UniStream®

Display

User Guide

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

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)

General Features of the UniStream PLC Series

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

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)

Page 2 contains a comparison table detailing the features offered by the different models. Exact features are detailed in the product specification sheets.

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.

Differences between B10, B5, and B3

Feature	B10 Pro	B5 Standard	B3 Basic
I/O Expansion via Uni-I/O	Yes		No
Remote I/O Expansion via Ethernet I/O Adapter (URB)	Up to 8		1
VFD	32		2
MicroSD	Yes		No*
Add-on COM modules	3		2
System Memory	6GB	3GB	3GB
MODBUS Slaves	Unlimited		Up to 8
Ethernet/IP Scanners	16		1
Ethernet/IP Adapters	32		8
Web Server	Yes	No	No
SQL Client	Yes	No	No
MQTT	Yes		
PID Loops	64		2
Data Sampler/Trends	Yes		No
CSV files: creating/ reading	Yes		No
FTP, server/client	Yes		No
Saving Data Tables to SD	Yes		No*
Screenshots	Yes		No
Sending email attachments	Yes		No
USB device (programming port)	Yes		No**

* Note that B3 models do not support features requiring SD cards. In addition, Alarm History is not retained after PLC reset.

** Note that B3 models may be programmed only via Ethernet cable.

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 are intended to aid understanding, and do not guarantee operation. Unitronics accepts no responsibility for 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 be installed only 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 Hazardous Locations: US5-B5-B1, US5-B10-B1, US7-B5-B1 and US7-B10-B1

The following models are UL listed for Ordinary Location:

- USL followed by -, followed by 050 or 070 or 101, followed by B05
- US followed by 5 or 7 or 10, followed by -, followed by B5 or B10 or C5 or C10, followed by -, followed by B1 or TR22 or T24 or RA28 or TA30 or R38 or T42

Models from series US5, US7 and US10 that include "T10" or "T5" in the model name are suitable for mounting on the flat surface of Type 4X enclosure. For examples: US7-T10-B1, US7-T5-R38, US5-T10-RA22 and US5-T5-T42.

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

- 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

Front   Rear
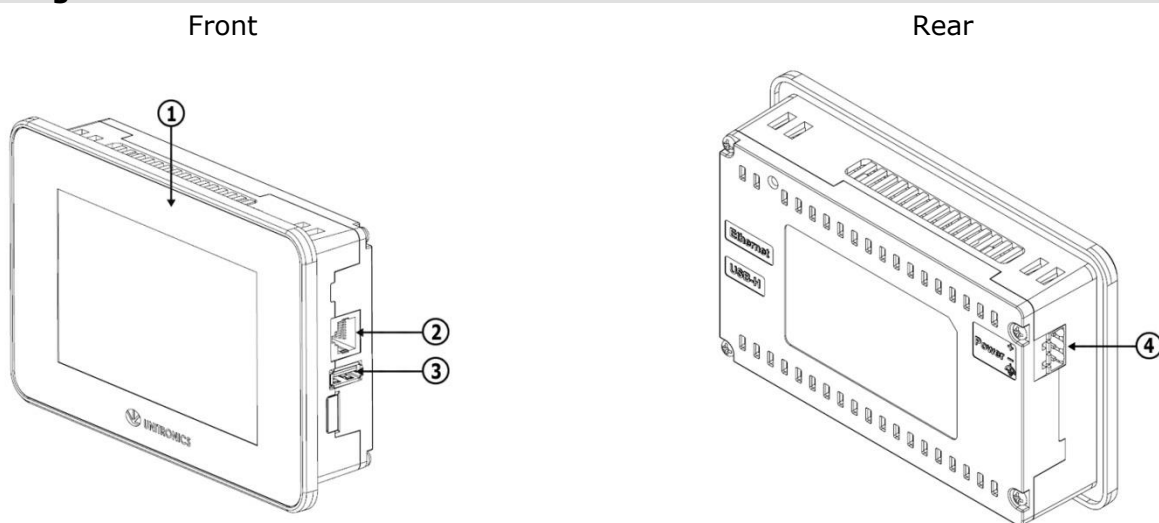
1	Screen Protection	A plastic sheet attached to the screen for protection. Remove it during installation.
2	Ethernet port	Enables you to connect the Display to the UniStream PLC via Ethernet cable. Note that USL-156-B05 has 2 Ethernet ports.
3	USB Host port	Provides the interface for system updates and 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.

