

VRX180 VIDEO RECORDER

US01-6047 10/99

SPECIFICATION SHEET

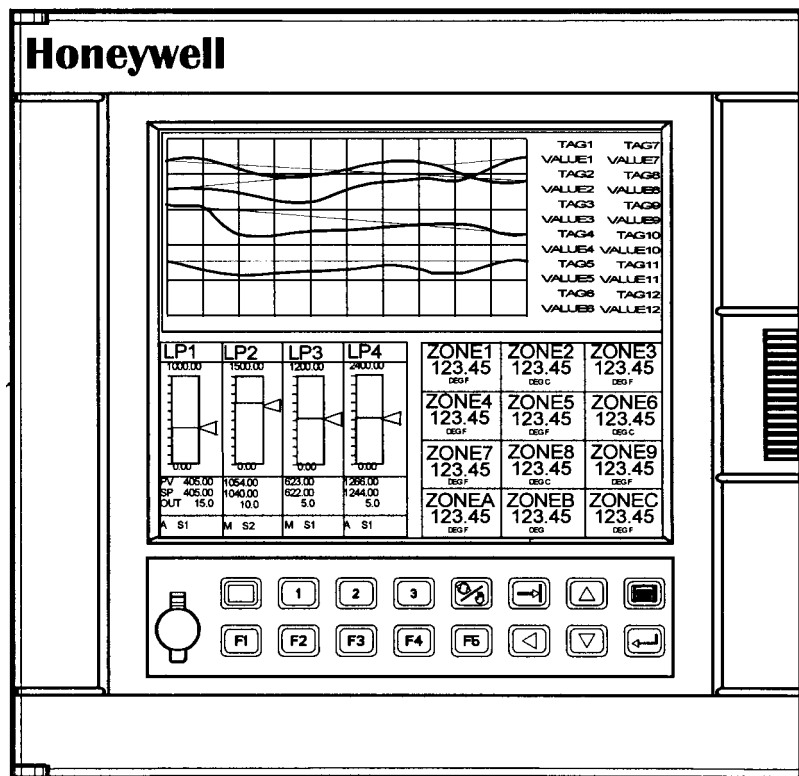
Overview

The VRX180 is a multifunction video instrument. Dedicated primarily for data acquisition, it can also perform control, program profile execution and compute advanced math calculations.

The instrument offers display versatility and a large capacity electronic data storage. This integration of several functions eliminates the need for multiple devices and reduces installation costs.

The instrument features an operator friendly interface: a large high resolution LCD color display capable of displaying up to 16 different colors simultaneously, the front door opens to allow access to data storage media, a mini DIN connector located on the front door can be used for connecting a PC keyboard or barcode reader for easy programming and labeling of parameters. Twelve panel keys control all functions of the instrument, including configuration.

Data can be directed to various display formats, stored on floppy disk, or read from an optional serial communications link. Historical data can be accessed from the instrument itself or analyzed off line on a PC.



Features

- 264 mm (10.4") diagonal color active matrix display, 640 x 480 pixels
- 3.5" 120 megabyte disk drive compatible with 1.44 megabyte floppy
- Up to 48 universal analog inputs
- Up to 64 calculations
- Up to 36 ac/dc discrete I/Os
- Up to 8 analog outputs
- Up to 8 control loops
- Fuzzy logic setpoint overshoot suppression capability to enhance control performance
- Optional setpoint programming capability
- PID, cascade, split output, and ON/OFF control strategies
- 33 primary and 13 support displays
- 96 alarm limits
- RS485 Communication Modbus™ RTU
- Retains data during power loss without batteries
- Assignable pen colors
- CE Compliant, IP55/NEMA 3 front face

Highlights

Simple to Use

Dedicated display keys and full screen menus allow the operator to easily set up the recorder and to quickly access and interpret data.

Improved Decision Making

On-line data analysis allows fast operator response during process upsets.

Meets Documentation Requirements

Permanent archived record of process and configuration data can be stored to disk and easily replayed on any VRX180 recorder or personal computer using SDA software.

Lower Cost of Ownership

Reduce maintenance costs, eliminate consumables such as chart paper and pens, while increasing reliability since no vulnerable print mechanism is present.

User Interface

The full color LCD display expands the view into your process. The 264 mm (10.4") diagonal high display resolution supports 16 simultaneous colors. Trend and bar graph displays use color to assist point identification. Numerical values can be displayed in decimal notation (e.g. 0.00001) or scientific notation (e.g. 1.0E-5). To maximize display life, a screen saver is available.

Operator displays are selected during configuration from a list of 33 formats. Dedicated display keys allow operators to quickly reach needed information. On-line menus are full screen and easy to understand.

The VRX180 supports five languages (English, French, German, Italian, and Spanish).

Buttons



Menu - Provides access to and from all setup and configuration menus.



Increment/Previous - Moves cursor up menus; increases value of selected numbers or parameters.



Decrement/Next - Moves cursor down menus; decreases value of selected numbers or parameters.



Left - Moves cursor to the left in entry fields for letters and numbers.



Enter - Executes menu and display selections (does not apply to setpoint or output entries on control loops).



Display - Successive presses access up to 10 pre-selected primary displays.



- Accesses preselected primary display #1, #2, #3.



Auto/Manual - Toggles Control Loop between Auto and Manual modes. Manual mode allows operator to manually set Control Loop output. On instruments without the control loop option, this button accesses pre-selected primary display #2.



Tab/Utility - Accesses specialized functions and menus related to the current display format.



Function keys - Act as momentary discrete inputs. Programmable by the user. These can be used to reset Totalizers, change storage rate, SP select, Sample and Hold function, Set Point Program Run/Hold, Reset plus other additional functions.

