UniStream®

Display

User Guide

USL-050-B05, USL-070-B05, USL-101-B05, USL-156-B05, USL-215-B05

This guide provides basic installation information for UniStream® Display models. Displays are compatible with UniStream® PLCs.

Technical specifications may be downloaded from the Unitronics website.

General Description

UniStream® Display models comprise resistive color touch-screens that support VNC client, and are available in different dimensions.

Via VNC, UniStream® PLCs can access Displays to show HMI screens.

In addition to HMI screens, Displays support UniApps™, a built-in system that enables the user to access communication settings, and manage the device.

The exact features are detailed in the product specification sheets.

Features	▪ Resistive Color Touch-screens ▪ 1 Built-in RJ45 Ethernet port (USL-156-B05 has 2 ports) ▪ 1 USB host port for firmware updates (USL-156-B05 has 2 ports)
Power Features	▪ Built-in Trends and Gauges, auto-tuned PID, data tables, data sampling, and Recipes ▪ UniApps™: Access & edit data, monitor, troubleshoot & debug and more ▪ Security: Multi-level password protection ▪ Alarms: Built-in system, ANSI/ISA standards
COM Options	▪ Built-in ports: 2 Ethernet, 1 USB host, 1 USB device port ▪ Add-on ports (UAC-CB), available by separate order: ➢ 1 CANbus port may be added to all models ➢ RS232/485 ports: according to model technical specifications
COM Protocols	▪ Fieldbus: CANopen, CAN Layer2, MODBUS, EtherNetIP and more. Implement any serial RS232/485, TCP/IP, or CANbus third-party protocols via Message Composer ▪ Advanced: SNMP Agent/Trap, e-mail, SMS, modems, GPRS/GSM, FTP Server/Client, Web Server, SQL, and MQTT. ▪ Remote Access via any device that supports VNC.
Programming Software	All-in-One UniLogic software for hardware configuration, communications, PLC and HMI applications; free download.
HMI	All UniStream® PLCs can display HMI screens on the following devices: • UniStream Display (USL) • UniStream Modular HMI panel (USP) • UniStream Built-in (on the panels integral to the device) • Any device screen that supports VNC
HMI	HMI screens are designed in UniLogic. In addition to the HMI screens, UniStream® PLCs offer built-in HMI features, including: • UniApps™: Access & edit data, monitor, troubleshoot, debug, and more • Security: Multi-level password protection Alarms: Built-in system, ANSI/ISA standards

USB Action files	Programmers can create files in UniLogic and save them to a USB mass storage device, such as a flash drive. This enables the end user to implement certain actions such as to update firmware, update network settings, download applications, extract log files and more.

Before You Begin

Before installing the device, the user must:

- Read and understand this document.
- Verify the Kit Contents.

NOTE ▪ Throughout this document, images based on the USL-050-B05 apply to all models.

Alert Symbols and General Restrictions

When any of the following symbols appear, read the associated information carefully.

Symbol	Meaning	Description
⚠	Danger	The identified danger causes physical and property damage.
⚠	Warning	The identified danger could cause physical and property damage.
Caution	Caution	Use caution.

All examples and diagrams provided are for illustrative purposes only and are intended to aid in understanding. They do not constitute a guarantee of product performance. Unitronics assumes no responsibility for the actual use of this product based on these examples.

Please dispose of this product according to local and national standards and regulations.

This product should only be installed by qualified personnel.

⚠ Failure to comply with appropriate safety guidelines can cause severe injury or property damage.

Do not attempt to use this device with parameters that exceed permissible levels.

Do not connect/disconnect the device when power is on.

Environmental Considerations

⚠ Ventilation: 10mm space is required between the device top/bottom edges and the enclosure's walls

Do not install in areas with: excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration, in accordance with the standards and limitations given in the product's technical specification sheet.

Do not place in water or let water leak onto the unit.

Do not allow debris to fall inside the unit during installation.

Install at maximum distance from high-voltage cables and power equipment.

UL Compliance

The following section is relevant to Unitronics' products that are listed with the UL.

The following models are UL listed for Ordinary Location:

- USL followed by -, followed by 050 or 070 or 101 or 156, followed by B05

UL Ordinary Location

In order to meet the UL ordinary location standard, panel-mount this device on the flat surface of Type 1 or 4X enclosures

UL Ratings, Programmable Controllers for Use in Hazardous Locations, Class I, Division 2, Groups A, B, C and D

These Release Notes relate to all Unitronics products that bear the UL symbols used to mark products that have been approved for use in hazardous locations, Class I, Division 2, Groups A, B, C and D.

Caution This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D, or Non-hazardous locations only.

- Input and output wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.
- WARNING—Explosion Hazard—substitution of components may impair suitability for Class I, Division 2.
- WARNING – EXPLOSION HAZARD – Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- WARNING – Exposure to some chemicals may degrade the sealing properties of material used in Relays.
- This equipment must be installed using wiring methods as required for Class I, Division 2 as per the NEC and/or CEC.

Panel-Mounting

For programmable controllers that can be mounted also on panel, in order to meet the UL Haz Loc standard, panel-mount this device on the flat surface of Type 1 or Type 4X enclosures.

Communication and Removable Memory Storage

When products comprise either USB communication port, SD card slot, or both, neither the SD card slot nor the USB port are intended to be permanently connected, while the USB port is intended for programming only.

Removing / Replacing the battery

When a product has been installed with a battery, do not remove or replace the battery unless the power has been switched off, or the area is known to be non-hazardous.

Please note that it is recommended to back up all data retained in RAM, in order to avoid losing data when changing the battery while the power is switched off. Date and time information will also need to be reset after the procedure.

UL des zones ordinaires:

Pour respecter la norme UL des zones ordinaires, monter l'appareil sur une surface plane de type de protection 1 ou 4X

Certification UL des automates programmables, pour une utilisation en environnement à risques, Class I, Division 2, Groups A, B, C et D.

