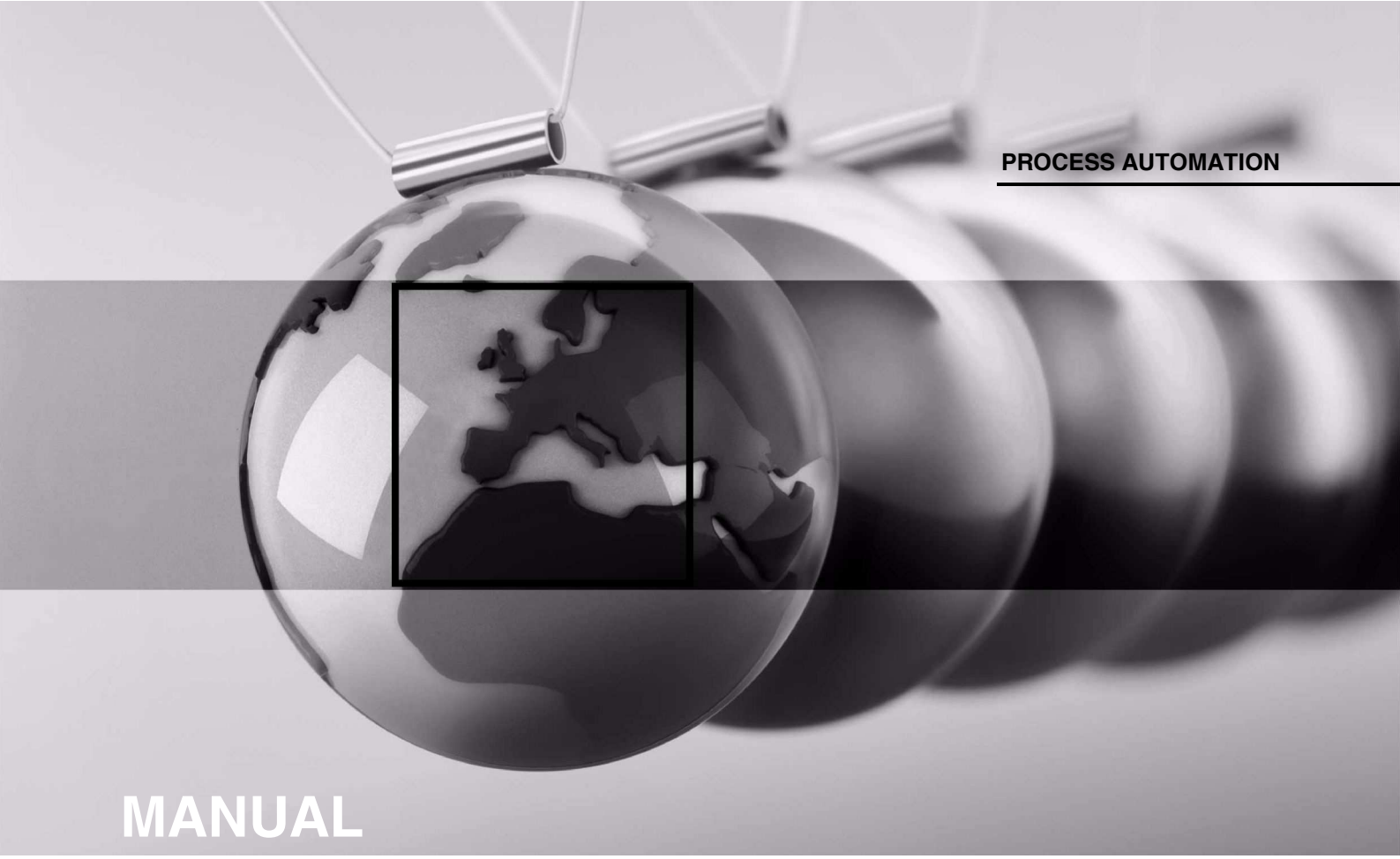

PROCESS AUTOMATION

MANUAL

VisuNet Display Unit

DPU2100-*

PEPPERL+FUCHS

With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

1 Introduction

1.1 Content of this Document

This document contains information that you need in order to use your product throughout the applicable stages of the product life cycle. These can include the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

Note!

This document does not substitute the instruction manual.

Note!

For full information on the product, refer to the instruction manual and further documentation on the Internet at www.pepperl-fuchs.com.

The documentation consists of the following parts:

- Present document
- Instruction manual
- Datasheet

Additionally, the following parts may belong to the documentation, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Additional documents

1.2 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

1.3 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:

Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols

Note!

This symbol brings important information to your attention.

Action

This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

2 Product Description

2.1 Overview

The DPU2100-* display unit is an ATEX/IECEx certified device intended for use in potentially explosive atmospheres such as Zones 1/21.

Connected to a Pepperl+Fuchs thin client unit or PC unit, the DPU serves as a display with an optional touchscreen. It enables users to perceive the system outputs of the computing unit and input user data.