Display Formats

Operator responses are enhanced with improved presentation of data. More information is conveyed using a versatile library of 33 different primary display formats. (See Figures 2a and 2b.) These formats include time-based trends, bar graphs, unit data, panel faceplates, totalizers, alarm summary, analog summary, discrete summary, unit data, data storage, setpoint programmer, control, and process summary displays. Select any 10 during off-line configuration as primary operating displays. Dedicated display keys allow the operator to access and scroll through the displays in the order assigned. The

VRX180 allows the selection of a black or white background on all trend, bar graphs, panel and loop screens. Using an IBM® compatible QWERTY keyboard with DIN-size connector, or a barcode reader, a 16-character descriptor and 7-character tag can be assigned to each point for easy identification during on-line operation. For status indication of alarms, diagnostics, and data storage, every on-line display uses icons and text in a dedicated area at the bottom of the screen. If two or more of these indicators occur at once, they will overlay in a cascade arrangement, with data storage on top, then diagnostics, and alarms underneath.

Recording Trend Displays

Four live trends are available, each with up to 12 analog or discrete traces. Each is supported by a RAM-resident buffer which operates even if none of the files are stored to disk. Vertical or horizontal trends are available, both with pointers and alarm limit indication. Each trend trace may be displayed alongside a dedicated digital read-out or bar graph of the trend's real-time value. Trended data points may also be configured to appear in a rotating scoreboard above the trend traces. Information about each point is shown sequentially at a user-selected rate of between 1 and 60 seconds, with the color of the information matching the color of the corresponding trend trace. Trend displays have uniform time bases so the operator is presented with consistent information. Traces are updated once per second. Trace colors are selectable by the user.

Trend Display Tools

To monitor process activity, the following on-line analysis tools are available:

POINT HOLD - On trend screens featuring the rotating scoreboard, this tool temporarily halts or stops scoreboard rotation to focus on a critical point.

TIME BASE CHANGE - This tool toggles between two pre-programmed time bases to increase viewing resolution on any trend.

SCROLL (PAN) - This tool scrolls the most recent trend history without going off-line. User can move a cursor backward and forward through past trend data. An "end of data" message is shown when the oldest trend data has been reached.

ZOOM - Enhances resolution with scale change to 2x, 4x, or full span of all the points displayed. Full span shows the configured limits of the selected point.

DETAIL - Gives exact reading of any trend point, eliminating tedious and difficult manual analysis. The cursor moves in single pixel increments to select any spot along the trend trace, to view the value and time at that point.

FIND - Search for data based on a particular time and date.

Bar Graph Displays

Vertical bar graphs are available for 4, 6, 8, or 12 live point values, for up to 8 control loops, or for 2, 3, or 4 setpoint profiler parameters. Horizontal bars are available for 4 and 6 points.

Panel Meter and Unit Data Displays

These displays can be configured to show up to 12 points in any combination of analog or discrete data in tabular or list form.

4 Panel Display

This display shows 4 live values in a character size large enough to read from approximately 10 meters (33 feet) away. The display rotates through all points in the list (up to 12) at a user-selected rate (1 second to 60 seconds) or it can be stopped on any 4 consecutive points.

Data Storage Status Display

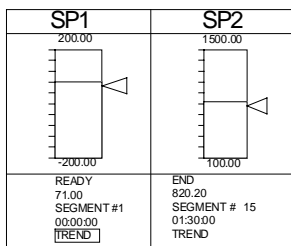
To help operators prepare for disk changes, this display gives information on the current state of the storage media. Storage information includes time remaining, samples remaining, and status of individual stored files. Disk messages and warnings also appear in the message window of every operating display.

Support Displays

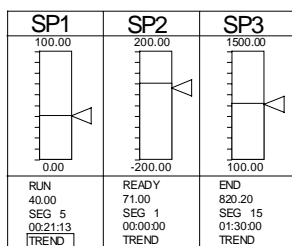
To review and modify process data, the following secondary level operating displays are accessed through the menu key.

- Diagnostic Summary
- Data Storage Setup
- Data Storage Status
- All Analog Points Summary
- All Discrete Points Summary
- Constant Values Summary
- Analog Input Value Adjustments
- DI/DO Status/Force
- Totalizer Reset
- Alarm Limits Adjustment
- Alarm Summary
- Analog Output Adjustment
- Tune Loops

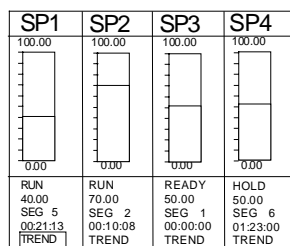
These displays can be security-protected to prevent unauthorized changes.



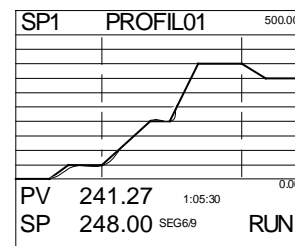
Setpoint Profiler 2 Bar Summary (SPP_2BS)



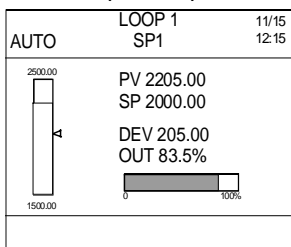
Setpoint Profiler 3 Bar Summary (SPP_3BS)



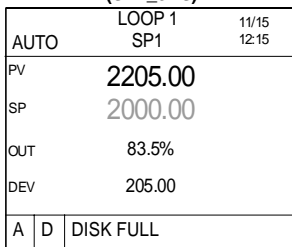
Setpoint Profiler 4 Bar Summary (SPP_4BS)



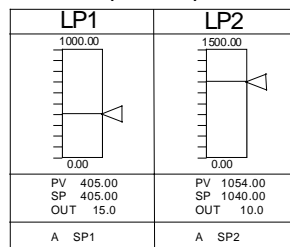
Setpoint Profiler Trend (SP_TREND)



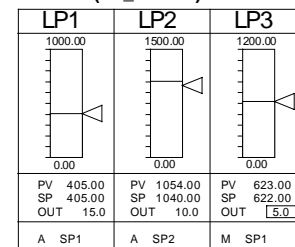
Loop with Bar Graph (LOOP_BAR)



