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)

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UniStream® PLC

Features:

PLC

- I/O options include digital, analog, high speed, and temperature
- Expand locally: up to 2048 I/Os[1]
- Expand remotely: via UniStream Remote I/O
- Auto-tune PID, up to 64 independent loops[2]
- Recipes & data logging via data tables & sampling[1]
- MicroSD card - log, backup, clone & more[1]
- Function Blocks & Structs

Communication

Built-in ports:

- 2 Ethernet TCP/IP
- 1 USB host
- 1 Mini USB for programming[1]

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 Client[4]
- Web Server[4]
- E-mail & SMS
- Remote access via VNC
- FTP server & client[1]
- GPRS

Virtual HMI

- Full HMI functionality
- Support different resolution type
- Includes Drag & Drop graphic library
- Multi-language display
- Built-in Alarm Screens
- PDF viewer[1]
- 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

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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 Digita 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.

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UniStream®
PLC

Technical Specifications:
USC-B3-R20, USC-B3-T20

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-B3-R20	USC-B3-T20
• 10 x Digital inputs, isolated, 24VDC, sink/source • 2 x Analog inputs, 0÷10V / 0÷20mA, 12 bits • 8 x Relay outputs, isolated	• 10 x Digital inputs, isolated, 24VDC, sink/source • 2 x Analog inputs, 0÷10V / 0÷20mA, 12 bits • 8 x Transistor outputs ,isolated, pnp, including 2 PWM output channels

Power Supply	**USC-B3-R20**	**USC-B3-T20**
Input voltage	24VDC	24VDC
Permissible range	20.4VDC to 28.8VDC	20.4VDC to 28.8VDC
Max. current consumption	0.37A@24VDC	0.33A@24VDC
Isolation	None	

General	
I/O support	
Built-in I/O	According to model
Remote I/O	Supprot 1 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 2 ports to a single controller using Uni-COM™ UAC-CB Modules (1)
Internal memory	RAM: 256MB ROM: 3GB system memory 1GB user memory
Ladder memory	1 MB
External memory	No
Bit operation	0.13 µs
Battery	Model: 3V CR2032 Lithium battery (2) 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 ports	
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 CAT-5e cable, up to 100 m (328 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	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			
Number of inputs	2		
Input range [3] [4]	**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** [5] is declared when an input value exceeds the Over-range boundary.		
Absolute maximum rating	±30V (Voltage), ±30mA (Current)		
Isolation	None		
Conversion method	Successive approximation		

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Resolution	12 bits
Accuracy (25°C / -20°C to 55°C)	±0.3% / ±0.9% of full scale
Input impedence	541kΩ (Voltage), 248Ω (Current)
Noise rejection	10Hz, 50Hz, 60Hz, 400Hz

Step response [6]
(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 [6]

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 [5]	Analog input overflow

Relay Outputs (USC-B3-R20)	
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 [7]	100k operations at maximum load

Transistor Outputs (USC-B3-T20)	
Number of outputs	8
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 specfication 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 [8]	O0, O1: 3kHz max. (Load resistance < 4kΩ)
Short-circuit protection	Yes

Transistor Outputs Power Supply (USC-B3-T20)	
Nominal operating voltage	24VDC
Operating voltage	20.4 – 28.8VDC
Maximum current consumption	30mA@24VDC Current consumption does not include load current

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LED Indications				
I/O LEDs	**Color**	**Indication**		
Digital Input	Green	Input state		
Analog Input	Red	On: Input value is in Overflow		
Relay and Transistor Output	Green	Output state		
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 Indication and USB Actions Indications for details	
USB	Green	On	A USB drive is detected that contains valid action file(s). See (9) 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**			
	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**			
	RUN	**ERROR**	**USB**	**Indication**
			Green On	USB drive detected with valid Action file(s) - press CONFIRM (9) 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-B3-R20	0.36 Kg (0.79 lb)	As shown in the images below
USC-B3-T20	0.35 Kg (0.77 lb)	

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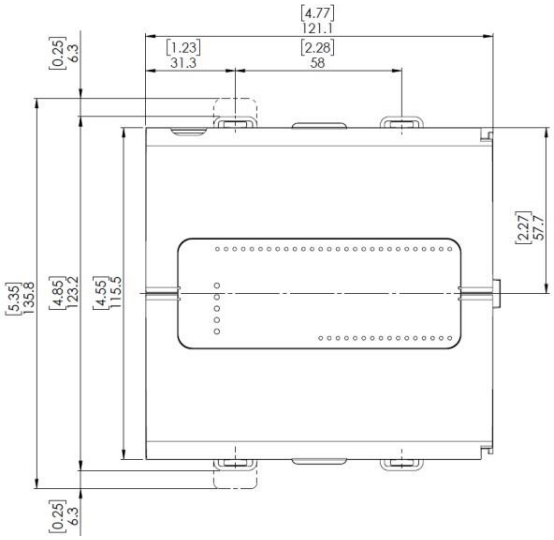
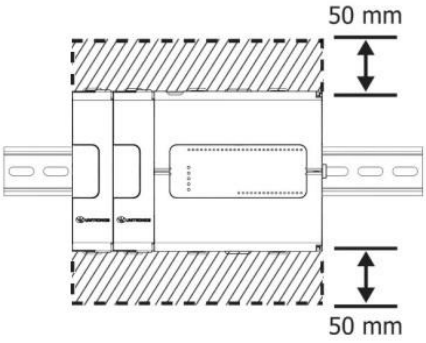
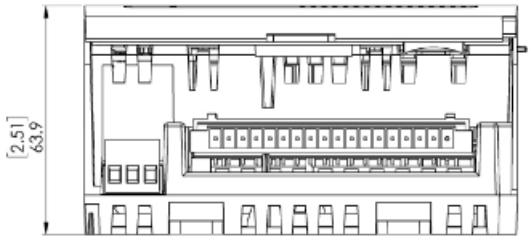
Mechanical Dimensions

Front View





Bottom View



Notes:

1. Uni-COM™ CB modules plug directly into the Uni-COM Jack on the side of the controller.
   This controller supports Uni-COM modules as follows:
   - One serial module
   - One CANbus module, which may be followed by a single serial module.

   For more information, refer to the product's installation guide.
2. 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.
3. The 4-20mA input option is implemented using 0-20mA input range.
4. 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.
5. 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®.
6. Step response and update time are independent of the number of channels that are used.
7. 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.
8. 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.
9. This refers to the CONFIRM button on the controller USB Actions; press it if the indication requires.

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