Five system keys on the front of the unit allow users to control system functions (e.g., brightness) and the computing unit (e.g., home key). Integrated signal lights on the front keys show selected failure modes in case of a defective component.

The display unit is optimized for use with the modular HMI components of the VisuNet product line: TCU1100-* thin client unit, PCU1100-* PC unit, and PSU1100-* power supply unit.

Note!

For a description of the product model nomenclature, view the DPU2100-J1-19U* product datasheet on www.pepperl-fuchs.com.

2.2 Technical Data

Note!

Environmental Conditions

This equipment is designed for indoor/outdoor use at a maximum altitude of 2000 m.

Supply	
Power dissipation	25 W
Power consumption	average: 24 W at maximum brightness: max. 25.2 W
Display	
Type	LC display with LED backlight optically bonded, thermally hardened glass
Screen diagonal	48.26 cm (19 inch)
Resolution	1280x1024 (SXGA) , Aspect ratio 5:4
Color depth	16.7 Mio.
Contrast	1000:1 (typical)
Brightness	1000 cd/m2
Reading angle	170° horizontal , 160° vertical
Life span	back lamp life: 70 000 hrs typical half life , at 25 °C (77 °F)
Input devices	
Touchscreen	optional: projective capacitive, 10 finger multi-touch, glove-friendly
Control elements	5 capacitive front keys (behind glass): 1 home button, 2 brightness control buttons, 1 touchscreen button, 1 power button
Interface	
Interface type	interface v1.0 from Pepperl+Fuchs for computing units from Pepperl+Fuchs
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations) ; EN 61000-6-4:2007+A1:2011
RoHS	
Directive 2011/65/EU (RoHS)	EN 50581:2012-09
Ambient conditions	
Operating temperature	-20 ... 60 °C (-4 ... 140 °F)
Storage temperature	-20 ... 60 °C (-4 ... 140 °F)
Relative humidity	93% at 40°C, non-condensating, according to EN 60068-2-78
Shock resistance	3 shocks 20 g , 11 ms all axis, IEC 60068-2-27
Vibration resistance	5 ... 500 Hz, +/- 0.075 mm , 1.5 g, 10 cycles per axis according to EN60068-2-6
Mechanical specifications	

Degree of protection	IP66
Material	
Surface	front: glass with powder-coated aluminum (6061) bezel back: powder-coated aluminum
Mass	approx. 14.5 kg
Dimensions	542 mm x 460 mm x 48 mm
Data for application in connection with hazardous areas	
EU-Type Examination Certificate	CML 17 ATEX 5191X
Marking	Ⓔx II 2G Ex eb ib q IIC T4 Gb Ⓔx II 2D Ex tb IIIC T85 °C Db
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012+A11:2013, EN 60079-5:2015, EN 60079-7:2015, EN 60079-11:2012, EN 60079-31:2014
International approvals	
IECEx approval	IECEx CML 17.0106X
Approved for	Ex eb ib q IIC T4 Gb Ex tb IIIC T85 °C Db
Standards	IEC 60079-0:2011, IEC 60079-5:2015, IEC 60079-7:2015, IEC 60079-11:2011, IEC 60079-31:2013

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2.3 Marking

ATEX/IECEx Marking

Display Unit DPU2100-* Pepperl+Fuchs GmbH Lilienthalstraße 200, 68307 Mannheim, Germany
ATEX: CML 17 ATEX 5191X Ex II 2G Ex eb ib q IIC T4 Gb Ex II 2D Ex tb IIIC T85 °C Db
IECEx: IECEx CML 17.0106X Ex eb ib q IIC T4 Gb Ex tb IIIC T85 °C Db

Note!

FCC Digital Devices Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference, in which case the user will be required to correct the interference at his own expense.