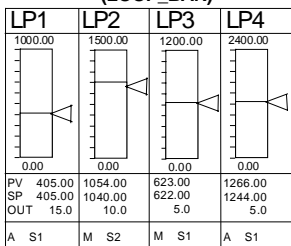
Digital Loop (LOOP_DIG)



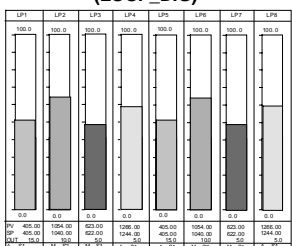
Loop 2 Bar Summary (LOOP_2BS)



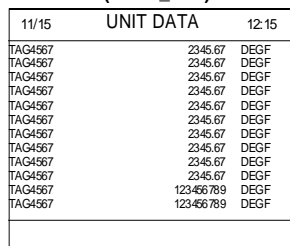
Loop 3 Bar Summary (LOOP_3BS)



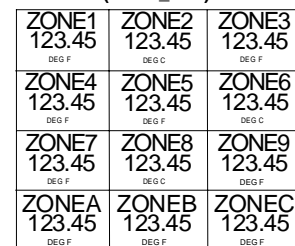
Loop 4 Bar Summary (LOOP_4BS)



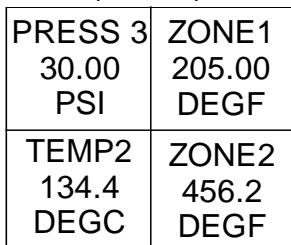
Loop 8 Bar Summary (LOOP_8BS)



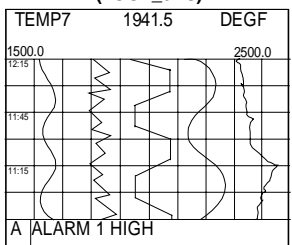
Unit Data (UNIT DATA)



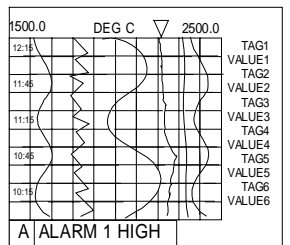
Panel Meter (PANMETER)



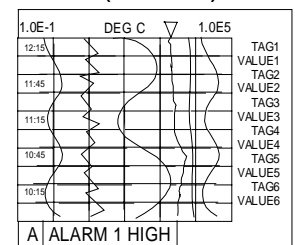
Panel Display - 4 Large Font Points (PANEL_4)



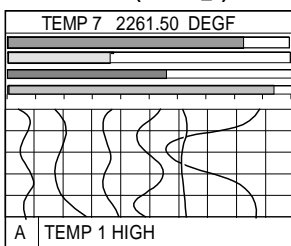
Vertical Trend (V_TREND)



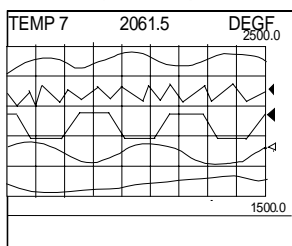
Vertical Trend Digital (VTRNDDIG)



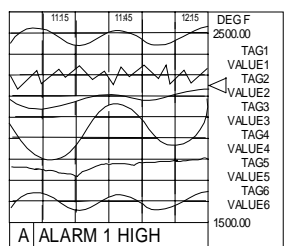
Vertical Trend-6 Division (VT_6DIV)



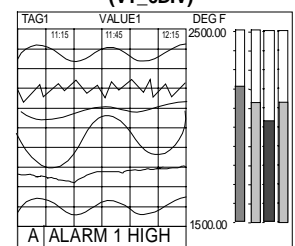
Vertical Trend w/ 4 Bar (VTRNDBAR)



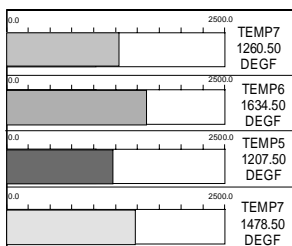
Horizontal Trend (H_TREND)



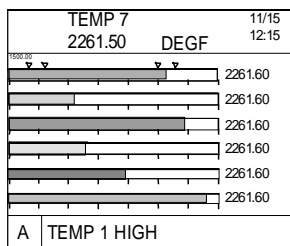
Horizontal Trend Digital (HTRNDDIG)



Horizontal Trend Bar (HTRNDBAR)



