

# VISION350™

Advanced PLC integrated with a 3.5" color touchscreen. Includes an onboard I/O configuration; expand up to 512 I/Os

## Features:

### HMI

- 1024 user-designed screens
- 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 3<sup>rd</sup>-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



**V350-J**  
Flat Panel



**V350**  
Classic Panel

“ There were significant cost savings using the Unitronics PLC. ”

CE/UL

Justin Butler,  
Senior Electrical Engineer at Energy Plant Solutions

		<b>V350</b>									
Article Number	Classic Panel	V350-35-B1	V350-35-TR20	V350-35-R34	V350-35-TR34	V350-35-TR6	V350-35-RA22	V350-35-TRA22	V350-35-T2	V350-35-T38	V350-35-TA24
	Flat Panel	V350-J-B1	V350-J-TR20	V350-J-R34	V350-J-TR34	V350-J-TR6	V350-J-RA22	V350-J-TRA22	V350-J-T2	V350-J-T38	V350-J-TA24
		No onboard I/Os	10 Digital 2 D/A Inputs <sup>1</sup> 6 Relay Outputs 2 High-speed Transistor Outputs	20 Digital 2 D/A Inputs <sup>1</sup> 12 Relay Outputs	20 Digital 2 D/A Inputs <sup>1</sup> 8 Relay 4 High speed Transistor Outputs	6 Digital, 2 D/A 4 Analog Inputs <sup>1</sup> 6 Relay Outputs 2 High-speed Transistor Outputs	8 Digital, 2 D/A 2 PT100/TC/ Digital <sup>1</sup> Inputs 8 Relay 2 Analog Outputs	8 Digital, 2 D/A 2 PT100/TC/ Digital <sup>1</sup> Inputs 4 Relay, 2 Analog 4 High-speed Transistor Outputs	10 Digital 2 D/A Inputs <sup>1</sup> 12 Transistor Outputs	20 Digital 2 D/A Inputs <sup>1</sup> 16 Transistor Outputs	8 Digital 2 D/A, 2 PT100/ TC/Digital <sup>1</sup> Inputs 10 Transistor 2 Analog Outputs
<b>Inputs</b>		None									
Digital pnp/npn			12	22	22	8	12	12	12	22	12
HSC/Shaft-Encoder/ Max. Freq. Measurer <sup>2&amp;3</sup>			3 200kHz <sup>4</sup> 32-bit	3 30kHz 32-bit	3 200kHz <sup>4</sup> 32-bit	1 200kHz <sup>4</sup> 32-bit	1 30kHz 32-bit	1 200kHz <sup>4</sup> 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	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	None
<b>Outputs</b>		None									
Digital			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	2 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	
<b>I/O Expansion</b>		Local or Remote I/Os may be added via expansion port or via CANbus									
<b>Program</b>		Application Logic: 1MB • Images: 6MB • Fonts: 512K									
Application Memory		15µ sec per 1K of typical application									
Scan Time		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									
Memory Operands		120K dynamic RAM data (recipe parameters, datalogs, etc.), up to 256K fixed data									
Data Tables		Store datalogs, Alarm History, Data Tables, Trend data, export to Excel • Back up Ladder, HMI & OS, clone PLCs									
SD Card (Micro)		Trends: graph any value and display on HMI • String Library: instantly switch HMI language									
Enhanced Features											
<b>Operator Panel</b>		TFT LCD • 65,536 colors, 16-bit resolution • Brightness- Adjustable via touchscreen or software									
Type & Colors		Resolution: 320 x 240 pixels (QVGA) • Size: 3.5"									
Display		Resistive, Analog									
Touchscreen		5 programmable keys. Labeling options- function keys, arrows, or customized									
Keys											
<b>General</b>		24VDC, except for V350-35-B1, which is 12/24VDC									
Power Supply		7 years typical at 25°C, battery back-up for all memory sections and RTC									
Battery		Real-time clock functions (date and time)									
Clock		IP66/IP65/NEMA4X (when panel mounted)									
Environment		CE, UL									
Standard		Many of our products are also UL Class 1 Div 2 and GOST certified - please contact Unitronics									

# Vision™ OPLC™

V130-33-T2/V130-J-T2

Art. No. 117822 / 130991

V350-35-T2/V350-J-T2

Art. No. 117966 / 130510

V430-J-T2

Art. No. 142950

## Technical Specifications

### Order Information

#### Item

V130-33-T2	PLC with Classic panel, Monochrome display 2.4"
V130-J-T2	PLC with Flat panel, Monochrome display 2.4"
V350-35-T2	PLC with Classic panel, Color touch display 3.5"
V350-J-T2	PLC with Flat panel, Color touch display 3.5"
V430-J-T2	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](http://www.unitronics.com).

### Power Supply

Item	V130-T2 V130J-T2	V350-T2 V350J-T2	V430J-T2
Input voltage	24VDC		
Permissible range	20.4VDC to 28.8VDC with less than 10% ripple		
Max. current consumption	See Note 1		
npn inputs	210mA@24VDC	230mA@24VDC	230mA@24VDC
pnp inputs	110mA@24VDC	135mA@24VDC	135mA@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
V130/J	10mA	35mA
V350/J/V430J	20mA	35mA

### 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)	0-5VDC for Logic '0' 17-28.8VDC for Logic '1'
npn (sink)	17-28.8VDC for Logic '0' 0-5VDC for Logic '1'
Input Current	8mA@24VDC
Input impedance	3KΩ
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 (max)	See Note 3	
Cable length (max.)	HSC	Shaft-encoder
10m	30kHz	20kHz
25m	30kHz	13kHz
50m	25kHz	9kHz

Duty cycle 40-60%  
Resolution 32-bit

### Notes:

2. V130/V350/V130J/V350J/V430J-T2 models comprise a total of 12 inputs.

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.

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## 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	243Ω	>150KΩ
Maximum input rating	25mA, 6V	15V
Galvanic isolation	None	
Conversion method	Successive 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.

## Digital Outputs

Number of outputs	12 transistor pnp (source)
Output type	P-MOSFET (open drain)
Isolation	None
Output current (resistive load)	0.5A maximum per output 3A maximum total per common
Maximum frequency	50Hz (resistive load) 0.5Hz (inductive load)
PWM maximum frequency	0.5KHz (resistive load). See Note 5
Short circuit protection	Yes
Short circuit indication	Via software
On voltage drop	0.5VDC maximum
Power supply for outputs	
Operating voltage	20.4 to 28.8VDC
Nominal voltage	24VDC

### Notes:

5. Outputs 0 to 6 can be used as PWM outputs.

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## Graphic Display Screen

Item	V130-T2 V130J-T2	V350-T2 V350J-T2	V430J-T2
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.	

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## Keypad

Item	V130-T2 V130J-T2	V350-T2 V350J-T2	V430J-T2
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-T2	V350-T2	V430J-T2	
	V130J-T2	V350J-T2		
Memory size				
Application Logic	512KB	512KB		512KB
Images	256KB	6MB		12MB
Fonts	128KB	1MB		1MB
Operand type	Quantity		Symbol	Value
Item	V130-T2 V130J-T2	V350-T2 V350J-T2 V430J-T2		
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 portPort 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.

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## 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).

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## 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-T2 V130J-T2	V350-T2 V350J-T2	V430J-T2
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		315g (11.11 oz)	335g (11.81 oz)	365g (12.87 oz)

### Notes:

10. 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, 11 ms duration
Vibration	IEC 60068-2-6, 5Hz to 8.4Hz, 3.5mm constant amplitude, 8.4Hz to 150Hz, 1G acceleration.

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