2.4 Dimensions and Type Labels

Dimensions

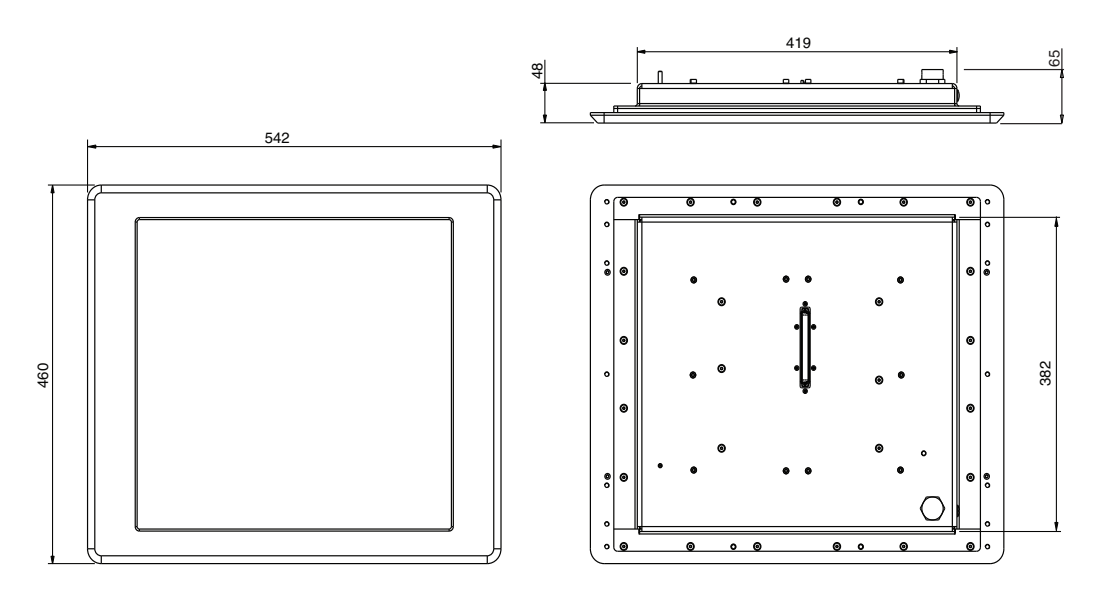
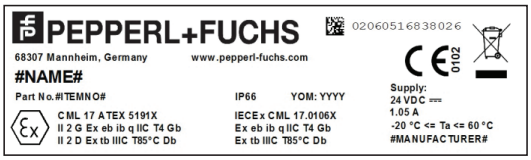
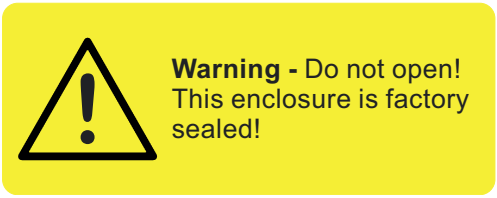
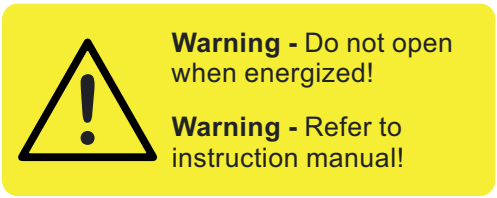


Figure 2.1 VisuNet DPU2100-* dimensions

Labels

The following labels are present on the display unit.

Type label display unit	
Warning marking "Warning – Do not open! This enclosure is factory sealed." "Avertissement – Cette enveloppe est scellée en usine. Ne pas l'ouvrir!"	
Warning marking "Warning – Do not open when energized!" "Warning – Refer to instruction manual!" "Avertissement – Ne pas ouvrir sous tension!" "Avertissement – Reportez-vouz au manuel d'instruction!"	

3 Installation

Note!

For detailed installation information, see the VisuNet IXD system manual.

Before installation, take into consideration the compatibility of the materials on this device and the environment in which the device will be used.

3.1 Special Conditions of Use

- The DPU must be mated with a suitably certified module, such as a TCU or PCU.
- Connection of TCU/PCU and display shall only be made when de-energized.
- The display does not pose an electrostatic discharge hazard under normal use conditions. Use only a water damp cloth and allow to air dry for cleaning the device. Do not use or install in high-charge areas. See IEC 60079-32-1 for further information.
- In hazardous dust environments, regularly remove dust from the display unit to prevent excessive temperature rise. See certificate for full information.
- The device shall be installed such that risk of high-impact energy on display glass is considered to be low.
- The unit type DPU2100-* may only be used in connection with Pepperl+Fuchs computer unit *CU1100-J1-* according to EU-Type examination certificate BVS 16 ATEX E 083X for ATEX applications or IECEx BVS 16.0060X for IECEx applications. It must be properly joined prior to being installed into a hazardous environment. See the system manual for full mounting details.
- Power supplied from the TCU**00-* or PCU**00-* needs to be from a SELV or PELV source.

3.2 General Installation Requirements

Observe the following requirements when installing the display unit.

- The equipment must be installed by competent personnel in accordance with the instructions. National laws and regulations must be observed.
- The building installation must provide a 20 A overcurrent protection.
- The installer must make a readily accessible disconnect device available.
- The safety of any system incorporating the power supply unit is the responsibility of the assembler of the system.

3.3 Mechanical Installation

Note!

For system installation instructions and complete mounting options, see the VisuNet IXD System Manual. Installation to IEC 60079-14 and other local and national requirements are to be followed as needed.

Mounting the PCU/TCU onto the DPU

1. Ensure the correct position of the PCU/TCU.
2. Place the PCU/TCU with the Pepperl+Fuchs connector above the Pepperl+Fuchs socket on the back of the display unit.

3. Carefully push the Pepperl+Fuchs connector into the Pepperl+Fuchs socket.
4. Use the mounting screws to attach the PCU/TCU onto the display unit. Tighten the screws in a criss-cross pattern to a torque of 2 Nm).

