

Powerful, Robust Controller with a New Concept: Virtual HMI

UNISTREAM® PLC provide you with advanced communication support – including Industry 4.0 - built-in I/Os, expandable to over 2,000 I/Os expansions and enhance your ability to master the complex, demanding control tasks required by your machine or process application.

- **Two technologies in one product** -



Virtual HMI

- Build your PLC and HMI applications using **the same programming software**
- Download your program applications to the PLC
- The UniStream PLC simultaneously stores & runs both the program logic and HMI application
- Remotely operate your machine or process via any mobile phone, PC, or any other display device

Hardware

- High-performance robust PLC matches vast application requirements
- Built-in I/O, expand to more than 2,000 I/Os
- Range of I/O modules: digital, analog, high-speed and temperature
- Advanced support for Industry 4.0



UniLogic®: Award-winning software - Cuts development time by 50%!

UniLogic® offers a fast, easy solution to OEMs and System Integrators—you program all tasks using the same software environment. Build the PLC application, design HMI screens, create Web pages in multiple languages, and save it all in a Library to re-use in other projects.

Available in three series: Pro (B10), Standard (B5), and Basic (B3)

UNISTREAM® PLC

Features:

PLC

- I/O options include digital, analog, high speed, and temperature
- Expand locally: up to 2048 I/Os¹
- Expand remotely: via UniStream Remote I/O
- Auto-tune PID, up to 64 independent loops²
- Recipes & data logging via data tables & sampling¹
- MicroSD card - log, backup, clone & more¹
- Function Blocks & Structs

Communication

Built-in ports:

- 2 Ethernet TCP/IP
- 1 USB host
- 1 Mini USB for programming¹

Add-on ports:³

- 1 CANbus
- 1 RS485
- 1 RS232

Protocols:

- MQTT Client
- EtherNet/IP
- Modbus TCP
- CANopen, CANlayer2, UniCAN
- SNMP
- BACnet, KNX and M-Bus via gateway
- Message Composer for 3rd party protocols

General Features:

- SQL Client⁴
- Web Server⁴
- E-mail & SMS
- Remote access via VNC
- FTP server & client¹
- GPRS

Virtual HMI

- Full HMI functionality
- Support different resolution type
- Includes Drag & Drop graphic library
- Multi-language display
- Built-in Alarm Screens
- PDF viewer¹
- Multi-level password protection – easy and fast

Supports UniStream® Displays & HMI Panels:

UniStream Display:

- Size: 5" (USL-050-B05)
- Size: 7" (USL-070-B05)

UniStream HMI Panels:

- Size: 10.4" (USP-104-B10)
- Size: 15.6" (USP-156-B10)



UniStream Display



¹ Pro (B10) and Standard (B5) only.

