

Minitrend V5 Electronic Data Recorder

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Specification

Function

Honeywell's Minitrend V5 recorder provides flexible, general-purpose electronic data recording in a DIN standard 144mm format recorder. The recorder accepts up to 16 universal analog inputs and stores data on an integral, removable storage media. The customer has a number of storage media options available, including a dual storage capability. The data is displayed on a 5.5" color active matrix LCD that provides wide viewing angles along with bright easy to read displays. The operator interface provides easy access to the recorder menus for quick set up and replaying of the data. Data is stored under pen configurations, in secure files and since the data is directly related to a pen there is no need to remember file names and file structures.

An Ethernet port provides an interface from the recorder to a LAN or the Internet for advanced networking and remote monitoring of the recorder.

Other advanced features include; Fuzzy Logging, Custom Screen Design and advanced data security to meet 21CFR Part 11 compliance for electronic data recording. Data replay is easily accomplished using the intuitive thumbwheel and keypad.

The TrendManager Pro V5 Software Suite complements the capabilities of the recorders by providing the benefits of configuration, data analysis and data acquisition using a personal computer. It ties your process together, providing for real-time or FTP communications with the recorders through a Local Area Network (LAN) or the Internet. TrendManager Pro V5 Software Suite provides the tools for viewing real time data, data analysis, data archiving and configuration for the entire family of electronic data recorders.

Features

- **5.5" Color Active Matrix Display**— makes it easy to interpret process data and take action with the easy to understand bar charts, digital values, trends or the customized display.
- **Ethernet Connectivity** — with support for various protocols provides unlimited connectivity to local area networks (LANs) or the Internet.
- **Paperless Chart Recording** — eliminates the need for paper and pens with their associated cost and mess.



Features, Continued

- **Up to 16 Analog Inputs** — up to sixteen universal analog inputs available that can monitor process variables from a variety of sensors.
- **Data Storage** — A number of data storage options are available; these include a standard 1.44MB floppy and PCMCIA interface. In addition to this the recorder is capable of supporting dual redundant storage media for added security.
- **Standard Mounting** — fits standard cutout and allows for easy replacement of existing 100 mm paper chart recorders.
- **CE Mark** — Conformity with 73/23/EEC, Low Voltage Directive and 89/336/EEC EMC Directive.
- **Total Data Integrity** — data is stored in secure files based on pen designations making it easy to retrieve the data based on process information rather than having to remember file names
- **Independent Display Chart Speeds and Logging rates** — logging rates can be programmed completely separate from the chart display speed, allowing the data to be displayed and stored at the rates that best suits the application.
- **Universal Power** - the instrument is designed to work between 90 Vac and 250 Vac.
- **Language Support** — Standard language prompts for English (US & UK), French, German, Italian, Portuguese, Spanish, Polish, Hungarian, Turkish, Romanian, Slovakian and Czechoslovakian.

Features, Continued

- **Real Time Clock** — provides accurate time stamping of logged data and events and is battery backed up to prevent a loss of the clock time/date.
- **Large Memory Buffer** — Up to 8Mbyte battery-backed buffer helps protect data during routine operation.
- **Password Protection** — multiple levels of password protection provided to ensure compliance with 21CFR Part 11. Up to 4 levels of password protection with up to ten different passwords are available for use. The password can prevent unauthorized entry to the entire recorder configuration or just portions of the recorder configuration or operation.
- **Fuzzy Logging** — This standard feature provides a unique method to increase the storage capacity of the recorder. The data is monitored to determine changes in process data; if no changes are observed data is logged periodically. If data is changing rapidly, it is recorded normally at the programmed rate. By not logging data that is static, data compression of up to 100:1 or more can be observed saving valuable disk space. The amount of disk space left is easily observed and can be set up as an alarm limit to provide notice when data could be lost.

Options

- **Alarm Outputs** — up to sixteen alarm outputs are easily set by users to announce selected out-of-limit conditions. Up to 8 SPDT relays are available or up to 16 discrete outputs (24Vdc, 200mA) are available to activate the user's external equipment.
- **Communications** — the recorder supports FTP, real time Trendbus, Modbus, web and e-mail over the Ethernet communications port. The recorder is also capable of Modbus RTU communications over an RS485 network. An RS232 port allows the use of an ASCII barcode reader to mark the chart or record batch specific data when used in conjunction with Event Markers.
- **Math** — A full function math package is available on the recorder. This feature can handle math expressions that can consist of expressions up to 250-characters in length.
- **12/24Vdc instrument power** — an optional 12/24Vdc-instrument power is available for those applications requiring 12/24Vdc-instrument power.

