is present, indicating the following in order - Charger High, Charger Low, Battery Low, Battery Fail, Battery Disconnected, Battery Low Capacity, Mains Failed. A thermistor open or short circuit is indicated by Charger High and Charger Low at the same time

12.7. PSU308

a. Adjustments

To adjust the float voltage ensure that the load is minimal, eg by disconnecting the battery and load, and adjust VR2. This voltage should be set to the battery manufacturer's recommended float voltage at the current temperature. The factory set voltage is 27.3V at 20°C.

b. LED's

LED	Colour	Function	Indications
1	Green	Mains On	Mains voltage is On.
2	Yellow	Charger High	The Charger Voltage is HIGHER than normal.
3	Yellow	Charger Low	The Charger Voltage is LOWER than normal. This may be due to a fault or a heavy load exceeding the current rating of the charger
4	Yellow	Battery Low	The Battery Voltage is lower than the 50% discharge point.

12.8. Adding an AMP rack to an Existing Supply

When an amp rack is added to an existing system, and no additional power supply is used, it will be necessary to fit a further circuit breaker to the power supply if it is a PSU308 or PSU2412.

The circuit breaker should be wired as shown in the diagram below.

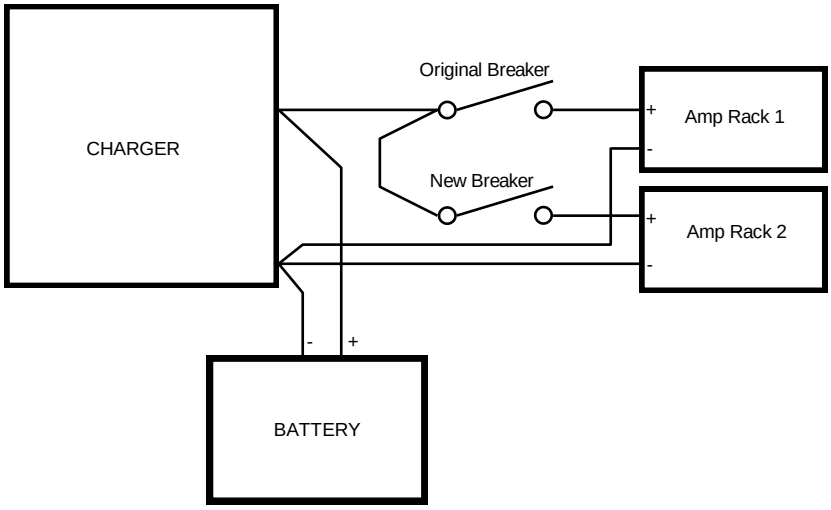


Figure 12-8: Addition of Circuit Breaker to PSU

Adding an amp rack to a system with a PSU2406 should only be done if the total amplifier load current is less than 50A, and then the supply to the two amp racks would be wired in parallel.

12.9. Adding an Additional Power Supply

When an additional power supply is added to a system, the following points should be noted

- Each Amp Rack should be wired to a separate AMP RACK circuit breaker.
- The ECP, ECM if any, and any FIP Input modules should be wired to the ECP output of the first Power Supply.
- Strobe Modules should be distributed across the power supplies, using the FIP/STROBE output of each supply, such that no output is loaded at more than its rating (10A for PSU2406, 25A for PSU2412 and PSU308).

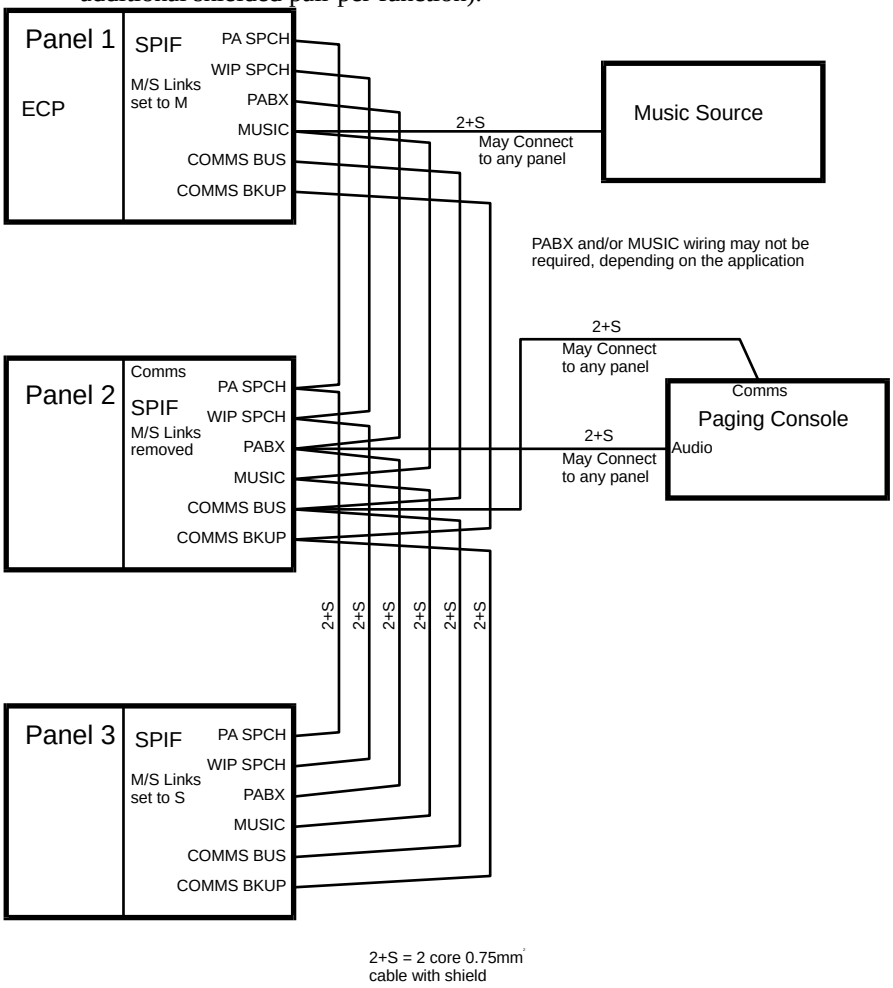
The CHARGER FAULT– outputs from each power supply need to be combined to a single CHARGER FAULT– signal to feed to the ECP.

Section 13 SECP & Remote Equipment Rack Interface

13.1. Wiring

Between ECPs and equipment racks it is necessary to run a minimum of four cables, each consisting of a fire rated shielded pair with each conductor 0.75mm2. There is a primary Comms cable, a spare Comms cable, a PA speech cable, and a WIP speech cable. In the event of failure of one of the speech cables, the remaining speech cable will be used for either PA or WIP as required. If both PA and WIP are used at the same time (e.g. two operators are using the ECP), PA will have priority and WIP communications will be temporarily suspended. If this is unacceptable, and it is necessary to have PA and WIP fully functional at the same time even when one of the cables is faulty, a fifth cable will need to be fitted. This is the Speech Backup cable.

If there are amplifiers at more than one location, and the system has Background Music or Paging Consoles, then additional cables may need to be run between all locations with amplifiers (one additional shielded pair per function).



Audio Monitoring
The panel with the M/S links in the M position (and no others) should have "Monitor Analog busses" set to with the ECP DIP switch.

Maximum cable length
The total bus length from Panel 1 to Panel 3 **plus** the length from Panel 2 to the Paging Console must be less than 1000m.

Figure 13-1: ECP / SPIF Inter-panel wiring

WARNING: There is an advantage in running two sets of cables by different routes, so that if the cables in one route are completely broken by structural damage to the building, the system can continue to operate. This is shown in the diagram below.

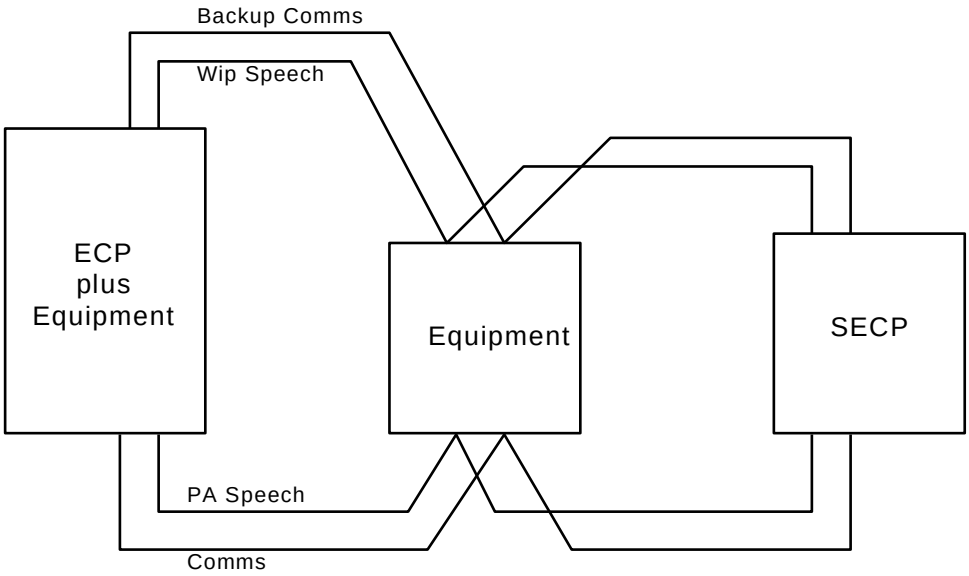


Figure 13-2: Wiring between ECPs and/or Equipment Racks

The diagram below shows the connections to the SPIF9506/SPIF9709 Interface module which will be located at each ECP and equipment rack in a multiple location system. The connections are bussed between like terminals on the interface modules. Note that although the comms wiring can be wired in a star or with spurs as desired, speech wiring must be bussed between locations - star / spur wiring or looping is not permitted. Also one end of the speech cables must be an ECP module, and that ECP module and its SPIF module must be set up to monitor the cables. Refer to Link and Switch Settings and DIP switch Settings.

For networked systems with ECM modules at each location refer also to Wiring Between Locations.

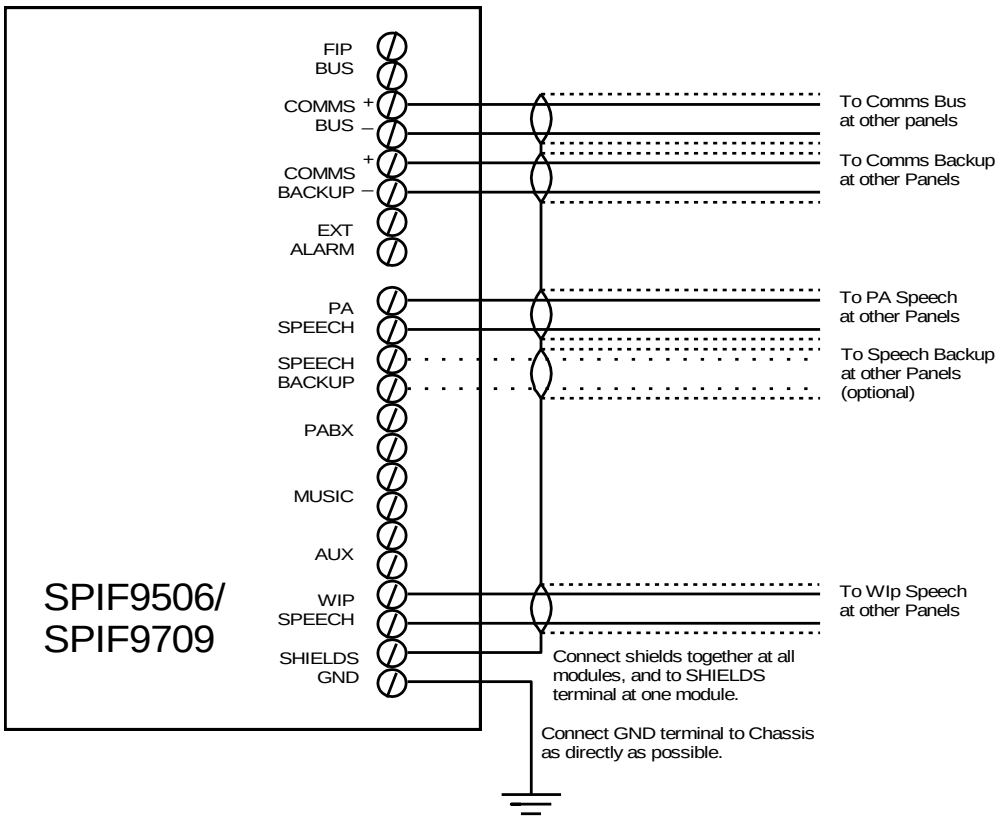


Figure 13-3: SPIF9506 / SPIF9709 Wiring

Notes -

The shields of all cables should be connected together at each ECP or equipment rack. At one of these locations they should be connected to the SHIELDS terminal. The GND terminal should be connected to the chassis at every ECP or equipment rack with a 2.5mm2 wire of maximum length 300mm.

If there are amplifiers at more than one location, and Music or Paging Consoles or other audio inputs are used, audio signals from these sources must be wired to all the locations with amplifiers that require the function. However the communications cable for the Paging Console can be wired to the most convenient SPIF9506/SPIF9709 module.

The EXT ALARM terminals provide a 24VDC 10mA output which operates in synchronism with the internal beeper. This may be connected to a 24V DC external beeper, or a relay with suppressor diode, as required.

13.2. Link and Switch Settings

On the SPIF modules, fit the links as follows -

a. Speech Backup Bus Fitted / Not Fitted

LK1, LK2, LK3, LK4 : Fit in SPEECH BACKUP BUS FITTED position if the speech backup bus is wired, and in the BACKUP = WIP / PA SWAP position if the speech backup bus is not wired.

b. Speech Bus Monitoring Point

Choose one end of the speech busses as a monitoring point. This end must have an ECP or ECM.

Links	Monitoring End	Other End	Intermediate Points

LK5, LK7, LK9	"M"	"S"	Removed
LK6, LK8, LK10	Fitted ("M")	Removed	Removed

In a system with no ECMs and with no ECP at either end of the bus -

Links	Monitoring Point	All Other Points	Bus Ends
LK5, LK7, LK9	"M"	Removed	Fit 120k resistor across PA Speech and WIP Speech Busses
LK6, LK8, LK10	Fitted ("M")	Removed	

For systems without ECMs it is also necessary to set some DIP switches on the ECP modules -

Set DIP switch 7 of the Evac ECP DIP switches ON at all ECPs in the system, if the speech backup bus is fitted, OFF otherwise.

Set DIP switch 8 of the Evac ECP DIP switches ON at the one ECP with the links on the SPIF module in the M position, OFF otherwise.

Refer also to ECP Module for more details of setting up the ECP module.

For systems with ECM modules, the ECM at the end of the bus with the links in the M position must be setup to monitor the analog busses, and all other ECMs setup to NOT monitor the busses.

If you have multiple segments of the PA SPEECH and WIP SPEECH busses, isolated by having two SPIF modules at one node or by an ALIM module, then **each segment** must be monitored as described above ie M link settings at one end of the segment and monitoring enabled in On Site Programming mode at that node, and S link settings at the other end of the segment. (Note you can't monitor at the ALIM end of a segment, the ALIM end must have a 56kΩ resistor installed in lieu of the S link setting.)

c. Normal / Isolate / Advanced Links

NORMAL / ISOLATE / ADVANCED LINKS

Links LK11, LK12, and LK13 are used to select normal, isolator or advanced modes as follows.

Link	Normal Mode	Isolate Mode	Advanced Mode
LK11	Removed	I	A
LK12	A,N	I	A,N
LK13	N	A,I	A,I

Normal Mode should be selected in all systems without ECMs.

Current production ECM systems should be set to Advanced mode.

Older ECM Systems

Refer to the configuration listing supplied. If this is in the current format, then the required mode is defined in the Network / Advanced table, in the section "Historical", for example -

SPIF Type	Advanced

If the configuration is in the older plain text format, or you use the configuration listing produced by the panel itself with the Display Factory Configuration command, look for

`SPIF must be set to Advanced Mode LK11,LK12,LK13 set to 'A'` or `SPIF must be set to Isolate Mode LK11,LK12,LK13 set to 'I'`

in the Networking Section. If either of these is found, select the appropriate mode, otherwise select the normal mode.

NOTE: *Some SPIF9506 modules were modified to give "Isolate Mode'. These will be so labelled. No link settings are required.*

13.3. RS232 (Printer) Interface

Connector J4 on the SPIF9506/SPIF9709 module (and connector J15 on the SE9004 module after early 1999) provides a connection point for a printer or terminal.

Refer to Printer / Terminal Connection for details of terminal and printer connection.

By default this port will log events, but if a terminal or laptop with terminal emulator software is connected it may also be used to set the time and date, set cascade on or off, set the cascade timeouts, and change the baud rate. To use the port in this manner follow the following instructions -

- Connect the terminal with settings as above.
- Press <Enter>.
- You should see a prompt, “Enter Password”. If you do not, it is possible the baud rate has already been set to something other than 9600. Try various settings.
- Enter QUINTRIX <Enter>. (This is the default password. You can change it, but if you do be sure to record your new password.)
- Enter HE <Enter>. This will give you help, i.e. a list of commands, including commands to set the cascade timeouts and baud rate.
- Enter the commands you require and follow the prompts.
- When you have finished, enter QU <Enter>. This will switch the port back to event logging mode.

13.4. SPIF LEDs

LED	Colour	Indication when ON	Normal State
LD1	Red	Relay 1 operated (Spare Comms Bus in use)	No ECM – alternates every 60 seconds if no paging console, or flicks on briefly once every 60 seconds if there is a paging console. In ECM system – On if Comms bus short.
LD2	Red	Relay 2 operated (ECP Microphone selected)	No ECM – On if ECP is in control (in manual or all ECPs are in auto and this ECP was last in manual). In ECM System – On if this ECP’s microphone is required to drive local or remote amplifiers and PTT is pressed.
LD3	Red	Relay 3 operated (Switched PA speech Buss)	PA Speech Buss faulty and switched to spare, Or PA and WIP speech busses swapped due to fault on required function.

LD4	Red	Relay 4 operated (Switched WIP speech Buss)	WIP Speech Buss faulty and switched to spare, Or PA and WIP speech busses swapped due to fault on required function.
LD5	Red	Relay 5 operated (Master phone enabled in Normal mode, local phone system connected to network in Advanced / Isolate modes)	No ECM, or ECM Normal Mode – Master Phone is OFF HOOK. In ECM system Advanced and Isolate modes, ON when local phone audio buss must be connected to network WIP SPEECH buss, OFF for local WIP operation independent from network.
LD6	Red (SPIF 9709 only)	Relay 6 operated (Local PA buss disconnected from network)	No ECM, or ECM Normal Mode – Always OFF. In ECM system Advanced and Isolate modes, ON when local PA audio buss must be disconnected from network PA SPEECH buss due to local PA independent from network.
LD7	Green	+24V Supply	(Note this is LD6 on SPIF9506)
LD8	Green	+5V Supply	(Note this is LD7 on SPIF9506)

13.5. SE9004 Signals Interface Module

The SE9004 is a very simplistic Signals Interface module. It is now used only in basic systems where there is no SECP, no remote equipment, and no paging console. (It was used in these systems before 1995, but does not provide full monitoring and redundancy of the WIP and PA SPEECH cables.)

It does not allow the ECP phone to be transferred to another circuit, as can be done when the SPIF9709 module is fitted.

When Evac ECP software version 2.0 or higher is used on a system with a SE9004, the WIP Bus and Evac Bus terminals must be looped together. WIP BUS+ is connected to EVAC BUS+, and WIP BUS– is connected to EVAC BUS–.

Section 14 WIP Slave Module

14.1. WIP Slave Overview

The WIPS2000 and WIPS9004 WIP Slave modules provide the following functions:

1) Provide the WIP phone signalling tones.

2) Control the switching of the appropriate WIP phone lines.

3) Monitor the WIP line for faults.

4) Supervise the input circuits for activation / fault on FIP / BGA / GP inputs.

Each module can control up to 30 WIPs. Two modules can be located in each rack to control up to 60 WIPS. A maximum number of six modules can be accommodated in a system for a total of 180 WIP lines.

If the ECP has one WIP per zone, a WIP circuit may or may not be allocated to any given zone. If the ECP has three WIPs per zone, any given zone may have zero, one, two, or three WIPs allocated to it. This allocation is performed by FireSense, and is printed on the Panel's configuration printout.

These modules do not have any field wiring themselves, but connect to the appropriate WIP termination module WTRM2000 or WTRM9007 via a flat ribbon cable and the backplane.

The WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.

When a WIP phone is picked up it automatically calls the ECP. A confidence tone will be heard until the call is answered provided the WIPS2000 card is communicating with the ECP. (If the WIPS2000 software is version 1.66 or lower, the confidence tone will be heard regardless of communication with the ECP.).

14.2. LED Indicators – WIPS2000

Eleven LED indicators are located on the front of the module and their function is as follows:

<table>
<tr><th>LED</th><th colspan="2">CONDITION INDICATED</th></tr>
<tr><td>V1 (green)</td><td colspan="2">On = 24V SUPPLY OK</td></tr>
<tr><td>V2 (green)</td><td colspan="2">On = +5V SUPPLY OK</td></tr>
<tr><td>COMMS (yellow)</td><td colspan="2">Flashing = Transmitting on COMMS CHANNEL</td></tr>
<tr><td>LD1 (green)</td><td rowspan="5">Indicate the number of any circuit in fault. The circuit number is sum of the weightings shown. For example, if leds 1 and 3 are on, circuit 20 is in fault (16 + 4). If more than one circuit is in fault, these LEDs will cycle around all such circuit numbers.</td><td>weighting = 16</td></tr>
<tr><td>LD2 (green)</td><td>weighting = 8</td></tr>
<tr><td>LD3 (green)</td><td>weighting = 4</td></tr>
<tr><td>LD4 (green)</td><td>weighting = 2</td></tr>
<tr><td>LD5 (green)</td><td>weighting = 1</td></tr>
<tr><td>LD6 (red)</td><td colspan="2">On steady when one or more phones are in talk mode</td></tr>
<tr><td>LD7 (yellow)</td><td colspan="2">Flashes when one or more circuits is ringing i.e. being called by the ECP.</td></tr>
<tr><td>LD8 (green)</td><td colspan="2">Flashes when one or more circuits is off-hook i.e. calling the ECP.</td></tr>
</table>

14.3. LED Indicators – WIPS9004

Five LED indicators are located on the front of the module and their function is as follows:

LED	NORMAL STATUS	CONDITION INDICATED
V1	ILLUMINATED	24V SUPPLY OK
V2	ILLUMINATED	+12V SWITCHING SUPPLY OK
V3	ILLUMINATED	+12V REFERENCE SUPPLY OK
Sys	ILLUMINATED	MICROPROCESSOR RUNNING OK
Cm	PULSING	COMMS CHANNEL OK

14.4. DIP Switch Settings

MODULE Address	WIP CIRCUITS	SW8	SW7	SW6	SW5	SW4	SW3	SW2	SW1
0	1-30	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
1	31-60	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
2	61-90	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
3	91-120	ON	ON	OFF	OFF	OFF	OFF	ON	ON
4	121-150	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
5	151-180	ON	ON	OFF	OFF	OFF	ON	OFF	ON
6	181-199	ON	ON	OFF	OFF	OFF	ON	ON	OFF

14.5. Link Settings

On the WIPS2000, there are 3 link settings to enable the Microprocessor (U1) to be programmed. These should normally be in the “RUN” position. They are set to the “PROG” position to program the Microprocessor Flash. Currently, this is performed only by Tyco.

There is a further link setting LK4 which enables the EEPROM (U3) to be written to. Currently this IC is not used, so the setting of LK4 is immaterial.

14.6. WIP System Expansion

When fitting a new WIP Slave module be sure to set the DIP switches correctly as described above, and refer to WIPTERM System Expansion for details on fitting and wiring the termination module.

The WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.

Section 15 Multiplexor Modules – EMUX9601 & EMUX9002

15.1. Multiplexor Overview

The Multiplexer module provides the following functions:

1. Controls the audio source to the amplifiers in the same card cage.

2. Generates the emergency tones and digitised speech message(s) for those amplifiers it is controlling.

3. Performs the speaker line fault monitoring in conjunction with the amplifiers it is controlling.
4. Performs monitoring of the amplifiers it is controlling.

Each rack contains one EMUX module which can control up to 5 amplifier modules. This module does not have any direct field wiring, but receives inputs from the signals interface module via a flat ribbon cable and the backplane.

There are two types of Multiplexer Modules - EMUX9002 and EMUX9601.

The EMUX9002 is now obsolete for new production and is replaced by the EMUX9601, but the EMUX9002 information is presented here for use in the upgrading of existing systems that still use it.

The functionality of the EMUX9601 and EMUX9002 is essentially the same, except the EMUX9601 provides additional facilities:

1. Field programmable messages recordable from 3 sources: PA Speech, Paging Console (PABX), and external line-level source.

2. Two versions are available - one with 16 seconds (4 messages) and the other with 60 seconds (15 messages) of stored speech.
3. Each unique message can be up to 4 seconds long. However a longer message can be created by overlapping up to 4 consecutive message spaces, i.e. up to 16 seconds long.
4. A 3 LED recording level meter.
5. Message playback test facility, which can be listened to by connecting an 8Ω speaker directly to the EMUX.
6. Messages can be played with the evacuation tones, with the alert tones, or standalone messages can be played to zones for background music.
7. Standalone messages can be played on background music once only, or continuously.
8. Two different evacuate tones are available – the original AS2220 evacuate tone and a newer ISO8201 evacuate tone. The ISO tone is only available with EMUX software version 1.16 or later (which requires the "Widget Board").

Refer to Widget Board for information on the "Widget Board" used to replace the microprocessor on the EMUX9601 from late 2004.

15.2. EMUX9601 LED Indicators

Ten LED indicators are located on the front of the EMUX9601. Their functions are as follows:

LED	OPERATING MODE	NORMAL STATUS	CONDITION INDICATED
V1	ALL	ON STEADY	24V SUPPLY OK

V2	ALL	ON STEADY	+8V SWITCHING SUPPLY OK
V3	ALL	ON STEADY	-VE SWITCHING SUPPLY OK
SYS	ALL	ON STEADY	MICROPROCESSOR RUNNING OK
CM	RUN	PULSING	COMMS CHANNEL OK
PROG MODE	PROGRAM	OFF	EMUX IN PROGRAM MODE
BUSY	PROGRAM	OFF	MESSAGE PLAYING OR RECORDING IN PROGRAM MODE*
HIGH	PROGRAM	OFF	RECORD SIGNAL TOO HIGH (CLIPPING)
OK	PROGRAM	OFF	RECORD SIGNAL LEVEL OK
LOW	PROGRAM	OFF	RECORD SIGNAL LEVEL TOO LOW

NOTE: *The BUSY LED flashes 3 times during the last second of each 4 second period when recording or replaying a message. .*

15.3. EMUX9601 DIP Switch Settings

There are two sets of DIP switches on the EMUX9601; SW1 a block of 4 just in from the edge of the board for selecting the module and amplifiers, and SW2 a block of 8 on the edge of the board for selecting mode, messages, recording sources, speech chip type, and evacuate tone (AS2220 or ISO).