² Basic (B3) supports up to 2 independent PID loops

³ Up to two serial modules for B10/B5 and one for B3

⁴ Pro (B10) only

UNISTREAM® PLC I/O Configurations

Article Number	Summary	Inputs				Outputs				Operating Voltage
		Digital (Isolated)	HSC/Shaft-encoder ¹	Analog	Temperature inputs, RTD/TC	Transistor ² (Isolated)	PWM ²	Relay	Analog	
USC-B5-B1 Art. N° 158936 USC-B10-B1 Art. N° 158943	No built-in I/Os	-	-	-	-	-	-	-	-	12/24VDC
USC-B5-TR22 Art. N° 158938 USC-B10-TR22 Art. N° 158945	10 Digital Inputs, 2 Analog Inputs, 2 Transistor Outputs, npn, including 2 PWM Outputs. 8 Relay Outputs	10 Sink/Source	-	2 0-10V, 0-20mA, 4-20mA 12-bit	-	2 Sink (npn)	2 30kHz	8	-	24VDC
USC-B5-T24 Art. N° 158937 USC-B10-T24 Art. N° 158944	10 Digital Inputs, 2 Analog Inputs, 12 Transistor Outputs, pnp, including 2 PWM Outputs	10 Sink/Source	-	2 0-10V, 0-20mA, 4-20mA 12-bit	-	12 Source (pnp)	2 3kHz	-	-	24VDC
USC-B5-RA28 Art. N° 158939 USC-B10-RA28 Art. N° 158946	14 Digital Inputs, including 2 HSC, 2 Analog Inputs, 2 Temperature Inputs, 8 Relay Outputs, 2 Analog Outputs	14 Sink/Source	2 90kHz 32-bit	2 (isolated) 0-10V, 0-20mA, 4-20mA 14-bit	2 (isolated) Thermocouple, PT100/NI100/ NI120/ PT1000/NI1000	-	-	8	2 0-10V 12-bit, ±10V, 11-bit+sign 0-20mA, 4-20mA 12-bit	24VDC
USC-B5-TA30 Art. N° 158940 USC-B10-TA30 Art. N° 158947	14 Digital Inputs, including 2 HSC, 2 Analog Inputs, 2 Temperature Inputs, 10 Transistor outputs, pnp, including 2 PWM Outputs, 2 Analog Outputs	14 Sink/Source	2 90kHz 32-bit	2 (isolated) 0-10V, 0-20mA, 4-20mA 14-bit	2 (isolated) Thermocouple, PT100/NI100/ NI120/ PT1000/NI1000	10 Source (pnp)	2 3kHz	-	2 0-10V 12-bit, ±10V 11-bit+sign 0-20mA, 4-20mA 12-bit	24VDC
USC-B5-R38 Art. N° 158941 USC-B10-R38 Art. N° 158948	24 Digital Inputs, including 4 HSC, 2 Analog Inputs, 12 relay Outputs	24 Sink/Source	4 90kHz 32-bit	2 0-10V, 0-20mA, 4-20mA 12-bit	-	-	-	12	-	24VDC
USC-B5-T42 Art. N° 158942 USC-B10-T42 Art. N° 158949	24 Digital Inputs, including 4 HSC, 2 Analog Inputs, 16 Transistor Outputs, pnp, including 2 PWM Outputs	24 Sink/Source	4 90kHz 32-bit	2 0-10V, 0-20mA, 4-20mA 12-bit	-	16 Source (pnp)	2 3kHz	-	-	24VDC
USC-B3-R20 Art. N° 158935	10 Digital Inputs, 2 Analog Inputs, 8 Relay Outputs	10 Sink/Source	-	2 0-10V, 0-20mA, 4-20mA 12-bit	-	-	-	8	-	24VDC
USC-B3-T20 Art. N° 158933	10 Digital inputs, 2 Analog Inputs, 8 Transistor Outputs, pnp, including 2 PWM Outputs	10 Sink/Source	-	2 0-10V, 0-20mA, 4-20mA 12-bit	-	8 Source (pnp)	2 3kHz	-	-	24VDC

¹ Note that the high-speed inputs are included in the total number of digital inputs.

² Note that the PWM outputs are included in the total number of transistor outputs.

Unitronics' UniStream® PLCs are DIN-rail mounted Programmable Logic Controllers (PLCs) with a built-in I/O configuration. This document provides the specifications for the built-in I/O configurations for the models USC-Bx-RA28 and USC-Bx-TA30.

The series is available in three versions: Pro, Standard, and Basic.

Note that a model number that includes:

- **B10** refers to Pro version (e.g. USC-B**10**-T24)
- **B5** refers to Standard version (e.g. USC-B**5**-RA28)
- **B3** refers to Basic version (e.g. only for USC-B**3**-T20)

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

USC-Bx-RA28	USC-Bx-TA30
<ul style="list-style-type: none"> • 14 x Digital inputs, isolated, 24VDC, sink/source, including 2 High speed counter input channels ⁽¹⁾ • 2 x Analog inputs, isolated, 0÷10V / 0÷20mA, 14 bits • 2 x Temperature inputs, isolated, RTD / Thermocouple • 8 x Relay outputs, isolated • 2 x Analog outputs, 0÷10V / -10÷10V / 0÷20mA / 4÷20mA, 12 bits 	<ul style="list-style-type: none"> • 14 x Digital inputs, isolated, 24VDC, sink/source, including 2 High speed counter input channels ⁽¹⁾ • 2 x Analog inputs, isolated, 0÷10V / 0÷20mA, 14 bits • 2 x Temperature inputs, isolated, RTD / Thermocouple • 10 x Transistor outputs, isolated, pnp, including 2 PWM output channels • 2 x Analog outputs, 0÷10V / -10÷10V / 0÷20mA / 4÷20mA, 12 bits

