

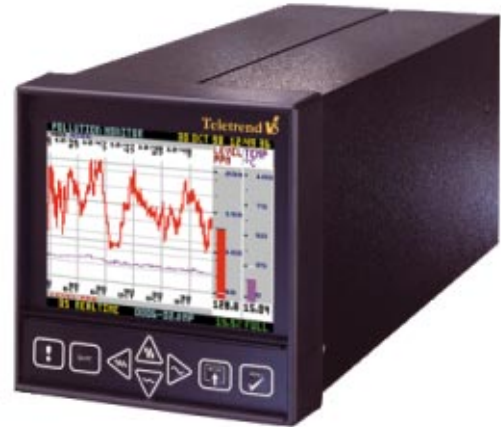
# General Specifications

## Teletrend V5

### OVERVIEW

The original paperless recorder that displays real-time measured data on a 5.5" colour LCD (TFT) with super wide viewing angles. Data is saved to a standard 3.5" floppy disk, in secure encrypted format. With 2, 4, 6 or 8 inputs, of either dc voltage, dc current, Thermocouple, RTD or contact.

The Teletrend V5 software is *TrendManager Pro*, this is the world's most comprehensive recorder software support package. Running under Windows it offers recorder Configuration and Simulation, Data Archiving, Graphing, Printing, Communications and Export.



### FEATURES

- Paperless recording - no paper, pens, mess or maintenance.
- 12 month pay back on pen recorder replacements
- 5.5" colour TFT with super wide viewing angles
- Rapid, simple on plant configuration
- Network up to 256 recorders to a PC
- Secure, encrypted data storage
- 2, 4, 6 and 8 input channels
- High speed data sampling
- 125 mSec response time
- DIN standard bezels
- Total data integrity

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## Standard Specifications

### CONSTRUCTION

#### Mounting:

Flush panel mounting on a vertical plane.

#### Panel thickness:

2 to 100 mm

#### Material:

- Case: aluminium extrusion
- Bezel: injection moulded ABS

#### Dimensions:

W: 144 mm, H: 144 mm, D: 365 mm

Cut Out: 138 mm x 138 mm

(Depth includes 40 mm recommended clearance for power cable and signal connectors as supplied).

#### Weight:

Approx. 3.5 kg

### INPUTS

#### Number:

2, 4, 6 or 8 input channels.

#### Sample rates:

Standard Analogue Card	125 mS for all channels
Universal Analogue Card	1 Sec for 2/4 channels
	1.5 Sec for 6/8 channels

#### Inputs types:

Standard Analogue Card	
dc Voltage	0-5 V and 1-5 V (>10 M $\Omega$ )
dc Current	0-20 mA, 4-20 mA (into 10 $\Omega$ )

Universal Analogue Card	
dc Voltage	$\pm 0-1$ V, $\pm 0-10$ V, $\pm 0-100$ mV, $\pm 0-200$ mV (All >10 M $\Omega$ )
dc Voltage	$\pm 0-10$ mA (into 10 $\Omega$ ), $\pm 0-20$ mA (into 10 $\Omega$ )

#### Resolution:

Standard analogue: <0.01 % (12 Bit ADC)

Universal analogue: 0.0015 % (16 Bit ADC)

#### Accuracy:

Standard analogue:  $\pm 0.5\%$  of full range.

Universal analogue: Voltage ranges  $\pm 0.02\%$  of full range.

Current ranges  $\pm 0.04\%$  of full range.

#### Ambient temperature effect:

-V, mV 0.005 %/ $^{\circ}\text{C}$

-mA 0.02 %/ $^{\circ}\text{C}$

#### Voltage input resistance

Standard analogue:>1 M $\Omega$

Universal analogue:>1 M $\Omega$

#### Current loop resistance:

Standard analogue: Internal, approx. 10  $\Omega$ ,  
 $\pm 5\%$

Universal analogue: Internal, approx. 10  $\Omega$ ,  
 $\pm 5\%$

#### Transmitter power supply

Optional on standard analogue: 18-24 V,  
25 mA

#### Isolation:

Standard and Universal analogue: 100 Vdc  
channel to channel, channel to ground.