MODULE ADDRESS	**AMPLIFIERS**	**SW1 SWITCHES ON (REST OFF)**
0	1 – 20	NONE
1	21 – 40	1
2	41 – 60	2
3	61 – 80	1, 2
4	81 – 100	3
5	101 – 120	1, 3
6	121 – 140	2, 3
7	141 – 160	1, 2, 3
8	161 – 180	4
9	181 – 200	1, 4

NOTE: *- These amplifier numbers refer to those which appear on the configuration printout:*

- *Each 10W amplifier is allocated a number.*
- *Each 25W amplifier is allocated two successive amplifier numbers*
- *A pair of 50W amplifiers uses the first two numbers in a group of four, with the second two numbers being unused.*
- *A 100W amplifier uses the first number in a group of four, with the next three numbers being unused.*

In Program mode the following switches select which message will be recorded.

MESSAGE	SW2 SWITCHES

NUMBER	OFF	ON
1	2, 3, 4	1
2	1, 3, 4	2
3	3, 4	1, 2
4	1, 2, 4	3
5	2, 4	1, 3
6	1, 4	2, 3
7	4	1, 2, 3
8	1, 2, 3	4
9	2, 3	1, 4
10	1, 3	2, 4
11	3	1, 2, 4
12	1, 2	3, 4
13	2	1, 3, 4
14	1	2, 3, 4
15		1, 2, 3, 4

Note: - The switch settings above are only used for the message number function in program mode. However they have additional functions when not in Program mode. When exiting program mode, be sure to set switches 1 – 4 to the required position to select the required message options.
- Message numbers 5 – 15 are not used in the 16 second (4 message) version of the EMUX9601.
- Message number 0 (SW2 - 1:4 all off) is not a valid message.

NOTE: *-*

- *The switch settings above are only used for the message number function in program mode. However they have additional functions when not in Program mode. When exiting program mode, be sure to set switches 1 – 4 to the required position to select the required message options.*
- *Message numbers 5 – 15 are not used in the 16 second (4 message) version of the EMUX9601.*
- *Message number 0 (SW2 - 1:4 all off) is not a valid message.*

The below table shows the function of DIP switches 1–4 when not in program mode, and the function of switches 5 – 8.

SW2 SWITCH	OFF FUNCTION	ON FUNCTION
1	Play AS2220 Evacuation Signal	Play ISO Evacuation signal with "Emergency" and "Evacuate Now" keywords.
2	Play the evacuation voice message from the speech chip. Special messages can be recorded on site or at the factory.	Play the evacuation voice message selected by SW2:3 from the widget board instead of speech chip message 1.
3	When SW2:2 is on, play the fixed "Evacuate as directed, evacuate as directed" voice message.	When SW2:2 is on, play the fixed "Evacuate the building using the nearest fire exit" voice message.
4	Alert tones (if any) include a voice message if so configured in Factory Programming.	If the default Alert message is configured in factory programming (i.e. speech chip message 3), it will **not** be played.
5	PA speech not selected as the recording source.	* PA Speech selected as the recording source.
6	PABX not selected as the recording source.	* PABX selected as the recording source.

7	EMUX9601 in RUN mode.	EMUX9601 In Program Mode
8	EMUX9601 is 16 second (4 message) version (ISD1416 is fitted).	EMUX9601 is 60 second (15 message) version (ISD2560 is fitted).

NOTE: *-*

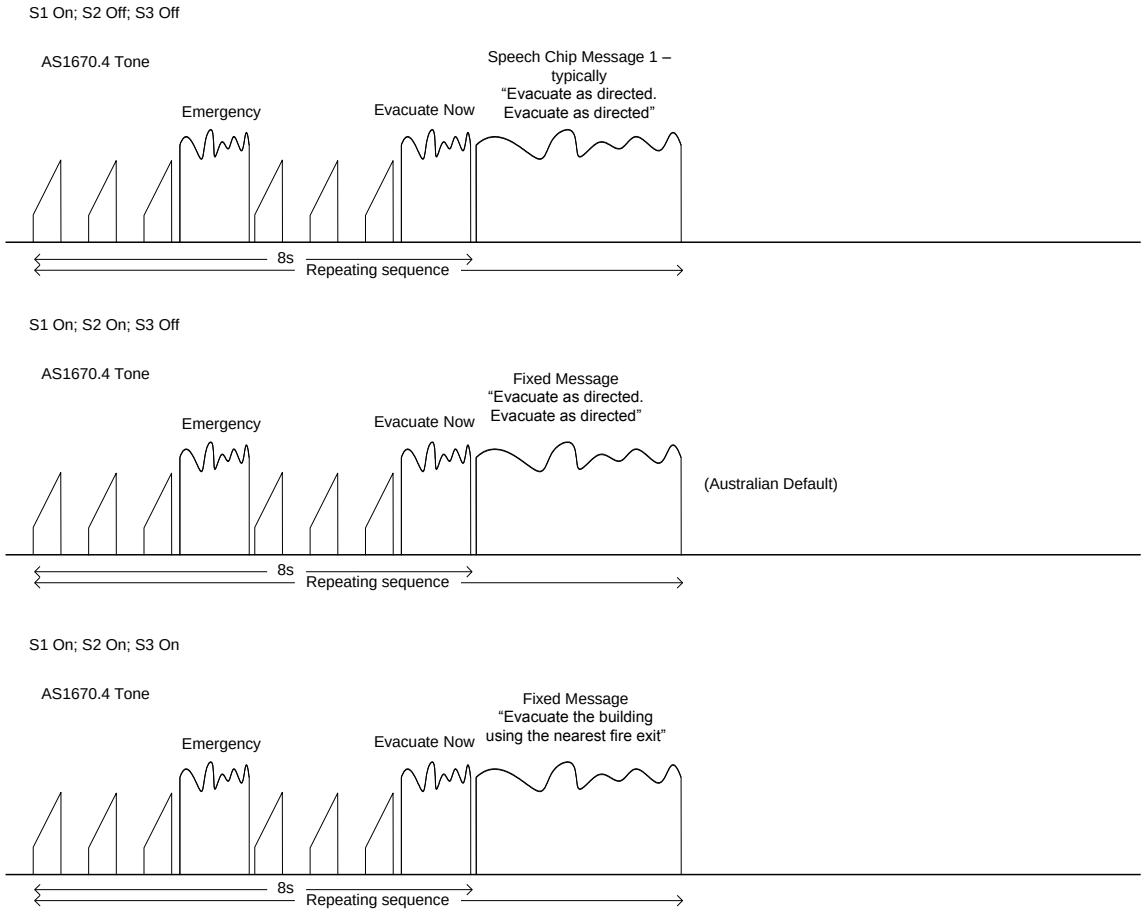
- *Switches 5 and 6 must never both be on at the same time. If both are off the Ext source (J3) input can be used.*
- *Switch 7 should only be in the on position when message recording or play-back is required. For normal I2000 operation switch 7 must be left in the offposition.*
- *The EMUX will be compatible with older revisions i.e. EMUX9601 up to Revision 5 and all revisions of EMUX9002, provided switches 1 – 4 are all switched off. It can thus be used for replacements in older systems.*

15.4. EMUX9601 Tones and Messages

The following diagrams show the effect of various combinations of the DIP switches 2-1 to 2-4.

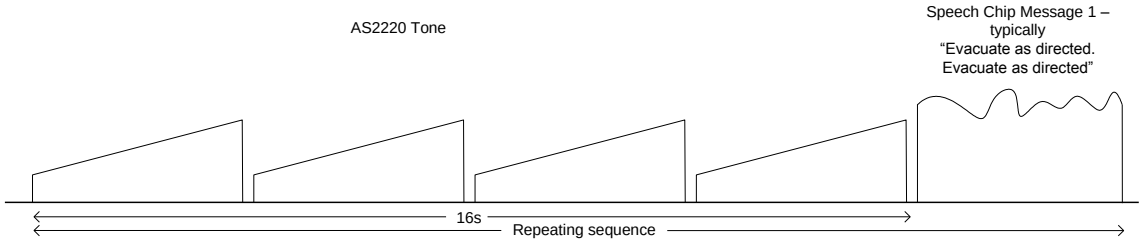
These are new features introduced in November 2004. Boards supporting these features have Rev 7 (or later) marked on the board, and have a label near U2 titled “SW2 Functions. (Note Rev 6 supported the ISO tones, but did not support interspersing the Emergency and Evacuate keywords in the 1.5 second gaps.)

a. ISO Evacuation Signal and Voice Message

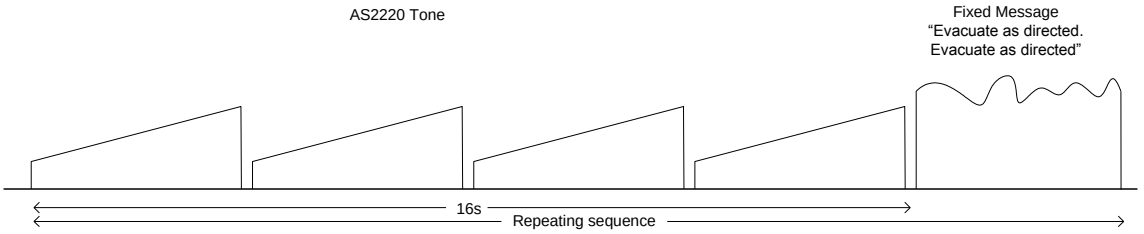


b. AS2220 Evacuation Signal

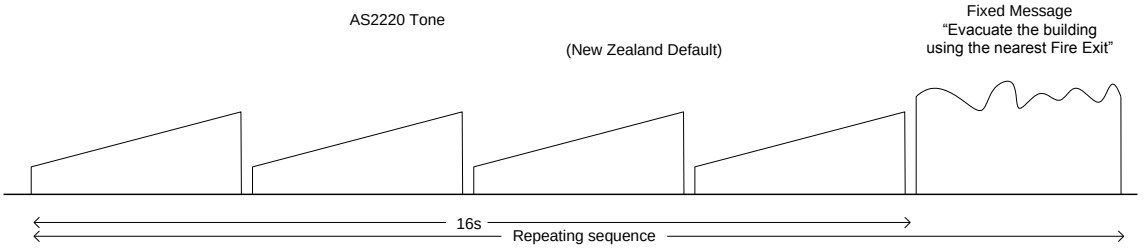
S1 Off; S2 Off; S3 Off



S1 Off; S2 On; S3 Off

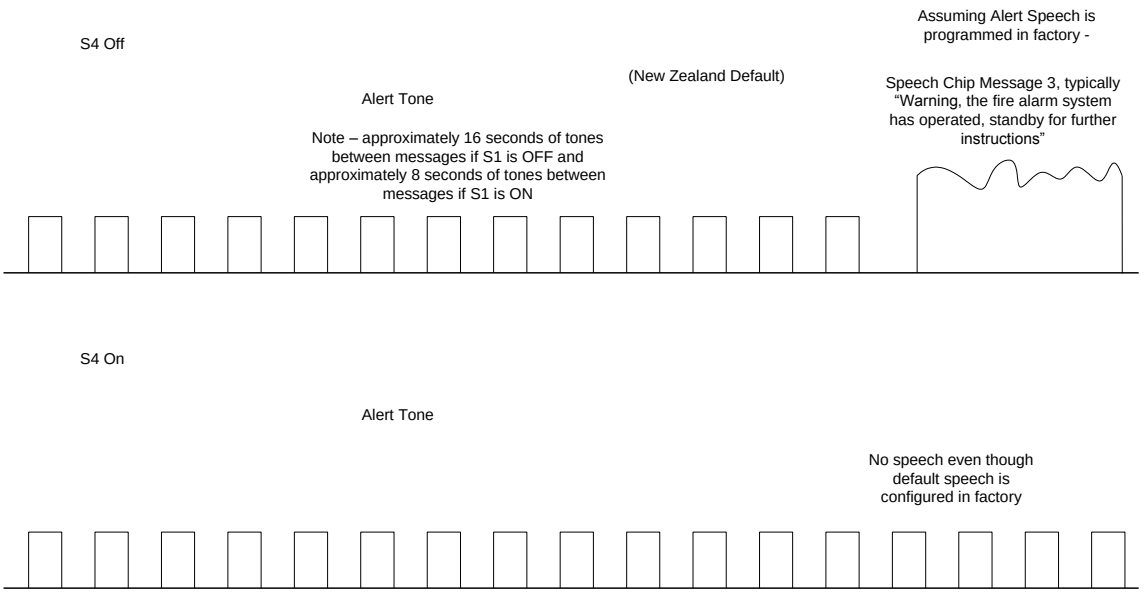


S1 Off; S2 On; S3 On



c. AS2220 Alert Tones

Note that Alert tone is now not used in Australia unless the building has a specific emergency plan requiring it (see "Cascade Sequences and Alert Tones" below), therefore the following diagram is often not relevant. However by default Alert speech will be programmed to message 3 in the factory, so that if Alert tone is selected in the factory or on-site configuration, then the generation of the Alert message can be controlled by DIP switch 4. Note that the option to disable the alert message only applies when the default message (i.e. message 3) is programmed in the factory configuration.



d. Balancing Tone and Speech Levels

The "Emergency" and "Evacuate Now" Keywords, and the fixed messages in the Widget board selected when SW2-2 is ON, cannot have their volume adjusted. (The Digitised Speech control only affects the Site Recordable messages generated by the "Speech Chip" U2.)

Older Production - EMUX 9601 Rev up to 7.

To ensure that the keywords and fixed messages are played at the highest level possible relative to the tones, the volume controls on all amplifier cards should be turned right up (and adjustments in various building areas made with the tappings on speakers). If the amplifier volume controls are turned down the speech level will decrease more than the tone level decreases and the resulting speech sound level may be significantly below the tone sound level. See also EMUX9601 Volume Control Adjustments and Output Level Adjustment.

New Production - EMUX9601 Rev 8 and higher.

The relative levels of speech and tones have been improved, and are not significantly affected by the amplifier volume control settings. (However it is still desirable to have speaker tappings set to the lowest power setting that gives enough sound level).

15.5. EMUX9601 Connectors

There are two connectors on the EMUX9601 for connection of the External Source recording signal (J3) and for an Ext Speaker (J2) (8Ω speaker) for listening to the recorded messages.

For successful recording, the External Source signal level should be at least 300mV RMS.

The pinouts are as follows:

Pin Number	J2 Ext Speaker	J3 Ext Source
1	+ Speaker (8Ω)	NC
2	NC	Signal Input
3	NC	0V
4	- Speaker (8Ω)	NC

15.6. EMUX9601 Customising Messaging

The standard EMUX9601 is supplied with pre-recorded messages for evacuation and alert. The message configuration is shown below.

Message	Message Number		Message Description
Type	16 Second	60 Second	
Evacuation	1	1	"Evacuate as directed, evacuate as directed"
Alert	3,4	3,4 9,10*	"Warning, the fire alarm system has operated, standby for further instructions".

NOTE: -

- *The 60 second version has an extra copy of the alert message stored at message number 9.*
- *The alert message is just over 5 seconds long and hence uses 2 message numbers..*

Standard ECP software shipped with each I2000 system is configured for playing of the evacuate message with evacuation tones only. Therefore the standard configuration does not include a message with alert tones.

Thus with a standard configuration of ECP and EMUX9601 software (regardless of whether it is the 16 or 60 second version) the user is only able to customize the evacuation message. The message duration can be between 100 milliseconds and 16 seconds, but must start at message number 1.

Custom ECP / ECM software is required for any of the following features:

1. Messages with alert tones.
2. Standalone messages to be played continuously to zones on background music.
3. Standalone messages to be played once to zones on background music.
4. Additional messages (e.g longer than 16 seconds, or multiple messages) to be played with the evacuate tones.
5. Messages to be played only in Auto and not Manual. (It is now the default for messages to be played in both Manual and Auto).

Contact FireSense if you require changes to the ECP / ECM software.

15.7. EMUX9601 Message Recording and Playback

The EMUX9601 provides field recording of the "speech chip" digitised speech messages (but not "Widget board" messages). The speech chip messages can be recorded / played back when the EMUX9601 is switched to PROGRAM mode (SW2-7).

There are two buttons provided at the front edge of the EMUX9601, labelled "PLAY" and "RECORD".

To record a message:

1. Put the EMUX9601 in PROGRAM mode by setting switch SW2-7 in the PROG position (ON). The I2000 control panel will now indicate a module fault, which needs to be acknowledged to

silence it.
Select the recording source by setting DIP switches SW2-5 and SW2-6.

2. Setting SW2-5 to the on position selects the ECP microphone (PA speech) as the recording source. Setting SW2-6 to the on position selects the paging microphone, or paging console (PABX) as the recording source. If both SW2-5 and SW2-6 are set to the off position the Ext Source (J3) is selected as the recording source. The external source can be any line level input (CD, DAT, tape deck or microphone and pre-amp) and is connected via the 4-way header J3 at the edge of the board.

***NOTE:** - Only one recording source should ever be selected at a time i.e. only one of the DIP switches SW2-5 and SW2-6 should ever be in the on position and both must be in the off position if an external recording source is connected. Always switch both recording source DIP switches to the off position first if changing between recording sources.*

3. Adjust the source signal with the RECORD LEVEL potentiometer (VR7) so that the record level meter has both green and yellow LEDs predominantly on, with the red LED flickering occasionally.

4. If for example, the ECP microphone is to be used as the recording source, speak into the microphone with the press-to-talk button depressed and adjust the RECORD LEVEL clockwise to increase the record level meter display (up from green to yellow to red), or anti-clockwise to decrease the meter level (back from red to yellow to green).

5. Select the message number that the recording is to start from by setting the first 4 DIP switches on the SW2 to the appropriate message number. (Note message number 0 is invalid).

6. Press and hold the RECORD button.

7. To start recording press and hold the PLAY button.

8. The message will continue recording for as long as the RECORD button is held down; or if the PLAY button is released before the end of a message number, recording will stop at the conclusion of the current message number. This is an ideal way of ensuring that the recording does not go over a message boundary and erase the next message. Message duration can be between 100 milliseconds and a maximum of 16 seconds (4 consecutive message numbers).

   If the message is to be greater than 4 seconds, the PLAY button must be held depressed at the end of each message (4 second period).

   The BUSY LED will illuminate for the duration of the recording and will flash three times during the final second of each message, to indicate the pending message number transition. The recording will automatically cease after the recording of 4 consecutive message numbers or if there is not enough message space left.

***NOTE:** -*

- *Recording a message will erase whatever previously occupied that message.*
- *A message recorded over the latter part of a multi-part message will delete the latter part of the original message and add the new message to the end of the remaining part of the original message.*
- *To delete a message entirely from playing during alert/evac, record a message for less than 100 milliseconds.*
- *It may be easier to temporarily install EMUX9601 modules from remote equipment racks in the MECP for message recording.*

To replay a message for test purposes:

1. Put the EMUX9601 in program mode by setting DIP switch SW2-7 to the Program mode position (ON).

2. Connect an 8□ or higher speaker to the external speaker header J2.

3. Select the message number that the playback is to start from by setting the first 4 DIP switches (SW2-1:4) to the appropriate message number.

4. Press the PLAY button. The selected message will play to its conclusion, which could be up to 16 seconds (4 consecutive messages).

   If the PLAY button is held down at the end of a message then the next message will be played. By continually holding the PLAY button down the entire message content of the EMUX can be played. Once the last message has been played playback will continue from the first message. If the PLAY button is released, the playback will cease at the end of the current message. The Busy LED will illuminate for the duration of the playback and will flash three times during the final second of each message number (4 second period) to indicate a pending message number transition.

   Playback will automatically cease after 16 seconds, or 4 message numbers of the same message.

   After recording or playing messages ensure that the Program mode DIP switch (SW2-7) is returned to the RUN position and that the PA Speech and PABX recording DIP switches are switched off. Also, disconnect any external source and speaker. The module fault on the I2000 can now be cleared.

15.8. EMUX9601 Volume Control Adjustments

Seven volume control adjustments are provided at the front edge of the EMUX9601 as shown in the diagram below.

The record level control is used to adjust the level of the recording in Program mode. It is used in conjunction with the record level meter.

The other six controls give volume adjustments common to all amplifiers in the card cage, and may be used to adjust the balance between Alert, PA Speech, Digitised Speech and Evacuate; or to reduce the Paging Console (PABX), auxiliary input (AUX) or background Music (BGM) levels below the emergency tone levels. Note that there is no control for Evacuate tones. You should first set up the amplifiers and speaker transformer taps to get the correct sound levels with Evacuate tones and then adjust the balance between Evacuate and all the other signals with the controls on this module.

The PA SPEECH control on this module has a similar function to the microphone level control on the ECP module, however the control on the ECP affects all outputs, while the control on an EMUX9601 affects only the outputs of the amplifiers in the card cage controlled by that EMUX9601.

***NOTE:** - Digitised Speech" control below does not affect the ISO keywords "Emergency" and "Evacuate now", or other messages set up to come from the Widget Board. (Refer to EMUX9601 DIP switch settings)*

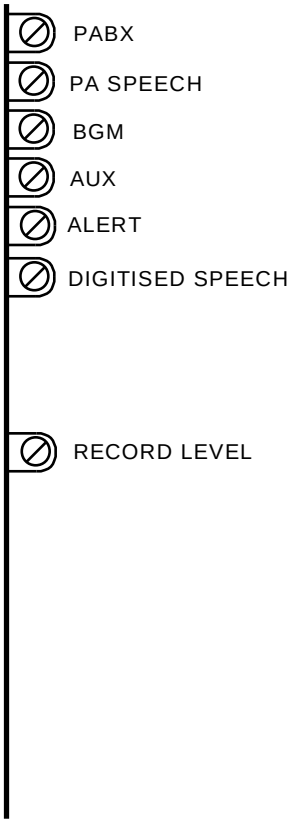


Figure 15-1: EMUX9601 Module Volume Adjustments

Revision 8 Evacuation tone / speech level change

Revision 8 of the EMUX9601 has the Evacuation tone level slightly reduced, and the digitised speech from the Widget board level slightly increased, relative to previous revisions.

Generally it should be possible to replace an older EMUX9601 with a revision 8 later revision without any noticeable adverse effects - in fact the increased speech level should be beneficial. If the drop in the evacuation tone level is noticeable, increase the amplifier volume controls slightly.

15.9. EMUX9002 LED Indicators

Five LED indicators are located on the front of the EMUX9002. Their functions are as follows:

LED	NORMAL STATUS	CONDITION INDICATED
V1	ON STEADY	24V SUPPLY OK
V2	ON STEADY	+8V SWITCHING SUPPLY OK
V3	ON STEADY	-VE SWITCHING SUPPLY OK
SYS	ON STEADY	MICROPROCESSOR RUNNING OK
CM	PULSING	COMMS CHANNEL OK

15.10. EMUX9002 DIP Switch Settings

MODULE ADDRESS	AMPLIFIERS	SWITCHES ON (REST OFF)
0	1 - 20	6
1	21 - 40	6, 1
2	41 - 60	6, 2
3	61 - 80	6, 2, 1
4	81 - 100	6, 3
5	101 - 120	6, 3, 1
6	121 - 140	6, 3, 2
7	141 - 160	6, 3, 2, 1
8	161 - 180	6, 4
9	181 - 200	6, 4, 1

NOTE: *- amplifier numbers refer to those on the configuration printout -*

- *Each 10W amplifier is allocated a number.*
- *Each 25W amplifier is allocated two successive amplifier numbers.*
- *A pair of 50W amplifiers uses the first two numbers in a group of four, with the second two numbers being unused.*
- *A 100W amplifier uses the first number in a group of four, with the next three numbers being unused.*
- *A 200W amplifier uses the first number in a group of eight, with the next seven numbers being unused. (In some cases the slave amplifier module may be mounted in a separate card cage with no EMUX module, in which case the 200W amplifier uses the first number in a group of four.)*

15.11. EMUX9002 Volume Control Adjustments

Five volume control adjustments are provided at the front edge of the EMUX9002 as shown in the diagram below.

These controls give a volume adjustment for all amplifiers in the card cage, and may be used to adjust the balance between the Alert, PA Speech and Evacuate; or to reduce the Paging Console (PABX), auxiliary input (AUX) or background Music (BGM) levels below the emergency tone levels. Note that there is no control for Evacuate tones, you should first set up the amplifiers and speaker transformer taps to get the correct sound levels with Evacuate tones and then adjust the balance between Evacuate and all the other signals with the controls on this module.

The PA SPEECH control on this module has a similar function to the microphone level control on the ECP module, however the control on the ECP affects all outputs, while the control on an EMUX9002 affects only the outputs of the amplifiers controlled by that EMUX9002

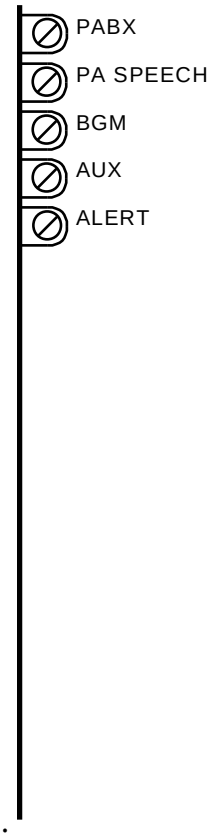


Figure 15-2: EMUX9002 Module Volume Adjustments

Section 16 ECP Module

16.1. Overview

The ECP module contains site specific software which defines the system configuration, and controls all the other modules.

If there is more than one ECP in the system, then only one is in control at any given time - the MECP if it is switched to manual, otherwise the SECP if it is switched to manual (the first SECP to be switched to manual if there is more than one), otherwise if all ECPs are switched to automatic, the last ECP which was in manual.

For a networked system with ECM modules, the role of the ECP is reduced - it is basically a control module for only the LEDs and switches. The overall control of the system is vested in the ECM modules.

The original ECP was the ECP9002. The ECP9702 is a newer revision of it with some additional features –

- EEPROM instead of battery backed RAM for storage of the system's on site setup information.
- Alarm when ECP circuit breaker is opened.
- Service jumper on the Beeper which reduces the volume.
- Software has full control of SYSTEM FAULT LED.
- Ring and confidence tone generation circuitry for Master Phone is on board, so the Master Phone does not need a RING9006 PCB. There is a two wire connector for the master phone instead of a 10 way ribbon cable connector.
- It has a 4 way 0.1" connector for the ME0290 microphone, as well as the original DIN socket for the ME0213.

Otherwise it is functionally compatible with and is interchangeable with the original ECP9002. (Refer to ECP Revision Interchangeability for details when changing ECP modules.)