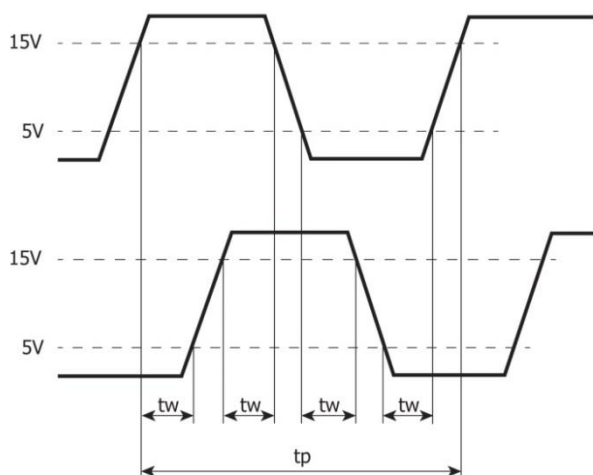
Power Supply	USC-Bx-RA28	USC-Bx-TA30
Input voltage	24VDC	24VDC
Permissible range	20.4VDC to 28.8VDC	20.4VDC to 28.8VDC
Max. current consumption	0.46A@24VDC	0.42A@24VDC
Isolation	None	

General		
I/O support	Up to 2,048 I/O points	
Built-in I/O	According to model	
Local Uni-I/O™ support ⁽²⁾	Up to 8 I/O modules with no additional power supply Up to 16 I/O modules with a Local Expansion ⁽³⁾ Power Kit	
Remote I/O	Up to 8 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-CB Modules ⁽⁴⁾ .	
Internal memory	Standard (B5)	Pro (B10)
	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 ⁽⁵⁾ Battery lifetime: 4 years typical, at 25°C Battery Low detection and indication (via BATT. LOW indicator and via System Tag).	

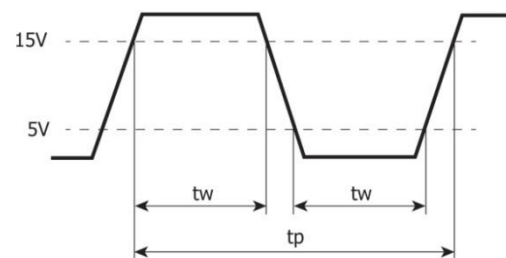
Communication (Built-in Ports)	
Ethernet port	
Number of ports	2
Port type	10/100 Base-T (RJ45)
Auto crossover	Yes
Auto negotiation	Yes
Isolation voltage	500VAC for 1 minute
Cable	Shielded CAT5e cable, up to 100 m (328 ft)
USB device ⁽⁶⁾	
Number of ports	1
Port type	Mini-B
Data rate	USB 2.0 (480Mbps)
Isolation	None
Cable	USB 2.0 compliant; < 3 m (9.84 ft)
USB host	
Number of ports	1
Port type	Type A
Data rate	USB 2.0 (480Mbps)
Isolation	None
Cable	USB 2.0 compliant; < 3 m (9.84 ft)
Over current protection	Yes

Digital Inputs	
Number of inputs	14
Type	Sink or Source
Isolation voltage	
Input to bus	500VAC for 1 minute
Input to input	None
Nominal voltage	I0-I9: 24VDC @ 6mA I10-I13: 24VDC @ 8mA
Input voltage	
Sink/Source	On state: 15-30VDC, 4mA min. Off state: 0-5VDC, 1mA max.
Nominal impedance	I0-I9: 4kΩ I10-I13: 3kΩ
Filter	I0-I9: 6ms typical I10-I13: 5.5μs, 50μs, 0.5ms, 6ms, 12ms
High speed inputs ⁽¹⁾	
Frequency / Period	Pulse/Direction mode: 90kHz max. / 11.1μs min (t _p in the Pulse/Dir Mode figure below). Quadrature mode: 80kHz max. / 12.5μs min (t _p in the Quadrature Mode figure below).
Pulse width	Pulse/Direction mode: 5.1μs min. for each state (t _w in Pulse/Dir Mode figure below). Quadrature mode: 2.5μs min. for each state (t _w in Quadrature Mode figure below).
Cable	Shielded twisted pair

