UniStream® Built-in

Technical Specifications

US5-B5-B1, US5-B10-B1, US5-B5-TR22,
US5-B10-TR22, US5-B5-T24, US5-B10-T24,
US5-C5-B1, US5-C10-B1, US5-C5-TR22,
US5-C10-TR22, US5-C5-T24, US5-C10-T24

US7-B5-B1, US7-B10-B1, US7-B5-TR22,
US7-B10-TR22, US7-B5-T24, US7-B10-T24,
US7-C5-B1, US7-C10-B1, US7-C5-TR22,
US7-C10-TR22, US7-C5-T24, US7-C10-T24

US10-B5-B1, US10-B10-B1, US10-B5-TR22,
US10-B10-TR22, US10-B5-T24, US10-B10-T24,
US10-C5-B1, US10-C10-B1, US10-C5-TR22,
US10-C10-TR22, US10-C5-T24, US10-C10-T24

US15-B10-B1, US15-C10-B1

Unitronics' UniStream® Built-in series are PLC+HMI All-in-One programmable controllers that comprise built-in HMI and built-in I/Os. UniStream connects directly to UniCloud, Unitronics' IIoT cloud platform using built-in UniCloud connectivity. More information about UniCloud is available at www.unitronics.cloud.

Model numbers in this document

US 5 - B 5 - B1

B1	• No built-in I/Os
TR22	• 10 x Digital inputs, 24VDC, sink/source • 2 x Analog inputs, 0÷10V / 0÷20mA, 12 bits • 2 x Transistor outputs, npn, including 2 High speed PWM output channels • 8 x Relay outputs
T24	• 10 x Digital inputs, 24VDC, sink/source • 2 x Analog inputs, 0÷10V / 0÷20mA, 12 bits • 12 x Transistor outputs, pnp, including 2 PWM output channels
5	Standard
10	Pro, offers additional features, detailed below
B	With UniCloud enabled functionality
C	With built-in 5 years UniCloud start-up subscription with no additional payment required for this period.
5	5" 800x480 (WVGA) display
7	7" 800x480 (WVGA) display
10	10.1" 1024x600 (WSVGA) display
15	15.6" 1366 x 768 (HD) display

Installation Guides are available in the Unitronics Technical Library at www.unitronicsplc.com.

Power Supply		USx-xx-B1	USx-xx-TR22	USx-xx-T24
Input voltage		12VDC or 24VDC	24VDC	24VDC
Permissible range		10.2VDC to 28.8VDC	20.4VDC to 28.8VDC	20.4VDC to 28.8VDC
Max. current consumption	US5	0.7A@12VDC 0.4A@24VDC	0.44A@24VDC	0.4A@24VDC
	US7	0.79A@12VDC 0.49A@24VDC	0.53A@24VDC	0.49A@24VDC
	US10	0.85A@12VDC 0.52A@24VDC	0.56A@24VDC	0.52A@24VDC
	US15	2.2A@12VDC 1.1A@24VDC	None	None
Isolation		None		

Display	UniStream 5"	UniStream 7"	UniStream 10.1"	UniStream 15.6"
LCD type	TFT			
Backlight type	White LED			
Luminous intensity (brightness)	Typically 350 nits (cd/m2), at 25°C	Typically 400 nits (cd/m2), at 25°C	Typically 300 nits (cd/m2), at 25°C	Typically 400 nits (cd/m2), at 25°C
Backlight longevity [1]	30k hours			
Resolution (pixels)	800 x 480 (WVGA)		1024 x 600 (WSVGA)	1366 x 768 (HD)
Size	5"	7"	10.1"	15.6"
Viewing area	Width x Height (mm) 108 x 64.8	Width x Height (mm) 154.08 x 85.92	Width x Height (mm) 222.72 x 125.28	Width x Height (mm) 344.23 x 193.53
Color support	65,536 (16bit)			
Surface treatment	Anti-glare			
Touch screen	Resistive Analog			
Actuation force (min)	> 80 g (0.176 lb)			

General	
I/O support	Up to 2,048 I/O points
Built-in I/O	According to model
Local I/O expansion	To add local I/Os, use UAG-CX I/O Expansion Adapters [2]. These adapters provide the connection point for standard UniStream Uni-I/O™ modules. You can connect up to 80 I/O modules to a single controller using these adapters. US15 only – Integrate I/O into your system by using UAG-BACK-IOADP adapter, snap onto the panel for an all-in-one configuration.
Remote I/O	Up to 8 UniStream Remote I/O Adapters (URB)
Communication ports	
Built-in COM ports	Specifications are provided below in the section Communications
Add-on Ports	Add up to 3 ports to a single controller using Uni-COM™ UAC-CX Modules [3].

