USER GUIDE

FlatClient MAR

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FLATCLIENT MAR - USER GUIDE

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⚠CAUTION Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled. Please follow the “General Safety Instructions” supplied with the system.

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

Revision History

Revision	Brief Description of Changes	Date of Issue	Author
1.0	Initial Issue	2020-Sept-30	hjs
1.1	Whiskey Lake processor in Table 3 removed, "General Safety Instructions for Electronic Devices" updated	2020-Oct-07	hjs
1.2	UL content for General Safety Instructions, Notice "Sunlit environment" inserted, french Caution remark für Lithium batteries, modified Current rates in Table 6 and Table 7, corrected connector input in chapter 6.1.1	2020-Nov-24	hjs
1.3	New title photo, Word2016 issues, Notice Online "General Safety Instructions" added	2021-Mar-15	hjs
1.4	Modfications in chapter 8.1: brightness is set to 200 cd/m² and additional hint for Customer-Section	2021-Mar-31	hjs
1.5	Removed Ubunto and added new logo	2023-Sept-06	CW

Terms and Conditions

Kontron warrants products in accordance with defined regional warranty periods. For more information about warranty compliance and conformity, and the warranty period in your region, visit http://www.kontron.com/terms-and-conditions.

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For contact information, refer to the corporate offices contact information on the last page of this user guide or visit our website CONTACT US.

Customer Support

Find Kontron contacts by visiting: https://www.kontron.de/support-and-services.

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.

For more details on Kontron's service offerings such as: enhanced repair services, extended warranty, Kontron training academy, and more visit http://www.kontron.com/support-and-services/services.

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.
	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.
	HOT Surface! Do NOT touch! Allow to cool before servicing.
	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.
	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.

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 battery.

⚠CAUTION

Danger of explosion if the battery is replaced incorrectly.

- **Replace only with same or equivalent battery type recommended by the manufacturer.**
- **Dispose of used batteries according to the manufacturer's instructions.**

⚠CAUTION

Danger d'explosion si la batterie est mal remplacée.

- **Remplacer uniquement par une pile de type identique ou équivalent recommandée par le fabricant.**
- **Éliminez les piles usagées conformément aux instructions du fabricant.**

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.

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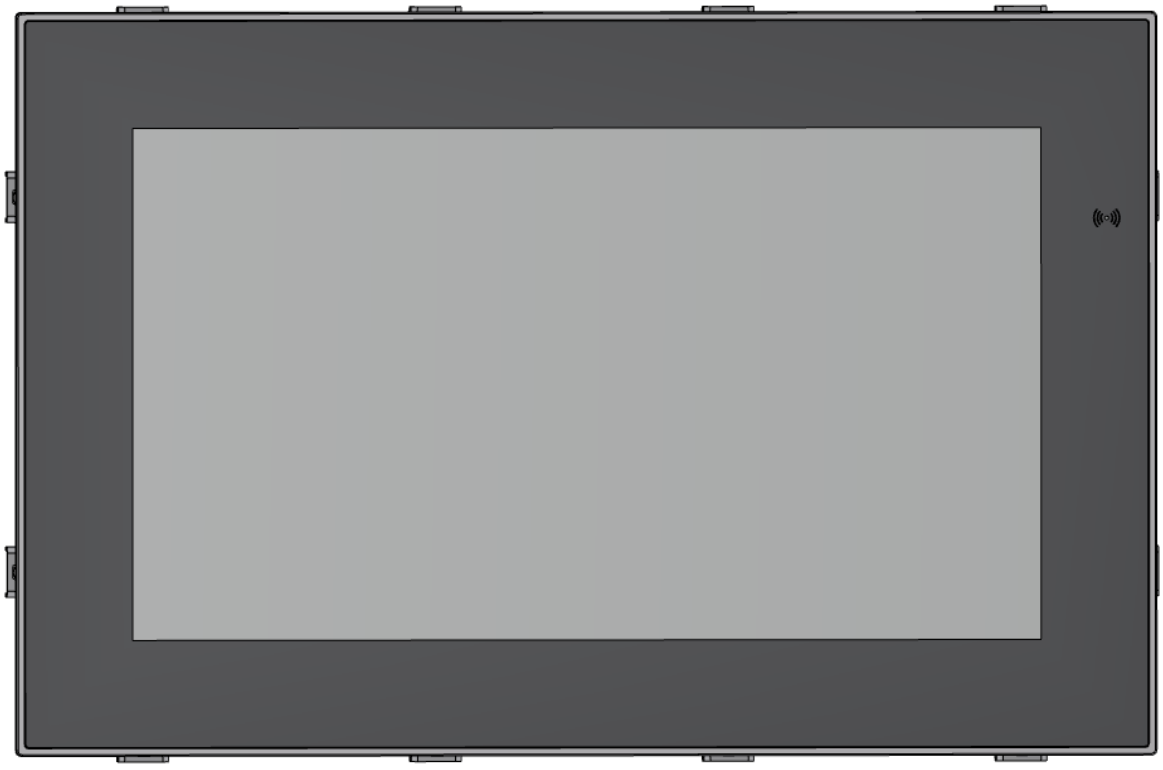
1/ Introduction

The FlatClient MAR systems are based on the design of the standard industrial FlatClient series. The FlatClient MAR is extended and improved, e.g. power supply and backlight control, to fit maritime environment.

The system is service-friendly for the user and is designed for a long life.

Figure 1: FlatClient MAR 15.6"



2/ General Safety Instructions for Electronic Devices

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.

2.1. General Safety Instructions

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 system close to heat sources or damp places. Make sure the system is well ventilated.
- Only devices or parts which fulfill the requirements of ES1/SELV circuits (Safety Extra Low Voltage) as stipulated by IEC 62368-1 may be connected to the available interfaces.
- Before opening the device, make sure that the device is disconnected from the mains.
- Switching off the device 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 device. Ensure that there is free and easy access to enable disconnection.
- The device may only be opened for the insertion or removal of add-on cards (depending on the configuration of the system). 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 system 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 device has visible damages or
  - the device is no longer functioning
    In this case the device must be switched off and it must be ensured that the device 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 battery is replaced incorrectly (short-circuited, reverse-poled, wrong battery type). Dispose of used batteries according to the manufacturer's instructions.
- The ext. supply has to meet the criteria for LPS (UL/IEC 60950-1) or PS2 (UL/IEC 62368-1).

Additional Safety Instructions for DC Power Supply Circuits (Non-ES1/SELV)

- To guarantee safe operation, please observe that:
  - no cables or parts without insulation in electrical circuits with dangerous voltage or power should be touched directly or indirectly
  - a reliable protective earthing connection is provided

- a suitable, easily accessible disconnecting device is used in the application (e.g. overcurrent protective device), if the device itself is not disconnect able
- a disconnect device, if provided in or as part of the equipment, shall disconnect both poles simultaneously
- interconnecting power circuits of different devices 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.
- The devices do not generally fulfill the requirements for “centralized DC power systems” (UL 62368-1, Annex DVD) and therefore may not be connected to such devices!