Cette note fait référence à tous les produits Unitronics portant le symbole UL - produits qui ont été certifiés pour une utilisation dans des endroits dangereux, Classe I, Division 2, Groupes A, B, C et D.

Attention

- Cet équipement est adapté pour une utilisation en Classe I, Division 2, Groupes A, B, C et D, ou dans Non-dangereux endroits seulement.
- Le câblage des entrées/sorties doit être en accord avec les méthodes de câblage selon la Classe I, Division 2 et en accord avec l'autorité compétente.
- AVERTISSEMENT: Risque d'Explosion – Le remplacement de certains composants rend caduque la certification du produit selon la Classe I, Division 2.
- AVERTISSEMENT - DANGER D'EXPLOSION - Ne connecter pas ou ne débranche pas l'équipement sans avoir préalablement coupé l'alimentation électrique ou la zone est reconnue pour être non dangereuse.
- AVERTISSEMENT - L'exposition à certains produits chimiques peut dégrader les propriétés des matériaux utilisés pour l'étanchéité dans les relais.
- Cet équipement doit être installé utilisant des méthodes de câblage suivant la norme Class I, Division 2 NEC et /ou CEC.

Montage de l'écran:

Pour les automates programmables qui peuvent aussi être monté sur l'écran,
pour pouvoir être au standard UL, l'écran doit être monté dans un coffret avec une surface plane de type 1 ou de type 4X.

Communication et de stockage amovible de mémoire (carte mémoire)

Produits comprend un port USB de communication, soit un port carte SD ou les deux, ni le port SD, ni le port USB ne sont censés être utilisés en permanence, tandis que l'USB est destiné à la programmation uniquement.

Retrait / Remplacement de la batterie

Lorsqu'un produit a été installé avec une batterie, retirez et remplacez la batterie seulement si l'alimentation est éteinte ou si l'environnement n'est pas dangereux.

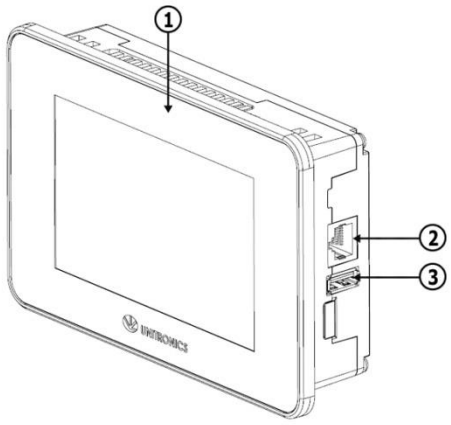
Veuillez noter qu'il est recommandé de sauvegarder toutes les données conservées dans la RAM, afin d'éviter de perdre des données lors du changement de la batterie lorsque l'alimentation est coupée. Les informations sur la date et l'heure devront également être réinitialisées après la procedure.

Kit Contents (except USL-215-B05)

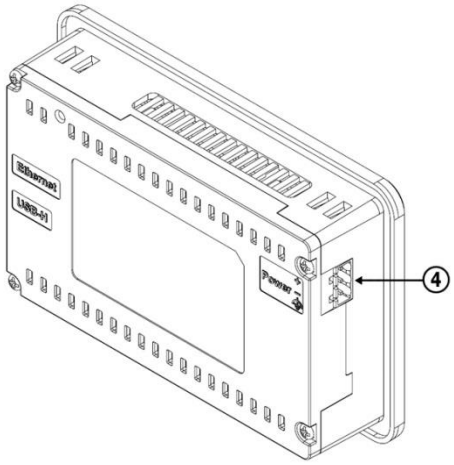
- 1 UniStream Display
- 4 mounting brackets (USL-050-B05, USL-070-B05)
- 8 mounting brackets (USL-101-B05)
- 10 mounting brackets (USL-156-B05)
- 1 panel mounting seal
- 2 panel supports (except USL-050-B05)
- 1 power terminal block

Product Diagram (except USL-215-B05)