Internal memory	Standard (B5/C5)	Pro (B10/C10)
	RAM: 512MB ROM: 3GB system memory 1GB user memory	RAM: 1GB ROM: 6GB system memory 2GB user memory
Ladder memory	1 MB	

External memory	microSD or microSDHC card
	Size: up to 32GB, Data Speed: up to 200Mbps
Bit operation	0.13 µs
Battery	Model: 3V CR2032 Lithium battery [4]
	Battery lifetime: 4 years typical, at 25°C
	Battery Low detection and indication (via the HMI and via System Tag).

Audio (Pro B10/C10 models only)

Bit Rate	192kbps
Audio compatibility	Stereo MP3 files
Interface	3.5mm Audio-out jack - use shielded audio cable of up to 3 m (9.84 ft)
Impedance	16Ω, 32Ω
Isolation	None

Video (Pro B10/C10 models only)

Supported Formats	MPEG-4 Visual , AVC/H.264

Communication (Built-in Ports)

Communication (Built-in Ports)	US5, US7, US10	US15
Ethernet port		
Number of ports	1	2
Port type	10/100 Base-T (RJ45)	
Auto crossover	Yes	
Auto negotiation	Yes	
Isolation voltage	500VAC for 1 minute	
Cable	Shielded CAT5e cable, up to 100 m (328 ft)	
USB device		
Port type	Mini-B	USB-C
Data rate	USB 2.0 (480Mbps)	
Isolation	None	
Cable	USB 2.0 compliant; < 3 m (9.84 ft)	
USB host		
Over current protection	Yes	

Digital Inputs (T24,TR22 models)

Number of inputs	10
Type	Sink or Source
Isolation voltage	
Input to bus	500VAC for 1 minute
Input to input	None
Nominal voltage	24VDC @ 6mA
Input voltage	
Sink/Source	On state: 15-30VDC, 4mA min.
	Off state: 0-5VDC, 1mA max.
Nominal impedance	4kΩ
Filter	6ms typical

Analog Inputs (T24,TR22 models)

Number of inputs	2		
Input range (6) (7)	**Input Type**	**Nominal Values**	**Over-range Values ***
	0 ÷ 10VDC	0 ≤ Vin ≤ 10VDC	10 < Vin ≤ 10.15VDC

	0 ÷ 20mA	0 ≤ Iin ≤ 20mA	20 < Iin ≤ 20.3mA
	* Overflow (8) is declared when an input value exceeds the Over-range boundary.		
Absolute maximum rating	±30V (Voltage), ±30mA (Current)		
Isolation	None		
Conversion method	Successive approximation		
Resolution	12 bits		
Accuracy (25°C / -20°C to 55°C)	±0.3% / ±0.9% of full scale		
Input impedance	541kΩ (Voltage), 248Ω (Current)		
Noise rejection	10Hz, 50Hz, 60Hz, 400Hz		

Step response (9) (0 to 100% of final value)	**Smoothing**	**Noise Rejection Frequency**			
		400Hz	60Hz	50Hz	10Hz
	None	2.7ms	16.86ms	20.2ms	100.2ms
	Weak	10.2ms	66.86ms	80.2ms	400.2ms
	Medium	20.2ms	133.53ms	160.2ms	800.2ms
	Strong	40.2ms	266.86ms	320.2ms	1600.2ms

Update time (9)	**Noise Rejection Frequency**	**Update Time**
	400Hz	5ms
	60Hz	4.17ms
	50Hz	5ms
	10Hz	10ms
Operational signal range (signal + common mode)	Voltage mode – AIx: -1V ÷ 10.5V ; CM1: -1V ÷ 0.5V	
	Current mode – AIx: -1V ÷ 5.5V ; CM1: -1V ÷ 0.5V (x=0 or 1)	
Cable	Shielded twisted pair	
Diagnostics (8)	Analog input overflow	

Relay Outputs (USx-xx-TR22)	
Number of outputs	8 (O0 to O7)
Output type	Relay, SPST-NO (Form A)
Isolation groups	Two groups of 4 outputs each
Isolation voltage	
Group to bus	1,500VAC for 1 minute
Group to group	1,500VAC for 1 minute
Output to output within group	None
Current	2A maximum per output (Resistive load)
Voltage	250VAC / 30VDC maximum
Minimum load	1mA, 5VDC
Switching time	10ms maximum
Short-circuit protection	None
Life expectancy (10)	100k operations at maximum load

