FlatClient PRO TGL

User Guide Rev. 1.2

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kontron

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▶ FLATCLIENT PRO – USER GUIDE

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NOTICE	You find the most recent version of the "General Safety Instructions" online in the download area of this product.

NOTICE	This product is not intended for use or suited for storage or operation in corrosive environments, in particular under exposure to sulfur and chlorine and their compounds. For information on how to harden electronics and mechanics against these stress conditions, contact Kontron Support.

Revision History

Revision	Brief Description of Changes	Date of Issue	Author
1.0	Initial version	2023-Jul-14	CW
1.1	Removed Ubuntu	2023-Sept-06	CW
1.2	Added new PSU accessory ER40-100012-01.	2024-Jan-22	CW

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Customer Service

As a trusted technology innovator and global solutions provider, Kontron extends its embedded market strengths into a services portfolio allowing companies to break the barriers of traditional product lifecycles. Proven product expertise coupled with collaborative and highly-experienced support enables Kontron to provide exceptional peace of mind to build and maintain successful products.

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Customer Comments

If you have any difficulties using this user guide, discover an error, or just want to provide some feedback, contact Kontron support. Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user guide on our website.

Symbols

The following symbols may be used in this user guide

⚠DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
NOTICE	NOTICE indicates a property damage message.
⚠CAUTION	CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury ATTENTION indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures mineures ou modérées.
⚡	**Electric Shock!** This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of products. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.
	ESD Sensitive Device! This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.
	Caution: HOT Surface! Do NOT touch! Allow to cool before servicing. Attention : Surface CHAUDE ! Ne pas toucher ! Laissez refroidir avant de procéder à l'entretien.
	Caution: Laser! This symbol inform of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.
i	This symbol indicates general information about the product and the user guide. This symbol also indicates detail information about the specific product configuration.
	This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

⚠ CAUTION	**Warning** **All operations on this product must be carried out by sufficiently skilled personnel only.**

⚠ CAUTION	Electric Shock! **Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.** **Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.**

Special Handling and Unpacking Instruction

NOTICE	ESD Sensitive Device! **Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.**

⚠ CAUTION	**Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled. Follow the "General Safety Instructions" supplied with the product.**

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

Lithium Battery Precautions

If your product is equipped with a lithium battery, take the following precautions when replacing the lithium battery.

⚠ CAUTION	Risk of Explosion if the lithium Battery is replaced by an incorrect Type. Dispose of used lithium batteries According to the instructions.
	Risque d'explosion si la pile au lithium est remplacée par une pile de type incorrect. Éliminez les piles au lithium usagées conformément aux instructions.

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this user guide or received from Kontron Support as a special handling instruction, will void your warranty.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, only follow the instructions supplied by the present user guide.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Quality and Environmental Management

Kontron aims to deliver reliable high-end products designed and built for quality, and aims to complying with environmental laws, regulations, and other environmentally oriented requirements. For more information regarding Kontron's quality and environmental responsibilities, visit http://www.kontron.com/about-kontron/corporate-responsibility/quality-management.

Disposal and Recycling

Kontron's products are manufactured to satisfy environmental protection requirements where possible. Many of the components used are capable of being recycled. Final disposal of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

WEEE Compliance

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

▶ Reduce waste arising from electrical and electronic equipment (EEE)
▶ Make producers of EEE responsible for the environmental impact of their products, especially when the product become waste
▶ Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
▶ Improve the environmental performance of all those involved during the lifecycle of EEE

	Environmental protection is a high priority with Kontron.
	Kontron follows the WEEE directive
	You are encouraged to return our products for proper disposal.

Table of Contents

List of Tables

List of Figures

1/ Introduction

This user guide describes the FlatClient PRO TGL, part of the FlatClient industrial HMI series of monitors known as FlatClient or product within this user guide. This user guide focuses on describing the product's special features and how to assemble, install, operate and maintain the product properly. New users are recommended to study the instructions within this user guide before switching on the product.

The FlatClient industrial HMI series, available as ECO and PRO variants, offers high mechanical flexibility with respect to design. The FlatClient can be used both standalone as a VESA solution (75 mm or 100 mm) or can be directly integrated into machines or consoles with a panel mount solution with PCAP touch and protection glass. Both product variants are available in numerous display sizes from 10.1" up to 23.8".

The FlatClient features an easy-clean, anti-glare and scratch-proof IP65 protected front glass. The product is service-friendly and is designed for a long life cycle thanks to carefully selected components from renowned manufacturers.

Figure 1: FlatClient PRO TGL

2/ General Safety Instructions

Please read this passage carefully and take careful note of the instructions, which have been compiled for your safety and to ensure to apply in accordance with intended regulations. If the following general safety instructions are not observed, it could lead to injuries to the operator and/or damage of the product; in cases of non-observance of the instructions Kontron Europe is exempt from accident liability, this also applies during the warranty period.

The product has been built and tested according to the basic safety requirements for low voltage (LVD) applications and has left the manufacturer in safety-related, flawless condition. To maintain this condition and to also ensure safe operation, the operator must not only observe the correct operating conditions for the product but also the following general safety instructions:

▶ The product must be used as specified in the product documentation, in which the instructions for safety for the product and for the operator are described. These contain guidelines for setting up, installation and assembly, maintenance, transport or storage.

▶ The on-site electrical installation must meet the requirements of the country's specific local regulations.

▶ If a power cable comes with the product, only this cable should be used. Do not use an extension cable to connect the product.

▶ To guarantee that sufficient air circulation is available to cool the product, please ensure that the ventilation openings are not covered or blocked. If a filter mat is provided, this should be cleaned regularly. Do not place the product close to heat sources or damp places. Make sure the product is well ventilated.

▶ Only connect the product to an external power supply providing the voltage type (AC or DC) and the input power (max. current) specified on the Kontron Product Label and meeting the requirements of the Limited Power Source (LPS) and Power Source (PS2) of UL/IEC 62368-1 .

▶ Only products or parts that meet the requirements for Power Source (PS1) of UL/IEC 62368-1 may be connected to the product's available interfaces (I/O).

▶ Before opening the product, make sure that the product is disconnected from the mains.

▶ Switching off the product by its power button does not disconnect it from the mains. Complete disconnection is only possible if the power cable is removed from the wall plug or from the product. Ensure that there is free and easy access to enable disconnection.

▶ The product may only be opened for the insertion or removal of add-on cards (depending on the configuration of the product). This may only be carried out by qualified operators.

▶ If extensions are being carried out, the following must be observed:
  ▶ all effective legal regulations and all technical data are adhered to
  ▶ the power consumption of any add-on card does not exceed the specified limitations
  ▶ the current consumption of the product does not exceed the value stated on the product label

▶ Only original accessories that have been approved by Kontron Europe can be used.

▶ Please note: safe operation is no longer possible when any of the following applies:
  ▶ the product has visible damages or
  ▶ the product is no longer functioning
  In this case the product must be switched off and it must be ensured that the product can no longer be operated.

▶ Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled.

▶ CAUTION: Risk of explosion if the lithium battery is replaced incorrectly (short-circuited, reverse-poled, wrong lithium battery type). Dispose of used lithium batteries according to the manufacturer's instructions.

▶ This product is not suitable for use in locations where children are likely to be present

Additional Safety Instructions for DC Power Supply Circuits

▶ To guarantee safe operation, please observe that:
  ▶ the external DC power supply must meet the criteria for LPS and PS2 (UL/IEC 62368-1)
  ▶ no cables or parts without insulation in electrical circuits with dangerous voltage or power should be touched directly or indirectly
  ▶ a reliable functional earth connection is provided

> ▶ a suitable, easily accessible disconnecting device is used in the application (e.g. overcurrent protective device), if the product itself is not disconnect able
> ▶ a disconnect device, if provided in or as part of the product, shall disconnect both poles simultaneously
> ▶ interconnecting power circuits of different products cause no electrical hazards

▶ A sufficient dimensioning of the power cable wires must be selected – according to the maximum electrical specifications on the product label – as stipulated by EN62368-1 or VDE0100 or EN60204 or UL61010-1 regulations.

For the General Safety Instruction in German or French, visit Kontron's product web page> Downloads> Manuals> General Safety Instructions.

2.1.1. Instructions générales de sécurité

Veuillez lire attentivement ce passage et prendre bonne note des instructions, qui ont été compilées pour votre sécurité et pour assurer une application conforme aux réglementations prévues. Le non-respect des consignes de sécurité générales suivantes peut entraîner des blessures pour l'utilisateur et/ou des dommages pour le produit. En cas de non-respect des consignes, Kontron Europe est exonéré de la responsabilité en cas d'accident, ceci s'applique également pendant la période de garantie.

Le produit a été construit et testé conformément aux exigences de sécurité de base pour les applications basse tension (DBT) et a quitté le fabricant dans un état impeccable en matière de sécurité. Pour maintenir cet état et pour garantir également un fonctionnement sûr, l'opérateur doit non seulement respecter les conditions d'utilisation correctes du produit, mais aussi les consignes de sécurité générales suivantes :

▶ Le produit doit être utilisé conformément à la documentation du produit, dans laquelle sont décrites les instructions de sécurité pour le produit et pour l'opérateur. Celles-ci contiennent des directives pour la mise en place, l'installation et le montage, la maintenance, le transport ou le stockage.

▶ L'installation électrique sur place doit répondre aux exigences des réglementations locales spécifiques du pays.

▶ Si un câble d'alimentation est fourni avec le produit, seul ce câble doit être utilisé. N'utilisez pas de rallonge pour connecter le produit.

▶ Afin de garantir une circulation d'air suffisante pour refroidir le produit, veuillez vous assurer que les ouvertures de ventilation ne sont pas couvertes ou obstruées. Si un élément filtrant est fourni, celui-ci doit être nettoyé régulièrement. Ne placez pas le produit à proximité de sources de chaleur ou d'endroits humides. Veillez à ce que le produit soit bien ventilé.

▶ Ne connectez le produit qu'à une alimentation externe fournissant le type de tension (AC ou DC) et la puissance d'entrée (courant max.) spécifiés sur le Label Produit Kontron et répondant aux exigences de la source d'alimentation limitée (LPS) et de la source d'alimentation (PS2) de la norme UL/IEC 62368-1 .

▶ Seuls les produits ou les pièces qui répondent aux exigences de la source d'alimentation (PS1) de la norme UL/IEC 62368-1 peuvent être connectés aux interfaces (E/S) disponibles du produit.

▶ Avant d'ouvrir le produit, assurez-vous qu'il est bien débranché du secteur.

▶ Le fait d'éteindre le produit par son bouton de mise en marche ne le déconnecte pas du secteur. Une déconnexion complète n'est possible que si le câble d'alimentation est retiré de la prise murale ou du produit. Veillez à ce que l'accès soit libre et facile pour permettre la déconnexion.

▶ Le produit ne peut être ouvert que pour l'insertion ou le retrait de cartes supplémentaires (selon la configuration du produit). Cette opération ne peut être effectuée que par des opérateurs qualifiés.

▶ Si des extensions sont effectuées, les points suivants doivent être respectés :

> ▶ toutes les réglementations légales en vigueur et toutes les données techniques sont respectées
> ▶ la consommation électrique d'une carte supplémentaire ne dépasse pas les limites spécifiées
> ▶ la consommation actuelle du produit ne dépasse pas la valeur indiquée sur l'étiquette du produit.

▶ Seuls les accessoires d'origine approuvés par Kontron Europe peuvent être utilisés.

▶ Veuillez noter que la sécurité des opérations n'est plus possible lorsque l'une des conditions suivantes s'applique.

> ▶ le produit présente des dommages visibles ou

> ▶ le produit ne fonctionne plus. Dans ce cas, le produit doit être éteint et il faut s'assurer que le produit ne puisse plus être utilisé.

▶ La manipulation et le fonctionnement du produit ne sont autorisés que pour le personnel formé dans un lieu de travail dont l'accès est contrôlé.

▶ ATTENTION: Risque d'explosion en cas de remplacement incorrect de la pile au lithium (court-circuit, inversion de polarité, mauvais type de pile au lithium). Éliminez les piles au lithium usagées conformément aux instructions du fabricant.

▶ Ce produit n'est pas adapté à une utilisation dans des endroits où des enfants sont susceptibles d'être présents

Instructions de sécurité supplémentaires pour les circuits d'alimentation en courant continu

▶ Pour garantir un fonctionnement sûr, veuillez observer ce qui suit:

> ▶ l'alimentation électrique externe en courant continu doit répondre aux critères des LPS et PS2 (UL/IEC 62368-1)
>
> ▶ aucun câble ou pièce non isolée dans les circuits électriques ayant une tension ou une puissance dangereuse ne doit être touché directement ou indirectement
>
> ▶ une connexion à la terre fonctionnelle fiable est fournie
>
> ▶ un dispositif de déconnexion approprié et facilement accessible est utilisé dans l'application (par exemple, un dispositif de protection contre les surintensités), si le produit lui-même n'est pas en mesure d'être déconnecté.
>
> ▶ un dispositif de déconnexion, s'il est prévu dans le produit ou s'il en fait partie, doit déconnecter les deux pôles simultanément
>
> ▶ l'interconnexion des circuits électriques de différents produits ne présente aucun risque électrique

▶ Un dimensionnement suffisant des fils du câble d'alimentation doit être choisi - en fonction des spécifications électriques maximales figurant sur l'étiquette du produit - comme stipulé par les réglementations EN62368-1 ou VDE0100 ou EN60204 ou UL61010-1.