Quadrature Mode



Pulse/Direction mode



Analog Inputs					
Number of inputs	2				
Input range ^{(7) (8)}	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 ⁽⁹⁾ is declared when an input value exceeds the Over-range boundary.				
Absolute maximum rating	±30V (Voltage), ±30V (Current)				
Isolation voltage					
Input to bus	500VAC for 1 minute				
Input to input	None				
Input to temperature inputs	None				
Conversion method	Delta-sigma				
Resolution	14 bits				
Accuracy (25°C / -20°C to 55°C)	±0.2% / ±0.5% of full scale (Voltage) ±0.2% / ±0.3% of full scale (Current)				
Input impedance	527kΩ (Voltage), 60.4Ω (Current)				
Noise rejection	10Hz, 50Hz, 60Hz, 400Hz				
Step response ⁽¹⁰⁾ (0 to 100% of final value)	Smoothing	Noise Rejection Frequency			
		400Hz	60Hz	50Hz	10Hz
	None	162.4ms	249.5ms	249.5ms	1242.4ms
	Weak	317.3ms	491.5ms	491.5ms	2477.3ms
	Medium	627.2ms	975.4ms	975.4ms	4947ms
Strong	1246.9ms	1943.3ms	1943.3ms	9886.5ms	
Update time ⁽¹⁰⁾	Noise Rejection Frequency		Update Time		
	400Hz		154.9ms		
	60Hz		242ms		
	50Hz		242ms		
	10Hz		1234.9ms		
Cable	Shielded twisted pair				
Diagnostics ⁽⁹⁾	Analog input overflow				

Temperature Inputs			
Number of inputs	2		
Sensor Type	RTD (4, 3 and 2 wire ⁽¹¹⁾), Themocouple		
Input range ⁽¹²⁾	Input type	Nominal values	Over/Under-range Values *
	RTD PT100 0.00385 0.00392 0.00391 PT1000 0.00385 0.00392	-200°C ≤ T ≤ 850°C (-328°F ≤ T ≤ 1,562°F)	Under-range: -220°C ≤ T < -200°C (-364°F ≤ T < -328°F) Over-range: 850°C < T ≤ 860°C (1,562°F < T ≤ 1,580°F)
	RTD NI100 0.00618 NI1000 0.00618	-100°C ≤ T ≤ 260°C (-148°F ≤ T ≤ 500°F)	Under-range: -150°C ≤ T < -100°C (-238°F ≤ T < -148°F) Over-range: 260°C < T ≤ 270°C (500°F < T ≤ 518°F)
	RTD NI120 0.00672	-80°C ≤ T ≤ 260°C (-112°F ≤ T ≤ 500°F)	Under-range: -130°C ≤ T < -80°C (-202°F ≤ T < -112°F) Over-range: 260°C < T ≤ 270°C (500°F < T ≤ 518°F)
	RTD NI100 0.00617	-60°C ≤ T ≤ 180°C (-76°F ≤ T ≤ 356°F)	Under-range: -104°C ≤ T < -60°C (-219°F ≤ T < -76°F) Over-range: 180°C < T ≤ 210°C (356°F < T ≤ 410°F)
	RTD NI1000 LG	-50°C ≤ T ≤ 190°C (-58°F ≤ T ≤ 374°F)	Under-range: -60°C ≤ T < -50°C (-76°F ≤ T < -58°F) Over-range: 190°C < T ≤ 200°C (374°F < T ≤ 392°F)
	Thermocouple type J	-200°C ≤ T ≤ 1,200°C (-328°F ≤ T ≤ 2,192°F)	Under-range: -210°C ≤ T < -200°C (-346°F ≤ T < -328°F) Over-range: 1,200°C < T ≤ 1,250°C (2,192°F < T ≤ 2,282°F)
	Thermocouple type K	-200°C ≤ T ≤ 1,372°C (-328°F ≤ T ≤ 2,501.6°F)	Under-range: -270°C ≤ T < -200°C (-454°F ≤ T < -328°F) Over-range: 1,372°C < T ≤ 1,400°C (2,501.6°F < T ≤ 2,552°F)

