

TSCM

Taktis Smoke Control Module

Australia Version 1

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1 General

The Taktis Smoke Control Module TSCM has been designed to meet the Control and Indication requirements of AS1670.1 2015 Section 7 'Smoke Control System'. The module can be set up in multiple modes with pre-configured functionality or can be setup in 'pass through' mode allowing the full control of each LED (red, green and yellow) and the on & off switch to be individually programmed by Cause & Effects (C&E). The Pass through mode allows the flexibility to utilise the Smoke Control Module for other purposes including pump status and over-rides if needed.

The Taktis smoke control module TSCM is available in two variants Master and Slave

The Master controller has provisions for five fan controls and indications, Plant isolate and reset switch, screw terminals for the direct interface to the Taktis RS485 data bus and 24V power and one 10-way boxed header for the first slave unit connection.

The Slave controller has provisions for six fan controls and indications plus one 10-way boxed header for the input from the Master (or pre-designing Slave) module and one 10-way boxed header output to the next slave.

2 Wiring:

The TSCM wiring should be kept within the Taktis panel.

- Master required 1 x 2 core data cable and 1 x 0.75mm twin cable for 24V dc power.
- Slave requires 1 x 10 ribbon from the pre-designing module (Master or Slave).

3 Addressing:

The Taktis RS485 Data bus supports up to 32 address in any combination of available I/O modules.

Each TSCM (whether *Master* or *Slave*) will use two consecutive addresses on the RS485 bus with the first address being even.

Address enumeration of the *Master* and *Slave* TSCMs on the RS485 bus is arbitrary. For example, a *Master* can be at address 6 with its three *Slaves* at addresses 2, 10 and 16 respectively.

A Taktis Panel can support any combination of Master or slave TSCM to a total of 15 TSCM allowing to utilise 30 of the available 32 address of the Taktis RS485 bus.

4 Front Panel Controls

Master modules has the following front panel controls:

- One “*Plant Trip Disablement*” switch. (two position, locking toggle)
- One “*Plant Trip Disabled*” LED (yellow).
- One “*Plant Trip Reset*” switch. (two position, momentary toggle)
- One “*Plant Trip Active*” LED (red).
- Five (5) independently configurable *Smoke Control Channels*.

Slave modules has the following front panel controls:

- Six (6) independently configurable *Smoke Control Channels*.

Each *Smoke Control* has the following:

- One, three position, locking toggle switch
- One “*ON*” LED (red).
- One “*OFF*” LED (green).
- One “*Fault*” LED (yellow).

5 Smoke Control Operating Logic

Each of the five *Smoke Control Channels* on the *Master*, and the six on each *Slave*, have identical logic.

5.1 FAN AUTO Mode:

This mode is active when the control switch is on the AUTO position.

When an alarm is processed by the TSCM, the associated fan outputs are activated. Depending on the configuration mode, this can either be a start or stop signal. A special case is when used to control a Supply Air or Stair Pressurisation Fan. This fan contains a self-resetting duct detector module. When this configuration is selected, the fan will start in order to blow fresh air into the system, and if smoke is detected in the duct, the fan will shut down. Once smoke clears from the duct and the duct detector resets, the fan will start again after a 65 second delay.

The configuration modes are

- Pass Through (Default value)
- Start On Alarm
- Start On Alarm NONLATCHING
- Stop On Alarm
- Stop On Alarm NONLATCHING
- Start On Alarm But Stop If Intake Smoke
- Start On Alarm But Stop If Intake Smoke NONLATCHING

5.2 FAN ON Mode:

This mode is selected when the control switch is in the ON state.

The Fan Control ON output is activated and the Control OFF output is deactivated.

5.3 FAN OFF Mode:

This mode is selected when the control switch is in the OFF state.

The Fan Control OFF output is activated and the Control ON output is deactivated.

