

VISION 130™

Palm-size, powerful PLC with built-in, black & white LCD 3.5" graphic display, keypad, & onboard I/O configuration, expand up to 256 I/Os

Features:

HMI

- 1024 user-designed screens
- 400 images per application
- HMI graphs & Trends
- Built-in alarm screens
- Text String Library - easy localization
- Memory and communication monitoring via HMI - No PC needed

PLC

- I/O options include high-speed, temperature & weight measurement
- Auto-tune PID, up to 24 independent loops
- Recipe programs and datalogging via Data Tables
- Micro SD card - log, backup, clone & more
- Date & Time-based control

Communication

- TCP/IP via Ethernet
- Web server: Use built-in HTML pages, or design complex pages to view and edit PLC data via the Internet
- Send e-mail function
- SMS messaging
- GPRS/GSM
- Remote Access utilities
- MODBUS protocol support
- CANbus: CANopen, UniCAN, J1939 and more
- DF1 Slave
- SNMP Agent V1
- FB Protocol Utility: enables serial or TCP/IP communications with 3rd-party device; barcode readers, frequency converters, etc
- Ports: supplied with 1 RS232/RS485; 2 ports may be added: 1 Serial/Ethernet/Profibus and 1 CANbus



V130-J
Flat Panel



V130
Classic Panel

“The perfect solution for our need, the Vision130™ is easy to program, user-friendly and backed up with responsive tech support.”