Installation Space Considerations

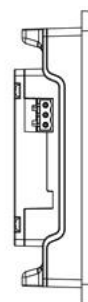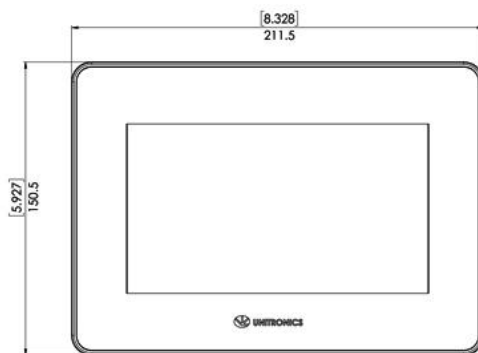Allocate space for:

- the device
- access to ports

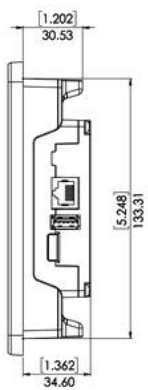For exact dimensions, please refer to the Mechanical Dimensions shown below.

Mechanical Dimensions

USL-050-B05

Cut Out drawing

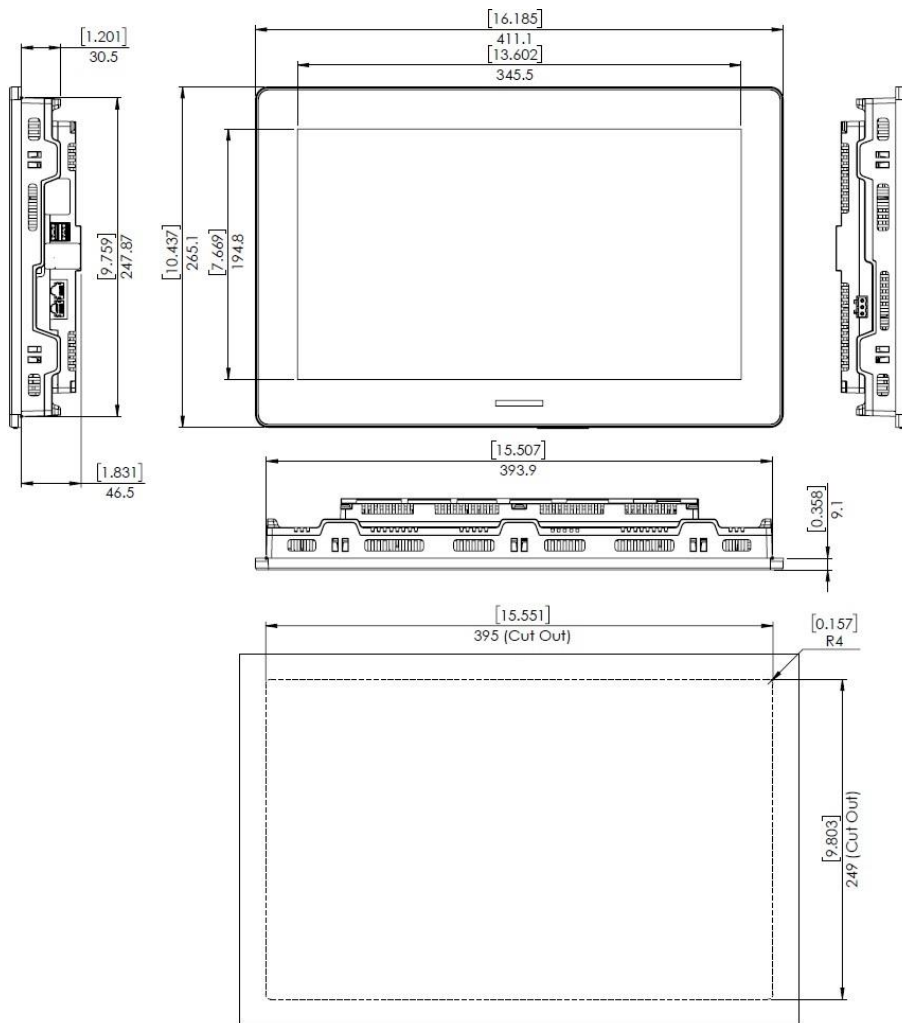### USL-070-B05

Cut Out drawing

USL-101-B05

Cut Out drawing
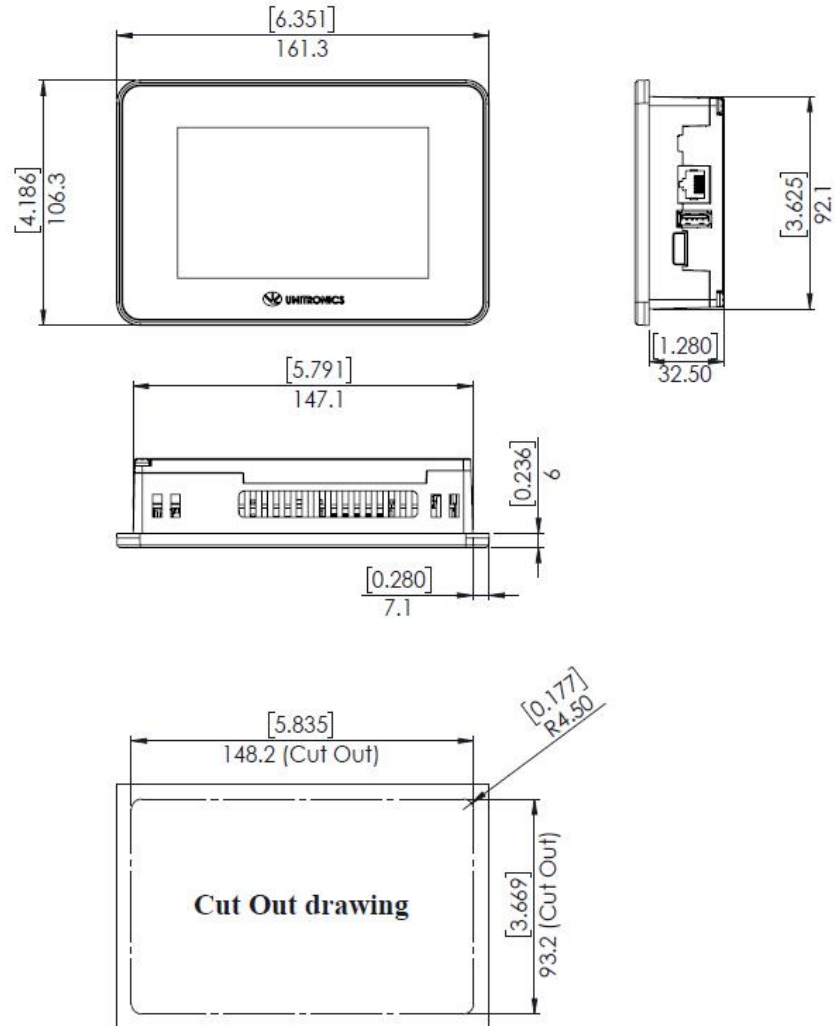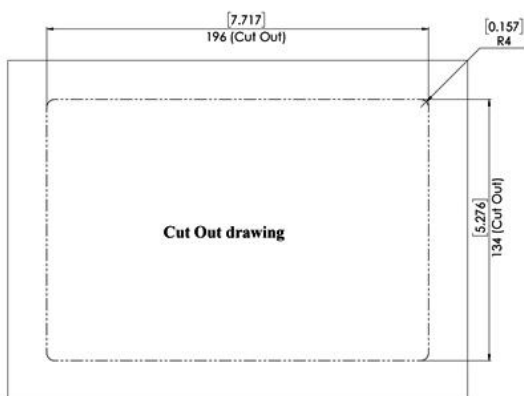