5.4 Fan configuration modes

Each fan control can be configured to be:

- Pass Through (Default value)
 - Start On Alarm:
 - Start On Alarm NONLATCHING:
 - Stop On Alarm
 - Stop On Alarm NONLATCHING
 - Start On Alarm But Stop If Intake Smoke
 - Start On Alarm But Stop If Intake Smoke NONLATCHING
-
- **Start on Alarm** – when the control trip is active the automatic mode of operation is to start the fan (Control ON). This option is latching and requires a Plant Reset to return to normal operation.
 - **Start on Alarm non-Latching** - when the control trip is active the automatic mode of operation is to start the fan (Control ON). This option is non-latching and will return to normal operation with a reset of the Fire Panel.
 - **Stop on Alarm** – when the control trip is active the automatic mode of operation is to stop the fan (Control OFF). This option is latching and requires a Plant Reset to return to normal operation.
 - **Stop on Alarm non-Latching** - when the control trip is active the automatic mode of operation is to stop the fan (Control OFF). This option is non-latching and will return to normal operation with a reset of the Fire Panel.
 - **Start on Alarm Stop Intake Smoke** - when the control trip is active the automatic mode of operation is to start the fan (Control ON). This option is latching and requires a Plant Reset to return to normal operation. In this option you get an extra input to the Smoke Control block being Control Intake (Duct Probe). The Control Intake input is where you map the Supply Air Duct Probe to. The Intake Duct Probe is typically setup to be non-latching so if the smoke clears it will restart the particular fan. When the intake duct probe is active the running LED will flash to indicate this mode is active (complying with AS1670.1 2015 section 7 requirements) and a Control OFF signal will be sent to the fan. After the intake duct probe

has cleared the internal logic of the Smoke Control will continue the Control OFF period for a further 60 seconds.

- **Start on Alarm Stop Intake Smoke non-Latching** - when the control trip is active the automatic mode of operation is to start the fan (Control ON). This option is non-latching and will return to normal operation with a reset of the Fire Panel. In this option you get an extra input to the Smoke Control block being Control Intake (Duct Probe). The Control Intake input is where you map the Supply Air Duct Probe to. The Intake Duct Probe is typically setup to be non-latching so if the smoke clears it will restart the particular fan. When the intake duct probe is active the running LED will flash to indicate this mode is active (complying with AS1670.1 2015 section 7 requirements) and a Control OFF signal will be sent to the fan. After the intake duct probe has cleared the internal logic of the Smoke Control will continue the Control OFF period for a further 60 seconds.
- **Pass through fan type:** allows complete control over the TFCM fan I/O channels via panel C&E.

Note except in Pass through mode the interlocks, timing and logic is controlled in the TFCM. This greatly simplifies the programming of complex 1668 fan controls.

6 I/O Channel Configuration

The I/O channels of the Master TSCM will be used as follows:

Addr	Ch1	OUTPUT	from panel	SMOKE_CONTROL_1_TRIP
Addr	Ch2	OUTPUT	from panel	SMOKE_CONTROL_1_ACTIVE
Addr	Ch3	OUTPUT	from panel	SMOKE_CONTROL_1_INTAKE_DETECTOR
Addr	Ch4	INPUT	to panel	SMOKE_CONTROL_1_ON
Addr	Ch5	INPUT	to panel	SMOKE_CONTROL_1_OFF
Addr	Ch6	OUTPUT	from panel	SMOKE_CONTROL_2_TRIP
Addr	Ch7	OUTPUT	from panel	SMOKE_CONTROL_2_ACTIVE
Addr	Ch8	OUTPUT	from panel	SMOKE_CONTROL_2_INTAKE_DETECTOR
Addr	Ch9	INPUT	to panel	SMOKE_CONTROL_2_ON
Addr	Ch10	INPUT	to panel	SMOKE_CONTROL_2_OFF
Addr	Ch11	OUTPUT	from panel	SMOKE_CONTROL_3_TRIP
Addr	Ch12	OUTPUT	from panel	SMOKE_CONTROL_3_ACTIVE
Addr	Ch13	OUTPUT	from panel	SMOKE_CONTROL_3_INTAKE_DETECTOR
Addr	Ch14	INPUT	to panel	SMOKE_CONTROL_3_ON
Addr	Ch15	INPUT	to panel	SMOKE_CONTROL_3_OFF
Addr	Ch16	INPUT	to panel	Reserved
Addr+1	Ch1	OUTPUT	from panel	SMOKE_CONTROL_4_TRIP
Addr+1	Ch2	OUTPUT	from panel	SMOKE_CONTROL_4_ACTIVE
Addr+1	Ch3	OUTPUT	from panel	SMOKE_CONTROL_4_INTAKE_DETECTOR
Addr+1	Ch4	INPUT	to panel	SMOKE_CONTROL_4_ON
Addr+1	Ch5	INPUT	to panel	SMOKE_CONTROL_4_OFF
Addr+1	Ch6	OUTPUT	from panel	SMOKE_CONTROL_5_TRIP
Addr+1	Ch7	OUTPUT	from panel	SMOKE_CONTROL_5_ACTIVE
Addr+1	Ch8	OUTPUT	from panel	SMOKE_CONTROL_5_INTAKE_DETECTOR
Addr+1	Ch9	INPUT	to panel	SMOKE_CONTROL_5_ON
Addr+1	Ch10	INPUT	to panel	SMOKE_CONTROL_5_OFF
Addr+1	Ch11	INPUT	to panel	PLANT_TRIP_DISABLE
Addr+1	Ch12	OUTPUT	from panel	GENERAL_ALARM_TRIP
Addr+1	Ch13	INPUT	to panel	GENERAL_ALARM_LATCHED
Addr+1	Ch14	INPUT	to panel	Reserved
Addr+1	Ch15	INPUT	to panel	Reserved
Addr+1	Ch16	INPUT	to panel	Reserved

The I/O channels of the *Slave* TSCM will be used as follows:

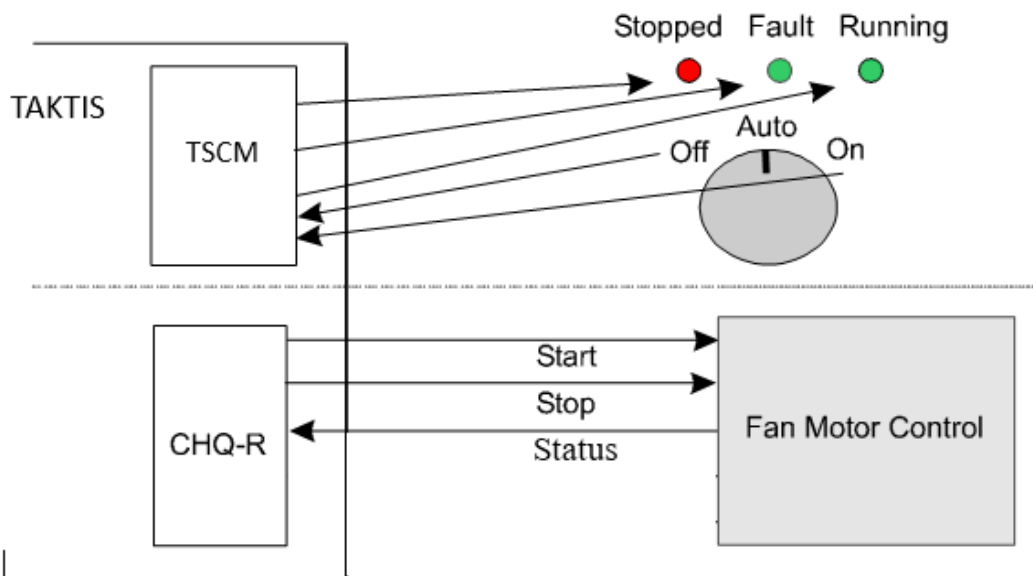
Addr	Ch1	OUTPUT	from panel	SMOKE_CONTROL_1_TRIP
Addr	Ch2	OUTPUT	from panel	SMOKE_CONTROL_1_ACTIVE
Addr	Ch3	OUTPUT	from panel	SMOKE_CONTROL_1_INTAKE_DETECTOR
Addr	Ch4	INPUT	to panel	SMOKE_CONTROL_1_ON
Addr	Ch5	INPUT	to panel	SMOKE_CONTROL_1_OFF
Addr	Ch6	OUTPUT	from panel	SMOKE_CONTROL_2_TRIP
Addr	Ch7	OUTPUT	from panel	SMOKE_CONTROL_2_ACTIVE
Addr	Ch8	OUTPUT	from panel	SMOKE_CONTROL_2_INTAKE_DETECTOR
Addr	Ch9	INPUT	to panel	SMOKE_CONTROL_2_ON
Addr	Ch10	INPUT	to panel	SMOKE_CONTROL_2_OFF
Addr	Ch11	OUTPUT	from panel	SMOKE_CONTROL_3_TRIP
Addr	Ch12	OUTPUT	from panel	SMOKE_CONTROL_3_ACTIVE

