Samba ™OPLC™ SM35-J-T20 Technical Specifications

The Unitronics SM35-J-T20 offers the following onboard I/Os:

- 12 Digital Inputs, configurable via wiring to include:
  3 HSC/Shaft-encoder Input, 2 Analog inputs
- 8 Relay Outputs

Available by separate order: Ethernet, additional RS232/RS485 or CANbus ports.

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

Technical Specifications

Power Supply

Input voltage	24VDC
Permissible range	20.4VDC to 28.8VDC with less than 10% ripple
Max. current consumption	See Note 1
npn inputs	215mA
pnp inputs	120mA

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
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 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
10m	30kHz	20kHz
25m	30kHz	13kHz
50m	25kHz	9kHz

Duty cycle	40-60%
Resolution	32-bit

Notes:

2. This model comprises a total of 12 inputs. Input functionality can be adapted as follows:
   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

Number of inputs	2, according to wiring as described above in Note 2	
Input type	Multi-range inputs: 0-10V, 0-20mA	
Input range	0-20mA	0-10VDC
Input impedance	243Ω	>150KΩ
Maximum input rating	25mA, 6V	15V
Galvanic isolation	None	
Conversion method	Successive approximation	
Resolution	10-bit (1024 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	8 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.

Graphic Display Screen

LCD Type	TFT, LCD display
Illumination backlight	White LED, software-controlled
Display resolution	320x240 pixels
Viewing area	3.5"
Colors	65,536 (16-bit)
Touchscreen	Resistive, analog
Screen brightness control	Via software (Store value to SI 9)
Virtual Keypad	Displays virtual keyboard when the application requires data entry

Program

Memory size: Application Logic – 0.5MB, Images – 1MB, Fonts – 512 KB

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, 59.99 s
Counters	32	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 1K of typical application

Communication Ports

Port 1	1 channel, RS232
Galvanic isolation	No
Baud rate	300 to 115200 bps
RS232	
Input voltage	±20VDC absolute maximum
Cable length	15m maximum (50')
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:
   - An additional port (Port 2). Available port types: RS232/RS485 isolated/non-isolated, Ethernet
   - A CANbus port

   Port module documentation is available in 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

Size	109 x 114.1 x 59.6mm (4.29 x 4.49 x 2.34").
Weight	205g (7.23 oz)

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)

DOC17004-A4 04/14