Michael Lamore,
President of Barrier1

		V130									
Article Number	Classic Panel	V130-33-B1	V130-33-TR20	V130-33-R34	V130-33-TR34	V130-33-TR6	V130-33-RA22	V130-33-TRA22	V130-33-T2	V130-33-T38	V130-33-TA24
	Flat Panel	V130-J-B1	V130-J-TR20	V130-J-R34	V130-J-TR34	V130-J-TR6	V130-J-RA22	V130-J-TRA22	V130-J-T2	V130-J-T38	V130-J-TA24
		No onboard I/Os	10 Digital 2 D/A Inputs ¹ 6 Relay Outputs 2 High-speed Transistor Outputs	20 Digital 2 D/A Inputs ¹ 12 Relay Outputs	20 Digital 2 D/A Inputs ¹ 8 Relay 4 High speed Transistor Outputs	6 Digital, 2 D/A 4 Analog Inputs ¹ 6 Relay Outputs 2 High-speed Transistor Outputs	8 Digital 2 D/A, 2 PT100/TC/ Digital ¹ Inputs 8 Relay 2 Analog Outputs	8 Digital, 2 D/A 2 PT100/TC/ Digital ¹ Inputs 4 Relay, 2 Analog 4 High-speed Transistor Outputs	10 Digital 2 D/A Inputs ¹ 12 Transistor Outputs	20 Digital 2 D/A Inputs ¹ 16 Transistor Outputs	8 Digital 2 D/A, 2 PT100/TC/Digital ¹ Inputs 10 Transistor 2 Analog Outputs
Inputs											
Digital pnp/npn			12	22	22	8	12	12	12	22	12
HSC/Shaft-Encoder/ Max. Freq. Measurer ^{2&3}			3 200kHz ⁴ 32-bit	3 30kHz 32-bit	3 200kHz ⁴ 32-bit	1 200kHz ⁴ 32-bit	1 30kHz 32-bit	1 200kHz ⁴ 32-bit	3 30kHz 32-bit	2 30kHz 32-bit	1 30kHz 32-bit
Analog		None	2 10-bit, 0-10V 0-20mA 4-20mA	2 10-bit, 0-10V 0-20mA 4-20mA	2 10-bit, 0-10V 0-20mA 4-20mA	2 10-bit, 0-10V 0-20mA, 4-20mA and 4 10-bit, 0-20mA 4-20mA	2 14-bit 0-10V, 0-20mA 4-20mA	2 (2 modes) Normal: 14-bit Fast: 12-bit 0-10V, 0-20mA 4-20mA	2 10-bit 0-10V 0-20mA 4-20mA	2 10-bit 0-10V, 0-20mA 4-20mA	2 (2 modes) Normal: 14-bit Fast: 12-bit 0-10V, 0-20mA, 4-20mA and 2 PT100/TC
Temperature Measurement			None	None	None	None	and 2 PT100/TC	and 2 PT100/TC	None	None	
Outputs											
Digital			6 relay	12 relay	8 relay	6 relay	8 relay	4 relay	12 pnp	16 pnp	10 pnp
High-Speed Outputs/PWM		None	2 npn (2 PTO) 200kHz max	None	4 npn (3 PTO) 200kHz max	2 npn (2 PTO) 200kHz max	None	4 npn (2 PTO) 200kHz max	7 0.5kHz	7 0.5kHz	5 0.5kHz
Analog			None	None	None	None	2 12-bit 0-10V, 4-20mA	2 12-bit 0-10V, 4-20mA	None	None	2 12-bit 0-10V, 4-20mA
I/O Expansion		Local or Remote I/Os may be added via expansion port or via CANbus									
Program		Application Logic: 512K • Images: 256K • Fonts: 128K									
Application Memory		Application Logic: 512K • Images: 256K • Fonts: 128K									
Scan Time		20µ sec per 1K of typical application									
Memory Operands		4096 coils, 2048 registers, 256 long integers (32-bit), 64 double words (32-bit unsigned), 24 floats, 192 timers (32-bit), 24 counters Additional non-retainable operands: 1024 X-bits, 512 X-integers, 256 X-long integers, 64 X-double words									
Data Tables		120K dynamic RAM data (recipe parameters, datalogs, etc.), up to 256K fixed data									
SD Card (Micro)		Store datalogs, Alarm History, Data Tables, Trend data, export to Excel • Back up Ladder, HMI & OS, clone PLCs									
Enhanced Features		Trends: graph any value and display on HMI • Built-in Alarm management system • String Library: instantly switch HMI language									
Operator Panel		Graphic STN LCD, white LED backlight									
Type		Graphic STN LCD, white LED backlight									
Display		Resolution: 128 x 64 pixels • Size: 2.4"									
Keys		20, including 10 user labeled keys (slide kit sold separately)									
General		24VDC, except for V130-33-B1, which is 12/24VDC									
Power Supply		24VDC, except for V130-33-B1, which is 12/24VDC									
Battery		7 years typical at 25°C, battery back-up for all memory sections and RTC									
Clock		Real-time clock functions (date and time)									
Environment		IP66/IP65/NEMA4X (when panel mounted)									
Standard		CE, UL Many of our products are also UL Class 1 Div 2 and GOST certified - please contact Unitronics									

¹ In these models certain inputs are adaptable, and can function as either digital, analog, and in certain models also as thermocouple or PT100. Using adaptable inputs reduces the amount of free digital inputs. For example, V130-33-RA22 offers 12 digital inputs. Implementing 2 TC inputs requires 4 digital inputs, leaving 8 free.

² Certain inputs can function as high-speed counters, shaft-encoder inputs, or normal digital inputs.

³ This specification depends on cable length.

⁴ This specification depends upon driver type.

Order Information

Item

V130-33-RA22	PLC with Classic panel, Monochrome display 2.4"
V130-J-RA22	PLC with Flat panel, Monochrome display 2.4"
V350-35-RA22	PLC with Classic panel, Color touch display 3.5"
V350-J-RA22	PLC with Flat panel, Color touch display 3.5"
V430-J-RA22	PLC with Flat panel, Color touch display 4.3"

You can find additional information, such as wiring diagrams, in the product's installation guide located in the Technical Library at www.unitronics.com.