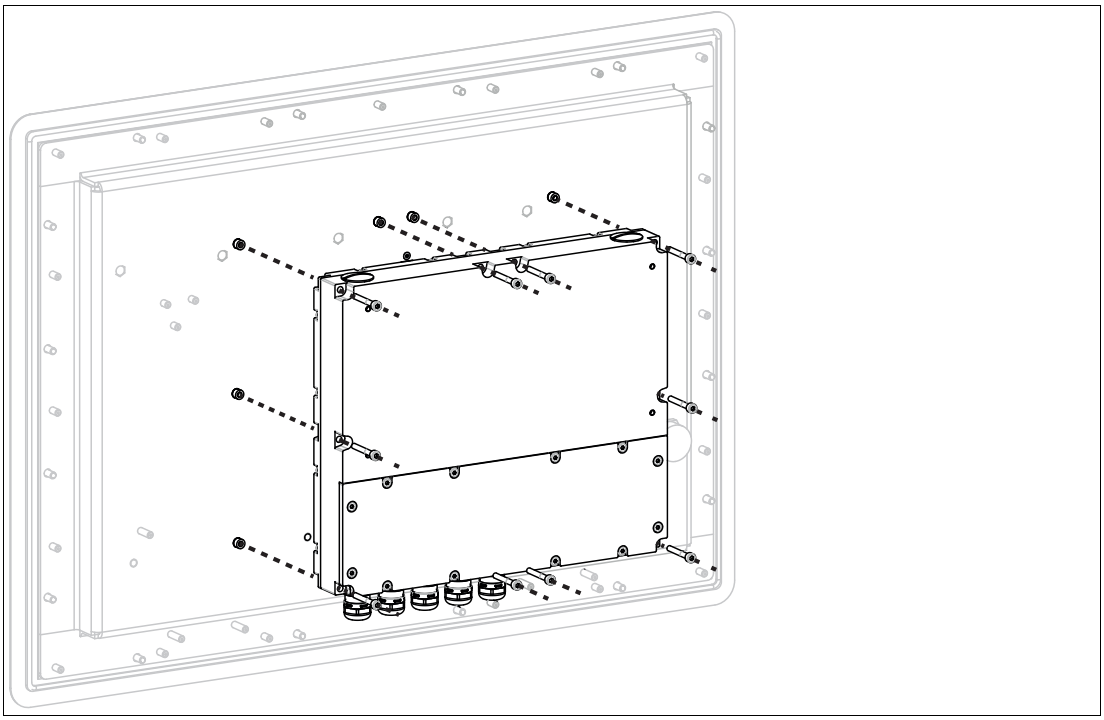


Figure 3.1 Mounting the TCU/PCU onto the display unit

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Caution!

Damage to pins

Carefully align the PCU/TCU with the DPU when connecting the units. Mounting or dismounting the PCU/TCU at an angle can damage the pins.

Ground Connection

The system must be properly grounded. The display's ground bolt serves as the ground bolt for the TCU/PCU once the TCU/PCU is mounted to the display.

The ground bolt is on the back of the display unit. The required hardware is included in delivery with the display unit. The grounding location is marked with a ground symbol:

Observe the following requirements:

- The protective grounding conductor / equipotential bonding conductor shall be the same size as the power feed, but a minimum of 4 mm^2.
- Torque ground hardware to 4 Nm.

3.4 Repair and Disposal

Note!

The DPU can be dismounted from the PCU/TCU and sent to Pepperl+Fuchs for repair and/or replacement. For mounting and dismounting instructions, see Chapter 3.3.

The powder filling (Ex q) of the display is not user-serviceable. Send the device to the factory for repairs, if required.

Disposal

Follow all local and any other requirements for disposing of electronic equipment.
When disposing of any system component, mark VOID across all certification labels.

4 Operation and Configuration

Front Buttons

The DPU2100* provides several system functions via the capacitive front buttons.

The front buttons are embedded in the system and located behind the security glass.

Warning!
Warning!

Do not use sharp tools like screw drivers to trigger the front buttons.

Warning!
Warning!

Do not use the display when there are scratches in the front glass.