Sink Transistor Outputs (USx-xx-TR22)

Number of outputs	2 (O8 and O9)
Output type	Transistor, Sink
Isolation	
Output to bus	1,500VAC for 1 minute
Output to output	None
Current	50mA max. per output
Voltage	Nominal: 24VDC Range: 3.5V to 28.8VDC
On state voltage drop	1V max
Off state leakage current	10µA max
Switching times	Turn-on: 1.6µs max. (4kΩ load, 24V)
	Turn-off: 13.4µs max. (4kΩ load, 24V)
High speed outputs	
PWM Frequency	0.3Hz min. 30kHz max. (4kΩ load)
Cable	Shielded twisted pair

Source Transistor Outputs (USx-xx-T24)

Number of outputs	12
Output type	Transistor, Source (pnp)
Isolation voltage	
Output to bus	500VAC for 1 minute
Output to output	None
Outputs power supply to bus	500VAC for 1 minute
Outputs power supply to output	None
Current	0.5A maximum per output
Voltage	See Source Transistor Outputs Power Supply specification below
ON state voltage drop	0.5V maximum
OFF state leakage current	10µA maximum
Switching times	Turn-on: 80µs maximum, Turn-off: 155µs maximum (Load resistance < 4kΩ)
PWM Frequency [11]	O0, O1: 3kHz max. (Load resistance < 4kΩ)
Short-circuit protection	Yes

Source Transistor Outputs Power Supply (USx-xx-T24)

|	
Nominal operating voltage	24VDC
Operating voltage	20.4 – 28.8VDC
Maximum current consumption	30mA@24VDC Current consumption does not include load current

Environmental	US5, US7, US10	US15
Protection	Front face: IP66, NEMA 4X Rear side: IP20, NEMA1	
Operating temperature	-20°C to 55°C (-4°F to 131°F)	0°C to 50°C (32°F to 122°F)
Storage temperature	-30°C to 70°C (-22°F to 158°F)	-20°C to 60°C (-4°F to 140°F)
Relative Humidity (RH)	5% to 95% (non-condensing)	
Operating Altitude	2,000 m (6,562 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	

Dimensions		
	Weight	Size
US5-xx-B1	0.31 Kg (0.68 lb)	Refer to the images on page 7
US5-xx-TR22	0.37 Kg (0.81 lb)	
US5-xx-T24	0.35 Kg (0.77 lb)	
US7-xx-B1	0.62 Kg (1.36 lb)	Refer to the images on page 8
US7-xx-TR22	0.68 Kg (1.5 lb)	
US7-xx-T24	0.68 Kg (1.5 lb)	
US10-xx-B1	1.02 Kg (2.25 lb)	Refer to the images on page 8
US10-xx-TR22	1.08 Kg (2.38 lb)	
US10-xx-T24	1.08 Kg (2.38 lb)	
US15-xx-B1	2.68Kg (5.9 lb)	Refer to the images on page 9

UniStream 5"

Cut Out drawing

UniStream 7"

