Instructions for the Sounder Controller and the Isolator Modules

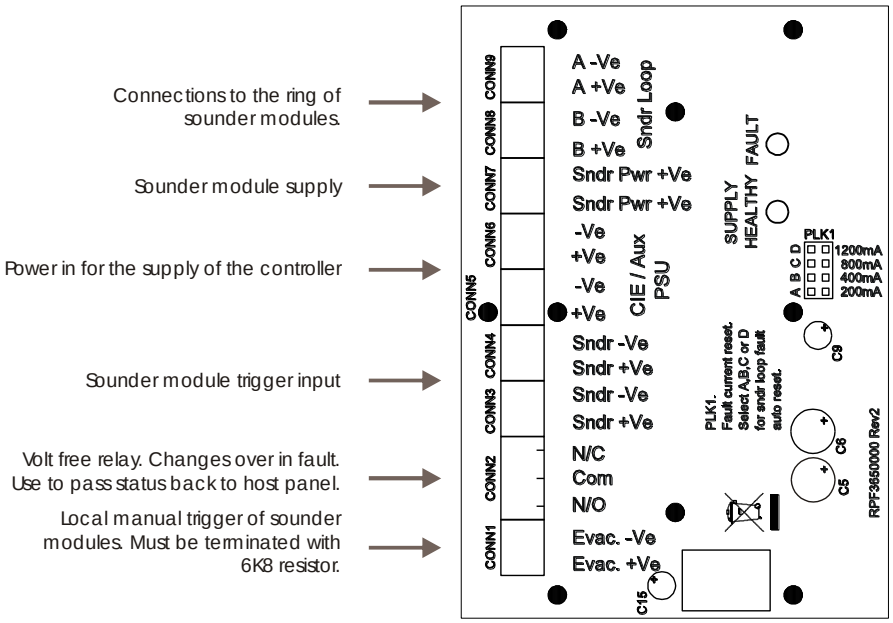
Please take the time to read these instructions and familiarise yourself with the operation of this system.

Conventional Sounder Controller with Fault Isolating Modules

Product Summary

The Sounder Controller and the associated Isolator Modules are designed to interface to the conventional sounder circuit on a fire panel (also known as Control Indicating Equipment- CIE).
The Sounder Controller transforms the CIE's sounder circuit monitoring and triggering voltages into its own special voltages that allow the monitoring and triggering of all the field Isolator Module devices. Each Isolator Module would have a conventional sounder (or sounder beacon) attached to it.
The unique nature of the Sounder Loop Controller allows its sounder circuit to be wired in a loop starting and terminating at the Sounder Loop Controller.
As the sounder circuit is now a true loop, any single short or open on the sounder loop will have no effect on the functionality of the actual sounders.
This is because the Sounder Loop Controller when in Alarm drives from both directions. Also, each Isolator Module can effectively isolate itself from its neighbouring sounder in case there is short on the intervening wiring.
This loop is fault monitored and any fault on this circuit is flagged back to the host CIE.
By having a loop arrangement for the sounder circuit which is fault tolerant, low cost cabling can be used eliminating the need for expensive and difficult to install fire resistant cabling.

Understanding the connections



The controller has twenty screw terminals, but some of these are duplicated terminals for ease of wiring through to other units or devices, thus avoiding the need for multiple cables in one terminal.

Sndr Loop. The sounders are connected in a loop from A to B. Do not spur off the loop.

Sndr Power. The loop sounders when triggered take their power from the current supplied to these terminals. This should be connected to an Aux PSU or the sounder circuit. Ensure that the current source can provide enough current for the total amount of loop sounders.

CIE Aux/PSU. These terminals are used for supplying the power that is used to run the controllers electronics. Current requirement for this is no greater than 50mA.

