

## Ordering Information

### Item

SM35-J-R20	PLC with Flat panel, Color touch display 3.5"
SM43-J-R20	PLC with Flat panel, Color touch display 4.3"
SM70-J-R20	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 [www.unitronics.com](http://www.unitronics.com).

## Power Supply

Item	SM35-J-R20	SM43-J-R20	SM70-J-R20
Input voltage	24VDC		
Permissible range	20.4VDC to 28.8VDC with less than 10% ripple		
Max. current consumption	See Note 1		
npn inputs	235mA@24VDC	235mA@24VDC	285mA@24VDC
pnp inputs	195mA@24VDC	195mA@24VDC	240mA@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)
SM35/SM43	20mA	35mA	5mA
SM70	80mA	35mA	5mA

## Digital Inputs

Number of inputs	12. See Note 2
Input type	See Note 2
Galvanic isolation	None
Nominal input voltage	24VDC
Input voltage	
npn (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	6.5KΩ
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 Specifications below apply when wired as HSC/shaft-encoder.  
See Note 2  
Frequency (max) See Note 3

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:

- 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 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.
    - If the digital inputs function as npn, analog option is not available.
  - 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.
- 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	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.	

#### Note:

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

**Digital Outputs**

Number of outputs	8 relay (in 2 groups). See Note 5
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)

**Note:**

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

**Graphic Display Screen**

Item	SM35-J-R20	SM43-J-R20	SM70-J-R20
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.		

**Program**

Item	SM35-J-R20	SM43-J-R20	SM70-J-R20
Memory size			
Application Logic	112KB	112KB	112KB
Images	1MB	2MB	5MB
Fonts	512KB	512KB	512KB

Operand type	Quantity	Symbol	Value
Memory Bits	512	MB	Bit (coil)
Memory Integers	256	MI	16-bit signed/unsigned
Long Integers	32	ML	32-bit signed/unsigned
Double Word	32	DW	32-bit unsigned
Memory Floats	24	MF	32-bit signed/unsigned
Fast Bits	64	XB	Fast Bits (coil) – not retained
Fast Integers	32	XI	16 bit signed/unsigned (fast, not retained)
Fast Long Integers	16	XL	32 bit signed/unsigned (fast, not retained)
Fast Double Word	16	XDW	32 bit unsigned (fast, not retained)
Timers	32	T	Res. 10 ms; max 99h, 59 min, 59.99s
Counters	16	C	32-bit

Data Tables                   32K dynamic data (recipe parameters, datalogs, etc.)  
                                       16K fixed data (read-only data, ingredient names, etc)

HMI displays                   Up to 24

Program scan time            15µs per 1kb of typical application

---

**Communication Ports**

Port 1	1 channel, RS232 (SM35) , USB device (SM43/SM70)
Galvanic isolation	SM35 and SM43 – No SM70 - Yes
Baud rate	300 to 115200 bps
<b>RS232 (SM35 only)</b>	
Input voltage	±20VDC absolute maximum
Cable length	15m maximum (50')
<b>USB device (SM43,SM70 only)</b>	
Port type	Mini-B
Specification	USB 2.0 compliant; full speed
Cable	USB 2.0 compliant; up to 3m
Port 2 (optional)	See Note 6
CANbus (optional)	See Note 6

**Notes:**

6. The user may order and install one or both of the following modules:
- 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-R20	SM43-J-R20	SM70-J-R20
Size	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 7	136 x 105.1 x 61.3mm (5.35 x 4.13 x 2.41"). See Note 7	210 x 146.4 x 42.3mm (8.26 x 5.76 x 1.66"). See Note 7
Weight	210g (7.4 oz)	350g (12.34 oz)	640g (22.57 oz)

**Notes:**

7. 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.

The information in this document reflects products at the date of printing. Unitronics reserves the right, subject to all applicable laws, at any time, at its sole discretion, and without notice, to discontinue or change the features, designs, materials and other specifications of its products, and to either permanently or temporarily withdraw any of the foregoing from the market.

All information in this document is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to any implied warranties of merchantability, fitness for a particular purpose, or non-infringement. Unitronics assumes no responsibility for errors or omissions in the information presented in this document. In no event shall Unitronics be liable for any special, incidental, indirect or consequential damages of any kind, or any damages whatsoever arising out of or in connection with the use or performance of this information.

The tradenames, trademarks, logos and service marks presented in this document, including their design, are the property of Unitronics (1989) (R"G) Ltd. or other third parties and you are not permitted to use them without the prior written consent of Unitronics or such third party as may own them.

DOC17018-A5 02/15