Front



Rear

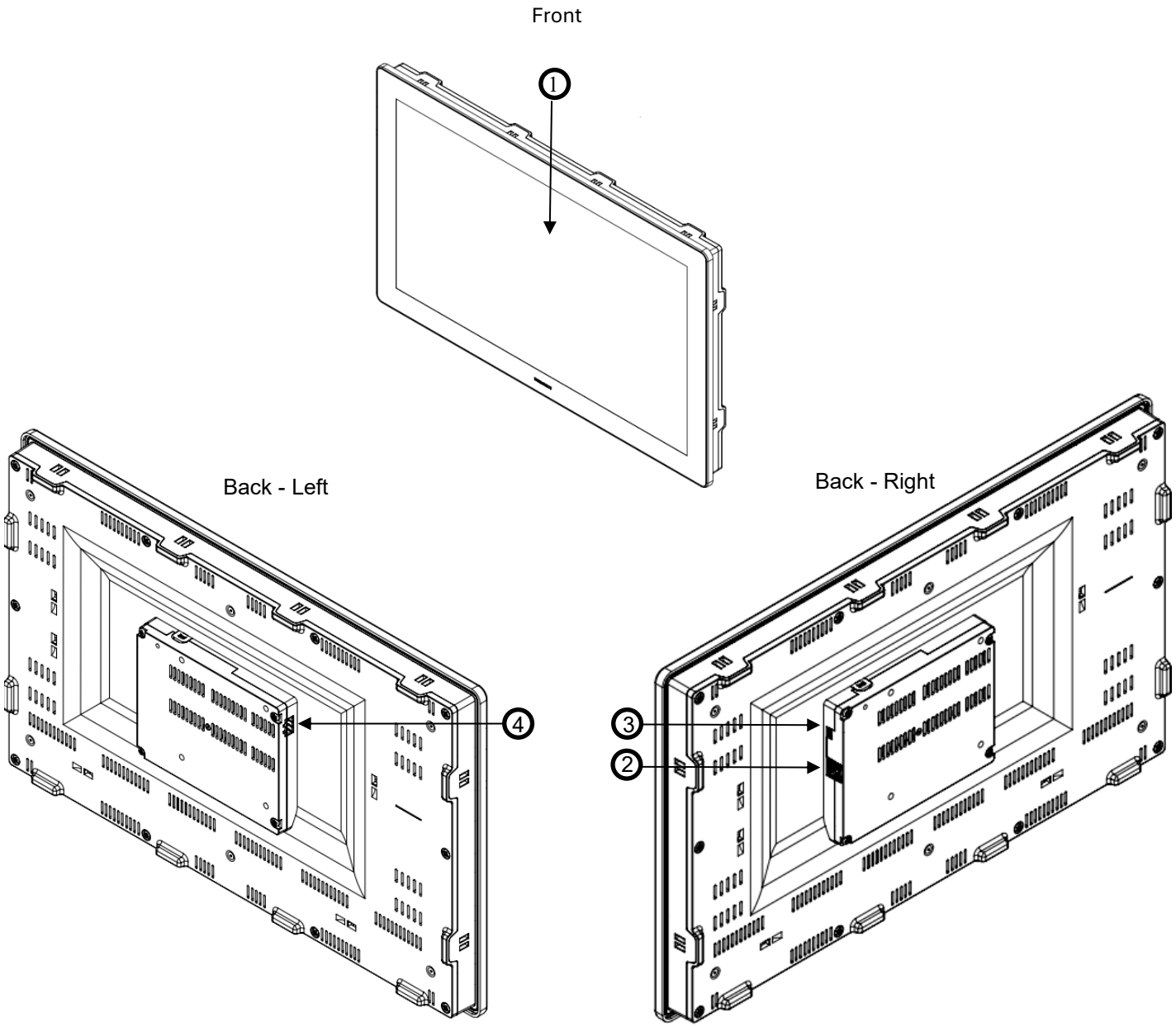


1	Screen Protection	A plastic sheet attached to the screen for protection. Remove it during installation.
2	Ethernet port	Enables you to connect the Display to the UniStream PLC via Ethernet cable. Note that USL-156-B05 has 2 Ethernet ports.
3	USB Host port	Provides the interface for system updates and system log access. Note that USL-156-B05 has 2 USB Host ports.
4	Power Supply Input	Connection point for the Display power source. Connect the Terminal Block supplied with the kit to the end of the power cable.

Kit Contents – USL-215-B05

- 1 UniStream Display
- 12 mounting brackets
- 1 panel mounting seal
- 2 panel supports
- 1 power terminal block

Product Diagram – USL-215-B05



1	Screen Protection	A plastic sheet attached to the screen for protection. Remove it during installation.
2	Ethernet port	Enables you to connect the Display to the UniStream PLC via Ethernet cable.
3	USB Host port	Provides the interface for system updates and system log access.
4	Power Supply Input	Connection point for the Display power source. Connect the Terminal Block supplied with the kit to the end of the power cable.

Installation Space Considerations

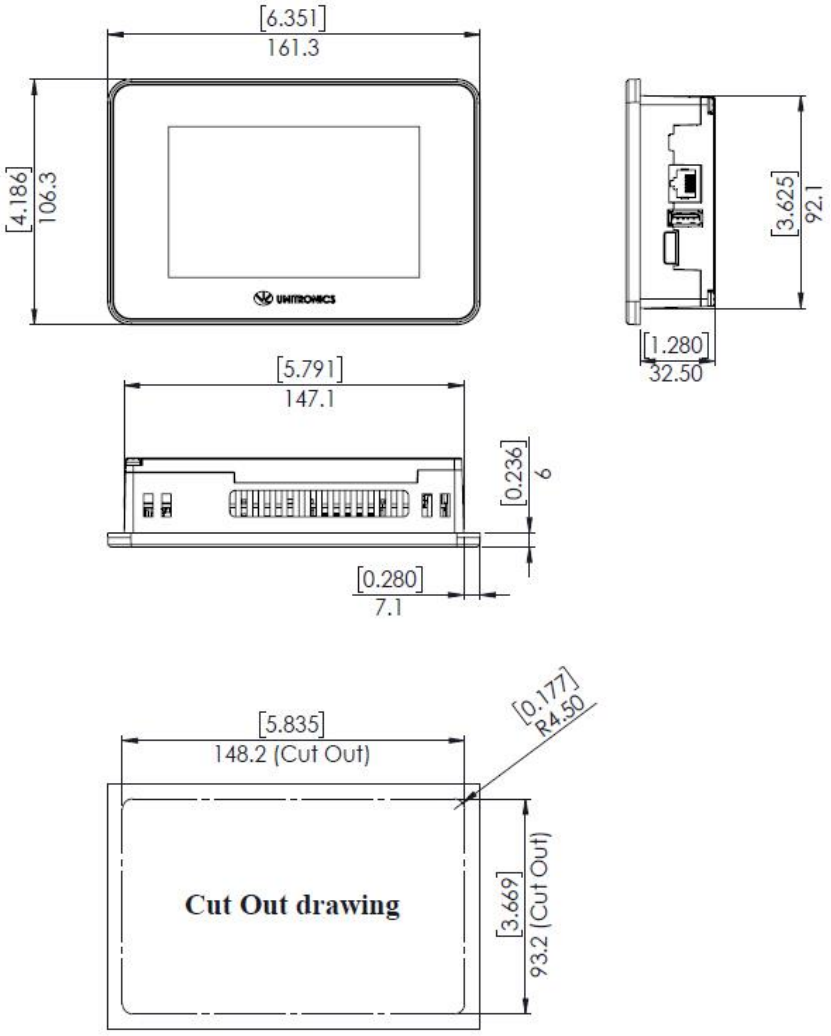
Allocate sufficient space for:

- The device itself
- Unobstructed access to all ports

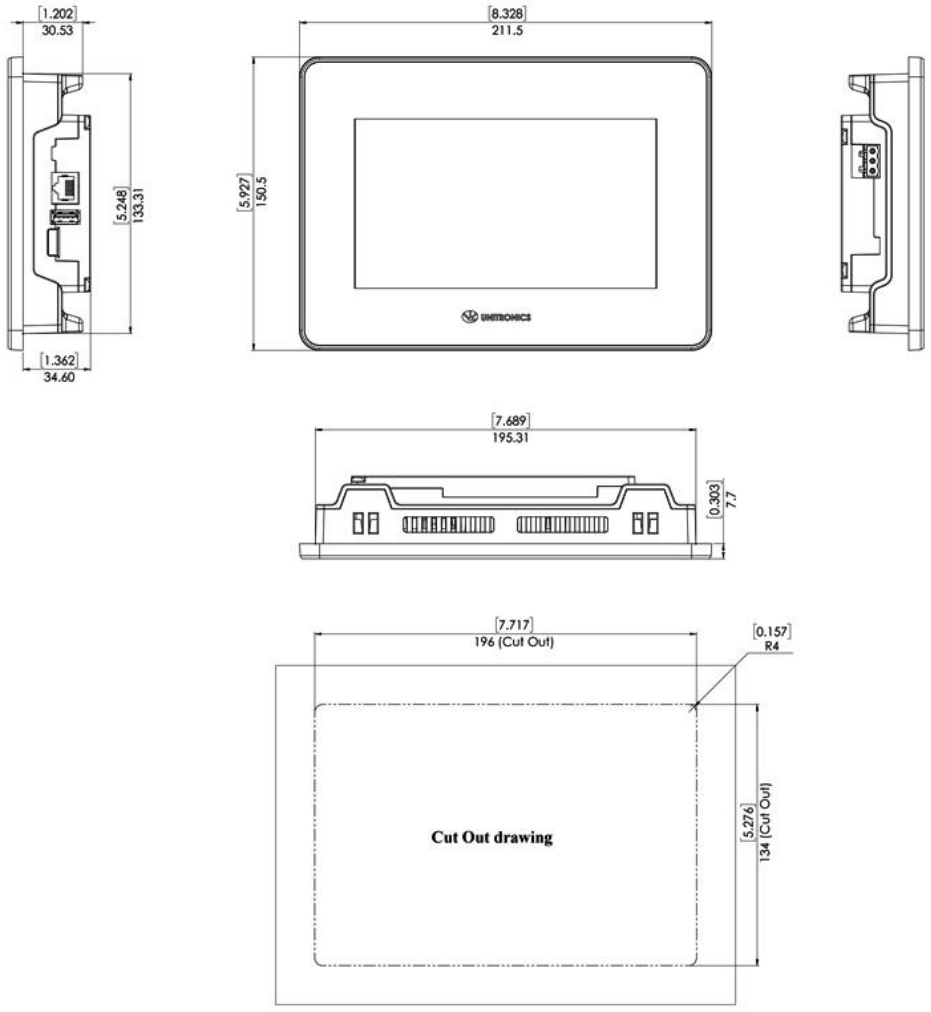
For precise measurements, please refer to the *Mechanical Dimensions* section below.

Mechanical Dimensions

USL-050-B05



USL-070-B05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[8.328]
211.5
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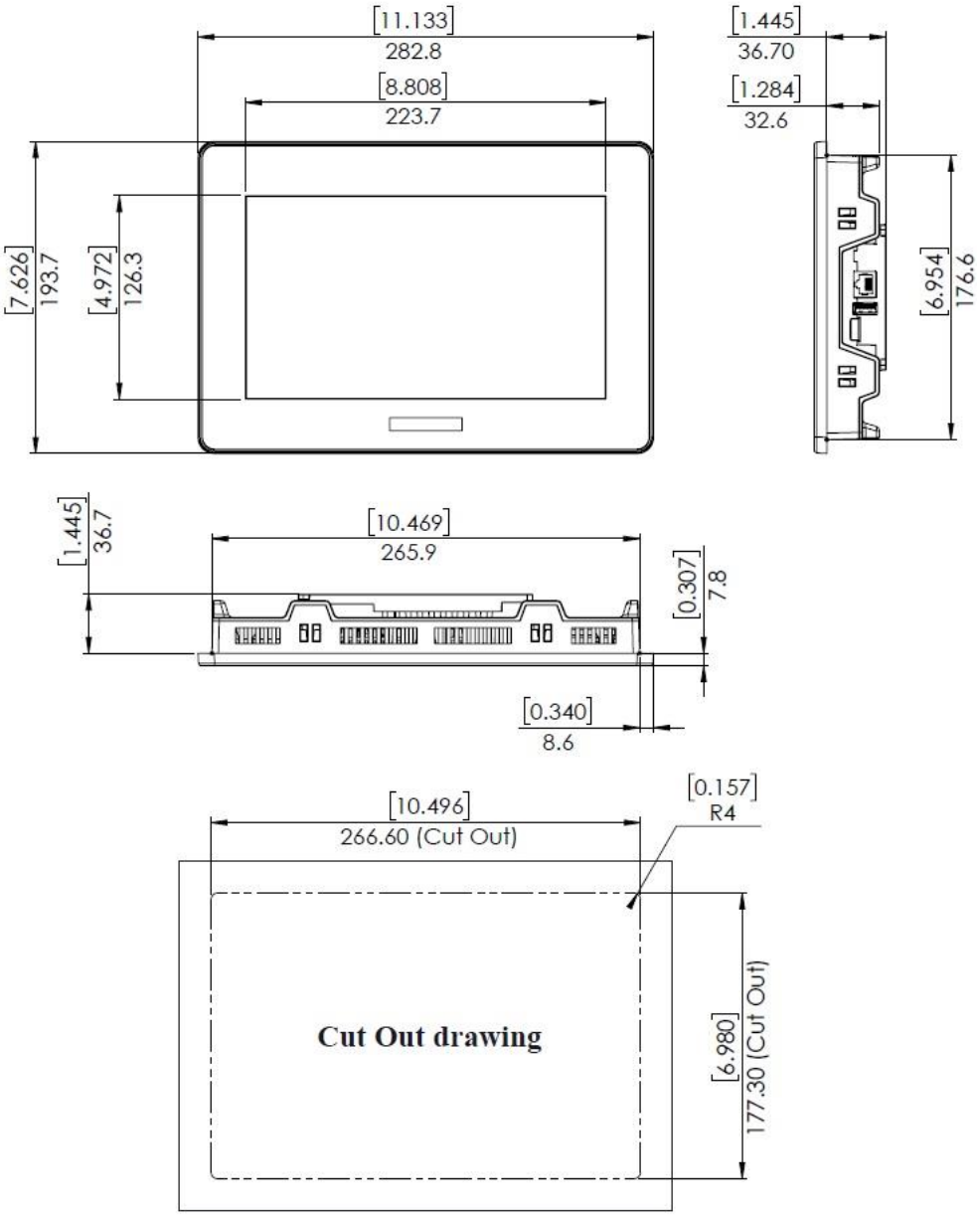
150.5
[7.689]
195.31
[0.303]
7.7
[7.717]
196 (Cut Out)
[0.157]
R4
Cut Out drawing
[5.276]
134 (Cut Out)