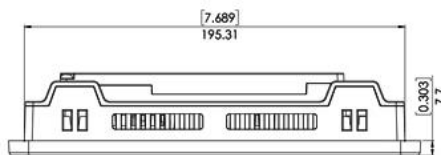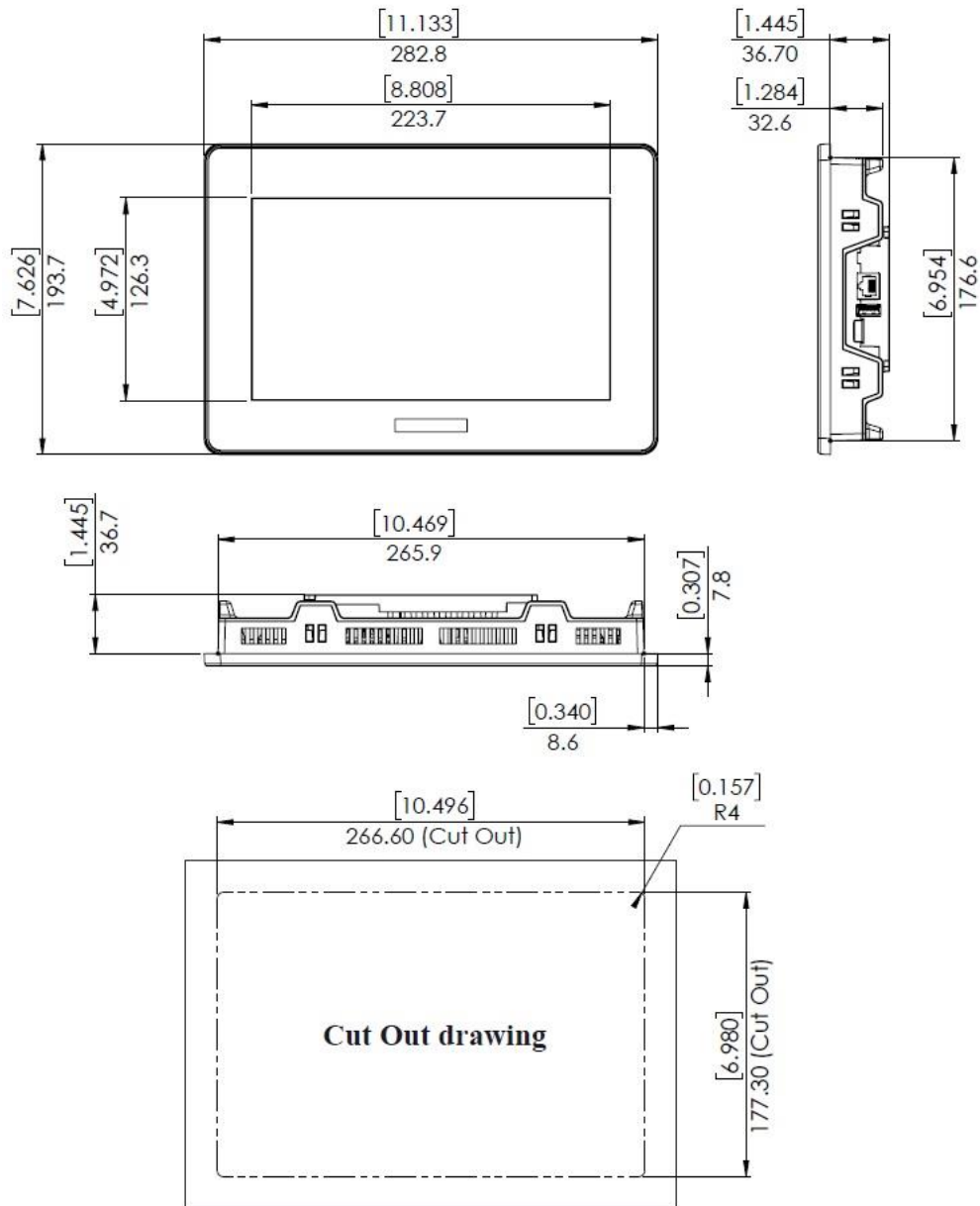
USL-156-B05

Panel Mounting

NOTE   ▪ Mounting panel thickness must be less or equal to 5mm (0.2").
   ▪ Ensure that the space considerations are met.

