VISION 430™

Advanced PLC integrated with a 4.3" wide aspect color touchscreen. Includes an onboard I/O configuration; expand up to 512 I/Os

Features:

HMI

- 1024 user-designed screens and 250 images per application
- HMI graphs - color-code 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, SAE 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 mini-USB programming port ; 2 ports may be added: 1 Serial/Ethernet/Profibus and 1 CANbus

V430

spectra

> **The huge advantage of this PLC was that - with everything built-in - the communications and use of tags in the HMI was so simple and intuitive.**
>
> **Ashley Parr,**
> HPS

V430

Article Number	V430-J-B1	V430-J-RH2	V430-J-R34	V430-J-TR34	V430-J-RH6	V430-J-RA22	V430-J-TRA22	V430-J-T2	V430-J-T38	V430-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

	V430-J-B1	V430-J-RH2	V430-J-R34	V430-J-TR34	V430-J-RH6	V430-J-RA22	V430-J-TRA22	V430-J-T2	V430-J-T38	V430-J-TA24
Digital pnp/npn	None	**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		**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 **and** **2** PT100/TC	**2** (2 modes) Normal: 14-bit Fast: 12-bit 0-10V, 0-20mA 4-20mA **and** **2** PT100/TC	**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			None	None	

Outputs

	V430-J-B1	V430-J-RH2	V430-J-R34	V430-J-TR34	V430-J-RH6	V430-J-RA22	V430-J-TRA22	V430-J-T2	V430-J-T38	V430-J-TA24
Digital	None	**6** relay	**12** relay	**8** relay	**6** relay	**8** relay	**4** relay	**12** pnp	**16** pnp	**10** pnp
High-Speed Outputs/PWM		**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 Memory	Application Logic: 512K • Images: 12MB • Fonts: 1MB
Scan Time	15µ sec per 1K of typical application
Memory Operands	8192 coils, 4096 registers, 512 long integers (32-bit), 256 double words (32-bit unsigned), 64 floats, 384 timers (32-bit), 32 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 • String Library: instantly switch HMI language

Operator Panel

Type & Colors	TFT LCD • 65,536 colors, 16-bit resolution • Brightness - Adjustable via touchscreen or software
Display	Resolution: 480x272 pixels • Size: 4.3"
Touchscreen	Resistive, Analog
Keys	5 programmable keys. Labeling options - function keys, arrows, or customized

General

Power Supply	24VDC, except for V430-J-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] Adapt specific inputs to function as digital or analog, and in certain models as TC or PT100. This reduces the number of free digital inputs. For example, V350-35-RA22 offers 12 digital inputs. Implementing 2 TC inputs requires 4, 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-TR20	PLC with Classic panel, Monochrome display 2.4"
V130-J-TR20	PLC with Flat panel, Monochrome display 2.4"
V350-35-TR20	PLC with Classic panel, Color touch display 3.5''
V350-J-TR20	PLC with Flat panel, Color touch display 3.5''
V430-J-RH2	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-TR20 V130J-TR20	V350-TR20 V350J-TR20	V430J-RH2
Input voltage	24VDC		
Permissible range	20.4VDC to 28.8VDC with less than 10% ripple		
Max. current consumption	See Note 1		
npn inputs	215mA@24VDC	240mA@24VDC	280mA@24VDC
pnp inputs	190mA@24VDC	215mA@24VDC	190mA@24VDC

Notes:

1. 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)
V130/J	10mA	35mA	8mA
V350/J/V430J	20mA	35mA	8mA

Digital Inputs

Number of inputs	12. See Note 2	
Input type	See Note 2	
Galvanic isolation	None	
Nominal input voltage	24VDC	
Input voltage	Normal digital input	High Speed Input. See Note 3
pnp (source)	0-5VDC for Logic '0' 17-28.8VDC for Logic '1'	0-3VDC for Logic '0' 20.4-28.8VDC for Logic '1'
npn (sink)	17-28.8VDC for Logic '0' 0-5VDC for Logic '1	20.4-28.8VDC for Logic '0' 0-3VDC for Logic '1
Input current	I0-I5: 5.4mA@24VDC	
	I6-I11: 3.7mA@24VDC (8mA@24VDC for V430J-RH2)	
Input impedance	I0-I5: 4.5KΩ	
	I6-I11: 6.5KΩ (3KΩ for V430J-RH2)	
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   Specifications below apply when wired as HSC/shaft-encoder.
                           See Note 2

Frequency, HSC

Driver type	pnp/npn	Push-pull
Cable length (max.)		
10m	95kHz maximum	200kHz maximum
25m	50kHz maximum	200kHz maximum
50m	25kHz maximum	200kHz maximum

Frequency, Shaft-encoder

Driver type	pnp/npn	Push-pull
Cable length (max.)		
10m	35kHz maximum	100kHz maximum
25m	18kHz maximum	100kHz maximum
50m	10kHz maximum	100kHz maximum

Duty cycle   40-60%
Resolution   32-bit

Notes:
 2. This model comprises a total of 12 inputs. Input functionality can be adapted as follows:
    All 12 inputs may be used as digital inputs. They may be wired, in a group,
    and set to either npn or pnp via a single jumper.

    In addition, according to jumper settings and appropriate wiring:
    - Inputs 10 and 11 can function as either digital or analog inputs.
    - Inputs 0, 2, and 4 can function as high-speed counters, as part of a shaft-encoder,
      or as normal digital inputs.
    - Inputs 1, 3, and 5 can function as either counter reset, as part of a shaft-encoder,
      or as normal digital inputs.
    - If inputs 0, 2, 4 are set as high-speed counters (without reset), inputs 1, 3, 5 can function as normal digital
      inputs.
 3. pnp/npn maximum frequency is at 24VDC.