Options

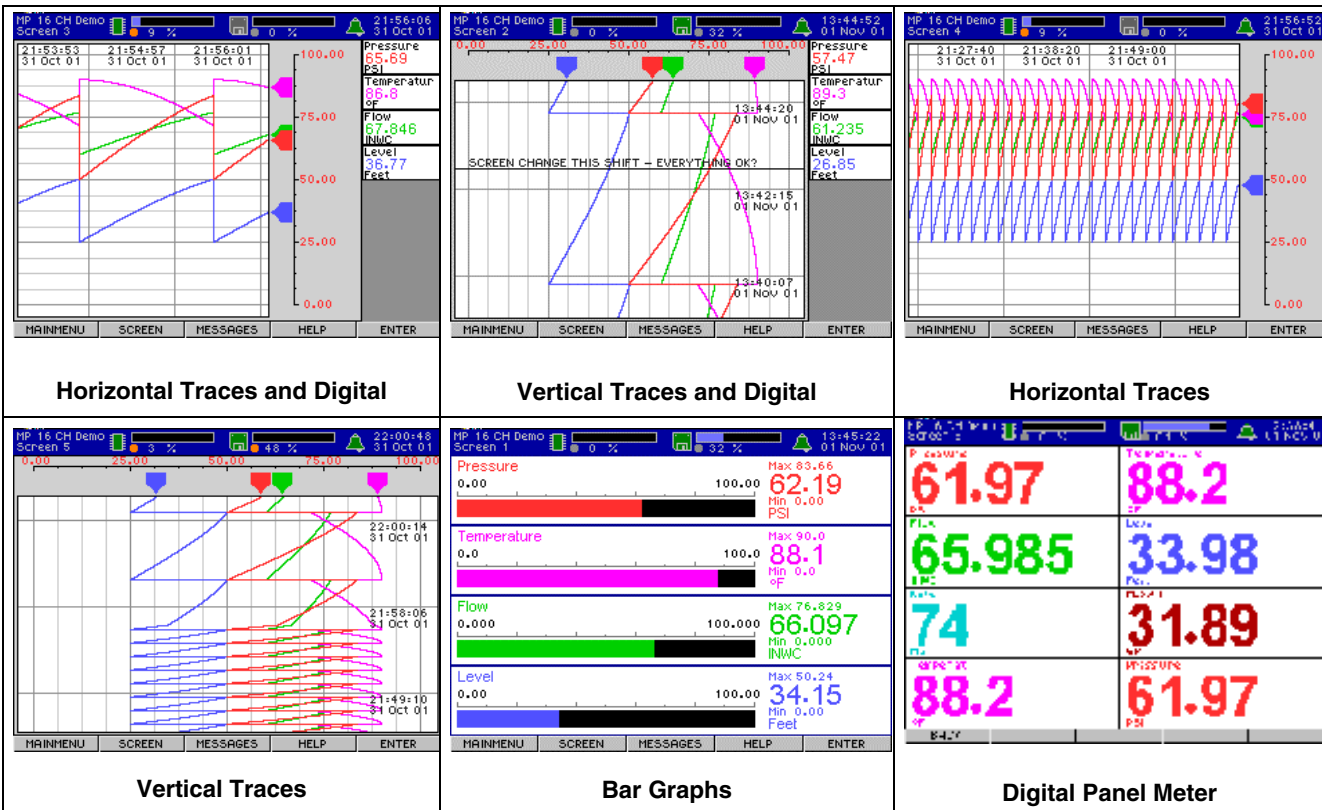
- **Digital Input** — a number of digital input options are available. The digital inputs allow users to initiate from a remote location through a dry contact closure. Selected recorder functions, such as start/stop/reset totalization, mark the chart.
- **Event Markers/Actions** — provides an easy method for a user to mark an event or message on the electronic recorder. These messages are time stamped and can be up to 44 characters long. Additionally, certain recorder actions such as start/stop recording, digital inputs actions, user key presses, etc., can also be logged.
- **Extended Security Software** — an optional software function providing extended features including entry of unique User ID's and associated passwords, timeout of password entry, password expirations, and traceability by user.
- **Validation Documentation** — Honeywell can provide the additional documentation associated with using the recorder in a validated process.