Refer to Widget Board for information on the widget board used to replace the WIP microprocessor on the ECP9702 from late 2004. Also refer to ECP Revision Interchangeability for details of the interchangeability of ECP boards which use the widget board and previous versions.

16.2. DIP Switch Settings

There are two DIP switches on the ECP module, which must be set to define -

- Whether the module is an MECP or SECP. In a system more than one ECP, the ECP which is to have master control if both are switched to Manual is the MECP. This is not necessarily the one with the equipment (amplifiers etc).
- If the module is an SECP, its address.
- Whether a serial port is fitted for connection to a printer or diagnostic terminal.. (In addition, a MAX232 IC must be fitted in the socket U9 if a serial port is to be fitted.)
- If the system has SPIF9506/SPIF9709 modules, whether the SPARE SPEECH bus is wired or not.

- If the system has SPIF9506/SPIF9709 modules whether this ECP is connected to the SPIF at one end of the bus with its links in the M position.

- Whether the hardware is one WIP per zone or three WIPs per zone.

On the ECP9002 (if manufactured during or after 1996) there is one jumper to select the EPROM size. Select the positions shown for various software versions. Note that from August 1997 onwards, all systems will require the 27512 position.

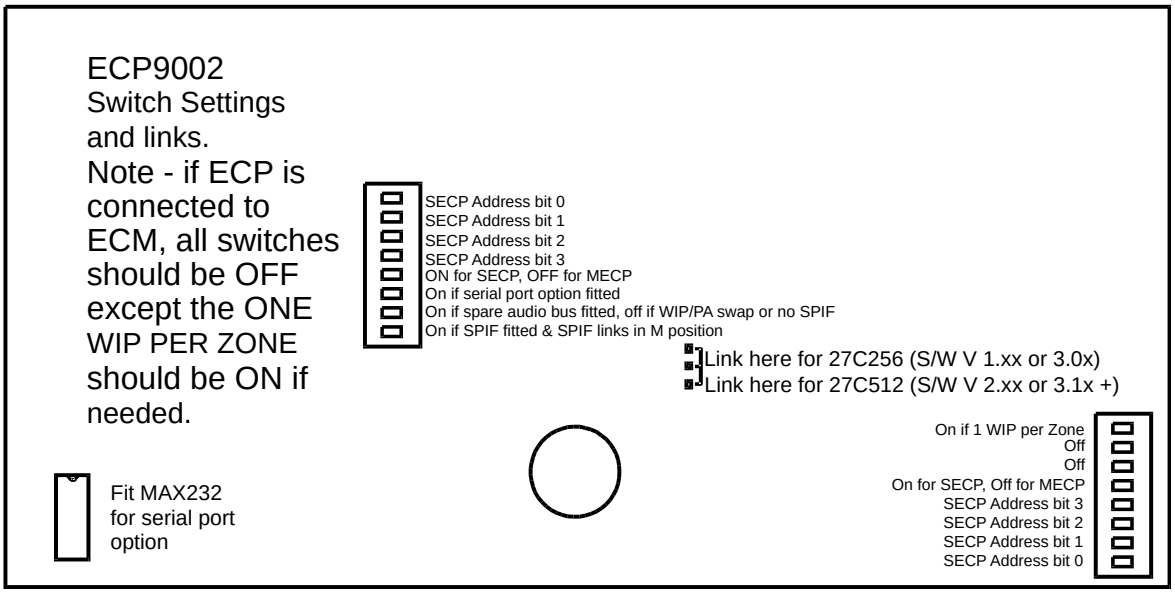


Figure 16-1: ECP9002 Module DIP Switches and Links

On the ECP9702 there are links for the RAM Size and EPROM size. These should be set as follows -

LK1 : 27C256 position if U10 is a 27C256 (used for version 1.xx software and 3.0x software), otherwise 27C512/010 position (used for version 2.xx, and version 3.1x and higher software).

LK2 : 2k position if U14 is a MK48T02, MK48Z02, MK48T12, MK48Z12, or DS1220. Otherwise 8k/32k position.

LK3 : 2k/8k position with all ICs currently used.

LK4 : 2k/8k position with all ICs currently used.

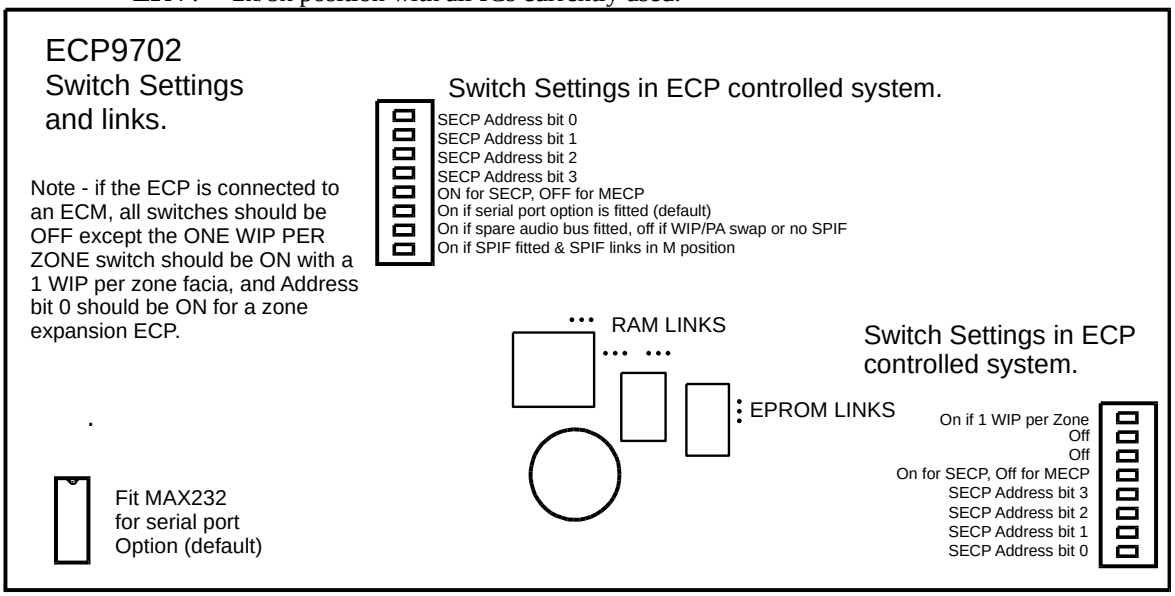


Figure 16-2: ECP9702 Module DIP Switches and Links

Refer to Connection to ECP for information on systems which have full networking with ECMs.

The address switches are coded as follows on both **SW1** and **SW2**.

	Switch label	**On= SECP**	**SECP A2**	**SECP A2**	**SECP A1**	**SECP A0**
Type of System	**Switch Number**	**5**	**4**	**3**	**2**	**1**
Networked (ECM)	Standard ECP	OFF	OFF	OFF	OFF	OFF
	Hidden Expansion ECP	OFF	OFF	OFF	OFF	ON
Non Networked (NON-ECM)	MECP	OFF	OFF	OFF	OFF	OFF
	SECP 0	ON	OFF	OFF	OFF	OFF
	SECP 1	ON	OFF	OFF	OFF	ON
	SECP 2	ON	OFF	OFF	ON	OFF
	SECP 3	ON	OFF	OFF	ON	ON
	SECP 4	ON	OFF	ON	OFF	OFF
	SECP 5	ON	OFF	ON	OFF	ON
	SECP 6	ON	OFF	ON	ON	OFF
	SECP 7	ON	OFF	ON	ON	ON

On SW1, switch 6 enables the RS232 serial event logging and diagnostics in ECP controlled systems. It should be ON, except in very old systems when the MAX232 U9 is not fitted and then it should be OFF. In ECM controlled systems, this switch should be OFF, as the ECP serial port serves no useful purpose.

For ECP controlled systems with RZDU high level inputs, the serial port is automatically enabled regardless of the position of switch 6.

16.3. ECP Revision Interchange ability

a. ECP9702 and ECP9002

The new ECP9702 is interchangeable with the old ECP9002 with the following caveats -

- On new I2000 systems using the ECP9702 the Master Phone will no longer have a RING9006 board fitted inside, and it will be wired to the ECP module with two wires instead of a 10 way flat ribbon cable. If an ECP9002 board is fitted into such a new system, it will be necessary to obtain a RING9006 board (PA0656) and ribbon cable (LM0084) and fit these into the master phone.

- If an ECP9702 module is used to replace an ECP9002, then it will be necessary to remove the RING9006 PCB from the existing master phone and wire the master phone to the ECP board with a two wire cable.

- By default, the ECP9702 will not have a battery-backed clock IC fitted to U14, but will have a standard RAM IC instead. Version 4 and higher ECP software uses a EEPROM IC on the ECP9702 for storage of on-site setup parameters. A battery-backed clock IC will only be fitted in new systems requiring a printer for event logging. Previously a battery backed clock IC or battery

backed RAM IC was required for storage of setup parameters in all ECP9002 modules even when there was no printer output. A battery backed RAM IC or battery backed clock Clock IC is required

1. In ECP9002 modules regardless of software versions.

2. In ECP9702 modules when the evac ECP software version is 2.99 or less.

When replacing an ECP board in a system which requires a battery-backed clock or RAM IC, if the replacement board is not fitted with an IC of type MK48T02, MK48Z02, MK48T12, MK48Z12, MK48T08, DS1643 or DS1220, it is necessary to remove this IC from the board being replaced and fit it into the replacement board. Of course it is always necessary to remove the Evac and WIP software ICs from the board being replaced and fit them to the replacement ECP. Also note that the on site setup parameters should always be checked after an ECP board is replaced. Refer to Software Locations for the locations of these components.

- If the ECP9702 has the Widget board fitted to U52 then refer to ECP Revision Interchangeability.

- The ECP9702 includes the DIN microphone connector for the ME0213 microphone as used on the ECP9002 along with a 4 way 0.1" connector for the ME0290 microphone.

***NOTE:** - when you need to insert an IC into a socket which has more positions than there are pins on the IC, you should leave the blank positions at the pin 1 end of the IC (the end with the indentation).*

***NOTE:** - If you are upgrading the Evac ECP software to version 2.0 or later from version 1.x when changing the ECP board (this is frequently done, but by no means essential) refer to SE9004 Signals Interface Module for notes about the SE9004 module.*

b. Replacing an Older ECP with a Widget Board ECP

Systems with Three WIP Per Zone Facias

The latest ECP9702 (part number PA0643) (i.e. Revision C/5/2 or higher, with the widget board in place of the TMS77C82 microprocessor) can be used to replace an older ECP9702 or ECP9002 provided the existing WIP ECP Software version is Version 2.0 or higher. This version is generic, i.e. not site-specific, and it has been used for all panels with SECPs or Amp Racks manufactured since late 1995 and all other panels manufactured since late 1997. If the existing system has an ECP9002 refer to ECP9702 and ECP9002 above for further information.

For older systems (i.e. with Version 1.x site specific WIP ECP Software) a specially-made service ECP9702 is available, part number PA0623. This has a 40 pin socket into which you can plug the site-specific WIP ECP software from the board being replaced. If the existing system has an ECP9002 this ECP9702 can also be used to replace it - refer to ECP9702 and ECP9002 above for further information.

Systems with One WIP Per Zone Facias

Older ECPs with a One WIP Per Zone facia, can be replaced with the PA0641. This has a 40 pin socket into which you can plug the site-specific or generic WIP ECP software from the board being replaced. If the existing system has an ECP9002 this ECP9702 can also be used to replace it - refer to ECP9702 and ECP9002 above for further information.

c. Replacing a Widget Board ECP with an Older ECP

An ECP9702 fitted with a Widget Board can theoretically be replaced by any ECP9702 as long as it is already fitted with version 2.x WIP ECP Software. However note that an ECP9702 fitted with a Widget Board cannot directly be replaced by the PA0623 service part, as the PA0623 has **no** WIP ECP Software fitted since it is was designed as a replacement for PA0643s with plug in software, and to take the software from the board being replaced.

16.4. Software Locations

If you are supplied with new software for a system, the diagram below shows where it is to be fitted in the ECP module.

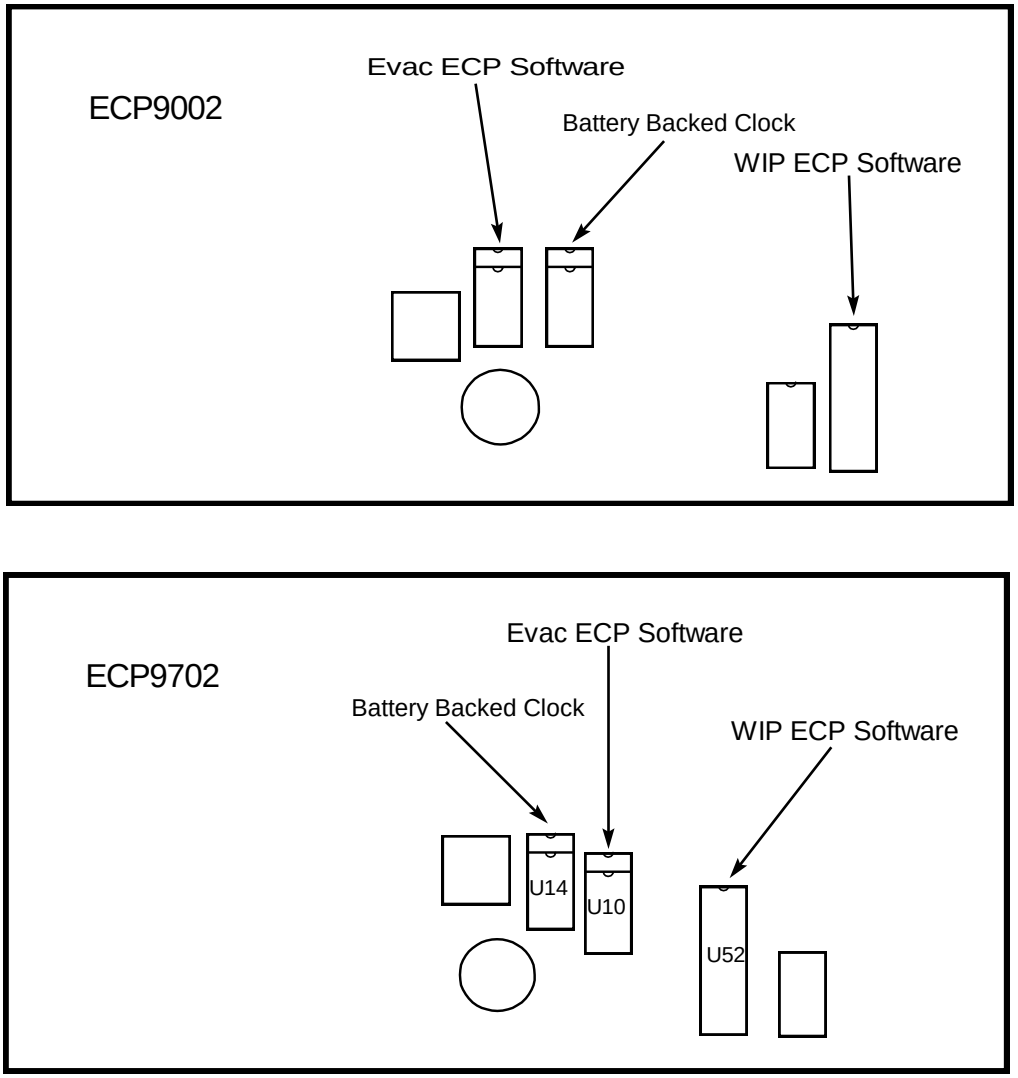


Figure 16-3: ECP Key Component Locations

16.5. Microphone Controls

There are also controls on this module for the ECP Microphone level and (on the ECP9002 only) its Voice Operated Switch sensitivity. Refer to Speech Microphone Level Adjustment for more information.

16.6. Master Phone Termination

On the ECP9702 a Master Phone of the same type as a WIP phone (refer to WTRM Wiring) needs to be connected across the two terminals on the demountable screw connector on the back of the right side of the ECP module (viewed from the front).

For all Altronics and AIPhone models, polarity is not important.

For the Vigilant FP0938 phone, correct polarity is required : the + terminal of the phone must be connected to the upper terminal on the ECP connector.

For all phones, no end of line component should be fitted. The resistor that comes with the Vigilant FP0938 must be removed.

16.7. Master Phone Sound Level

AS2220.1 (1989) requires a sound pressure level (SPL) of >= 80dB(A) at 1m in front of the ECP with the door closed.

If this SPL cannot be achieved on site and it needs to be increased, order an external speaker in a small plastic box -

`ME0468 ME, I2000 WIP External Ring Speaker`

Mount the box in the centre front of the top of the ECP cabinet, facing outwards. Drill 3 holes in the plastic box and top of the I2000 cabinet to (1) take the cable through and (2) bolt the plastic box to the cabinet.

If the batch code of the master phone is higher than 0812000

- Route the cable to the master phone, cut off the two pin connector and strip a length of insulation, and screw the two wires to the SPKR terminals.

Otherwise (i.e. the batch code of the phone is less than 0812000)

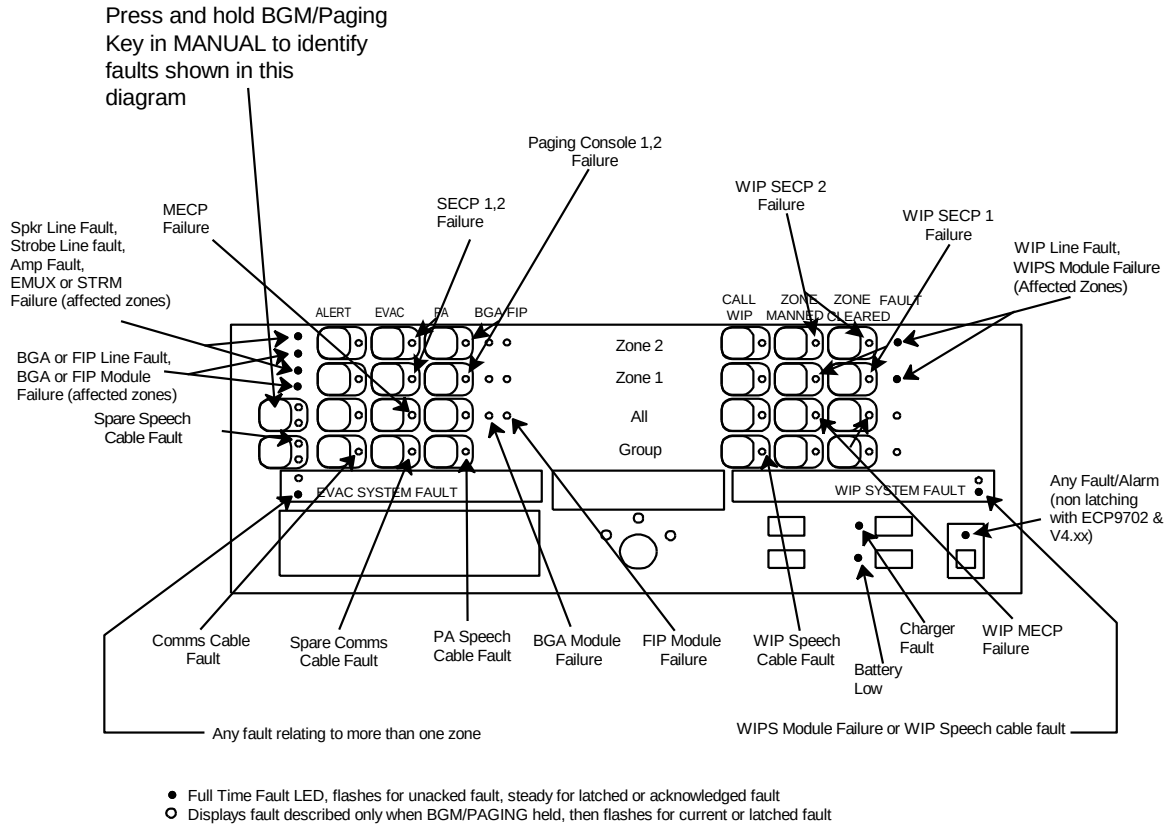
- Route the cable to the inside of the master phone (you may need to drill a hole in the underside of the phone body). Plug the cable into the the two pin plug of the PCB inside the master phone, in place of the existing plug that goes to the internal speaker. Leave the existing internal speaker disconnected.

16.8. ECP LEDs

There are dedicated fault and alarm LEDs on the ECP module, and other LEDs are used to further identify faults when BGM is pressed and held in Manual.

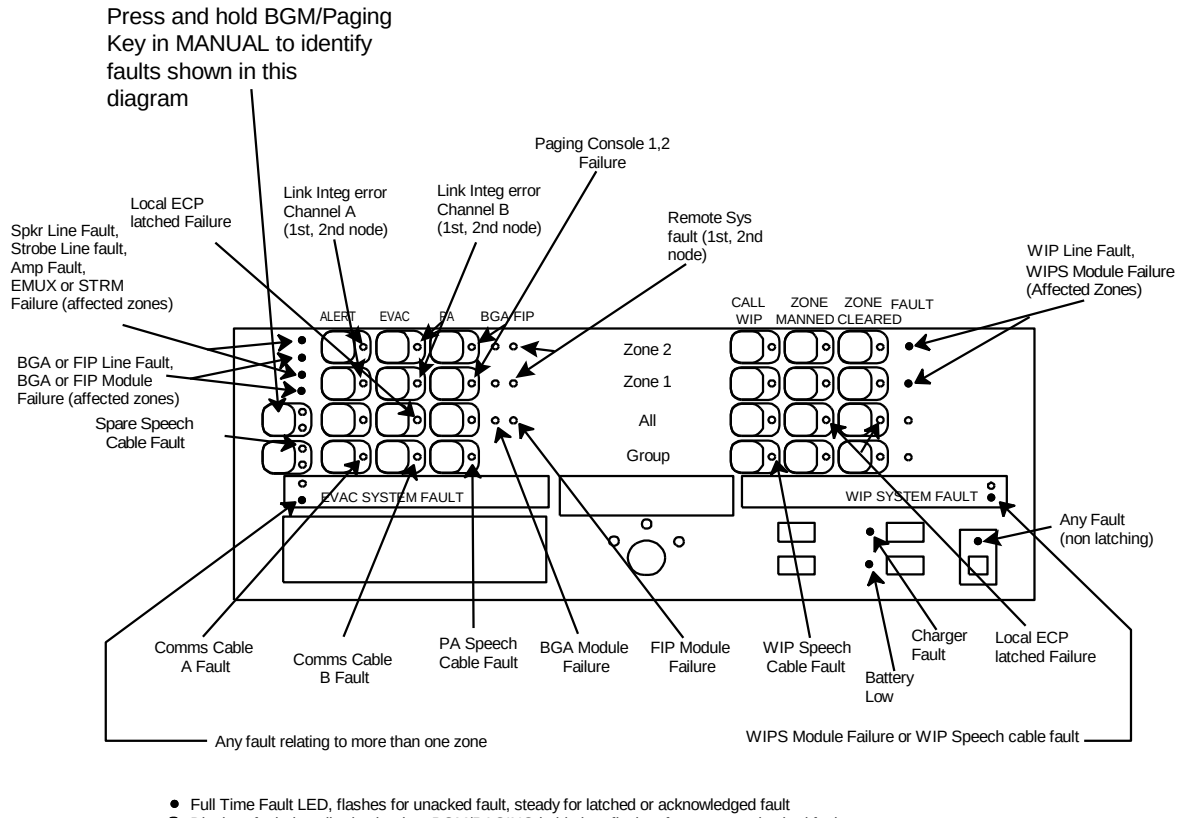
***NOTE:** - in non-ECM systems with older software (versions before 2.00) it is not necessary to hold BGM and there are some other differences – refer to the I2000 Operator's Manual.*

The fault LEDs are identified in the diagrams below –



QE90 Version 2.xx / 4.xx : System Fault Display

Figure 16-4: Versions 2.xx / 4.xx /6.xx Fault Display



QE90 ECM Networked System : System Fault Display

Figure 16-5: ECM Networked System – Fault Display

16.9. Hidden ECP for Expanding Display Zones

In systems with ECMs, it is possible to expand the display zones at a node above the normal limit of 98 @ 1 WIPs / Zone or 82 @ 3 WIPs per zone, by the use of one or more hidden ECPs to control some of the display extender modules.

The address switches (Evac and WIP) on these hidden ECPs should be set as follows -

Expansion ECP	MECP/SECP	SECP A2	SECP A1	SECP A0
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF

16.10. Fluorescent Light Output

The I2000 panel can be ordered with an optional Fluorescent light fitted. This light will turn on if the mains is failed and the Auto / Manual / Isolate keyswitch is switched to Manual.

The light output (J3-5 and J3-6) can control one light directly. If there is more than one cabinet with displays, and each cabinet has a fluorescent light, the light output of the ECP module must be connected to a relay, and the relay contacts used to drive the lights. Refer to drawing 699-180 in Drawings.

If the panel does not have a fluorescent light, and does not have any relays available for a fault output (for example it does not have a FIB8910 module or any spare strobe relay outputs), then the fluorescent light output can be used to drive an external relay and programmed to operate when there is a fault condition. In fact it can be programmed with any other logic equation just like other relay outputs.

The output can be wired to a PA0730 relay board as shown the diagram below. Note that if the relay is programmed as a fault output, it will be programmed to be energised when there is no fault, so the C and N/O contacts will be connected when there is no fault.

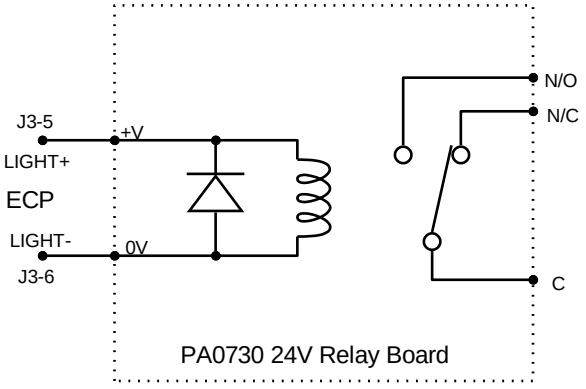


Figure 16-6: Relay connected to light output

Section 17 Placing into Operation

17.1. Overview

Before undertaking any activities ensure that all cards, plugs, and ICs are fully plugged in as described in Checking system after transit.

Refer to AS1670.4 section 6.

You should now fit zone labels to the front of the ECP using the pockets in the mylar, and by typing labels to fit inside the pockets.

Before powering up, check the loading on the speaker lines as described in Checking Speaker Loadings if this has not already been done.

17.2. Power Switches and Circuit Breakers

Several Power Supply Models are in use -

- The 3 Amp PSU2403 has a Mains switch on the left and two 24V DC switches on the right, one labelled ECP and one labelled AMP RACK.