2.2. UL Canada: Instructions générales de sécurité pour les appareils électroniques

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 laissé 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 tapis filtrant est fourni, celui-ci doit être nettoyé régulièrement. Ne placez pas le système à proximité de sources de chaleur ou d'endroits humides. Veillez à ce que le système soit bien ventilé.
- Seuls les dispositifs ou pièces qui répondent aux exigences des circuits ES1/SELV (Safety Extra Low Voltage) comme stipulé par la norme CEI 62368-1 peuvent être connectés aux interfaces disponibles.
- Avant d'ouvrir l'appareil, assurez-vous qu'il est débranché du secteur.
- Le fait d'éteindre l'appareil 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 de l'appareil. Veillez à ce que l'accès soit libre et facile pour permettre la déconnexion.
- Le dispositif ne peut être ouvert que pour l'insertion ou le retrait de cartes supplémentaires (selon la configuration du système). 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 système 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 :
  - l'appareil présente des dommages visibles ou
  - l'appareil ne fonctionne plus
    Dans ce cas, l'appareil doit être éteint et il faut s'assurer que l'appareil ne peut 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 si la batterie est remplacée de manière incorrecte (court-circuit, inversion de polarité, mauvais type de batterie). Éliminez les piles usagées conformément aux instructions du fabricant.
- La fourniture ext. doit répondre aux critères de LPS (UL/IEC 60950-1) ou PS2 (UL/IEC 62368-1).

Instructions de sécurité supplémentaires pour les circuits d'alimentation en courant continu (non E/S1/SELV)

- Pour garantir un fonctionnement sûr, veuillez observer ce qui suit :
  - 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 fiable à la terre de protection est prévue
  - un dispositif de déconnexion approprié et facilement accessible est utilisé dans l'application (par exemple, un dispositif de protection contre les surintensités), si le dispositif lui-même n'est pas en mesure de se déconnecter
  - un dispositif de déconnexion, s'il est prévu dans ou comme partie de l'équipement, doit déconnecter les deux pôles simultanément
  - l'interconnexion des circuits d'alimentation de différents appareils 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.
- Les appareils ne répondent généralement pas aux exigences des "systèmes centralisés d'alimentation en courant continu" (UL 62368-1, annexe DVD) et ne peuvent donc pas être connectés à de tels appareils !

2.3. Cleaning of Display

Clean the surface of your display with a dry and clean cloth to eliminate dust and particles of dirt.

NOTICE	Particles may scratch the surface. Do not apply any pressure. Use commercially available glass cleaner.

2.4. Electromagnetic Compatibility EU

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. If the user modifies and/or adds to the equipment (e.g. installation of add-on cards) the prerequisites for the CE conformity declaration, (safety requirements) may no longer apply.

2.5. 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 2.5.1 Grounding Methods below.

2.5.1. 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.
- Turn 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.

3/ Scope of Delivery

This chapter describes the components that are delivered and can be optionally ordered.

Please check that your delivery is complete and contains the items below (according to the ordered unit configuration). If you discover damaged or missing items, please contact your dealer.

Table 1: Scope of Delivery

	Qty	Part Number	Part Description
	1		FlatClient Panel PC
	1	EM21-100168-01 (10.1") EM21-100065-0 (10.4"/12.1") EM21-100066-0 (15.0"/15.6") EM21-100068-01 (18.5"/23.8") EM21-100069-01 (21.5")	Mounting set with fastening clips and screws, only for built-in variant

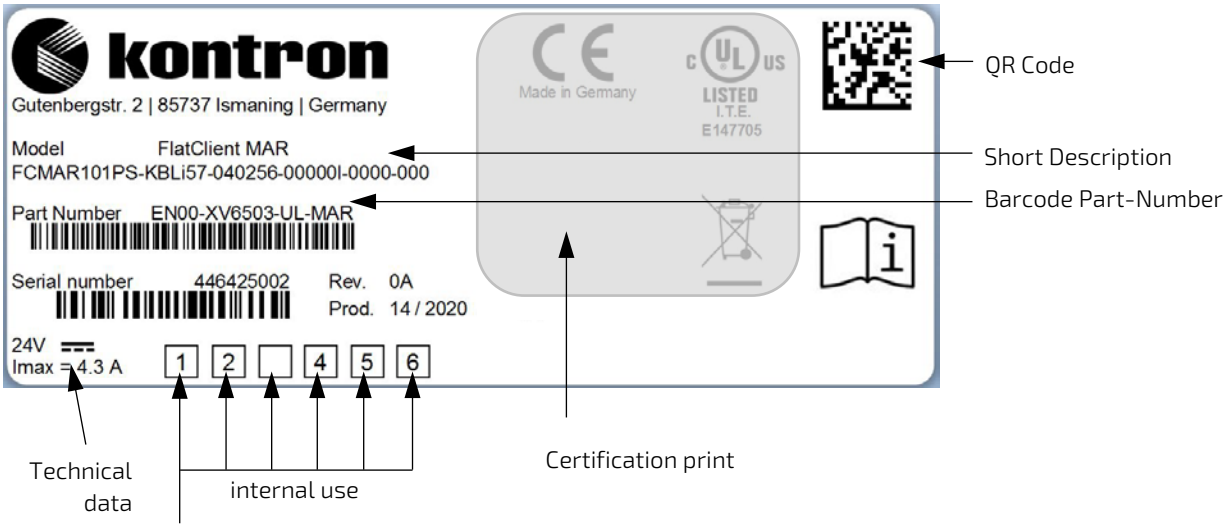
Table 2: FlatClient MAR Accessories

	Qty	Part Number	Part Description
	1	1062-2463	Weidmüller power connector for galvanically isolated FlatClient power input. No cable included.
	1	ER40-100008-01	AC Power Supply, 65 W, 2.7 A, 24 V Output including connector for galvanically isolated FlatClient power input.

3.1.1. Internal Type Label and Product Identification

Product and Package Label, size 85 x 35mm, polyester matt silver.

Figure 2: Type Label



The numbering schema for the FlatClient MAR series is as follows:

EN00-$P_1P_2P_3P_4P_5P_6$-01-MAR

Table 3: Placeholder Attribute Valid values Description

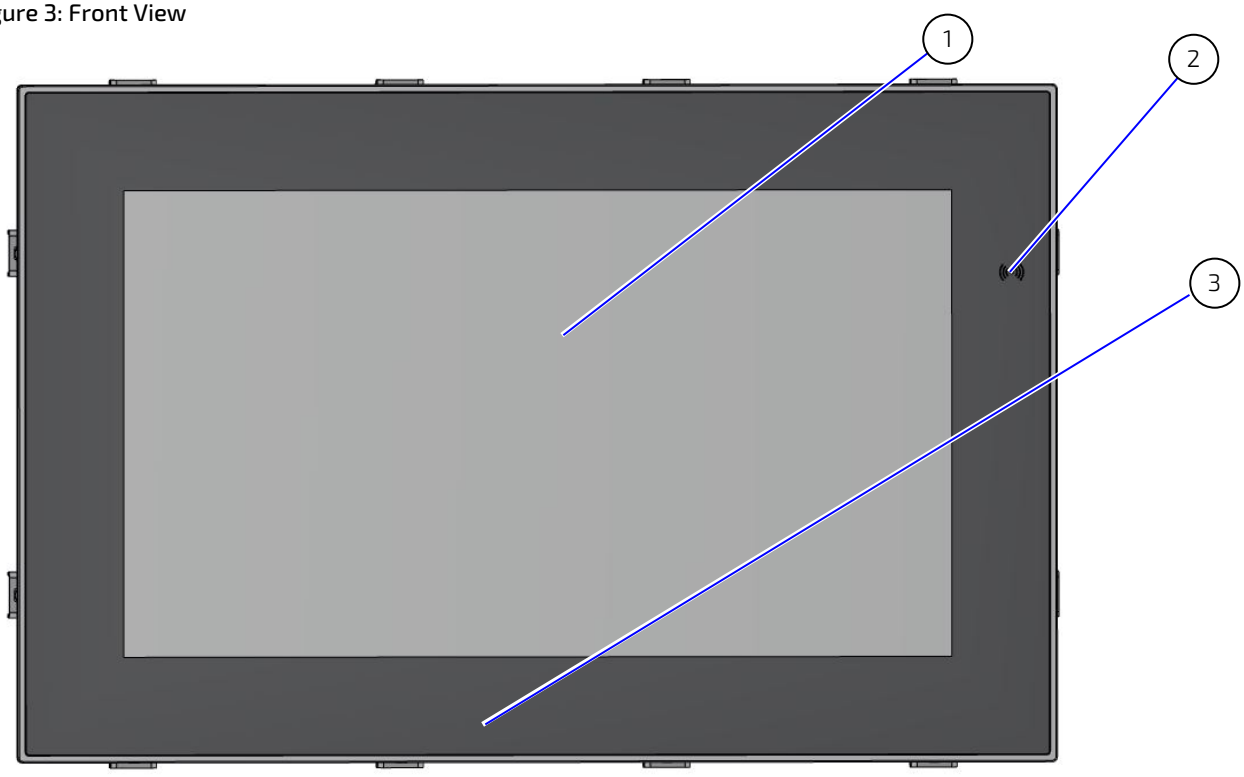
Placeholder	Attribute	Valid values	Description
P_1	Board/CPU Generation	Y X	Intel Apollo Lake Intel Kaby Lake
P_2	Display Size and Processor performance class	4 6 8 9 B D U V W X	15.6" Low 18.5" Low 21.5" Low 15.6" High 18.5" High 21.5" High 10.1" Low 10.1" High 12.1" WXGA Low 12.1" WXGA High
P_3	Touch-Technology	6 7	PCAP V2 Protection glass V2 no sensor
P_4	Mounting Variant	2 5	Panel mount Panel mount, service lid
P_5	Options I/O	0 1 2 3 4 5 6	No optional interface One RS232/422/485 Two RS232/422/485 Only RFID One RS232/422/485 and RFID Two RS232/422/485 and RFID Two CAN Interfaces
P_6	Options Memory and mass storage, number or character indicating a certain combination of RAM/M.2/2.5"	1 2 3 4 5 6 7 8 ... Z ...	4GB RAM/64GB 4GB RAM/128GB 4GB RAM/256GB 4GB RAM/512GB 8GB RAM/32GB 8GB RAM/64GB/256 GB 8GB RAM/128GB 8GB RAM/256GB 16GB RAM/256GB/256 GB ...

Note: low/high see Table 5

4/ System Specifications

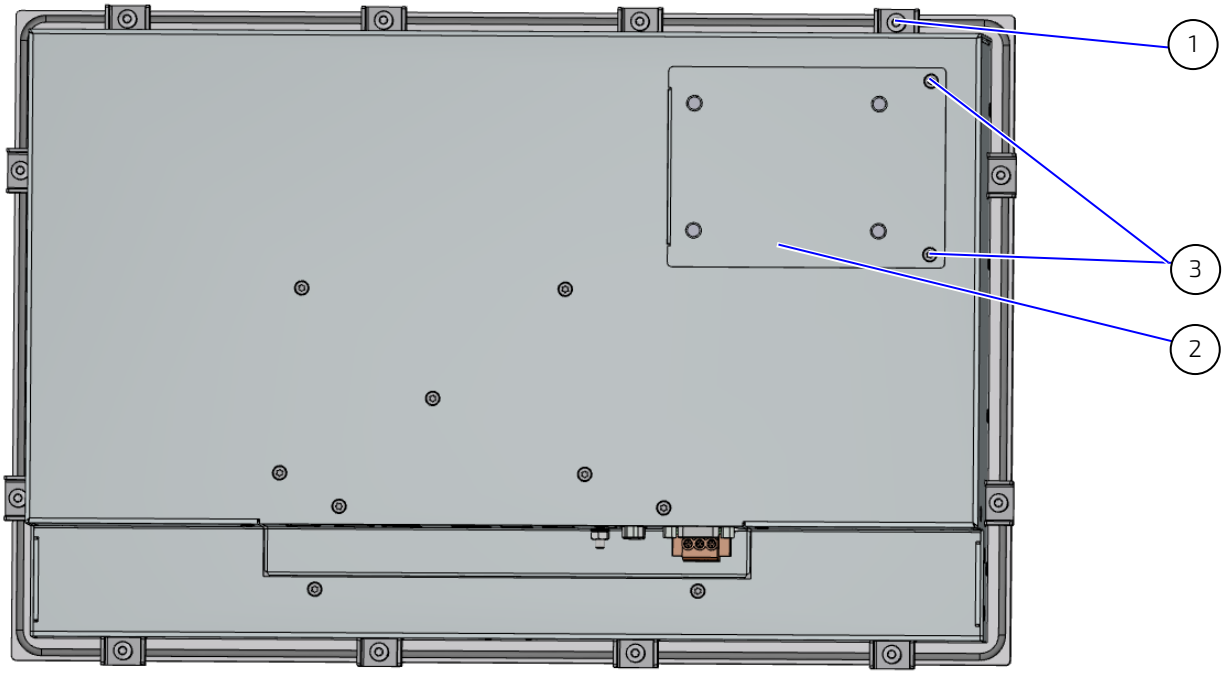
4.1. Product Views

Figure 3: Front View



1 TFT Display with PCAP Multitouch
2 RFID (optional)
3 Front plate

Figure 4: Back View



1. 12x fastening clips for 15.6", 6x for 10.1", 8x for 12.1", 14x for 18.5" and 21.5"
2. Service cover
3. 2x Screws for Service cover

4.2. Technical Data and Environmental Specification

Table 4: Technical Data

Display Size	10.1“	12.1“	15.6“	18.5“	21.5“
Resolution (pixel)	1280x800	1280x800, WXGA	1920x1080, Full HD	1920x1080, FullHD	1920x1080, Full HD
Format	16:10	16:10	16:9	16:9	16:9
Contrast Ratio	800:1	1000:1	800:1	1000:1	1000:1
Brightness	500cd	500 cd	450 cd	500 cd	300 cd
Angle View	H170°/V170°	H178°/V178°	H170°/V170°	H178/V178°	H178°/V178°
Colors	16.2 million	16.7 million	16.2 million	16.7 million	16.7 million
LED Lifetime (> 50%, 25°C)	> 50.000 h	> 100.000 h	> 50.000 h	> 50.000 h	> 50.000 h
Dimensions (WxHxD-mm)	276 x 195 x 65	315 x 228 x 65	432 x 281 x 74	500 x 321 x 74	575 x 367 x 74
Weight	~ 3.6 kg	~ 5.0 kg	~ 6.7 kg	~ 8.6 kg	~ 10.7 kg
Protection glass	X	X	X	X	X
PCAP (Multitouch)	X	X	X	X	X
RFID			X	X	X
Display Backlight Controller	X	X	X	X	X

Table 5: Technical Data for Intel® Pentium® N4200, Intel® Celeron® 3965U, Intel® Core™ i5-7300U Processors

CPU	Intel® Pentium® N4200 (low)	Intel® Celeron® 3965U (low)	Intel® Core™ i5-7300U (high)
Memory	4 GB		
BIOS	AMI uEFI BIOS		
Hardware Monitor	Temperature, Voltages		
Watchdog	Programmable WDT to generate System reset event		
Realtime Clock (RTC)	Processor integrated RTC		
I/O Interfaces	2xGbE, 4x USB3.0, 1x DP, 1x HDMI		
Power Supply	24 V – 25%/+30% VDC, galvanic isolation		
Cooling	Fanless passive cooling		
OS Support	Windows 10 IoT, Linux		
MTBF	25°C: 85610 h 40°C: 70139 h		
Options	Memory on demand, M.2 SSD 32 GB, 64 GB, 128 GB, 2x COM (RS232, RS422, RS485), 2x CAN, 2.5" HDD/SSD, RFID		