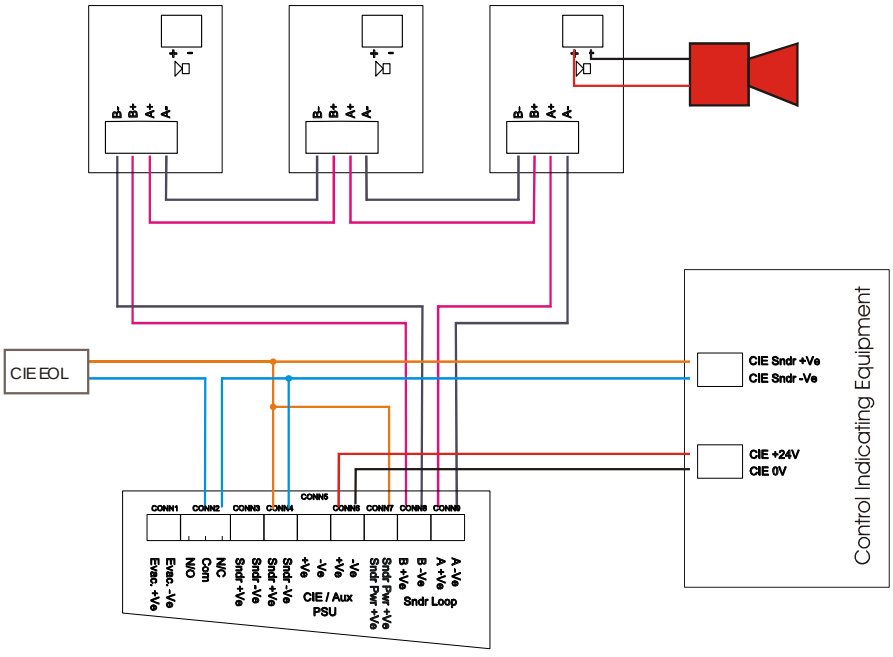
Sndr Connections. These connections are for the triggering of the loop sounders into an active state. A positive signal of 15v or greater is required to trigger the loop sounders.

NC NO relay connections. These connections are from the fault relay. The relay is used to open circuit the EOL unit of the CIE to flag a fault.

Evacuate Trigger. This is for the manual activation of the sounders. This circuit is fault monitored for open and short circuits. A manual trigger is achieved by 470R 1/2W resistor being introduced across this detection circuit. The EOL 6k8 resistor must be fitted, other wise a fault is generated.

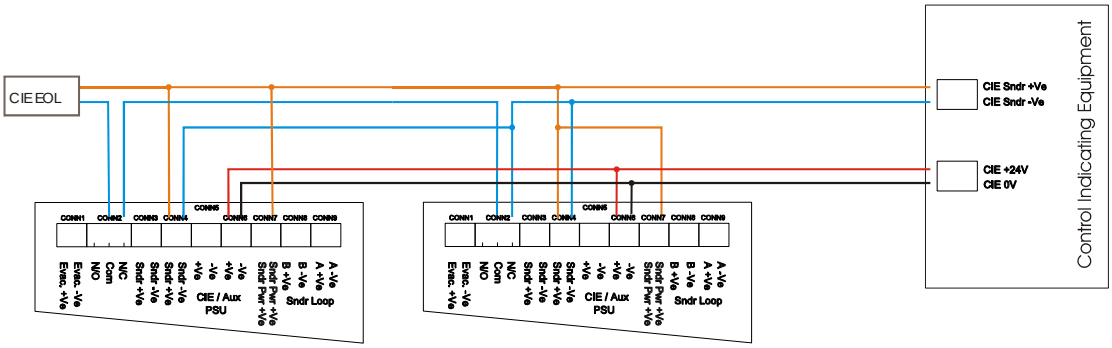
Simplified Wiring Configurations.

1. Typical Configuration



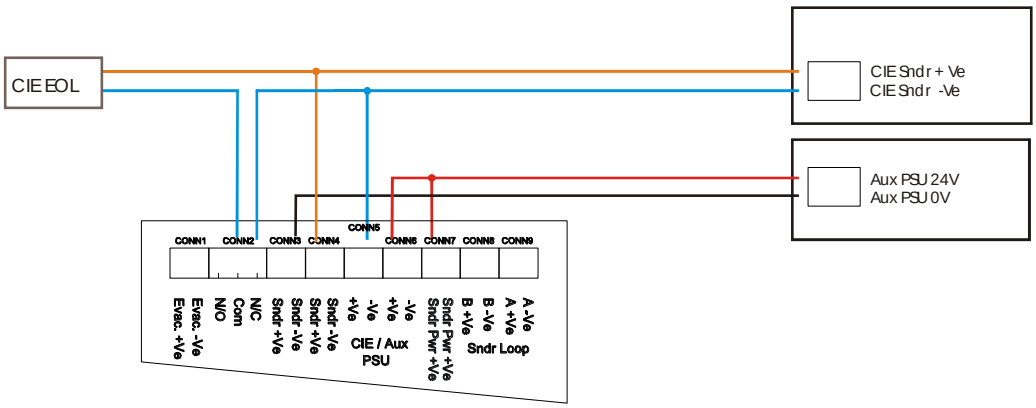
The above example shows how a basic system would be wired to the CIE. The sndr loop fault relay is wired so that the SNDR cct EOL device is disconnected if a wiring fault occurs on the loop. This does not affect the functionality of the loop controller.
The CIE sounder circuit provides the current for the activated loop sounders.
The CIE Aux 24V provides power only to run the controllers switching electronics, no current is used for activated sounders.