- The 6 Amp PSU2406 has a Mains switch on the left and a 24V DC switch on the right, labelled ECP and a circuit breaker labelled AMP RACK. In 21U cabinets an internal “brick” model is used, while in other cabinets a 2U rack mounting version is used.

- The 12 Amp PSU2412 has a Mains switch on the left and a number of 24V DC breakers on the right, labelled ECP and AMP RACK 1, AMP RACK 2, AMP RACK 3 etc..

- The 12 Amp PSU308. The mains switch is on a GPO outlet mounted on the gear plate above the top card frame. The system DC circuit breakers / switches are located on the left hand side of the power supply/charger unit. Up to four circuit breakers may be fitted depending upon the system configuration. The left-most circuit breaker switches power to the ECP, while the remaining breakers switch power to the amplifier racks.

The ECP switch supplies the ECP module, FIP Input modules, and Strobe output modules, while AMP RACK switch(es) supply the amplifiers, EMUX module, and WIPS module. (Note, sometimes heavily loaded strobe cards are supplied via a circuit breaker rather than the ECP switch).

The mains switch controls the 240V input to the battery charger, and this should be ON at all times except when testing that the system will run on its batteries alone, or when required for maintenance.

The normal position of the 24V DC switches is ON. Turning all switches to the OFF position will completely remove 24V DC power to the equipment.

In some cases it may be useful to switch the amplifiers off but leave the ECP on, e.g. to check the connections from a Fire Panel or Breakglass inputs and the resulting Evacuation cascade sequence without disturbing the building occupants. The ECP will indicate several faults if this is done, however the indications of alarms and the indications of cascading of Alert and Evacuate tones will still occur normally.

17.3. Power Up

To place a correctly installed system into operation, perform the following steps:

STEP 1 Ensure that the Mains Isolate Switch is OFF

Ensure that all the DC circuit breakers or switches are switched OFF

Ensure that all cards, plugs, and ICs are fully plugged in as described in Checking system after transit.

STEP 2 Ensure that 240 VAC is available and connected to the system from the mains distribution switchboard.

STEP 3 Connect the batteries, ensuring correct polarity.

When connected the system fault LED may illuminate.

STEP 4 Turn the panel keyswitch to the ISOLATE position.

Turn Mains Isolate Switch to the ON position. The charger indicators/meters should register.

Switch ON the DC circuit breakers starting with right most breaker and then progressing to through to the left most breaker (i.e.. power the amp racks first before the ECP).

The sounder may operate and audio fault LEDs may be flashing. Press the SILENCE key to mute the sounder if it is on. Wait about 45 seconds for any audio line faults to be detected.

Then press and hold the SILENCE key for 2 seconds to clear the system fault indicator.

STEP 5 Check the panel to ensure that no fault indicators are illuminated. Check and remedy those that are (refer Operator Manual).

STEP 6 With the keyswitch in the ISOLATE position, confirm the operation of all panel switches and their associated indicators.

Press the LAMP TEST button on both the evacuation system panel and fire phone system panel to ensure that all non-switch indicators are operational.

STEP 7 Turn keyswitch to the MANUAL position.

Operate an ALERT switch and check that the alert tone is generated in the selected zone. While the alert tone is being generated, operate the EVAC switch and ensure that the EVAC tone is generated, overriding the alert tone.

STEP 8 While the EVAC tone is present, press the zone P/A SPEECH switch and then operate the push-to-talk switch on the microphone. Talk into the microphone and check that the EVAC tone is overridden with speech.

Release the push-to-talk switch on the microphone and check the output returns to the EVAC tone.

Repeat steps 7 and 8 for each zone fitted.

STEP 9 Enter on-site setup mode (refer to ECP on-site settings or ECM on-site settings) and check that the delay before action timeout, initial timeout and subsequent timeout periods have been set correctly, and cascade has been enabled or disabled as required.

Turn the keyswitch to the AUTO position, wait 10 seconds, and generate an alarm signal on a FIP input. The relevant zone FIP LED should illuminate and the system should automatically generate the ALERT tone (after the delay before action, if any), for the set period after which it should switch to the EVAC tone interspersed with a voice message.

If the system has been set for cascade operation check that the cascade sequence functions correctly. If Cascade is disabled check that all alert tones are generated in all zones, then after the set delay, evacuate tones are generated in all zones.

***NOTE:** - When many zones are generating tones a Charger Low fault may be generated. This is to be expected as the batteries are supplying the full load to the system and the charger is only required to supply the quiescent current plus charging current*

Repeat the alarm activation for each connected FIP input.

STEP 10 Generate an alarm signal on each BGA input. The relevant zone BGA status LED should illuminate and the system should automatically generate the ALERT TONE for the set period after which it should switch to a continuous EVAC tone interspersed with a voice message. Repeat for each BGA input.

STEP 11 Lift the intercom master handset and verify that a pulsed confidence tone is heard. (Continuous confidence tone with Software version 2.)

STEP 12 Press a zone WIP FIRE PHONE key on the front panel and check the zone WIP is now ringing. (On the ECP phone, a pulsed tone will be heard with software Version 2 and no tone with version 1.x software.) Pick up the ringing WIP handset.

When the selected WIP is answered the indicator should go steady. Verify that conversation can take place clearly. Hang up the zone handset.

Repeat step 12 with each fitted WIP.

STEP 13 Verify that a ring tone is generated at the master handset when a remote WIP calls the MECP by lifting the handset.

STEP 14 Press the WIP CALL ALL key on the front panel. Confirm that the WIP status indicators are flashing for all enabled WIPs and that a ring tone is being generated at each WIP.

Confirm that when each WIP is answered, the respective WIP status indicator goes steady and that speech from the master handset can be heard at the remote WIP. Verify that no speech generated at a remote WIP can be heard at the master WIP or at other remote WIPs.

STEP 15 Check that the float charge voltage at the battery terminals is 27.3V (less at higher temperatures, more at lower temperatures). If not adjust the float voltage to the correct value (VR1 on PSU)

STEP 16 When the batteries are fully charged turn the "mains" switch OFF. Check that a charger fault is indicated after a few seconds. Check that the fluorescent light operates when the ECP is switched to MANUAL. Place all zones into ALERT using the ALL ALERT key and confirm that the system functions correctly under full load on the standby batteries.

Place all zones in EVAC using the ALL EVAC key and confirm that the system functions correctly under full load on the standby batteries.

STEP 17 Check the operation of any optional equipment (e.g. Paging Consoles) and any special functions.

17.4. Output Level Adjustment

The general method of output level adjustment is as follows-

- Set all **amplifier** volume controls to their maximum position. Refer to Location of Amplifier Controls.

- For each zone, select Evacuate tones and adjust the speaker tap settings in the zone to the minimum power rating required to achieve the required sound level. If required, adjust the controls on the amplifiers to achieve more precisely the level required, or to reduce the level if it is too loud even with speakers on their lowest tapping. However, if the EMUX9601 Revision number is less than 8, refer to Balancing Tone and Speech Levels.

- Adjust the SPEECH control on the EMUX(es) to about 75% clockwise position.

- Adjust the control on the ECP module to achieve loud, clear and undistorted speech. (For the former ECP9002 model, refer to ECP9002 Speech Microphone Level Adjustments.)

- For each EMUX module, adjust the controls shown in EMUX9601 Volume Control Adjustments or EMUX9002 Volume Control Adjustments to achieve balance between the various emergency signals and the required level for any non-emergency signals, for those amplifiers controlled by that EMUX i.e. those amplifiers in the same card cage. Normally, if there are two card cages in a cabinet, the upper card cage is terminated in the transformer modules down the left side of the cabinet, and the lower card cage is terminated in the transformer modules down the right hand side of the cabinet.

a. Location of Amplifier Controls

The location of the controls is shown in the diagram below.

4 x 10W AMPLIFIER

If the EAMP9001 module is configured as 4 x 10W amplifiers, all four controls are used.

2 x 25 WATT AMPLIFIER MODULE

If the EAMP9001 module is configured as two 25 Watt amplifiers then only volume controls 1 and 3 are used.

2 x 50 WATT AMPLIFIER MODULE

If the HAMP9308 module is configured as two 50 Watt amplifiers then both volume controls 1 and 2 are used.

1 x 100 WATT AMPLIFIER MODULE

If the HAMP9308 module is configured as one 100 Watt amplifier then only volume control 1 is used.

200 WATT AMPLIFIER MODULE

The volume control on the “Master” module is used. Refer to AMP200 Master / Slave Interconnection.

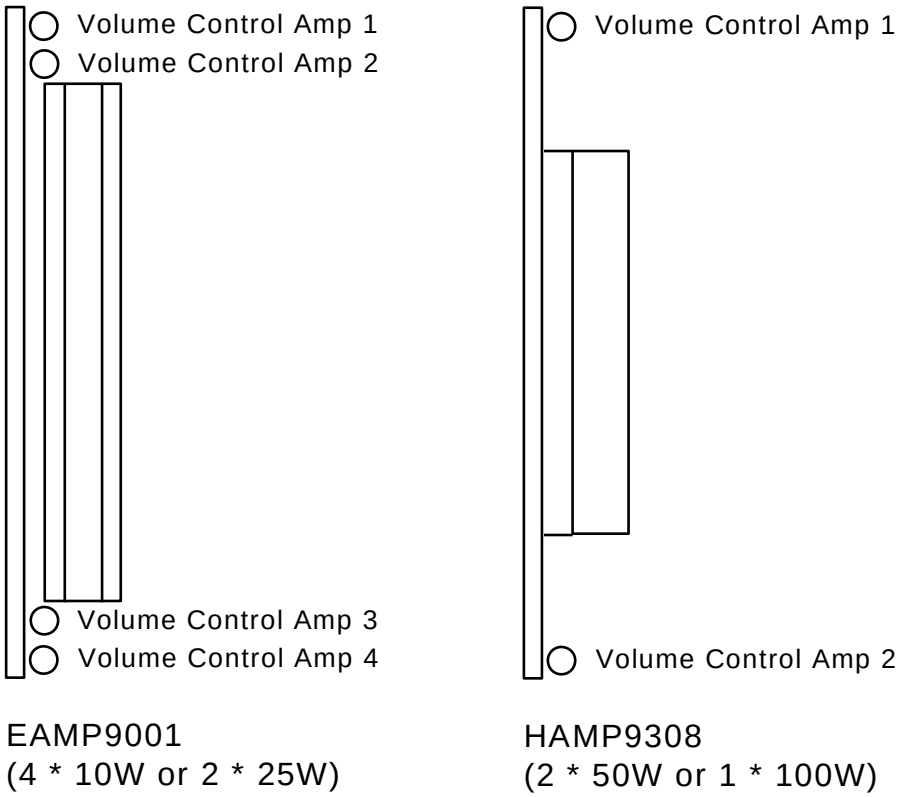


Figure 17-1: Volume Controls for EAMP9001 and HAMP9308 Amplifiers

b. ECP9002 Speech Microphone Adjustments

Two adjustment potentiometers are located on the rear of the **older ECP9002** module.

- The TOP pot (50K ohm) provides microphone level adjustment. (Rotate clockwise to increase level.)
- The BOTTOM pot (10k ohm) provides Voice Operated Switch (VOX) level adjustment. (Rotate anticlockwise to increase sensitivity.) Adjust the VOX level pot such that the speech attack time is not too long i.e. speech is heard as soon as the person speaks into the microphone and not halfway through a word.

NOTE: *- On modules manufactured before 1993, rotation direction may be reversed from that stated above for each pot.*

Section 18 Evacuation Communications Module

18.1. Overview

The Evacuation Communications Module (ECM9603) is used:

- In networked systems, where there are multiple ECPs, some of which control only some zones;
- In systems where there is a Panel Link or Simplex high level link to a fire panel.
- When a Modbus interface is required, e.g., for interface to colour graphics;
- In large systems, i.e., systems which would otherwise have in total more than 16 slave modules.

The ECM provides a high speed RS485 communications bus between networked locations. The I2000 communications bus connecting the modules within each location becomes a local bus. The ECM also provides the RS232 ports used for communicating at a high level with Fire Panels or colour graphics PCs.

The ECM EPROM contains the site and panel specific information, and is programmed at the factory specifically for each panel. In a panel with an ECM, the ECM provides most of the system processing, with the ECP reverting to a simpler control and display panel.

18.2. ModBus Interface

The ECM Modbus interface provides a status output from the I2000 and also allows some control. It is often used for connection to a Colour Graphics system (Overview, or XL Graphics).

It can also be used for connection to a B.M.S. (Building Management System). For full details of the interface call FireSense Technical Support for more info.

18.3. Connection to ECP

In a system with no ECM, the ECP connects directly to its SPIF with a 34 way cable. When an ECM is used the ECP connects to the ECM with a 34 way cable, and the ECM connects to the SPIF with a second 34 way cable.

The ECP needs generic software to be fitted, i.e. the ECP software is no longer site-specific. For the EVAC ECP the EPROM will be labelled GENERIC ECP Ver 3.xx, and for the WIP ECP it will be labelled WIP ECP V2.06 or greater. The EPROM for the Evac ECP is a 27C256 for versions 3.00 to 3.09, and a 27C512 for version 3.10 and higher – be sure the link on the ECP is set correctly. (Refer to DIP Switch Settings)

The ECP address switches should be set as if the Evac ECP and Wip ECP are MECPs, regardless of their function in the network. I.e. All switches off for the evac DIP switch, all switches off for the WIP DIP switch except switch 1 on for a 1 wip per zone system. (In the special case where there are 3 wips per zone and more than 66 zones there will be an additional hidden ECP for WIP zones 67 and above. This ECP should have the evac DIP switch 5 on and WIP DIP switch 4 on with all other switches off.)

Refer DIP Switch Settings for further information on DIP switch settings, noting that the following switches have no effect if the ECP is connected to an ECM.

- The switch labelled “On if printer option fitted”.
- The switch labelled “On if spare audio bus fitted, off if WIP/PA swap or no SPIF”.
- The switch labelled “On if SPIF fitted and SPIF links in M position”

All these switches should be OFF.

The diagram below shows the arrangement of the ECM in the I2000 panel.

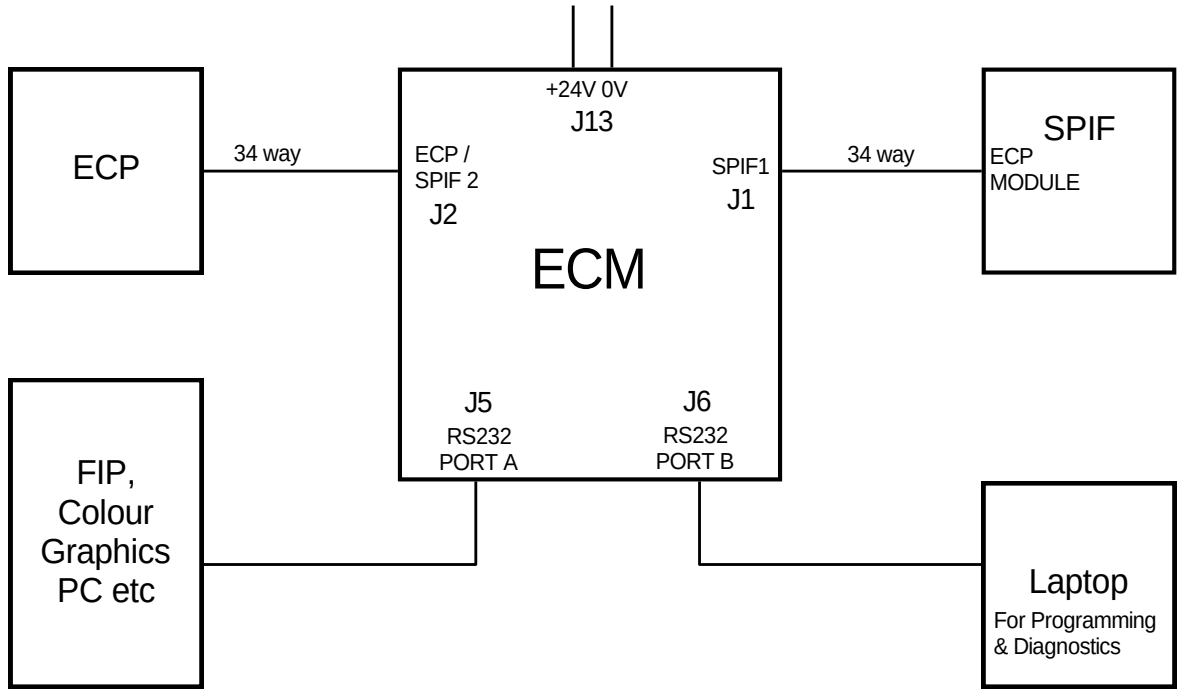


Figure 18-1: ECM Wiring to ECP and SPIF

18.4. Wiring between Locations

The RS485 cables (A and B) and the WIP Speech and PA Speech must be connected between all locations. This can be done in a bussed mode, or a bus with spurs.

The RS485 ports on all the ECMs must be bussed together. There is no connection to the COMMS and COMMS BKUP on the SPIF modules. (Except that if there is a Paging Console it should be connected to COMMS). It is possible to program which SPIF/ECM(s) monitor the SPEECH cables and whether or not there is a dedicated SPEECH buss fitted, in the ECM programming mode (see later). Refer to Link and Switch Settings for more information on link settings on the SPIF.

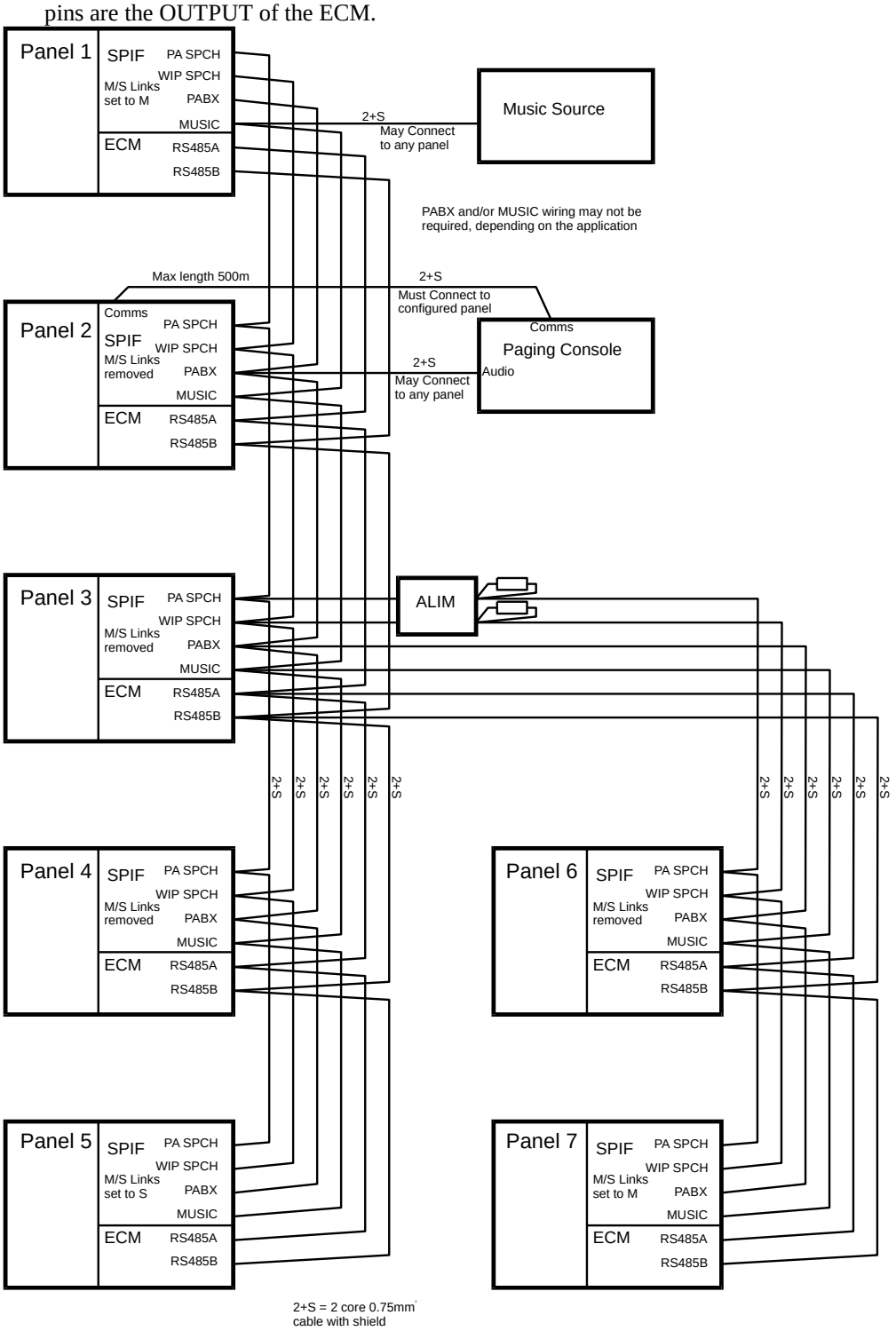
Refer to the diagram below for a typical topology.

Further down the diagram "Network Wiring At SPIF9506/SPIF9709 and ECM" shows in more detail how each panel is wired, and shows the wiring via the ALIM9706 at the location where the spur joins the main bus (Location 2 in the diagram below). Other locations will not have a spur and will not require the ALIM9706.

It was previously recommended that termination resistors / capacitors were fitted to the ends of the bus. This has been found to provide no advantage (usually at least), and it is now recommended that they are not fitted.

In some cases where very long cables are used, Tyco Safety Products may provide specific alternative details for particular systems. These system specific details override the information given in this manual.

In the case where the RX and TX pins must be separate (for example connection via a modem, fibre-optic interface, or 4 wire per port interface to another ECM), links 11 and 13 must be removed for port 1, and links 12 and 14 removed for port 2. The RX pins are then the INPUT to the ECM, and the TX pins are the OUTPUT of the ECM.



Audio Monitoring
The two panels with the M/S links in the M position (and no others) should have "Monitor Analog busses from this ECM" set to "Yes" (in ECM Programming mode).

Maximum cable length
The total bus length including spurs should be less than 1200m
i.e. Panel 1 to Panel 5 plus Panel 3 to Panel 7 must be less than 1200m.
The maximum length of a stub (Panel 3 to Panel 7) must be less than 200m.

Figure 18-2: General Wiring Topology of ECM networked I-2000

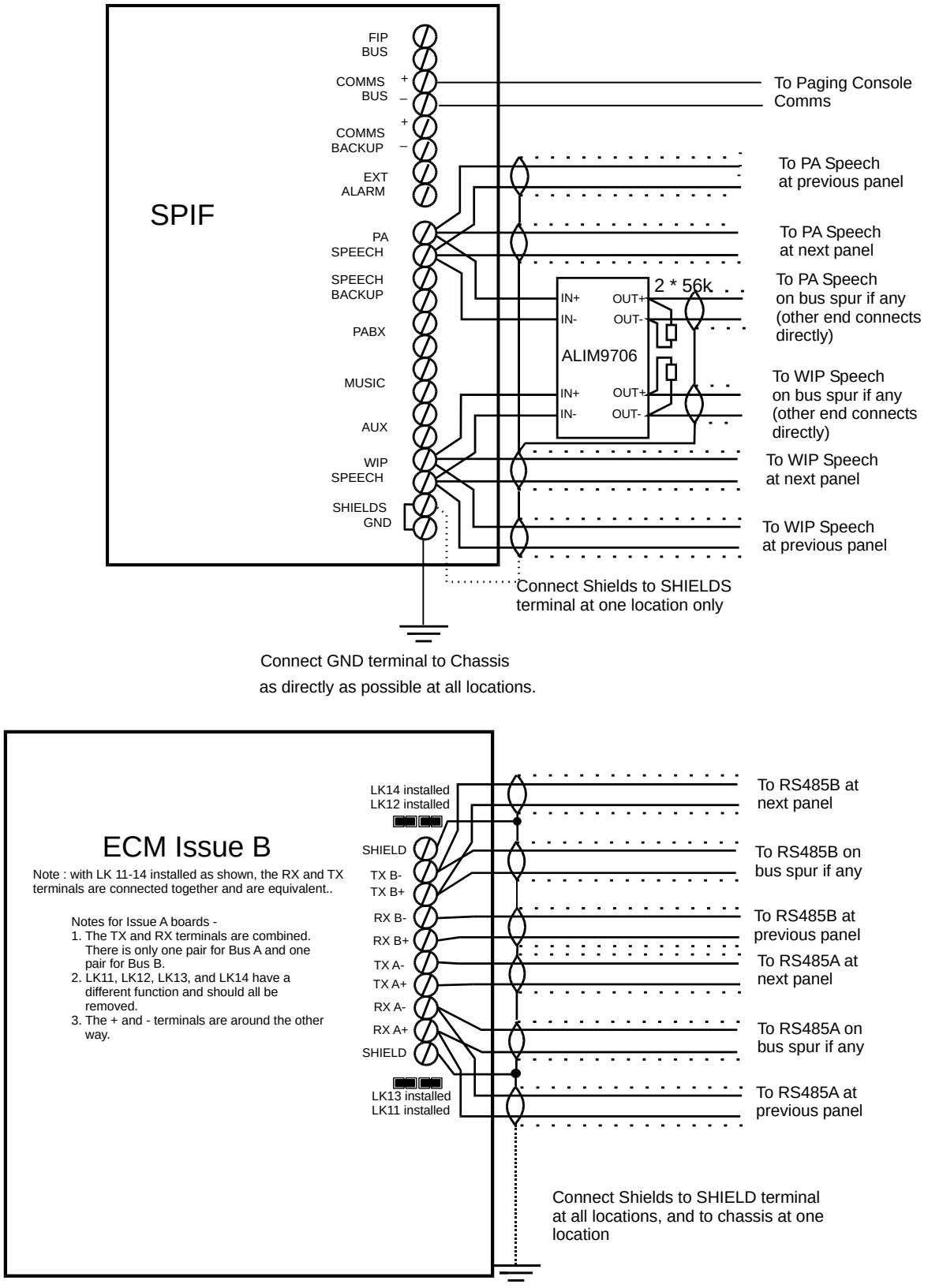


Figure 18-3: Network Wiring at SPIF9506/SPIF9709 and ECM

18.5. Systems with Multiple PA / WIP Bus Segments

On some complex systems the PA and WIP busses may be broken into segments, in order to allow more than one PA broadcast or WIP conversation at a time. For example in a system with a number of MECPs and corresponding SECPs there may be a bus segment between each MECP and its

corresponding SECP, and another global segment which joins the MECPs. At the locations where two segments join, there will be two SPIF modules. One of these modules will connect to the local bus segment and the other module to the global bus segment. A system of this type is shown in the diagram "Segmented PA/WIP Speech Wiring". In this example MECP1 and MECP2 will have two SPIF modules as shown in the diagram "Wiring at Panel With Network Join". The configuration listing will list which segments connect to each location and each SPIF module.