Table 6: Current Rating at 24 V with Intel® Pentium® N4200 Processors

Display Size	Current [A]
10.1"	1,74
12.1" (1280x800)	1,83
15.6"	2,23
18.5"	2,59
21.5"	2,66

Table 7: Current Rating at 24 V with Intel® Core i5 7300U and Celeron 3965U Processors

Display Size	Current [A]
10.1"	1,98
12.1" (1280x800)	2,07
15.6"	2,47
18.5"	2,82
21.5"	2,90

Table 8: Environmental Specification and Certifications

Operating Temperature	0°C - 50°C
Storage Temperature	-20°C to 85°C
Operating Altitude	Up to 3000 m (9900 ft)
Humidity	10 % - 90 % @ 39°C non-condensing
Certification	CE, UL, Design to meet FCC, DNVGL
Protection Class	Front: IP65, rear housing IP20
Flammability	IEC 60695-11-5
Shock, Vibration, Bump	Shock DIN EN 60068-2-27 Operating Shock 15 G, 6 ms duration, half-sinus , 4000 pos/4000 neg. Storage Shock 30 G, 6 ms duration, half-sinus , 3 pos/3 neg. Vibration DIN EN 60068-2-6 Operating Vibration 10 – 2000 Hz: 2.0 G/3axis Storage Vibration 10 – 150 Hz: 5.0 G/3axis
CE-Mark	Electromagnetic Compatibility Directive 2014/30/EU
	Low Voltage Directive 2014/35/EU
EMC Emission	EN 61000-6-3 - Residential, commercial and light-industrial environments EN 61000-6-2 - Industrial area DIN EN 55011/IEC/CSISPR 11 - Industrial, scientific and medical equipment (radio interference/limits and methods of measurement) EN 55032/IEC/CISPR 32 - Information technology equipment (radio disturbance characteristics/Limits and methods of measurement)
EMC Immunity	EN61000-6-2 - Basic standard Interference immunity EN61000-4-2 - Discharge of static electricity EN61000-4-3 - Immunity to high-frequency electromagnetic fields EN61000-4-4 - Immunity to fast transient electrical disturbances/Burst EN61000-4-5 - Immunity against surge voltage EN61000-4-6 - Immunity to conducted disturbances induced by high frequency fields EN61000-4-8 - Testing of immunity to magnetic fields with energy-related frequencies EN55024 Information technology equipment Immunity characteristics

FCC	CFR 47 Part 15, Subpart B: The American National Standards Institute standard ANSI C63.4 is the key standard for measuring electrical and electronic equipment for showing compliance to FCC and Industry Canada regulations.
Safety	UL62368-1: Audio/video, information and communication technology equipment, Part 1: Safety requirements
WEEE	WEEE directive 2012/19/EU: EU Compliant with the Waste Electrical and Electronic Equipment (WEEE) directive to reduce waste of electrical and electronic equipment, encourage recycling and environmental disposal and increase the environmental awareness of producers
RoHS/REACH	The systems are designed to comply with the RoHS requirements of EU directive 2011/65/EC plus 2015/863/EU and 2017/2102/EU. Regarding REACH the systems complies with the EU regulation no. 1907/2006.
Maritime Certification	DNVGL classification for Control rooms and bridge with severity levels: Temperature B, Humidity B, Vibration A, EMC B, Enclosure B. For compass safe distances see Table 9: Compass Safe DistanceTable 9. EN60945 - Maritime navigation and radiocommunication equipment and systems. General requirements Methods of testing and required test results

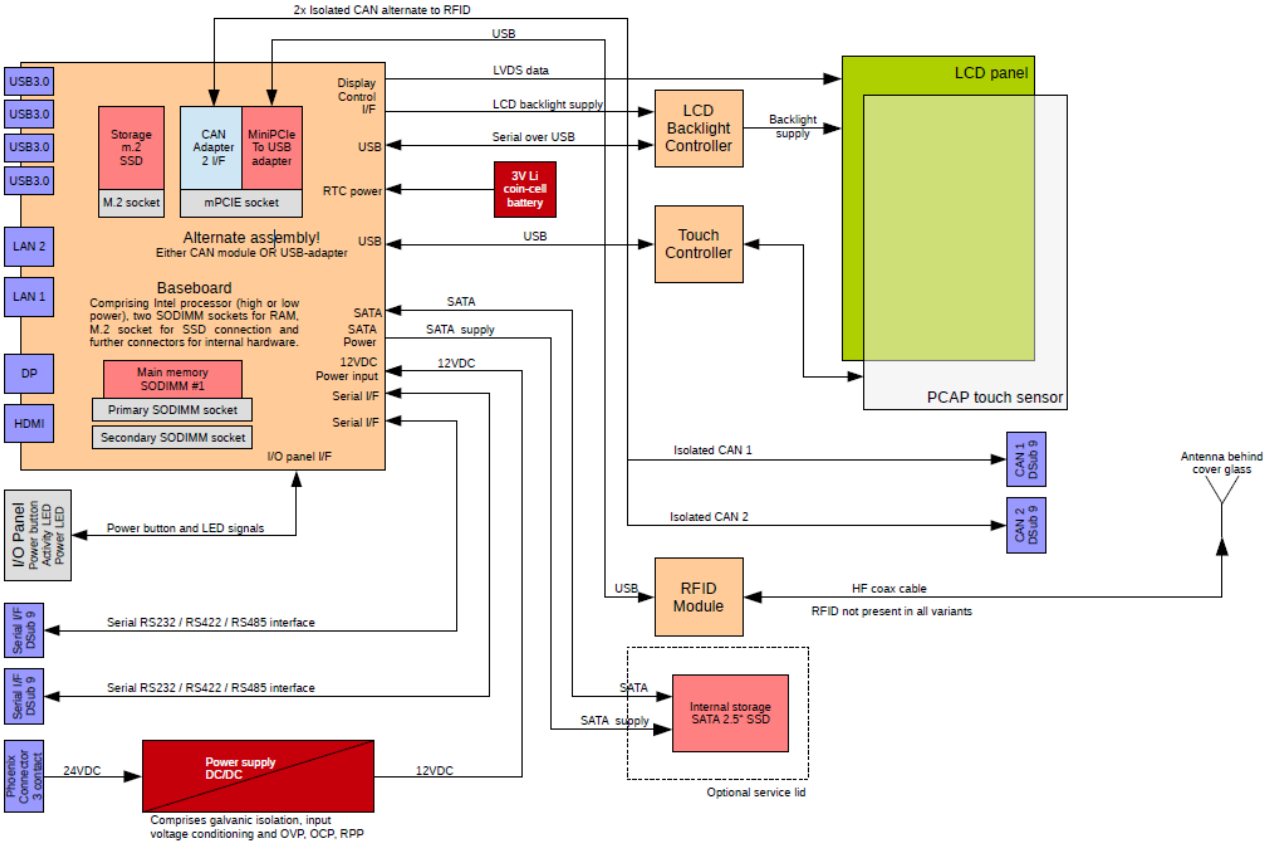
NOTICE **The Flatclient MAR must only installed in weather protected areas.**

Table 9: Compass Safe Distance

FlatClient MAR variant	Standard Compass Distance (cm)	Emergency Compass Distance (cm)
10.1"	105	70
12.1"	110	70
15.6"	130	80
18.5"	135	85
21.5"	145	85