4 Point Horizontal Bar Graph (H_4_BAR)



6 Point Horizontal Bar Graph (H_6_BAR)

Figure 2a Primary Display Formats

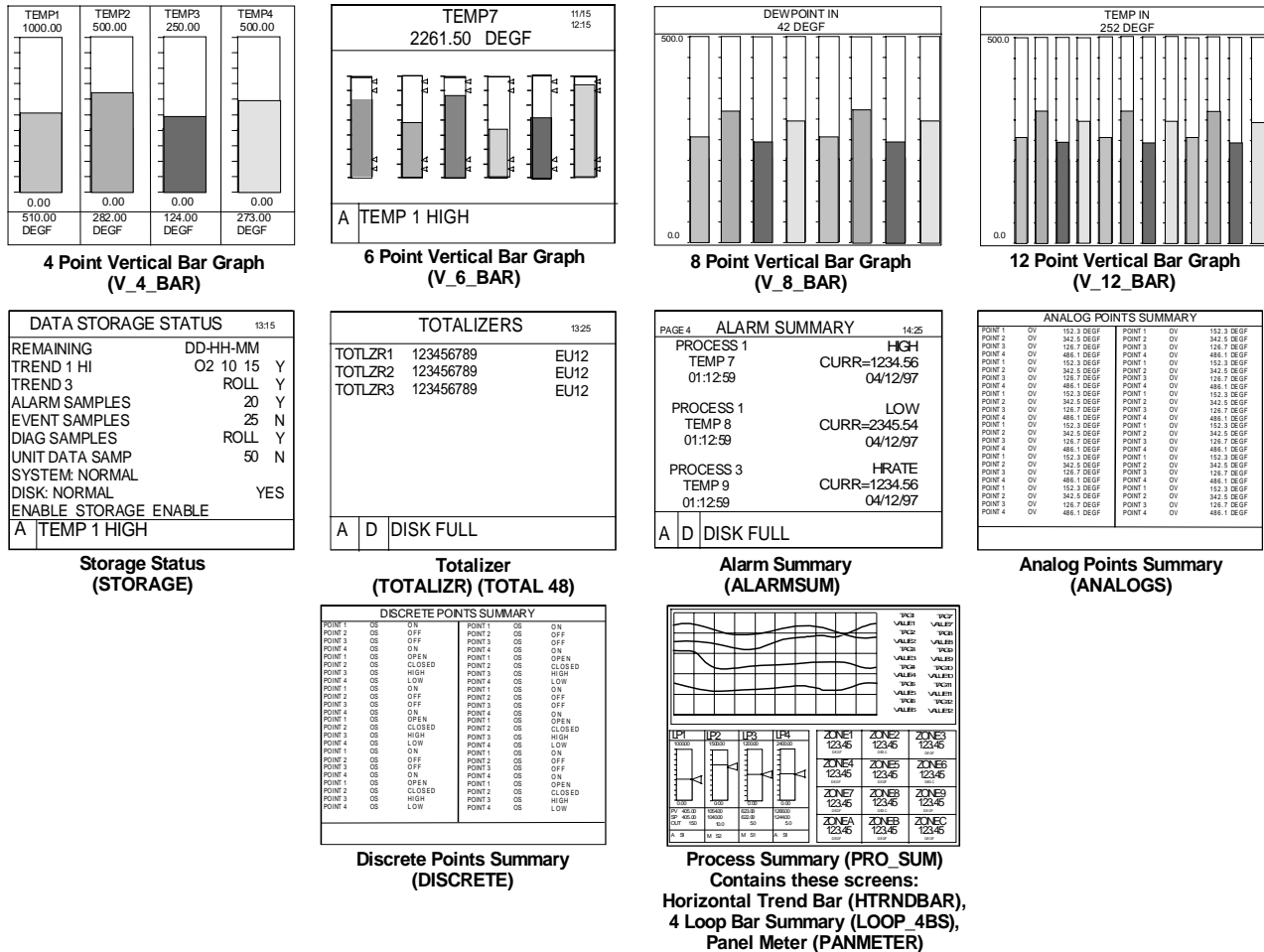


Figure 2b Primary Display Formats

Data Storage/Archiving

Standard with the VRX180 is a 3.5-inch, 120 MB floppy disk drive for storage of configurations, calibrations, programs, and data archiving and retrieval. The 120 MB disk drive is compatible with 1.44 MB floppy disk. The instrument can support both continuous and batch storage of trends, unit data, alarms, events and diagnostics. The trend data files are specified with a user-selected point list and storage rate. Available storage rates include 0.5 second through 3600 seconds. On a 2 point instrument, a 0.25 second rate is also available. Two different storage rates may be programmed into the instrument, low and high. High speed storage can be triggered by an internal event (such as going into an alarm), or by an external event (such as a discrete input switching on). Four trend files may be stored. Each file may have up to 12 points, with a maximum of 48 points across all files.

The unit data file can have up to 12 points and is stored to disk at a user-

selected time or event driven interval. As they occur, alarms, events and diagnostics are stored to a designated area of the disk.

Data storage may be started or stopped from:

- VRX180 Keypad
- External discrete triggers
- Internal discrete status triggers
- Alarm, math

Total disk capacity (in time) is calculated and displayed once all storage configuration is completed. This eliminates the need for manual calculations and gives the operator the disk capacity of the selected configuration. A disk full warning level may be entered to trigger a message whenever storage capacity is above this level.

Recorded trends and unit data may be replayed on the instrument display or on a personal computer using the Honeywell SDA data analysis software package. Data records are coded on the disk in a way to preserve their integrity. The stored data can be

displayed on PC by using the SDA software. Data files may then be printed from the computer in whatever format is required. An export utility in SDA makes it possible to convert data files collected by the VRX180 into formats recognized by most commercially available spreadsheet programs (.DIF, .CSV).

Historic Trends

The layout of retrieved historic trends is identical to that of live trends. Upon playback, the operator is prompted to select a time base in which to review the data. Once brought to the screen, features for analysis are similar to those for live trends; that is, scroll (pan), zoom, compress, and detail. During this activity, the operator may choose to view an entire file, or only a portion based on a start and stop time and date. This saves time and allows the operator to focus on only the relevant information.

SDA software provides off-line data analysis for reviewing process data stored on the instrument's disk. The software runs on any personal computer

operating in the Microsoft® Windows® environment. An external 120 MB floppy disk can be connected to the PC if it is not available internally.

Control

The VRX180 supports the following control algorithms:

- Standard PID
- Advanced PID
- Cascade (Primary/Secondary)
- Split Output (Heat/Cool)
- ON/OFF
- Ratio
- Position Proportioning (future)

The following Control Output types are available.

1. **Current Adjusting Type [CAT]** - Used for PID control or for retransmitting inputs or profiler setpoints.
2. **Duration Adjusting Type [DAT]** - Used for time proportioning control.

For tuning, a display (Figure 3) is provided to plot process variable over a user selected time base. This will assist the operator in locating optimum tuning parameters for the loop.

