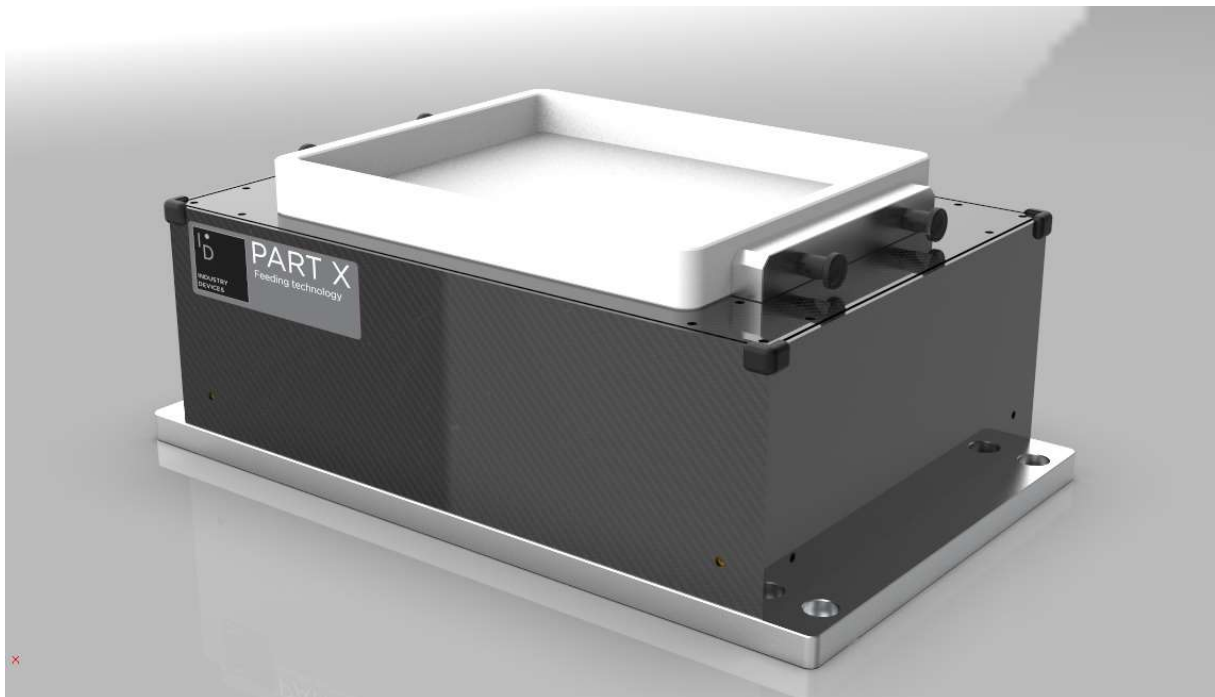




PART X1 USER MANUAL



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1. Introduction

1.1. General information

The following document is the property of Industry Devices d.o.o. and may not be copied or circulated without permission. The information contained in this document is subject to change without notice for the purpose of product improvement. Please read this document carefully before operating your product, to ensure it is used correctly. Nevertheless, should you encounter difficulties during operation or maintenance, please contact the company Industry Devices. The illustrations in this document may vary depending on the model purchased.

In this manual, the safety precautions that you must respect are classified as: “Danger”, “Warning” and “Note”. The following symbols are used:



DANGER!

Failure to observe the instruction may result in serious injury.



DANGER!

Failure to observe this instruction may result in electrocution or serious injury due to electric shock.



IMPORTANT!

Failure to observe this instruction may result in serious injury or damage to property.



NOTE:

The reader's attention is drawn to this point in order to ensure that the product is used correctly. However, failure to respect this instruction does not pose a danger.



REFER TO...

For more information on a specific subject, the reader is invited to refer to another manual or another paragraph.



IMPORTANT!

Under no circumstances may Industry Devices be liable for any loss or damage arising from a failure to observe the instructions contained in the “Safety precautions”. The customer is solely responsible for ensuring the necessary instructions are passed on to all persons concerned.



NOTE:

All dimensions in this document are expressed in millimeters.

1.2. Safety precautions

1.2.1. General safety precaution

1.2.1.1. Transportation



Danger!

Be aware of the weight and take care when transporting the machine. For more information, please refer to chapter 3 “Transportation, handling and installation”.

1.2.1.2. General information



Danger!