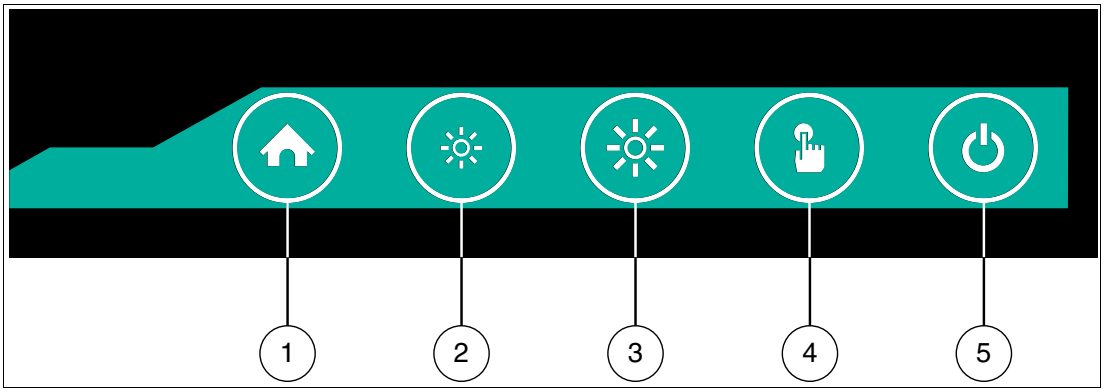

Figure 4.1 Buttons on the front of the DPU2100-* display

	Button	Description
1	Home	Configurable front button to call a specified function
2	Brightness -	Reduce display brightness (dimmable to 0 %)
3	Brightness +	Increase display brightness
4	Touchscreen	Enable/disable touchscreen (e.g. for cleaning purposes). If the display unit has no built-in touchscreen, the touchscreen button is disabled.
5	Power	Configurable power button (shutdown, restart, hybernate); button can be disabled

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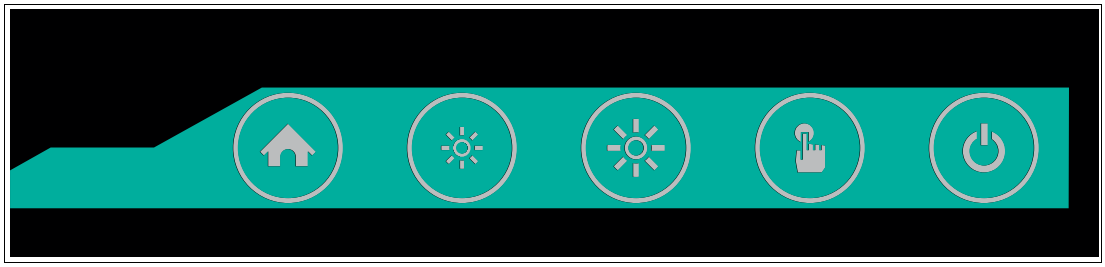
Status OFF - Power OFF	off	off	off	off	off
Status OFF - Power ON	off	off	off	off	on (solid white)
Power ON - Touchscreen ON	on (solid white)	on (solid white)	on (solid white)	on (solid white)	on (solid green)
Power ON - Touchscreen OFF	on (solid white)	on (solid white)	on (solid white)	on (flashing white)	on (solid green)
Power ON - Display OFF (Brightness 0%)	on (solid white)	on (solid white)	on (flashing white)	on (solid white)	on (solid green)
Sleeping Mode	off	off	off	off	on (flashing green)