Thermocouple type T	$-200^{\circ}\text{C} \leq T \leq 400^{\circ}\text{C}$ ($-328^{\circ}\text{F} \leq T \leq 752^{\circ}\text{F}$)	Under-range: $-270^{\circ}\text{C} \leq T < -200^{\circ}\text{C}$ ($-454^{\circ}\text{F} \leq T < -328^{\circ}\text{F}$) Over-range: $400^{\circ}\text{C} < T \leq 430^{\circ}\text{C}$ ($752^{\circ}\text{F} < T \leq 806^{\circ}\text{F}$)
Thermocouple type E	$-200^{\circ}\text{C} \leq T \leq 1,000^{\circ}\text{C}$ ($-328^{\circ}\text{F} \leq T \leq 1,832^{\circ}\text{F}$)	Under-range: $-270^{\circ}\text{C} \leq T < -200^{\circ}\text{C}$ ($-454^{\circ}\text{F} \leq T < -328^{\circ}\text{F}$) Over-range: $1,000^{\circ}\text{C} < T \leq 1,010^{\circ}\text{C}$ ($1,832^{\circ}\text{F} < T \leq 1,850^{\circ}\text{F}$)
Thermocouple type R	$0^{\circ}\text{C} \leq T \leq 1,768^{\circ}\text{C}$ ($32^{\circ}\text{F} \leq T \leq 3,214.4^{\circ}\text{F}$)	Under-range: $-50^{\circ}\text{C} \leq T < 0^{\circ}\text{C}$ ($-58^{\circ}\text{F} \leq T < 32^{\circ}\text{F}$) Over-range: $1,768^{\circ}\text{C} < T \leq 1,800^{\circ}\text{C}$ ($3,214.4^{\circ}\text{F} < T \leq 3,272^{\circ}\text{F}$)
Thermocouple type S	$0^{\circ}\text{C} \leq T \leq 1,768^{\circ}\text{C}$ ($32^{\circ}\text{F} \leq T \leq 3,214.4^{\circ}\text{F}$)	Under-range: $-50^{\circ}\text{C} \leq T < 0^{\circ}\text{C}$ ($-58^{\circ}\text{F} \leq T < 32^{\circ}\text{F}$) Over-range: $1,768^{\circ}\text{C} < T \leq 1,800^{\circ}\text{C}$ ($3,214.4^{\circ}\text{F} < T \leq 3,272^{\circ}\text{F}$)
Thermocouple type B	$200^{\circ}\text{C} \leq T \leq 1,820^{\circ}\text{C}$ ($392^{\circ}\text{F} \leq T \leq 3,308^{\circ}\text{F}$)	Under-range: $100^{\circ}\text{C} \leq T < 200^{\circ}\text{C}$ ($212^{\circ}\text{F} \leq T < 392^{\circ}\text{F}$) Over-range: $1,820^{\circ}\text{C} < T \leq 1,870^{\circ}\text{C}$ ($3,308^{\circ}\text{F} < T \leq 3,398^{\circ}\text{F}$)
Thermocouple type N	$-210^{\circ}\text{C} \leq T \leq 1,300^{\circ}\text{C}$ ($-346^{\circ}\text{F} \leq T \leq 2,372^{\circ}\text{F}$)	Under range: $-270^{\circ}\text{C} \leq T < -210^{\circ}\text{C}$ ($-454^{\circ}\text{F} \leq T < -346^{\circ}\text{F}$) Over-range: $1,300^{\circ}\text{C} < T \leq 1,350^{\circ}\text{C}$ ($2,372^{\circ}\text{F} < T \leq 2,462^{\circ}\text{F}$)
Thermocouple type C	$10^{\circ}\text{C} \leq T \leq 2,315^{\circ}\text{C}$ ($50^{\circ}\text{F} \leq T \leq 4,199^{\circ}\text{F}$)	Under-range: $0^{\circ}\text{C} \leq T < 10^{\circ}\text{C}$ ($32^{\circ}\text{F} \leq T < 50^{\circ}\text{F}$) Over-range: $2,315^{\circ}\text{C} < T \leq 2,370^{\circ}\text{C}$ ($4,199^{\circ}\text{F} < T \leq 4,298^{\circ}\text{F}$)
Resistance	$0\Omega \leq R \leq 390\Omega$	$390\Omega < R \leq 395.85\Omega$
mV	$-70\text{mV} \leq V \leq 70\text{mV}$	Under-range: $-71.05\text{mV} \leq V < -70\text{mV}$ Over-range: $70\text{mV} \leq V < 71.05\text{mV}$
* Overflow or Underflow ⁽⁹⁾ is declared when an input value exceeds the Over-range or Under-range boundaries respectively.		