Addr	Ch13	OUTPUT	from panel	SMOKE_CONTROL_3_INTAKE_DETECTOR
Addr	Ch14	INPUT	to panel	SMOKE_CONTROL_3_ON
Addr	Ch15	INPUT	to panel	SMOKE_CONTROL_3_OFF
Addr	Ch16	INPUT	to panel	Reserved
Addr+1	Ch1	OUTPUT	from panel	SMOKE_CONTROL_4_TRIP
Addr+1	Ch2	OUTPUT	from panel	SMOKE_CONTROL_4_ACTIVE
Addr+1	Ch3	OUTPUT	from panel	SMOKE_CONTROL_4_INTAKE_DETECTOR
Addr+1	Ch4	INPUT	to panel	SMOKE_CONTROL_4_ON
Addr+1	Ch5	INPUT	to panel	SMOKE_CONTROL_4_OFF
Addr+1	Ch6	OUTPUT	from panel	SMOKE_CONTROL_5_TRIP
Addr+1	Ch7	OUTPUT	from panel	SMOKE_CONTROL_5_ACTIVE
Addr+1	Ch8	OUTPUT	from panel	SMOKE_CONTROL_5_INTAKE_DETECTOR
Addr+1	Ch9	INPUT	to panel	SMOKE_CONTROL_5_ON
Addr+1	Ch10	INPUT	to panel	SMOKE_CONTROL_5_OFF
Addr+1	Ch11	OUTPUT	from panel	SMOKE_CONTROL_6_TRIP
Addr+1	Ch12	OUTPUT	from panel	SMOKE_CONTROL_6_ACTIVE
Addr+1	Ch13	OUTPUT	from panel	SMOKE_CONTROL_6_INTAKE_DETECTOR
Addr+1	Ch14	INPUT	to panel	SMOKE_CONTROL_6_ON
Addr+1	Ch15	INPUT	to panel	SMOKE_CONTROL_6_OFF
Addr+1	Ch16	INPUT	to panel	Reserved

While the Input and Output may seem reversed in its function, it must be remembered that we are programming this from the perspective of the Taktis panel, not the TSCM.

For example: Channel 3: Intake smoke detector 1 is an INPUT from the smoke detector duct probe, processed by the Taktis panel and then OUTPUTS to the TSCM for processing. Thus it is listed on the I/O module as an OUTPUT.

The general interaction between the TSCM and the plant is shown below.



Each channel will be dealt with in the next section in detail.

7 Plant Controls - TFCM Master only

General Alarm Trip (“OUTPUT” channel from the panel to the TSCM *Master*)

General Alarm Latched (“INPUT” channel to the panel from the *Master*)

The General Alarm Latched is a logic signal from the Master TSCM to the panel. It is a “latched” version of the GENERAL_ALARM_TRIP signal from the panel. It is activated whenever General Alarm Trip is active (True). It clears only when General Alarm Trip is clear and the Plant Trip Reset switch is activated.

Tip this output can be used to control general fire trips that required a separate reset control.

“Plant Trip Reset” switch

The activation of the plant reset switch will signal a reset control from a TSCM *Master* to all TSCM *Slave* units which are connected to it via the 10-way ribbon cable. The signal is not passed to other *Master* units or any *Slave* units connected to those *Masters*.

Note a plant reset can only happen once all alarms have been cleared and reset.