2.2. Electrostatic Discharge (ESD)

A sudden discharge of electrostatic electricity can destroy static-sensitive devices or micro-circuitry. Therefore, proper packaging and grounding techniques are necessary precautions to prevent damage.

Always take the following precautions:

ESD Sensitive Device!

Keep electrostatic sensitive parts in their containers until they arrive at the ESD-safe workplace. Always be properly grounded when touching a sensitive board, component, or assembly.

For more Information, see the Special Handling and Unpacking Instruction within this user guide and Chapter 2.3: Grounding Methods.

2.3. Grounding Methods

The following measures help to avoid electrostatic damages to the device:

▶ Cover workstations with approved antistatic material. Always wear a wrist strap connected to the workplace, as well as properly grounded tools and equipment.

▶ Use antistatic mats, heel straps, or air ionizers for more protection.

▶ Always handle electrostatically sensitive components by their edge or by their casing.

▶ Avoid contact with pins, leads, or circuitry.

▶ Switch off power and input signals before inserting and removing connectors or connecting test equipment.

▶ Keep the work area free of non-conductive materials such as ordinary plastic assembly aids and styrofoam.

▶ Use field service tools such as cutters, screwdrivers, and vacuum cleaners that are conductive.

▶ Always place drives and boards with the PCB-assembly-side down on the foam.

2.4. Instructions for Lithium Battery

If the product is equipped with a lithium battery, there is a risk of explosion if the lithium battery is replaced incorrectly (short-circuited, reverse-poled, wrong lithium battery type). Dispose of used batteries according to the manufacturer's instructions. For more information, see Chapter 12.1: Changing the Lithium Battery.

⚠CAUTION	Risk of Explosion if the lithium battery is replaced by an incorrect Type. Dispose of used batteries according to the instructions. Risque d'explosion si la pile au lithium est remplacée par une pile de type incorrect. Éliminez les piles au lithium usagées conformément aux instructions
	Do not dispose of lithium batteries in general trash collection. Dispose of the lithium battery according to the local regulations dealing with the disposal of these special materials, (e.g. to the collecting points for dispose of batteries).

3/ Shipment and Unpacking

3.1. Packaging

The FlatClient is packaged together with all parts, in a product specific cardboard package designed to provide adequate protection and absorb shock.

3.2. Unpacking

To unpack the FlatClient perform the following:

1. Remove packaging.

2. Do not discard the original packaging. Keep the original packaging for future transportation or storage.

3. Check the delivery for completeness by comparing the delivery with the original order.

4. Keep the associated paperwork. It contains important information for handling the product.

5. Check the product for visible shipping damage.

If you notice shipping damage or inconsistencies between the contents and the original order, contact your dealer.

3.3. Scope of Delivery

This scope of delivery describes the parts included in your delivery. Check that the delivery is complete, and contains the items listed. If damaged or missing items are discovered, contact your dealer.

Table 1: Scope of Delivery

Part	Qty.	Part Number	Part Description
	1	See Chapter 5/Order Information	FlatClient PRO TGL
		EM21-100168-01 (10.1") EM21-100065-01 (12.1") EM21-100066-01 (15.6") EM21-100068-01 (18.5") EM21-100069-01 (21.5"/23.8")	Mounting set with clamps and screws. (only for panel mount variant)
	1	0-0062-3268	3-pin Phoenix power connector (PSC 1.5/ 3-F)

3.4. Accessories

Table 2: List of Accessories

Part	Part Number	Part Description
	EE04-100001-01	Phoenix 3-pin power subcon in D-sub 9 connector
	840-0059	EU-power cord 1.8 m
	ER40-100001-01	External Power Supply 24 VDC, 65 W with Phoenix connector (only for processor variants Intel® Core™ i3 & Intel® Celeron®)
	ER40-100005-01	External Power Supply Set 24 VDC, 65 W with Phoenix connector and EU-Power cord 1.8 m (only for processor variants Intel® Core™ i3 & Intel® Celeron®)
	ER40-100012-01	External Power Supply 24 VDC, 90 W with Phoenix connector (Prerequisite for processor variants Intel® Core™ i5 & i7)
	PR22-100004-01	Adapter cable HDMI – Display Port 1.2, 20 cm, 4K aktiv Delock: 62607
	PR22-100005-01	Adapter HDMI – Display Port 1.2, 4K aktiv Delock: 65573
	PR22-100007-01	Adapter VGA – Display Port 1.1 Delock: 65567

3.5. Type Label and Product Identification

The type label contains specific product identification information and FlatClient PRO TGL technical information.

Figure 2: Type Label Example
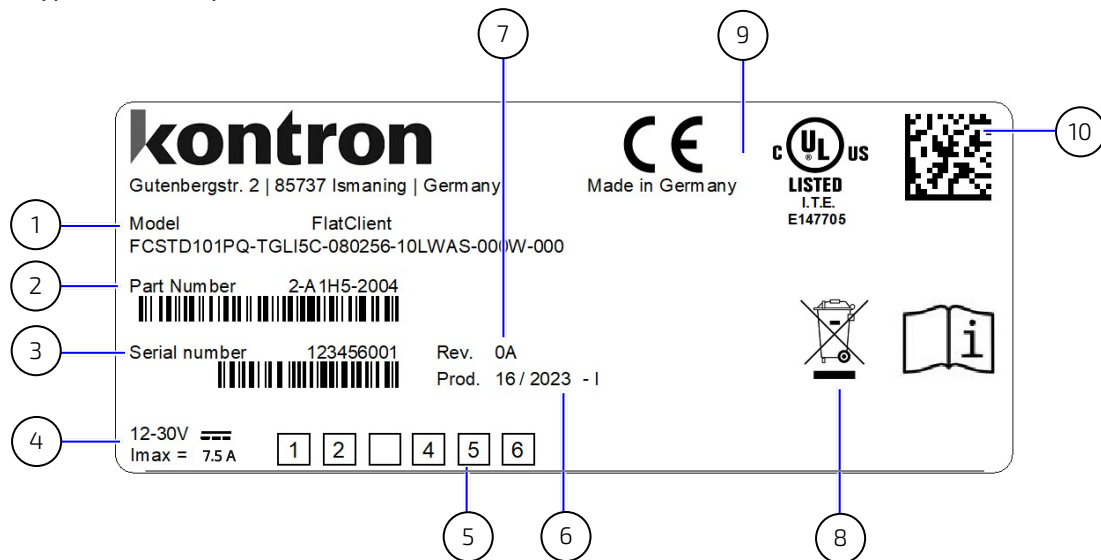
1	Product family	6	Production date
2	Part Number with bar code	7	Revision
3	Serial Number and bar code	8	Disposal Information
4	Electrical specification	9	Compliance
5	For Internal use [1 to 6]	10	QR-Code

4/ Product Features

Before implementing the FlatClient PRO TGL in a system, Kontron recommends new users to take a few minutes to learn about the product's various features.

4.1. Front Features

The FlatClient panel mount and VESA variants have the same front. The front consists of an aluminum frame and 2.8 mm glass.

Figure 3: Front (VESA and panel mount)

| 1 | Front plate | 2 | Display |

4.2. Rear Panel Features

The FlatClient panel mount and VESA variants have different rear panels.

Figure 4: Rear Panel and Sides (panel mount)
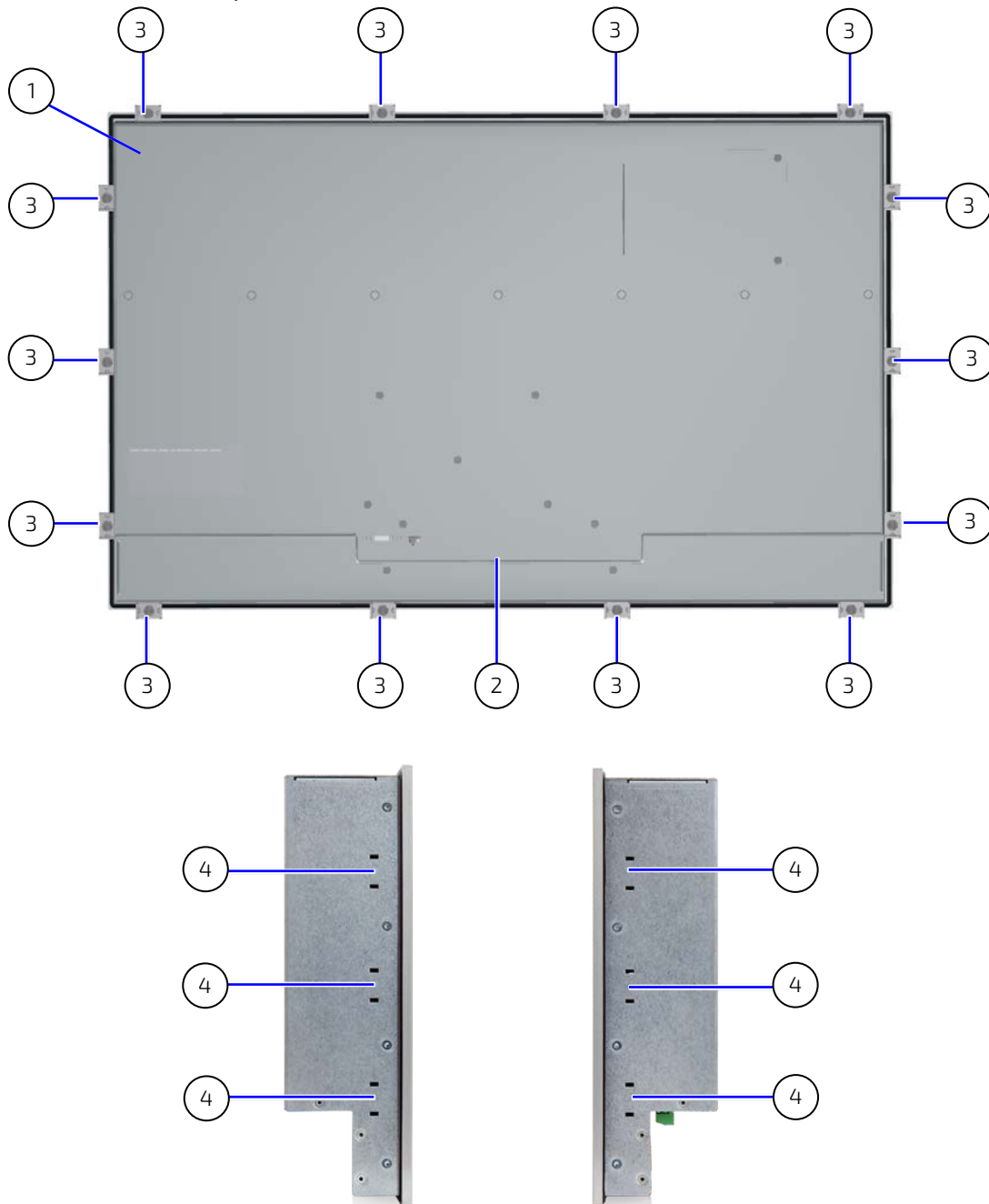
1	Rear panel	3	Mounting clips
2	Interface panel	4	Opening for mounting clips

> The number of mounting clips depends on the size of the display. For more information, see Table 4: Technical Data Display.

Figure 5: Rear Panel (VESA)
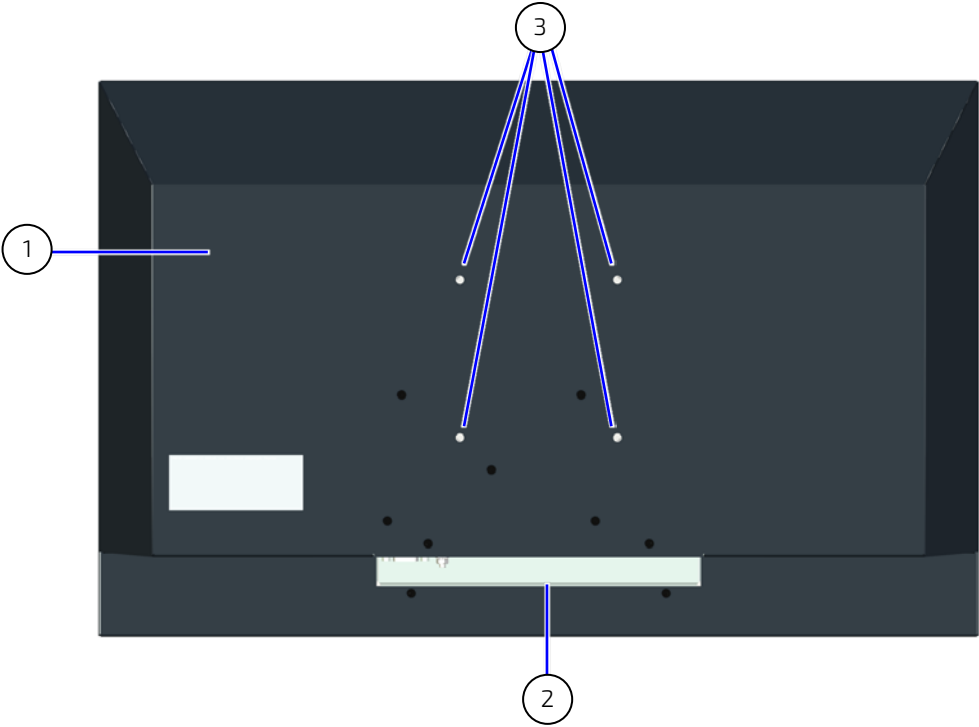
1	Rear Panel	3	VESA mount openings (75 mm or 100 mm)
2	Interface panel		

> The VESA mounting bracket requires either VESA 75 mm or VESA 100 mm depending on the display size. For more information, see Table 4: Technical Data Display.