Analog Inputs (current/voltage)

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	243Ω	>150KΩ
Maximum input rating	25mA, 6V	15V

Galvanic isolation   None
Conversion method   Succesive approximation
Resolution (except 4-20mA) 10-bit (1024 units)
Resolution (at 4-20mA)   204 to 1023 (820 units)
Conversion time   One configured input is updated per scan. See Note 4
Precision   0.9%
Status indication   Yes – if an analog input deviates above the permissible range, its value will be
                          1024.

Notes:
 4. For example, if 2 inputs are configured as analog, it takes 2 scans to update all analog values.

Relay Outputs

Number of outputs	6 relay
Output type	SPST-NO (Form A)
Isolation	By relay
Type of relay	Fujitsu, JY-24H-K or compatible
Output current	5A maximum (resistive load)
Rated voltage	250VAC / 30VDC
Minimum load	10mA, 5VDC
Life expectancy	50k operations at maximum load
Response time	10ms (typical)
Contact protection	External precautions required (see *Increasing Contact Life Span* in the product's Installation Guide)

Transistor Outputs (TR20 Only)

Number of outputs	2 npn (sink). See Note 5
Output type	N-MOSFET, (open drain)
Galvanic Isolation	None
Maximum output current (resistive load)	100mA per output
Rated voltage	24VDC
Maximum delay OFF to ON	$1\mu s$
Maximum delay ON to OFF	$10\mu s$
HSO freq. range with resistive load	5Hz-200kHz (at maximum load resistance of 1kΩ)
Maximum ON voltage drop	1VDC
Short-circuit protection	None
Voltage range	3.5V to 28.8VDC

Notes:

5. Outputs 6 and 7 share a common 0V signal.
   The 0V signal of the output must be connected to the controller's 0V.

Graphic Display Screen

Item	V130-TR20 V130J-TR20	V350-TR20 V350J-TR20	V430J-RH2
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-TR20 V130J-TR20	V350-TR20 V350J-TR20	V430J-RH2
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 *V130 Keypad Slides.pdf.* 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 *V350 Keypad Slides.pdf.* Two sets of slides are supplied with the controller: one set of arrow keys, and one blank set.	None

Program

Item	V130-TR20 V130J-TR20	V350-TR20 V350J-TR20	V430J-RH2
Memory size			
Application Logic	512KB	512KB	512KB
Images	256KB	6MB	12MB
Fonts	128KB	1MB	1MB

Operand type	Quantity		Symbol	Value
Item	**V130-TR20** **V130J-TR20**	**V350-TR20** **V350J-TR20** **V430J-RH2**		
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

Removable Memory

Micro SD card	Compatible with standard SD and SDHC; up to 32GB store datalogs, Alarms, Trends, Data Tables, backup Ladder, HMI, and OS. See Note 6

Notes:

6. User must format via Unitronics SD tools utility.

Communication Ports

Port 1	1 channel, RS232/RS485 and USB device (V430 only). See Note 7
Galvanic isolation	No
Baud rate	300 to 115200 bps
RS232	
Input voltage	±20VDC absolute maximum
Cable length	15m maximum (50')
RS485	
Input voltage	-7 to +12VDC differential maximum
Cable type	Shielded twisted pair, in compliance with EIA 485
Cable length	1200m maximum (4000')
Nodes	Up to 32
USB device **(V430 only)**	
Port type	Mini-B, See Note 9
Specification	USB 2.0 complaint; full speed
Cable	USB 2.0 complaint; up to 3m
Port 2 (optional)	See Note 8
CANbus (optional)	See Note 8

Notes:

7. This model is supplied with a serial port: RS232/RS485 (Port 1). The standard is set to either RS232 or RS485 according to jumper settings. Refer to the product's Installation Guide.

8. The user may order and install one or both of the following modules:
   - An additional port (Port 2). Available port types: RS232/RS485 isolated/non-isolated, Ethernet
   - A CANbus port
   Port module documentation is available on the Unitronics website.

9. Note that physically connecting a PC to the controller via USB suspends RS232/RS485 communications via Port 1. When the PC is disconnected, RS232/RS485 resumes.

I/O Expansion

	Additional I/Os may be added. Configurations vary according to module. Supports digital, high-speed, analog, weight and temperature measurement I/Os.
Local	Via I/O Expansion Port. Integrate up to 8 I/O Expansion Modules comprising up to 128 additional I/Os. Adapter required (P.N. EX-A2X).
Remote	Via CANbus port. Connect up to 60 adapters to a distance of 1000 meters from controller; and up to 8 I/O expansion modules to each adapter (up to a total of 512 I/Os). Adapter required (P.N. EX-RC1).

Miscellaneous

Clock (RTC)	Real-time clock functions (date and time)
Battery back-up	7 years typical at 25°C, battery back-up for RTC and system data, including variable data
Battery replacement	Yes. Coin-type 3V, lithium battery, CR2450

Dimensions

Item		V130-TR20 V130J-TR20	V350-TR20 V350J-TR20	V430J-RH2
Size	Vxxx	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67”). See Note 10	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67”). See Note 10	
	Vxxx-J	109 x 114.1 x 66mm (4.92 x 4.49 x 2.59”). See Note 10	109 x 114.1 x 66mm (4.92 x 4.49 x 2.59”). See Note 10	136 x 105.1 x 61.3mm (5.35 x 4.13 x 2.41”). See Note 10
Weight		297g (10.47 oz)	317g (11.18 oz)	350g (12.34 oz)

Notes:

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

Environment

Operational temperature	0 to 50ºC (32 to 122ºF)
Storage temperature	-20 to 60ºC (-4 to 140ºF)
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.