“Plant Trip Active” LED (red) (*Master* Front panel indicator)

The “*Plant Trip Active*” LED will be activated whenever any LATCHED signal is active (**True**) on either the *Master* or a *Slave* connected to it. It is not affected by active LATCHED signals on other *Master* units or their *Slaves*.

“Plant Trip Disablement” switch

The “Plant Trip Disablement” switch is a two-position locking toggle switch on the front panel of the Master TSCM. It does not directly affect any of the TSCM smoke control channel logic, but can be used in the panel programming (cause & effects) to affect them indirectly.

Plant Trip Disabled” LED (yellow)

The Master TSCM’s “Plant Trip Disabled” LED is active when the “Plant Trip Disablement” switch is On and Off when the switch is Off.

8 Fan LED indications

When a fan control is configured in “Pass Through” mode the first three output channels are mapped to each of the three led’s

- Channel 1 – Green LED
- Channel 2 – Red led
- Channel 3 – Yellow led

In all other configuration modes the status LED’S are controlled via the logic in TFCM in conjunction with the Active and Control signals to the module

Run Led: Activation of the Run led indicate the STATUS control channel is active. And the Fan is running

Stop Led: Activation of the Stop led in indicate the STATUS control channel is NOT active and the Fan is Stopped

Fault Led: Activation of the fault led would indicate the fan status is not as expected. I.e. if the fan was required to run and the feedback status is inactive “STOPPED” or the fan was required to stop and the feedback status is active “running” the fault led will operate indicating the Fan is in fault

Note the fault led has a 60 second delay to allow for the fan status to normalise.

Run led flashing: if the fan is configured as “Start On Alarm But Stop If Intake Smoke” If the run led begins to flash this indicates the intake channel is activated. that controlled via the C&E by the duct detector being active.

Note in most cases have the Stop led should also be active indicating the fan has also stopped.

9 Duct Detectors

Typical input configuration for a Duct Detector setup.

The screenshot shows the configuration window for an ALK-AS/ALK-ASN Photo Sensor at Address 082.00. The window has two tabs: 'Input Properties' and 'Sensor Properties'. The 'Input Properties' tab is active. The 'Input Type' section has two radio buttons: 'Standard Fire Detection Device' (selected) and 'AAF Detection Device'. The 'Input Action' section has a grid of radio buttons: 'Fire', 'Alert', 'Disarm', 'Ack Alarm Only', 'Fault', 'Security', 'Test Mode', 'Override Delays', 'Pre Alarm', 'Silence', 'Status', 'Technical Alarm' (selected), 'Reset', 'Fire Drill', 'Evacuate', 'Transparent' (selected), and 'Ack Alarm Extended Delay'. The 'Input Action Message' field contains 'Tech Alarm'. The 'Input Delay' field is set to '0 seconds'. The 'Output Delay' section has a 'Bypass' checkbox. The 'Input Latch' section has two radio buttons: 'Latching' and 'Non-Latching' (selected). The 'Location Text' field contains 'FRESH AIR PRESS FAN DUCT PROBE'. The 'Map to Zone' dropdown is set to '49'. There are 'Save' and 'Cancel' buttons at the bottom right.

Note the input Action would typically be Technical Alarm or Transparent type depending if you would like the device to show in the other events screen and the buzzer to operate on the panel when activated or be silent “transparent” in addition the Running led of the mapped smoke control will also flash to indicate the alarm state of the duct detector.

10 TFCM Configuration Settings

After adding a TFCM to your configuration, you can configure each smoke control type by edit the properties of the module and selecting the type

The screenshot shows the 'Master Smoke Control' configuration window. The title bar says 'Master Smoke Control'. There are two tabs: 'Name' and 'Address'. The 'Name' tab is active. The 'Name' field contains 'Master Smoke Control'. The 'Address' dropdown is set to '2'. Below this is the 'Smoke Control Channel Classification' section. It has five rows, each with a 'Smoke Control' label and a dropdown menu. The first row is 'Smoke Control 1' with 'Start on Alarm Stop Intake Smoke Non-Latchi...'. The second row is 'Smoke Control 2' with 'Start on Alarm Stop Intake Smoke Non-Latchi...'. The third row is 'Smoke Control 3' with 'Start on Alarm Non-Latching'. The fourth row is 'Smoke Control 4' with 'Start on Alarm Stop Intake Smoke Non-Latchi...'. The fifth row is 'Smoke Control 5' with 'Pass Thru'. There are 'Save' and 'Cancel' buttons at the bottom right.