Cut Out drawing
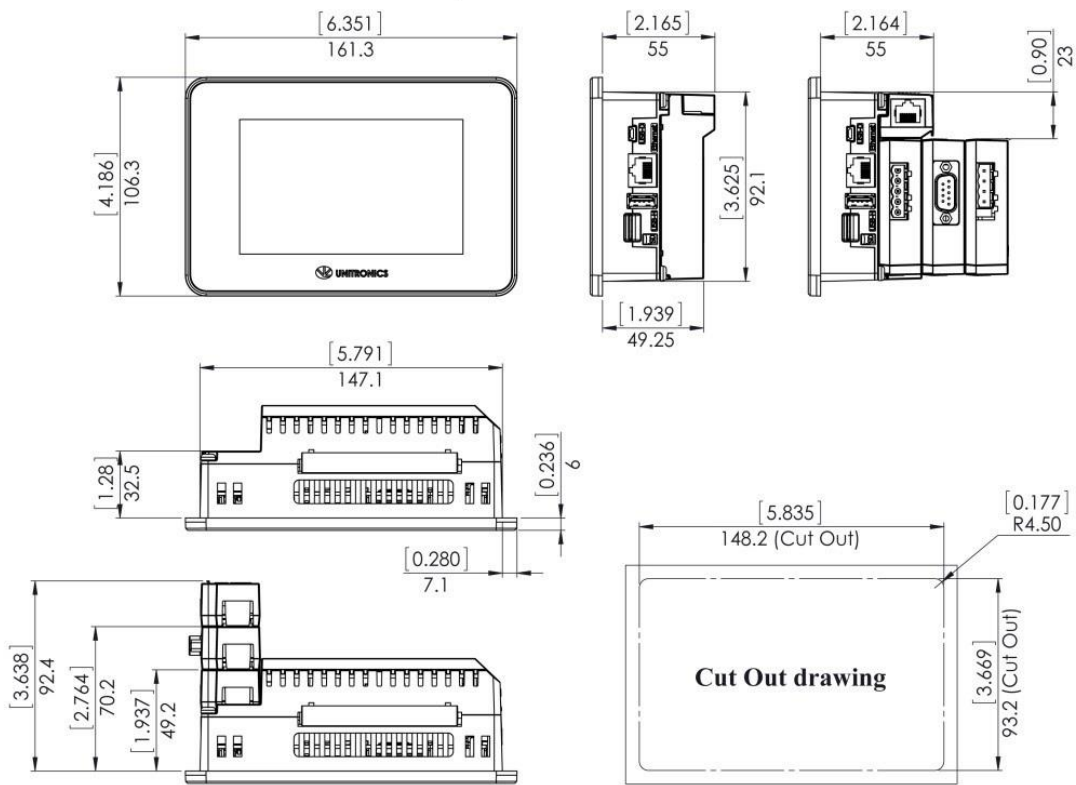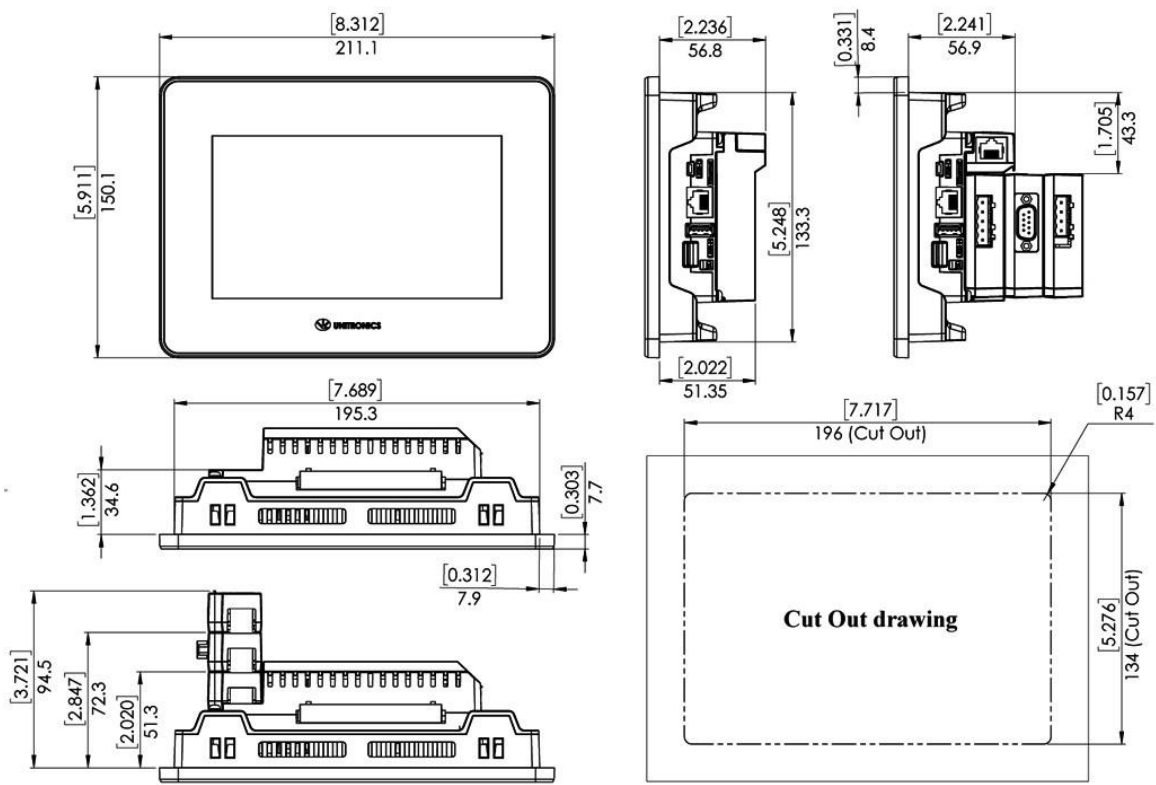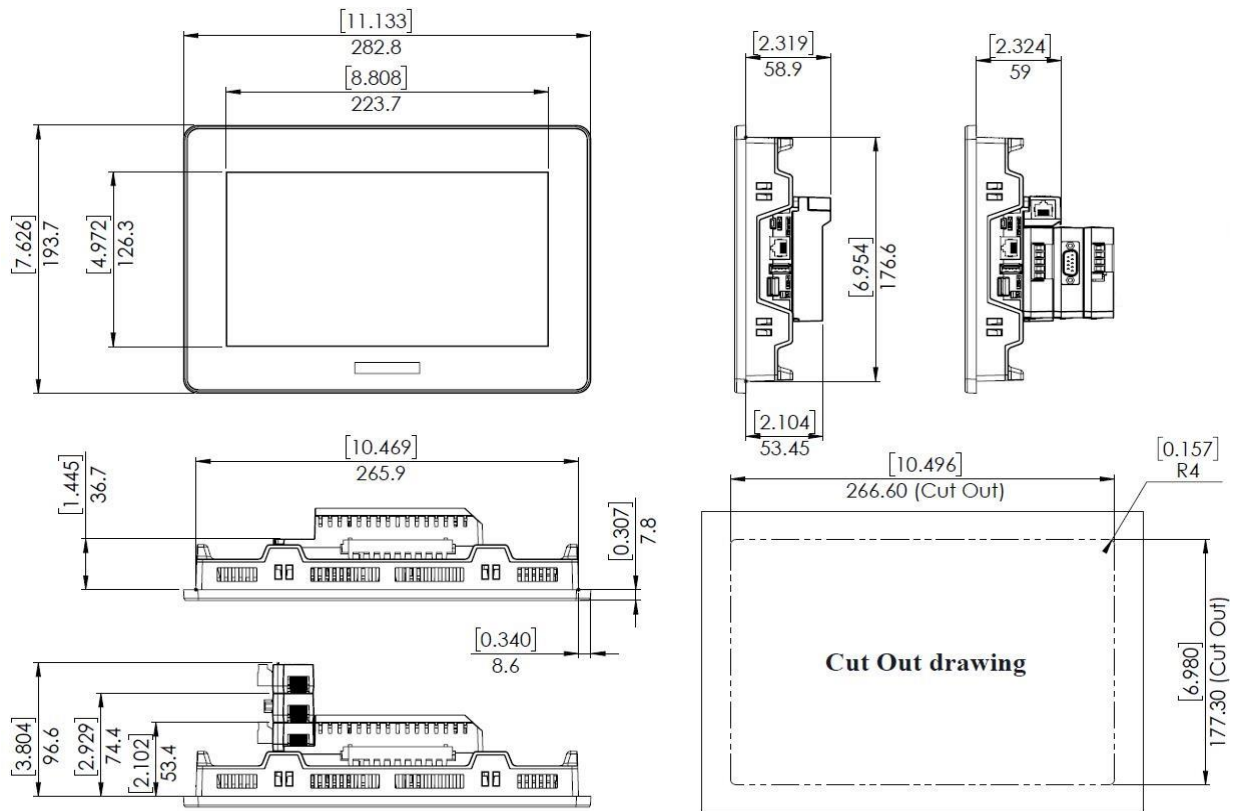
UniStream 10.1"