Absolute maximum rating	±9 V			
Isolation voltage				
Input to bus	500 VAC for 1 minute			
Input to input	None			
Input to analog inputs	None			
Conversion method	Delta-sigma			
Resolution	Temperature – 0.1°C (0.1°F) ⁽¹³⁾ Resistance – 14 bits mV – 13 bits plus sign			
Accuracy (25°C / -20°C to 55°C)	Input type	Accuracy		
	RTD, all types	± 0.5°C / ± 1.0°C (± 0.9°F / ± 1.8°F)		
	Thermocouple type J ⁽¹⁴⁾	± 0.4°C / ± 0.7°C (± 0.72°F / ± 1.26°F)		
	Thermocouple type K ⁽¹⁴⁾	± 0.5°C / ± 1.0°C (± 0.9°F / ± 1.8°F)		
	Thermocouple type T ⁽¹⁴⁾	± 0.6°C / ± 1.2°C (± 1.08°F / ± 2.16°F)		
	Thermocouple type E ⁽¹⁴⁾	± 0.4°C / ± 0.8°C (± 0.72°F / ± 1.44°F)		
	Thermocouple type R ⁽¹⁴⁾	± 1.2°C / ± 2.4°C (± 2.16°F / ± 4.32°F)		
	Thermocouple type S ⁽¹⁴⁾	± 1.2°C / ± 2.4°C (± 2.16°F / ± 4.32°F)		
	Thermocouple type B ⁽¹⁴⁾	± 2.0°C / ± 3.8°C (± 3.46°F / ± 6.84°F)		
	Thermocouple type N ⁽¹⁴⁾	± 1.0°C / ± 1.5°C (± 1.8°F / ± 2.7°F)		
	Thermocouple type C ⁽¹⁴⁾	± 0.8°C / ± 2.0°C (± 1.44°F / ± 3.46°F)		
	Resistance	± 0.05% / ± 0.1% of full scale		
mV	± 0.05% / ± 0.1% of full scale			
Noise rejection	10Hz, 50Hz, 60Hz, 400Hz			
Step response ⁽¹⁰⁾ (0 to 100% of final value)	Smoothing	Noise Rejection Frequency		
		400Hz	60Hz	50Hz
	None	162.4ms	249.5ms	249.5ms
	Weak	317.3ms	491.5ms	491.5ms
	Medium	627.2ms	975.4ms	975.4ms
Strong	1246.9ms	1943.3ms	1943.3ms	9886.5ms
Update time ⁽¹⁰⁾	Noise Rejection Frequency	Update Time		
	400Hz	154.9ms		
	60Hz	242ms		
	50Hz	242ms		
10Hz	1234.9ms			
Thermocouple Cold junction error ⁽¹⁴⁾	±1.5°C (±2.7°F)			
Cable	Shielded, see installation guide for details			
Diagnostics ⁽⁹⁾	Input Overflow or Underflow, sensor connection fault ⁽¹⁵⁾			

Relay Outputs (USC-Bx-RA28)	
Number of outputs	8
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 ⁽¹⁶⁾	100k operations at maximum load

Source Transistor Outputs (USC-Bx-TA30)	
Number of outputs	10
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/off: 80µs max. (Load resistance < 4kΩ)
PWM Frequency ⁽¹⁷⁾	O0, O1: 3kHz max. (Load resistance < 4kΩ)
Short-circuit protection	Yes

Source Transistor Outputs Power Supply (USC-Bx-TA30)	
Nominal operating voltage	24VDC
Operating voltage	20.4 – 28.8VDC
Maximum current consumption	30mA@24VDC Current consumption does not include load current

Analog Outputs			
Number of outputs	2		
Output range ⁽¹⁸⁾	Output Type	Nominal Values	Over/Under-range Values *
	0 ÷ 10VDC	$0 \leq V_{out} \leq 10VDC$	$10 < V_{out} \leq 10.15VDC$
	-10 ÷ 10VDC	$-10 \leq V_{out} \leq 10VDC$	$-10.15 \leq V_{out} < -10VDC$ $10 < V_{out} \leq 10.15VDC$
	0 ÷ 20mA	$0 \leq I_{out} \leq 20mA$	$20 \leq I_{out} \leq 20.3mA$
	4 ÷ 20mA	$4 \leq I_{out} \leq 20mA$	$20 \leq I_{out} \leq 20.3mA$
* Overflow or Underflow is declared when an output value exceeds the Over-range or Under-range boundaries respectively.			
Isolation	None		
Resolution	0 ÷ 10VDC – 12 bit -10 ÷ 10VDC – 11 bit + sign 0 ÷ 20mA – 12 bit 4 ÷ 20mA – 12 bit		
Accuracy (25°C / -20°C to 55°C)	±0.3% / ±0.5% of full scale (Voltage) ±0.5% / ±0.7% of full scale (Current)		
Load impedance	Voltage – 1kΩ minimum Current – 600Ω maximum		
Settling time (95% of new value)	0 ÷ 10VDC – 1.8ms (2kΩ resistive load), 3.7ms (2kΩ + 1μF load) -10 ÷ 10VDC – 3ms (2kΩ resistive load), 5.5ms (2kΩ + 1μF load) 0 ÷ 20mA and 4 ÷ 20mA – 1.7ms (600Ω load), 1.7ms (600Ω + 10mH load)		
Short circuit protection (voltage mode)	Yes (no indication)		
Cable	Shielded twisted pair		
Diagnostics ⁽⁹⁾	Current – Open circuit indication Supply level – Normal / Low or missing		