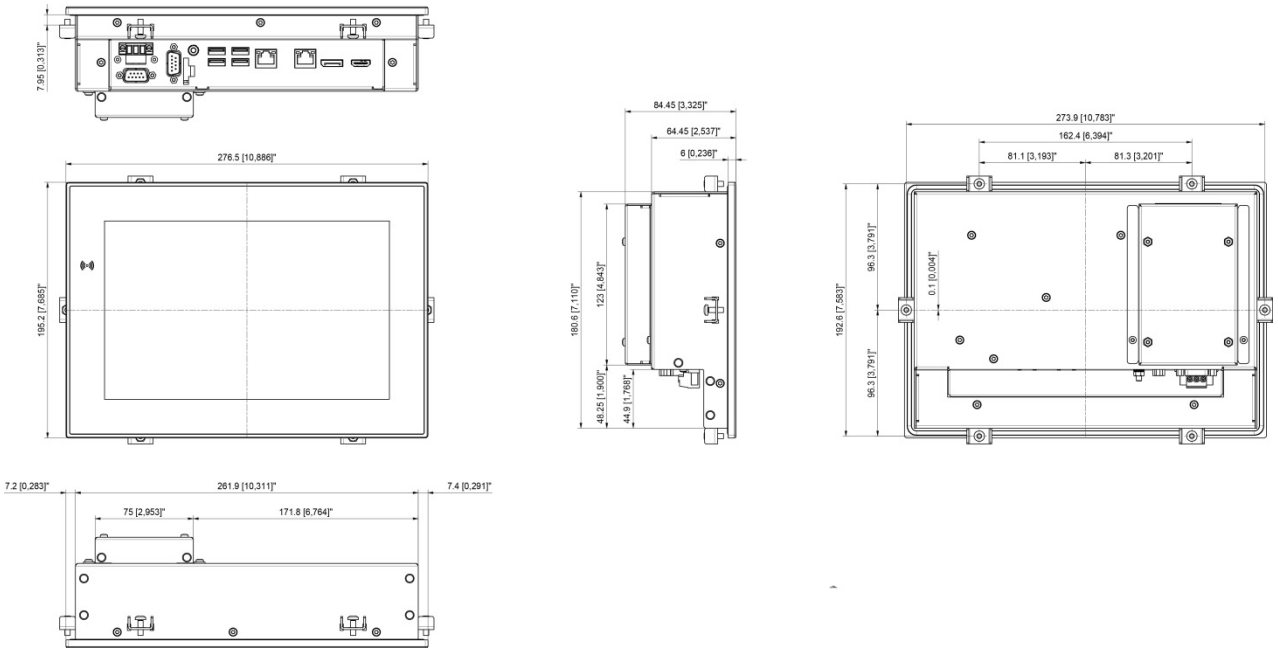
4.3. Block Diagram

Figure 5: System Block Diagram



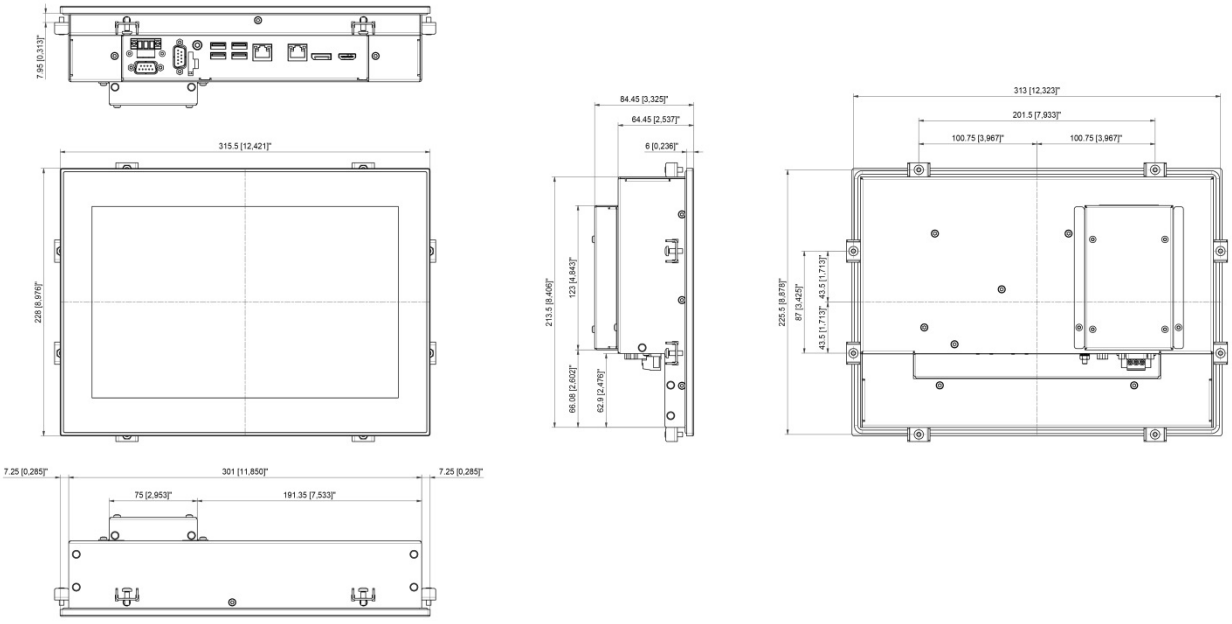
5/ Mechanical specification

5.1. 10.1“ Variant



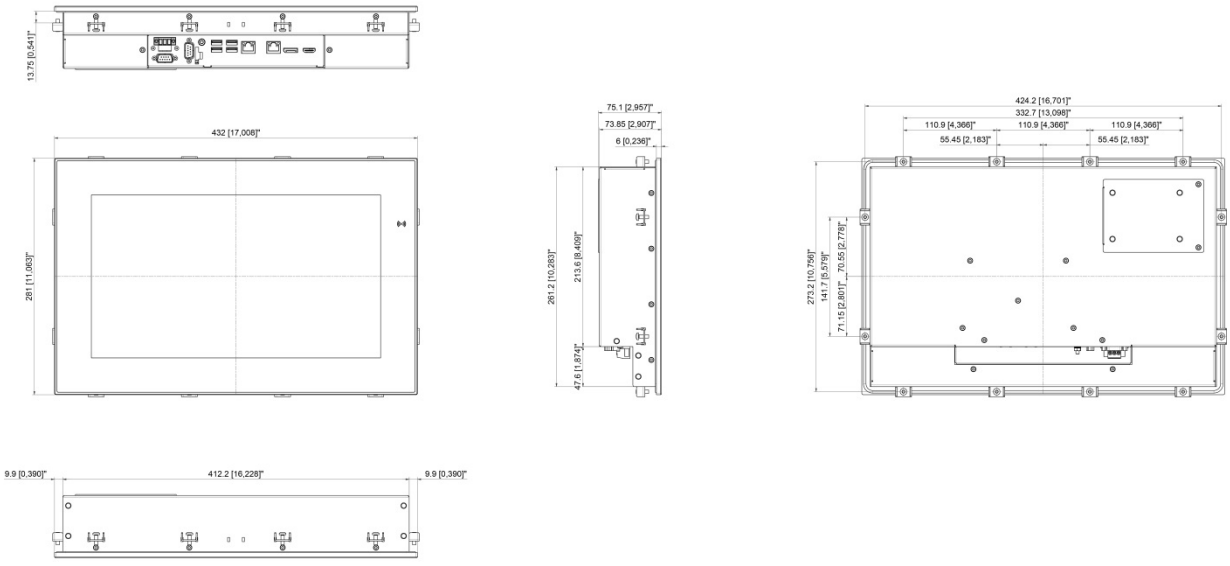
5.1.1. 10.1"Panel Cutout

5.2. 12.1“ Variant



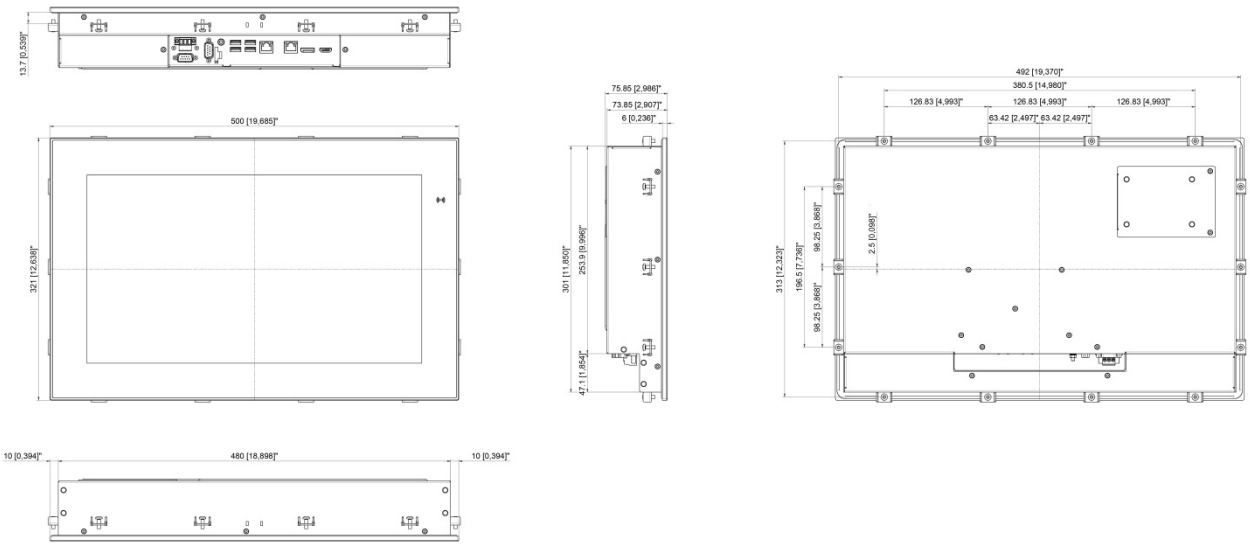
5.2.1. 12.1" Panel Cutout

5.3. 15.6“ Variant



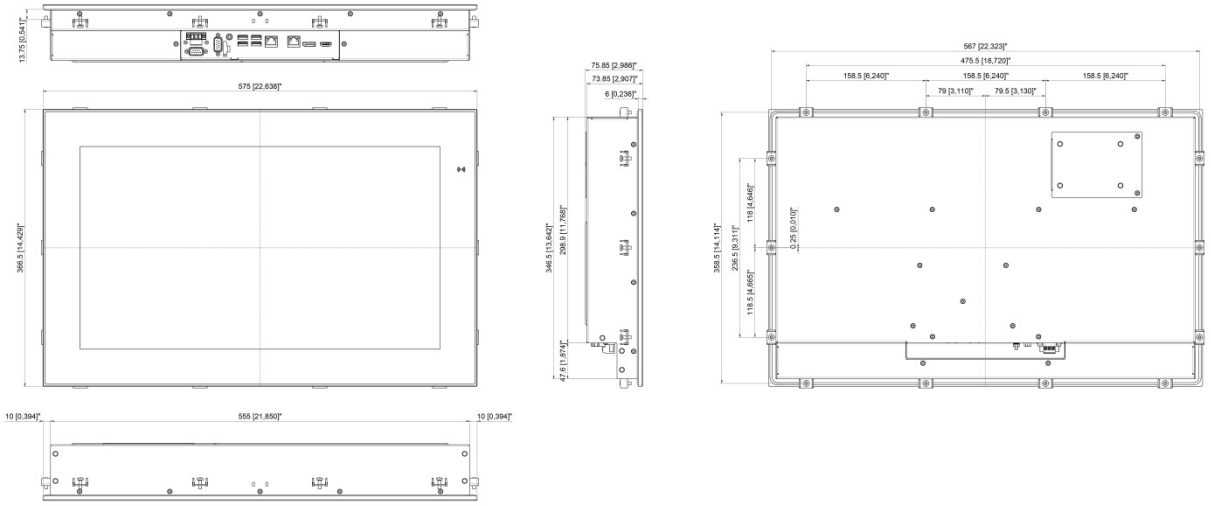
5.3.1. 15.6" Panel Cutout

5.4. 18.5“ Variant



5.4.1. 18.5" Panel Cutout

5.5. 21.5“ Variant

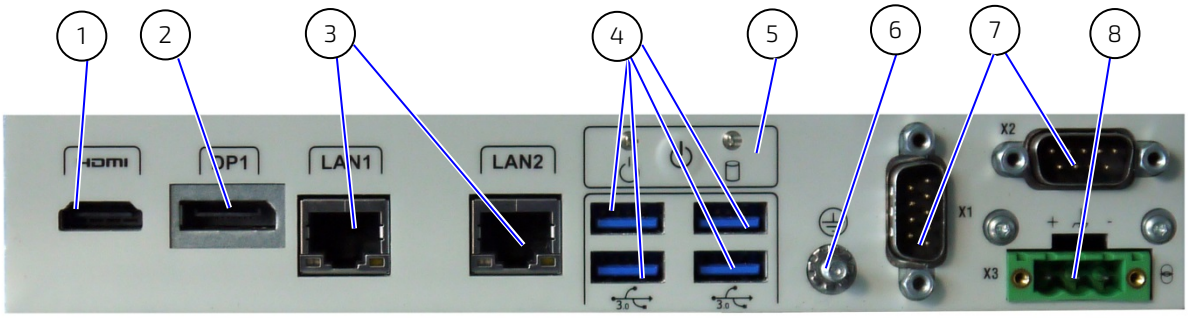


5.5.1. 21.5" Panel Cutout

6/ Connectors/LEDs

6.1. FlatClient MAR External Connectors

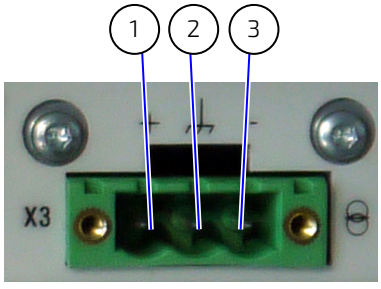
Figure 6: Interfaces for Panel PC



1 HDMI
2 DP connector
3 2x GbE
4 4x USB 3.0
5 Power/LEDs
6 Grounding stud
7 2x CAN Bus or serial (optional)
8 Power connector

6.1.1. Input Power Connector

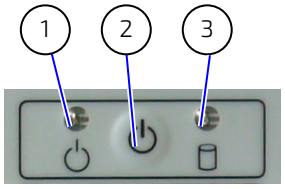
Figure 7: Input Power



1 V+
2 Shield
3 V-

6.1.2. Power-Switch and LEDs

Figure 8: Power-Switch and LEDs



1 LED Power
2 Power On/Off
3 LED Drive Activity

Table 10: Power LED (1)

LED	Signal
Off	No Power
Green	Active
Green blinking	Standby

Table 11: Button Functions (2)

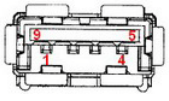
Button Functions	Activity
Pressed during active system	OS is put into sleep state
Pressed when power LED is green-blinking	OS is started from sleep state
Pressed when system was shut-down	New OS start

Table 12: Drive Activity (3)