4.3. Interface Panel

Figure 6: Interface Panel
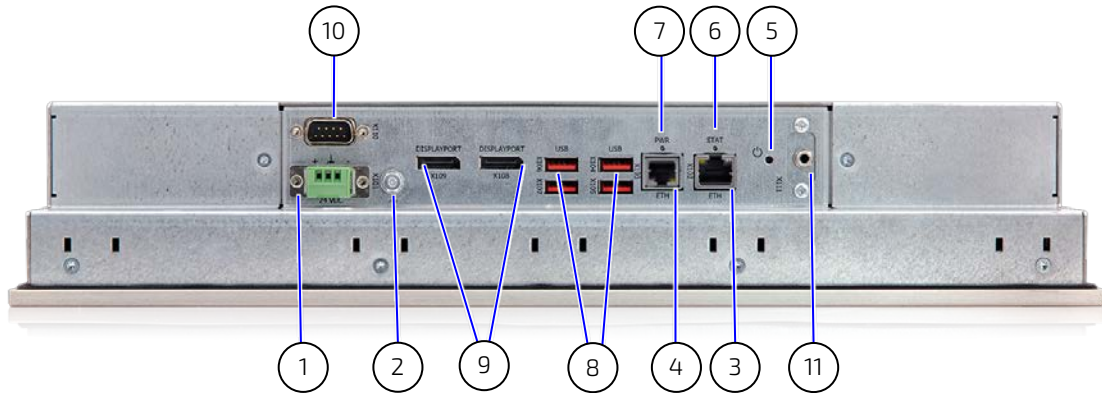
1	Input Power (X101)		7	Power LED
2	Functional earth bolt		8	4x USB 3.2 Gen 2 (X104-X107)
3	2.5 GbE Ethernet (X102)		9	2x Display Port (DP++) (X108-X109)
4	GbE Ethernet (X103)		10	Breakouts (X110): shown here with COM
5	Power button		11	Breakouts (X111): shown here with Audio line-out
6	State LED			

4.4. Options

The Breakout panel options are factory installed. The breakout panels (X110 and X111) support the following options:

▶ COM (RS232, RS422, RS485)

▶ Antenna for Wi-Fi 6/Bluetooth

▶ Audio-line-out

Additional options on request are:

▶ Audio stereo (3 W)

▶ Battery automotive grade (lifetime > 10 years)

▶ Exchangeable SSD

▶ RFID

▶ CAN

For more Information regarding on-request items, contact your Kontron sales representative.

5/ Order Information

Table 3: Order Number Information

Product Name	Description
2-A1Hv-yxxx	Flat monitor standard product family
2-A1H**v**-yxxx	5: FlatClient PRO TGL 6: FlatClient ECO EKL
2-A1Hv-**y**xxx	2: Standard 0: Customer specific product (MOST)
2-A1Hv-y**xxx**	Sequential number

6/ Product Specification

6.1. Technical Specifications

Table 4: Technical Data Display

Display Size	10.1"	12.1" WXGA	15.6"
Resolution (pixel)	1280x800	1280x800	1920x1080, Full HD
Format	16:10	16:10	16:9
Contrast Ratio	800:1	1000:1	800:1
Brightness	500 cd/m²	500 cd/m²	450 cd/m²
Angle View (H/V)	170°/170°	178°/178°	170°/170°
Colors	16.2 million	16.7 million	16.2 million
LED Lifetime (> 50%, 25°C)	> 50.000 h	> 70.000 h	> 50.000 h
Dimensions (WxHxD)	276 x 195 x 65 mm	315 x 228 x 65 mm	399 x 260 x 75 mm
Weight	~3.6 kg	~5.0 kg	~6.5 kg
Protection glass	✓	✓	✓
PCAP (Multitouch)	✓	✓	✓
Color	RAL 7021 (black anthracite)		
Mounting (VESA only) (Panel Mount only)	VESA 75 6 Mounting brackets	VESA 75 8 Mounting brackets	VESA 100 12 Mounting brackets
Protection Class	Front: IP65, Housing IP20		
Cooling	Fanless passive cooling		
Display Size	18.5"	21.5"	23.8"
Resolution	1920x1080, Full HD	1920x1080, Full HD	1920x1080, Full HD
Format	16:9	16:9	16:9
Contrast Ratio	1000:1	1000:1	1000:1
Brightness	500 cd/m²	300 cd/m²	400 cd/m²
Angle View	178°/178°	178°/178°	178°/178°
Colors	16.7 million	16.7 million	16.7 million
LED Lifetime (> 50%, 25°C)	> 50.000 h	> 50.000 h	> 50.000h
Dimensions (WxHxD)	465 x 299 x 75 mm	533 x 339 x 75 mm	575 x 364 x 75 mm
Weight	~8.4 kg	~10.5 kg	~11.8 kg
Protection glass	✓	✓	✓
PCAP (Multitouch)	✓	✓	✓
Color	RAL 7021 (black anthracite)		
Mounting (VESA-only) (Panel Mount only)	VESA 100 14 Mounting brackets	VESA 100 14 Mounting brackets	VESA 100 14 Mounting brackets
Protection Class	Front: IP65, Housing IP20		
Cooling	Fanless passive cooling		

Table 5: Technical Data FlatClient PRO TGL

FlatClient PRO TGL	Description			
Processor	Intel® Core™ i3-1115G4E	Intel® Celeron® 6305E	Intel® Core™ i5-1145GRE-XT	Intel® Core™ i7-1185GRE-XT
	Dual core	Dual core	Quad core	Quad core
	6 MB Cache	4 MB Cache	8 MB Cache	12 MB Cache
	2.2 GHz, up to 3.9 GHz (Turbo)	1.8 GHz	1.5 GHz, up to 4.1 GHz (Turbo)	1.8 GHz, up to 4.4 GHz (Turbo)
	15W	15W	15W	15W
Memory	Up to 64 GByte 2x DDR4 SO-DIMM (options: 4GByte, 8GByte, 16GByte, 32GByte)			
I/O (standard)	1x 2.5 GbE 1x GbE 4x USB 3.2 Gen 2 2x DP++			
RTC	Integrated: lifetime 5 years (min.)			
Options	COM (RS232, RS422, RS485) Wi-Fi 6/Bluetooth Audio Line-out On request: ▶ Audio stereo (3 W) ▶ Battery automotive grade (lifetime > 10 years) ▶ Exchangeable SSD ▶ RFID ▶ CAN For more information regarding on-request items, contact your Kontron sales representative.			

6.2. Software Specification

Table 6: Software Specification

BIOS	AMI uEFI BIOS
Operating System	Windows 10 IoT, Linux

> **i** For available Board Support Packages/Driver/Tools, visit Kontron's Customer Section.

> **i** For available BIOS updates, visit Kontron's Customer Section.

6.3. Power Specification

Before connecting to an external DC power supply, ensure that the external DC power supply meets the electrical specification on the product's Type Label (Figure 2) and as specified in the electrical specification (Table 7). The external DC power supply must automatically recover from AC power loss and startup under peak loading.

⚠CAUTION

Only connect the product to an external power supply providing the voltage type (AC or DC) and the input power (max. current) specified on the Kontron Product Label.

The external power supply must meet the requirements of ES1/PS2 according to IEC/UL 62368-1.

Connectez le produit uniquement à une alimentation externe fournissant le type de tension (AC ou DC) et la puissance d'entrée (courant max.) spécifiés sur l'étiquette du produit Kontron. L'alimentation externe doit répondre aux exigences de ES1/PS2 selon IEC/UL 62368-1.

The electrical specification depends on the implemented processor and remains the same for all display sizes.

Table 7: Electrical Specification

Electrical Specification	Intel® Core™ i3-1115G4E	Intel® Celeron® 6305E	Intel® Core™ i5-1145GRE-XT	Intel® Core™ i7-1185GRE-XT
Input Voltage	12 VDC to 30 VDC			
Input Current (max)	5 A		7.5 A	
Power (max.)	60 W		90 W	

Table 8: Typical Current Rating @ 24 VDC per Display Size

Display Size	Typical Current Rating @24 VDC
10.1"	1.5 A
12.1"	1.6 A
15.6"	1.9 A
18.5"	2.1 A
21.5"	1.9 A
23.8"	2.1 A

6.3.1. Power Supply Protection Requirements

The external DC power supply must incorporate protection and supply features such as over current, over temperature, over voltage and brownout protection, to protect the product against fluctuations and interruptions and ensure operation without loss of data or product damage.

NOTICE

To protect the product and any connected peripherals, make sure that the power cables have the right diameter to withstand the maximum available current.

NOTICE

Ensure that the power supply is used according to the manufacturer's instructions.

NOTICE

If there is an unintentional voltage drop in the mains power supply for longer than the specified holdup time (brownout), all supply voltages should be shut down and remain in the off state long enough to allow internal voltages to discharge sufficiently. During the off state time do not disconnect or add cables to/from the I/O connectors. Failure to observe the off state time means that parts of the product or attached peripherals may work incorrectly or suffer a reduction of MTBF.

The minimum off state time, to allow internal voltages to discharge, depends on the power supply used and additional electrical factors. To determine the required off state time, each case must be considered individually. For more information, contact Kontron Support.

6.3.2. Functional Earth Bolt

The functional earth bolt connects to the internal shield. To avoid damage to the product, observe proper grounding methods.

1. Connect the product to ground before switching on the product.

2. Only connect the product to an applied ground that meets all applicable local, national and international grounding requirements.

3. When assembling, connect the first cable to the functional earth bolt and when disassembling, the last cable to be removed is the ground cable.

⚠CAUTION

Ground Properly

The installation sites applied ground must meet your local, national and international region grounding requirements.

6.4. Environmental Specification

Table 9: Environmental Specification

Temperature	Operating	0°C to 50°C (32°F to 122°F)
	Storage	-20°C to 70°C (-4°F to 158°F)
Humidity		10%-90% @ 39°C, non condensing
Altitude		Up to 3000 m (9900 ft.)
Shock, according to EN 60068-2-27	Operating	15 G, 11 ms duration (half sine), shock count 3/direction, total 18
	Storage	30 G, 11 ms duration (half sine) shock count 3/direction, total 18
Vibration, according to EN 60068-2-6	Operating	10-500 Hz: 1 G
	Storage	10-500 Hz: 2 G

NOTICE

The product is intended for indoor use only. To avoid product damage do not use in a sheltered outdoor, outdoor or sunlit environment.

Observe that the product is not exposed to direct sunlight (UV radiation):

- Prolonged exposure shortens field life and voids the warranty
- Short exposure may lead to higher temperatures inside the product and cause permanent damage
- Direct exposure accelerates long-term aging

For intend use in an outdoor environment or a sunlit environment, contact your Kontron sales representative.

6.5. Compliance

The FlatClient PRO TGL plans to comply with the relevant requirements and the approximation of the laws relating to 'CE' or 'RED' (Wi-Fi) the standards that are constitutional parts of the declaration.

Table 10: Compliance CE Mark

Europe – CE Mark	
Directives	**2014/30/EU** Electromagnetic compatibility **2014/35/EU** Low Voltage **2011/65/EU** RoHS II Restriction of the use of Hazardous Substances in electrical and electronic equipment
EMC	**EN 55032** Electromagnetic compatibility of multimedia equipment – Emission requirements **EN 61000-6-2** Electromagnetic compatibility (EMC), Part 6-2: Generic Standards - Immunity for industrial environments
Safety	**EN 62368-1** Audio/video, information and communication technology equipment – Part 1: Safety requirements

Table 11: Compliance CE RED Mark

Europe – CE RED Mark	
Directives	**2014/53/EU** RED: Radio equipment Directive **2011/65/EU** RoHS II Restriction of the use of Hazardous Substances in electrical and electronic equipment
EMC	**EN 55032** Electromagnetic compatibility of multimedia equipment – Emission requirements **EN 61000-6-2** Electromagnetic compatibility (EMC), Part 6-2: Generic Standards - Immunity for industrial environments **EN 301 489-1 V2.2.0** ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU **EN 301 489-17 V3.1.1** ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems **EN 300 328 V2.2.2** Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques **EN 301 489-3 V2.1.1** ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz **EN 300 330 V2.1.1** Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz

Europe – CE RED Mark	
Safety	EN 62368-1
	Audio/video, information and communication technology equipment – Part 1: Safety requirements
Health and Safety	EN 62311
	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

The FlatClient PRO TGL plans to comply with the following country specific certifications.

