SM35-J-RA22 SM43-J-RA22 SM70-J-RA22 Technical Specifications

Ordering Information

Item

SM35-J-RA22	PLC with Flat panel, Color touch display 3.5"
SM43-J-RA22	PLC with Flat panel, Color touch display 4.3"
SM70-J-RA22	PLC with Flat panel, Color touch display 7"

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

Power Supply

ltem	SM35-J-RA22	SM43-J-RA22	SM70-J-RA22
Input voltage Permissible range	24VDC 20.4VDC to 28.8VDC with le	ass than 10% rinnle	
Max. current	20.4VDC to 28.8VDC with less than 10% ripple		
consumption	See Note 1		
npn inputs	275mA@24VDC	275mA@24VDC	330mA@24VDC
pnp inputs	235mA@24VDC	235mA@24VDC	295mA@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
SM35/SM43	20mA	35mA	5mA	48mA/30mA*
SM70	80mA	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)	0-5VDC for Logic '0' 17-28.8VDC for Logic '1'
npn (sink)	17-28.8VDC for Logic '0' 0-5VDC for Logic '1'
Input current	3.7mA@24VDC
Input impedance	6.5ΚΩ
Response time	10ms typical, when used as normal digital inputs
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)	See N	Specifications below apply when wired as HSC/shaft-encoder. See Note 2 See Note 3			
Cable length (max)	HSC	Sha	ft-encoder pnp	Shaft-encoder npn
10	m	30kHz		20kHz	16kHz
25	m	25kHz		12kHz	10kHz
50	m	15kHz		7kHz	5kHz
Duty cycle	40-60%				
Resolution	32-bit				

Notes:

2. This model comprises 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.

3. 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 ur	nits)	
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.		
Accuracy	±0.44%		
Status indication	Yes. See Note 5		

Notes:

- 4. 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.
- 5. 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
Accuracy	±0.44%
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		

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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 7 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
Accuracy	±0.44%
Warm-up time	1/2 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:

Туре	Temp. Range
mV	-5 to 56mV
В	200 to 1820°C (300 to 3276°F)
E	-200 to 750°C (-328 to 1382°F)
J	-200 to 760°C (-328 to 1400°F)
К	-200 to 1250°C (-328 to 2282°F)

Туре	Temp. Range
Ν	-200 to 1300°C (-328 to 2372°F)
R	0 to 1768°C (32 to 3214°F)
S	0 to 1768°C (32 to 3214°F)
Т	-200 to 400°C (-328 to 752°F)

2/16	

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	3A maximum per output
(resistive load)	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	1kΩ minimum—voltage
	500Ω maximum—current
Galvanic isolation	None
Accuracy	±0.3%
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

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Item	SM35-J-RA22	SM43-J-RA22	SM70-J-RA22
LCD Type	TFT, LCD display	TFT, LCD display	TFT, LCD display
Illumination backlight	White LED	White LED	White LED
Display resolution	320x240 pixels	480x272 pixels	800x480 pixels
Viewing area	3.5"	4.3"	7"
Colors	65,536 (16-bit)	65,536 (16-bit)	65,536 (16-bit)
Touchscreen	Resistive, analog	Resistive, analog	Resistive, analog
Screen brightness control	Via software (Store value to SI 9, values range: 0 to 100%)		
Virtual Keypad	Displays virtual keyboard when the application requires data entry.		

SMxx-J-RA22 Technical Specifications

Memory size Application Logic 112KB 112KB 112KB 112KB Images 1MB 2MB 5MB 5MB Fonts 512KB 512KB 512KB Operand type Quantity Symbol Value Memory lits 512 MB Bit (coil) Memory Integers 32 ML 32-bit signed/unsigned Long Integers 32 ML 32-bit signed/unsigned Double Word 32 DW 32-bit signed/unsigned Fast Bits 64 XB Fast Bits (coil) – not retained Fast Bits 64 XB Fast Bits (coil) – not retained Fast Double Word 32 XL 32 bit signed/unsigned (fast, not retained) Fast Double Word 16 XLW 32 bit signed/unsigned (fast, not retained) Fast Double Word 16 XDW 32 bit signed/unsigned (fast, not retained) Fast Double Word 16 XDW 32 bit signed/unsigned (fast, not retained) Fast Double Word 16 XDW 32 bit signed/unsigned (fast, not retained) Fast Double Word 16 XDW </th <th>Program</th> <th></th> <th></th> <th></th> <th></th>	Program				
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	Specification	USB 2.0 complaint; full speed			
Port 2 (ontional) See Note 10	Cable	USB	2.0 complair	nt; up to 3m	
	Port 2 (optional)	See	Note 10		
CANbus (optional) See Note 10	CANbus (optional)	See	Note 10		

- A serial RS232/RS485 isolated/non-isolated interface module, or an Ethernet Interface module in port 2.

- A CANbus module

modules documentation is available on the Unitronics website.

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	SM35-J-RA22	SM43-J-RA22	SM70-J-RA22
Size	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 11	136 x 105.1 x 61.3mm (5.35 x 4.13 x 2.41"). See Note 11	210 x 146.4 x 42.3mm (8.26 x 5.76 x 1.66"). See Note 11
Weight	226g (7.97 oz)	365g (12.87 oz)	654g (23.07 oz)

Notes:

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

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

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