1. Prepare a panel cut-out according to the dimensions as shown in the previous section.
2. Slide the device into the cut-out, ensuring that the Panel Mounting Seal is in place as shown below.
3. Push the mounting brackets into their slots on the sides of the panel as shown below.
   Note that USL-050-B05 and USL-070-B05 models have 4 brackets, USL-101-B05 has 8 brackets and USL-156-B05 model has 10 brackets.
4. Tighten the bracket screws against the panel. Hold the brackets securely against the unit while tightening the screws.

When properly mounted, the device is squarely situated in the panel cut-out as shown below.
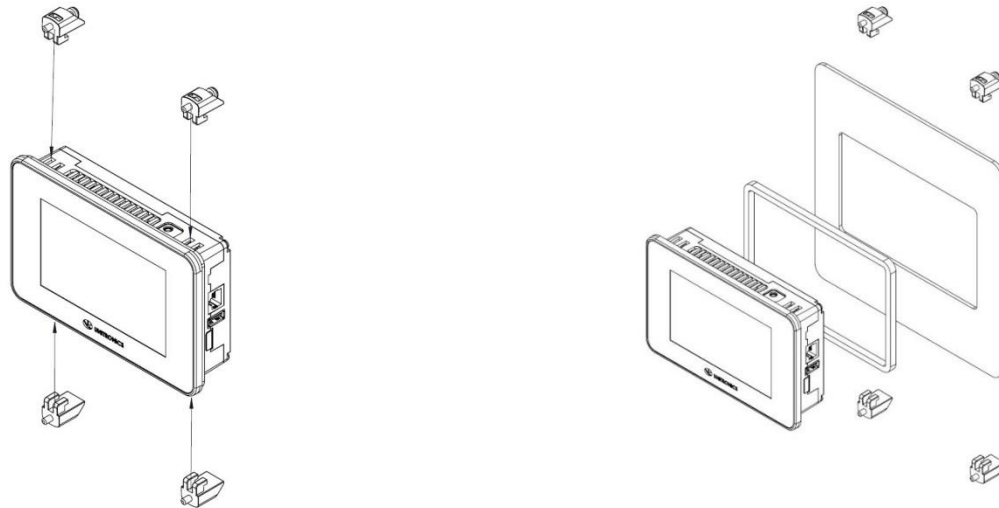
Caution   ▪ The necessary torque is 0.35 N·m (3.5 kgf·cm).

Panel Support Installation

1. Insert the Panel Support tabs into their location.
   Note that the exact location varies according to the panel model.

2. Pull on the Panel Support until it locks (clicks) into it's place.
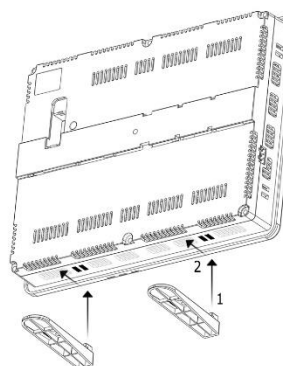
Wiring

⚠ • This equipment is designed to operate only at SELV/PELV/Class 2/Limited Power environments.
 • All power supplies in the system must include double insulation. Power supply outputs must be rated as SELV/PELV/Class 2/Limited Power.
 • Do not connect either the 'Neutral' or 'Line' signal of the 110/220VAC to device's 0V point.
 • Do not touch live wires.
 • All wiring activities should be performed while power is OFF.
 • Use over-current protection, such as a fuse or circuit breaker, to avoid excessive currents into the power supply connection point.
 • Unused points should not be connected (unless otherwise specified). Ignoring this directive may damage the device.
 • Double-check all wiring before turning 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 detailed information, refer to the document System Wiring Guidelines, located in the Technical Library in the Unitronics' website.