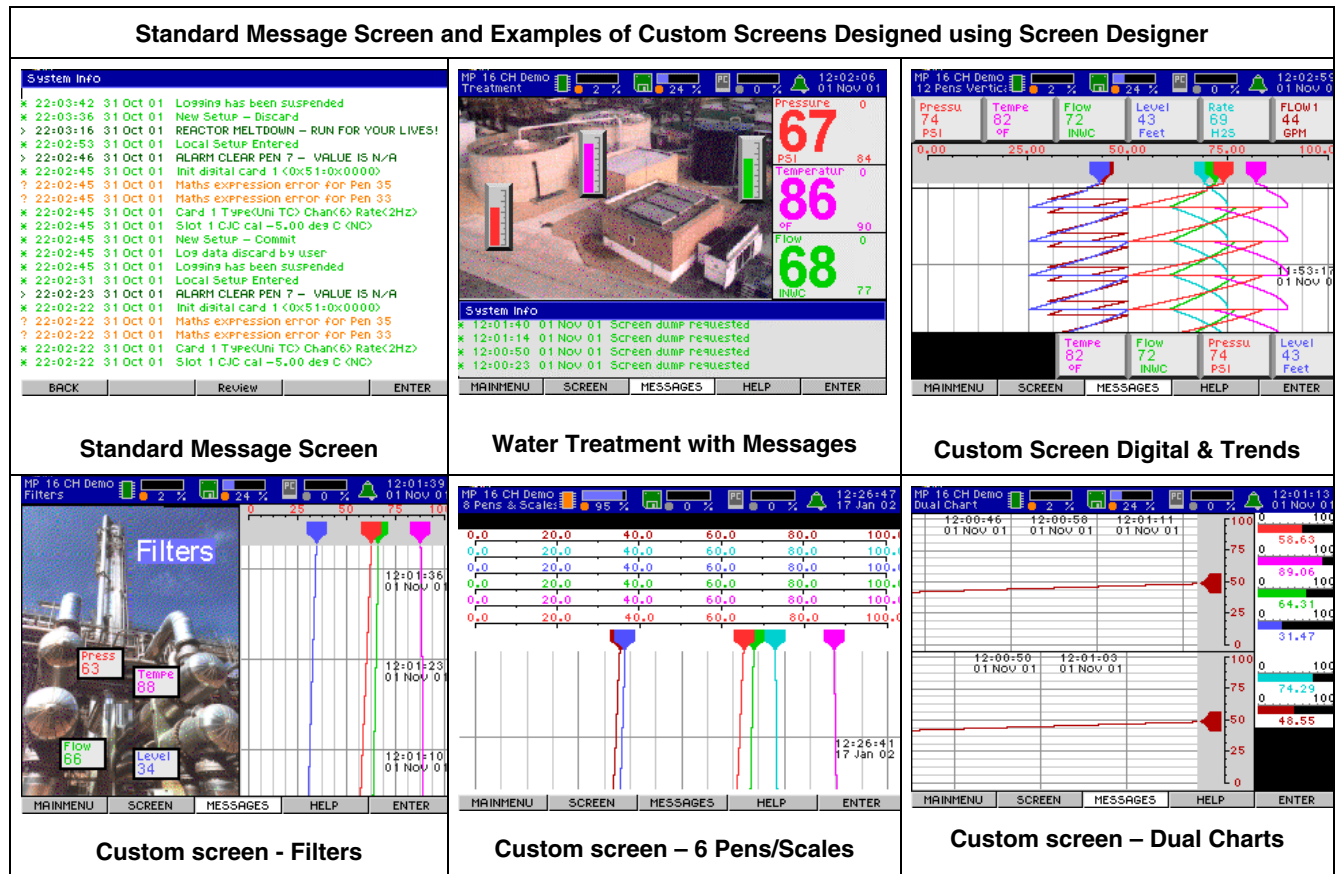
TrendManager Pro V5

Software Suite

- **TrendViewer** — Standard software package for viewing, graphing, and printing stored data.
- **TrendManager Pro** — is an advanced data analysis/archiving software package. It provides full configuration of the recorders along with e-mail set up. TrendManager Pro also allows files to be exported using comma separated variables (CSV) format.
- **TrendServer Pro** — is a fully network aware software package for communicating with the recorders. It supports all the capabilities of Trend Manager Pro plus FTP (file transfer protocol) and Web browser access. TrendServer Pro provides multi-level, multi-user access to the recorder data by various departments with security.
- **TrendServer Pro with Comms Server** — TrendServer Pro is available with an OPC Server to make it easier to interface third party HMI software packages that support an OPC Client

Standard Screens





Specifications

Design Attributes	
Digital Indication & Display	<p><i>Display Type:</i> Color LCD (TFT)</p> <p>Industrial grade with brightness adjustment and wide viewing angle</p> <p><i>Screen Size:</i> 5.5" diagonal</p> <p><i>Resolution:</i> QVGA (320 x 240 pixels)</p> <p><i>Screen Saver:</i> Set in minutes from 1 to 255 plus brightness adjustment</p> <p>Digital values displayed include alarms on bars, engineering units, pen name, events including tag, time & date, 20-character description & totalized values.</p>
Display Update Rate	Display values updated every second.
Memory Status Display	A status bar, at the top of the recorder's screen, constantly displays real-time icons of memory % full and Disk % full. These percentages can be used and displayed by allocating a pen in a math expression.
Mimics & Custom Screens	Provides the ability to import custom built screens and/or bit maps from the Screen Designer software.
Other Display Contents	<p>Fully programmable display values in engineering units. Time & date stamp on every division, current time & date, session number writing, writing, read only, recycling.</p> <p>Independent user-definable display screens and groups can be used to show a combination of pens, events, alarm summary and totalizer. Plant diagrams and mimics can be generated and then integrated into the recorder display in conjunction with traditional chart, bar graph and digital displays.</p>
Analog Display Methods	<p><i>Horizontal:</i> Thick or thin traces, with or without bar, max/min markers, major & minor divisions, time and date marked, name and description.</p> <p><i>Vertical:</i> Thick or thin traces, with or without bar, max/min markers, major & minor divisions, time and date marked, name and description</p>
Message screen	Displays system information and records any setup activity that has been changed. Provides warning and error message updates, lists alarm activity and places user defined marks on chart facility.

Analog Display Colors	Pen Number	Color	Pen Number	Color		
	Pen 1	Red	Pen 9	Dark Blue		
	Pen 2	Magenta	Pen 10	Blue/Green		
	Pen 3	Green	Pen 11	Khaki		
	Pen 4	Blue	Pen 12	Salmon		
	Pen 5	Cyan	Pen 13	Pink		
	Pen 6	Dark Red	Pen 14	Lime		
	Pen 7	Dark Purple	Pen 15	Light Blue		
	Pen 8	Dark Green	Pen 16	Turquoise		
Data Storage	<i>Removable Media:</i> 3.5" 1.44Mbyte floppy and PCMCIA memory interface card. The PCMCIA interface accepts ATA Type I, Type II or Type III PCMCIA cards with a capacity of 8Mbytes to 256Mbyte flash card, up to 1.2Gbyte hard disk					
	Supports dual storage media – 1.44Mbyte floppy and PCMCIA interface (requires extra pens for setting up dual data storage)					
	<i>Internal Data Buffer:</i> 4 or 8MByte battery backed up RAM data buffer, rechargeable battery designed to retain data approximately 3 weeks if fully charged					
	<i>Setup:</i> Stored internally on EEPROM					
	<i>Manual Saving:</i> Data saving by inserting external floppy disk or PC card memory					
	<i>Data Saving Period:</i> Related to log rate, number of pens, total events and alarms. Each pen is capable of its own independent storage rate.					
	<i>Data Format:</i> Honeywell binary encoded format					
	<i>Recycling Mode:</i> Internal memory has full data recycle capability where the newest data overwrites the oldest data.					
	Set for Sample Storage		Time			
	Channels	1 Sec	10 Sec	30sec	1 Min	Media Type
	2	4D 3H 23M	41D 7H 49M	123D 23H 27M	247D 22H 45M	1.44 MB
		287D 23H 38M	7Y 324D 19H	23Y 244D 8H	47Y 123D 7H	100MB PCMCIA
	4	2D 1H 41M	20D 15H 54M	61D 23H 43M	123D 23H 22M	1.44 MB
		143D 23H 53M	3Y 344D 21H	11Y 304D 16H	23Y 244D 3H	100MB PCMCIA
	8	1D 0H 49M	10D 7H 57M	30D 23H 51M	61D 23H 41M	1.44 MB
	71D 23H 55M	1Y 354D 22H	5Y 344D 20H	11Y 304D 13H	100MB PCMCIA	
12	0D 16H 31M	6D 21H 18M	20D 15H 54M	41D 7H 47M	1.44 MB	
	47D 23H 56M	1Y 114D 23H	3Y 34D 21H	7Y 324D 17H	100MB PCMCIA	
16	0D 12H 23M	5D 3H 58M	15D 11H 55M	30D 23H 50M	1.44 MB	
	35D 23H 57M	359D 23H 29M	2Y 349D 22H	5Y 334D 18H	100MB PCMCIA	
Power Requirements	Voltage (VRMS): 90 Vac to 250 Vac (auto select). Frequency: 50/60 Hz Power Consumption <50 VA. Optional instrument power <i>Voltage:</i> 12/24 Vdc +6 Vdc/-1 Vdc. <i>Power Consumption:</i> < 30 watts					
Password Protection	Four levels of Password protection are provided – Engineer, Supervisor, Technician, and Operator. Password protection restricts user entry to the recorder set up and specific screens. <ul style="list-style-type: none">• Engineer - Highest access to all levels, Supervisor, Technician and Operator.• Supervisor - 2nd highest level including Technician and Operator access• Technician - 3rd level including Operator access• Operator - 4th and lowest level of access.					
Clock	Calendar function, daylight savings time adjustable manually or with communications The time can be adjusted and synchronized using Ethernet scheduler Tolerance: ±20ppm to a resolution of 1 second Battery backed up, Lithium battery - 10 years life (powered)					
Languages	English UK, English US, French, German, Italian, Portuguese (Brazilian), Spanish, Polish, Hungarian, Turkish, Romanian, Slovakian and Czechoslovakian.					
Temperature units	°C, °F or K (Kelvin)					
Recorder Identification	Recorder name, Screen name, Time and Date displayed at all times.					
Alarm Set Points	Up to 64 integral “soft” alarm set points easily set by user to announce selected out of limit conditions. Alarm Set points defined in TrendManager Pro V5 Software Suite					