USL-101-B05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193.7
[4.972]
126.3
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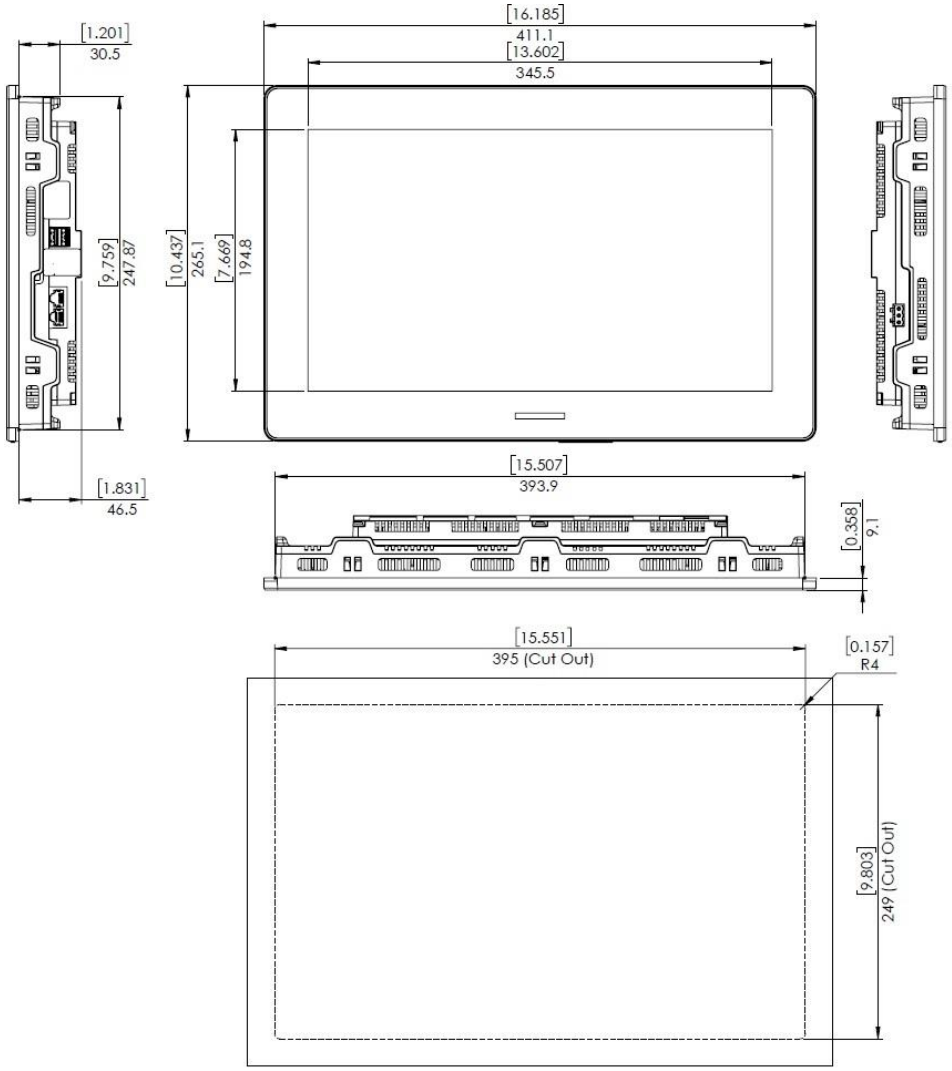
36.70
[1.284]
32.6
[6.954]
176.6
[1.445]
36.7
[10.469]
265.9
[0.307]
7.8
[0.340]
8.6
[10.496]
266.60 (Cut Out)
[0.157]
R4
Cut Out drawing
[6.980]
177.30 (Cut Out)