#### Reference conditions:

Temperature – 20  $^{\circ}\text{C}$

#### Resistance Thermometer: PT100 to BS1904

Burn Out	upscale
Range	-200 to +400 $^{\circ}\text{C}$
Min span	20 $^{\circ}\text{C}$
Accuracy	$\pm 0.2$ of span

**INPUTS (CONT.)****Long term stability:**

0.1 %/year

**Ambient temperature effect:**

RTD - 0.035 %/°C

**Source resistance:**

RTD - 0.1 °C/Ω (40 Ω max.) approx.

**Thermocouples:**

Type	Temperature range	Accuracy as % of span
K	-100 °C to 1000 °C	± 0.1 %
	1000 °C to 1200 °C	± 1 %
R	0 °C to 400 °C	± 4 °C (1.0%)
	400 °C to 1400 °C	± 0.1 %
	1400 °C to 1700 °C	± 2.5 %
S	0 °C to 400 °C	± 4 °C (1.0%)
	400 °C to 1400 °C	± 0.1 %
	1400 °C to 1700 °C	± 2.5 %
B	0 °C to 600 °C	no spec
	600 °C to 1050 °C	± 2.5 %
	1050 °C to 1650 °C	± 3.5 %
	1650 °C to 1750 °C	± 4.5 %
J	0 °C to 1100 °C	± 0.1 %
T	-100 °C to 300 °C	± 0.75 °C
	300 °C to 400 °C	± 0.1 %
E	0 °C to 800 °C	± 0.1 %
N	0 °C to 1300 °C	± 0.1 %
C	0 °C to 2300 °C	± 0.2 %
W	1000 °C to 1300 °C	± 0.2 %

Note: Sensor errors are not included

**Temperature effect:**

T/C - 0.01 %/°C

**Source resistance:**

T/CmV 0.5 °C/100 Ω (1000 Ω max.) approx.

**Reference junction accuracy:**

± 1 % °C

**Cold junction effect:**

0.03 °C/°C

**Integration time:**

50/60 Hz for mains rejection

**Linear Scaling:**

- -9999 to +9999, scale factor of 1 to 9999.
- Decimal point automatic.
- Engineering units, user definable (5 characters)

**Square root extraction:**

- Scaling limits: ± 1,000,000
- Decimal point: User selectable
- Engineering units: user definable, up to 12 characters

**DATA STORAGE**

- Data (internal): 128 kb
- Data (transfer): 1.44 Mbyte
- Setup (internal): EEPROM

**DISPLAY****Display used:**

- Size: 5.5" colour high brightness wide viewing angle
- Resolution: QVGA (320 x 240 pixels)
- Technology: Industrial LCD (TFT)

**Analogue Display methods:**

- Horizontal: Thick or thin traces, with or without bar, max/min markers, major & minor divisions, time and date marked, name and description.
- Vertical: Thick or thin traces, with or without bar, max/min markers, major & minor divisions, time and date marked, name and description, wide chart, thin bar, scale on bar, no scale, time stamp frequency.
- Tiled: One pen per 'Tile, thick or thin trace, with or without bar, max/min markers, major & minor divisions, time & date marked, digital panel only.

**Analogue display, colours:**

Pen No.	Colour	Pen No.	Colour
Pen 1	Red	Pen 5	Cyan
Pen 2	Magenta	Pen 6	Dk Red
Pen 3	Green	Pen 7	Dk Purple
Pen 4	Blue	Pen 8	Dk Green

**Digital Indication:**

Digital values update every second, alarms on bars, engineering units, pen name, events including tag, time & date, 20 character description & totalised values.

**Memory Status:**

Disk % full is be displayed at all times.

**Recorder Identification:**

Recorder name, Description, Time and Date displayed at all times

**Chart speed:**

Chart sec/div		Chart min/div		Chart hr/div	
5	250 mS/log	1	3 s/log	1	3 min/log
10	500 mS/log	2	6 s/log	2	6 min/log
15	750 mS/log	3	9 s/log	3	9 min/log
20	1 s/log	4	12 s/log	4	12 min/log
30	1.5 s/log	5	15 s/log	6	18 min/log
40	2 s/log	6	18 s/log	8	24 min/log
50	2.5 s/log	8	24 s/log	9	27 min/log
60	3 s/log	10	30 s/log	10	30 min/log
100	5 s/log	15	45 s/log	12	36 min/log
200	10 s/log	20	60 s/log	16	48 min/log
		30	90 s/log	20	60 min/log
		40	2 min/log	24	72 min/log
		60	3 min/log	36	108 min/log
		100	5 min/log	48	144 min/log

**Other Display Contents:**

Rotating bars, black chart, fully programmable display values in engineering units. Time & date stamp on every division, current time & date, session number writing, writing, read only, recycling. Scrolling description & ID number.