Table 12: Compliance International

USA/CANADA	
EMC	FCC 47 CFR Part 15 (Class B)
	Complies with part 15 FCC rules and regulations of title 47 of the CFR rules for class B products; under which an unintentional radiator may be operated, administrated and other conditions relating to the marketing of part 15 devices.
Safety	UL 62368-1/CSA-C22.2 No. 62368-1
	Audio/video, information and communication technology equipment – Part 1: Safety requirements
UK CA (UK Conformity Assessed)	
EMC	EN 55032
	Electromagnetic compatibility of multimedia equipment – Emission requirements
	EN 61000-6-2
	Electromagnetic compatibility (EMC), Part 6-2: Generic Standards - Immunity for industrial environments
Safety	EN 62368-1
	Audio/video, information and communication technology equipment – Part 1: Safety requirements
International Certifications	
Safety	IEC 62368-1
	Audio/video, information and communication technology equipment – Part 1: Safety requirements

> If the product is modified, the prerequisites for specific approvals may no longer apply.

> For the product's Declaration of Conformity (DoC), visit Kontron's Customer Section.

> Kontron is not responsible for any radio television interference caused by unauthorized modifications of the delivered product or the substitution or attachment of connecting cables and equipment other than those specified by Kontron. The correction of interference caused by unauthorized modification, substitution or attachment is the user's responsibility.

7/ Thermal Management

7.1. Passive Cooling

The FlatClient PRO TGL panel mount and VESA variants are both passively cooled. The entire rear panel surface can get very hot and precautions must be taken before handling or touching.

Do not obstruct the airflow around the rear panel as this may cause a build-up of heat. Observe a minimum clearance distance around the product, see Chapter 7.3: Clearance.

Both the panel mount and VESA variants support the installation of an optional heatsink for a more efficient path for the transfer of heat out of the product and into the ambient surrounding environment.

Figure 7: Rear Panel (panel mount and VESA) without Heatsink
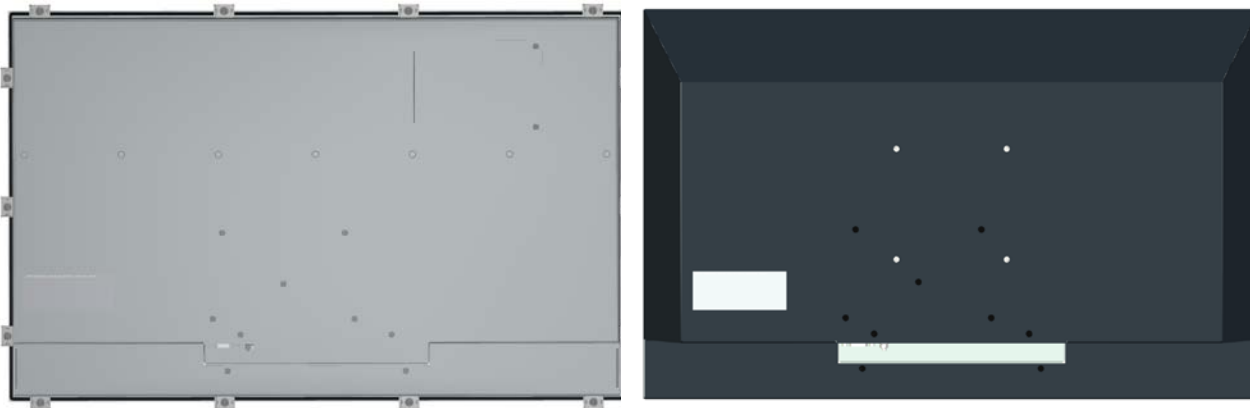
	Caution: Hot Surface
	The heatsink and/or the entire rear panel surface can get very hot. To avoid burns and personal injury when handling the heatsink or rear panel surface:

- Do not touch while in operation
- Allow to cool before handling
- Wear protective gloves

Attention : Surface chaude

Le dissipateur thermique et/ou toute la surface du panneau arrière peuvent devenir très chauds. Pour éviter les brûlures et les blessures lors de la manipulation du dissipateur thermique ou de la surface du panneau arrière :
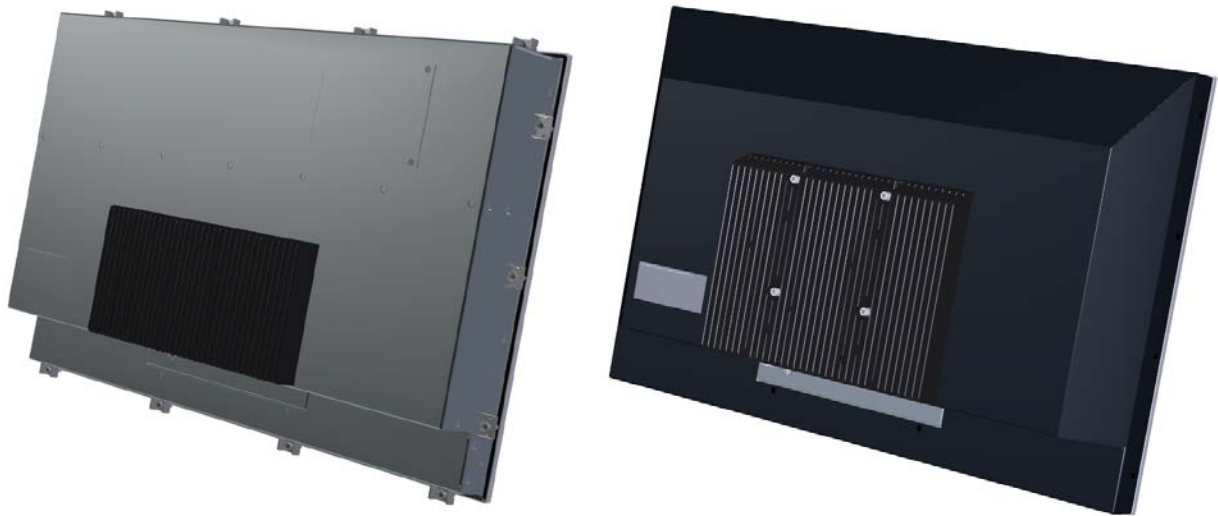
- Ne pas toucher pendant le fonctionnement
- Laisser refroidir avant la manipulation
- Portez des gants de protection

7.2. Heatsink (optional)

A heatsink is available for both the panel mount and VESA variants. The heatsink is optimized to improve the thermal performance of the product. The heatsink is installed on the product's rear panel.

Do not obstruct the airflow around the heatsink as this may cause a build-up of heat. Observe a minimum clearance distance around the product, see Chapter 7.3: Clearance.

Figure 8: Rear Panel (panel mount and VESA) with Heatsink

⚠	**Caution: Hot Surface** The heatsink and/or the entire rear panel surface can get very hot. To avoid burns and personal injury when handling the heatsink or rear panel surface: • Do not touch while in operation • Allow to cool before handling • Wear protective gloves **Attention : Surface chaude** Le dissipateur thermique et/ou toute la surface du panneau arrière peuvent devenir très chauds. Pour éviter les brûlures et les blessures lors de la manipulation du dissipateur thermique ou de la surface du panneau arrière : • Ne pas toucher pendant le fonctionnement • Laisser refroidir avant la manipulation • Portez des gants de protection

The heatsink's mechanical specifications differ depending on the type of rear panel and the display size. All heatsinks add an additional 25 mm (0.99 inch) to the product's overall depth.

Table 13: Heatsink Dimensions

Heatsink Type	Dimension	
Heatsink panel mount (all display sizes)	245 mm x 120 mm x 25 mm	(9.65 inch x 4.72 inch x 0.99 inch)
Heatsink VESA (display sizes: 10.1 to 12.1)	245 mm x 120 mm x 25 mm	(9.65 inch x 4.72 inch x 0.99 inch)
Heatsink VESA (display sizes: 15.6 and above)	245 mm x 180 mm x 25 mm	(9.65 inch x 7.09 inch x 0.99 inch)

7.3. Clearance

Take care not to obstruct the airflow over the product's rear panel (with/without heatsink), as this can stop sufficient heat dissipating into the ambient environment and cause a build-up of heat. To ensure that sufficient air can flow away from the rear panel (with/without heatsink), observe a suitable minimum clearance distance of 20 mm (0.79 inch) all around the product.

NOTICE	Ensure proper operation by observing a suitable minimum clearance distance of 20 mm (0.79 inch) all around the product.

7.4. Thermal Management

The products operating range is 0°C to 50°C (32°F to 122°F), however when operated at temperatures above 40°C (104°F) the performance of the processor reduces, see Figure 9, Blue line.

Full performance over the operating temperature range of 0°C to 50°C (32°F to 122°F) requires the installation of a heatsink on the rear panel, to enable sufficient heat to be dissipated into the environment, see Figure 9, green line.

Figure 9: Performance vs Temperatures (40°C /104°F), 50°C /122°F)
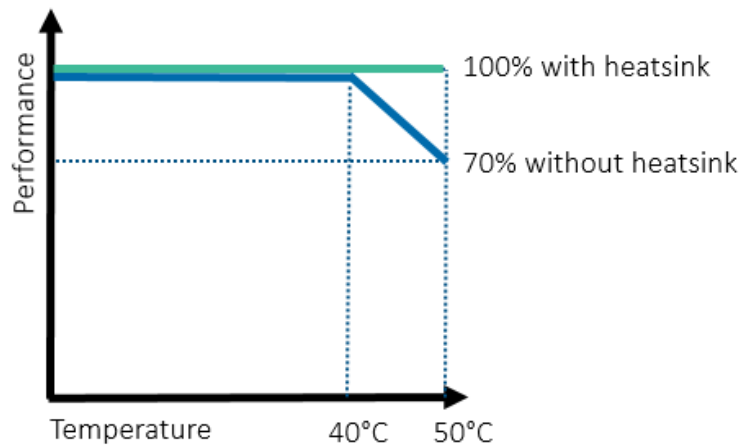
| ⚠️	Caution: Hot Surface
	The heatsink and/or the entire rear panel surface can get very hot. To avoid burns and personal injury when handling the heatsink or rear panel surface:
	• Do not touch while in operation
	• Allow to cool before handling
	• Wear protective gloves
	Attention : Surface chaude
	Le dissipateur thermique et/ou toute la surface du panneau arrière peuvent devenir très chauds. Pour éviter les brûlures et les blessures lors de la manipulation du dissipateur thermique ou de la surface du panneau arrière :
	• Ne pas toucher pendant le fonctionnement
	• Laisser refroidir avant la manipulation
	• Portez des gants de protection

8/ Mechanical Specification

8.1. 10.1" Panel Mount
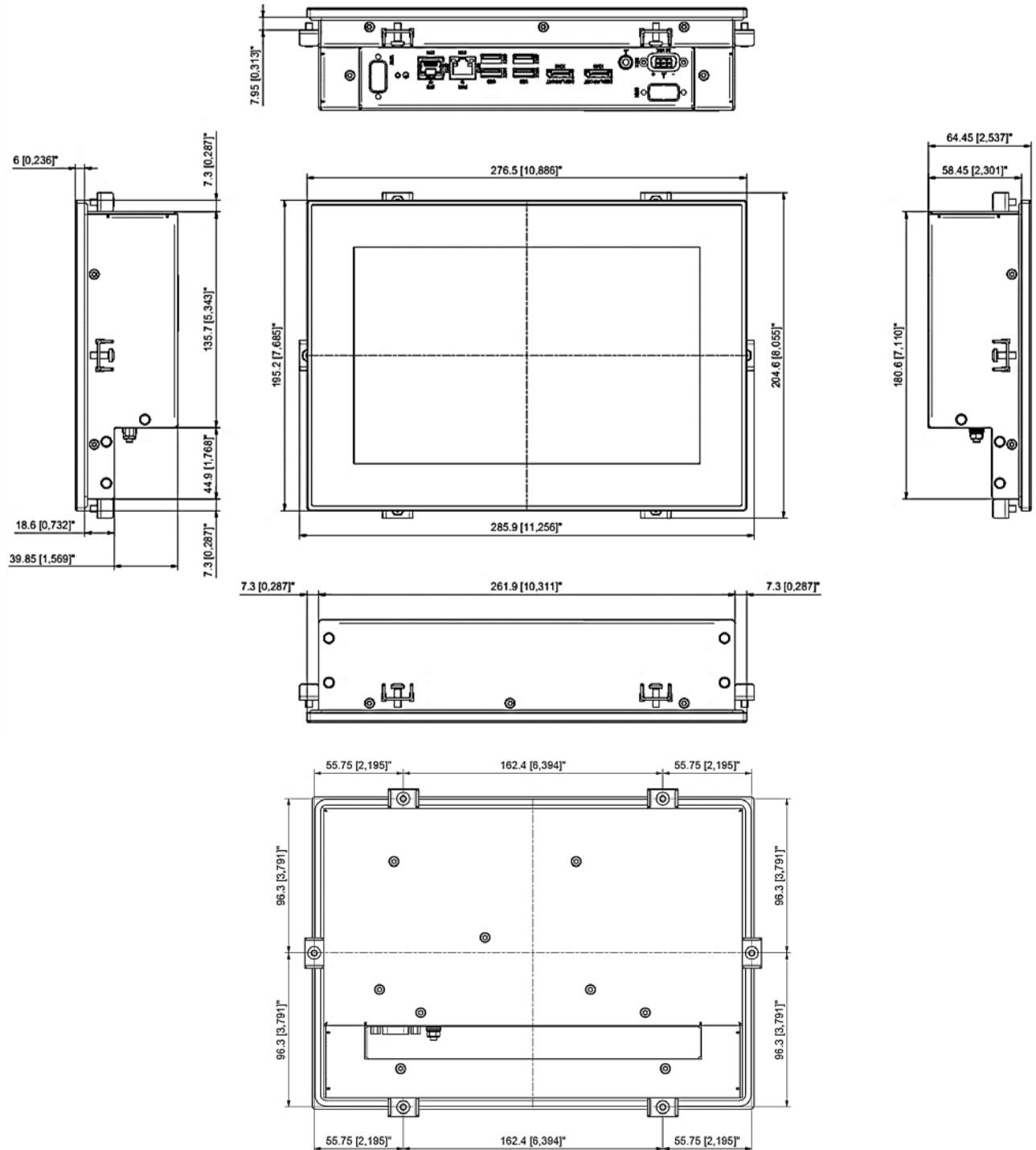
Dimensions	Panel Cutout Horizontal	Panel Cutout Vertical	Height for Mounting Brackets (max.)
10.1" Display	263.9 mm [10.390"]	182.6 mm [7.189"]	5.00 mm [0.197"]