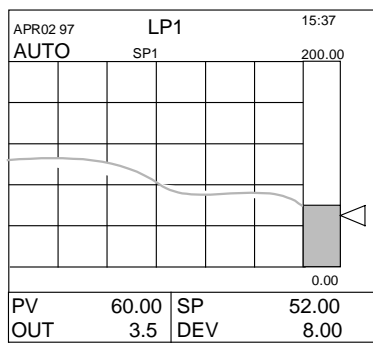


Figure 3 Loop Tuning Display

Control loop performance may be enhanced by engaging the setpoint overshoot suppression feature. Developed using principles of fuzzy

logic, the overshoot suppression algorithm reduces setpoint overshoot and works to complement controller behavior set forth by PID tuning constants. Improved responsiveness to load changes or process upsets and better loop efficiency are cost saving benefits that are realized when fuzzy overshoot suppression is used with loop operation.

Calculated Values

On-line data manipulation saves time and enhances analysis capabilities. Several built-in algorithms are available to customize specific applications. With full screen and easy to understand menus, configuration is simple. Up to 64 calculated variables can be configured. Calculations accept analog or discrete inputs from external sources or can be linked to internal values, constants, and status.

Totalizers

In addition to calculated values, up to 48 nine-digit totalizers are available. Both analog inputs and calculated variables may be used as the inputs to the totalizers. Reset can be done through the keypad, from an external discrete input, from an internal status, or locked for no reset.

Alarm Capabilities

Up to 96 alarms are available which can be assigned to any analog input or calculation. Each function may be configured as:

- High limit value exceeded
- Low limit value exceeded
- Increase rate of change limit exceeded
- Decrease rate of change limit exceeded
- Deviation value limit exceeded

Alarm functions may be configured to drive relay outputs directly, or they may be connected in an AND or an OR arrangement using internal logic. Alarms may also activate high speed storage, alternate time base on trend display, or storage of unit data.

Present on every on-line display is a dedicated alarm status area which gives indication of active alarms. For increased visibility, the instrument offers an alarm summary display which gives more detailed information on all active alarms.

Analog Input/Output

Up to 48 universal analog inputs are available and capable of accepting thermocouple, RTD, millivoltage, voltage, milliamp (via 250 ohm shunt resistor), and Honeywell pyrometer signals. Scan rates: examples 4 or less inputs run at 250 ms; 12 or less inputs run at 500 ms; 24 run at 1 second. All alarms, events, calculations, and totalizers associated with instrument operation are monitored/executed at these same rates.

All analog inputs are provided with:

- Lag - dampens unstable measurements
- Hold - accepts a discrete input to freeze current value
- Failsafe Action - causes upscale or downscale action for open or breached input signal sources.

Up to 16 analog outputs are available for control or re-transmission. Analog outputs can be 4 mA to 20 mA Current Adjusting Type (CAT). See **Control** for other analog output types.

Discrete Input/Output

All discrete signals can be logically linked for use as interlocks and security checks. Discrete states can be identified from a library of labels for use in displays.

Discrete inputs can be used to trigger a number of actions associated with profiler and control loop execution, math calculations, or data storage.

Discrete outputs can be used to provide external indication of an internal event, status, calculation, or an alarm. The operator can force them into open or closed state. They are also used in Duration Adjusting Type (DAT) control outputs or on/off control outputs.

Configuration

Configuration is performed while the instrument is off-line, all operations are suspended, and all outputs are held constant. Changes may be password protected. Complete instrument configuration can be achieved in three ways:

- Developed through the keypad using a series of menu selections as an easy guide. A copy may be saved on floppy disk using the instrument keypad.
- An IBM® QWERTY keyboard may be connected for easier text and label entry.
- Developed on a personal computer using Honeywell SCF Configuration Software. It can then be manually transferred by floppy or communications link to one or more instruments.

Non-Volatile Storage

To ensure operational integrity, the instrument's buffers will preserve key RAM-resident data for a maximum of 1.5 hours after power loss. Preserved data includes trends, alarms, events, diagnostics, storage, and function block values. If power is off for a longer period of time, worst case loss of data storage information will only be one minute, the archiving disk update time.

Configuration and calibration data is supported with permanent non-volatile storage.

Communication Ports

The instrument accommodates RS422/485 serial communication. This feature supports access to all on-line, setup, and configuration parameters in the instrument. All these functions may be performed from a PC using the appropriate software packages. The VRX180 supports Modbus™ RTU communications protocol.

Software

The software packages SDI, SDA, SCF, and PlantScape™ Vista are offered for use with the VRX180 and are designed to operate under Microsoft® Windows® in any IBM® compatible personal computer.

Honeywell SDI is used on the PC for initialization of new LS120 disks.

Honeywell SDA (Data Analysis) - Allows off-line analysis of historical data from floppy disk. This includes horizontal and vertical trend displays, X-Y plots, simultaneous display of multiple trend files, split screens to compare two trend displays, panning (scrolling), value and box zooming, compression. Data can be converted to DIF or CSV for use in

commercial spread sheet and word processing packages.

Honeywell SCF (Configuration) - Allows complete off-line instrument configuration using fill-in-the-blank templates. This information can then be transferred to one or more instruments over a communication link. It can also be transferred onto a floppy disk. The disk can then be loaded into one or more instruments.

PlantScape Vista - The Honeywell PlantScape Vista system can be used for real-time data acquisition from any device connected on a communication link.

Security

A 3-digit code may be assigned to operating menus to protect against unauthorized changes. Access to all set-up, maintenance and configuration may be security code protected.

Bar Code Capability

The VRX180 lets you scan in equipment tags and descriptors by bar code, saving time over entering them manually through the instrument's keys. You can also scan bar codes to store the scanned information in an event file.