USL-156-B05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46.5
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393.9
[0.358]
9.1
[15.551]
395 (Cut Out)
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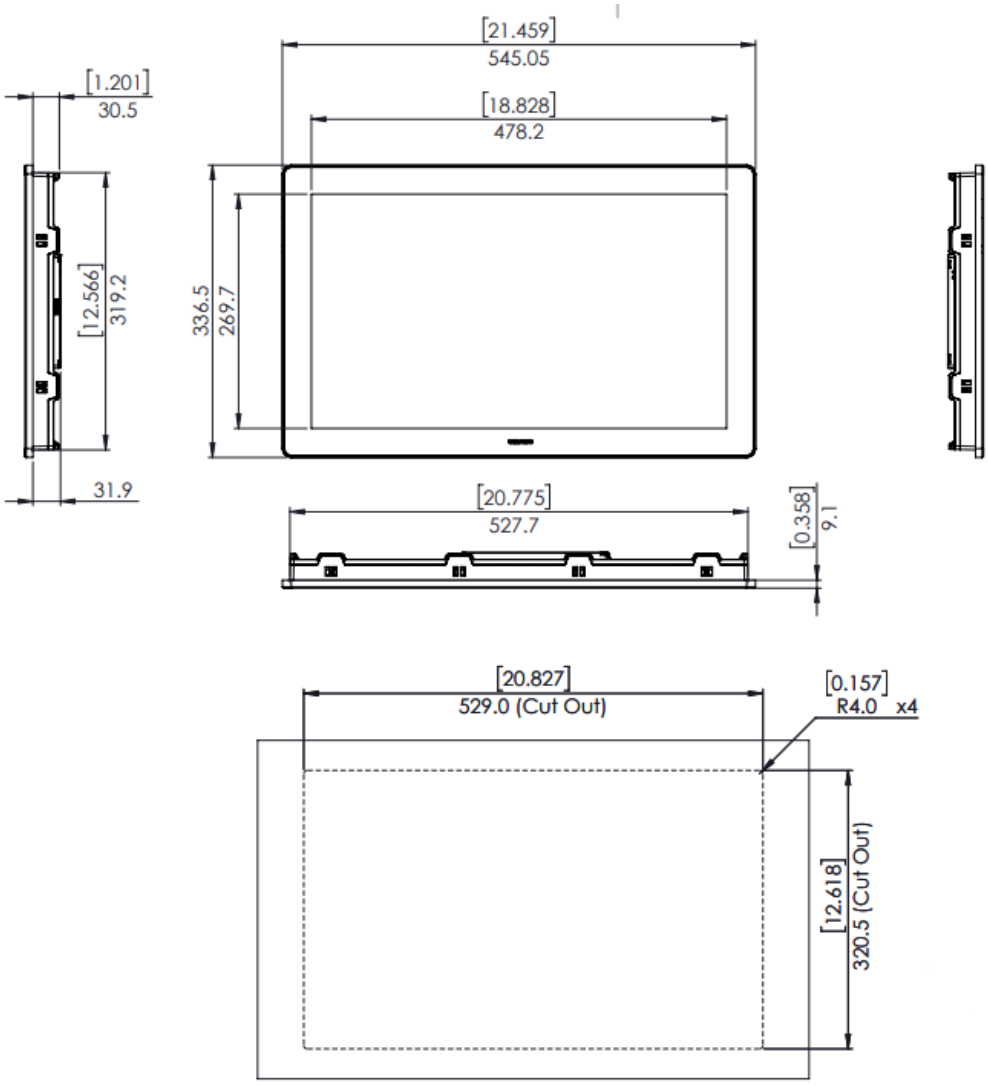
R4
[9.803]
249 (Cut Out)

USL-215-B05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30.5
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319.2
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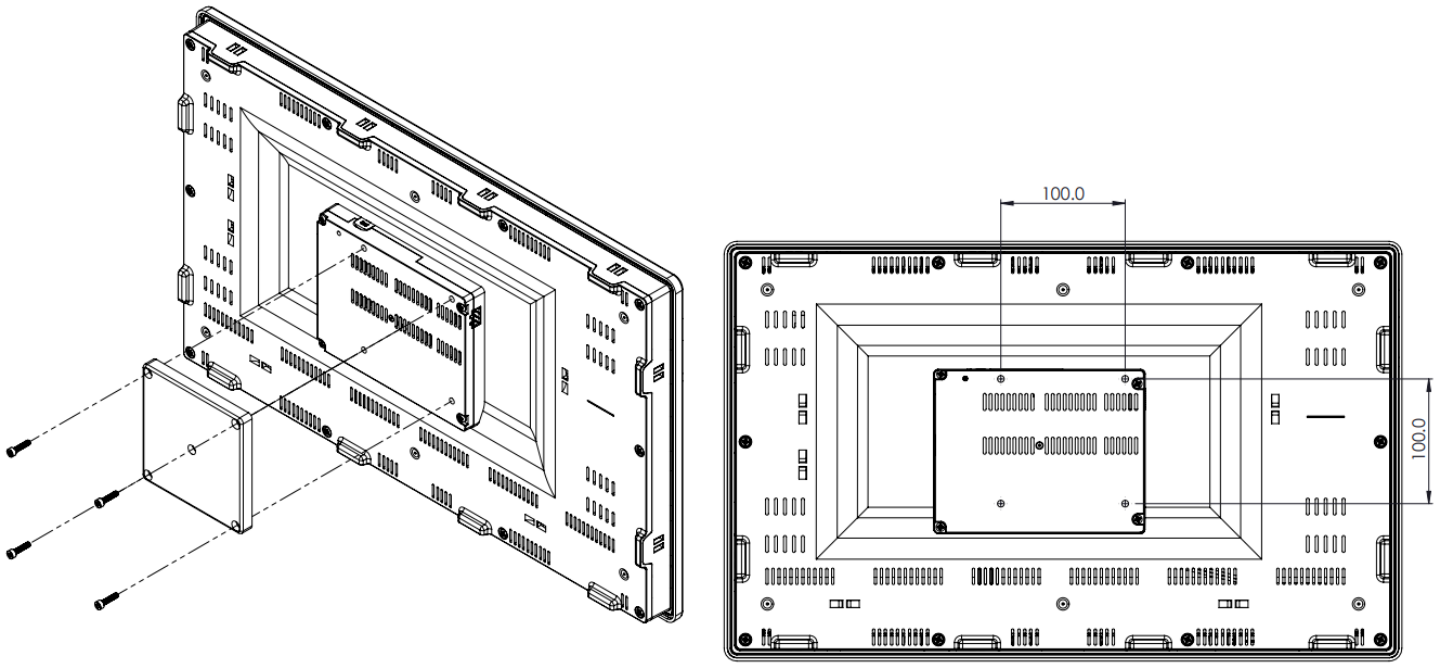
269.7
31.9
[20.775]
527.7
[0.358]
9.1
[20.827]
529.0 (Cut Out)
[0.157]
R4.0 x4
[12.618]
320.5 (Cut Out)

VESA Mount Installation for USL-215-B05:



Follow the steps below to securely mount the USL-215-B05 using a VESA-compatible bracket:

1. Confirm that the VESA mount includes four screw holes arranged in a 100 mm x 100 mm square pattern and is designed to accept M4 screws.
2. Position the device so that the mounting holes on the rear panel align with the corresponding holes on the VESA mount.
3. Using appropriate M4 screws, attach the device to the VESA mount. Ensure all screws are evenly and securely tightened.