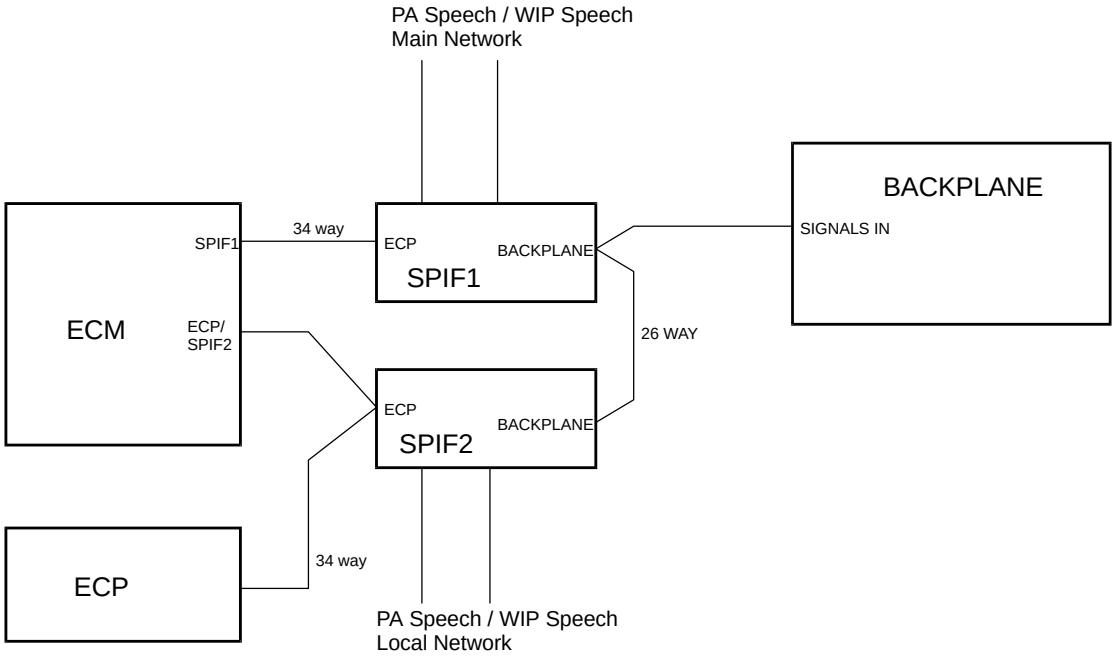


Figure 18-4: Wiring at Panel with Network Join

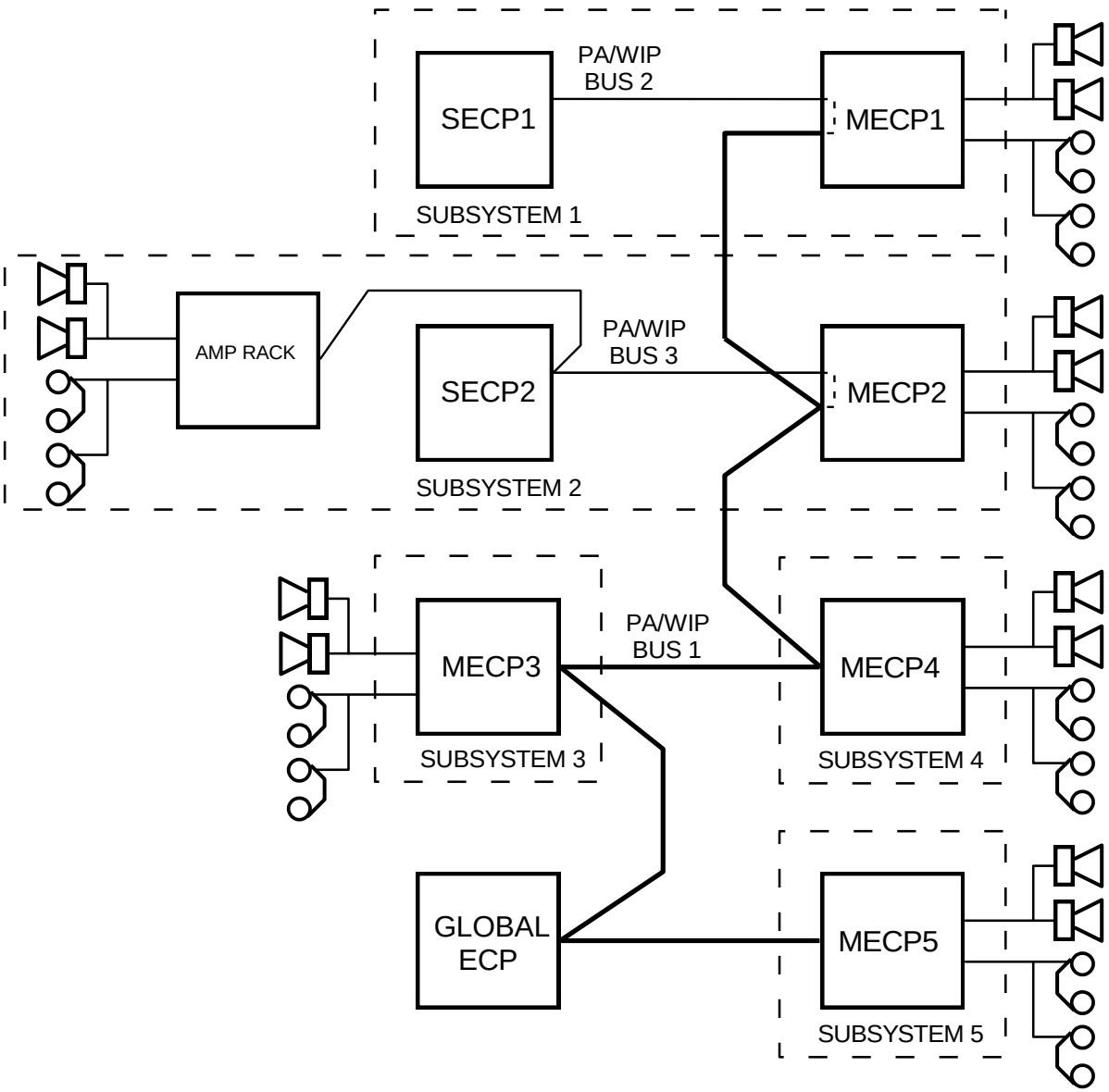


Figure 18-5: Segmented PA/WIP Speech Wiring

18.6. Connection to IHUB

The digital data traffic between I2000 ECMs may pass through one or more IHUBs which are setup in PanelLink or RingNet mode.

One or more I2000s (with ECMs) may connect to each port of an IHUB. The I2000 RS485 bus is simply extended to the port of the IHUB. In all cases connect A+ to A+, A- to A-, B+ to B+, and B- to B-.

If the IHUBs are using RingNet, the I2000 ECM RS485 terminals must connect to the RS485 terminals on an RS485 board connected to the IHUB ECM port 3, 4, or 5.

If the IHUB is using PanelLink, the I2000 ECM RS485 terminals may connect to the RS485 terminals on an RS485 board connected to the IHUB ECM port 3, 4, or 5, or directly to the RS485 terminals on the IHUB ECM (ports 1 and 2).

The IHUB must be programmed to pass through Application 8 for I2000 and to pass through Link Integrity. You can tell what I2000 need to communicate with each other from the Networking / Related Nodes section of the configuration printout.

The IHUB must be programmed to NOT use concatenated messages if the ECM software version is before version 1.50 or between versions 5.19 to 5.35 inclusive. If the ECM software version is higher than 5.35 and the IHUB does have CONCAT MSG enabled, the ECM must **not** have "Optimise Panel link RX for no concat or split msgs" set to Y.

The I2000s must be setup to Disable Cyclic Addressing when I2000 data must pass through an IHUB. Then the IHUB should usually be programmed to acknowledge broadcasts on each port that I2000s connect to. The most distant (or only) I2000 on each IHUB port should be programmed to acknowledge broadcasts from the IHUB. Refer to ECM On-site settings.

When the connection of a I2000 network to an IHUB, is only to provide high level FIP inputs to the I2000, it is not necessary to Disable Cyclic Addressing on the I2000 network. The IHUB port which connects to the I2000 must still be setup to not use message concatenation with the ECM software versions mentioned above. The most distant I2000 from the IHUB should be set to Acknowledge broadcasts from the IHUB. In this case, the IHUB must pass through Link Integrity and the Status Transfer Application (not Application 7 or 8). Refer to High Level FIP Interfaces for further information on High Level FIP Inputs to I2000.

18.7. ECM Links

The links on the ECM should be set as follows

LK1 : (EEPROM SIZE) 1-3 & 4-5

LK2 : (Issue A only) (EPROM SIZE) 1/4M

LK3 : (RAM SIZE) 62256/628128

LK4 : (EEPROM Write Enable) Removed, write disabled. (However it must be temporarily installed when exiting on-site setup mode if something has been changed.)

LK5 : (DIGITAL I/O VOLTAGE) Don't care.

LK6 : (RS232 PORT B CTS/DCD SELECT) CTS

LK7 : Removed

LK8 : (SPIF 2 Power) Removed, unless SPIF rather than ECP connected in ECP/SPIF2 position

LK9 : (SPIF 2 Power) Removed, unless SPIF rather than ECP connected in ECP/SPIF2 position

LK10 : (ENABLE I2000 COMMS) : Fitted.

LK11 : Issue A - Do not Fit.
Issue B - Fit if RX and TX common for RS485 port 1.

LK12 : Issue A - Do not fit.
Issue B - Fit if RX and TX common for RS485 port 1.

LK13 : Issue B - Fit if RX and TX common for RS485 port 2.

LK14 : Issue B - Fit if RX and TX common for RS485 port 2.

18.8. ECM On-site Settings

a. Overview

The ECM can be setup from a laptop running terminal emulation software (e.g. Hyperterminal, or WinComms). It is not possible to change any setup from an ECP. The laptop/terminal needs to be

connected to the ECM with (1) a ribbon cable adaptor LM0065 and (2) a null modem cable LM0076. Refer to Printer / Terminal Connection for more details of connecting a printer or terminal.

The terminal or terminal emulation software should be set for 9600 baud, 8 data bits, no parity, 1 stop bit.

The ECM requires on-site setup to select Cascade timeouts and Background Music Zones in EEPROM. It is also possible to set network parameters but as these default to the normal values, it is seldom necessary to change them. To setup the Cascade or Background Music zones, or to change a network parameter, it is necessary to have a laptop connected and running a terminal emulator program.

The cascade timeouts and background music zones must be set at the ECM(s) where the amplifiers are located, and not at a node which contains an ECP only. The values set only affect the cascading at the node where they are setup and they can be different at different nodes. (However often correct operation of the site-wide cascade will require the delays to be set the same at each node.)

The adjustment of on-site settings described here allows a few frequently changed items, or items that will be unknown in the factory, to be set on site without any special program.

b. Procedure for adjusting on-site settings

<Enter> represents the Enter key. For all entries, the current value will be displayed. To leave the value as is just type **<Enter>**.

- Connect the laptop as described above, and start up the terminal emulation program.
- Power Up the ECM, and within 5 seconds type a lower case **e** three times.
- The main menu will be displayed as follows -

```
Set Date & Time (D)

Configure Network (C)

Tune Network (T)

Print Config(P)

QE90 Configure (Q)

Display I2000 Factory Configuration (F)

Exit Configuration (X)
```

Type D, C, T, P, Q, F, or X as required.

Q Menu

```
Delay after alarm before any tones (secs) Currently 0 :
```

Enter the required delay (See “Delay Before Action” in Cascade Sequences).

```
Initial cascade time delay (secs) Currently 30 :
```

Enter the delay between the first tones being generated and tones first spreading to other zones or changing from Alert to Evacuate. (See “Initial Delay” in Cascade Sequences.)

```
Subsequent cascade time delay (secs) Currently 30 :
```

Enter the delay between each subsequent cascade stage. (See “Subsequent Delay” in Cascade Sequences.)

```
Cascade Disabled (Y / N) Currently N :
```

Enter Y to disable the Cascade at this node (and select an alternative more rapid evacuation plan). Note that this option is only available with software version 5.50 or later, and even then the option may not be available, for example if the cascade at each node is part of an overall cascade spread over several nodes.

```
Cascade includes Alert phase (Y / N) Currently N :
```

Enter the Y if you want the cascade to include Alert, N if it is proceed straight to Evacuate(see Cascade Sequences) (Note, available only in software version 5.40 and later.)

```
Monitor analog busses from this ECM (Y / N) Currently N :
```

Enter Y if this ECM is at the end of a bus or spur and its links are in the M position.

```
Monitor joined analog busses from this ECM (Y / N) Currently N :
```

(Only presented if there are joined analog busses, connected to a second SPIF.) Enter Y if this ECM is at the end of a the joined bus or spur and the links on the second SPIF links are in the M position.

```
Spare speech bus is fitted (Y / N) Currently N :
```

Enter Y if there are 3 audio busses fitted, and redundancy is provided by switching in the spare bus. Enter N if there are only two audio busses fitted, and redundancy is provided by swapping WIP and PA busses.

```
Zones for Background Music
```

Enter zones which are to receive background music if there is no run-time control of such zones. Use commands like **ADD 3 6-8 <Enter>** to add zones 3 and 6 to 8, or **DEL 5 22 <Enter>** to delete zones 5 and 22. When finished just type **<Enter>**

```
Zones for Alert/Evac/PA Group Keys
```

Enter zones which are controlled by the Alert, Evac, and PA Group keys. The format is the same as for adding or deleting Background music zones.

```
Default Zones for non-emergency paging default (PABX)

(relevant if the PABX input is used but there is no paging console)
```

Enter zones which are to receive the PABX audio input if there is no run-time control of such zones. Use commands like **ADD 3 6-8 <Enter>** to add zones 3 and 6 to 8, or **DEL 5 22 <Enter>** to delete zones 5 and 22. When finished just type **<Enter>**

```
Current modem dial string []

To change, type a new string <Enter> eg ATDT1,12345678

To disable dial out facility, type / <Enter>
```

Enter the dial string for the modem as described in 20.11. If there is no modem to dial out and print alarms remotely, and a string is already defined, type **/<Enter>** which will remove the string.

```
Current modem initialise string []

To leave as is type <Enter>
```

```
To change, type a new string <Enter>

This string should disable echo and result codes eg ATE0Q0

To disable modem initialisation, type / <Enter>
```

Enter the initialisation string for the modem as described in 20.11. If these is no modem to dial out and print alarms remotely, and a string is already defined, type **/<Enter>** which will remove the string.

```
Modbus Zone Address (0 to disable) Currently 0 :
```

Enter the lower of the two slave addresses to be used for Modbus (typically colour graphics) communications. This address is the Zone address. The Group address is one higher.

```
Maximum time between modbus polls (255 to disable fault) Currently 5 :
```

(Only presented if the modbus zone address is not 0). Enter the maximum time in seconds between modbus polls before a fault is raised.

```
Control via modbus disallowed Currently N :
```

(Only presented if the modbus zone address is not 0). Enter Y to disable control over modbus.

```
Zones isolated on FIP display fault on EWIS Currently N :
```

(Only presented if there is a high level FIP input.) Enter Y to generate a fault for disabled input zones.

```
Baud rate for printer / terminal port Currently 9600 :
```

Enter the baud rate for the port you are using. Any change will take effect after you exit on-site setup mode and restart the ECM.

```
Use hardware handshaking on printer/terminal port (Y / N) Currently N :
```

Enable or disable hardware handshake for the port you are using. Any change will take effect after you exit on-site setup mode and restart the ECM.

```
Baud rate for colour graphics / modbus port Currently 19200 :
```

Enter the baud rate for the colour graphics / modbus / high level FIP port. Any change will take effect after you exit on-site setup mode and restart the ECM.

C Menu

```
Set everything to default (Y / N) :
```

Enter Y to set **all** site configurable data to its default. **This includes setting all items in the Q and T menus to their default values.**

```
Your address is 5
```

This is for your information, you can't change it.

```
Acknowledge Broadcasts from which SIDs

0 = None, 255 = All, Other = Single specific SID Currently 0 :
```

Set to 0 unless you are connecting to other I2000s through IHUB(s) and therefore you have set "Disable Cyclic Addressing" to Y. Then you should enable one node on the network spur to Acknowledge messages from all panels on that spur (typically the IHUB), and one node to

acknowledge messages from the IHUB. So in this case you would enter the IHUBs address here. See also Connection to IHUB.

```
Point to point mode (Y / N) Currently N :
```

Enter Y only if there is only one other node on the network and you have separate cables for transmit and receive to that other node, or you are connecting through a modem or similar and you can transmit and receive at the same time. That other node must also be set to Y.

```
Tx all link integrity on both channels (Y / N) Currently N :
```

Entering Y will transmit link integrity messages for channels A **and** B on each channel (instead of transmitting channel A link integrity on channel A only and transmitting channel B link integrity on channel B only). This avoids getting fault indications when there is only a single channel (connecting to a non-essential part of the system).

```
Disable Cyclic Addressing (Y / N) Currently N :
```

Enter Y if data between I2000s must pass through one or more IHUBs. In this case see also "Acknowledge broadcasts from which SIDs" above.

```
Optimise Panel link RX for no concat or split msgs (Y / N) Currently N :
```

The Y setting is largely to optimise processing time in very large I2000 only networks. Enter Y only if you are sure that the I2000 will not be receiving concatenated messages e.g. there are only I2000s and/or MX4428 panels on the network and no data passes through an IHUB, or if there is an IHUB the port that the I2000 connects to does not have CONCAT MSG enabled. If in doubt set to N.

```
Additional Refresh Interval

 (Additional to basic interval of 60 - 120secs )  Currently 0 :
```

Enter a number usually in the range of 60 - 200 on large systems. This reduces network traffic at the expense of increasing the time between refreshing data which has not changed.

T menu

```
Network tuning - set to default (D), modify/view (M), leave as is  :
```

Self explanatory. Setting to default applies only to this menu.

```
Network baud Currently 9600 :
```

Enter the baud rate for the network.

```
Rx Timeout * 3.3msec Currently 2 :
```

Leave at this default unless instructed otherwise by FireSense.

```
Tx delay * 3.3msec Currently 1 :
```

Leave at this default unless instructed otherwise by FireSense.

```
Ack Time * 33msec Currently 40 :
```

Leave at this default unless instructed otherwise by FireSense.

```
Dup Periods * 33msec Currently 45 :
```

Leave at this default unless instructed otherwise by FireSense.

```
Leading FF Currently 1 :
```

Leave at this default unless instructed otherwise by FireSense.

```
Trailing FF Currently 1 :
```

Leave at this default unless instructed otherwise by FireSense.

```
Link Integrity Rx interval * 1sec (0 = disabled) Currently 25 :
```

Leave at the default of 25, or set to 50 on larger systems.

```
Link Integrity Tx interval * 1sec (0 = disabled) Currently 5 :
```

Leave at the default of 5, or set to 10 on larger systems. If you set to 10 also set the RX interval above to 50.

```
Multicast Tx times Currently 2 :
```

Leave at this default unless instructed otherwise by FireSense.

```
Point to point mode (Y / N) Currently N :
```

Another way of selecting point to point mode as described in the C menu.

```
Network Tuning OK ? (Y / N) : y
```

Enter Y if you are happy with your changes, or N to go through the menu again.

Exit

If any changes have been made install the EEPROM write enable link (LK4). Type **X<Enter>** to save your changes and exit. Remove the write enable link (LK4). On older systems it may be necessary to power down and up for the changes to take effect.

18.9. Charger Fault Connection at Amp Rack

At a location with a power supply but no ECP e.g. a remote amplifier rack, the PTT input is used to monitor the power supply "charger fault" output and signal it to ECPs. If "PTT" is open it will be taken as a charger fault, if closed no fault. This will normally be wired in the factory.

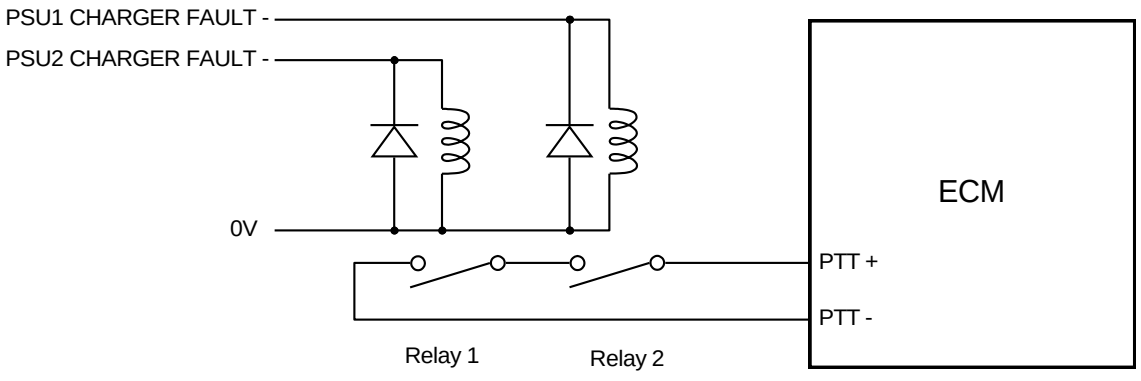


Figure 18-6: Charger Fault Wiring at Amplifier Rack

18.10. Connection and Colour Graphics PC

If the ECM is acting as an interface to a colour graphics PC acting as an ECP, the RING9006 PCB is connected to the FRC connector J10 on the ECM. The PTT switch on the microphone is connected to

the ECM screw terminals J9 through the PA0688 Preamp. See the diagram below "Colour Graphics Wiring".

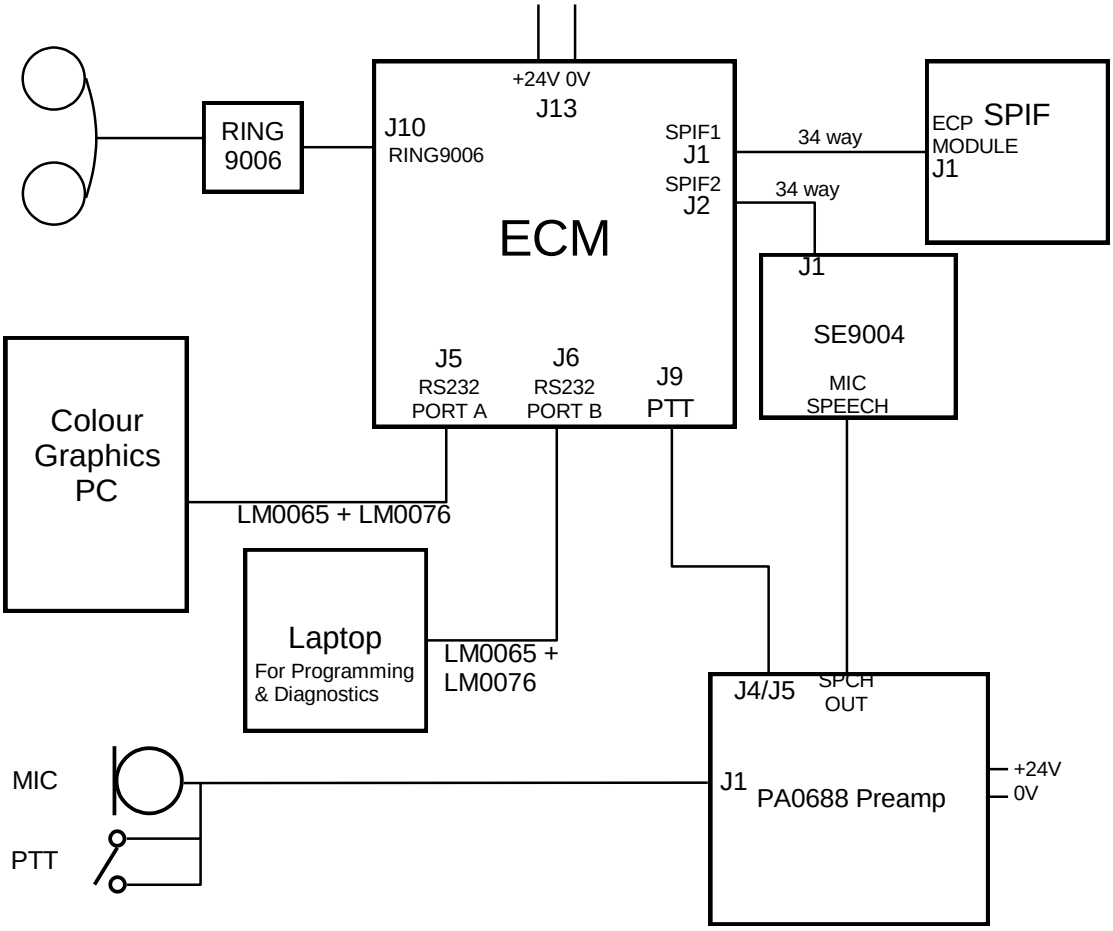


Figure 18-7: Colour Graphics Wiring

18.11. ECM Diagnostics and Event Log

a. Overview

The ECM has a diagnostic facility which can be used to print events on a printer, or using a terminal emulator, list all off normal conditions, control alert and evacuation tones for zones, and log various comms messages. The logs of the communications messages are intended for Tyco's use, normally Tyco will advise what to do to diagnose a problem.

Refer to Printer / Terminal Connection for more details of connecting to a printer or terminal.

The facility to display off normal conditions, and to control zones, means that most of the commissioning of an "amp rack" (i.e. a panel with no ECP containing amplifiers, possibly strobe outputs, possibly FIP/BGA inputs, and possibly WIP circuits), can be done at the amp rack, with or without the remote ECP powered up.

b. Diagnostics Procedure

Connect the laptop/terminal emulator as described in Printer / Terminal Connection.

Type 'h' (then <Enter> with ECM software version 5.57 and later) and you will get a list of commands like the following -

```
Terminal commands within '' below - ALL NOW REQUIRE ENTER KEY

'f' Display factory configuration and some site programmed values
```

```
'o' (letter) Display status by displaying all off normal conditions

'e' Toggle Event Log On/Off

'q' Toggle Local (QE90) Comms Diagnostic Log On/Off

'm' Toggle Brief Modbus Comms Diagnostic Log On/Off

'M' Toggle Detailed Modbus Comms Diagnostic Log On/Off

'p' Toggle Brief RS485 Panel Link Comms Diagnostic Log On/Off

'P' Toggle Detailed RS485 Panel Link Comms Diagnostic Log On/Off

'l' Toggle RS485 Link Integrity Comms Diagnostic Log On/Off

's' Toggle Simplex FIP HLL Comms Diagnostic Log On/Off

'r' Toggle RZDU FIP HLL Comms Diagnostic Log On/Off

'x' Toggle External Speech Generator Log

' ' (Space) Turn Off all Comms Diagnostic Logs

'd' Display Diagnostic Counters

'0' (digit) Clear Diagnostic Counters

'<' Display Memory Usage

'===RESET_ECM==='        Reset (Restart) ECM

'===PROGRAM_ECM==='      Reset ECM and go into on-site setup mode

'date 25/12/2001' for example : set date

'time 23:15:00' for example  : set time

'E20=1' for example : any script language statement

'?E20|E21' for example : evaluate expression in script language

Note log of most events is suspended while entering lines
```

With ECM software version 5.57 and later, **all the above commands must be followed by the <Enter> key.**

With version 5.56 and before, the above keys were typed by themselves and the date, time, script statements, reset, and program commands had to be preceded by typing 'i'. The available commands varied somewhat by version - type <Enter> to see what commands are available.