Events List	Enabling the user to review events logged, activate date option, filter screen to display specific events e.g. alarm activity only. Reset option available.	
Data Replay Mode	Data replay facility on chart displays at normal, fast or slow speeds. Data is replayed from the buffer with the buffered time available for replay dependant on chart speed.	
Chart Speeds	1 mm/hour, 5 mm/hour, 10 mm/hour, 20 mm/hour , 30 mm/hour, 60 mm/hour, 120 mm/hour, 600 mm/hour, 1200 mm/hour, 6000 mm/hour, 12000 mm/hour Chart speeds can be set independently for each chart and is independent of logging rate First channel in Screen Layout determines the display chart speed	
CE Conformity	This product conforms with the protection requirements of the following European Council Directives: 73/23/EEC , the Low Voltage Directive, and 89/336/EEC , the EMC Directive. Conformity of this product with any other “CE Mark” Directive(s) shall not be assumed.	
Immunity	Complies with EN61326	
Product Classification	Class I: Cord Connected, Panel Mounted Industrial Control Equipment with protective earthing (grounding). (EN 61010-1)	
Enclosure Rating	Front panel designed to IP 65 (IEC 529), Splash proof cover designed to IP65/NEMA 4	
Installation Category (Over-voltage Category)	Category II: (EN 61010-1)	
Emissions	Complies with EN50081-1 (Ref. IEC 664-1)	
EMC Classification	Group 1,Class A, ISM Equipment (EN 55011, emissions), Industrial Equipment (EN 61326, immunity)	
Safety	Complies with EN61010-1: 1993. Panel Mounted Equipment, Terminals must be enclosed within the panel.	
Disturbances	Complies with EN605555-2, EN60555-3	
Seismic Qualification	Complies with IEEE 344-75 (optional)	
Analog Inputs		
Number of Inputs	4, 6, 8, 12 or 16 input channels	
Input Types	EMF (mV, V, mA) Thermocouple, RTD	
PT100/200Ω RTD Inputs Ni 100/120Ω RTD Inputs Cu 10/Cu 53	The universal input card will access and work with all RTD, T/C and Linear input signals. The Fast Scan Input card does not accept Cu 10/CU53 Inputs and if set to RTD or T/C ranges the scan rate is 200ms or 500ms	
PT100/200 Ω RTD Inputs Ni 100/120Ω RTD Inputs	This universal input card will access and work with all the RTD inputs. It accepts the T/C and Linear input signals.	
Minimum Input Span	Range is fully configurable with span limitation of the operating range selected with 4% under range to 4% over range capability	
Input Resolution	0.0015 % (16 Bit ADC)	
Input Impedance	Current loop resistance dc: 10 ohms ±5%, all other: >1 MΩ	
Source Impedance	RTD: 40 ohms per lead maximum, 0.1 °C/Ω, T/C 1000• max., 0.5°C/100•	
Square Root Extraction	Scaling limits: ±1,000,000 Decimal point: User selectable Engineering units: user definable, up to 12 characters	
Input Sampling Rate	Recorder has 2 available slots of 8 analog inputs each, the input sampling rate is dependent on actuation type. For 20ms sampling all inputs for that slot must be set to linear inputs (mV, mA, V) (20msec scanning must be selected as the Fast Scanning option)	
	Linear only (Fast Scan Card)	20 ms (50 Hz), 200 ms (5 Hz), 500 ms (2 Hz)
	Thermocouple/RTD	200 ms (5 Hz), 500 ms (2 Hz)
	Universal Card	500 ms (2 Hz)
	Linear Card	100 ms (10 Hz), 200 ms (5 Hz), 500 ms (2 Hz)
Input Filter	Single Low pass filter software adjustable from 1 to 15 seconds	
Linear Input Scaling	-999999 to 999999, scale factor of 1 to 9999 Decimal Point automatic or programmable Engineering units, user definable (5 characters)	
Input Isolation	Fast Scan or Linear Card - 100 Vdc channel-to-channel, channel-to-ground Universal Card – 400 Vdc channel-to-channel, channel-to-ground	
Noise Rejection	Universal Card – Series mode > 60db, Common mode > 130db @ 120Vac	
Input Sampling Method	Method: Sample, Average, Min-Max	
Dielectric Strength	Power supply to ground terminal: 1350 Vac (50/60 Hz), < 1minute	
Insulation Resistance	>9.9 MΩ Each terminal to ground terminal	