8.2. 10.1" VESA
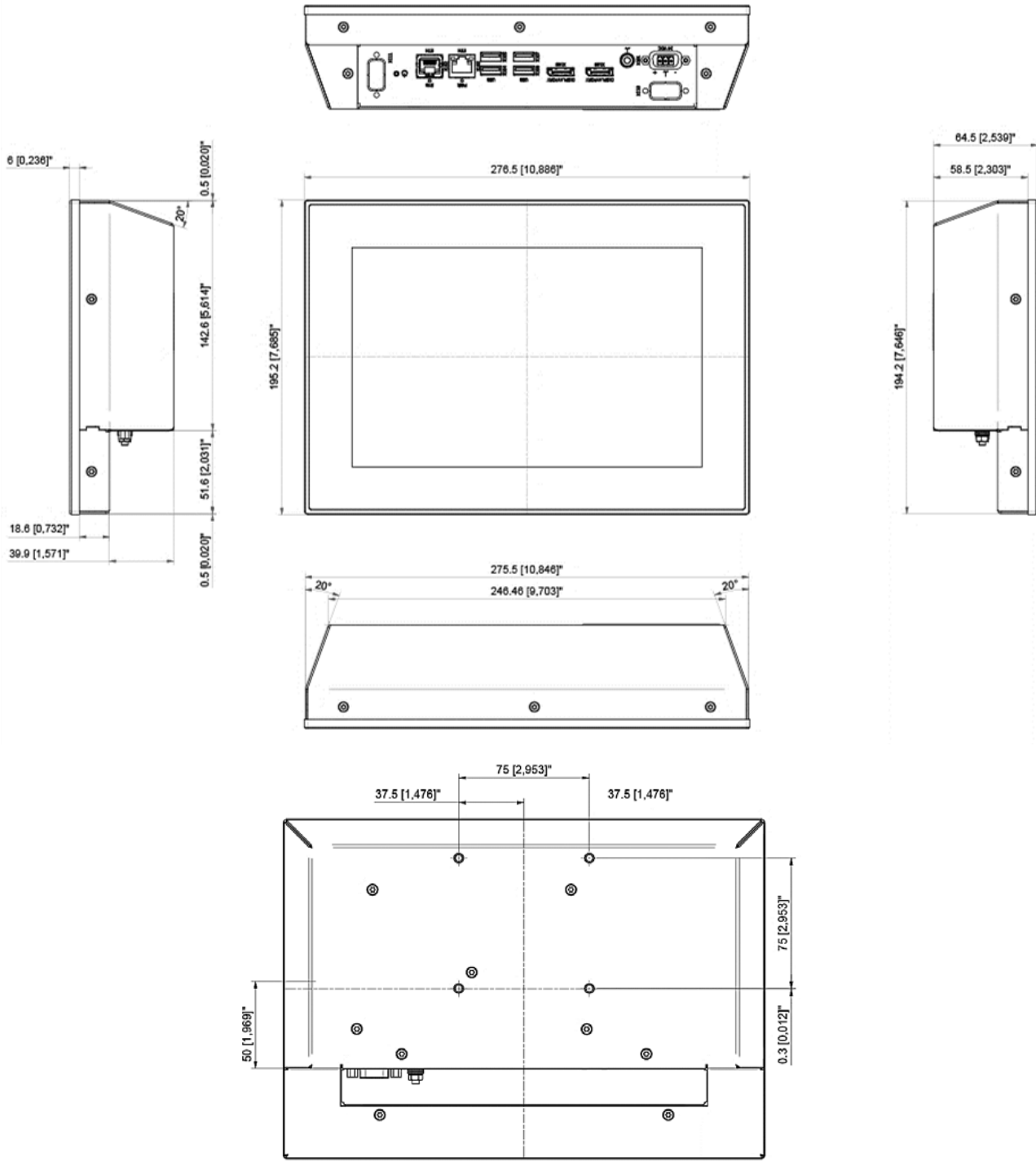
For the product's Mechanical drawings and 3D Files, visit <u>Kontron's Customer Section</u>.

8.3. 12.1" Panel Mount

Dimensions	Panel Cutout Horizonal	Panel Cutout Vertical	Height for Mounting Brackets (max.)
12.1" Display	303 mm [11.929"]	215.5 mm [8.484"]	5.00 mm [0.197"]

8.4. 12.1" VESA

For the product's Mechanical drawings and 3D Files, visit Kontron's Customer Section.

8.5. 15.6" Panel Mount

Dimensions	Panel Cutout Horizonal	Panel Cutout Vertical	Height for Mounting Brackets (max.)
15.6" Panel	389 mm [15.315"]	250 mm [9.843"]	10.75 mm [0.423"]

8.6. 15.6 VESA

For the product's Mechanical drawings and 3D Files, visit Kontron's Customer Section.

8.7. 18.5" Panel Mount

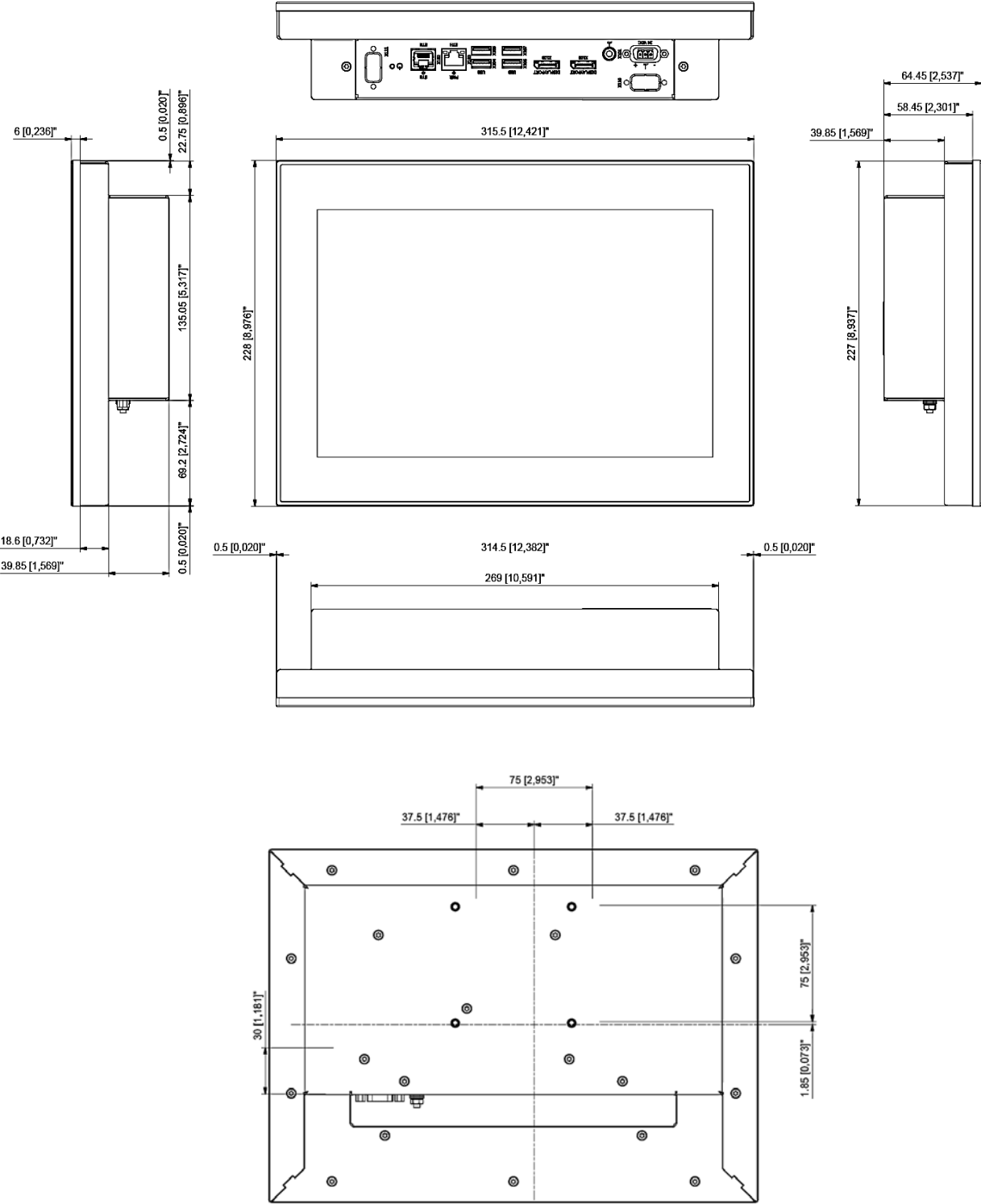| Dimensions	Panel Cutout Horizonal	Panel Cutout Vertical	Height for Mounting Brackets (max.)
18.5" Display	455.3 mm [17.925"]	289 mm [11.378"]	10.75 mm [0.423"]