LED	Signal
Off	No Access
Blue blinking	Active

6.1.3. USB3.0 Type-A Connector

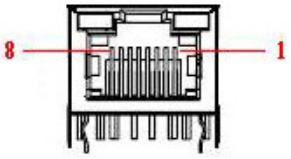
Table 13: Pinout USB 2.0



Pin	Signal Name	Pin	Signal Name
1	+USB_VCC	5	USB_RX-
2	USB_D-	6	USB_RX+
3	USB_D+	7	GND
4	GND	8	USB_TX-
		9	USB_TX+

6.1.4. GbE RJ-45 Connector

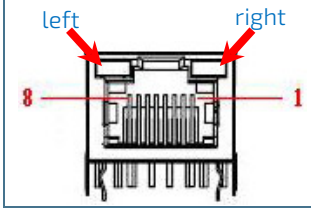
Table 14: Pinout GbE RJ-45 Connector



Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-

6.1.5. LED Diagram of LAN Connectors

Table 8: Status of LEDs from GbE RJ-45 Connector

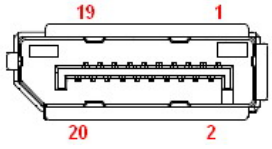


left LED: activity/link		right LED: 10/100/1000	
off	No LAN connectivity	off	10 Mbit
yellow	link	green	100 Mbit
yellow blinking	activity	orange	1 GbE

6.1.6. DisplayPort Connector

The Dual-Mode DisplayPort source automatically detects the presence of a plugged-in Dual-Mode DisplayPort cable adaptor and provides the DVI or HDMI signal, as required, to support the connected DVI or HDMI monitor.

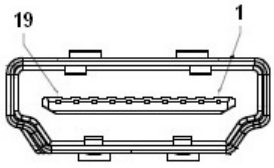
Table 15: Pinout DisplayPort Connector



Pin	Signal	Pin	Signal
1	TX0+	11	GND
2	GND	12	TX3-
3	TX0-	13	GND
4	TX1+	14	GND
5	GND	15	AUX+
6	TX1-	16	GND
7	TX2+	17	AUX-
8	GND	18	HPD
9	TX2-	19	GND
10	TX3+	20	PWR

6.1.7. HDMI Connector

Table 16: Pinout HDMI Connector



Pin	Signal Name
1	TMDS Data2+
2	GND
3	TMDS Data2–
4	TMDS Data1+
5	GND
6	TMDS Data1–
7	TMDS Data0+
8	GND
9	TMDS Data0–
10	TMDS Clock+
11	GND
12	TMDS Clock–
13	Reserved
14	Reserved
15	DDC_CLK
16	DDC_DATA
17	GND
18	+5 V Power
19	Hot Plug Detect

6.1.8. CAN Interface (optional)

As an option the systems are equipped with a CAN module. Which provides two CAN interfaces. The external connectors are mounted at the position of the standard serial interfaces (RS422/323/485).

It occupies one miniPCIE socket. It can be installed only when no serial interfaces (RS232/422/485) are installed. It can only be installed when no RFID module is installed.

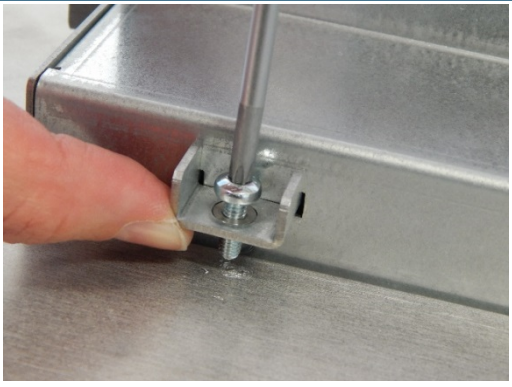
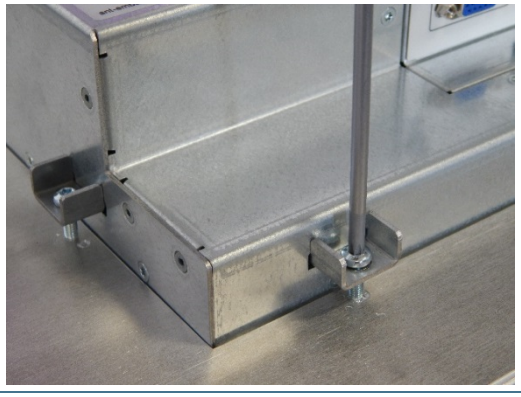
Figure 9: CAN interfaces X1 and X2

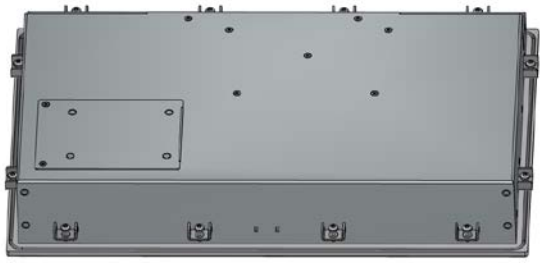
7/ Installation and Start

7.1. Mounting Instructions

NOTICE Fixation screw torque is 0,8 Nm +/- 0,2 Nm.

Table 17: Mounting Instructions

Step	Installation	Description
1	  	▶ Use mounting set with screws and fastening clips ▶ Lens head Screw Philips M4x12 ▶ DIN 7985 - ISO 7045 ▶ Use Philips head Screwdriver
2		▶ Fix the bracket with the screw to the housing
3		▶ Repeat step 4 for all positions of fastening clips. Fixation screw torque is 0,8 Nm +/- 0,2 Nm.

Step	Installation	Description
4		▶ Example 15.6" Monitor: 12 Screws with fastening clips

NOTICE

Wall-/Switch cabinet doors thickness has to be at least 3 mm. Otherwise please use an adapter frame or adapter brackets.

7.2. Startup Procedure

To activate your FlatClient Panel PC connect the power supply to power connector on the FlatClient back side. Alternative use the mating power connector for connecting your power cable. The LED "PWR" turns green. FlatClient starts booting sequence now. If an operating system is installed, it starts automatically.

To contact support:

e-mail: support@kontron.com

Phone: +49-821-4086-888

All essential drivers you´ll find in the EMD Customer Section
https://www.kontron.de/support-and-services/support/customer-section

UEFI only! No legacy support and no Master Boot Record (MBR) installation.

8/ Operation

8.1. Backlight and Backlight Control

The backlight control of FlatClient MAR series is adapted to marine requirements and provides a range from around 0,6 cd/m² up to the maximum brightness of the display. The maximum depends on the display type and FlatClient MAR device. For the user the backlight change is perceived as a linear change from dark to full brightness. Default display brightness is set to 200 cd/m². After software reset or hardware the previously used brightness setting is applied.

To control the brightness the application must connect to a serial port and use appropriate commands to control the brightness. Further status information, e.g. temperature, can be retrieved from the backlight controller. The backlight control of the operating system and corresponding uEFI/BIOS settings have no effect on the brightness control of the Flatclient MAR devices.