**Display magnification/reduction functions:**

Use QuickView for instant alternate time scale, chosen from:

- 20, 50, 100 Sec/Div
- 5, 10, 20 Min/Div
- 1, 2, 4, 8, 12, 20, 24, 48 hour/Div

**LCD saver function:**

Automatic screen saver on the Teletrend set in minutes from 1 to 60.

**Temperature units:**

°C, °F, or K (Kelvin)

## LOGGING

Pen specific logging set up

### Logging method:

Sample, Average, Max-Min

### Logging Rates:

Data is logged to disk at 20 samples per division

- 5 to 90 sec per division
- 1 to 90 min per division
- 1 to 48 hours per division

### Logging rate control:

By alarm, analogue, event, time, % change

## POWER SUPPLY

### Rated power supply:

Voltage 90 to 264 Vac

### Rated power supply frequency:

47 to 440 Hz.

### Power consumption:

Consumption <30 VA

## POWER dc (OPTIONAL)

**Voltage:** 24Vdc

**Consumption:** <30 W

## DATA SAVING FUNCTION

### Storage medium:

3.5" Floppy disk (DD or HD) 1.44 Mbyte

### Method:

Buffered data transfer to disk

### Data Saving Period:

Related to log rate, number of pens, totals, events and alarms.

### File Format:

All files are binary encrypted for complete data security, and minimum size. The format offers the most compact storage method of any paperless chart recorder on the market.

## Saved File Types:

- Setup.\*\*\*

A setup file accompanies every recording session, with complete recorder configuration information. Setup.002 is the 3rd setup file on the disk.

- Log01.\*\*\*

Each pen is individually configurable for Log rate and log type, with its own data file, e.g.

Log01.003, is Pen 1-fourth data file.

**Sample**, stores instantaneous data sampled at a specific rate.

**MaxMin**, stores the maximum and minimum values between two specific log points and saves both.

**Average**, stores the average value between two specific log points.

**Max**, stores the maximum value sampled between two specific log points.

**Min**, stores the minimum value sampled between two specific log points.

- Event.\*\*\*

The Event.001 holds all event information for recording session 001. This includes derived events, markers, system events and periodic events. Each event having a time and date stamp, a 5 character 'Tag' and 20 character 'Description'.

- Total.\*\*\*

The Total.002 holds all stored totalisation values for all pens during recording session 002. Totals are logged at a programmable interval.

Every:

- 1 minute
- 5 minutes
- 15 minutes
- 30 minutes
- 1 hour
- 6 hours
- 24 hours

**SAMPLING TIMES**

Analogue input sample speed is set per card not per unit

Standard card	Universal card
4 times per second	2/4 ch. = 1 per second 6/8 ch. = 1.5 per second

For the Teletrend V5 the disk will last as follows:

2 Pens	(more than 300,000 point/channel)			
Min/Div	1 Min	5 Min	10 Min	20 Min
Disk Lasts	10 days	54 days	110 days	220 days

Sample	250mSecs	0.5 Sec	1Sec	2 Sec
Disk Lasts	28 Hrs	2 days	4 days	8 days

4 Pens	(more than 150,000 point/channel)			
Min/Div	1 Min	5 Min	10 Min	20 Min
Disk Lasts	5 days	27 days	55 days	110 days

Sample	250mSecs	0.5 Sec	1Sec	2 Sec
Disk Lasts	14 Hrs	1 days	2 days	4 days

6 Pens	(more than 100,000 point/channel)			
Min/Div	1 Min	5 Min	10 Min	20 Min
Disk Lasts	80 Hrs	18 days	36 days	72 days

Sample	250mSecs	0.5 Sec	1Sec	2 Sec
Disk Lasts	8 Hrs	16 Hrs	1.5 Hrs	3 Hrs

8 Pens	(more than 75,000 point/channel)			
Min/Div	1 Min	5 Min	10 Min	20 Min
Disk Lasts	40 Hrs	13 days	26 days	50 days

Sample	250mSecs	0.5 Sec	1Sec	2 Sec
Disk Lasts	5.5 Hrs	11 Hrs	1 day	2 days

NB. All times are calculated for sample or average logging. For max/min logging simply divide Disk Lasts value by 2.