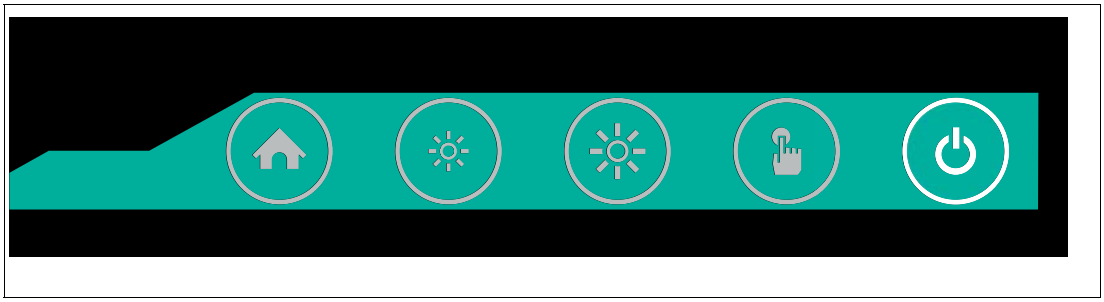
Status OFF - Power OFF

LEDs off



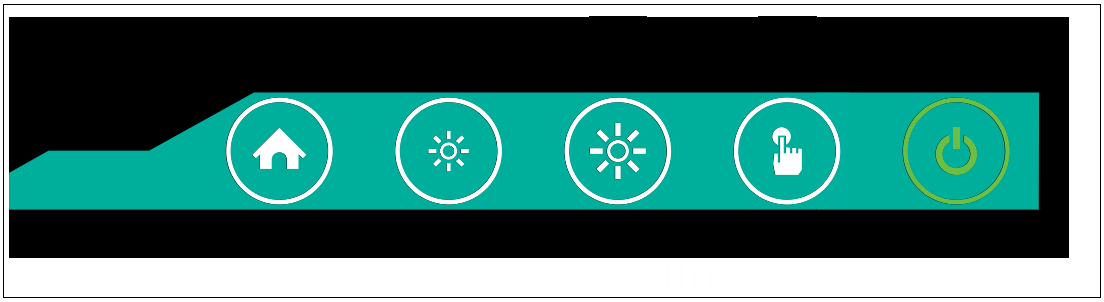
Status OFF - Power ON

Power LED solid white



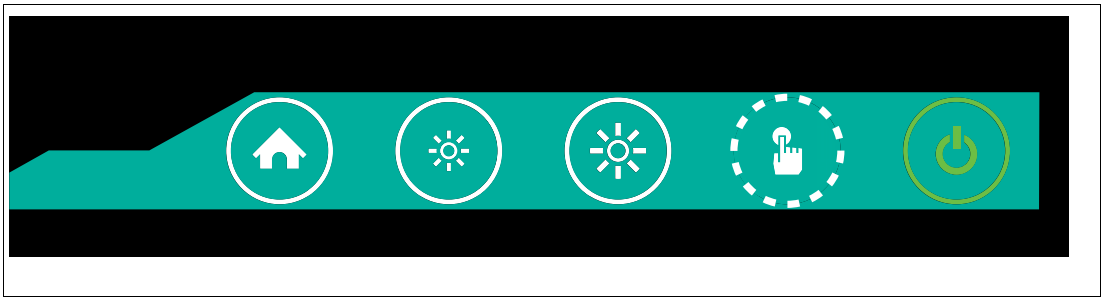
Power ON - Touchscreen ON

- Power LED solid green
- Other LEDs solid white



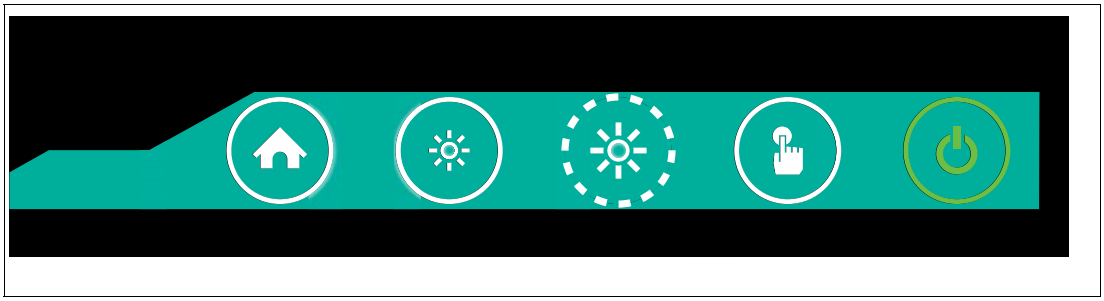
Power ON - Touchscreen OFF

- Power LED solid green
- Touchscreen LED flashing white
- Other LEDs solid white



Power ON - Display OFF (Brightness 0%)

- Power LED solid green
- "Brightness +" LED flashing white
- Other LEDs solid white



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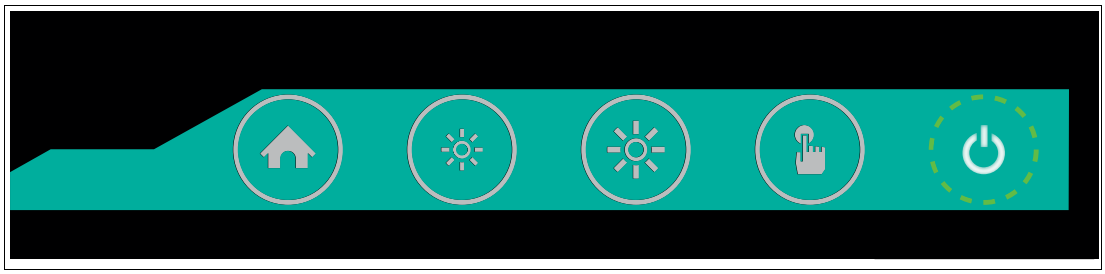
Sleeping

- Power LED flashing green
- Other LEDs off



Brightness Control

The Service controller sets the backlight brightness and controls it directly with the two brightness buttons

Increasing/Reducing Brightness

1. To increase the display brightness, press the button. Press and hold the button to increase the display brightness faster.

   ↳ Each single button press increases the display brightness about 10 %. Pressing and holding the button increases the brightness about 20 % every 0.5 second.

2. To reduce the display brightness, press the button. Press and hold the button to reduce the display brightness faster.

   ↳ Each single button press reduces the display brightness about 10 %. Pressing and holding the button reduces the brightness about 20 % every 0.5 second.

Rebooting the System

To reboot the system, press and hold , and for 5 seconds.

Touchscreen

In contrast to resistive touchscreens, the 10-point multi-touch capacitive touchscreen behind security glass does not operate with selective force (like touching the screen with a finger).

The function principle is based on the change of a capacitive field: a small current of electricity runs across the touchscreen and is measured in the corners of the touchscreen. Touching the display with a finger or a suitable stylus will change the capacitance of the electrical field. In this way the exact finger/stylus position can be located on the touchscreen.

Touch Sensitivity

To increase or decrease the sensitivity of the touchscreen, a number of different sensitivity profiles are available.

This allows adjusting the sensitivity of the touch sensor according to the application requirements (e.g. for working with gloves).

Increasing/Decreasing Touch Sensitivity by Choosing a Sensitivity Profile

To choose a sensitivity profile, use the VisuNet RM Shell user interface.