Much of the above is self explanatory, some commands are expanded below -

- **e** enables/disables the event log. This log is enabled by default and will display changes in the Alert and Evacuate status for each zone, and most kinds of faults. The display is generally similar to output of the "Off Normals" command, but each condition is listed as it happens along with the time and date.

- **o** lists all off normal conditions as described in Off Normal Display.

c. Off Normal Display

The **o** command will give a display `like the following` with explanations added in this font

`Off Normal conditions Tyco Demo V1.13 Mar 06 1997. SID 120`

(The name of the system is Tyco Demo, the software version is 1.13, the date it was programmed is March 06 1997, and the network SID (address) is 120.)

`Alert Zone(s) 1 2 3 4` (Zones 1, 2, 3,and 4 are generating Alert Tones.)

`Speaker Line Faults on circuits *4` (Speaker circuit 4 has a line fault.)

`BGA Alarms on circuits *2 3` (BGA circuit 2 has an alarm. BGA circuit 3 has a latched alarm, i.e. there has been an alarm but it has now cleared.)

`WIP Line Faults on circuits *7 *10` WIP circuits 7 and 10 have line faults

`Speaker Line Faults on zones *4` There is a speaker line fault on zone 4.

`WIP circuits active as BGA/FIP/GP inputs *15` WIP circuit 15 is active as a BGA, FIP, or switch input.

`BGA Alarms on zones *2 3 *5.` There are BGA alarms on zones 2 and 5. There has been a BGA alarm on zone 3.

`WIP1 Line Faults on zones *7 *10` There are WIP line faults on the WIP1 connection for zones 7 and 10.

`Card Failures (Hexadecimal addresses) *70 c0` (I2000 Card address hex 70 is not responding. Card address hex c0 has been not responding but now is responding.)

`SIDs not responding *6` (SID 6 is not acknowledging messages addressed to it. Note that only SIDs listed under Related Nodes in the configuration listing can generate this condition.)

`Link Integ Ch A not received here from SIDs *6` (This means that **this node** is not receiving link integrity transmissions on channel A from SID 6. Note that only SIDs listed under Related Nodes in the configuration listing can generate this condition.)

`QE90 SIDs which have detected Link Integ Error, Channel A *7` (This means that **SID 7** is not receiving link integrity transmissions on channel A from at least one expected SID. Note that only SIDs listed under Related Nodes in the configuration listing can generate this condition)

Note that a * precedes circuit and zone numbers where the fault or alarm is current, except for Alert and Evacuate conditions for zones which never have a * and are not latched. If there is no * preceding the circuit or zone number, the condition is latched, i.e. the abnormal condition has occurred and subsequently returned to normal. These latched conditions are reset when faults are reset at an ECP, i.e. the SILENCE key is pressed and held for 2 seconds.

The local information is displayed for “circuits” and again for “zones”. A circuit refers to the circuit number on the I/O termination module, or to an amplifier number. A zone refers to the zone the circuit is mapped to.

The relationship between local circuits and zones can be obtained from the factory configuration printout. A zone may have zero, one, or more than one circuit of each type assigned to it.

Remote Information is given only for zones. Circuit data is not transmitted across the network.

OFF NORMAL DISPLAY NOTES

The I2000 card addresses are as follows

00 Evac ECP

2x EMUX module x

4x FIP module x

5x BGA module x

6x Strobe module x

7x Paging Console x

80 WIP ECP

cx WIP slave module x.

d. Interpret Command

After typing **i** it is possible to enter the commands to turn Alert and Evacuate On and Off for each zone. It is necessary to type **i** before each command. Commands have the general form

A(range)=0 or A(range)=1 or E(range)=0 or E(range)=1.

A corresponds to Alert, E to Evacuate. Setting Alert or Evacuate to 1 turns it on, setting it to 0 turns it off. The (range) is best described by examples. Note that the case (upper/lower) of the letters is significant and must be as in the following examples.

`A5=1`	Set alert for zone 5
`E12=0`	Reset evacuate for zone 12
`An=1`	Set alert for all zones
`An5-12=0`	Reset alert for zones 5 to 12

Any powered up ECPs at other locations which could control the zones must be switched to AUTO or their controls may override the commands typed in.

18.12. Dial Out Alarm Log

The ECM can be configured to dial out using a modem when an alarm occurs and display/print the alarm message remotely. The modem is connected to RS232 PORT B (J6), i.e. the same port as the laptop/terminal for diagnostics. In on-site setup mode under I2000 programming you can enter a modem initialisation string and a modem dial command string. The baud rate used to converse with the modem is 9600 baud. Most modern modems will auto detect this. Most modern modems will also automatically determine a suitable baud rate with which to converse with the remote modem. The initialisation string should reset the modem to the factory defaults then NO ECHO, NO RESULT CODES and GENUINE CARRIER DETECT (if this is not the default). For example for the US Robotics Sportster VI, AT&F0E0Q1. If the modem is required to auto answer so that the ECM can be called from a remote terminal, then command it to do so eg AT&F0E0Q1S0=1. The ECM will add a carriage return character to the strings it sends to the modem. The dial string should be whatever is needed to dial the remote system eg ATDT1,,96460001. After entering the codes with the laptop and exiting on-site setup mode, the ECM should be powered down and the modem connected to RS232 PORT B (J6) and the ECM powered up. The modem can be connected using the Tyco loom LM0065 which provides 9 way male and female DB9 connectors, and then a standard 9 pin to 9 pin or 9 pin to 25 pin cable as required to suit the modem. Most modems will come with a suitable cable.

The remote system should run a terminal emulator program and initialise its modem to auto answer. If required the terminal emulator program can be configured to automatically print data as it is received - if this is the case it is suggested that the remote computer should run DOS and not Windows as it is not possible for a Windows program to print line by line.

The remote system can do all of the diagnostics listed under ECM DIAGNOSTICS, either when automatically dialled as a result of an alarm, or by manually dialling in. When the ECM dials out it will terminate the call 1 minute after the last activity, however if the remote system dials the ECM, then the call must be terminated by the remote system.

18.13. Diagnostic LEDs

There are some diagnostic LEDs on the ECM which may be useful -

LD1 (red) will flash with every communications error with I2000 modules (i.e. Evac and WIP ECPs, FIP/BGA modules, EMUX modules, Strobe and WIP modules).

LD2 (yellow) will flash with every successful communications message with I2000 modules. It should be flashing very rapidly.

LD3 (green) should be always on if the ECM is powered up. If it flicks off briefly it indicates the ECM is being reset.

LD4 (yellow) (RS485 A Transmit) flicks on whenever the ECM transmits on the channel A RS485 bus. It should do this at least once every 5 seconds, transmitting its link integrity message. Whenever anything changes, and about once per minute, this LED and LD6 flash together indicating transmissions on both A and B busses.

LD5 (yellow) (RS485 A Receive) flicks on whenever the ECM receives on the channel A RS485 bus. This should include whenever it transmits, and whenever it receives from another ECM. This LED should be normally off, blinking on with data reception. If it is on steady or not blinking there is something wrong.

LD6 (yellow) (RS485 B Transmit) flicks on whenever the ECM transmits on the channel B RS485 bus. It should do this at least once every 5 seconds, transmitting its link integrity message. Whenever anything changes, and about once per minute, this LED and LD4 flash together indicating transmissions on both A and B busses.

LD7 (yellow) (RS485 B Receive) flicks on whenever the ECM receives on the channel B RS485 bus. This should include whenever it transmits, and whenever it receives from another ECM. This LED should be normally off, blinking on with data reception. If it is on steady or not blinking there is something wrong.

18.14. ECP Status LEDs

All the status LEDs on the bottom of the ECP module will flash when it is powered up, until communication is established with the ECM.

The AUTO, MANUAL, and ISOLATE LEDs on the ECP display in various combinations to indicate various conditions.

AUTO Some or all zones are in AUTO.

Steady MANUAL All zones are under manual control at this ECP

Steady ISOLATE All zones are in ISOLATE and under the control of this ECP

Continuous flash MANUAL Some zones are under manual control at this ECP.

Continuous flash ISOLATE Some zones are in ISOLATE and under the control of this ECP.

Flash-flash-pause MANUAL	Some zones are under manual control of another ECP.
Flash-flash-pause ISOLATE	Some zones are in ISOLATE and under the control of another ECP.

It is possible for there to be more than one LED on at a time. For example if this ECP is in AUTO but some zones are under manual control at another ECP, the AUTO LED will be steady and the MANUAL LED will be flashing with a flash flash pause cadence.

Some but not all of the above also apply to non-networked systems and are described in LT0087, I2000 Operators Manual.

The EVACUATION SYSTEM OPERATING LED always flashes with a flash-flash-pause cadence.

The FIRE PHONE SYSTEM OPERATING LED will flash continuously when there is no call in progress, or when there is a call between that ECP phone and a WIP connected to that panel. The LED will flash with a flash-flash-pause cadence when there is a call between a WIP connected to that panel and a remote ECP phone, indicating that the call has been initiated or answered at a remote ECP.

18.15. ECP Diagnostic LEDs

The fault LEDs on the ECP function in a similar manner to those for non networked software, with some additions. Refer to Networked Fault Display for more details. In the diagram the “first” remote node is the one in the leftmost Sid_xx_Zone column in the NETWORK INTERFACE section of the configuration printout. The “second” remote node is the one in the second Sid_xx_Zone column in the NETWORK INTERFACE section of the configuration printout. Similarly for the other remote nodes.

All these faults are displayed as flashing indications for current or latched faults. The “off normal” command on the laptop gives much more detailed information.

18.16. I-2000 Module Address Switches

Each node on the network is self contained and the module addresses (FIP, BGA, EMUX, STRM, WIPS, and ECP) restart from their base address at each node. If upgrading from an older system without ECMs the addresses would have incremented across the whole system, and may need adjusting.

Section 19 Audio Line Isolator Module (ALIM9706)

19.1. Overview

The Audio Line Isolator Module (ALIM9706) is used:

- As an isolation transformer (with optional volume control) for background music inputs connecting to the Local Inputs of Amplifiers (refer to Local Inputs) (Note to connect a 100V line to a I2000 input).
- To allow spurs on the WIP speech and PA speech busses in a networked system.

19.2. ALIM9706 on Amplifier Local Inputs

The ALIM9706 should be wired as shown in the diagram below to provide isolation, balanced inputs, and optional volume controls for amplifier local inputs.

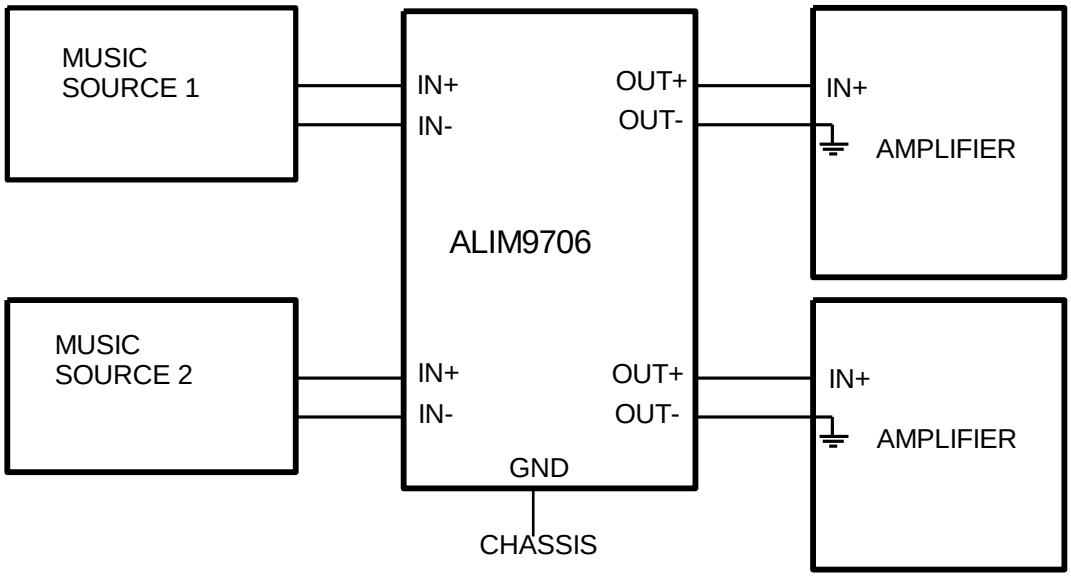


Figure 19-1: ALIM9706 Providing Isolation for Amplifier Local Inputs

There are two circuits per ALIM9706 - each module can provide isolation for two music sources.

If **no** individual zone volume controls are required, links LK1 and LK2 on the ALIM9706 should be installed, and LK3 not installed. In this mode the ALIM9706 has unity gain, and the input voltage required for maximum output is 300mV RMS.

When individual zone volume controls **are** required, links LK1 and LK2 should be removed, and link LK3 installed in the 2-3 position. In this mode the ALIM9706 has a maximum gain of about 0.3 , and the input voltage required for maximum output is 1V RMS.

19.3. Providing Spurs on Network System Wiring

The ALIM9706 can be used in a networked I2000 system (one with ECMs) to allow spurs in the wiring to the various panels. This is achieved as described in Wiring Between Locations.

Section 20 Printer /Terminal Connection and Diagnostics

20.1. Printer / Terminal Overview

The I2000 EWIS system has an RS232 Port configured for a Terminal or Printer. (9600 baud, 8 data bits, no parity.)

The port can be used to attach a printer, terminal, or laptop computer with terminal emulation software, so that events and fault conditions can be logged in more detail than is available through the ECP front panel LEDs. This is particularly useful during commissioning or fault finding as specific fault conditions will be identified.

The printer / terminal will log all events as they occur, be they front panel activations by the operator or automatic operations initiated by FIP or BGA inputs. If a terminal is used, it can also be used to display an “Off normals” list including all alarm and fault conditions, to set up the Cascade variables, to set the date and time, and to change the baud rate from the default of 9600, and also adjust many additional items on ECM networked systems.

An example of the log follows. The format will vary slightly depending on the software version and whether the system has ECM networking or not.

```
Tue 28-07-92  16:31:19 keyswitch turned to Manual

Tue 28-07-92  16:31:37 All EVAC on

Tue 28-07-92  16:31:40 All EVAC off

Tue 28-07-92  16:31:42 Zone 1 ALERT on

Tue 28-07-92  16:31:46 Zone 1 ALERT off

Tue 28-07-92  16:31:50 keyswitch turned to Auto

Tue 28-07-92  16:31:59 Zone 13 Amplifier in fault

Tue 28-07-92  16:32:20 Zone 2 BGA active

Tue 28-07-92  16:32:30 Zone 2 ALERT on

Tue 28-07-92  16:33:30 Zone 2 EVAC on

Tue 28-07-92  16:33:30 Zone 1 ALERT on

Tue 28-07-92  16:33:30 Zone 3 ALERT on

Tue 28-07-92  16:33:30 Zone 4 ALERT on

Tue 28-07-92  16:33:48 keyswitch turned to Manual

Tue 28-07-92  16:33:53 All ALERT on

Tue 28-07-92  16:33:54 All ALERT off

Tue 28-07-92  16:33:55 All EVAC on

Tue 28-07-92  16:33:56 All EVAC off
```

```
Tue 28-07-92  16:34:01 FIB Card Adr 0 off line

Tue 28-07-92  16:34:08 Zone 2 BGA cleared

Tue 28-07-92  16:34:16 Zone 5 BGA in fault
```

In a non networked system with an SECP the printer may be connected at the MECP or SECP, and it will log all events as they occur including manual operations carried out at any ECP.

In an ECM networked system, the printer may connected to any ECM. It will log events relating to all zones mapped to that ECM. Thus, for a system-wide event log the printer should be connected to an ECM at an ECP or SECP/VDU interface which controls all zones in the system.

The events logged include:

1. Manual operations of Alert, Evac and PA.
2. Alarm inputs from FIP and BGA inputs.
3. Automatic activations of Alert and Evac due to an alarm input.
4. FIP, BGA, Strobe, and Speaker Line Faults.
5. Amplifier supervision fault.
6. Fault Silence and Reset operations from the front panel.
7. Changes to cascade settings from the front panel.
8. Changes to the position of the AUTO/MANUAL/ISOLATE keyswitch, and any resulting changes to the ECP in control (for a system with an SECP).
9. WIP Faults – logged on non-networked systems with ECP Version 4.00 and higher, and logged on all versions of ECM Networked systems.
10. WIP Calls – logged on non-networked systems with ECP version 4.00 and higher, and optionally logged on ECM Networked systems with ECM version 5.36 and higher.

20.2. Off Normals Display

a. ECM Off Normals Display

Typing ‘o’ at the diagnostic terminal will produce a display of all off-normal conditions. (with ECM software version 5.57 and later type 'o' then <Enter>.) Refer to Off Normal Display.

b. ECP Off Normals Display

This section applies to only ECP Software version 6.00 and later.

Typing the <Enter> key at the diagnostic terminal will display the following

```
Enter password for programming mode, or one of these commands

=OF off normals; =Ax simulate zone x alarm; =NC next cascade; =RE Reset
```

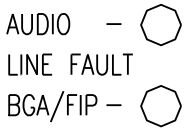
Typing `=OF` will then display the off-normal conditions as in the following example

Condition displayed	Explanation
Wed 01-01-92 01:23:17	Current time and date
QE2826 Evac ECP V6.00	File name created from, and software version
QE2826 Moon Flights Inc CRC=5604	Title, and CRC of config data
Created by SmartConfig 1.4.0.1 on Tue Nov 08 12:14:43 2005	Program version created by
Mode = Manual	Auto, Manual, or Isolate
This ECP has control	This ECP or Another ECP "in Control"
This is SECP 0	MECP, or SECP and address
Not Monitoring Audio busses here	Identifies whether this ECP is set up to monitor Audio busses between panels
*** Off Normals (excluding latched faults) ***	
Alert Zones <1,3,6-12>	Zones which receive Alert if no higher priority signal is selected
Evac Zones <None>	Zones which receive Evac if no higher priority signal is selected
PA Zones <None>	Zones which receive PA if Press To Talk button is pressed.
Music Zones <1-30>	Zones which receive Music if no higher priority signal is selected
Non emerg paging Zones <None>	Zones which receive non-emergency paging if no higher priority signal is selected
FIP Alarm in Zones <None>	
BGA Alarm in Zones <None>	
Speaker Line Fault on Amp 2 (MUX Adr 0; Amp Card 1; Amp 2 on card) Zone 6	
WIP Fault WIP 4 (WIP Card Adr 0 cct 4)Zone 4 WIP 1	

Input conditions and output faults are displayed by circuit number, then this is expanded into the module address and input number on the module, and finally the zone the input or output is mapped to is listed. For amplifier cards, the EMUX address (0 – 9), amplifier card number for that card cage (1 – 5), and amplifier number on the card (1 – 4) are displayed.

Note - Addressable modules are always described by address (starting at 0 for each module type), while input numbers and other card numbers (e.g. amplifier cards) start at 1.

On a system with a High Level link to a FIP RZDU port, it is not possible to "type" any input data, although it is possible to connect a printer or terminal to the RS232 output. Therefore an alternative method of triggering the "Off normals" output is provided. Press the hidden key under the "LINE FAULT" text for zone 1. Note - the baud rate of the terminal must be set to 1200.



20.3. Other Diagnostics on Non-ECM System

This section applies to only ECP Software version 6.00 and later.

Typing the <Enter> key at the diagnostic terminal will display the following

```
Enter password for programming mode, or one of these commands =OF off
normals; =Ax simulate zone x alarm; =NC next cascade; =RE Reset
```

Note that all these commands start with = so that they can be distinguished from passwords, and are thus echoed to the screen as you type them.

ECP software version 6 and later allows cascade sequences to run with the MECP switched to Isolate, so that the cascade sequence resulting from alarms on various zones can be tested without alerting building occupants.

The Ax, NC, and RE commands are useful for testing Cascade sequences in Isolate mode.

=Ax is used to simulate an alarm in zone x. This can be used when it is difficult to generate real alarm input conditions. However the best test is to simulate or otherwise produce the alarms on the FIP, or operate BGA inputs (MCPs). The =Ax command is provided only as an alternative where this is not feasible. **=A32** for instance simulates an alarm on zone 32. This will be indicated on the FIP LED for zone 32. Note that the simulated alarm is a general alarm input condition (neither specifically FIP nor BGA) and in rare cases where the I2000 is programmed to take different action depending on whether an alarm input is a BGA alarm or FIP alarm, the simulated alarm may not be useful.

=NC bypasses the remainder of the initial or subsequent timeout and proceeds to the next cascade phase. This command can be used to speed up the testing process.

=RE resets simulated alarms, and resets latched genuine alarm inputs (FIP and BGA). This is the same operation as you get by holding the SILENCE button for 2 seconds. =RE does not reset any zones that might be in the Alert or Evacuate state, you will need to do this from the MECP control panel.

Note - when testing the effect of alarms in different zones, you will have to reset all the conditions resulting from the test of an alarm in one zone before proceeding to testing an alarm in the next zone. This includes resetting the alarm input source (so that all FIP and BGA LEDs are off), and resetting any Alert and Evacuation states in zones.

Note - these "Other Diagnostics" are not possible at an ECP which has an RZDU interface connected.

20.4. Software Requirements

The Event Log is supported on non networked systems with ECP software version 1.65 or later, and on systems with ECM networking ECM version 1.50 and later. Earlier versions may provide a partial event log and should preferably have upgraded software fitted.

20.5. Hardware Requirements – New Production

From early 1999, all I2000s built have the required hardware to allow the printer / terminal to be used. However additional hardware may be required if non volatile date and time identification is required. All ECM systems, and Non-ECM systems with ECP Version 6.00 and later maintain the time and date. However, unless special battery backed hardware is fitted, the time and date must be re-entered every time the panel is powered up.

I2000 System	Terminal / Printer	Requirements	Cable Connects to	DIP Switch 1:6 on ECP
Non-ECM	Terminal	LM0138 (Std Cable DB9 Plug to DB9 socket) KT0169 if non volatile time/date required	DB9 socket on SPIF9709 or SE9004	ON
Non-ECM	Printer	FP0546 Printer FP0752 Printer cable / power supply KT0169 if non volatile time/date required	DB9 socket on SPIF9709 or SE9004	ON
ECM	Terminal	LM0065 Ribbon Cable (supplied) LM0076 Null Modem Cable (supplied) IC0412 if non volatile time/date required	RS232 PORT B on ECM	OFF
ECM	Printer	FP0546 Printer FP0752 Printer cable / power supply IC0412 if non volatile time/date required	RS232 PORT B on ECM	OFF

FP0546 is a small printer capable of operating from a DC supply. FP0752 contains a supply for the FP0546 so that it can be powered from the I2000, and an LM0131 cable for connecting the printer to the I2000.

The diagrams "Wiring to PC / Terminal" and "Wiring to Printer" at the end of this chapter show how the various systems are wired.

The 28 pin IC in KT0169 is fitted into the ECP by removing U14 from its socket and fitting the new 28 pin IC. There is also a 14 pin MAX232 IC in KT0169 – this is fitted into the U9 socket on the ECP if there is no IC there already. Also ensure that Evac DIP switch 6 on the ECP board is ON with non ECM networked systems. Refer to the diagram "Location of MAX232 and Battery Backed Clock" at the end of this chapter.

The IC0412 part is fitted into an ECM by removing IC U5 from its socket, inserting IC0412 into the U5 socket, and then reinserting U5 into the socket on IC0412.

20.6. Connector Pinouts

For users wishing to use their own printers or cables, the following tables show the pinout of the various ports.