Table 1 VRX180 Video Recorder Specifications

Physical	
Enclosure	Metal case and rugged die cast aluminum door and frame. High impact resistant polycarbonate keypad and glass or polycarbonate window. IP55 rating (NEMA 3) from front of panel.
Mounting (Panel)	1.52 mm to 20 mm (0.06" to 0.8") thickness
Dimensions	<i>Compact size:</i> 320 mm (12.60") depth 310 mm front face height x 317 mm width (12.21" x 12.48") 278 mm x 278 mm (10.95" x 10.95") cutout
I/O Ports Standard	PC keyboard connector (6-pin mini DIN type) – on front panel. May be used to connect to a QWERTY keyboard or to an ASCII bar code reader.
Environmental	
Temperature	<i>Operating:</i> 5 °C to 40 °C (41 °F to 104 °F). <i>Storage:</i> –20 °C to 70 °C (–4 °F to 158 °F). <i>Relative Humidity:</i> 10 % to 90 %, non-condensing at 40 °C.
Altitude	< 2000 meters
Installation Category	II
Pollution Degree	2
Power	Universal power supply, 85 Vac/dc to 250 Vac/dc, 100 VA maximum
Fuse Rating	3.15 A / 250 Vac, slow blow
Attributes	
Display	<i>Type:</i> Color LCD active matrix. <i>Screen Size:</i> 264.2 mm (10.4") diagonal <i>Resolution:</i> 640 x 480 pixels. <i>Update Rate:</i> 1 second. <i>Trend Timebase:</i> 5 min to 24 hr/screen; 0.5 cm/hr to 154 cm/hr vertical, 0.8 cm/hr to 250 cm/hr horizontal.
Keys	16 membrane switches.

Table 1 VRX180 Video Recorder Specifications (continued)

Attributes (continued)					
Data Archiving	<i>Media:</i> 3.5" floppy disk, 120 Megabytes. Disk driver compatible with 1.44 MB floppy disk. <i>Data Types:</i> Analog points, calculations, discrete status, alarms, diagnostics. <i>Trends:</i> 4 groups (up to 12 channels each). <i>Unit Data:</i> 1 (up to 12 points, 10,000 records) (Unit Data and Trend Points combined: ≤ 18 points.) <i>Alarm History:</i> Up to 65,536 records <i>Event History:</i> Up to 65,536 records <i>Diagnostic History:</i> Up to 65,536 records <i>Storage Rate Range:</i> 0.25 to 3600 sec.				
	Total Channels	Channels per Group	Storage Rate		
			5 seconds	10 seconds	30 seconds
	8	2	2.2 months	4.5 months	1.1 year
	12	3	1.7 month	3.4 months	10.3 months
	24	6	1 month	1.8 month	6 months
48	12	15 days	1 month	3 months	
Examples of estimated disk capacity					
Control Loops	<i>Number:</i> Up to 8 <i>Type:</i> PID, On/Off, Cascade, Split Output, Ratio				
Auto Tune	<ul style="list-style-type: none">Each loop can be pre-tuned automatically to establish acceptable tuning parameters.On-line fuzzy overshoot suppression				
Setpoint Program Capability					
Number	Up to 4 programmers capable of up to 63 segments per profile				
Ramping Capability	Ramp X - Ramp rate is set by specifying x degrees per second, per minute, or per hour.				
	Ramp T - Ramp rate is set by selecting the time to go from previous setpoint to next setpoint in t time.				
	Ramp E - Ramp rate is set to increment by ΔSP for every pulse of a digital input.				
	Value Duration Ramp - Ramp rate is based on the start value of the ramp and the time specified to reach the next soak start value.				
Ramp Time Range	0-9,999,999 hours, minutes, or seconds.				
Soak	Guaranteed or non-guaranteed. Can be applied to ramp or soak segment or across entire profile/program.				
Soak time range	0-9,999,999 hours, minutes, or seconds.				
Program Cycling	Entire programs or portions of a program can be cycled up to 99 times. Loops can be nested at least 4 deep.				
Startup/Shutdown Segments	Can be set up to use a predefined startup profile separate from the normal processing programs. Shutdown profile can be attached to the end of a profile and can be jumped to for emergency shutdown.				
PV Hot Start	Can start the profile at the point where the present PV value first intersects the profile.				
Batch Programming	1 to 255 Batch numbers. Batch number is assigned by the programmer and is incremented automatically when batch is started. Using a keyboard or bar code reader and the front keyboard connector, a batch can be labeled with a name of up to 8 characters.				
Profile Events	Up to 16 events can be defined in each segment of a profile. Each event's state is activated at the beginning of the segment and is held throughout the segment.				

Table 1 VRX180 Video Recorder Specifications (continued)

Universal Analog Inputs		
Number	4 per module, up to 12 modules per video recorder.	
Input Types	mV, V, mA, T/C, RTD, pyrometers.	
Signal Source	Thermocouple with cold junction compensation Line resistance up to 1000 ohms, T/C, mV, mA, V RTD Pt 100 ohms, 3-wire connections, 40 ohms balanced maximum	
Input Impedance	10 megohms for T/C and mV inputs; >1 megohm for volt inputs	
Input Isolation	400 Vdc point-to-point 1350 Vac RMS A/D converter to logic	
Stray Rejection	Series mode > 60 dB. Common mode at 120 Vac > 130 dB.	
Burnout	T/C, mV, V (except following ranges) configurable to upscale, downscale, or <i>Volt</i> : −500 mV to 500 mV; −1 V to 1 V; −2 V to 2 V; −5 V to 5 V; 0 V to 10 V; −10 V to 10 V; inherent to zero volt <i>RTD</i> : Inherent upscale <i>mA</i> : Inherent downscale	
T/C Break Detection	Via current pulse	
Scanning Rate	4 channels: 250 msec 12 channels: 500 msec 16 channels: 750 msec 24 channels: 1000 msec 32 channels: 1500 msec 48 channels: 3000 msec	
A/D Converter Resolution	Better than 1 part in 50,000 at 50 Hz Better than 1 part in 41,667 at 60 Hz	
Analog Outputs		
Number	4 per module (non-isolated), up to 2 modules per video recorder (8 outputs)	
Type	Current output configurable within 0 mA to 20 mA – Maximum load: 400 ohms per output.	
Isolation from Logic	350 Vac RMS	
Accuracy	Factory configured accuracy = 0.15 % at reference conditions Field calibration accuracy = 0.05 %	
Temperature Effects	0.1 % per 10 °C in the rated limits	
D/A Resolution	16 bits	
Digital Inputs		
Number	AC Inputs	DC Inputs
	6 per module, up to 6 modules per video recorder	6 (sink/source) per module, up to 6 modules per video recorder
Input Voltage Range	80 Vac to 264 Vac	10.2 Vdc to 26.4 Vdc
Peak Voltage	264 Vac	26.4 Vdc
AC Frequency	47 Hz to 63 Hz	N/A
ON Voltage Level	75 Vac minimum	9.5 Vdc minimum
OFF Voltage Level	20 Vac maximum	3.5 Vdc maximum