Power Supply

Item	V130-RA22 V130J-RA22	V350-RA22 V350J-RA22	V430J-RA22
Input voltage	24VDC		
Permissible range	20.4VDC to 28.8VDC with less than 10% ripple		
Max. current consumption	See Note 1		
npn inputs	265mA@24VDC	290mA@24VDC	290mA@24VDC
pnp inputs	220mA@24VDC	250mA@24VDC	250mA@24VDC

Notes:

- To calculate the actual power consumption, subtract the current for each unused element from the maximum current consumption value according to the values below:

	Backlight	Ethernet card	Relay Outputs (per output)	All Analog Outputs, voltage/current
V130/J	10mA	35mA	5mA	48mA/30mA*
V350/J/V430J	20mA	35mA	5mA	48mA/30mA*

*If the analog outputs are not configured, then subtract the higher value.

Digital Inputs

Number of inputs	12. See note 2
Input type	See note 2
Galvanic isolation	None
Nominal input voltage	24VDC
Input Voltage	
pnp (source)	0-5 VDC for Logic '0' 17-28.8 VDC for Logic '1'
nnp (sink)	17-28.8 VDC for Logic '0' 0-5 VDC for Logic '1'
Input Current	3.7mA@24VDC
Input impedance	6.5KΩ
Response Time	10ms typical, when used as normal digital input
Input Cable length	
Normal digital Input	Up to 100 meters
High Speed Input	Up to 50 meters, shielded, see Frequency table below

High speed inputs
Frequency (max)

Specifications below apply when wired as HSC/shaft-encoder. See Note 2.
See Note 2

Cable length (max.)	HSC	Shaft-encoder pnp	Shaft-encoder npn
10m	30kHz	20kHz	16kHz
25m	25kHz	12kHz	10kHz
50m	15kHz	7kHz	5kHz

Duty cycle 40-60%
Resolution 32-bit

Notes:

- V130/V350/V130J/V350J/V430J-RA22 models comprise a total of 12 inputs.
All 12 inputs may be used as digital inputs. They may be wired in a group via a single jumper as either npn or pnp.
In addition, according to jumper settings and appropriate wiring:
 - Inputs 5 and 6 can function as either digital or analog inputs.
 - Input 0 can function as a high-speed counter, as part of a shaft-encoder, or as normal digital inputs.
 - Input 1 can function as either counter reset, normal digital input, or as part of a shaft-encoder.
 - If input 0 is set as a high-speed counter (without reset), input 1 can function as a normal digital input.
 - Inputs 7-8 and 9-10 can function as digital, thermocouple, or PT100 inputs; input 11 can also serve as the CM signal for PT100.
- pnp/npn maximum frequency is at 24VDC.

Analog Inputs

Number of inputs	2, according to wiring as described above in Note 2	
Input type	Multi-range inputs: 0-10V, 0-20mA, 4-20mA	
Input range	0-20mA, 4-20mA	0-10VDC
Input impedance	37Ω	12.77kΩ
Maximum input rating	30mA, 1.1V	±15V
Galvanic isolation	None	
Conversion method	Voltage to frequency	
Normal mode		
Resolution, except 4-20mA	14-bit (16384units)	
Resolution, at 4-20mA	3277 to 16383 (13107 units)	
Conversion time	100ms minimum per channel. See Note 4	
Fast mode		
Resolution, except 4-20mA	12-bit (4096 units)	
Resolution, at 4-20mA	819 to 4095 (3277 units)	
Conversion time	30ms minimum per channel. See Note 4	
Full-scale error	±0.4%	
Linearity error	±0.04%	
Status indication	Yes. See Note 5	

Notes:

- Conversion times are accumulative and depend on the total number of analog inputs configured.
For example, if only one analog input (fast mode) is configured, the conversion time will be 30ms; however, if two analog (normal mode) and two RTD inputs are configured, the conversion time will be 100ms + 100ms + 300ms + 300ms = 800ms.
- The analog value can indicate faults as shown below:

Value: 12-bit	Value: 14-bit	Possible Cause
-1	-1	Deviates slightly below the input range
4096	16384	Deviates slightly above the input range
32767	32767	Deviates greatly above or below the input range

RTD Inputs

RTD Type	PT100
Temperature coefficient α	0.00385/0.00392
Input range	-200 to 600°C/-328 to 1100°F. 1 to 320Ω.
Isolation	None
Conversion method	Voltage to frequency
Resolution	0.1°C/0.1°F
Conversion time	300ms minimum per channel. See Note 4 above
Input impedance	>10MΩ
Auxillary current for PT100	150μA typical
Full-scale error	±0.4%
Linearity error	±0.04%
Status indication	Yes. See Note 6
Cable length	Up to 50 meters, shielded

Notes:

6. The analog value can indicate faults as shown below:

Value	Possible Cause
32767	Sensor is not connected to input, or value exceeds permissible range
-32767	Sensor is short-circuited

Thermocouple Inputs

Input range	See Note 7
Isolation	None
Conversion method	Voltage to frequency
Resolution	0.1°C/ 0.1°F maximum
Conversion time	100ms minimum per channel. See Note 4 above
Input impedance	>10MΩ
Cold junction compensation	Local, automatic
Cold junction compensation error	±1.5°C/±2.7°F maximum
Absolute maximum rating	±0.6VDC
Full-scale error	±0.4%
Linearity error	±0.04%
Warm-up time	½ hour typically, ±1°C/±1.8°F repeatability
Status indication	Yes. See Note 6 above

Notes:

7. The device can also measure voltage within the range of -5 to 56mV, at a resolution of 0.01mV.

The device can also measure raw value frequency at a resolution of 14-bits (16384). Input ranges are shown in the following table:

Type	Temp. Range	Type	Temp. Range
mV	-5 to 56mV	N	-200 to 1300°C (-328 to 2372°F)
B	200 to 1820°C (300 to 3276°F)	R	0 to 1768°C (32 to 3214°F)
E	-200 to 750°C (-328 to 1382°F)	S	0 to 1768°C (32 to 3214°F)
J	-200 to 760°C (-328 to 1400°F)	T	-200 to 400°C (-328 to 752°F)
K	-200 to 1250°C (-328 to 2282°F)		

Digital Outputs

Number of outputs	8 relay (in 2 groups). See Note 8
Output type	SPST-NO (Form A)
Isolation	By relay
Type of relay	Tyco PCN-124D3MHZ or compatible
Output current (resistive load)	3A maximum per output 8A maximum total per common
Rated voltage	250VAC / 30VDC
Minimum load	1mA, 5VDC
Life expectancy	100k operations at maximum load
Response time	10ms (typical)
Contact protection	External precautions required (see <i>Increasing Contact Life Span</i> in the product's Installation Guide)

Notes:

8. Outputs 0, 1, 2 and 3 share a common signal. Outputs 4, 5, 6, and 7 share a common signal.

Analog Outputs

Number of outputs	2
Output range	0-10V, 4-20mA. See Note 9
Resolution	12-bit (4096 units)
Conversion time	Both outputs are updated per scan
Load impedance	1k Ω minimum—voltage 500 Ω maximum—current
Galvanic isolation	None
Linearity error	$\pm 0.1\%$
Operational error limits	$\pm 0.2\%$

Notes:

9. Note that the range of each I/O is defined by wiring, jumper settings, and within the controller's software.

Graphic Display Screen

Item	V130-RA22 V130J-RA22	V350-RA22 V350J-RA22	V430J-RA22
LCD Type	STN, LCD display	TFT, LCD display	TFT, LCD display
Illumination backlight	White LED	White LED	White LED
Display resolution	128x64 pixels	320x240 pixels	480x272 pixels
Viewing area	2.4"	3.5"	4.3"
Colors	Monochrome	65,536 (16-bit)	65,536 (16-bit)
Screen Contrast	Via software (Store value to SI 7, values range: 0 to 100%)	Fixed	Fixed
Touchscreen	None	Resistive, analog	Resistive, analog
'Touch' indication	None	Via buzzer	Via buzzer
Screen brightness control	Via software (Store value to SI 9, 0 = Off, 1 = On)	Via software (Store value to SI 9, values range: 0 to 100%)	
Virtual Keypad	None	Displays virtual keyboard when the application requires data entry.	