SE9004 Issue C, MEXP, and SPIF (Used on system without ECM)

(Also connection on LM0077 on system with RZDU High Level Link)

1	No Connection	
2	TXDATA	Data from I2000 to printer or terminal
3	RXDATA	Data from terminal keyboard to I2000
4	No Connection	(DO NOT CONNECT on pre-1994 MEXP)
5	GND	Reference
6	No Connection	
7	CTS	High input required for I2000 to Transmit
8	RTS	High output transmitted by I2000.
9	No Connection	

DB9 Connector on LM0065 to ECM

1	DCD	Not used
2	RXDATA	Data from terminal keyboard to I2000
3	TXDATA	Data from I2000 to printer or terminal
4	DTR	
5	GND	Reference
6	DSR	
7	RTS	High output transmitted by I2000.
8	CTS	High input required for I2000 to Transmit
9	RI	Not used

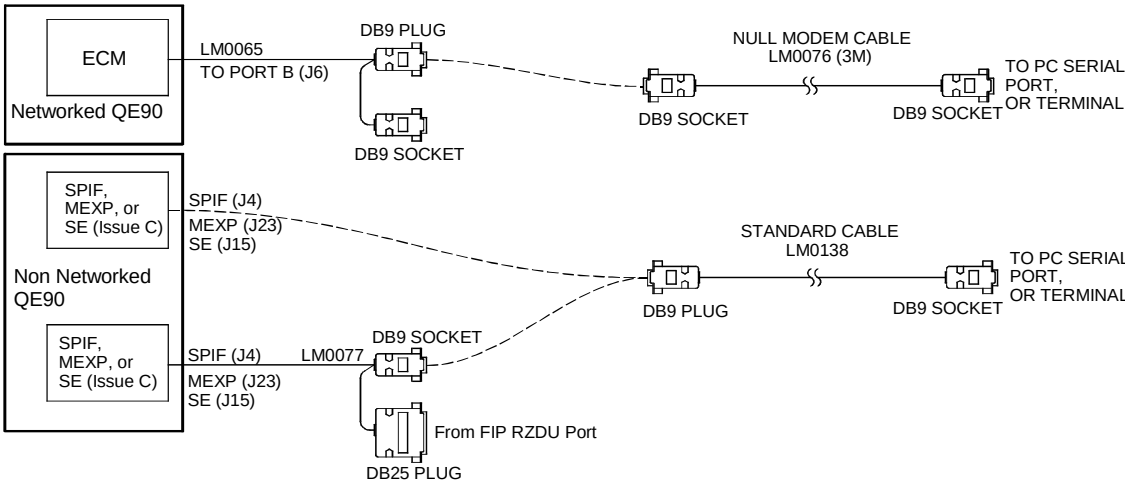


Figure 20-1: Wiring to PC / Terminal

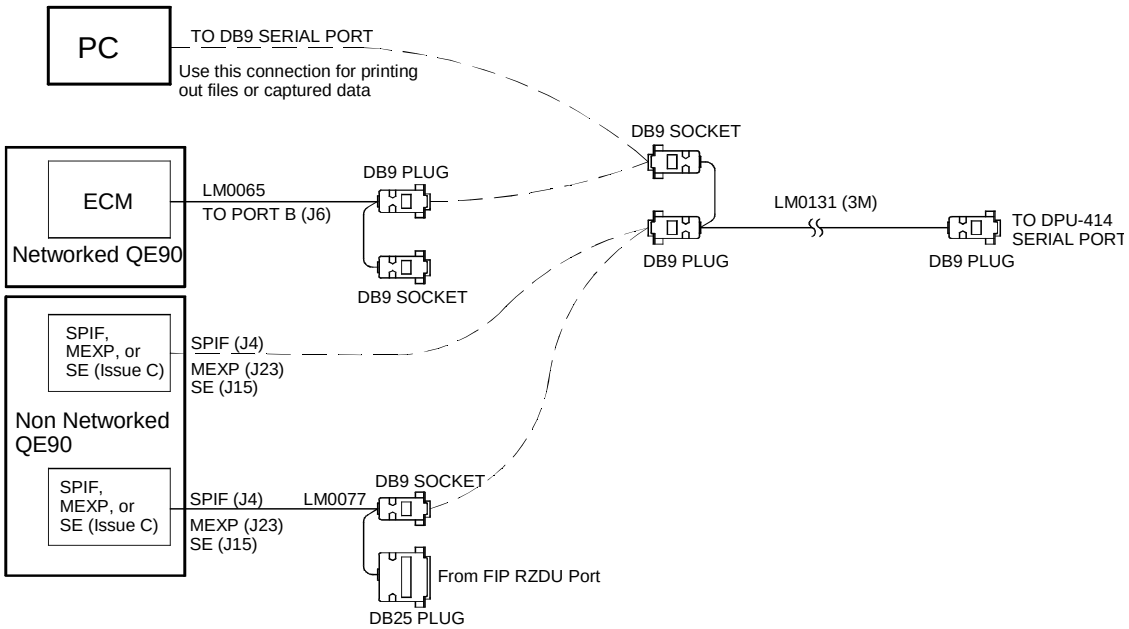


Figure 20-2: Wiring to Printer

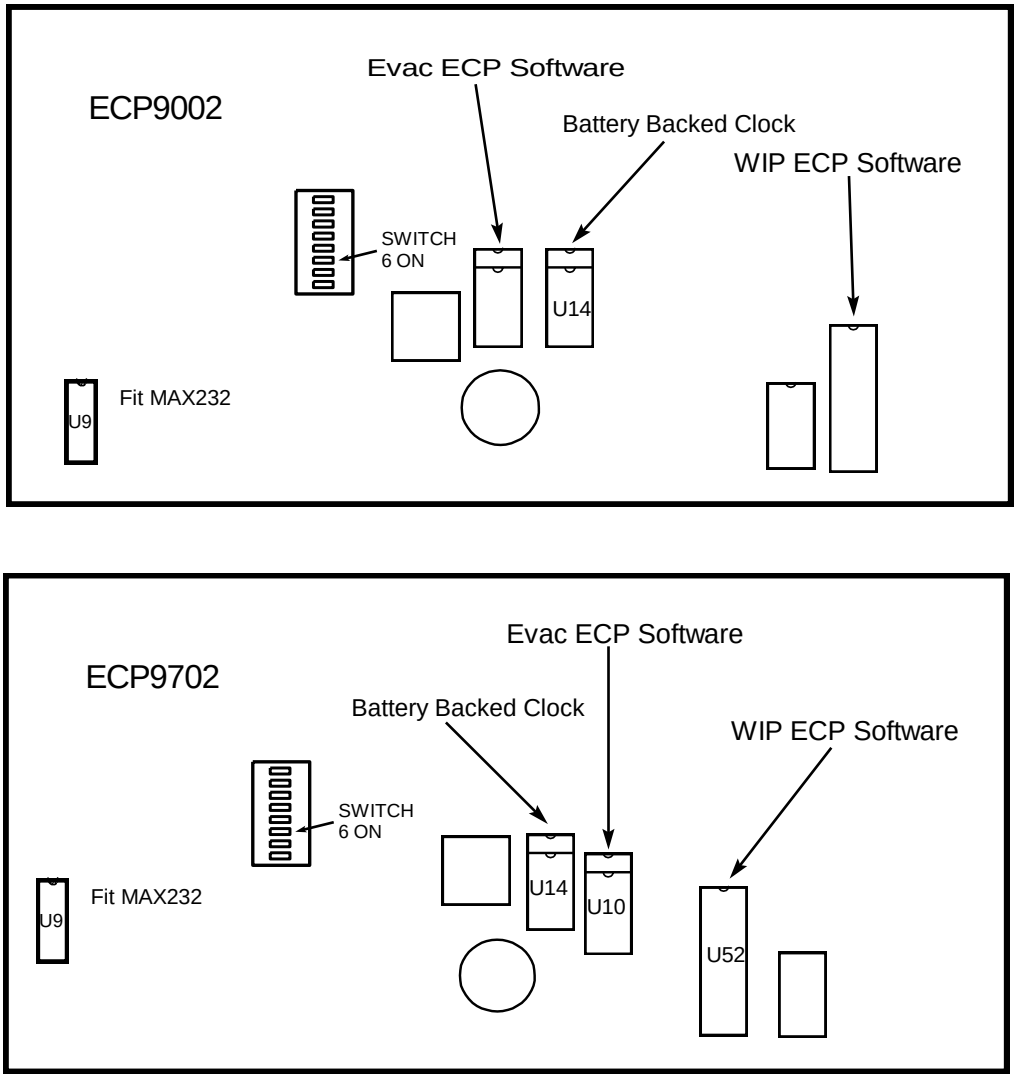


Figure 20-3: Location of MAX232 and Battery Backed Clock

Section 21 Cascade and Other On-Site Settings

21.1. General

The I2000 EWIS panel can be set-up on-site to adjust the following settings:

a) Cascade Enabled / Disabled

b) Cascade has Alert phase or not (available only for software version 6.00 and higher). Note that this option also requires that the configuration program is designed to use this feature.

c) Cascade Time Periods

- Delay before action

- Initial time out

- Subsequent time out

d) Zones belonging to GROUP Alert, Evacuate and PA Speech Commands.

e) Zones that background music is enabled for.

f) Zones to be isolated. (Service function only, not available on ECM)

g) Time and date for the real time clock (if present)

h) WIP Master Phone redirection.

For systems with an ECM, the on-site setup is done using a laptop connected to the ECM. Refer to ECM On site settings for details.

For systems without an ECM there are two methods of setting up the information in the I2000.

- Front panel via keyboard – refer to ECP on-site settings using keyboard.

- PC via serial port – refer to ECP on-site settings using terminal.

Note the WIP Master phone redirection can be setup only via the front panel – Refer to Master Phone Redirection.

The default values for the on-site settings are given in Default Values.

A description of the effect of the cascade settings follows.

The adjustment of on-site settings described here allows a few frequently changed items, or items that will usually be unknown in the factory, to be set on site without any special program.

21.2. Cascade Sequences

The following tables illustrate the Cascade Time delays, the effect of the on-site settable Cascade Enabled / Disabled switch, and the effect of the on-site settable Alert Enabled / Disabled switch.

Note the “Standard 2 up 1 down” sequences are only defaults and many sites have site specific sequences. The Cascade Disabled sequences are generally as shown and are not customised.

The “Delay before Action” is usually set to zero. When non-zero, during this time no tones are generated by the I2000, however its alarm relay output (if any) will be activated and its beeper will be sounding.

It may often be useful to set the “Initial Delay” to zero to obtain a particular effect. Less frequently, it may also be useful to set the “Subsequent Delay” to zero (generally to evacuate the whole building at once).

Note that the New Zealand “Two Up One Down” cascades begin two zones up and one down from the alarm zone, then continue one zone up after each timeout until the top floor is reached, and finally continue below the alarm zone one zone down after each timeout.

Australian Standard 2 up 1 down, Alert Disabled. Alarm in Zone N					
Zone N + 6					Evacuate
Zone N + 5					Evacuate
Zone N + 4				Evacuate	Evacuate
Zone N + 3				Evacuate	Evacuate
Zone N + 2			Evacuate	Evacuate	Evacuate
Zone N + 1			Evacuate	Evacuate	Evacuate
Zone N		Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1			Evacuate	Evacuate	Evacuate
Zone N – 2				Evacuate	Evacuate
Zone N – 3					Evacuate
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
					--> Time

Australian Standard 2 up 1 down, Alert Enabled. Alarm in Zone N					
Zone N + 6					Alert
Zone N + 5					Alert
Zone N + 4				Alert	Evacuate
Zone N + 3				Alert	Evacuate
Zone N + 2			Alert	Evacuate	Evacuate
Zone N + 1			Alert	Evacuate	Evacuate
Zone N		Alert	Evacuate	Evacuate	Evacuate
Zone N – 1			Alert	Evacuate	Evacuate
Zone N – 2				Alert	Evacuate
Zone N – 3					Alert
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
					--> Time

Australian Cascade Disabled, Alert Disabled. Alarm in Zone N					
Zone N + 6			Evacuate	Evacuate	Evacuate
Zone N + 5			Evacuate	Evacuate	Evacuate
Zone N + 4			Evacuate	Evacuate	Evacuate
Zone N + 3			Evacuate	Evacuate	Evacuate

Zone N + 2			Evacuate	Evacuate	Evacuate
Zone N + 1			Evacuate	Evacuate	Evacuate
Zone N		Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1			Evacuate	Evacuate	Evacuate
Zone N – 2			Evacuate	Evacuate	Evacuate
Zone N – 3			Evacuate	Evacuate	Evacuate
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
					--> Time

Australian Cascade Disabled, Alert Enabled. Alarm in Zone N					
Zone N + 6			Alert	Evacuate	Evacuate
Zone N + 5			Alert	Evacuate	Evacuate
Zone N + 4			Alert	Evacuate	Evacuate
Zone N + 3			Alert	Evacuate	Evacuate
Zone N + 2			Alert	Evacuate	Evacuate
Zone N + 1			Alert	Evacuate	Evacuate
Zone N		Alert	Alert	Evacuate	Evacuate
Zone N – 1			Alert	Evacuate	Evacuate
Zone N – 2			Alert	Evacuate	Evacuate
Zone N – 3			Alert	Evacuate	Evacuate
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
					--> Time

New Zealand Standard 2 up 1 down, Alert Disabled. Alarm in zone N							
Zone N + 5 (Top Zone)						Evacuate	Evacuate
Zone N + 4					Evacuate	Evacuate	Evacuate
Zone N + 3				Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 2			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 1			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N		Evacuate	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 2							Evacuate
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
							--> Time

New Zealand Standard 2 up 1 down, Alert Enabled. Alarm in zone N							
Zone N + 5 (Top Zone)		Alert	Alert	Alert	Alert	Evacuate	Evacuate
Zone N + 4		Alert	Alert	Alert	Evacuate	Evacuate	Evacuate
Zone N + 3		Alert	Alert	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 2		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 1		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate

Zone N – 2		Alert	Alert	Alert	Alert	Alert	Evacuate
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
							--> Time

New Zealand Cascade Disabled, Alert Disabled. Alarm in Zone N							
Zone N + 5 (Top Zone)			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 4			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 3			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 2			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 1			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N		Evacuate	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 2			Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
							--> Time

New Zealand Cascade Disabled, Alert Enabled, Alarm in zone N							
Zone N + 5 (Top Zone)		Alert	Alert	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 4		Alert	Alert	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 3		Alert	Alert	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 2		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 1		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 2		Alert	Alert	Evacuate	Evacuate	Evacuate	Evacuate
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
							--> Time

21.3. New Zealand Type 5/7 Apartment Zone Configuration

A I2000 may be used in a NZ Building Code Type 5 or Type 7 installation. Typically, this has multiple apartments in each evacuation zone, with each apartment being a separate detection zone. The loudspeakers in each apartment can be selectively connected by the fire panel to the I2000 via an AZM800 Apartment Zone Module, to provide local smoke alarm warnings or general evacuation warnings as required.

As well as the cascade sequences described above, such I2000 systems will require additional configuration scripting to provide these functions:

For each evacuation zone in the I2000, there will typically be two inputs. These could be FIP/BGA inputs or zones in a high level link:

1. Alerting input:

   a. When this input is active, the I2000 will produce Alerting tone only in the corresponding evacuation zone, and any normal Alerting speech message will be suppressed.

b. The activation will not cascade to other zones.

c. The zone will reset when the input resets to normal, i.e., be non-latching.

2. Evacuation input:

a. When this input is active, the I2000 will produce the pre-programmed cascade, as described above.

b. The zone will stay latched if the input resets to normal (see also NZS 4512:2003 Brigade Control Switches below for unlatching mechanism).

21.4. NZS 4512:2003 Brigade Control Switches

New Zealand I2000 systems typically have extra inputs programmed for:

- (Trial) Alert keyswitch
- (Trial) Evacuate keyswitch
- (Brigade) Silence Alarms keyswitch
- I2000 cabinet door interlock switch

The keyswitch functions are specified by NZS 4512:2003 in sections 205, 207 and 218, and would usually be wired to Bulgin key switches accessible by Fire Service personnel without opening the EWIS cabinet door.

Keyswitch Operation

Trial Alert sets all EWIS zones to Alert, regardless of the Auto / Manual state of the system. When Trial Alert returns to normal, all zones will return to their state before Trial Alert was asserted.

Trial Evacuate sets all EWIS zones to Evacuate, regardless of the Auto / Manual state of the system. Cascading is suspended. When Trial Evacuate returns to normal, all zones will return to their state before Trial Evacuate was asserted, and any cascade in progress will resume.

Silence Alarms operates as follows:

- When Silence Alarms is asserted, Alert and Evacuate are turned off for all zones if the panel is in Auto.
- When the panel is in Manual, Silence Alarms has no immediate effect, but the next point still applies.
- For 15 seconds after Silence Alarms returns to normal, FIP inputs are made non-latching and any FIP inputs that have returned to normal, or return to normal during this 15 second interval, will be reset.
- 15 Seconds after Silence Alarms returns to normal, cascading will restart from the beginning based on any currently-active FIP inputs.

This allows for the I2000 to be reset completely during the 15 second interval after removal of Silence Alarms, provided that the fire panel removes all FIP input signals to the I2000 during that 15 second window. Any remaining FIP alarms will be treated as new alarms at the end of the 15 second interval and a new cascade will commence.

Operation of Trial Alert or Trial Evacuate switches overrides Silence Alarms.

Alternative - FIP Controls Alert and Evacuate Directly

Another (less common) configuration is to have two separate (non-latching) FIP inputs per EWIS zone, one to select Alert and one to select Evacuate, with the FIP controlling all cascading functions. Trial Evacuate, Trial Alert, and Silence Alarms inputs are then simply active for as long as they are asserted, with Trial Evacuate overriding.

Older Systems

NZ systems prior to NZS 4512:2003 had simple Trial Evacuate / Silence Alarms functions that were active for as long as the switches were operated, and restored the remembered state prior when the switches were restored, again with Trial Evacuate overriding Silence Alarms.

Relay Outputs

The two relays on the FIB8910 module should be used to signal I2000 status back to the FIP for indication and remote signalling. The relays are configured to be energised in the Normal state, and de-energised in the active state. There are two common configurations:

- Common I2000
    - RL1 signals any fault in the I2000.
    - RL2 signals that the I2000 door is closed and the I2000 is not in Auto mode.
- Type 5 or Type 7 Apartment I2000 Systems using AZM800 Apartment Zone Modules
    - RL1 signals any fault in the I2000, or that the I2000 door is closed and the I2000 is not in Auto mode.
    - RL2 signals that the I2000 is not in Auto mode, or that Trial Evacuation or Trial Alert keyswitches are operated. This signal directs the FIP to activate all the switched loudspeakers connected to AZM800 modules.

These relay outputs would be connected to the FIP as normally-closed circuits, going open circuit when active. Note that the relay contact labelling on the FIB8910 reflects the relay state when it is normally energised, which is different to most other relay labelling.

Keyswitch Connection

The keyswitches and door interlock switch should be wired to FIP/BGA inputs on the FIB8910 or FIPE9004 modules in the I2000. These switches should be wired to the last available positions on the FIP/BGA inputs, leaving the first positions for use as ordinary FIP inputs.

NOTE: In general, these switches will need to be 2-pole types since both the I2000 and the FIP will need to know that a switch is operated.

The I2000 inputs can be wired to unused switch poles on the brigade keyswitches in the FIP as shown below.

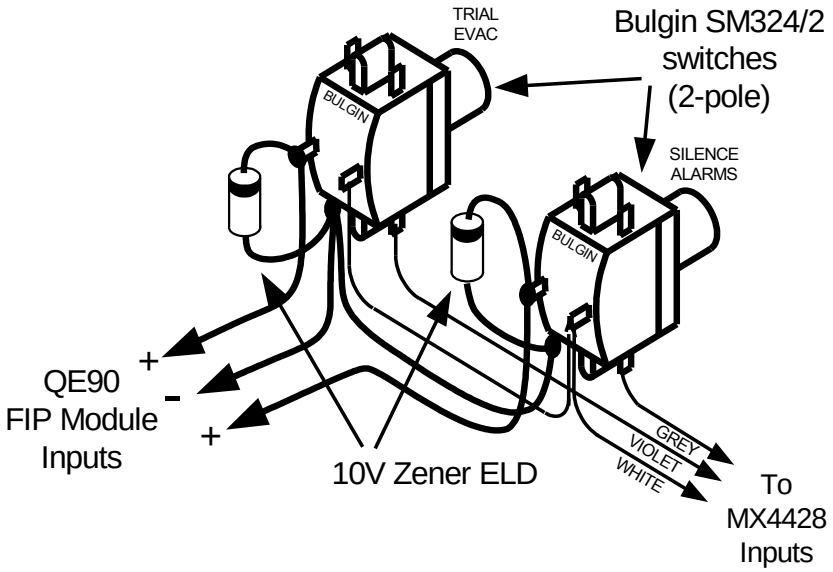


Figure 21-1: Connecting I-2000 to FIP Brigade Keyswitch Assembly

Alternatively, or as well, a dedicated set of brigade keyswitches could be located on the I2000 cabinet, using the ME0433 keyswitch assembly.

21.5. ECP on-site settings

Use one of the following methods to adjust the on-site settings for a system with no ECM. These settings should be made at the MECP (and not at any SECPs). (For a system with an ECM, **every** panel will need the settings made as described in ECM on-site settings.)

a. ECP on-site settings using keyboard

On site settings can be adjusted at the MECP when the keyswitch is in Isolate and no zones have been selected for Alert, Evacuate or PA Speech.

Note the complete Evacuation System is disabled during on-site setup mode and only the keys that are valid at each position in the setup sequence will work at that position.

The following steps work through each of the programmable items. This process is also shown as a flowchart below.

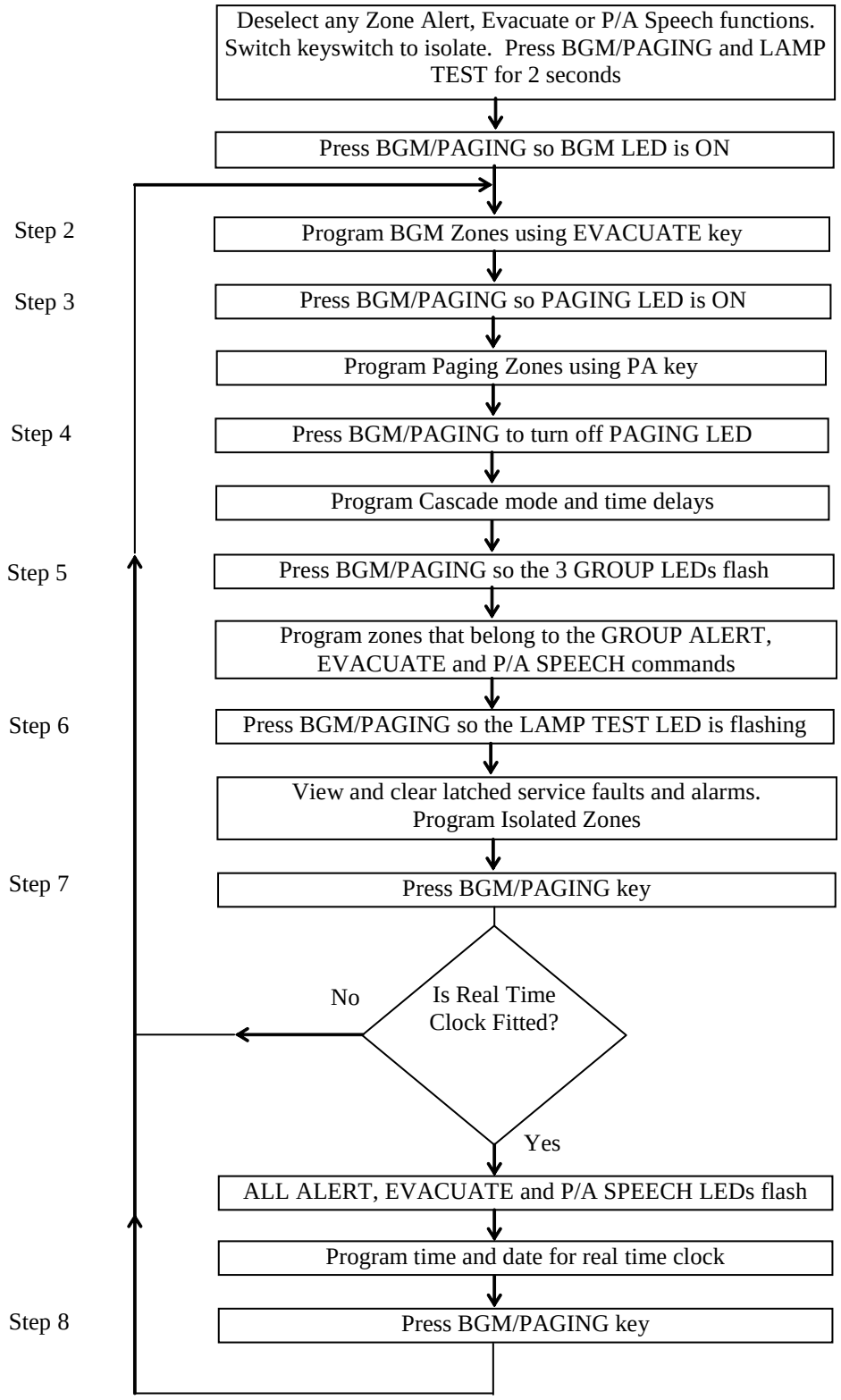
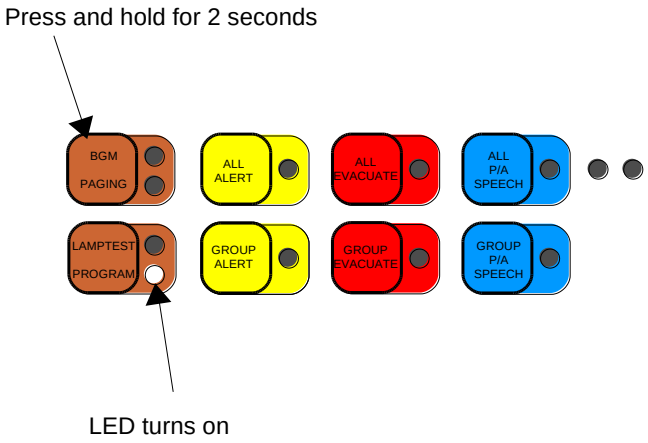


Figure 21-2: Front Panel On-Site Setup Flowchart

STEP 1: On-Site Setup Mode Entry.

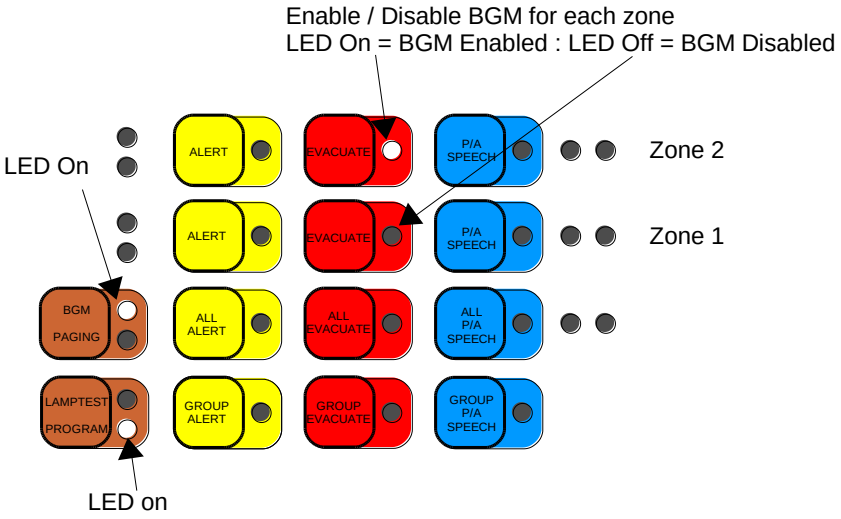
At the MECP de-select any zones in Alert, Evacuate, or PA Speech. Turn the keyswitch to the ISOLATE position. Press and hold the BGM/PAGING key for 2 seconds until the PROGRAM LED turns on. (Note during this 2 second period, faults will be shown on Zone LEDs as described in ECP LEDs.) (Please note, on very old versions of ECP Software, it is necessary to hold the LAMPTEST and BGM/PAGING keys together for 2 seconds.)



STEP 2: Select Zones for Background Music (BGM).

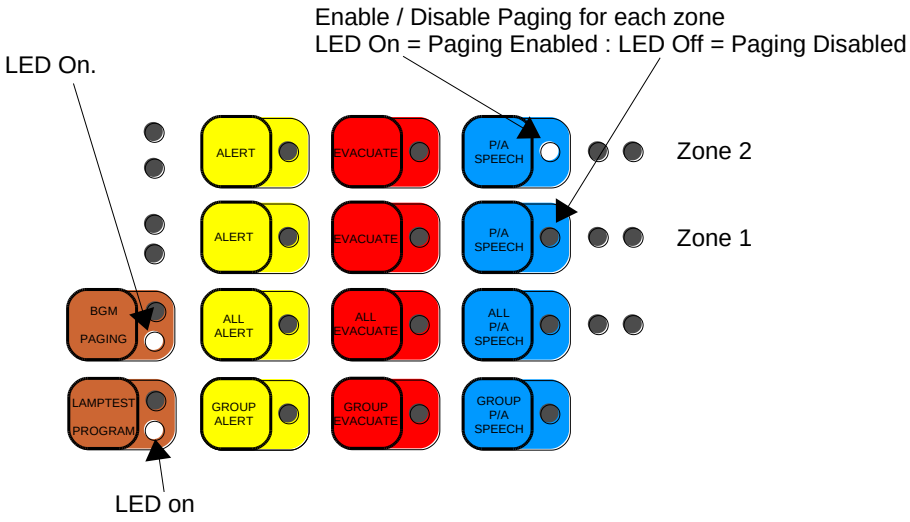
Press the BGM/PAGING key so that the BGM LED is on to indicate that BGM zones can be set.