2. An example of more than one control units being driven from the same sounder circuit.



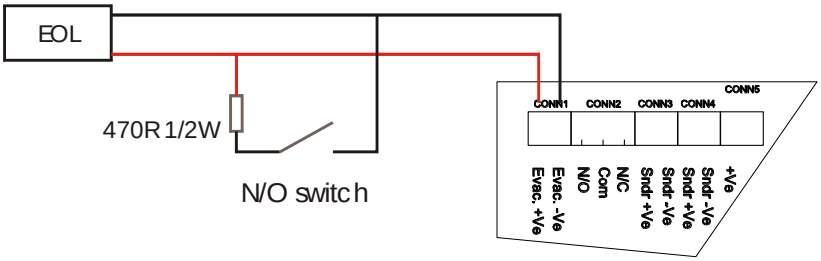
Note the wiring arrangement of the CIE sounder circuit wiring. The wiring is such that if a controller goes into fault, then the triggering of the controllers is still possible (these wires to the Sndr terminals MUST not be interrupted by the relay opening).

3. This example shows an auxiliary power supply, that is used to power the sounders. The CIE Sndr cct now only provides a small amount of current for triggering the loop sounders.
Note that a PSU with a fault relay is recommended so that the EOL device is also switched in and out of circuit by a fault on the Aux PSU. This is so that if the Aux PSU has some form of fault (i.e. mains / battery failure), this will then be indicated to the host CIE. Again take the same precautions as the above example in the routing of the sounder wiring.



An aux PSU would typically be used when the current required for the sounder loop exceeds that of the host CIE SNDR circuit.
This example will work for the CIE's own 24V output providing the rated output current to supply the sounders and controller is not exceeded.

4. Manual evacuate trigger.
This shows how to use the manual evacuate. A 470R ½ W resistor across the detection circuit will cause the loop sounders to trigger. A short circuit or open circuit will put a fault on the controller. The EOL must be a 6k8 ¼ resistor. Note that for manual evacuate operation, then power to the loop modules must be supplied from a permanently active 24v source, not a switched source such as the sounder circuit that only becomes active only when it is triggered by the CIE.



PLK1.
This sets the automatic over current reset for the sounder loop current. Choose the setting that is above the maximum current that will be drawn from the sounders when they are activated. If this current level is exceeded, the unit will go through a reset procedure.
This automatic cut out is designed to protect the fusing element of the aux psu or CIE sounder fuse in the event of a short on the sounder loop when it is activated. If no link is selected, then the over current reset function will not work and will pass high currents. This should not be done as it could cause damage to the sounder controller system or the host CIE / Aux PSU.
An automatic reset would likely to take place if a loop wiring short occurred when in an active state. If this was to happen then, then the reset procedure would isolate the short.

System Planning & Design Considerations:

Before commencing any installation, consideration must be given to system planning. This is important for selecting the impedance of the cable and selecting the correct power supply.

Calculate the current requirement for the total number of sounders on the loop and select the over current auto reset setting that is above that value. If the loop current exceeds this value, then the sounder loop will go through a continuous automatic reset procedure. In practice, unless sure of exact operating parameters of the sounders, allow a margin of tolerance between the calculated running current and reset setting.

At start up, some sounders can take currents higher than stated as their normal running current. The sounder controller will tolerate a degree of instantaneous overload current, but highly capacitive sounders may still trip the over current reset. If this happens, decrease the amount of sounders or use the next greater auto reset setting.

Ensure that the CIE or Aux PSU can supply the current demand and exceed that of the over current setting otherwise if this is not done; a loop fault may cause the host supply to trigger its current over load protection device. This could be some form of single shot fuse, which would then cause all the sounders to stop.

Cable impedance should be carefully calculated to ensure that unintended operation does not occur due to volt drop down the cable. As the system is a loop, current in an active state is normally supplied from both directions, so half way round the loop would normally see the worst volt drop. In a worst case open circuit fault scenario, the wiring loop could develop a fault close to or at the controller. This would give the longest possible cable run to the furthest (in electrical terms) isolator module. Calculate cable impedances as though for a single linear line. When the controller is activated, the volt drop at the furthest isolator module must not drop below its activation voltage otherwise it will not turn on its output to the sounder.