Table 1 VRX180 Video Recorder Specifications (continued)

Input Impedance	51 K	5.6 K
Input Current	0.9 mA @ 100 Vac	1.1 mA @ 12 Vdc 3.2 mA @ 24 Vdc
Minimum ON Current	0.3 mA	0.3 mA
Maximum OFF Current	0.15 mA	0.2 mA
Base Power Required*	50 mA maximum	50 mA maximum
OFF to ON Response	5 ms to 30 ms	1 ms to 8 ms
ON to OFF Response	10 ms to 50 ms	1 ms to 8 ms
Logic Inputs		
Number	6 (dry contact) per module, up to 6 modules per video recorder.	
Switching Voltage	5 Vdc	
Switching Current	5 mA	
Digital Outputs		
Number	AC Outputs	DC Outputs
	6 per module, up to 6 modules per video recorder	6 (current sinking) per module, up to 6 modules per video recorder
Operating Voltage	15 Vac to 264 Vac	10.2 Vdc to 26.4 Vdc
Output Type	SSR (Triac)	NPN open collector
Peak Voltage	264 Vac	40 Vdc
AC Frequency	47 Hz to 63 Hz	N/A
ON Voltage Drop	< 1.5 Vac (> 0.1A) < 3.0 Vac (< 0.1A)	1.5 Vdc maximum
Maximum Load Current	0.5 A per point	0.3 A per point
Maximum Leakage Current	4 mA (264 Vac, 60 Hz) 1.2 mA (100 Vac, 60 Hz) 0.9 mA (100 Vac, 50 Hz)	0. mA @ 40 Vdc
Maximum Inrush Current	10 A for 10 ms	1 A for 10 ms
Minimum Load	10 mA	0.5 mA
Base Power Required*	20 mA/ON pt. 250 mA maximum	120 mA maximum 5 V
OFF to ON Response	1 ms	1 ms
ON to OFF Response	1 ms + 1/2 cycle	1 ms
Fuses (European Type 5 x 20 mm)	1 per output, 1.0 A slow blow	1 per output 1A fast blow
Relay (Alarm) Outputs		
Number	6 per module, up to 6 modules per video recorder	
Contact Rating	2 A, 250 Vac on resistive load	
Contact Type	SPST normally open (NO), individually configurable to normally closed (NC) via jumper	
Time Proportional Outputs (TPO)		
Time Resolution	4 msec	
Module	Any digital output may be configured.	
Synchronization	Individual TPOs are not synchronized with others	

*Base power required is the power required to provide module operation within specifications.

Table 1 VRX180 Video Programmer Recorder Specifications (continued)

Performance/Capacities			
Math Calculations	Standard Math package includes: 24 Calculated Values along with the following Math functions: Free Form Math, Math Operators (+, −, x, ÷, Absolute Value, Square Root, Std. Deviation), Free Form Logic, Logic Operators (AND, OR, XOR, Inverter, Flip Flop, One-Shot), Inverter algorithms.		
	Advanced Math package includes: 64 Calculated Values with the functions from Standard Math along with the following types of pre-packaged algorithms: Signal Select, Compare, Signal Clamp, Periodic Timer, Interval Timer, Counter, Relative Humidity, Standard Splitter, Scaling.		
Constants	32		
Alarms	96 alarm setpoints		
Totalizers	0, 4 or 48 (optional)		
Control Loops	Up to 8 (PID, ON/OFF, Cascade, Split, Ratio).		
Communications (optional)	Type: Modbus™ RTU protocol Connection/Distance: RS232 (25-pin) 25 feet RS422 1 twisted pair 2000 feet RS485 2 twisted pair 2000 feet Number of links: Up to 30 Baud Rate: 1200, 2400, 4800, 9600, 19.2K, 38.4K, 76.8K. Parity: Selectable; odd, even, none.		
Analog Inputs Accuracy and Rated Limits			
Accuracy	Reference Conditions	Temperature: 23 °C ± 2 °C (73 °F ± 3 °F) Humidity: 65 % RH ± 5 % Line voltage: Nominal ± 1% Source resistance: 0 ohm Series mode and common mode: 0V Frequency: Nominal ± 1 %	
	Accuracy	Field calibration accuracy 0.05 % of the selected range (IEC 873) Factory calibration at ± 0.1 % Cold junction accuracy: ± 0.5 °C	
Rated Limits and Associated Drifts	Parameters	Rated Limits	Influence of Accuracy
	Temperature	0 °C to 50 °C (32 °F to 120 °F)	0.15 % per 10 °C of change (Note A) Cold junction: 0.3 °C/10 °C
	Supply voltage	85 V to 250 V	No influence
	Source resistance	T/C, mV	6 µV per 400 ohms of line resistance maximum = 1000 ohms
		RTD	0.1 °C per ohm in each wire balanced leads 40 ohms maximum (from 0 °C to 400 °C)
	Humidity	10 % to 90 % RH at 25 °C	0.1 % maximum
	Long-term stability		0.1 % per year

Analog Input Ranges

Linear Types

Millivolts 0 to 10 −10 to +10 0 to 20 −20, 0, +20 0, 50 −50, 0, +50 10 to 50 0 to 100 −100, 0, +100 0 to 500 −500, 0, +500	Volts 0 to 1 −1, 0, +1 0 to 2 −2, 0, +2 0 to 5 −5, 0, +5 1 to 5 0 to 10 −10, 0, +10	Current 0, 20 mA 4, 20 mA Ohms 0 to 200 0 to 2000
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Analog Input Ranges (continued)