8.8. 18.5" VESA
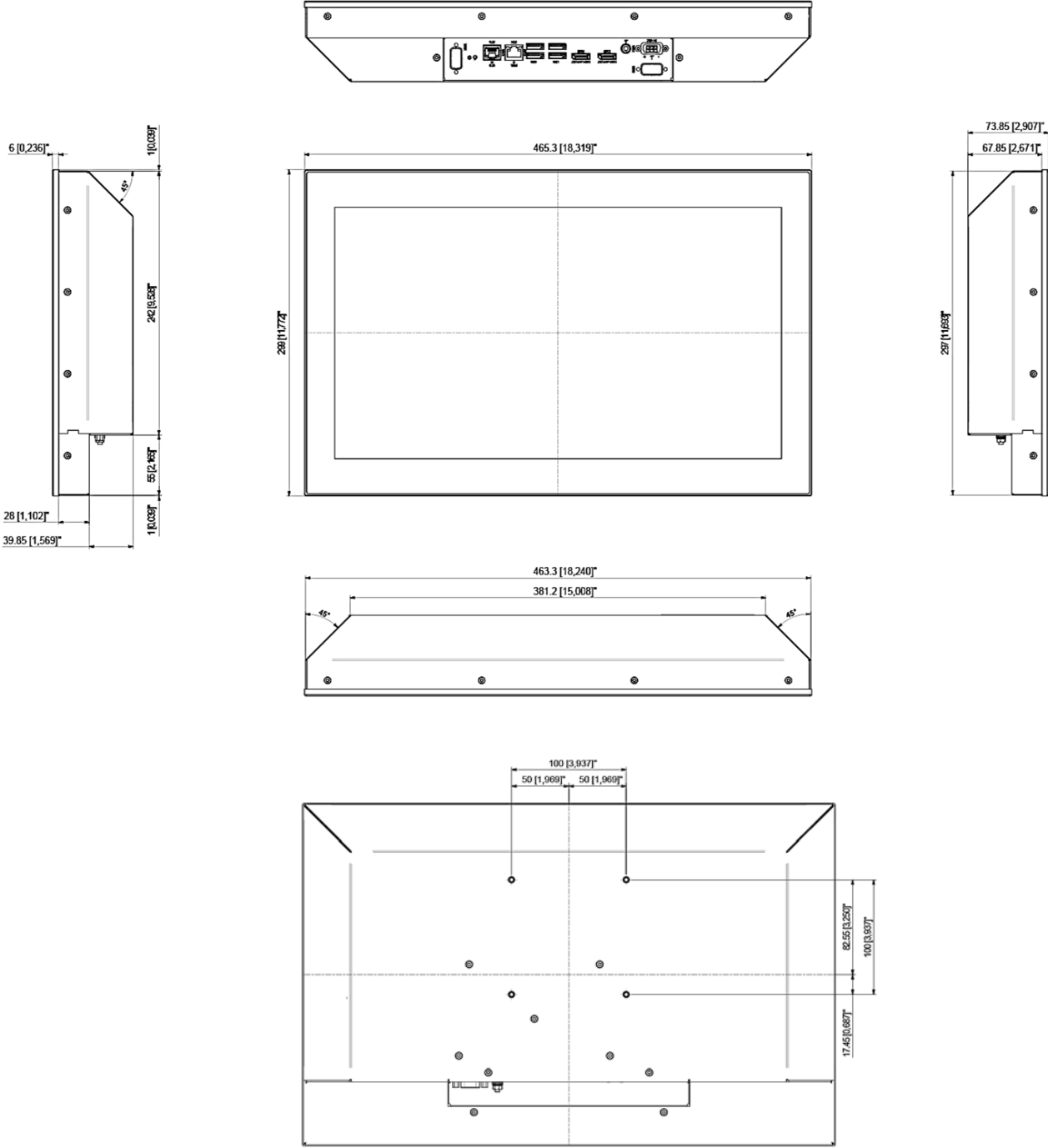
For the product's Mechanical drawings and 3D Files, visit Kontron's Customer Section.
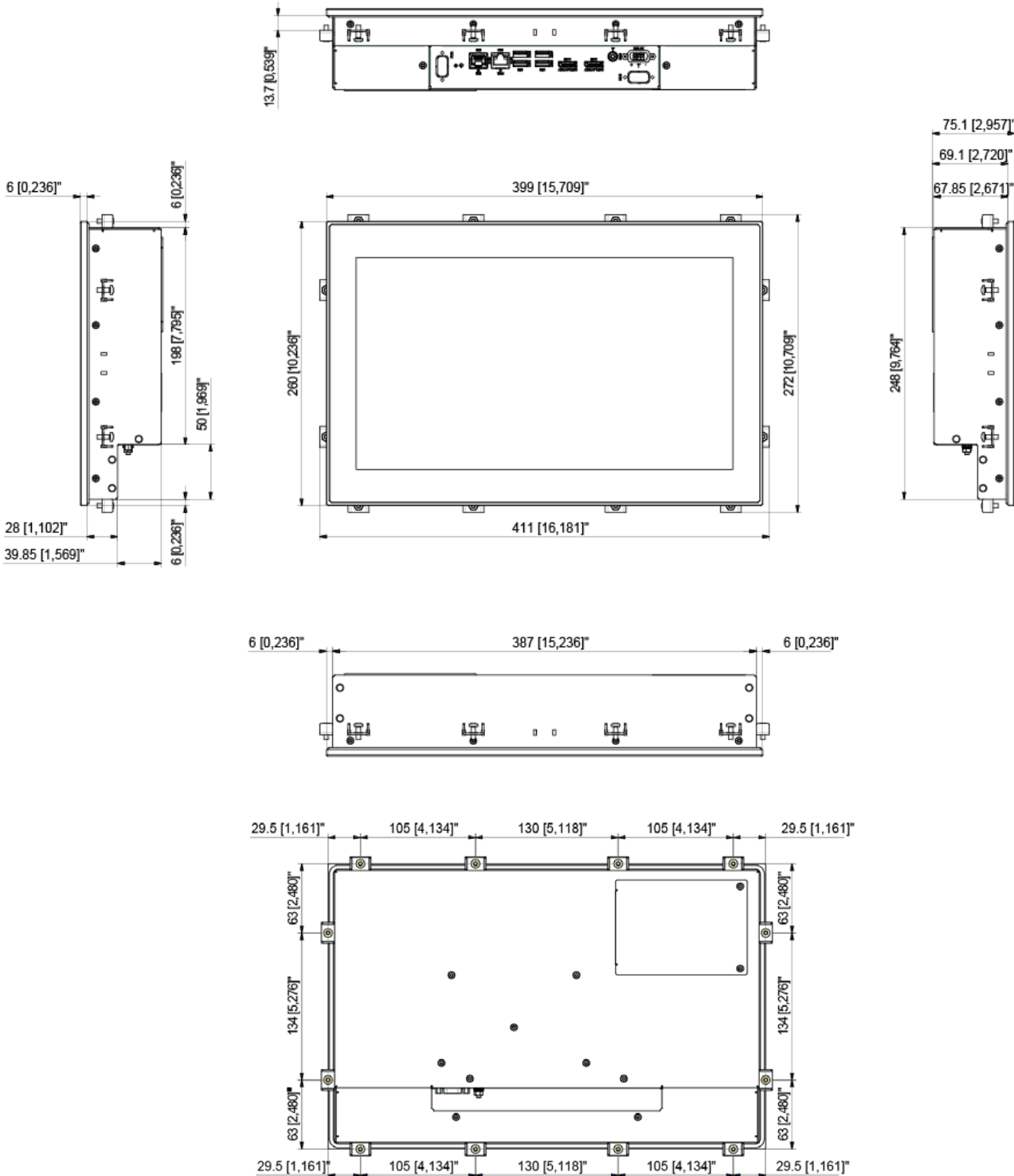
8.9. 21.5" Panel Mount

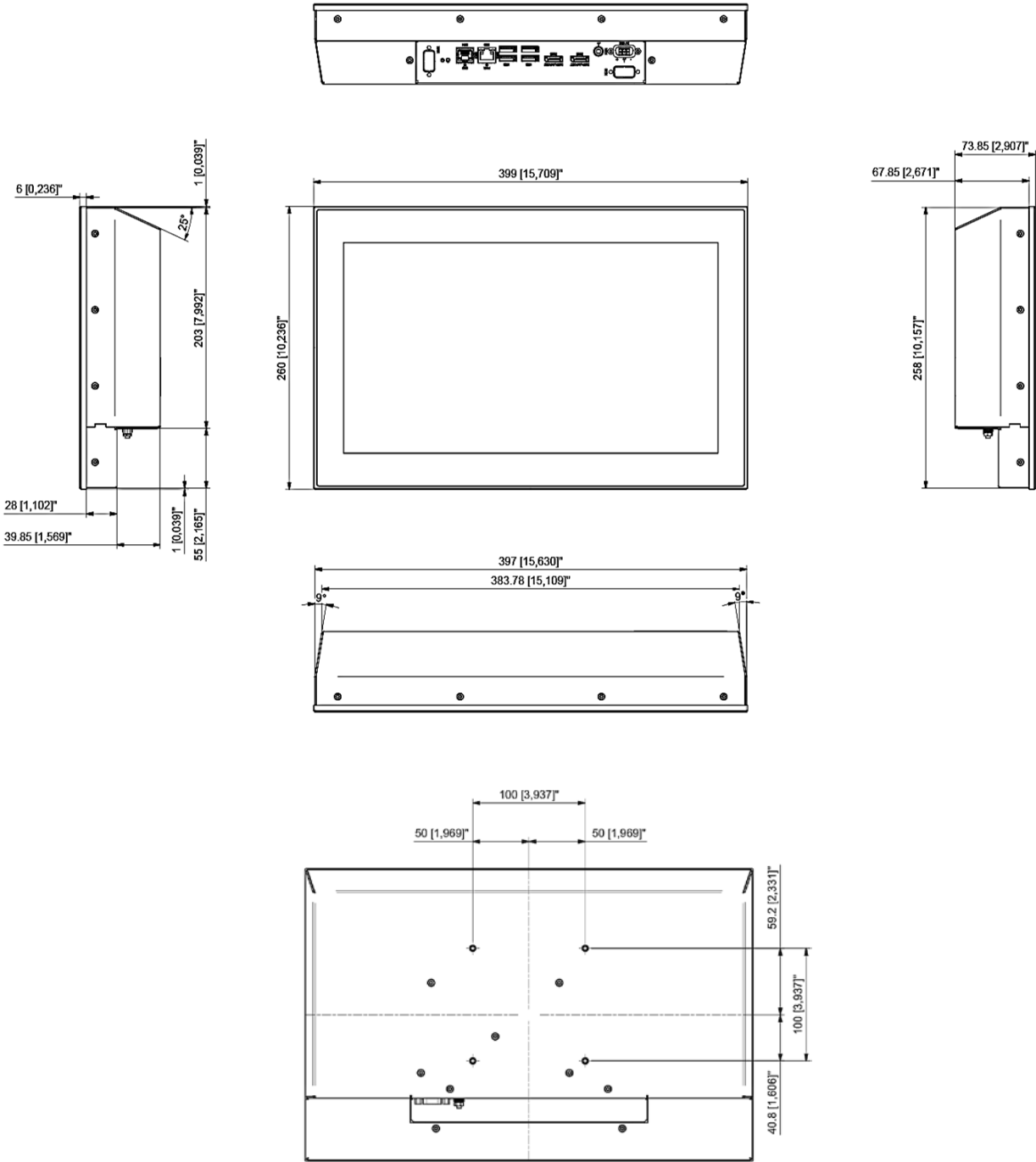| Dimensions	Panel Cutout Horizonal	Panel Cutout Vertical	Height for Mounting Brackets (max.)
21.5" Display	522.5 mm [20.571"]	328.5 mm [12.933"]	10.75 mm [0.423"]

8.10. 21.5" VESA
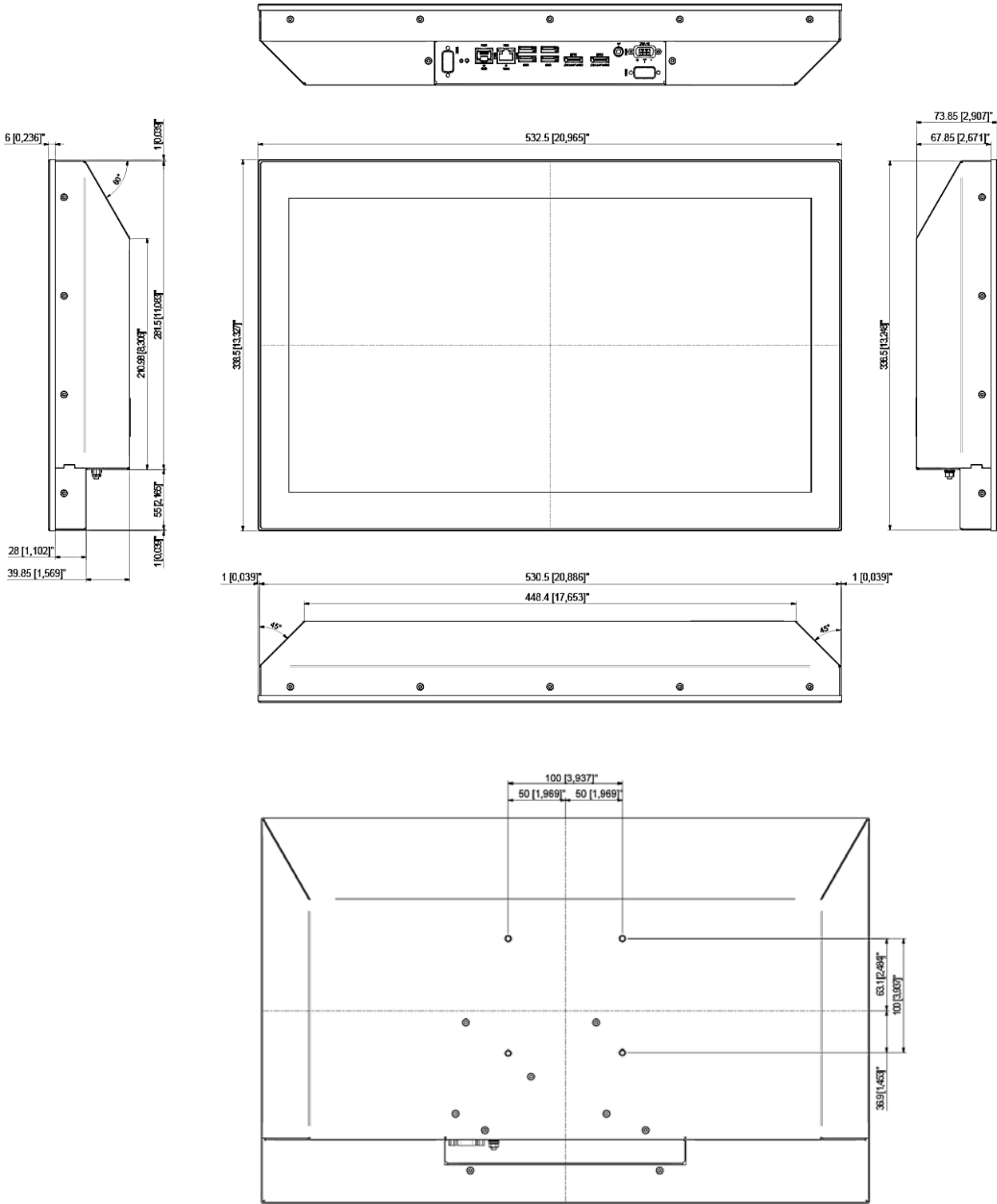
For the product's Mechanical drawings and 3D Files, visit Kontron's Customer Section.