LED Indications				
I/O LEDs	Color	Indication		
Digital Input	Green	Input state		
Analog Input	Red	On: Input value is in Overflow		
Temperature Input	Red	On: Input value is in Overflow, Underflow, or a connection fault occurs		
Relay and Transistor Output	Green	Output state		
Analog Output	Red	On: Open Circuit (when set to Current mode)		
Status LEDs	Color & State		Indication	
RUN	Green	On	Run mode	
		Blink	This indication is in conjunction with the USB LED. See table below, USB Actions Indications, for details	
	Orange	On	Start-up mode	
		Blink	Stop mode	
ERROR	Red	On/Blink	The Error LED can give indications in conjunction with the RUN and/or USB LED. See the next tables Error Indications and USB Actions Indications for details	
USB	Green	On	A USB drive is detected that contains valid action file(s). See ⁽¹⁹⁾ for details	
		Blink	USB Action in progress	
BATT. LOW	Red	On	Battery is low or missing	
FORCE	Red	On	I/O Force on	
Error Indications	LED, Color & State			Indication
	RUN	ERROR	USB	Indication
		Red blink	Off	USB Action has failed – disconnect the USB drive to dismiss the error
		Red blink		HW Configuration Mismatch – the HWC in the UniLogic application does not match the Uni-I/O modules physically connected to the PLC
	Orange blink	Red blink		Application Invalid or Version Mismatch (UniLogic version is not supported by device firmware)
		Red On		Uni-I/O Error (check wiring connections)
	Orange blink	Red On		OS/Application error

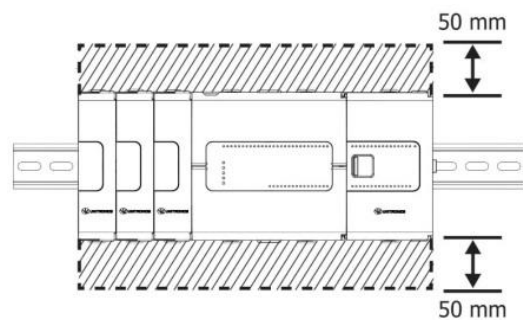
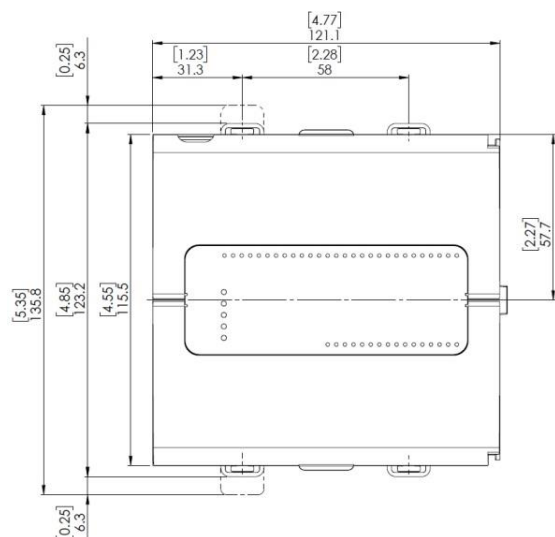
USB Actions Indications	LED, Color & State			Indication
	RUN	ERROR	USB	
			Green On	USB drive detected with valid Action file(s) - press CONFIRM ⁽¹⁹⁾ to start Action or USB Action finished successfully.
			Green blink	USB Action in progress.
	Green blink		Green On	USB Action requires reset; press CONFIRM to restart system
		Red blink	Green Off	USB drive detected, but contains corrupt Action file(s)
		Red blink	Green ON	USB Action ran with error – disconnect the USB drive to dismiss the error.