Keypad

Item	V130-RA22 V130J-RA22	V350-RA22 V350J-RA22	V430J-RA22
Number of keys	20 keys, including 10 user-labeled keys	5 programmable function keys	
Key type	Metal dome, sealed membrane switch		
Slides	Slides may be installed in the operating panel faceplate to custom-label the keys. Refer to <i>V130 Keypad Slides.pdf</i> . A complete set of blank slides is available by separate order	Slides may be installed in the operating panel faceplate to custom-label the keys. Refer to <i>V350 Keypad Slides.pdf</i> . Two sets of slides are supplied with the controller: one set of arrow keys, and one blank set.	None

Program

Item	V130-RA22 V130J-RA22	V350-RA22 V350J-RA22	V430J-RA22
Memory size			
Application Logic	512KB	512KB	512KB
Images	256KB	6MB	12MB
Fonts	128KB	1MB	1MB

Item	Quantity		Symbol	Value
	V130-RA22 V130J-RA22	V350-RA22 V350J-RA22 V430J-RA22		
Memory Bits	4096	8192	MB	Bit (coil)
Memory Integers	2048	4096	MI	16-bit signed/unsigned
Long Integers	256	512	ML	32-bit signed/unsigned
Double Word	64	256	DW	32-bit unsigned
Memory Floats	24	64	MF	32-bit signed/unsigned
Fast Bits	1024	1024	XB	Fast Bits (coil) – not retained
Fast Integers	512	512	XI	16 bit signed/unsigned (fast, not retained)
Fast Long Integers	256	256	XL	32 bit signed/unsigned (fast, not retained)
Fast Double Word	64	64	XDW	32 bit unsigned (fast, not retained)
Timers	192	384	T	Res. 10 ms; max 99h, 59 min, 59.99s
Counters	24	32	C	32-bit
Data Tables	120K dynamic data (recipe parameters, datalogs, etc.) 192K fixed data (read-only data, ingredient names, etc) Expandable via SD card. See Removable Memory below			
HMI displays	Up to 1024			
Program scan time	20µs per 1kb of typical application	15µs per 1kb of typical application		

Dimensions

Item		V130-RA22 V130J-RA22	V350-RA22 V350J-RA22	V430J-RA22
Size	Vxxx	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 14	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 14	
	Vxxx-J	109 x 114.1 x 66mm (4.92 x 4.49 x 2.59"). See Note 14	109 x 114.1 x 66mm (4.92 x 4.49 x 2.59"). See Note 14	136 x 105.1 x 61.3mm (5.35 x 4.13 x 2.41"). See Note 14
Weight		295g (10.4 oz)	320g (11.28 oz)	350g (12.34 oz)

Notes:

14. For exact dimensions, refer to the product's Installation Guide.

Environment

Operational temperature	0 to 50°C (32 to 122°F)
Storage temperature	-20 to 60°C (-4 to 140°F)
Relative Humidity (RH)	10% to 95% (non-condensing)
Mounting method	Panel mounted (IP65/66/NEMA4X) DIN-rail mounted (IP20/NEMA1)
Operating Altitude	2000m (6562 ft)
Shock	IEC 60068-2-27, 15G, 11ms duration
Vibration	IEC 60068-2-6, 5Hz to 8.4Hz, 3.5mm constant amplitude, 8.4Hz to 150Hz, 1G acceleration.

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DOC13038-A3 01/15