Make sure that all power sources and other cables are disconnected from the machine before working on the product.



Danger!

Only qualified person (trained by Industry Devices) are authorized to work on this device.



Danger!

Never unscrew the system’s electrical boxes or protective covers. Serious physical injury could result from electric shock. Only authorized Industry Devices personnel are allowed to access these parts of the system for maintenance or for repair.



Danger!

Do not plug or unplug cables of the system unless it is switched off.



Danger!

Never modify the product. Unauthorized modification may cause the product to malfunction, resulting in injury, electric shock, fire, etc.



Danger!

Turn the machine off in the event of power failure. If you do not do this may cause the product to suddenly start moving when the power is restored.



Danger!

Do not use the product in a place where it may come in contact with water or other liquids.

1.2.1.3. Disposal

When the product reaches the end of its service life, it must be disposed of in accordance with regulations concerning industrial waste.



Important!

All applicable laws, regulations and standards must be observed when disposing of the product.

1.2.2. Danger

1.2.2.1. Safety equipment for operators

For safety reasons operators must wear protective eyewear when using the backlight.



Note:

It is the customer's responsibility to install warning signs to inform anyone working around the PART X1 that they must wear the appropriate safety equipment.

1.2.2.2. Specific danger



Backlight

The PART X1 has an integrated backlight that consists of LEDs (Light Emitting Diodes).



These LEDs emit visible or invisible radiation Depending on the color of the backlighting. LED lighting can create discomfort, cornea, Retinal and lens damage.

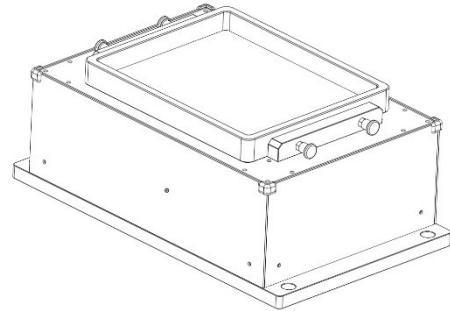


Figure 1-1: Specific warnings

The LEDs used are class 0 according to norm EN 62471. It is the sole responsibility of customer to document their specific application and instruct employees on procedures to limit exposure to LED radiation. The following prevention measures can be recommended:

- Interpose, insofar as the job allows a high pass filter at x nm depending on the color under a fixed or adjustable connection between the source and the employee.
- When the implementation of the foregoing is not possible, provide workers with goggles or a face shield suitable for blocking radiation beyond 700 nm.
- Prohibit or limit as much as possible direct to the source (exposure in the axis or radiation).
- Establish a security perimeter to provide operators from approaching the light source at distances beyond the normal ocular hazard recommended by the manufacturer.

Sound level



The sound level of the PART X1 during intensive use without components in the platform is less than 72 dB(A). Depending on the components distributed in the platform, the sound level may be higher.

In this case, it is the customer's responsibility to implement the necessary measures to meet the safety requirements for operators.

1.3. Warranty information

You will find the PART X1 warranty information (duration, scope or warranty) in the general conditions of sale.

2. Description

2.1. Overview of the product

The PART X1 is composed of a platform capable of vibrating in 3 orthogonal directions in the order to optimally distribute the components in the platform.

PART X1 consists of:

- A 3D vibrating platform
- Electrical interfaces (communication, Power supply, I/O...)



For more information on electrical Interfaces of the PART X1, please refer to section “2.3. Electrical interfaces” on page 12.

- An integrated backlight (optional) that allows easy Recognition of the parts by a camera placed above.

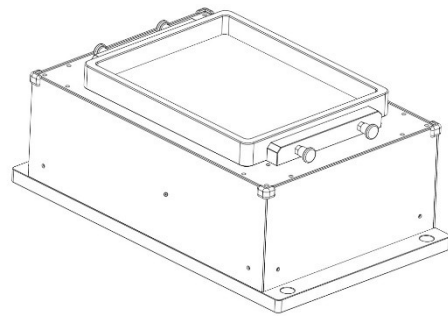
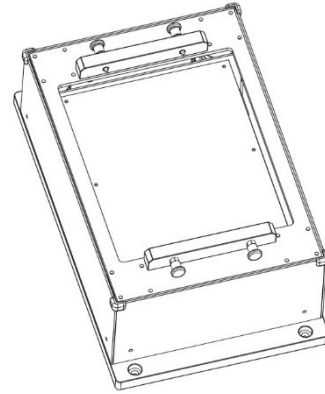


Figure 2-1: PART X1 feeder system overview



For more information on how to remove or change the platform, please refer to section “4.2.2. Removing/ replacing the platform” on page 19.