Each smoke control I/O channel can be labelled as required according to the control type

Example below is FAN1 “start on alarm” FAN2 “Start On Alarm But Stop If Intake Smoke” FAN3 “pass though”

Item	Groups	Zone	Location Text	Action	Action Msg	Input Delay	Latch	Evac	Def. Ring
Control 1 TRIP	None	26	FAN 1 TRIP					No	No
Control 1 STATUS	None	26	FAN 1 STATUS					No	No
Control 1 Not Used	None	26	-----					No	No
Control 1 ON	None	26	FAN 1 START	Transparent		0 seconds	No		
Control 1 OFF	None	26	FAN 1 STOP	Transparent		0 seconds	No		
Control 2 TRIP	None	26	FAN 2 Trip					No	No
Control 2 STATUS	None	26	FAN 2 STATUS					No	No
Control 2 INTAKE	None	26	FAN 2 DUCT DETECTOR					No	No
Control 2 ON	None	26	FAN 2 START	Transparent		0 seconds	No		
Control 2 OFF	None	26	FAN 2 STOP	Transparent		0 seconds	No		
Control 3 Green LED	None	26	CONTROL 3 LED GREEN					No	No
Control 3 Red LED	None	26	CONTROL 3 LED RED					No	No
Control 3 Yellow LED	None	26	CONTROL 3 LED YELLOW					No	No
Control 3 ON	None	26	CONTROL SWITCH 3 ON	Transparent		0 seconds	No		
Control 3 OFF	None	26	CONTROL SWITCH 3 OFF	Transparent		0 seconds	No		

Double clicking on each I/O Channel allows any property to be set

11 Plant interface Module

The START and STOP plant interface should have all flags cleared on the output option to allow full control via the panel C&E

START output setup

CHQ-R/CHQ-DRC Relay Module at Address 080.01

Change Address
Device Installed

Output Properties
Disablenents

Options

- Def. Ring Mode (Fire)
- Evacuate Output
- Alert Output
- Pre Alarm Output
- Tech. Alarm Output
- Fault Output
- Security Output
- Day/Night Sensitivity Output
- Delay Mode Output

Alarm Silence

Silenceable

Invert Output

Off upon activation, normally On

Delay

Ignore Global Delays

First Delay Min:

Second Delay Min:

Duration

Hour Minute Seconds

Note: Uncheck Def. Ring Mode (Fire) if Output is to be controlled by Cause & Effects.

Location Text

Fan 1 Start Output Zone

Save Cancel

STOP output setup

CHQ-R/CHQ-DRC Relay Module at Address 080.02

Change Address Device Installed

Output Properties Disablenents

Options

- Def. Ring Mode (Fire)
- Evacuate Output
- Alert Output
- Pre Alarm Output
- Tech. Alarm Output
- Fault Output
- Security Output
- Day/Night Sensitivity Output
- Delay Mode Output

Alarm Silence

Silenceable

Invert Output

Off upon activation, normally On

Delay

Ignore Global Delays

First Delay 0 Min:

Second Delay 0 Min:

Duration

Hour Minute Seconds

0 0 0

Note: Uncheck Def. Ring Mode (Fire) if Output is to be controlled by Cause & Effects.