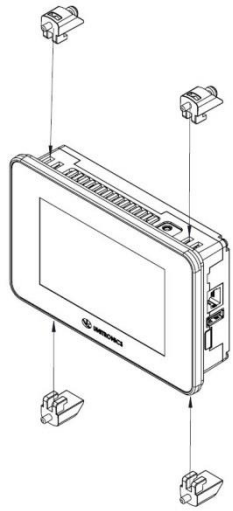
Caution	Use M4 screws with a thread length of 12–20 mm (M4x12–M4x20), based on a typical VESA mounting bracket thickness of 2 mm.
⚠	Using screws of incorrect length may damage the device or result in improper mounting.

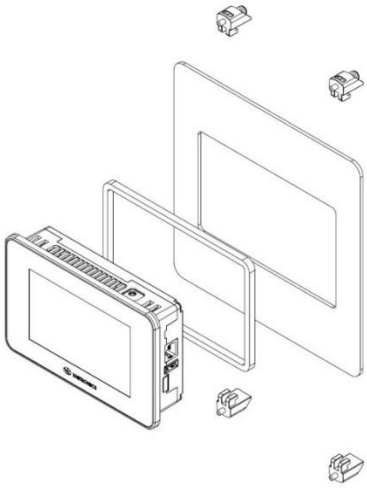
Panel Mounting

NOTE
- The thickness of the mounting panel must be less than or equal to 5 mm (0.2”).
- Ensure that all space requirements are met.

1. Cut an opening in the panel according to the dimensions specified in the *Mechanical Dimensions* section.
2. Slide the device into the panel cut-out, ensuring that the *Panel Mounting Seal* is correctly positioned as illustrated below.
3. Insert the mounting brackets into the designated slots on the sides of the panel, as shown in the diagram below.
   - USL-050-B05 and USL-070-B05 models require **4 brackets**
   - USL-101-B05 model requires **8 brackets**
   - USL-156-B05 model requires **10 brackets**
   - USL-215-B05 model requires **12 brackets**
4. Tighten the bracket screws against the rear side of the panel. While tightening, hold each bracket firmly against the unit to ensure a secure fit.

When properly mounted, the device is squarely situated in the panel cut-out as shown below.



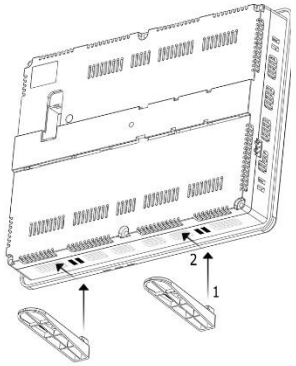


Caution	Apply a tightening torque of **0.35 N·m (3.5 kgf·cm)** when securing the mounting brackets to ensure proper installation without damaging the device or panel.

Panel Support Installation

1. Insert the Panel Support tabs into their designated location.
   Note that the exact tab location varies depending on the panel model.

2. Pull on the Panel Support outward until it locks into place with an audible *click*.



Wiring

⚠ This equipment is intended for operation only in SELV/PELV/Class 2/Limited Power environments.

All power supplies used in the system must provide **double insulation**. Output ratings must comply with **SELV/PELV/Class 2/Limited Power** requirements.

Do not connect the 'Neutral' or 'Line' signals of 110/220 VAC directly to the device's 0V terminal.

Do not touch live wires under any circumstances.

Perform all wiring activities **with the power turned OFF**.

Implement **over-current protection**—such as a fuse or circuit breaker—at the power supply connection point to prevent excessive current.

Do not connect unused terminals, unless explicitly specified. Failure to comply may result in damage to the device.

Verify all wiring connections before switching on the power supply.

Caution

To avoid damaging the wire, use a maximum torque of 0.5 N·m (5 kgf·cm).

Do not use tin, solder, or any substance on stripped wire that might cause the wire strand to break.

Install at maximum distance from high-voltage cables and power equipment.

Wiring Procedure

Use crimp terminals for wiring; use 26-12 AWG wire (0.13 mm^2 –3.31 mm^2)

1. Strip the wire to a length of 7±0.5mm (0.250–0.300 inches).
2. Unscrew the terminal to its widest position before inserting a wire.
3. Insert the wire completely into the terminal to ensure a proper connection.
4. Tighten enough to keep the wire from pulling free.

Wiring Guidelines

In order to ensure that the device will operate properly and to avoid electromagnetic interference:

- Use a metal cabinet. Make sure the cabinet and its doors are properly earthed.
- Individually connect each functional ground point (⏚) to the earth of the system (preferably to the metal cabinet chassis).
  Use the shortest and thickest wires possible: less than 1m (3.3') in length, minimum thickness 14 AWG (2 mm^2).
- Connect the power supply 0V to the earth of the system.

- Earthing the cables' shield:
  - Connect the cable shield to the earth of the system (preferably to the metal cabinet chassis). Note that the shield must be connected only at one end of the cable; it is recommended to earth the shield at the Display-side.
  - Keep shield connections as short as possible.
  - Ensure shield continuity when extending shielded cables.

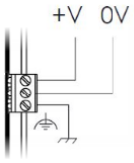
NOTE For comprehensive details, refer to the *System Wiring Guidelines* document, available in the Technical Library on the Unitronics website.

Wiring the Power Supply

The device requires an external power supply.

⚠ In the event of voltage fluctuations or if the power supply does not conform to the specified voltage requirements, connect the device to a **regulated power supply** to ensure stable and reliable operation.

Connect the +V and 0V terminals as shown in the accompanying figure.