For more information about the backlight color, see section “2.5.2. Backlight” on page 15.

2.2. General characteristics



Important!

Do not use the device outside the specifications. Failure to follow this instruction will invalidate the warranty.

2.2.1. Technical features

PART X1	
Typical part size	length of side: 10 mm to 40 mm
Integrated high power LED backlight	Optional
Interchangeable backlight color	Green, red, blue, white, infra-red
Independent vibrations in three orthogonal directions	Yes
Interchangeable vibration surface	For more information, please refer to section 2.5.1. Additional platform page 15
Configurable vibration frequency	From 10 Hz to 60 Hz
Maximum weight on the platform (components)	1 kg
Backlight input	Yes
RoHS	Yes

2.2.2. Overall dimensions

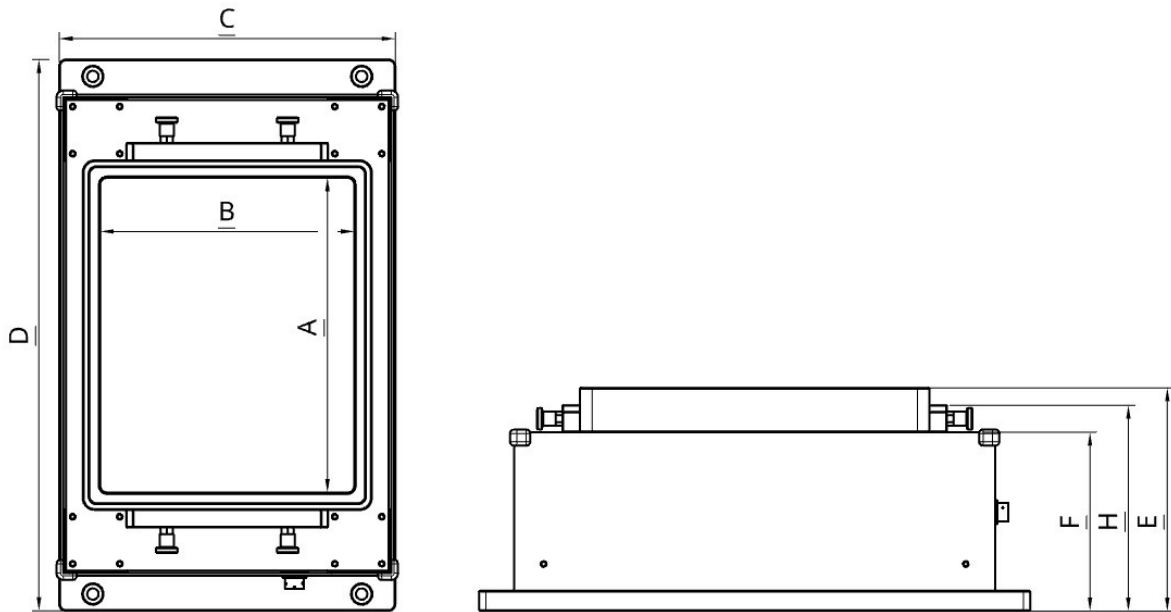


Figure: 2-2: Dimensions

Characteristic		PART X1
Footprint	C	250
	D	410
Size of vibration platform	A	234
	B	189
Profile	F	221
	H	153
	E	166
Weight with platform and backlight		17 kg

2.2.3. Maximum permissible external force on the platform (PART X1)

The maximum permissible external force on a point of the platform (for example, with the gripper) is:

- $F_x = 10 \text{ N}$
- $F_y = 10 \text{ N}$
- $F_z = 30 \text{ N}$

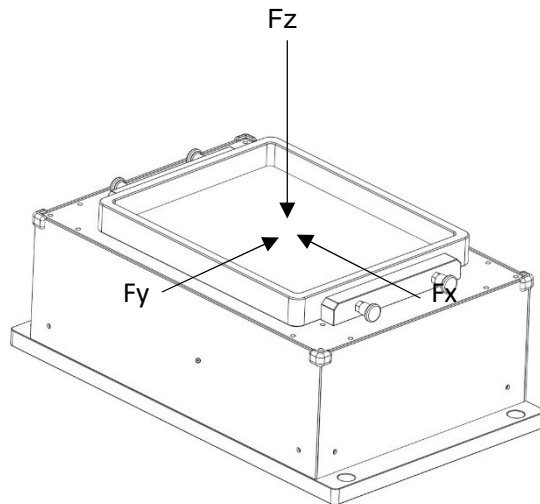


Figure 2-3: External force on the platform



Note that the shock/ impact of the gripper may damage the surface of the platform.