If a partial short was to occur when in an active state, but without drawing enough current for an over current auto reset to take place, this would cause extra current to flow into the loop. This would mean extra volt drop in the loop. Again factor this in for wiring loop impedance.
If this could be a concern, a way to minimise this effect without having to specify lower impedance cable is to consider a system design that has a 'no fault' active loop current that is closer to the over current reset setting selected, rather than the next setting down. A partial short would then trip the auto reset (causing the isolator modules to isolate the short on the intervening wiring) before the volt drop could cause problems.
In both the above cases, it is advisable to design for cable impedances so that the minimum voltage at an isolator when in alarm does not go below at least 15volts. This will give a margin of error so as not to allow the isolator to go below the minimum activation voltage in operation.

Installation of the Units

The controller unit should be fitted to a back box (minimum depth 25mm or 1") that is securely fixed to a wall. Typically for fitting the sounder controller onto the building surface, use No8 x 1.5" (4 x 40mm) screws or for a plaster board type wall, use a hollow wall fixing, typically 4 to 5mm dia. and of appropriate length.
The controller (if in pcb card only form) should be mounted internally of an EN54 approved CIE or Aux PSU. If this is done, use five self adhesive standoffs to fit a hole of 4mm that will securely hold the pcb in place.
The isolator module should be secured inside the mounting base of the sounder by self adhesive pads or a No6 x 10 self tapping screws via the half moon cut outs on the module base. The modules should be fitted into EN54-3 approved sounders.

Maintenance Information

This equipment forms part of the fire alarm system, and as such should be regularly tested as part of the periodic testing and maintenance of the fire alarm system as specified by the fire alarm panel manufacturer or relevant code of practice.
Once the sounder controller and isolator have been set up no further adjustments are necessary as part of maintenance.
As part of this regular maintenance, it is recommended that the sounder controller is activated from the passive state to the active state and that the isolator modules then cause the sounders to activate.

Full Specifications

Sounder Loop Controller:

Compatible with most manufacturers CIE. – will work with panels that totally reverse sounder circuit polarity.
Max Number of Loop Controllers on any single CIE sndr cct : limit to ten.
Physical Size: Designed to fit onto a standard UK double gang back box.
Indicators: Green supply present, Yellow fault indicator.
Max Number Loop Modules: 30
Supply Voltage range: 20 – 30volts d.c.
CIE Sounder Trigger Range: 15 - 30volts d.c.
Quiescent Current Consumption: 36mA
Active Current Consumption: Quiescent + Current into Sounder Loop (this is system design dependent)
Max Output Current in to the Sounder Loop: 1200mA (nominal)
Over current auto reset

- 200mA setting – trip current 195mA min, 225mA max
- 400mA setting – trip current 400mA min, 450mA max
- 800mA setting – trip current 800mA min, 1010mA max
- 1200mA setting – trip current 1200mA min, 1425mA max

Manual Trigger Cct EOL: 6K8 10% 0.25W
Manual Trigger Activation Resistor: 470R 10% 0.5W
Voltage Out to Loop when in Active State: Supply Voltage less 1.5V*

Isolator Modules:

Fault isolating module with sounder drive capability.
Physical Size: 55 x 55 x 16mm (will fit into the space of most deep base sounders)
Quiescent current: 250uA
Max permitted loading from Sounder output: 250mA
Resistance through isolating switch in normal: 0.08 Ohm max
Resistance through isolating switch in fault: 2700 Ohm
Passive state: 9v to 12V
Short circuit trip voltage: 2 - 6Volts
Sounder output activation voltage range: 14.5V to 30V
Output to sounder when in active state: Voltage at Isolator less 1V *

*max voltage deviation dependent upon current drawn

EN54-17:2005 and EN54-18:2005
This documentation is for the Sounder Controller and Isolator Modules; part numbers BF365SC & BF365IM *(or part numbers as agreed by Computionics with the authorised agents)*

Supplied by: Computionics *<or Computionics's authorised agent>*

CE 2797
Computionics Limited (C-TEC), Challenge Way, Martland Park, Wigan, Lancashire WN5 0LD. www.c-tec.com **10** 2797-CPR-562187
EN54-17: 2005 Short-circuit isolators. **EN54-18: 2005** Input/output devices.
Model Reference *<insert suppliers part number for the sounder controller>* *<insert suppliers part number for the isolator module>*