**Trigger Function:**

An external contact, key on the recorder, timer, event or alarm can be used to start or stop recording.

**Disk Full:**

In recycling: Oldest data over written.

In standard: Recording stops.

At 90 % full: Alarm contact may be set.

**Other Specifications****Clock: Real time**

- With calendar function
- The time can be adjusted and synchronised using Trendbus comms link option
- Summer/Winter time adjustable
- Accuracy:  $\pm 100$  ppm to resolution of 1 second.

**Memory backup:**

- Clock: Lithium battery, 10 years life (powered).
- Setup: EEPROM & Disk.

**Password protection:**

Restricts user entry to operation modes at different levels preventing setting changes.

**Insulation resistance:**

Each terminal to ground terminal  $>9.9 \text{ M}\Omega$  or greater.

**Dielectric strength test:**

Power supply to ground terminal: 1350 Vac (50/60 Hz), 1 minute.

## **Normal Operation Conditions**

**Power voltage:** 90 to 264 Vac auto-select

**Power supply frequency:** 47 to 440 Hz

**Ambient temperature:** 0 °C to 50 °C

**Ambient humidity:** 10 % to 90 % RH (non-condensing)

**Vibration:** 5 to 100 Hz, 10 m/s

**Shock:** 1 g

**Magnetic field:** 450 AT/m (0 to 60 Hz)

### **Noise:**

Normal mode (50/60 Hz):

- Standard card < 10%
- Universal card < 10%

Common Mode (50/60 Hz)

- 200 V max

**Mounting:** ±15° from the horizontal

**Warm up:** 20 minutes minimum.

## **Safety and EMC Standards**

### **Safety standards:**

Complies with EN61010-1:1993

### **Immunity:**

Complies with EN50082-2

### **Emissions:**

Complies with EN50081 - 1

### **Disturbances:**

Complies with EN60555-2, EN60555-3

## **ENCLOSURE**

- Panel mount (std)
- Cover designed to meet IP65 / Nema 4
- Portable case

## **TRANSPORT AND STORAGE CONDITIONS**

These conditions refer to the time during shipment from the factory and the start of operation. This includes storage time and transportation and storage time if briefly out of operation.

### **Ambient temperature:**

-25 to 60 °C

### **Relative humidity:**

10 % to 90 % RH

### **Operating temperature:**

0 to 50 °C

### **Storage temperature:**

-10 to 60 °C

## **Options Specifications**

### **PEN INPUTS**

#### **Sample rate:**

- 250mS for standard analog cards
- 1 sec for 4 channel universal analog card
- 1.5 sec for 8 channel universal analog card

**Number:** 2, 4, 6, 8 channels

#### **Type:**

- ±100 mV (>1 MΩ)
- ±200 mV (>1 MΩ)
- ±1 V (>1 MΩ)
- ±10 V (>1 MΩ)
- ±10 mA (into 10 Ω)
- ±20 mA (into 10 Ω)

**Resolution:** 0.0015 %

#### **Accuracy:**

- Voltage range ±0.02 % of full range
- Current ranges ±0.04 % of full range
- RTDs & thermocouples ±0.2 % of span

#### **Isolation:**

100 Vdc channel to channel, channel to ground.

## **Alarm Cards**

An alarm signal is output from the rear panel, via a 24-way connector, as a relay contact signal.

Two programmable alarm set points can be configured to activate up to 8 relay outputs. Alarm types comprise of high and low rate of change.

### **Update rate:**

250 mS for all alarms

### **Number:**

- 4 or 8 relay contacts
- 8 relay contacts/ 2 digital inputs
- 8 I/O

### **Type:**

High, Low, Rate up & Rate down

### **Display:**

The alarm status and type are displayed on the Bar, or by digital value. The alarm changes colour on activation

### **Hysteresis:**

On (0 to 100 %) or Off, selectable by channel and alarm. Selectable symmetrical or not.

### **Damping:**

Selectable by channel and by alarm, to seconds, minutes and hours

### **Peaks:**

Selectable by channel and by alarm, to seconds, minutes and hours.

### **Label:**

5 character alarm label

### **Logged:**

Log alarm to disk as an event, selectable by channel and by alarm. Number only limited by space on the disk.

### **Outputs:**

Any alarm on any pen, may be programmed to activate any one or multiple combination of relay outputs. 4 or 8 output cards available.