Location Text

Fan 1 Stop Output Zone 1

Save Cancel

Status input properties

The input action type and latching properties should normally be set to transparent and non-latching for the fan status input on the control interface

CHQ-R/CHQ-DRC Relay Module at Address 080.03

Change Address Device Installed

Input Properties

Input Action

- Fire
- Alert
- Disablement
- Override Delays
- Fault
- Security
- Test Mode
- Pre Alarm
- Silence
- Status
- Technical Alarm
- Reset
- Ack Alarm Extended Delay
- Evacuate
- Transparent
- Ack Alarm Only

Action Message

None

Input Delay

0 seconds

Output Delay

Bypass

Input Latch

Latching Non-Latching

Input Invert

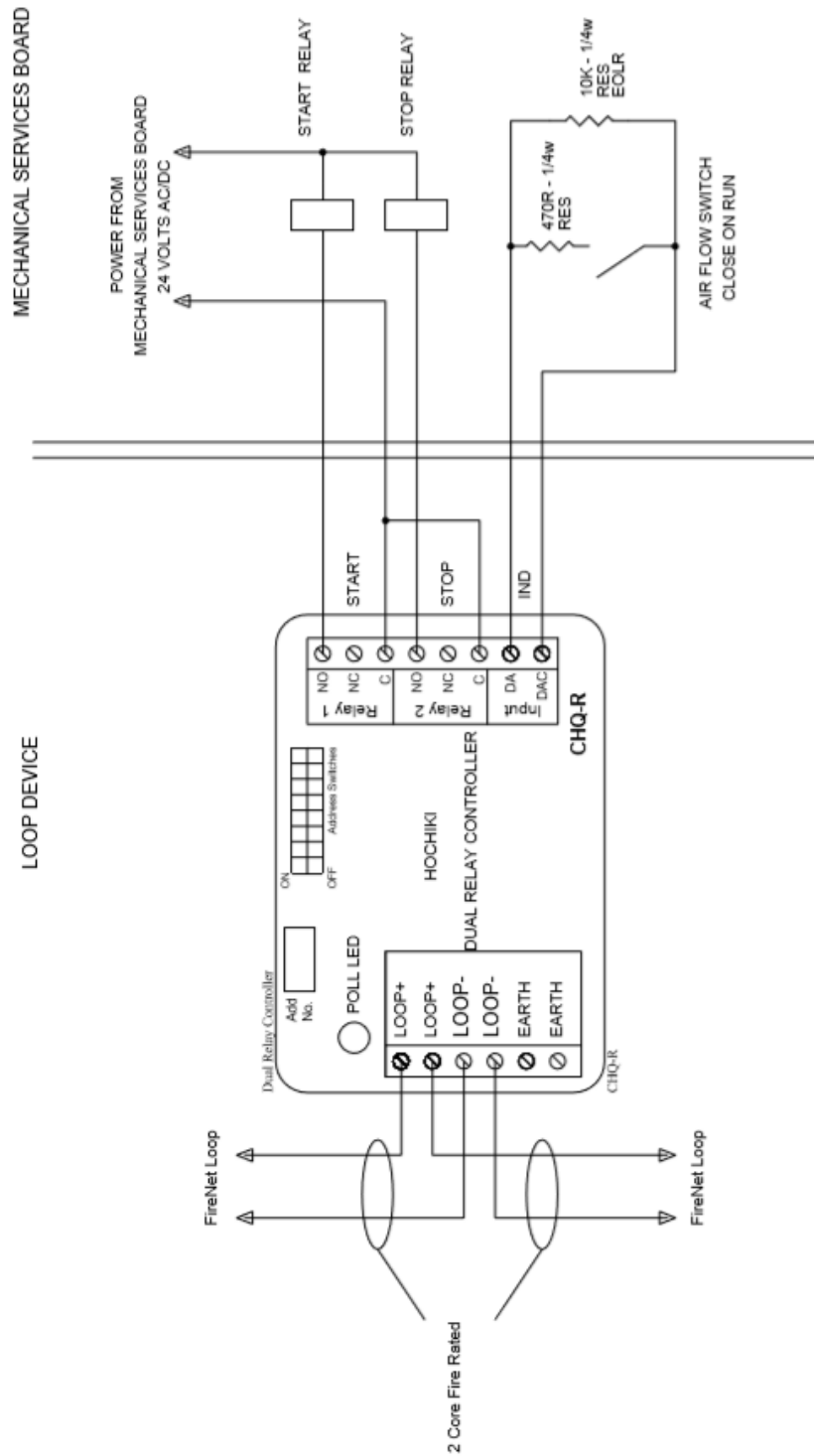
normally closed, operate when opened

Location Text

Fan 1 Status Input Zone 1

Save Cancel