Select the zones to have BGM present by pressing the EVACUATE key for that zone so that the EVACUATE LED is on. Similarly, pressing the EVACUATE key so the LED is off will disable BGM for that zone.



STEP 3:

Press the BMG/PAGING key again to turn on the PAGING LED. In systems without a Paging Console it is possible to select at this point zones which will receive the non-emergency paging (PABX) audio input if no emergency signal is present. This could be used to enable an alternative channel of music for some zones. Note - zones selected for both PABX and MUSIC will receive only PABX. Note - usually when the PABX input is used, the Paging Console determines which zones are selected and the zones selected here will have no effect.

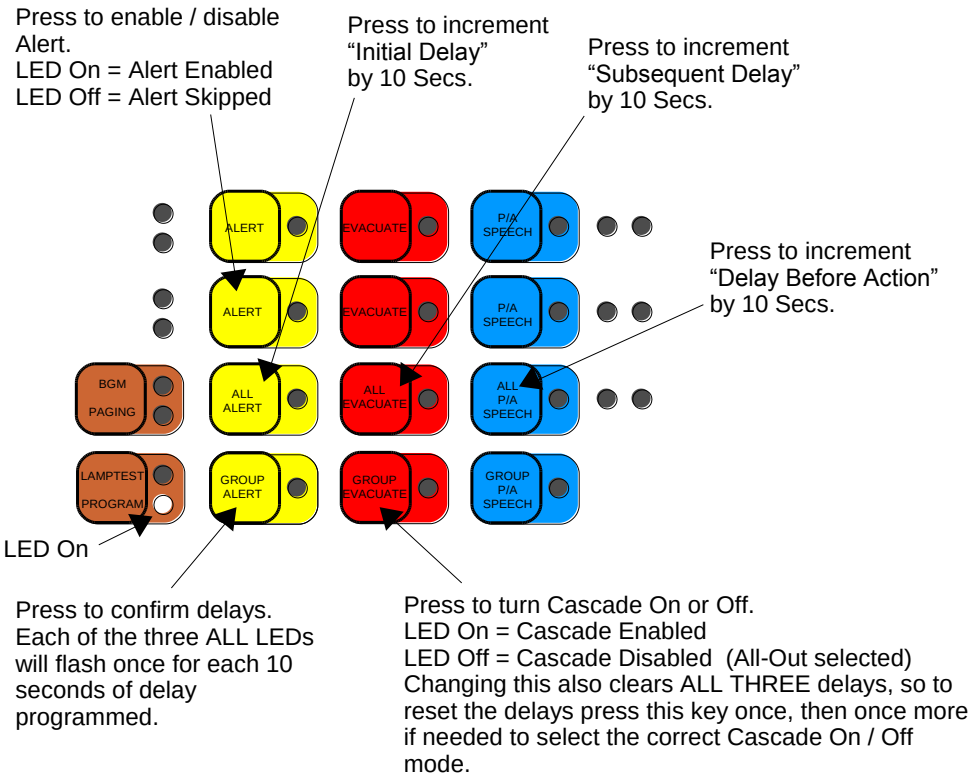


STEP 4: Select Cascade/No Cascade, Alert / No Alert, and Cascade Times.

See Cascade Sequences for the meanings of the 3 cascade delays, enabling / disabling the cascade, and enabling / disabling the alert phase.

Press the BGM/PAGING key again to just turn off the PAGING LED. The ALL ALERT, ALL EVACUATE, ALL PA SPEECH, GROUP EVACUATE, and ZONE 1 ALERT LEDs may or may not be on, depending on the current setup.

In the Select Cascade setup mode the following keys and actions are available. Note Initial and Subsequent Delays may not be set to more than 10 minutes for compliance with AS2220, and may not be set to more than 42.5 minutes in any case. "Delay Before Action" should be set to zero unless the Evacuation Plan specifies otherwise.

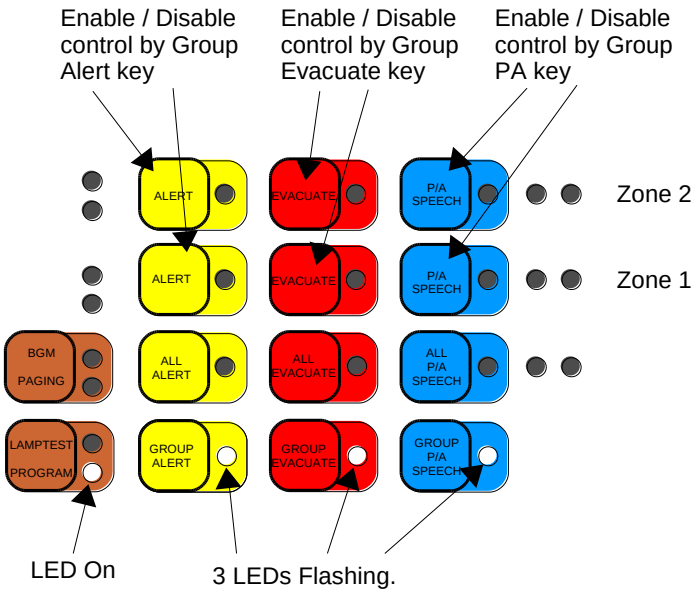


STEP 5: Select Zones belonging to Group Commands.

Press the BGM/PAGING key again so the 3 Group LEDs flash.

At this point the current programming of zones to the Group ALERT, EVACUATE and PA SPEECH commands is shown.

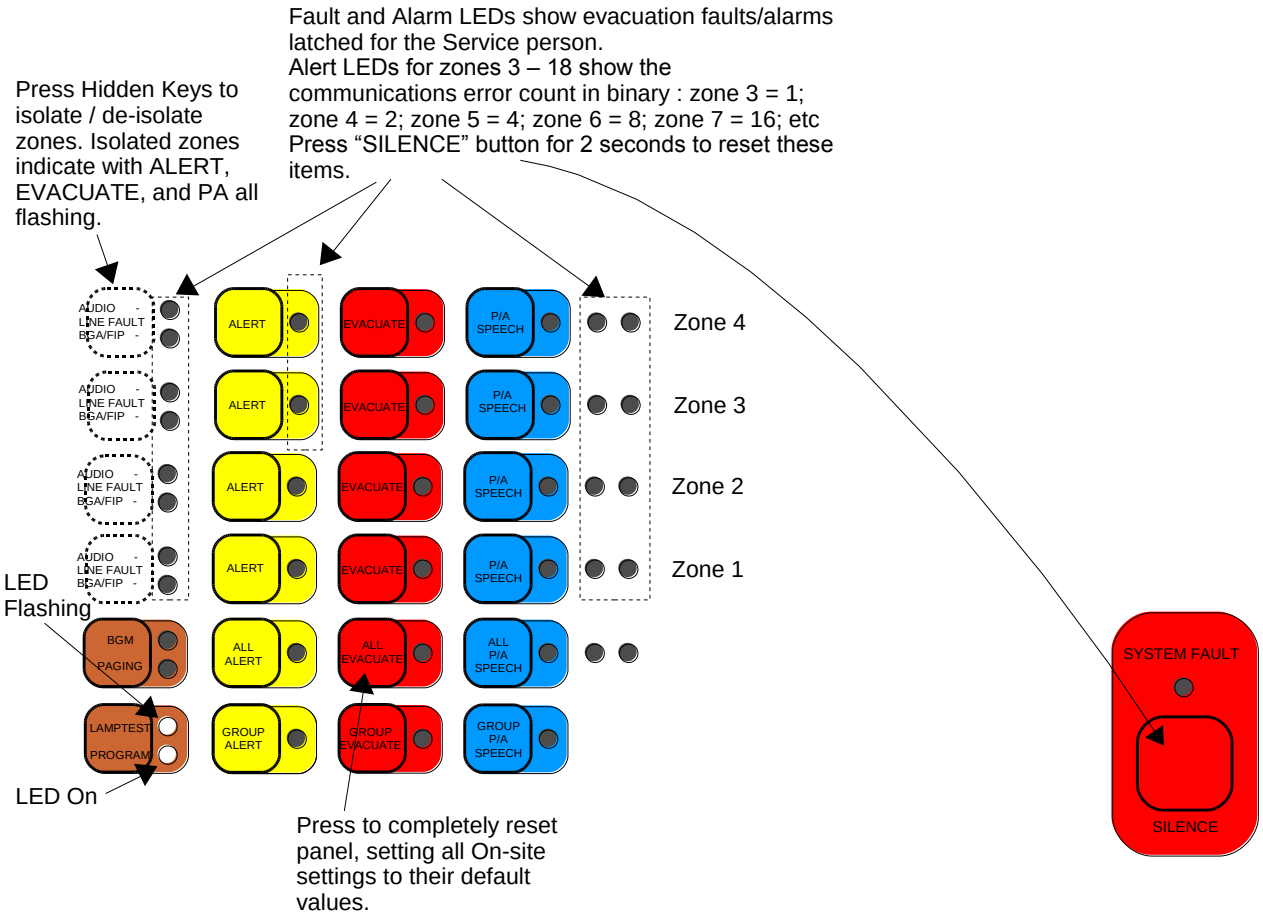
For each of Alert, Evacuate, and PA
set Zone LEDs ON to enable control by the corresponding group key,
OFF to disable control by the corresponding group key.



STEP 6: Select Service Fault Table Display.

Press the BGM/PAGING key again so that the LAMP TEST LED flashes.

At this point zones that have been into fault or alarm and/or modules that have been in fault will be shown with the appropriate fault or alarm LED(s) illuminated. This gives the engineer/service person a separate latched fault/alarm memory in addition to the operator one. WIP faults are not stored in this memory.



The "communications error count" mentioned above should be investigated if it is higher than say 10 per hour.

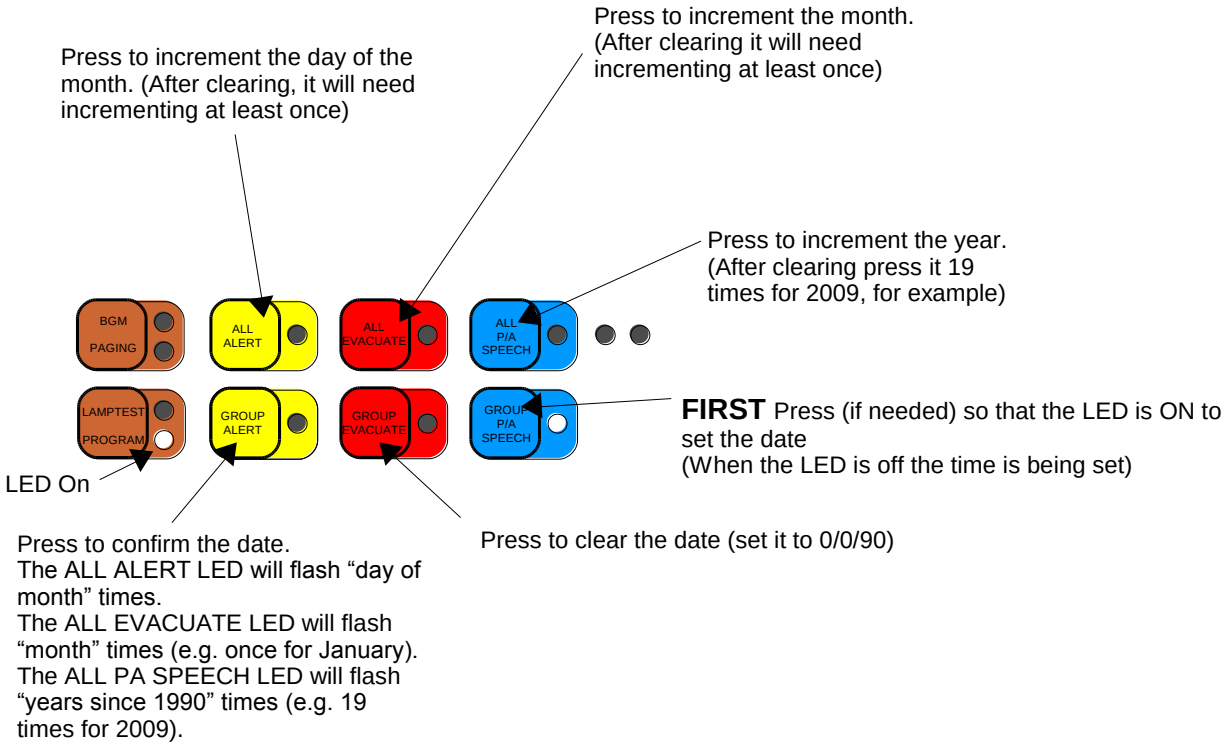
Holding the SILENCE key (on the bottom right of the keyboard) for 2 seconds while this information is being displayed, will clear it.

STEP 7: Set the time and date for the real time clock.

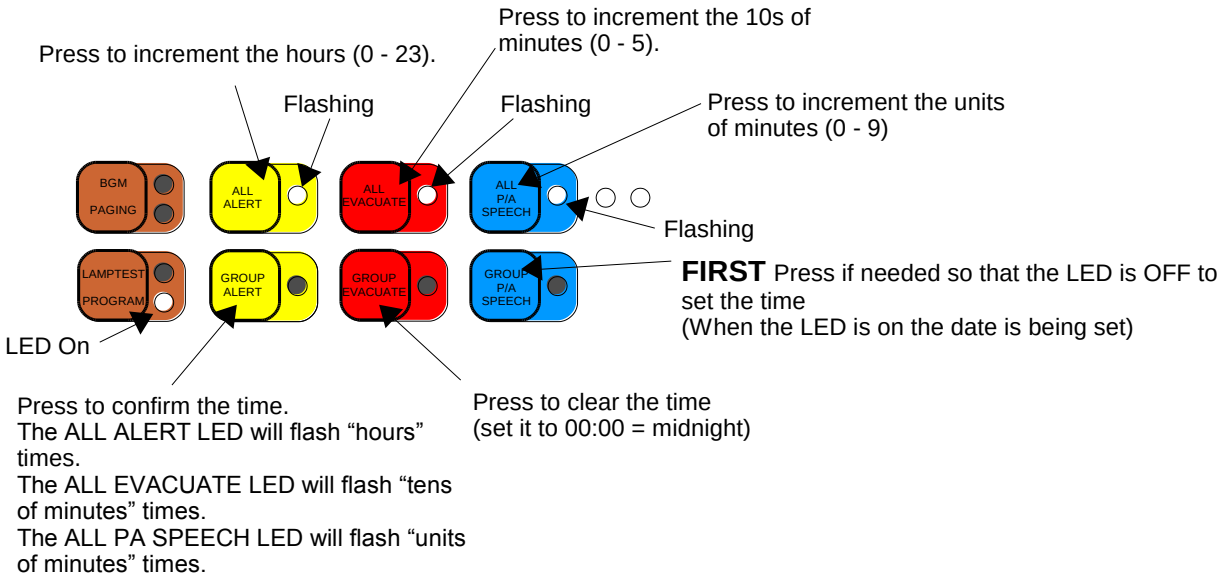
The ECP module can contain an optional battery-backed real time clock (RTC) that is used to generate the date and time for the event printout on the optional logging printer. Newer versions of ECP software will maintain the time and date even without the RTC, but it will be lost on power-down.

Press the BGM/PAGING key again so that the ALL ALERT, ALL EVACUATE and ALL PA SPEECH LEDs flash in unison. If this cannot be obtained then the RTC is not fitted and the ECP software version does not support the non-volatile time and date.

Setting the date



Setting the time



STEP 8: Cycle through steps 2 - 7 repeatedly

The BGM/PAGING key can be pressed repeatedly to cycle through steps 2 to 7 and to verify all the setup information.

STEP 9: Save Setup Information & Exit.

At any point during the sequence it is possible to exit on-site setup mode and save all changes by turning the keyswitch out of ISOLATE.

b. ECP on-site settings using Terminal

Setup of Computer and Connection to System

NOTE: *- on-site setup via the serial port is not possible for systems with an RZDU high level link*

The computer needs to be running a Terminal Emulator program, such as HYPERTERMINAL, WINCOMMS, or ACCUTERM and setup as follows:-

9600 baud rate (unless the I2000 is setup otherwise)

8 data bits

1 stop bit

No Parity

Xon/Xoff Flow Control

Connect the serial port of the computer to the connection point listed below, depending on the Signals Interface Board fitted to the system.

Signals Interface PCB	Connection Point
SE9004 Issue C or later	J15
SPIF9709	J4
SPIF9506	J4
MEXP9103	J23
SE9004 Issue A or B	No serial port connection is provided.

Accessing On-site Setup Mode

NOTE: *- If an ECP is connected to a FIP via a RZDU Interface, the serial port cannot be used for on-site setup. The ECP must be setup using the keyboard. See ECP on-site settings using keyboard.*

Normally the I2000 serial port is operating in printer mode logging events as they occur. To enter on-site setup mode press the Enter key to obtain the "Enter Password" prompt.

Enter the password (QUINTRIX by default) followed by the Enter key. Note the keys are echoed as *, and if the password is correct a "I2000 programming mode:" message will be shown.

If nothing happens check that the ECP serial port is fitted and enabled. Refer to ECP DIP Switch Settings.

Type HE <Enter> to give a summary of the available commands. They are as follows:

```
CA edit cascade variables

DA read and set date

HE command summary

PW change user password

SP change comms baud rate
```

```
TI read and set time

VE current software version

Q  quit and exit programming
```

Edit Cascade Variables

The Cascade variables that can be edited are described in Cascade Sequences.

Type CA <Enter> and the screen will show:

```
Delay before action        0 seconds

New time in seconds -->
```

Enter the new time followed by <Enter>, or just <Enter> to leave the current value unchanged.

Next the Initial Timeout and Subsequent Timeout are shown and can be altered in the same manner.

```
Initial time out of        0 seconds

New time in seconds -->
```

Then the subsequent timeout is shown.

```
Subsequent time out of     180 seconds

New time in seconds -->
```

Next, whether the cascade has an Alert phase is shown. Press Y to change the setting to the opposite, or just <Enter> to leave it unchanged.

```
Cascade has No Alert

Change cascade has alert or not y/n -->
```

Finally, whether cascade is enabled (on) or disabled (off) is shown. Press Y to change the value to the opposite, or just <Enter> to leave it unchanged.

```
Cascade off

Change cascade on or off y/n -->
```

Read and Set Date

The date can be read and optionally changed by entering DA <Enter> at the main prompt.

The current date is displayed and a prompt given for the new date e.g.

```
Current date is Fri 15-09-00.

Enter new date (dd-mm-yy):
```

The new date can now be entered, e.g. 17-08-00, then press <Enter>, or just press <Enter> to skip changing the date. If a new date is entered then the new date entered is shown as the current date (including the day of the week) and so can be checked. Enter the correct date if it is still wrong, or just <Enter> to exit the command.

Command Summary

The HE <Enter> command will show the available commands – refer to Accessing On-site Setup Mode.

Change User Password

The PW <Enter> command allows the serial port on-site setup password to be changed. DO NOT enter this command unless you intend to change the password. If you do enter it un-intentionally, re-enter the existing password to get out.

The PW command will display a prompt:

```
Enter new user password (max 8 characters) -->
```

Type in the new password followed by <Enter>. Do not use = as the first character of a password, because = is used as the first character of serial port commands, refer to ECP Off normals display.

With ECP software versions before 4.32 use only UPPER CASE characters for passwords, otherwise it can be impossible to enter a matching password.

Change Comms Baud Rate

This command allows the Baud rate of the on-site setup / printer serial port to be changed (e.g. to suit a particular printer). The newly set value takes effect immediately, so the PC will need to have its settings changed to the new baud rate in order to re-establish communications.

Type SP <Enter> and the screen will show:

```
Enter new baud rate -->
```

Type in the required baud rate followed by <Enter>. The values allowed are 300, 600, 1200, 2400, 4800 & 9600. If no change is required just press <Enter>.

Read and Set Time

This command allows the current time to be displayed and changed if necessary.

Type TI <RETURN>

The screen will show the current time and a prompt to enter the new time in 24 hour format.

```
Current time is (e.g.) 12:47:30

Enter new time (24 hour format):
```

The new time can now be entered, e.g. 15:30:00, then press <Enter>, or just <Enter> to exit the command. The screen will display the new time if one is entered.

Current Software Version

Type VE <Enter> to display the software version on the screen eg:

QUINTRIX version V6.01

Quit and Exit On-site Setup Mode

Typing Q <Enter> will exit from on-site setup mode and return to printer event logging mode.

On site settings can be adjusted at the MECP when the keyswitch is in Isolate and no zones have been selected for Alert, Evacuate or PA

21.6. Master Phone Redirection

The I2000 can be setup so that a field WIP will ring whenever the master WIP rings. Picking up either handset will stop both handsets ringing. Picking up the remote WIP will automatically answer the call and enable voice communication to occur between the calling WIP and the redirected WIP.

Picking up the master WIP still requires the calling WIP button to be pressed to enable voice communication.

This feature enables WIP calls to be answered at a remote location when the MECP is not manned.

This WIP redirection can be setup on the I2000 front panel at any time. Simply press the WIP-side PROGRAM key (the LED turns on) and then the WIP key that calls should be redirected to (the PROGRAM LED turns off). If redirection is to be cancelled simply press the WIP-side PROGRAM key twice (LED turns on then off).

On an ECM networked system, with firmware versions less than 5.57, the master phone can be redirected only to a WIP terminated at the ECP where the redirection is done.

21.7. Default Values

On the very initial factory power up of an ECP system the following default values are set. For an ECP controlled systems, These default parameters can also be restored in ECP on-site settings using keyboard while in the Service Fault Table Display.

Cascade Disabled.

No Alert Phase.

Zero delay before action.

3 Minute subsequent time out.

Zero initial time out.

Group Commands include all zones.

No zones are selected for BGM.

No zones isolated.

However, factory or pre-commission testing may result in some values being changed. Therefore it is necessary to ensure all values are set correctly during commissioning of each EWIS system.

Section 22 System Maintenance

22.1. Monthly Testing

The **I2000** EWIS Panel is designed for high reliability and minimum maintenance. However, in order to comply with the requirements of AS1851.10, the owner/occupier (or nominated representative) must carry out periodic inspections and maintenance checks.

The recommended procedure for monthly testing is :

STEP 1: Inform all building occupants that testing is to take place. Inform the local fire control authority, if required, that testing of the EWIS is to take place and that simulated fire alarm calls may be generated from the Fire Indicator Panel.

STEP 2: Visually inspect the cabinet and panel to ensure it is clean, operable and that system components are free from damage. Inspect the dust seal and ensure that it is undamaged.

STEP 3: Place the panel in the MANUAL operating mode and perform a lamp test for both the Evacuation and Fire Phone Systems. Check that all LEDs operate.

STEP 4: Check the operation of each zone by selecting each of ALERT, EVACUATE and PA SPEECH tones and verifying that the speakers and warning lights are operational.

STEP 5: Check the operation of the Warden Intercom function for each installed WIP by calling each WIP and requesting that they call the Master back.

STEP 6: Where the system is connected to a Fire Indicator Panel, place the EWIS panel in AUTO mode and simulate a fire alarm at the associated FIP. Check that the alarm is indicated at the MECP as well as any connected SECP. Check that the ALERT tone is automatically distributed to the appropriate zones with the correct time delay.

When the time delay has expired, the tone should automatically change to the EVACUATE tone interspersed with the digitised voice message.

If the EWIS is fitted with a cascade sequence, check that the automatic evacuation sequence is initiated from the alarm zone and that it spreads throughout the building.

Return the keyswitch to MANUAL and turn off all selected tones and remove the simulated fire alarm.

STEP 7: Return all panel switches and controls to their normal operating position.

STEP 8: Inform the building occupants and the local fire control authority that testing is concluded.

STEP 9: Record the results of these tests in the logbook and ensure that the owner signs the logbook.

22.2. 6 Monthly Test

In addition to the monthly testing described above, perform the following additional tests at six monthly intervals.

STEP 1: Visually check the location, installation and siting of all equipment against the system installation record contained in the operator handbook or installation drawings. Check for any building or occupancy alterations that may alter the effectiveness of the audible or visual warnings. Report and record any discrepancies.

STEP 2: Check that the battery float voltage and currents are within the specified tolerance.

STEP 3: Disconnect the AC mains and check that the standby battery voltage under full load conditions is not less than 95% of the nominal battery voltage (not charge voltage).

STEP 4: Measure and record the audible sound level in each zone. Check that it is in accordance with previous measurements.

STEP 5: If visual warning lights are installed, check that they operate and the flash rate is between 60 and 120 flashes per minute.

STEP 6: Record the results of these tests in the log book and ensure that the owner signs the test report.

STEP 7: Inform the building occupants and the local fire authority that testing is concluded.

22.3. Annual Testing

In addition to the six monthly test, the following additional tests are to be performed yearly:

STEP 1: Remove the battery from the system and replace it with one of the same or greater capacity.

STEP 2: Discharge the removed battery at the current as specified in AS1851.10.

STEP 3: Check that the time taken to reach the battery flat level is greater than 90 minutes.

STEP 4: Recharge the battery to a capacity greater than 95% of its initial charge and reconnect.

STEP 5: Record the results of these tests in the log book and ensure that the owner signs the test report.

STEP 6: Inform the building occupants and the local fire authority that testing has concluded.

APPENDIX

22.4. Contract & System Details

For operator reference please complete the following charts on the location, installation and configuration of the *I2000* Panel.

CONTRACT DETAILS

PANEL SUPPLIED BY	
INSTALLATION LOCATION	
CONTRACT/JOB NUMBER	
SERIAL NUMBER	
SYSTEM DRAWING NUMBER (AS INSTALLED)	ISSUE
DATE PANEL INSTALLED	
DATE PANEL COMMISSIONED	
MAINTENANCE COMPANY	
TELEPHONE	B.H. A.H.
SERVICE CONTRACT	
SITE CONTACT OR REGISTERED USER (INCLUDE TITLE)	
COMPANY/ADDRESS	
TELEPHONE	B.H.

PANEL CONFIGURATION

CASCADE ENABLED Y / N	SPECIAL CASCADE Y / N
DELAY BEFORE ACTION	
INITIAL TIME OUT	
SUBSEQUENT TIME OUT	

22.5. Zone Configuration

EVACUATION ZONE	CORRESPONDING FIRE ZONE	RATING OF AMPLIFIER	BGA Y/N	# OF STROBES	BGM ENABLED Y/N	GROUP COMMAND			# OF WIPS
						A	E	PA	

Notes