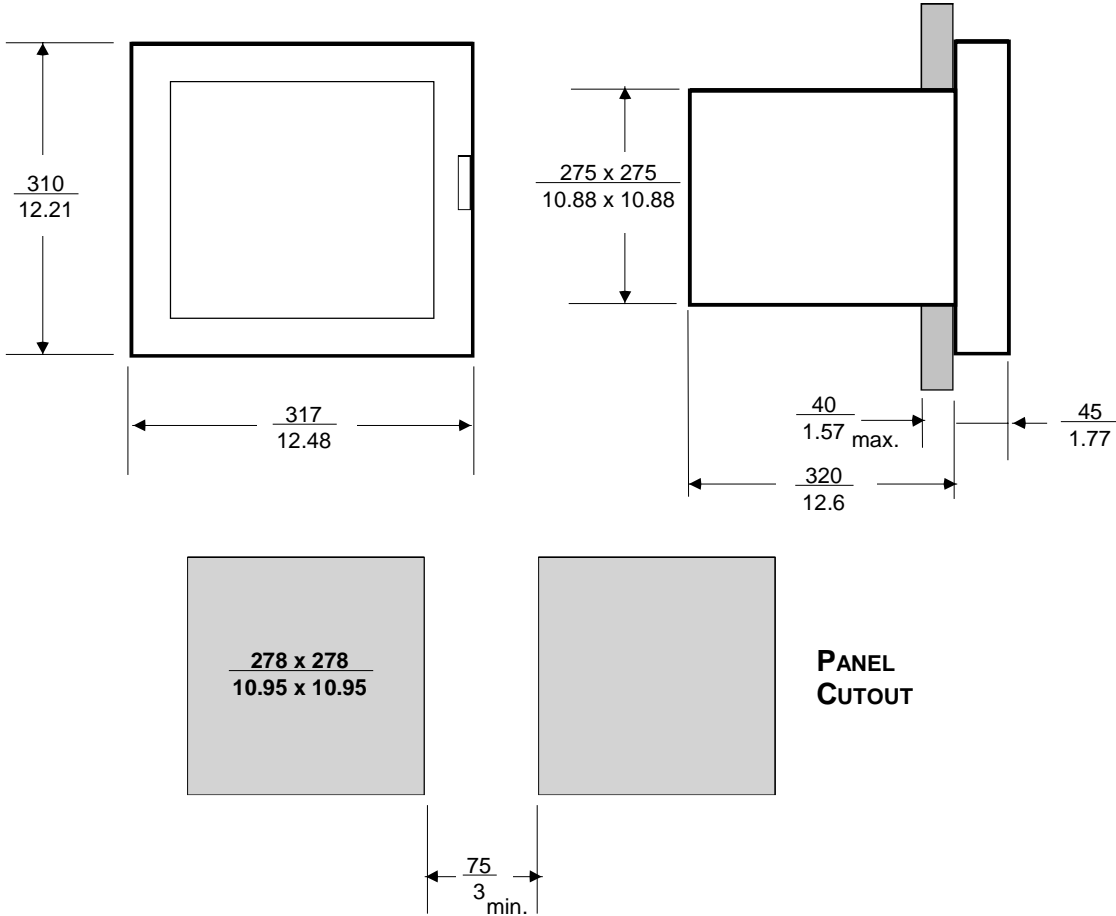
Non-Linear Types

Thermocouples	°C	°F
B (total range)	43 to 1816	110 to 3300
B (reference range for accuracy)	400 to 1816	752 to 3300
E	−268 to 999	−450 to 1830
J	−18 to 1199	0 to 2190
K	−18 to 1371	0 to 2500
N	−18 to 1300	0 to 2372
Ni-Ni-Mo	0 to 1372	32 to 2502
PLAT II	−73 to 1371	−100 to 2500
R	−18 to 1766	0 to 3210
S	−18 to 1766	0 to 3210
T	−184 to 400	−300 to 752
W5W26 (total range)	−18 to 2316	0 to 4200
W5W26 (reference range for accuracy)	0 to 1800	32 to 3272
RTD Note A	°C	°F
PT100 IEC	−184 to 854	−300 to 1570
CU10	−73 to 154	−100 to 310
Pyrometry (Rayotube and Spectray) Types	°C	°F
18890-3302	399 to 871	750 to 1600
18890-0073	427 to 982	800 to 1800
18890-0074	594 to 1260	1100 to 2300
18890-0035	649 to 1426	1200 to 2600
18890-0412	747 to 1648	1375 to 3000
18890-0075	816 to 1815	1500 to 3300
18890-1729	899 to 1982	1650 to 3600
18890-00643	1010 to 2204	1850 to 4000
18890-0216	1155 to 2537	2110 to 4600
18890-5423	1210 to 2760	2210 to 5000
18890-0163	94 to 537	200 to 1000
18899-8814	172 to 982	340 to 1800
18894-9014	400 to 1400	752 to 2552
18894-0579	400 to 1400	752 to 2552
Spectray 18885	1000 to 1900	1832 to 3452
Spectray 18885-1	700 to 1600	1292 to 2912
Spectray 18885-2	430 to 760	806 to 1400
Spectray 18886	1001 to 1900	1833 to 3452
Spectray 18886-1	700 to 1600	1292 to 2912
18874-0578	400 to 1400	752 to 2552
18875-0579	400 to 1400	752 to 2552

NOTE A: t° influence: 0.5 % per 10 °C on Cu10 ohms, 0.3 % per 10 °C on Pt 100 ≤ 200 °C

- For non-linear temperature transmitter, the transmitter range MUST be identical to the input range of the recorder.
- The mA input has to be connected on a 250 ohm resistor across the input terminals.
- Pyrometry: typical accuracy 0.1 % of the range

Dimensions



Distributor

Honeywell

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