Performance					
Accuracy – Fast Scan or Linear Only Card					
Input Actuation (Linear)	Range		Accuracy		Temp. Stability ±
Millivolts dc	-100 to 100		+-0.1%		0.01%/°C
Volts dc	-200 to 200		+-0.1%		0.01%/°C
Milliamps **	-1.0 to 1.0		+-0.1%		0.01%/°C
	-10 to 10		+-0.1%		0.01%/°C
	-10 to 10		+-0.2%		0.01%/°C
	-20 to 20		+-0.2%		0.01%/°C
Input Actuation (Thermocouples)	Range		Ref. Accuracy *		Temp. Stability ± Degrees Error Per 1 Degree ΔT
	°F	°C	± °F	± °C	
C(W5)	32 to 4172	0 to 2300	10.35	5.75	0.06%/°C
E	-328 to 1832	-200 to 1000	10.8	6	0.06%/°C
	-328 to 32	-200 to 0	5.4	3	
	32 to 1832	0 to 1000			
J	-328 to 2174	-200 to 1190	8	4.5	0.03%/°C
	-328 to 32	-200 to 0	4	2.3	0.03%/°C
	32 to 2174	0 to 1190			
K	-328 to 2462	-200 to 1350	9	5	0.03%/°C
	-328 to 32	-200 to 0	4.5	2.5	0.03%/°C
	32 to 1832	0 to 1000	5.4	3	0.03%/°C
	1832 to 2462	1000 to 1350			
L	-328 to 1652	-200 to 900	5	2.75	0.03%/°C
N (Nicrosil Nisil)	-328 to 2372	-200 to 1300	2.7	1.5	0.05%/°C
	-328 to 32	-200 to 0	2.7	1.5	0.04%/°C
	32 to 2372	0 to 1300			
T	-328 to 752	-200 to 400	8	4.5	0.08%/°C
	-328 to 32	-200 to 0	3.6	2	0.08%/°C
	32 to 752	0 to 400			
W	1832 to 4172	1000 to 2300	5.9	3.25	0.15%/°C
Nickel/Cobalt	-58 to 2372	-50 to 1300	1.8	1	0.05%/°C
Chromel/Copel	-58 to 1112	-50 to 600	3.6	2	0.05%/°C
Input Actuation (RTD's)	°F	°C	± °F	± °C	
PT100 100 ohms (To BS1904)	-328 to 1202	-200 to 650	3.1	1.7	0.05%/°C
PT200 200 ohms	-328 to 356	-200 to 180	7.2	4	0.05%/°C
100 ohm Nickel	-76 to 356	-60 to 180	2.7	1.5	0.05%/°C
120 ohm Nickel	-112 to 464	-80 to 240	3.2	1.75	0.05%/°C

Reference Temperature	20°C	Reference Sample Rate:	2 Hz (500msec)
Reference Humidity	65% RH ±15%	CJC Temperature Effect:	±0.05°C/°C
Reference junction Accuracy	±1.0degrees Centigrade	Long term stability:	0.2%/year

* Does not includes reference junction calibration of ±2.0 ° C using the standard “ice bath” method of calibration. Factory accuracy can be improved by performing a field calibration.

** Tolerance for these input types includes that of the external dropping resistors

Performance					
Accuracy – Universal Input Card					
Input Actuation (Linear)	Range		Accuracy		Temp. Stability ±
Millivolts dc	-100 to 100		±0.1%		0.01%/°C
Volts dc	-500 to 500		±0.1%		0.01%/°C
Milliamps **	-1.0 to 1.0		±0.1%		0.01%/°C
	-10 to 10		±0.1%		0.01%/°C
	4 to 20		±0.2%		0.01%/°C
	0 to 20		±0.2%		0.01%/°C
Input Actuation (Thermocouples)	Range		Ref. Accuracy *		Temp. Stability ± Degrees Error Per 1 Degree ΔT
	°F	°C	± °F	± °C	
B	212 to 500	100 to 260	30	16.7	0.13%/°C
	500 to 1000	260 to 538	8	4.5	
	1000 to 3300	538 to 1820	4	2.3	
C(W5)	32 to 600	0 to 316	3.5	2	0.06%/°C
	600 to 3600	316 to 1982	3	1.7	
	3600 to 4172	1982 to 2300	3.5	2	
E	-328 to -202	-200 to -130	25	14	0.06%/°C
	-202 to 1832	-130 to 1000	2.3	1.3	
J	0 to 1600	-18 to 871	1.2	0.6	0.03%/°C
K	0 to 2400	-18 to 1316	2	1.2	0.03%/°C
L	-328 to 1652	-200 to 900	5	2.75	0.03%/°C
N (Nicrosil Nisil)	0 to 2372	-18 to 1300	2	1.2	0.05%/°C
R	0 to 500	-18 to 260	5	2.8	0.1%/°C
	500 to 3100	260 to 1704	2.2	1.2	0.1%/°C
S	0 to 500	-18 to 260	5	2.8	0.1%/°C
	500 to 3100	260 to 1704	2.2	1.2	0.1%/°C
T	-300 to 700	-184 to 371	2	1.2	0.08%/°C
W_W ₂₆	1832 to 4172	1000 to 2300	3.5	2	0.06%/°C
Nickel/Cobalt	-58 to 2480	-50 to 1360	2.4	1.4	0.05%/°C
Chromel/Copel	-58 to 1110	-50 to 600	3.2	1.8	0.05%/°C
Input Actuation (RTD's)	°F	°C	± °F	± °C	
PT100 100 ohms IEC α=0.00385	-300 to 1200	-184 to 649	1.4	0.8	0.05%/°C
PT200 200 ohms	-300 to 1200	-184 to 649	0.9	0.5	0.05%/°C
100 ohm Nickel	-76 to 356	-60 to 180	4.5	2.5	0.05%/°C
120 ohm Nickel	-112 to 464	-80 to 240	4.5	2.5	0.05%/°C
Cu 10	-4 to 482	-20 to 250	2.5	1.4	0.05%/°C
Cu 53	32 to 302	0 to 150	1.7	0.8	0.05%/°C

Reference Temperature	20°C	Reference Sample Rate:	2 Hz (500msec)
Reference Humidity	65% RH ±15%	CJC Temperature Effect:	±0.05°C/°C
Reference junction Accuracy	±1.0degrees Centigrade	Long term stability:	0.2%/year

* Does not includes reference junction calibration of ±1.0 ° C using the standard "ice bath" method of calibration. Factory accuracy can be improved by performing a field calibration.