Wiring the Power Supply

The device requires an external power supply.

⚠   ▪ In the event of voltage fluctuations or non-conformity to voltage power supply specifications, connect the device to a regulated power supply.

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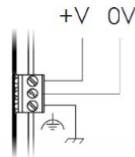
Connecting Ports

▪ Ethernet   **CAT-5e shielded cable with RJ45 connector**

▪ USB Host   **Standard USB Type-A plug**

Uninstalling the Device

1. Disconnect the power supply.
2. Remove all wiring.
3. Unscrew and remove the mounting brackets, taking care to support the device to prevent it from falling during this procedure.

Connecting the Display to a UniStream®

1. After the device is powered on, select the Network tab at the bottom of the screen.
2. Enter the IP Address for the VNC connection, a password if one is required by the VNC server, edit the timeout if required, and then tap Apply.

To add connections, tap the Connection scroller and repeat the steps above

1. When a connection is defined, the Connect button is activated; tap it to initiate the VNC connection.
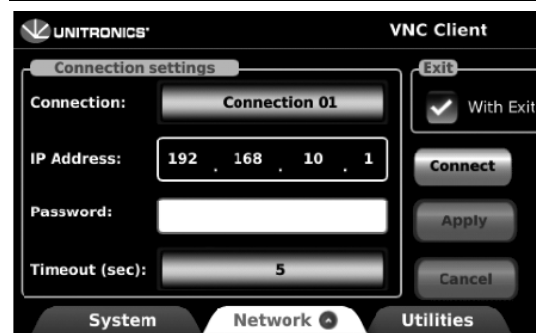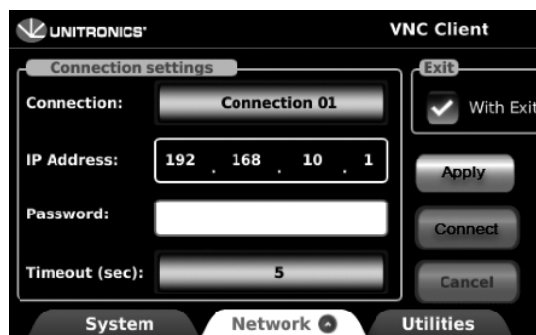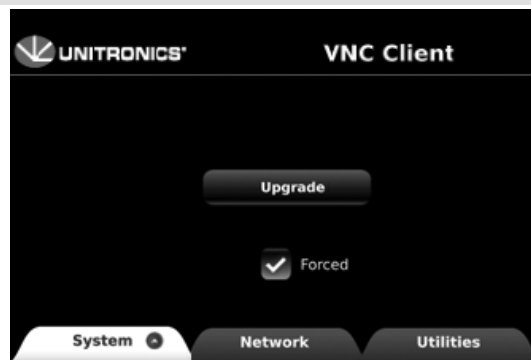

With Exit

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.

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

Power Supply	USL-050-B05	USL-070-B05	USL-101-B05	USL-156-B05
Input voltage	12VDC or 24VDC			
Permissible range	10.2VDC 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
Isolation	None			

Display	USL-050-B05	USL-070-B05	USL-101-B05	USL-156-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
Backlight longevity [1]	30k hours			
Resolution (pixels)	800 x 480 (WVGA)		1024 x 600 (WSVGA)	1366 x 768
Size	5"	7"	10.1"	15.6"
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)
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)
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
Data rate	USB 2.0 (480Mbps)
Isolation	None
Cable	USB 2.0 compliant; < 3 m (9.84 ft)
Over current protection	Yes

Environmental	
Protection	Front face : IP65/66, NEMA 4X Rear side: 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
USL-050-B05	0.28 Kg (1.32 lb)	Refer to the images on page 3
USL-070-B05	0.6 Kg (0.62 lb)	Refer to the images on page 3
USL-101-B05	1 Kg (2.2 lb)	Refer to the images on page 4
USL-156-B05	2.9 Kg (6.4 lb)	Refer to the images on page 5

Notes:

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

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