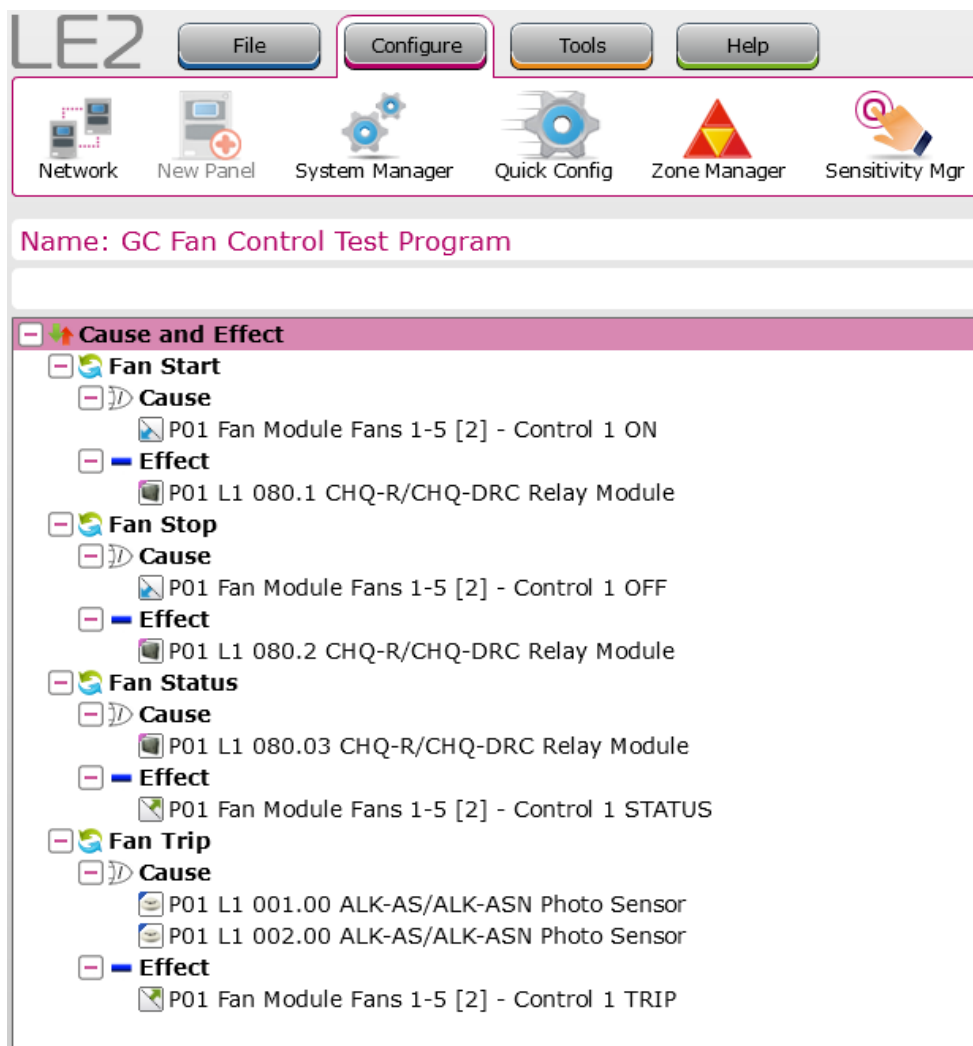
12 Typical Plant control field wiring interface



13 Writing the C&E

In Order operate the plant interface controlling device there are 4 basic control logic C&E required.

- 1) Fan (START). The switch turns on the Start output
- 2) Fan (STOP). The switch turns on the Stop output
- 3) The Fan Trip. This is the Zone or Zones that Start the fan automatically upon Alarm
- 4) The Fan Status. This provides the indication on the Fan Controller of the actual state of the fan via the input module for the fan



More advance functionality can easily be achieved though the C&E however this will not be covered in this manual. Please see www.incitefire.com.au for a list of training dates and times for the Taktis system

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