Connecting Ports

- Ethernet **CAT-5e shielded cable with RJ45 connector**
- USB Host **Standard USB Type-A plug**

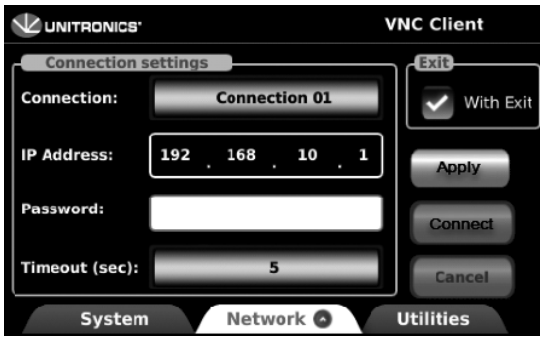
Uninstalling the Device

1. Ensure the power supply is completely disconnected before beginning the removal process.
2. Detach all connected wires from the device.
3. Carefully unscrew and remove the mounting brackets.
   Caution: Support the device securely during this step to prevent it from falling.

Connecting the Display to a UniStream®

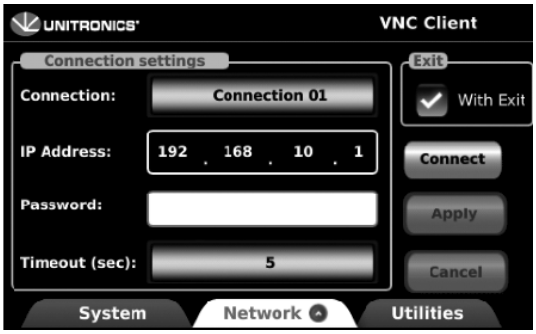
1. Once the device is powered on, navigate to the **Network** tab located at the bottom of the screen.
2. Configure VNC Connection

   - Enter the **IP Address** of the VNC server.
   - If required, enter the **password** for the VNC server.
   - Modify the **timeout** setting as needed.
   - Tap **Apply** to save the connection settings.



3. Add additional connections (if needed)

   - Tap the Connection Scroller to access additional slots.
   - Repeat the configuration steps for each new connection.



4. Once a connection is defined, the **Connect** button becomes active. Tap **Connect** to initiate the VNC session.

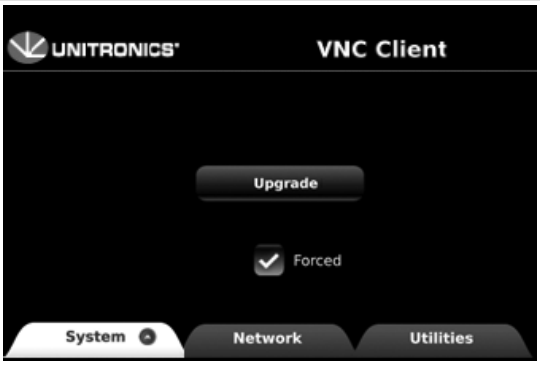
With Exit

Selecting the With Exit option places an Exit VNC button on screen during a VNC session. This can be tapped in order to exit to UniApps.

Upgrading Firmware

1. Place a USB flash drive containing the firmware update into the USB port.
2. Select the System tab, tap Upgrade, and follow the on-screen instructions.

Note that Firmware updates are located on the Unitronics website, on the UniLogic page, under Download Software.



UniStream® Display

Technical Specifications

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

Power Supply	USL-050-B05	USL-070-B05	USL-101-B05	USL-156-B05	USL-215-B05
Input voltage	12VDC or 24VDC				24VDC
Permissible range	10.2VDC to 28.8VDC				20.4VDC to 28.8VDC
Max. current consumption	0.7A@12VDC 0.4A@24VDC	0.79A@12VDC 0.49A@24VDC	0.85A@12VDC 0.52A@24VDC	1.54A@12VDC 0.8A@24VDC	1.1A@24VDC
Isolation	None				

Display	USL-050-B05	USL-070-B05	USL-101-B05	USL-156-B05	USL-215-B05
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	Typically 500nits (cd/m2), at 25°C
Backlight longevity (1)	30k hours			50k hours	
Resolution (pixels)	800 x 480 (WVGA)		1024 x 600 (WSVGA)	1366 x 768 (WXGA)	1920 x 1080 (FHD)
Size	5”	7"	10.1"	15.6"	21.5”
Viewing area Width x Height	108 x 64.8 (mm)	154.08 x 85.92 (mm)	222.72 x 125.28 (mm)	344.23 x 193.53 (mm)	476.064 x 267.786 (mm)
Color support	65,536 (16bit)			16M (24bit)	
Surface treatment	Anti-glare				
Touch screen	Resistive Analog				
Actuation force (min)	> 80 g (0.176 lb)				

Communication (Built-in Ports)	
Ethernet port	
Number of ports	1, 2 ports at USL-156-B05
Port type	10/100 Base-T (RJ45), 10/100M/1G for USL-215-B05
Auto crossover	Yes
Auto negotiation	Yes
Isolation voltage	500VAC for 1 minute
USB host	
Number of ports	1, (2 ports at USL-156-B05)
Port type	Type A, Type C for USL-215-B05
Data rate	USB 2.0 (480Mbps)
Isolation	None
Cable	USB 2.0 compliant; < 3 m (9.84 ft)
Over current protection	Yes

Environmental	All Products	USL-156-B05	USL-215-B05
Protection	Front face：IP65/66, 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
USL-050-B05	0.28 Kg (1.32 lb)	Refer to the *Mechanical Dimensions* section - page 7
USL-070-B05	0.6 Kg (0.62 lb)	Refer to the *Mechanical Dimensions* section - page 8
USL-101-B05	1 Kg (2.2 lb)	Refer to the *Mechanical Dimensions* section - page 9
USL-156-B05	2.9 Kg (6.4 lb)	Refer to the *Mechanical Dimensions* section - page 10
USL-215-B05	3.94 Kg (8.7 lb)	Refer to the *Mechanical Dimensions* section - page 11

Notes:

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

UG_USL-xxx.pdf 08/25