(Re-)Calibrating the Touchscreen

To (re-)calibrate the touchscreen, use the VisuNet RM Shell user interface.

Locking and Unlocking Front Buttons

The capacitive front buttons are sensitive to water and moisture. To avoid "false positive" button triggers in challenging environments, the front buttons can be protected with a lock mechanism in Service Controller firmware versions 1.3.2.198 and higher.

When the lock mechanism is activated, the operator must first unlock the front buttons via an unlock pattern.

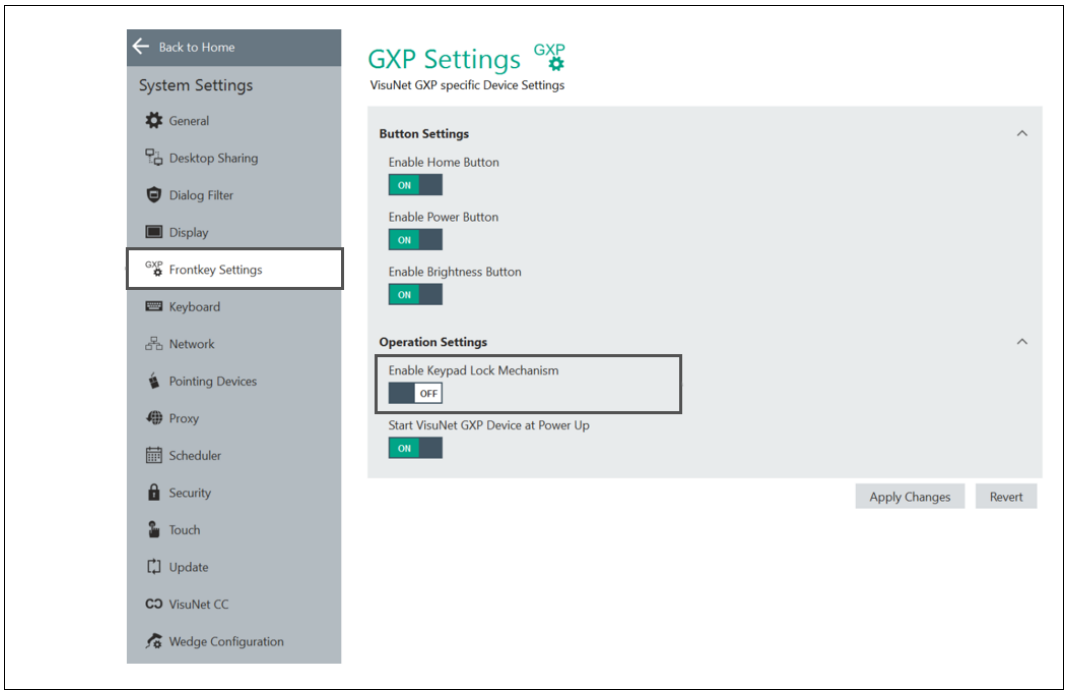
The lock mechanism can only be enabled via VisuNet RM Shell 5 firmware. This feature is available in RM Shell 5 versions with an update of 5.0.1.441 or higher.

Locking the Front Buttons via VisuNet RM Shell 5

The default setting of the button lock mechanism is "off."

1. From the main screen of RM Shell 5, change "Operator" to "Administrator."
2. Enter the system settings app by clicking the appropriate icon on the home screen.

3. Navigate to "frontkey settings" on the navigation bar.
4. Enable the keypad lock mechanism.



5. Set the idle time before the automatic locking of the keypad (in seconds) by using the slider to adjust between 1 and 120 seconds.

Apply/Revert Changes in VisuNet RM Shell 5

If you changed settings, the "Apply Changes" button turns green to indicate changes to the current settings.

1. To save the changes, click Apply Changes.

   ↳ The changes have been saved.

2. If you want to discard the changes, click Revert.

   ↳ The changes have been discarded. The settings have been set back to the last saved version.

In the enabled keypad lock mechanism, none of the front buttons operates individually, but the front buttons continue to show the same state as unlocked. The attempt to press a key causes all LEDs to flash three times. Once home is the only button that lights up, the unlock sequence can be started.

Unlocking the Front Buttons via VisuNet RM Shell 5

When the keypad lock mechanism is enabled, the front buttons must be unlocked before the button functions can be used. To unlock the front buttons, an unlock sequence from left to right on the keypad is required:

1. Press the "home" button when it is illuminated  .
2. Press the "decrease brightness" button when it is illuminated  .
3. Press the "increased brightness" button when it is illuminated  .
4. Press the "touch enable/disable" button when it is illuminated  .
5. Press the "power" button when it is illuminated  .

If the unlock sequence is performed incorrectly, the process must be started again from the beginning.

An unsuccessful unlocking sequence is indicated by an animation: all buttons flash twice, followed by the animation that shows the unlock sequence via the front button LEDs.

If the keypad lock mechanism is activated and any button is pressed except the home button, the unlock animation is shown.