2.2.4. Permissible platform weight

PART X1	
Maximum weight of the frame + platform assembly (without components)	3 kg
Maximum weight of components (in addition to the maximum weight of the frame + platform assembly)	1,5 kg

2.2.5. Maximum plate displacement

PART X1	
Maximum displacement x	± 2
Maximum displacement y	± 2
Maximum displacement z	± 3

2.2.6. Plate Z repeatability

Platte Z repeatability	$\leq \pm 0.3\text{mm}$

2.2.7. Work surface

The maximum dimensions of the work Surface correspond to the size of the illuminated PART X1 platform:

A	234
B	189
C	286

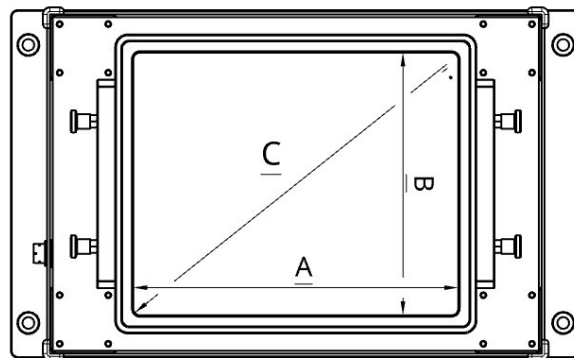


Figure 2-4: Work surface

2.3. Electrical interfaces

2.3.1. Overview

PART X1 is independent module with its own controller.
The electrical interfaces of the PART X1 are situated
at the back of the device:

- a) Power connector
- b) Ethernet connection (RJ45)
- c) Backlight synchronisation

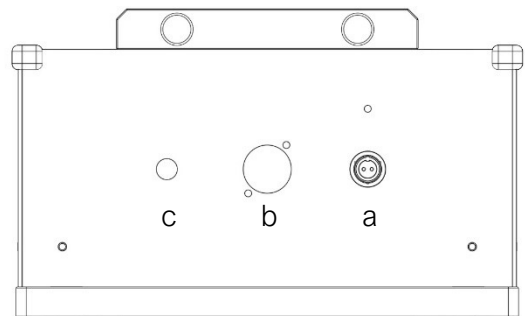


Figure 2-5: Electrical interfaces



Note:

The cables are not part of the PART X1, but can be ordered separately.

Please refer to chapter “2.5.3. Cables” page 16.

2.3.2. Power connection



Important!

- Before supplying power to the PART X1, check that your distribution voltage is the same as normal voltage.
- Use PELV (protected extra-low voltage) normal voltage.
- Always connect the GROUND pin to the supply via the power cable.
- Make sure to connect the 0 and 24V according to the table. An incorrect connection can damage the PART X1.

Signal description	Cable (option)
24V S - power	1
0V GND - S	2

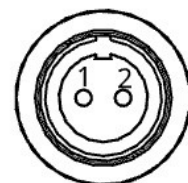


Figure 2-6: Power connection

Connector type (on PART X1 side) is Weipu FS12.

Characteristic	
Voltage	+24 V DC +5%
Consumption	5 A
Peak consumption	12 A



Note:

Use a 20 A supply with a current reserve of 150% for 3 seconds.

The following two power supplies have been approved by Industry Devices:

- PULS QS20.241
- SIEMENS 6EP1336-3BA10

The communication with the PART X1 is established by a standard Ethernet communication via the RJ45 port.

Characteristic	Value
Default IP address	192.162.1.11
Default subnet mask	255.255.255.0
Port	2000
MAC address	Can be read by ARP request

2.3.3. Backlight synchronization

A standard M8 3-pin cable is used to synchronise the camera's image acquisition with the PART X1 backlight. This cable must be connected as follows:

Pin	Waveform	Cable (option)
1	Not wired	Brown
3	0 V GND	Blue
4	+24 V plus (illumination synch)	Black

Connector type (on PART X1 side): M8, 3P, male.

