

Ditech Control Card Manual

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***DI-952 Audio Card***

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## 1. GENERAL

The DI-952 audio card is designed as the central audio and visual alarm signal processor for all detector cards. The unit contains alarm and fault update facilities together with pulse circuits for other inputs.

All input and output connections are made to the card via a 64 way DIN41612 edge connector. This arrangement gives superior reliability over an arrangement of gold plated 'fingers'.

Logic input signals to the card are of the active low type and inputs must be pulled down to 0 V to signal a true condition. Outputs are of two types; either volt free relay contacts or active low outputs capable of sinking up to 500 mA. Additionally, there is an audio output capable of driving an 8 ohm speaker for alarm purposes.

## 2. INPUTS AND OUTPUTS

| DI-952 AUDIO CARD |                         |             |             |                    |
|-------------------|-------------------------|-------------|-------------|--------------------|
| 31A               | ACCEPT ALARM O/P        | AUDIO O/P   | 5B          |                    |
| 30A               | PULSE ALARM I/P         |             | 10B         |                    |
| 29A               | PULSE FAULT I/P         | ALARM RELAY | C 11B       |                    |
| 5A                | RESET O/P               |             | NO 12B      |                    |
| 8B                | 1 SEC O/P               |             | NC 13B      |                    |
| 4B                | EXT. L. TEST            |             | C 16B       |                    |
| 7B                | EXT. RESET I/P          |             | NO 15B      |                    |
| 32A               | EXT. ACCEPT I/P         |             | NC 14B      |                    |
| 23B               | CONTINUOUS ALARM INPUTS |             | FAULT RELAY | C 17B              |
| 24B               |                         |             |             | NO 18B             |
| 25B               |                         |             |             | NC 19B             |
| 26B               |                         |             |             | C 22B              |
| 27B               |                         | NO 21B      |             |                    |
| 28B               |                         | NC 20B      |             |                    |
| 29B               |                         | FAULT I/P   |             | 6B                 |
| 30B               |                         | FAULT O/P   |             | 9B                 |
| 31B               |                         |             |             | 0V 3A/B            |
| 32B               |                         |             |             | 24V 1A/2A<br>1B/2B |

### 2.1 POWER SUPPLIES

There are two power inputs to this card permitting dual supplies to be used. If one fails, the other will keep the card functioning but a fault condition will be flagged, causing the pilot LED to be extinguished, the fault LED to illuminate and the sounder to operate.

The supply inputs are both protected against reverse and over-voltage and are separately protected with 1 amp onboard fuses to prevent system damage.

### 2.2 PRIMARY INPUTS

All of these inputs, designed for external connectors, are active low. They are fitted with blocking diodes to prevent reverse polarity damage and therefore may be connected to inputs which rise to a maximum of 35 V dc when inactive. These inputs must be within 1 volt of the system zero volts line before it is said to be active, and above 6 volts before it is said to be inactive. Transient voltages within the 1 to 6 volt band should be kept to a minimum.

#### **Continuous Alarm Inputs**

These are a set of 10 separate but identical inputs which are paralleled together on the card so that an alarm condition is registered if one or more of the 10 inputs become active. The signals are differentiated before being paralleled thus, one input becoming active will not mask subsequent inputs becoming active. These inputs are normally driven from the continuous alarm outputs of the other detector type cards.

**NOTE: The nature of the pulse generation circuit on each of these inputs means that they are not designed for repeated operation at periods of less than 1 or 2 minutes.**

### ***External Lamp Test***

Taking this input to 0 V forces all front panel indicators to illuminate so permitting a check of lamp operation.

### ***External Reset***

Taking this input to 0 V causes all latches on the card to be set to their quiescent state so resetting any alarm or fault outputs.

### ***External Accept***

Taking this input to 0 V has the same effect as operating the accept button on the front panel and accepts any detected alarm condition, i.e. stops the alarm indicators flashing, silences the audio output, and resets the relay outputs.