After the set idle time, the front buttons will be locked again automatically. To signal this, all LEDs flash three times. To lock the front buttons before the idle time has passed, press and hold the "touch enable/disable" button until all LEDs are flashing three times.

The locking feature can also be set on startup, or only single buttons can be disabled as requested. For more information, refer to the latest version of the VisuNet RM Shell 5 manual on www.pepperl-fuchs.com.

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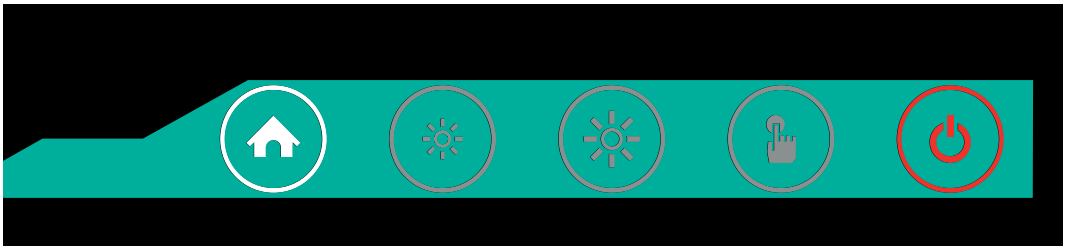
5 Appendix

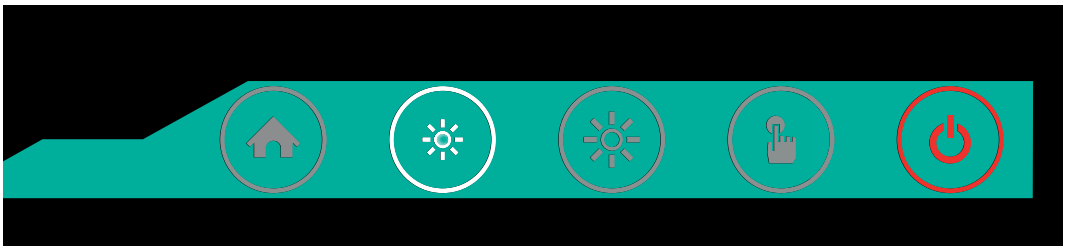
5.1 Health Monitoring

CPU / Display Error



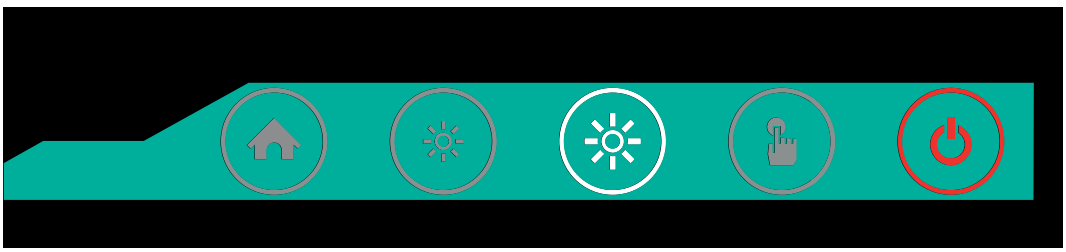
Indication	Problem	Solution
Home button solid white Power button solid red	CPU (Most likely Service Controller) damaged	Replace the CPU
	If backlight still turns on: Display frontkey controller damaged	Replace the display unit

Temperature Error (too Low)



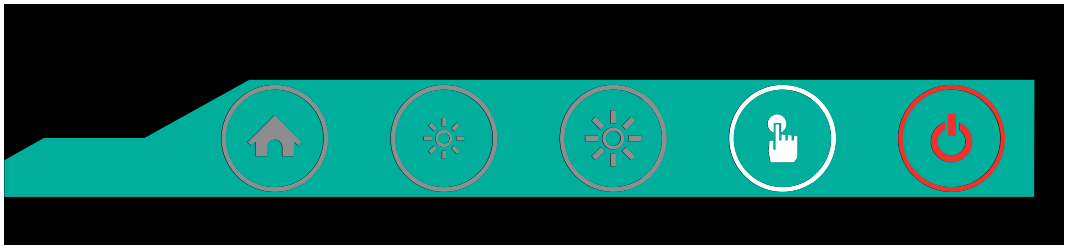
Indication	Problem	Solution
"Brightness -" button solid white Power button solid red	Temperature too low (monitored only during booting up)	Check if ambient temperature surrounding the panel is lower than the panel's allowed operating temperature.

Temperature Error (too High)



Indication	Problem	Solution
"Brightness +" button solid white Power button solid red	Temperature too high (monitored only during booting up)	Check if ambient temperature surrounding the panel exceeds the panel's allowed operating temperature.

Communication Error



Indication	Problem	Solution
Touchscreen button solid white Power button solid red	No communication with DPU devices (e.g. storage device, temperature monitoring,…)	Replace display unit

PROCESS AUTOMATION – PROTECTING YOUR PROCESS

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