

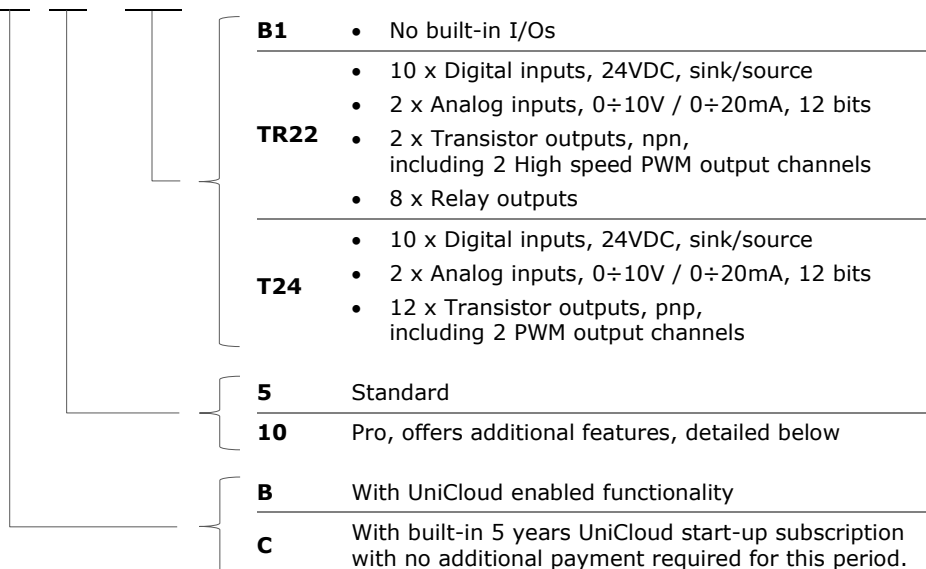
**USC-B5-B1, USC-B10-B1,  
USC-C5-B1, USC-C10-B1,  
USC-B5-TR22, USC-B10-TR22,  
USC-C5-TR22, USC-C10-TR22,  
USC-B5-T24, USC-B10-T24,  
USC-C5-T24, USC-C10-T24**

Unitronics' UniStream® PLCs are DIN-rail mounted Programmable Logic Controllers (PLCs) with a built-in I/O configuration.

UniStream connects directly to UniCloud, Unitronics' IIoT cloud platform using built-in UniCloud connectivity. More information about UniCloud is available at [www.unitronics.cloud](http://www.unitronics.cloud).

### Model numbers in this document

**USC - B 5 - B1**



Installation Guides are available in the Unitronics Technical Library at [www.unitronicsplc.com](http://www.unitronicsplc.com).

| Power Supply             | USC-xx-B1                  | USC-xx-TR22        | USC-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 | 0.65A@12VDC<br>0.38A@24VDC | 0.42A@24VDC        | 0.38A@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 | Up to 8 I/O modules can be connected directly to the controller. You can connect up to 88 I/O modules to a single controller using Local I/O Expansion adapters <sup>(1)</sup> . For complete details refer to Local I/O Expansion adapters technical specification. |                                                       |
| 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-CB Modules <sup>(2)</sup> .                                                                                                                                                                              |                                                       |
| Internal memory        | <b>Standard (B5/C5)</b>                                                                                                                                                                                                                                              | <b>Pro (B10/C10)</b>                                  |
|                        | RAM: 512MB<br>ROM: 3GB system memory<br>1GB user memory                                                                                                                                                                                                              | RAM: 1GB<br>ROM: 6GB system memory<br>2GB user memory |
| Ladder memory          | 1 MB                                                                                                                                                                                                                                                                 |                                                       |
| External memory        | microSD or microSDHC card<br>Size: up to 32GB, Data Speed: up to 200Mbps                                                                                                                                                                                             |                                                       |
| Bit operation          | 0.13 µs                                                                                                                                                                                                                                                              |                                                       |
| Battery                | Model: 3V CR2032 Lithium battery <sup>(3)</sup><br>Battery lifetime: 4 years typical, at 25°C<br>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 <sup>(4)</sup>      |                                            |
| 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  | 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.<br>Off state: 0-5VDC, 1mA max. |
| Nominal impedance | 4k $\Omega$                                                 |
| Filter            | 6ms typical                                                 |

### Analog Inputs

|                                           |                                                                                                   |                            |                             |
|-------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------|-----------------------------|
| Number of inputs                          | 2                                                                                                 |                            |                             |
| Input range <sup>(5)</sup> <sup>(6)</sup> | <b>Input Type</b>                                                                                 | <b>Nominal Values</b>      | <b>Over-range Values *</b>  |
|                                           | 0 ÷ 10VDC                                                                                         | $0 \leq V_{in} \leq 10VDC$ | $10 < V_{in} \leq 10.15VDC$ |
|                                           | 0 ÷ 20mA                                                                                          | $0 \leq I_{in} \leq 20mA$  | $20 < I_{in} \leq 20.3mA$   |
|                                           | * <b>Overflow</b> <sup>(7)</sup> is declared when an input value exceeds the Over-range boundary. |                            |                             |
| Absolute maximum rating                   | $\pm 30V$ (Voltage), $\pm 30mA$ (Current)                                                         |                            |                             |
| Isolation                                 | None                                                                                              |                            |                             |
| Conversion method                         | Successive approximation                                                                          |                            |                             |
| Resolution                                | 12 bits                                                                                           |                            |                             |
| Accuracy<br>(25°C / -20°C to 55°C)        | $\pm 0.3\%$ / $\pm 0.9\%$ of full scale                                                           |                            |                             |
| Input impedance                           | 541k $\Omega$ (Voltage), 248 $\Omega$ (Current)                                                   |                            |                             |
| Noise rejection                           | 10Hz, 50Hz, 60Hz, 400Hz                                                                           |                            |                             |