8.11. 23.8" Panel Mount

Dimensions	Panel Cutout Horizonal	Panel Cutout Vertical	Height for Mounting Brackets (max.)
23.8" Display	565.1 mm [22.248"]	353.9 mm [13.933"]	10.75 mm [0.423"]

8.12. 23.8" VESA
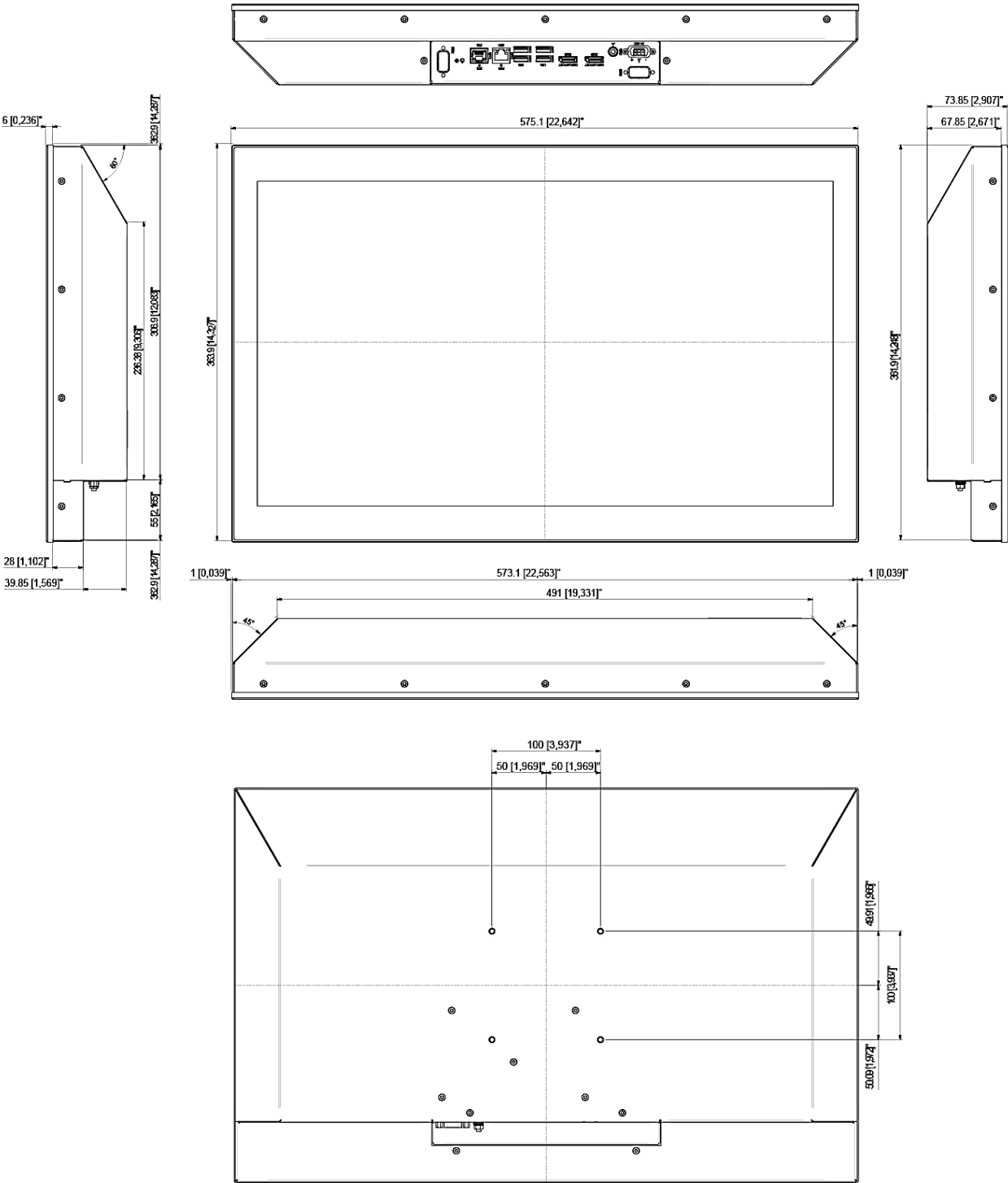
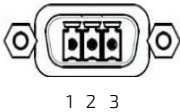For the product's Mechanical drawings and 3D Files, visit Kontron's Customer Section.

9/ Connector Pin Assignments

9.1. Input Power Connector (X101)

The Input Power connector connects to an external power supply delivering the specified inputs voltage (12 VDC to 30 VDC), using the supplied mating power connector (PSC 1.5/ 3-F) and the corresponding wiring.
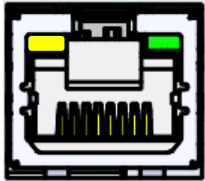
Table 14: Input Power Connector Pin Assignment

3-Pin Phoenix PSC 1.5/3-M	Pin	Signal Name/ Description
	1	GND (–)
	2	Connected to system chassis (electrical connected to functional earth bolt)
1 2 3	3	VCC (+)

9.2. Ethernet Connectors (X102, X103)

The two Ethernet ports have two LEDs indicating speed and activity.

Table 15: 2.5Gbe LAN Connector Pin Assignment (X102)

RJ45 (female) X102	Pin	Signal Name	Left LED: Activity		Right LED: Speed	
	1	TX1+	Off	Link down	Off	10/100 Mbit/s
	2	TX1–				
	3	TX 2+	Yellow Flashing	Link up and active	Orange	1000 Mbit/s
	4	TX 3+				
	5	TX 3–	Yellow	Link up and no activity	Green	2.5 Gbit/s
	6	TX 2–				
	7	TX 4+				
	8	TX 4–				

Signal	Description
TX1+ / TX1–	In MDI mode, this is the first pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DA+/– pair, and is the transmit pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DB+/– pair, and is the receive pair in 10Base-T and 100Base-TX.
TX2+ / TX2–	In MDI mode, this is the second pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DB+/– pair, and is the receive pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DA+/– pair, and is the transmit pair in 10Base-T and 100Base-TX.
TX3+ / TX3–	In MDI mode, this is the third pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DC+/– pair. In MDI crossover mode, this pair acts as the BI_DD+/– pair.
TX4+ / TX4–	In MDI mode, this is the fourth pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DD+/– pair.In MDI crossover mode, this pair acts as the BI_DC+/– pair.

To achieve the specified performance of the Ethernet port, Category 5 twisted pair cables must be used with 10/100 MByte and Category 5E, 6 or 6E with 1 Gbit/2.5Gbit LAN networks.

The orientation of the two Ethernet connector LEDs differs from top to bottom depending on the Ethernet connectors X103 and X102.

Table 16: GbE LAN Connector Pin Assignment (X103)

RJ45 (female) X102	Pin	Signal Name		Left LED: Speed		Right LED: Activity	
	1	TX1+		Off	10 Mbit/s	Off	Link down
	2	TX1-					
	3	TX 2+		Green	100 Mbit/s	Yellow Flashing	Link up and active
	4	TX 3+					
	5	TX 3-		Orange	1000 Mbit/s	Yellow	Link up and no activity
	6	TX 2-					
	7	TX 4+					
	8	TX 4-					

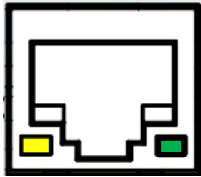| Signal	Description
TX1+ / TX1-	In MDI mode, this is the first pair in 1000Base-T, i.e. the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX.
TX2+ / TX2-	In MDI mode, this is the second pair in 1000Base-T, i.e. the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX.
TX3+ / TX3-	In MDI mode, this is the third pair in 1000Base-T, i.e. the BI_DC+/- pair. In MDI crossover mode, this pair acts as the BI_DD+/- pair.
TX4+ / TX4-	In MDI mode, this is the fourth pair in 1000Base-T, i.e. the BI_DD+/- pair. In MDI crossover mode, this pair acts as the BI_DC+/- pair.

> To achieve the specified performance of the Ethernet port, Category 5 twisted pair cables must be used with 10/100 MByte and Category 5E, 6 or 6E with 1 Gbit/2.5Gbit LAN networks.
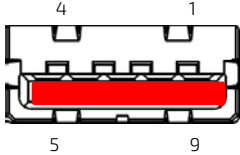
> The orientation of the two Ethernet connector LEDs differs from top to bottom depending on the Ethernet connectors X103 and X102.

9.3. USB 3.2 Connectors (X104, X105, X106, X107)

The four USB ports connectors support USB 3.2 Gen 2 compatible devices.

Table 17: USB 3.2 Gen 2 Type A Pin Assignment (X104, X105, X106, X107)

USB 3.2 Type A	Pin	Signal Name	Description
	1	+USB_VCC	+5 V power supply for USB device
	2	USB_D-	USB 2.0 differential pair (-)
	3	USB_D+	USB 2.0 differential pair (+)
	4	GND	Ground
	5	USB_RX-	USB 3.2 receiver differential pair (-)
	6	USB_RX+	USB 3.2 receiver differential pair (+)
	7	GND	Ground
	8	USB_TX-	USB 3.2 transmitter differential pair (-)
	9	USB_TX+	USB 3.2 transmitter differential pair (+)

| | For USB 3.2 Gen 2 cabling, use only HiSpeed USB cable specified in the USB 3.2 Gen 2 standard. |

| | USB 3.2 Gen 2 ports are backwards compatible with USB 2.0. |
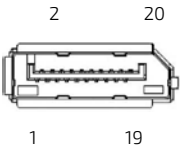
9.4. Display Port Connectors (X108, X109)

The two Display Port (DP) connectors are standard DP ports.

Table 18: Display Port Pin Assignment (X108, X109)

20-pin DP (female)	Pin	Signal Name	Description	Pin	Signal Name	Description
	1	TX0+	Tx Lane 0 differential pair (+)	11	GND	Ground
	2	GND	Ground	12	TX3–	Tx Lane 3 differential pair (-)
	3	TX0–	Tx Lane 0 differential pair (-)	13	GND	Ground
	4	TX1+	Tx Lane 1 differential pair (+)	14	GND	Ground
	5	GND	Ground	15	AUX+	Aux. channel differential pair (+)
	6	TX1–	Tx Lane 1 differential pair (-)	16	GND	Ground
	7	TX2+	Tx Lane 2 differential pair (+)	17	AUX–	Aux. channel differential pair (-)
	8	GND	Ground	18	HPD	Hot Plug Detect
	9	TX2–	Tx Lane 2 differential pair (-)	19	GND	Ground
	10	TX3+	Tx Lane 3 differential pair (+)	20	PWR	Power for connector

9.5. Power Button

The power button switches on and switches off the product. A short press on the button creates a soft power off and the operating system is shutdown. Pressing the power button for more than 4 seconds creates a hard power off.

9.6. Indicator LEDs (PWR, STAT)

The PWR and STAT LEDs indicate the status of the product's power and state.

Table 19: Indicator LEDs (PWR, STAT) Description

STAT LED (green)	PWR LED (yellow)	Description
On	On	S0 (Full On)
Blinking	On	S3 (Suspend-to-RAM)
Off	On	S4 (Suspend-to-Disk)
Off	On	S5 (Soft Off)
Off	Off	G3 (Mechanical Off)

9.7. Breakout Panel (X110 and X111)

The pinouts for the breakout panel's options are described in this chapter.
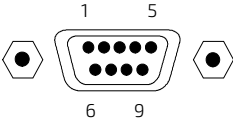
9.7.1. Serial Port Connector (option)

The serial port option is factory installed with up to two RS232, RS422 or RS485 (full and half duplex) serial ports.

Table 20: Serial Port Pin Assignment

9-pin D-SUB (male)	Pin	RS232	RS422	RS485 (Half Duplex)	RS485 (Full Duplex)
	1	DCD	Tx-	Data-	Tx-
	2	DSR			
	3	RxD	Tx+	Data+	Tx+
1 5	4	RTS			
	5	TxD	Rx+		RX+
	6	CTS			
6 9	7	DTR	RX-		Rx-
	8	RI			
	9	GND	GND	GND	GND
	10	+5V	+5V	+5V	+5V

Signal Name	Description
DCD	Data Carrier Detect
TXD	Transmitted Data sends data to the communications link. The signal is set to the marking state (-12 V) on hardware reset when the transmitter is empty or when loop mode operation is initiated.
RXD	Received Data, receives data from the communications link.
DTR	Data Terminal Ready indicates that the on-board UART is ready to establish communication link.
DSR	Data Set Ready, indicates that the modem etc. is ready to establish a communications link.
RTS	Request To Send, indicates to the modem etc. that the on-board UART is ready to
RI	Ring Indicator, indicates that the modem has received a ringing signal from the telephone line.
TX+/-	Transmitted Data differential pair sends data to the communications link.
RX+/-	Received Data differential pair receives data from the communications link.
GND	Power supply GND signal
+5V	5V Power supply signal

9.7.2. Audio Line-out Connector (option)

The audio line-out option is factory installed for use with a 3.5 mm audio jack to enable the connection of external speakers, headphones, or other output devices.

10/ Installation

Before installing the FlatClient PRO TGL in the operating environment, ensure that the operating environment meets the specification stated within this user guide, and that there is sufficient access to the Input Power connector (X101).

The product is designed for vertical operation (+/-25°), and intended for indoor use only without exposure to direct sunlight (UV radiation).

⚠CAUTION	Do Not Mount Alone
	Due to the weight of the product, mounting alone may result in product damage or personal injury.

NOTICE	To ensure proper operation:
	• Mount the product in the vertical position +-25°
	• Observe a suitable clearance distance all around the product
	• Provide sufficient ventilation
	• Ensure no other devices heat up the product

NOTICE	The product is intended for indoor use only. To avoid product damage do not use in a sheltered outdoor, outdoor or sunlit environment.
	Observe that the product is not exposed to direct sunlight (UV radiation):
	• Prolonged exposure shortens field life and voids the warranty
	• Short exposure may lead to higher temperatures inside the product and cause permanent damage
	• Direct exposure accelerates long-term aging
	For intend use in an outdoor environment or a sunlit environment, contact your Kontron sales representative.

NOTICE	Handle with care to avoid damage to the front display screen.

10.1. Mounting Instructions - Panel Mount

To mount the FlatClient (panel mount) in a panel, follow the steps below:

1. Create the cutout required to mount in the panel by referring to the panel cutout dimensions for the corresponding display size in Chapter 8/ Mechanical Specification.