### **Activation:**

Fully programmable internal alarm levels or rates of change.

### **Relay contact rating:**

- 4 or 8 relays 2 input/output – 3 A 240 Vac (non inductive, internally suppressed)
- 8 input/output - C/NO – 1 A 24 Vdc. (non-inductive)

All input contacts only.

### **Terminal configuration:**

- 4 or 8 relays 2 input/output - SPDT (NO-C-NC).
- 8 input/output - SPDT (C/NO)

## **DIGITAL I/O**

8 channel digital input/output card where all channels may be used as digital inputs. A digital input is provided by a volt free contact between the normally open (NO) and a common (C) terminal of an output relay. If not used as alarm outputs.

## **COMMUNICATIONS MEDIA AND PROTOCOL**

### **Connections:**

RS485

### **Protocol:**

- Honeywell private protocol (Trendbus)
- Modbus

### **Media:**

- RS485 (2 or 4 wire bus, isolated)
- Barcode interface (TTL)

### **Modbus:**

- Mode: RTU SLAVE
- Data type: Data read, data write  
Values in % ( 0 - 100%)
- Wiring: 2 wires (for RS485)



**FIRMWARE****Maths expression**

All analogue input channels have a maths expression block.

This is a fully user programmable 60 character maths calculation for each pen. Maths calculations available on all pens, plus up to 8 extra pens.

Add, Subtract, Multiply, Divide, Squared to the Power of n, Square Root, Modbus, Log, LN, Lowest, Highest, Round, Reciprocal, Derived Pen, Absolute, To any Root, Totalised, To the Power of, Outside.

**Totalisation:**

Totalises the value of a pen, a total measured over a timed period.

User programmable fully independent 10 digit totalisation channels can be configured with each pen.

**Events marker:**

10 user defined process events are recorded and actioned. These can consist of recording start/stop, digital inputs, user key press, totalising actions, timers, barcode, etc.

Once an event has been caused it can produce a definable set of effects on the recorder which can include, mark on chart, relay outputs, recording control, counters, totalising actions, triggering other event. Each event marker can be recorded to disk for analysis within TrendManager Pro.

**Display groups:**

9 independent user-definable display screens in conventional strip and tiled modes. Groups can be used to show a combination of pens, events, alarm summary and totaliser. Plant diagrams and mimics can be generated and then integrated into the recorder display in conjunction with traditional chart, bargraph and digital displays.

**APPLICATION SOFTWARE*****TrendManager Pro Suite***

The comprehensive recorder configuration can be set-up remotely using TrendManager Pro.

Use TrendManager Pro to configure your recorder.

Intuitive software and help facilities ensure quick and easy setup of all the recorders parameters including scales, logging rates, chart speeds, display configuration, alarms. Transfer the configuration file from PC to recorder on a 3.5" disk.

TrendManager Pro will take recorded data from disk and store it on the comprehensive data base. Data and configurations from many recorders can be handled by TrendManager Pro, and once on the database, analysis may begin.

TrendManager Pro allows quick and easy analysis of all trend, event and alarm information. Each graph is totally independent allowing archived data to be compared across recorders, channels and time. Data can be compressed or expanded in the horizontal and vertical axis by zooming.

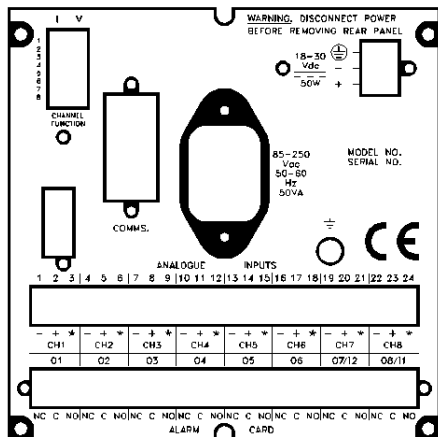
Up to 32 recorders can be linked to provide real time display of process variables - plus data retrieval - using a dedicated PC and a standard Windows platform. Optional Modbus protocol can be utilised with any independent SCADA package.

Any printer supported by Windows may be used to obtain hard copies of archived data, either in graphical or tubular form.