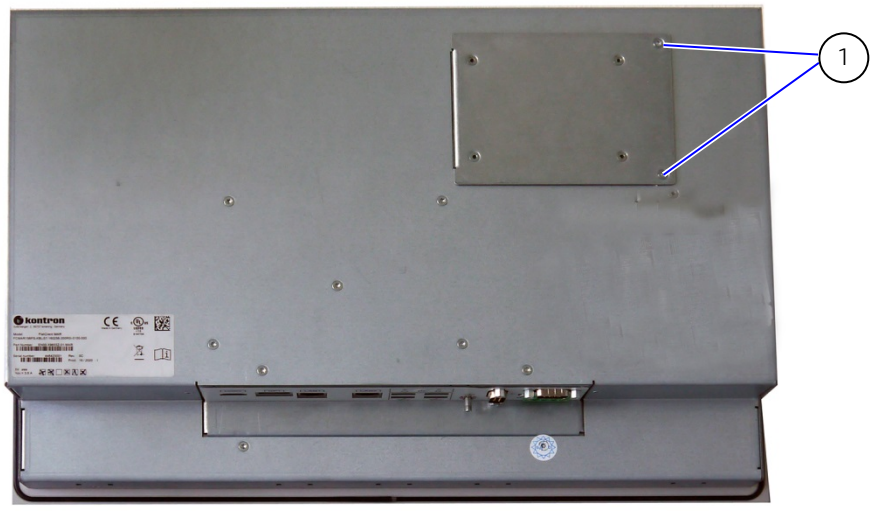
NOTICE

The Display Backlight Controller is set to a power-up/cold start default brightness of 200 cd/m². A LCD minimum brightness is possible down to at least 0,6 cd/m².

Further information about the API for controlling the backlight and a Demo-Application can be found in the customer section https://www.kontron.de/support-and-services/support/customer-section.

8.2. RTC Battery Exchange

Figure 10: Service Cover on the Back

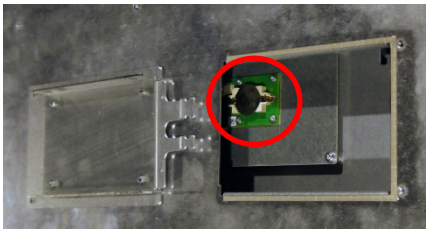


1 2x Screws

⚠CAUTION **It must be ensured, that no parts or particles fall into the housing during the procedure. This may lead to malfunction and damage the device.**

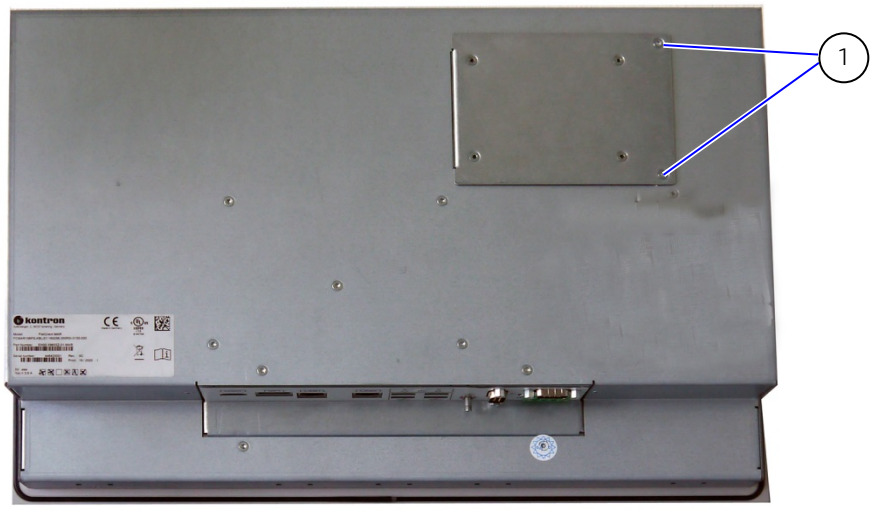
1. Shut down FlatClient MAR and disconnect the device from power.
2. Remove the two fixation screws of the service cover. Store the screws at a safe place.
3. Open the rear cover and take care of the 2.5" drive wiring if present.
4. Remove the RTC battery carefully from the socket.
5. Replace it with a battery of the same type. When inserting the battery observe that the battery is not short-circuited.
6. Put the service cover back into place and take care that the 2.5" drive wiring is properly folded into the service area.
7. Fix the service cover at its closed position with the two screws.

Figure 11: Open Service Cover with RTC Battery



8.3. 2.5" Harddisk Exchange

Figure 12: Service Cover on the Back



1 2x Screws

⚠CAUTION **It must be ensured, that no parts or particles fall into the housing during the procedure. This may lead to malfunction and damage the device.**

1. Shut down FlatClient MAR and disconnect the device from power.
2. Remove the two fixation screws of the service cover. Store the screws at a safe place.
3. Open the rear cover and take care of the 2.5" drive wiring.
4. The harddisk is fixed by four clinch pins. For exchange you have to untighten theses pins.
5. Put the service cover back into place and take care that the 2.5" drive wiring is properly folded into the service area.
6. Fix the service cover at its closed position with the two screws.

Figure 13: 2.5" Harddisk with power (white colour) and data cabeling (red colour)

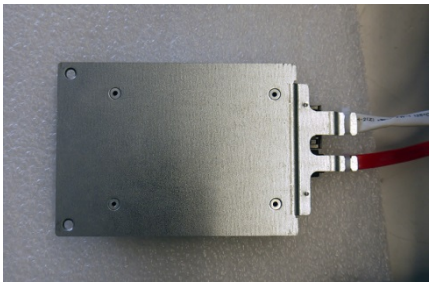
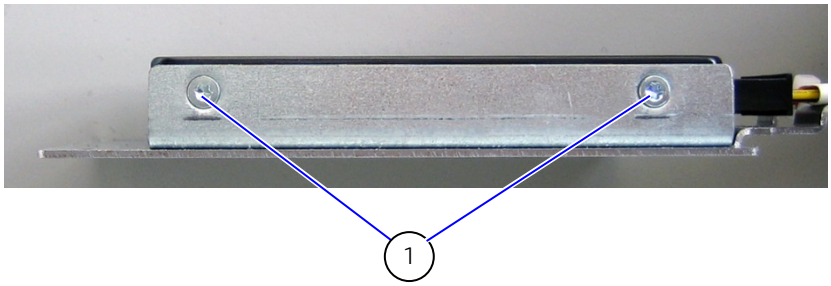


Figure 14: 2.5" Harddisk fixation with Torx screws on both sides



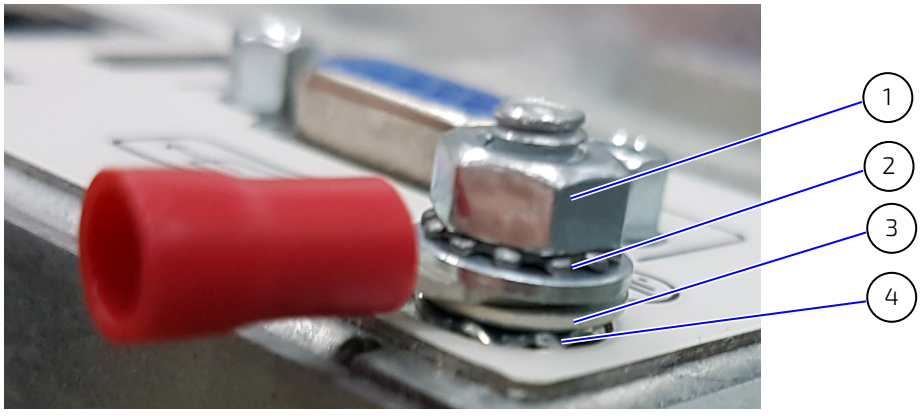
1 2x Torx screws (on both sides)

8.4. Usage of Grounding Stud

The delivery state of the grounding stud for the Flatclient MAR is:

- tooth washer
- 2x washer
- tooth nut

Figure 15: Grounding Stud



1 Tooth nut
2 Cable lug
3 Washer
4 Tooth washer

NOTICE Torque for the nut is 1.3 Nm.

9/ 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 side.

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

9.1. 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 CMOS battery, for example.

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

9.2. 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:
http://www.kontron.com/support-and-services/support/rma-information

   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.

2. 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

3. 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.

4. 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.

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: **www.kontron.com**

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