2. Make sure the panels mounting surface is clean, smooth and meets the thickness requirements of 3 mm to 7 mm.

3. Use all the clamping bracket and M4x12 Torx (DIN 7985 - ISO 7045) screws provided in the delivered Mounting Set as shown in Figure 10: Mounting Set with Clamping Brackets and Screws. The number of clamping brackets and screws depends on the display size.

Figure 10: Mounting Set with Clamping Brackets and Screws

4. Insert the screw into the clamping bracket as shown in Figure 11: Clamping Bracket with Screw.

Figure 11: Clamping Bracket with Screw

5. Insert the clamping bracket in the housing, as shown in Figure 12: Clamping Bracket Insertion.

Figure 12: Clamping Bracket Insertion

6. Fasten the screw, to mount as shown in Figure 13: Fastening the Clamping Bracket. The recommended tightening torque is 0,8Nm +-0,2Nm. Use the correct screwdriver to fasten the M4x12 Torx screws.

NOTICE	Do not use force when fastening the screw. Too much force may cause damage. The recommended torque to fasten the screws is 0,8Nm +-0,2Nm.

Figure 13: Fastening the Clamping Bracket

7. Repeat step 4 for all delivered clamping brackets, as shown in Figure 14: Clamping Bracket Positions.

Figure 14: Clamping Bracket Positions
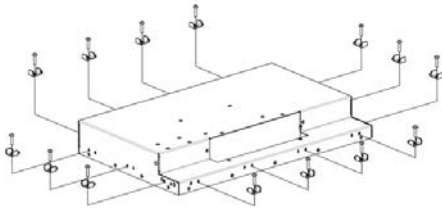
⚠ CAUTION	Verify Secure Mounting: • Always use all the clamping brackets and screws in the delivered Mounting Set • Mount on a mounting surface 3 mm to 7 mm thick

10.2. Mounting Instructions - VESA

To mount the FlatClient (VESA), follow the steps below:

1. Selecting a VESA mounting bracket that corresponds to the VESA requirement VESA (75 mm or 100 mm).

2. Mount using all four threaded openings and M4 screws that are long enough to secure the product. The required screw length depends on the VESA bracket's thickness. However to avoid damaging the product, do not use screws longer than 8 mm.

NOTICE	Mount using all four threaded holes with screws long enough to secure the product. Do not use screws longer than 8 mm.

11/ Starting Up

Before connecting the FlatClient PRO TGL to an external DC power supply, observe the General Safety Instructions within this user guide and the instructions within this chapter, and ensure that the power supply complies with the product's electrical specification, on the Type Label.

The product boots automatically when connected to power and restarts automatically when power returns after an interruption.

⚠CAUTION	Do not switch on or handle the product if there is any visible damage.

⚠CAUTION	Only connect the product to an external power supply providing the voltage type (AC or DC) and the input power (max. current) specified on the Kontron Product Label. The external power supply must meet the requirements of ES1/PS2 according to IEC/UL 62368-1. Connectez le produit uniquement à une alimentation externe fournissant le type de tension (AC ou DC) et la puissance d'entrée (courant max.) spécifiés sur l'étiquette du produit Kontron. L'alimentation externe doit répondre aux exigences de ES1/PS2 selon IEC/UL 62368-1.

⚠CAUTION	Switching off the product by the power button does not disconnect the product from the mains. Complete disconnection is only possible if the power cable is removed from the wall plug or from the product. Ensure that there is free and easy access to enable disconnection.

NOTICE	To protect the product and any connected peripherals, make sure that the power cables have the right diameter to withstand the maximum available current.

NOTICE	Support the power and I/O cables to minimize the strain on the connectors.

NOTICE	The last cable to be connected must always be the power cable.

i	For essential drivers, visit Kontron's Customer Section website.

11.1.1. Connecting to a Power Supply/Switching On

To connect the FlatClient to the Kontron AC/DC power supply with mating power connector, perform the following:

1. Connect the power supply to the Input Power connector (Figure 6, pos. 1) using the Phoenix connector. Pay attention to the polarity of the connections

2. Connect the power cord to the mains power source.

3. The product boots automatically when initially connected to power and the power LED illuminates yellow.

To connect the FlatClient to an external 12 VDC to 30 VDC power supply, perform the following

1. Wire the mating power connector with an appropriate wired power cabled as described in Chapter 11.1.2: Wiring the Mating Power Connector.

2. Switch off the external DC power supply via a disconnecting device (fuse/circuit breaker), to ensure that no power flows during the connection procedure.

3. Connect the wired mating power connector to the Input Power connector on the rear panel (Figure 6, pos. 1). Pay attention to the polarity of the connections.

4. Connect the other end of the wired mating power connector cable to the external power supply and switch on the external power supply.

5. The product boots automatically when initially connected to power and the power LED illuminates yellow.

| **NOTICE** | Mark the supply wires (+/-) clearly to ensure a safe connection from the power connector to the DC power supply. |

11.1.2. Wiring the Mating Power Connector

Figure 15: Mating Power Connector
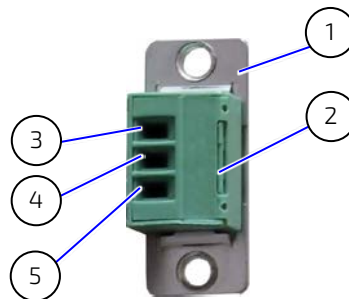
1	3-pin mating power connector	3	Clamp for 0 VDC wire
2	Cover over the slotted pan head screws	4	Clamp for earth wire
		5	Clamp for +24 VDC wire

To wire the supplied mating power connector, perform the following:

1. Cut three (1 mm²) AWG18 isolated wires to the required length and strip each end 5 mm – 7 mm.

2. Twist the striped wire-ends and provide them with ferrules.

3. Access the slotted pan head screws by opening the mating power connector's cover (Figure 15, pos. 2).

4. Loosen the slotted pan head screws far enough so that you can insert the end of the prepared wires.

5. Insert the wires into the corresponding clamp of the mating power connector. Pay attention to the polarity of the connections.

6. Fasten the screws to secure the wires into the mating power connector's clamps.

7. Close the mating power connector's cover (Figure 15, pos. 2).

| **NOTICE** | Mark the supply wires (+/-) clearly to ensure a safe connection from the power connector to the DC power supply. |

11.1.3. Switching On/Off

Once connected to power, the product may be switched on and switched off using the power button on the rear panel. Switching Off using the power button performing an orderly system shutdown but does not fully disconnect the product from the mains power source. To ensure the product is fully disconnected, remove the power cable from either the product's Input power connector (X101) or the mains power supply.

⚠CAUTION	Switching off the product by the power button does not disconnect the product from the mains power source. Complete disconnection is only possible if the power cable is removed from the wall plug or from the product. Ensure that there is free and easy access to enable

NOTICE	Do not disconnect the power while the product is operating. This performs a forced shutdown and can lead to loss of data. To shutdown properly without data loss, switch off using the power button.

12/ Maintenance

The FlatClient contains no user serviceable parts and must be return to Kontron for maintenance or repair. To return the product, see Chapter 13.1: Returning Defective Merchandise.

> **i** The product contains no customer serviceable parts. If problems of a technical nature occur, contact <u>Kontron Support</u> or return for repair.

12.1. Changing the Lithium Battery

To replace the lithium battery (BR2032/CR2032 with cable), return the FlatClient to Kontron, see Chapter 13.1: Returning Defective Merchandise.

> **i** The product contains no customer serviceable parts. If problems of a technical nature occur, contact <u>Kontron Support</u> or return for repair.

12.2. Cleaning the Front

Before cleaning the front, read the instructions within this chapter.

> **NOTICE** Penetration of liquids
> The display (cover glass and frame) is rated with the IP65 protection class and may be cleaned with a liquid cleaner.

> **NOTICE** When cleaning the display, do not apply any pressure or use an abrasive substance/cloth that might scratch or damage the display's surface.

When cleaning the front:

▶ Use a clean soft microfiber cloth.

▶ Use a commercially available glass cleaner or Ethanol Alcohol.

▶ Gently wipe the display with a cloth dampened with the glass cleaner.

▶ Do not press on the display when cleaning.

12.3. Cleaning the Rear Panel

Before cleaning the surface of the rear panel, read the instructions within this chapter.

> **NOTICE** Avoid penetration of liquids!
> The rear panel with connector panel is rated with the IP20 protection class; and may be damaged if liquids enter through openings. Do not pour or spray any liquid directly onto the rear panel.

> **NOTICE** Do not use a chemical substance on the rear panel, this may damage the lettering and varnish finish.

	Caution: Hot Surface
	The heatsink and/or the entire rear panel surface can get very hot. To avoid burns and personal injury when handling the heatsink or rear panel surface:

- Do not touch while in operation
- Allow to cool before handling
- Wear protective gloves

Attention : Surface chaude

Le dissipateur thermique et/ou toute la surface du panneau arrière peuvent devenir très chauds. Pour éviter les brûlures et les blessures lors de la manipulation du dissipateur thermique ou de la surface du panneau arrière :

- Ne pas toucher pendant le fonctionnement
- Laisser refroidir avant la manipulation
- Portez des gants de protection

When cleaning the rear panel:

▶ Ensure the product is not in operation and has cooled sufficiently.

▶ Use a clean soft microfiber cloth.

▶ Use warm soapy water only.

▶ Do not use a chemical substance when cleaning the rear panel, this may damage the lettering and varnish finish.

▶ Gently wipe the rear panel with a cloth dampened with warm soapy water.

▶ Do not pour or spray any liquid directly onto the rear panel.

13/   Technical Support

For technical support contact our Support Department:

▶ E-mail: support@kontron.com
▶ Phone: +49-821-4086-888

Make sure you have the following information available when you call:

▶ Product ID Number (PN),
▶ Serial Number (SN)

> The serial number can be found on the Type Label, located on the product's rear panel.

Be ready to explain the nature of your problem to the service technician.

13.1. Returning Defective Merchandise

All equipment returned to Kontron must have a Return of Material Authorization (RMA) number assigned exclusively by Kontron. Kontron cannot be held responsible for any loss or damage caused to the equipment received without an RMA number. The buyer accepts responsibility for all freight charges for the return of goods to Kontron's designated facility. Kontron will pay the return freight charges back to the buyer's location in the event that the equipment is repaired or replaced within the stipulated warranty period. Follow these steps before returning any product to Kontron.

1. Visit the RMA Information website: https://www.kontron.com/en/support/rma-information

2. Download the RMA Request sheet for **Kontron Europe GmbH** and fill out the form. Take care to include a short detailed description of the observed problem or failure and to include the product identification Information (Name of product, Product number and Serial number). If a delivery includes more than one product, fill out the above information in the RMA Request form for each product.

3. Send the completed RMA-Request form to the fax or email address given below at Kontron Europe GmbH. Kontron will provide an RMA-Number.

    Kontron Europe GmbH
    RMA Support
    Phone: +49 (0) 821 4086-0
    Fax: +49 (0) 821 4086 111
    Email: service@kontron.com

4. The goods for repair must be packed properly for shipping, considering shock and ESD protection.

> Goods returned to Kontron Europe GmbH in non-proper packaging will be considered as customer caused faults and cannot be accepted as warranty repairs.

5. Include the RMA-Number with the shipping paperwork and send the product to the delivery address provided in the RMA form or received from Kontron RMA Support.

14/   Storage and Transportation

14.1. Storage

If the product is not in use for an extended period time, disconnect the power plug from the power supply. If it is necessary to store the product then re-pack the product as originally delivered to avoid damage. The storage facility must meet the products environmental storage requirements as stated within this user guide. Kontron recommends keeping the original packaging material for future storage or warranty shipments.

14.2. Transportation

To ship the product use the original packaging, designed to withstand impact and adequately protect the product. When packing or unpacking products always take shock and ESD protection into consideration and use an EOS/ESD safe working area.

15/ Warranty

Due to their limited service life, parts that by their nature are subject to a particularly high degree of wear (wearing parts) are excluded from the warranty beyond that provided by law. This applies to the lithium battery, for example.

> **If there is a protection label on your product, then the warranty is lost if the product is opened.**

Appendix: List of Acronyms

AC	Alternating Current
CE	Conformitè Europëenne
COM	Communication port
DC	Direct Current
EMC	ElectroMagnetic compatibility
ESD	ElectroStatic Discharge
FCC	Federal Communications Commission
GbE	Giga Bit Ethernet
HD	High Definition
HDMI	High Definition Multimedia Interface
IOT	Internet of Things
LED	Light Emitting Diode
LPC	Limited Power Source
MDI	Media Dependent Interface
MTBF	Mean Time Before Failure
PS	Power Source
RMA	Return of Material Authorization
RoHS	Restriction of Hazardous Substances
RTC	Real Time Clock
SD card	Secure Digital Card
SVGA	Super Video Graphics Array
TFT	Thin-Film Transistors
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
UL	Underwriters Laboratories
USB	Universal Serial Bus
UV	Ultra Violet
VESA	Video Electronics Standards Association
VGA	Video Graphics Array
WXGA	Wide Extended Graphics Array
XGA	Extended Graphics Array

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About Kontron

Kontron is a global leader in Embedded Computing Technology (ECT). Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall.

For more information, please visit: http://www.kontron.com/

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