System requirements for both packages are:-

- 200 MHz pentium processor or higher
- 3.5" Floppy disk drive
- CD-ROM drive
- Monitor recommended screen resolution 1024 x 768 minimum requirement, high colour
- Windows 98, 2000, ME, XP, or NT ver. 4.0 with Service pack 3, onwards
- 32 Mbyte of RAM (64 Mbyte recommended)
- 10 Mbyte free hard disk space
- A mouse

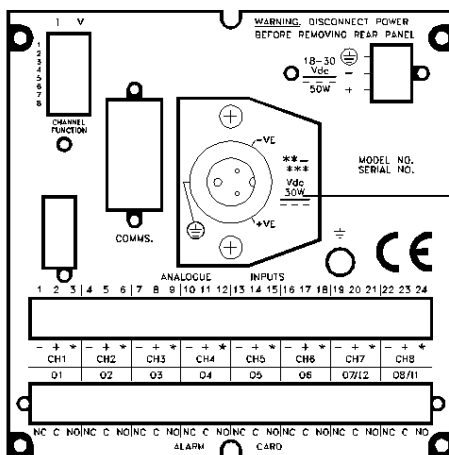
## Getting Connected



AC Rear Panel

### AC Power

AC Supply is connected via the standard configuration IEC chassis plug on the rear panel, labelled 85-250 Vac 50-60 Hz



DC Rear Panel, low voltage 24Vdc

Low voltage for 24Vdc

### DC Power

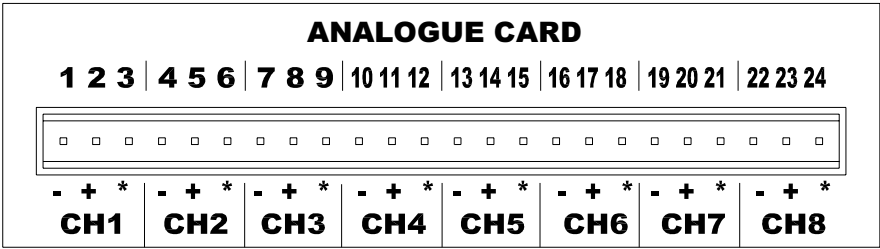
Power to the low voltage dc variant is connected via a rectangular 3-pin plug in position shown.

Getting Connected

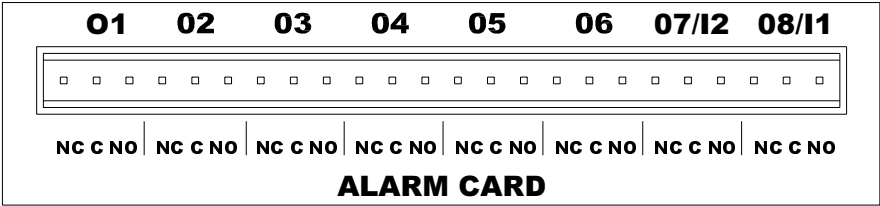
Standard Analogue card

Universal analogue card

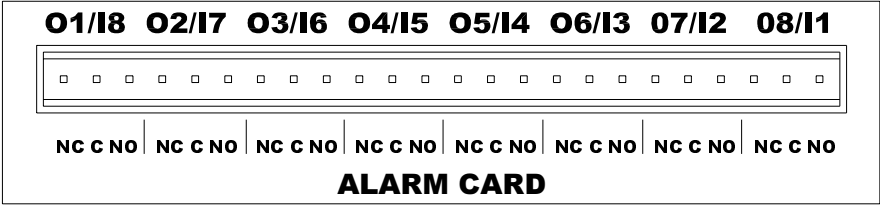
Transmitter power supply card



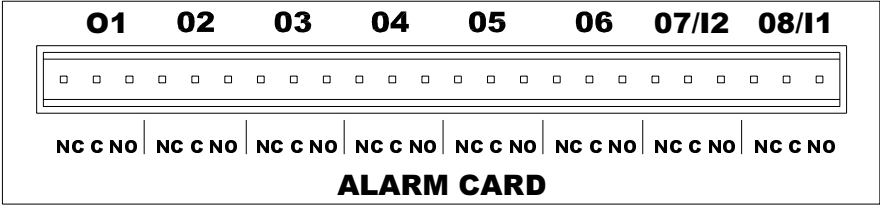
4 & 8 Relay Alarm Card



8 Input/Output Alarm Card



Digital Inputs



**Warranty/Remedy**

Honeywell warrants goods of its manufacture as being free of defective material and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during that period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.

While we provide application assistance, personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

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