** Tolerance for these input types includes that of the external dropping resistors

Logging	
Logging Method	Sample, Average, Min/Max
Logging Types	Continuous, Events, Fuzzy
Logging Rates	From 20 msec. to 4 days per pen
Fuzzy Logging	A secure data storage technique which typically delivers data compression ratio of 100:1 or more; self teaching, storing the data at a variable rate to match the process
Physical Parameters	
Enclosure	Case: Mild steel, zinc plated and passivated Bezel: Aluminum, black polyester powder coat Splash proof cover, designed to IP65/Nema 4
Mounting (Panel)	Flush panel mounting on a vertical plane. Mounting adjustable for panel thickness of 2 mm to 100 mm. Adapter kits available for covering existing panel cutouts. ± 15° from the horizontal, for 1.44MB Floppy ± 25° from the horizontal
Dimensions	W: 144 mm, H: 144 mm, D: 285 mm (Depth includes 40 mm recommended clearance for power cable and signal connectors as supplied). Cutout 138 x 138mm/5.43 x 5.43"
Weight	3.5 Kg max.
Color	Bezel: Black
Wiring Connections	IEC Power Plug. Removable terminal strip for input and alarm connections
Options	
Alarm Outputs (optional)	An alarm signal is outputted from the rear panel, via a 24-way connector, as a relay contact signal. Programmable alarm set points can be configured to activate up to 16 relay outputs. Alarm types comprise of high and low rate of change. Programming of alarm parameters is done using Trend Manger Software <i>Update rate:</i> 200 ms for all alarms <i>Number/Type:</i> <ul style="list-style-type: none"> 4 or 8 relay contacts NO/NC, 3 A, 240 Vac/dc (non-inductive, internally suppressed) 8 I/O or 16 I/O - 1 A 24 Vdc (non-inductive, internally suppressed) <i>Activation:</i> Fully programmable internal alarm levels or rates of change. Freely assignable to any relay or discrete output.
Digital I/O (optional)	2, 8 or 16 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.
Custom Screens & Mimics (optional)	Provides the capability in the recorder to accept custom screen designs and bit maps from the Screen Designer software. Depending on the size of the screen designs, up to 10 screens can be loaded into the recorder memory.
Event Marker (optional)	User defined process events are recorded and can be set to cause particular recorder actions. Events can consist of recording start/stop, digital inputs, user key press, totalizing 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, totalizing actions, triggering other event. Each event marker can be recorded to disk for analysis using the TrendManager Software Suite. Event Markers required when using the RS232 ASCII port to input bar code messages.
Transmitter Power (optional)	200mA @ 24 Vdc ± 3 Vdc.
Communications (optional)	RS485 supporting Honeywell Trendbus Protocol. Trendbus is used in conjunction with TrendServer Pro Ethernet 10 Base –T connector supporting Real time Trendbus, Modbus, FTP protocol, Internet, e-mail Ethernet 10 Base –T connector/RS485 Trendbus/RS232 ASCII – Ethernet support Real time Trendbus, Modbus, FTP protocol, Internet, e-mail, RS485 supports Trendbus protocol, RS232 supports bar code input (Event Marker option required to enter bar code messages) RS485 (4-wire) supporting Modbus RTU protocol

Analog Outputs (Re-transmission) (optional)	2 or 4 re-transmission outputs available; each output is driven by a pen. Analog inputs, totalized values or any mathematical result can be re-transmitted. <i>Update Rate:</i> 200 msec all channels <i>Type:</i> 4 mA to 20 mA, 0 mA to 24 mA <i>Resolution:</i> 0.0015% <i>Accuracy:</i> ±0.25 % <i>Maximum Load Resistance:</i> 500 <i>Isolation:</i> 300 Vdc			
Totalizers (optional)	One totalizer per input. Totalizer value is assigned to a pen for data storage. Totalization values are ten digits plus exponent.			
Extended Security (Optional)	Provides full support for 21 CFR Part 11. Includes features for entry of unique User ID's and associated passwords, timeout of password entry (1 to 10 min.), password expiration (1 to 190 days), up to 20 users, password re-entry lock out for incorrect entry of password more than 3 times, no re-use of passwords (programmable 4 to 12 times), tracibility by user name			
Agency Approval	CE Mark Standard, CSA (Optional) Certificate Number L101284, UL (Optional) File # 201698			
Math Algorithms	All analog input channels have a math expression block. This is a fully user programmable 250 character free form math expression for each pen. Math calculations available on all pens, with 16 extra pens. Standard Math includes Add, Subtract, Multiply, and Divide.			
Math Algorithms (Optional)	Math Expressions			
	Square	Square root	Modulus	Log
	LN (natural log)	Lowest	Highest	Round
	Reciprocal	Absolute	Totalized	Over
	Under	Inside	Outside	SIN
	COS	TAN	°F to °C	°C to °F
	Rolling Average	Delay	Index Analog	Index Digitals
	Index Relay Output	Evaluate	Exponential	Floor
	Ceiling	Cold Junction Comp.	Counter Alarms	Counter Digital
	Counter Events	Counter User	Root	Power
	ACOS	ASIN	ATAN	SINH
	COSH	TANH	ASINH	ACOSH
	ATANH	AL (Alarm Status)		
TDC Trend Recorder Connector	Optional rear cover with 50-pin connector for direct connection of recorder. TDC2000/3000 system using Vutronik Trend Recorder, 24Vdc Instrument Power only.			
Miscellaneous	Customer ID Tagging (3 lines of up to 22 characters each line)			
Environmental and Operating Conditions				
Parameter	Reference	Rated	Extreme	Transport and storage
Ambient Temperature	67 °F to 77 °F 19 °C to 25 °C	58 °F to 104 °F 15 °C to 40 °C	32 °F to 122 °F 0 °C to 50 °C 0 °C to 40 °C (Floppy)	-14 °F to 140 °F -10 °C to 60 °C
Relative Humidity (%RH)	50 to 65*	10 to 90*	5 to 90*	5 to 95*
Vibration				
Frequency (Hz)	0	0 to 70	0 to 100	0 to 100
Acceleration (g)	0	0.1	0.2	0.5
Mechanical Shock				
Acceleration (g)	0	1	5	20
Duration (ms)	0	30	30	30
Mounting Position from Vertical				
Tilted Forward	5°	20°	25°	Any
Tilted Backward	5°	20°	25°	Any
Tilted to Side (±)	5°	20°	25°	Any
Power Requirements				
Voltage (VRMS)	119 to 121	90 to 250	90 to 250	N/A
Frequency (Hz)	49.8 to 60.2	47 to 440	47 to 440	N/A
Power Consumption	50 VA maximum			
Warm Up	30 minutes minimum			