## **2.3 SECONDARY INPUTS**

These secondary inputs are specifically for connection to the common alarm and fault busses within a system.

### ***Pulse Alarm Input***

Any number of pulse alarm outputs from detector cards may be connected to this input bus. Any one of these outputs becoming active will have the same effect as one of the continuous alarm inputs becoming active. The card alarm LEDs will flash and the audible alarm will initiate.

### ***Pulse Fault Input***

This input is similar to the pulse alarm input in that any number of pulse fault outputs may be connected to the bus. Any one of these becoming active causing a fault condition to be registered.

## **2.4 PRIMARY OUTPUTS**

### ***Audio Output***

The two output pins connect to an 8  $\Omega$ , 4 W speaker permitting audible indication of a fault or alarm condition. The outputs must float and must not be directly connected to either 0 V or the supply. The output is protected by an onboard 500 mA fuse.

The sound for an alarm condition is a continuous tone, whereas a fault is described by an alternating high and low tone. The sounder may be silenced by pressing the card accept button or by driving the accept input momentarily low.

**NOTE: For heat dissipation reasons it is not recommended that the audio output should be allowed to operate for longer than 12 hours at a time.**

### ***Alarm Relay Contacts***

The alarm output relay fitted to the card is normally de-energised. It will energise whenever an alarm condition is detected by the card. Once the alarm condition has been accepted then the relay will revert back to its de-energised state. This facility makes the output particularly suited to controlling an audible alarm external to the system.

### ***Fault Relay Contacts***

The fault output relay, as with the alarm output relay above, is normally de-energised. It will energise whenever a fault condition is detected by the card. Again, this function is similar to the alarm relay as it will revert back to a de-energised state once the fault has been accepted. This facility makes the output particularly suited to controlling an audible alarm external to the system.

## 2.5 SECONDARY OUTPUTS

### **Reset**

This output is of the active low type and becomes true if the card is reset either via the external reset input or the front panel reset button.

### **Clock Pulse**

This is used to synchronise the alarm annunciation facilities within the Ditech control system. Without it no control cards would flash their LEDs or activate their *Flashing Alarm* outputs correctly. In addition, it is used as the time base for the alternate sounding of the audible fault output.

The output is an open collector drive, oscillating between 0 V dc and high impedance (12 V dc) with an equal mark:space ratio and a one second period. The period is not critical and does drift marginally with temperature at a rate by which it has doubled to 2 Hz at approximately 50°C.

### **Accept Alarm**

This output becomes active low if either the front panel accept button is operated or if the external accept input becomes active.

### **Card Fault Relay**

This output is used for both the termination of the system fault loop and the repeat out to a slave relay (if fitted). The fault loop itself is a normally closed loop running through all control cards, plugs and sockets. It provides a common fault indication and this is shown on the audio card. In addition, it may also be connected out to a slave relay.

**NOTE: Monitoring along the fault loop ends at the audio card. Any repeat connections from the audio card onwards are not monitored for faults.**

## 2.6 FRONT PANEL INDICATORS AND CONTROLS

The front panel carries six LEDs which indicate the current state of the card.



### **Alarm LEDs**

There are two red alarm LEDs which flash on and off together, synchronised by the clock pulse, when a new alarm condition is detected. When the alarm is accepted they are both extinguished. The alarm LED(s) on the cards in alarm will change from flashing to steady and may only be reset once the initiating alarm condition has cleared, and the reset button has been pressed, except when the card(s) have been set up for auto-reset when the reset button will not have to be pressed.

### **Link Fault LED**

This amber LED illuminates when the common fault loop is broken. It cannot be extinguished until the reset button is pressed and the integrity of the common fault loop has been re-established. Attempts to clear the LED by pressing reset will result in the sounder operating if the fault loop is still broken.

### **Pulse Fault LED**

This amber LED illuminates when the pulse fault bus has been activated momentarily. Pressing the reset button will clear this LED but subsequent input control card faults will re-activate it. Principally the only equipment which connects to the pulse fault bus are input control cards DI-800, DI-860, DI-861, DI-862, DI-950 and DI-951UN.