Environmental	
Protection	IP20, NEMA1
Operating temperature	-20°C to 55°C (-4°F to 131°F)
Storage temperature	-30°C to 70°C (-22°F to 158°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

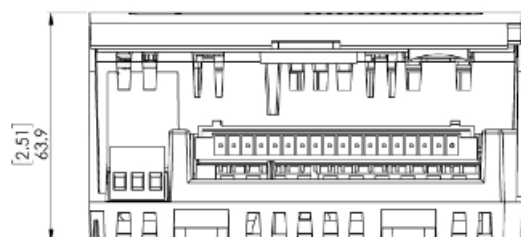
Dimensions		
	Weight	Size
USC-Bx-RA28	0.39 Kg (0.86 lb)	As shown in the images below
USC-Bx-TA30	0.38 Kg (0.84 lb)	

Mechanical Dimensions

Front View



Bottom View



Notes:

- Four of the digital inputs (I10-I13) may be configured to function either as normal, or as high speed digital inputs, that can receive high speed pulse signals from up to two sensors or shaft encoders.
- The controller, without any additional power supply, can support up to 8 Uni-I/O™ modules, either plugged directly into the I/O Bus connector on the side of the controller, or via a Local Expansion Kit. If more Uni-I/O™ modules are required, you must use a Local Expansion Kit with a power supply, this enables a single controller to support up to 16 modules.
- The Local Expansion Kits comprise a Base unit, an End unit, and a connecting cable. You must plug the Base Unit into the last Uni-I/O™ module plugged into the controller. If no module is present, plug the Base unit into the I/O Bus connector.
- Uni-COM™ CB modules plug directly into the Uni-COM Jack on the side of the controller. Uni-COM modules may be installed in the following configurations:
 - If a module comprising a serial port is plugged directly into the controller, it may be followed only by another serial module, for a total of 2.
 - If your configuration includes a CANbus module, it must be plugged directly into the controller. 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.
- 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.
- The USB device port is used to connect the device to a PC.
- The 4-20mA input option is implemented using 0-20mA input range.
- 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 as well as by the respective input LED (see LED Indications), 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.

- 9. See LED Indications Table for description of the relevant indications. Note that the diagnostics results are also indicated in the system tags and can be observed through the UniApps™ or the online state of the UniLogic®.
- 10. Step response and update time are independent of the number of channels that are used.
- 11. The controller inherently supports 3-wire sensors.
 4-wire sensors may be connected by utilizing 3 of the sensor wires; in-order to achieve the specified performance, all sensor wires shall be of identical type and length just as with a 3-wire sensor connection.
 2-wire sensors may also be connected; performance in this case will degrade because of the wires` resistance.
 Refer to the controller installation guide for detailed installation instructions.

- 12. The controller temperature inputs measure values that are slightly higher or lower than the nominal input range (Input Over/Under-range respectively).
 Note that when input Overflow, Underflow or a connection fault occurs, it is indicated in the corresponding I/O Status tag (refer to the UniLogic® help for details) as well as by the respective input LED (see LED Indications), while the input value is registered as follows:

Fault Type	Registered Value in the Input Tag
Overflow	32,767
Underflow	-32,767
Connection fault	-32,768

- 13. For temperature measurement, the value is represented in 0.1° units. For example, a temperature of 12.3° is represented as 123 at the Value tag.
- 14. The overall accuracy for thermocouples is a combination of the per-sensor specified accuracy and the thermocouple cold junction error specification.
- 15. Sensor connection fault check is active by default for temperature, resistance and mV measurements. This may interfere with some test equipment like RTD, thermocouple, resistance and voltage simulators and thus may induce reading errors or cause malfunction of the test equipment and/or the controller.
 In order to interoperate correctly with such equipment, you may set the Disable Fault Detection I/O tag. This will disable connection fault check for all inputs.
 Note that when this tag is set, the controller will not check, or report, connection faults; thus, the reading in such case is unpredictable.
- 16. 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.
- 17. 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.
- 18. The controller analog outputs are able to output values that are slightly higher or lower (if applicable) than the nominal output range (Output Over/Under-range respectively).
- 19. This refers to the CONFIRM button on the controller USB Actions; press it if the indication requires.

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 forgoing 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.