* The maximum rating only applies up to 104 $^{\circ}\text{F}$ (40 $^{\circ}\text{C}$). For higher temperatures, the RH specification is de-rated to maintain constant moisture content.

Application Software – TrendManager Pro V5 Software Suite

TrendViewer software is available at no charge when ordering any recorder; it allows the user to view, graph and print data.

TrendManager Pro is a stand-alone package that delivers to the user total recorder configuration, simulates the recorder's performance on the PC, and archives, graphs, prints and exports data. Full data graphing, archiving and export tools are included.

Minimum System requirements for TrendViewer and TrendManager Pro:

- 200 MHz Pentium processor or higher
- 3.5" Floppy disk drive
- CD-ROM drive
- Monitor recommended screen resolution 800 x 600 minimum requirement, high color
- Windows 98SE, 2000, ME, XP, NT ver. 4.0 with Service pack 6, onwards
- 32 Mbyte of RAM (64 Mbyte recommended)
- 10 Mbyte free hard disk space
- A mouse

TrendServer Pro is a fully network aware package, which allows data viewing, archiving and communications. The recorder uses a

RS485 network or can access them directly with the recorder's own Ethernet TCP/IP port. Standard kit includes data archive tools plus E-mail, graph, print import and export data facilities.

Minimum System requirements for TrendServer:

- 450 MHz Pentium processor or higher
- CD-ROM drive
- Monitor recommended screen resolution 1024 x 768 minimum requirement, high color
- 2 Gbyte Hard-drive free disk space
- Windows 98SE, 2000, ME, XP, NT ver. 4.0 with Service pack 6, onwards
- 64 Mbyte of RAM
- TCP IP installed
- A mouse

TrendServer Pro with Comms Server provides the same functions as the TrendServer Pro but includes the added function of an integrated Comms Server to allow easy interfacing to third party HMI software packages that support an OPC Client. This provides a real-time interface between servers and clients.

Screen Designer enables the customers to design unique display layouts for transfer to the recorder's screen. Screen layouts can be created using any combination of indicators such as trending Charts, Digital Panel Meters (DPM), Bar graphs, Bitmaps, Digital pictures and Plant diagrams. Flexibility allows each type of indicator to have elements of its appearance changed to create an individual presentation.

The **Screen Designer** software design package is compatible with **Minitrend V5** and **Multitrend Plus V5** recorders allowing layouts to be transferred on to single or multiple recorders. This contributes to continuity and standardization of process data.

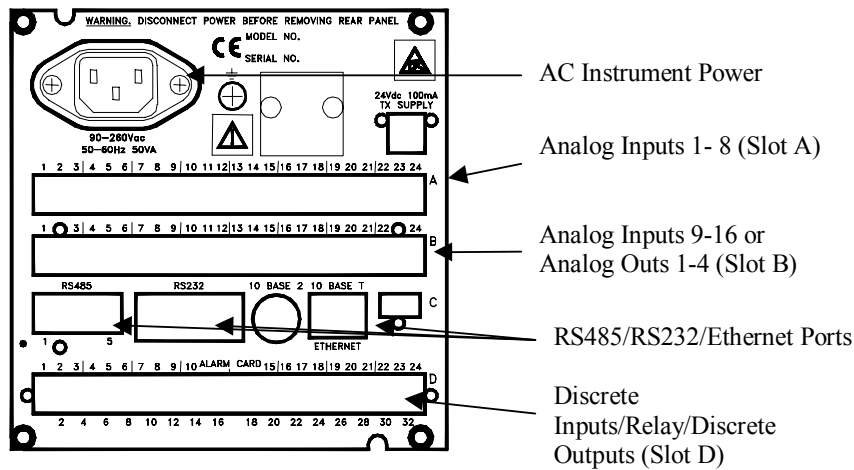
Minimum System requirements for Screen Designer:

- 200 MHz Pentium processor or higher
- 3.5" Floppy disk drive
- CD-ROM drive
- Windows 98SE, 2000, ME, XP, NT ver. 4.0 with Service pack 6, onwards
- 32 Mbytes of RAM (64 Mbytes recommended)
- 16 bit color graphics (24 bit recommended)
- 10 Mbytes free hard disk space
- A mouse

Trend Manager Suite Comparison

Features	Trend Viewer	Trend Manager	Trend Server
Full Configuration of any recorder on PC		*	*
Import data from disk	*	*	*
Print all graph data and recorder configurations	*	*	*
Archive data on secure databases	graph data only	*	*
Graph all data, including ideal vs actual batch comparison		*	*
E-mail recorder configurations and data on WWW		*	*
Upgrade available over WWW	*	*	*
Export using CSV format		*	*
Export using OPC links			*
Communicate with up to 256 recorders on RS485			*
Communicate with recorders using Ethernet TCP/IP			*
Distribute recorder data over plant-wide LAN			*
FTP/IP and Real time Ethernet connection			*
Fuzzy logging		*	*
Events System		*	*
Password protection			*
Web browse a recorder			*
Send setup to recorder via Ethernet			*
Audit trail manager			*