|                                                            |                                                                                                                  |                           |             |         |          |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------|-------------|---------|----------|
| Step response <sup>(8)</sup><br>(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 <sup>(8)</sup>                                 | 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<br>Current mode – AIX: -1V ÷ 5.5V ; CM1: -1V ÷ 0.5V (x=0 or 1) |                           |             |         |          |
| Cable                                                      | Shielded twisted pair                                                                                            |                           |             |         |          |
| Diagnostics <sup>(7)</sup>                                 | Analog input overflow                                                                                            |                           |             |         |          |

| <b>Relay Outputs (USC-xx-TR22)</b> |                                        |
|------------------------------------|----------------------------------------|
| 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 <sup>(9)</sup>     | 100k operations at maximum load        |

**Sink Transistor Outputs (USC-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<br>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)<br>Turn-off: 13.4μs max. (4kΩ load, 24V) |
| High speed outputs        |                                                                              |
| PWM Frequency             | 0.3Hz min.<br>30kHz max. (4kΩ load)                                          |
| Cable                     | Shielded twisted pair                                                        |

**Source Transistor Outputs (USC-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/off: 80μs maximum, Turn-off: 155μs maximum<br>(Load resistance < 4kΩ) |
| PWM Frequency <sup>(10)</sup>  | O0, O1:<br>3kHz max. (Load resistance < 4kΩ)                                  |
| Short-circuit protection       | Yes                                                                           |

### Source Transistor Outputs Power Supply (USC-xx-T24)

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

### 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 Indications and USB Actions Indications for details |                                                                                                                                    |
| USB                         | Green              | On                             | A USB drive is detected that contains valid action file(s). See table below, USB Actions Indications, 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                                                                                                               |

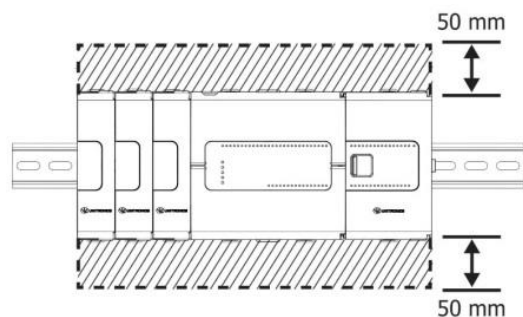
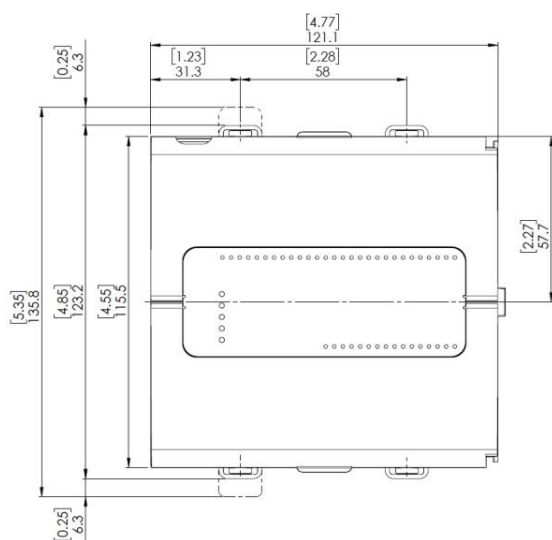
| USB Actions Indications | LED, Color & State |           |             |                                                                                                                                   |
|-------------------------|--------------------|-----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
|                         | RUN                | ERROR     | USB         | Indication                                                                                                                        |
|                         |                    |           | Green On    | USB drive detected with valid Action file(s) - press CONFIRM <sup>(11)</sup> 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 |

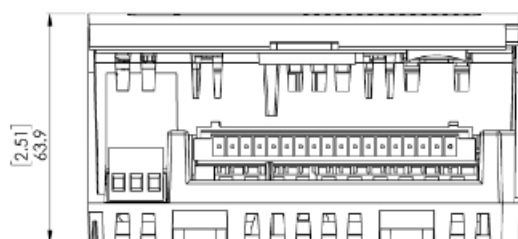
| Dimensions         |                   |                              |
|--------------------|-------------------|------------------------------|
|                    | Weight            | Size                         |
| <b>USC-xx-B1</b>   | 0.31 Kg (0.68 lb) | As shown in the images below |
| <b>USC-xx-TR22</b> | 0.36 Kg (0.79 lb) |                              |
| <b>USC-xx-T24</b>  | 0.35 Kg (0.77 lb) |                              |

## Mechanical Dimensions

*Front View*



*Bottom View*





**Notes:**

1. 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.
2. 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.
3. 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.
4. The USB device port is used to connect the device to a PC.
5. The 4-20mA input option is implemented using 0-20mA input range.
6. 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  $0 \div 10V$ , 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.
7. 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®.
8. Step response and update time are independent of the number of channels that are used.
9. 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.
10. 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.
11. This refers to the CONFIRM button on the controller USB Actions; press it if the indication requires.

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