UniStream 15.6"
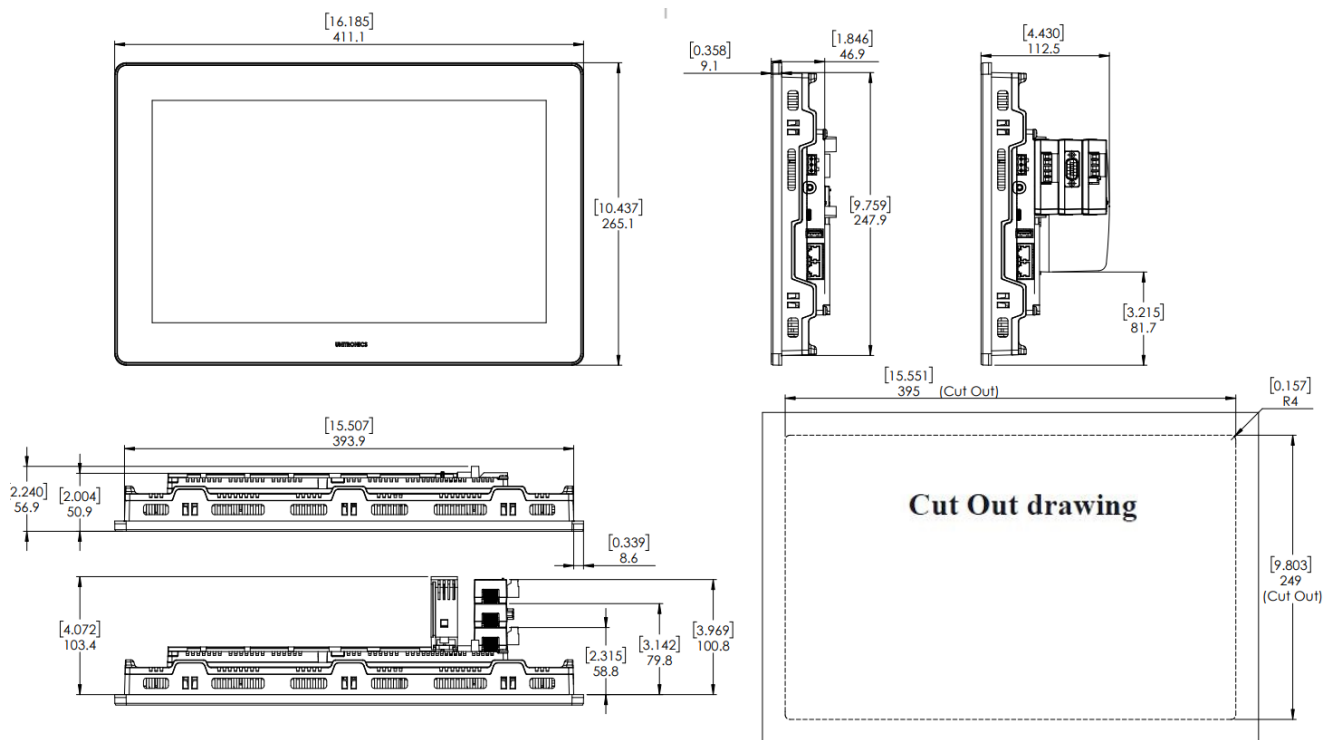
Notes:

1. The HMI panel's backlight longevity is the typical operating time after which the brightness drops to 50% of its original level.

2. UAG-CX Expansion Adapter Kits comprise a Base unit, an End unit, and a connecting cable. You plug the Base Unit into the controller's I/O Expansion Jack and connect standard UniStream Uni-I/O™ modules. For more information, refer to the product's installation guide and technical specifications.

3. Uni-COM™ CX modules plug directly into the Uni-COM™ CX Module Jack on the back of the controller.
   UAC-CX modules may be installed in the following configurations:
   - If a module comprising a serial port is snapped directly into to the back of UniStream, it may be followed only by another serial module, for a total of 2.
   - If your configuration includes a CANbus module, it must be snapped directly to the back of UniStream. The CANbus module may be followed by up to two serial modules, for a total of 3.
   For more information, refer to the product's installation guide and technical specifications.

4. When replacing the unit's battery, make sure that the new one has environmental specifications that are similar or better than the one specified in this document.

5. The USB device port is used to connect the device to a PC.

6. The 4-20mA input option is implemented using 0-20mA input range.

7. The analog inputs measure values that are slightly higher than the nominal input range (Input Over-range).

   Note that when the input overflow occurs, it is indicated in the corresponding I/O Status tag while the input value is registered as the maximum permissible value. For example, if the specified input range is 0 ÷ 10V, the Over-range values can reach up to 10.15V, and any input voltage higher than that will still register as 10.15V while the Overflow system tag is turned on.

8. The diagnostics results are indicated in the system tags and can be observed through the UniApps™ or the online state of the UniLogic™.

9. Step response and update time are independent of the number of channels that are used.

10. Life expectancy of the relay contacts depends on the application that they are used in. The product's installation guide provides procedures for using the contacts with long cables or with inductive loads.

11. Outputs O0 and O1 can be configured as either normal digital outputs or as PWM outputs.   PWM outputs specifications apply only when outputs are configured as PWM outputs.