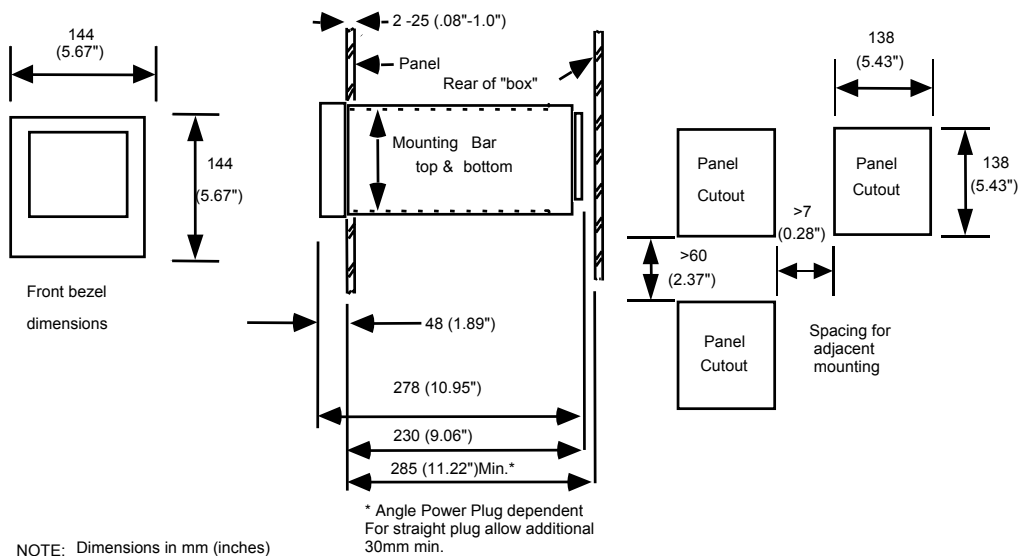
<u>Key number</u> Minitrend V5 Electronic Data Recorder	
<u>Table I - Analog Inputs</u> <u>Number of Inputs</u> 4 4 _ 6 6 _ 8 8 _ 12 A _ 16 B _ Eight Linear Inputs L _ Sixteen Linear Inputs M _ <u>Input Type</u> Universal (T/C, RTD, mV, mA) _ 0 Fast Scanning _ F Linear _ L Fast Scan (slot 1) & Universal (slot 2) _ M	
<u>Table II - Discrete Inputs/Outputs & Analog Outputs</u> <u>Discrete Inputs/Outputs</u> None 0 _ 4 Relay Outputs 4 _ 8 Relay Outputs/2 Digital Inputs 8 _ 8 Discrete Outputs/8 Digital Inputs A _ 16 Discrete Inputs/16 Discrete Outputs B _ <u>Analog Outputs Type</u> None _ 0 2 Analog Outputs (not available with 32 AI) _ 2 4 Analog Outputs (not available with 32 AI) _ 4	
<u>Table III - Firmware Options</u> <u>Firmware</u> None 0 __ Math + 8 Extra Pens M __ Event Markers E __ Math + Totalizers + 8 Extra Pens C __ Math + Event Markers + 8 Extra Pen G __ Math + Totalizers + Event Markers + 8 Extra Pens A __ Math +Totalizers +Event Markers + 16 Extra Pens P __ <u>Screen Options</u> None _ 0 _ Custom Screens _ C _ Custom Screens w/8MB Ram Card _ E _ Mimics and Custom Screens _ M _ Screen Designer w/Mimics and Custom Screens _ S _ <u>Security</u> Standard __ 0 Extended System Security __ S	
<u>Table IV - Communications</u> <u>Communication Protocol</u> None 0 __ RS485 (Real time Trendbus) T __ Ethernet (Real time Trendbus, Web, FTP, E-mail) E __ Ethernet/RS232/485 (Real time Trendbus, Modbus, Web, FTP, RS232, Barcode) A __ RS485 Modbus Protocol M __ <u>Instrument Power</u> 90 - 240 Vac _ 0 _ 12/24 Vdc _ 2 _ <u>Transmitter Power</u> None __ 0 Transmitter Power __ P	
<u>Table V - Data Storage/Memory Card</u> <u>Data Storage</u> None 0 __ 1.44 Mbyte floppy F __ <u>Memory Card Interface</u> Memory Card interface _ 1 _ <u>No Selection</u> None __ 0	
<u>Table VI - Options</u> <u>Case/Mounting</u> Standard Panel Mounting 0 ____ NEMA4/IP65 cover C ____ Portable Case P ____ Vutronik Trend Recorder Connection V ____ <u>Documentation</u> English _ U ____ French _ F ____ German _ G ____ Italian _ I ____ Spanish _ S ____ Documentation on CD _ O ____ <u>Tagging</u> None __ 0 ____ Linen Tag _ L ____ Stainless Steel Tag __ S ____ <u>Approvals</u> None ___ 0 ___ CSA Approval ___ C ___ UL Listed ___ U ___ UL & CSA Approval ___ B ___ <u>Certifications</u> None ___ 0 ___ Certificate of Conformance (F3391) ___ B ___ Custom Calibration Test Report ___ C ___ Cert. of Conformance & Calib. Test Report ___ E ___ Validation Manual ___ V ___ Validation Manual c/w Cert. of Conf & Calib Test ___ W ___ <u>Software</u> None ___ 0 ___ TrendManager Pro ___ P ___ TrendServer Pro (Single User License) ___ S ___ TrendServer Pro w/OPC (Single User License) ___ T ___	



90 – 250 Vac Rear Panel AC power is connected via the standard configuration IEC chassis plug on the rear panel

Minitrend Recorder Back panel Layout

Minitrend Recorder Dimension Layout



WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the 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, express or implied, including those of merchantability and fitness for a particular purpose.** Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

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