**Pilot LED**

This is a green LED which is normally illuminated to indicate that the card is functioning but extinguishes if either of the two power inputs fail (including fuse failure) or if the clock stops operating.

**Clock LED**

This is a green LED which flashes on and off in synchronism with the one second clock signal to provide a visual indication that the clock and its divider are functioning correctly.

**Accept Button**

This is the large red button which may be used to accept alarm and fault conditions. Its function is to silence the audible output from the card, to change the card fault/alarm relays back to a normal, healthy, non-alarm state, and to pull the 'Accept' output low for the duration of the button press.

**Lamp Test/Reset Button**

This button is used to clear down the card and perform a lamp test. In addition it will, if wired, perform a global reset on the system's control equipment. If a fault is still detected by the common fault loop then the audible output and fault relay outputs will re-activate.

### 3. OPERATION

#### 3.1 FAULT DETECTION

There are two fault inputs to the card - the link fault input and pulse fault input. The link fault input is usually derived from the fault relay outputs of all the other cards connected serially, so that if a fault occurs in any card, or continuity is lost, a fault is registered. The pulse fault input is connected to all the pulse fault outputs in the system so that if any one of them develops a fault, it will be registered. These two forms of input permit connection to most types of system cards.

The two types of input are latched separately and illuminate their respective front panel LEDs if set. Subsequent to the two indicators, the two fault signals are combined to produce a single fault signal. This signal causes the following to occur:

- a) The fault relay contacts change state.
- b) The audible alarm output alternates between 2 tones.

This condition persists until an accept signal is received either via the external input or from the front panel. When this occurs, the audible signal is silenced and the fault relay reverts to its quiescent state, but the fault (link and pulse) LEDs indicating the original fault will remain illuminated until the reset is given. The detector card must be reset before attempting to reset the audio card, otherwise the alarm will re-initiate. If an alarm condition was present, this will be reset by the accept signal.

#### 3.2 ALARM DETECTION

If an alarm condition is detected, either via the continuous alarm inputs or the pulse alarm input, the condition is latched and the following occurs:

- a) The alarm LEDs on the front panel begin flashing synchronised with the clock pulse.
- b) The alarm relay contacts change state.
- c) The audible alarm output operates giving a continuous tone.

This condition persists until an accept signal is received either via the external input or from the front panel. When this occurs, the flashing alarm LEDs are extinguished and the audible alarm is silenced. The card will now be ready to accept any subsequent incoming alarm conditions, which will re-initiate audible and visual signals. On receipt of the accept signal, the alarm LEDs on the card(s) initiating the alarm will remain steady enabling the location of the alarm(s) to be determined.

### 3.3 ON-CARD FAULT

Two on-card faults are possible. These are:

- a) Failure of one power source.
- b) Failure of the oscillator generating the one second pulse.

If this occurs, the green pilot LED on the front panel will extinguish and output fault relay will de-energise causing the module fault relay contacts to open. There will be no other action. The module fault contacts, however, may be wired to cause a link fault and so sound an alarm.

## 4. SPECIFICATIONS

### *Mechanical*

|        |                |
|--------|----------------|
| Width  | 25.4 mm (5 HP) |
| Length | 128 mm         |
| Depth  | 247 mm         |

### *Connections*

DIN41612 64 way A/B male connector

### *Electrical*

|               |                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------|
| Output Relays | 2 pole change over<br>1 amp, 30 V dc non-inductive<br>Normally de-energised                                                      |
| Logic Outputs | 500 mA sink when active<br>12 V when inactive                                                                                    |
| Logic Inputs  | 0 V to activate<br>12 V when inactive                                                                                            |
| Fault Relay   | Single pole normally open (closed under healthy conditions)<br>Normally energised, de-energising on fault<br>0.5 A non-inductive |
| Power         | 18-35 V dc input<br>46 mA minimum<br>375 mA full alarm<br>405 mA maximum                                                         |