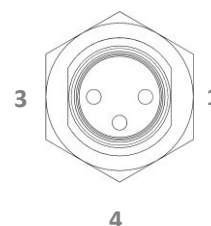


Figure 2-7: Backlight synchronization



Note:

The PART X2 backlight illumination time corresponds to the signal impulse length.

2.4. Mechanical interfaces

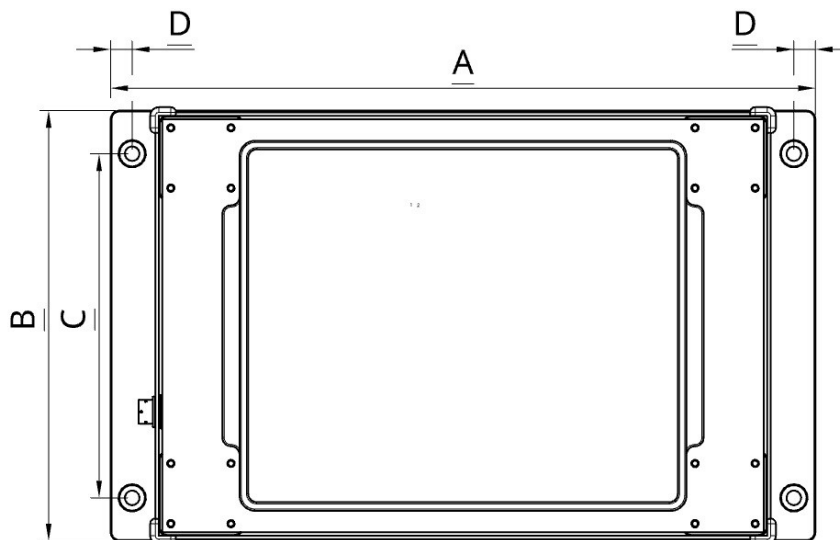
2.4.1. Attachment of the PART X1

To guarantee correct operation, the PART X1 must be securely attached (with four M8 screws) to a solid support, ideally a steel plate, secured to a frame. The total weight of the plate and frame, if they are not attached to the floor, should be at least 200 kg, in order to dampen some of the vibrations.



Notice:

Depending on the weight of the system to which the PART X1 is secured, the vibrations of the PART X1 can interfere with the sensitive surrounding processes. These interferences can be reduced using solid support or by securing it to the floor.

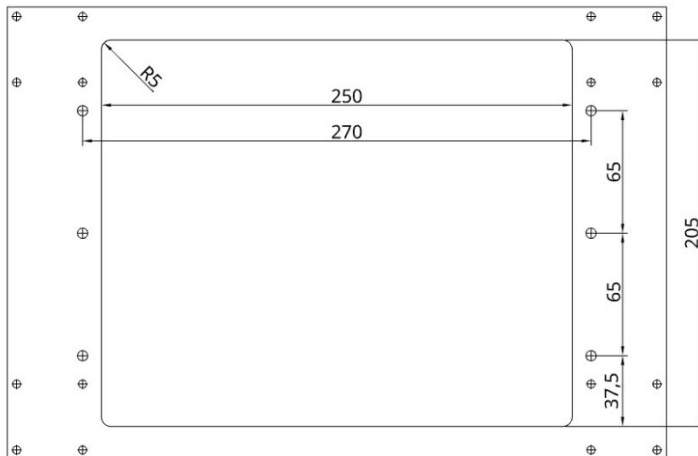


A	410
B	250
C	200
D	12,5

2.5. Accessories and optional modules

2.5.1. Additional platform

In order to improve the availability of certain components on the surface of the feeder, it is possible to structure the platform surface. Industry Devices can provide various types of the platform on request. The customer can also make their own platforms, respecting the following dimensions:



2.5.2. Backlight

The following backlights are available:

Color	Wavelength
Blue	465 nm
Green	550 nm
Infrared	250 nm
Red	645 nm
White	6500 K

The backlight is supplied fitted when it is ordered at the same time as the PART X1.



Danger!

Infrared light (IR) is invisible to the human eyes.
Never use the infrared light without the platform (A).
When the platform (A) is fitted on the PART X1,
the system does not pose a risk for the operator.

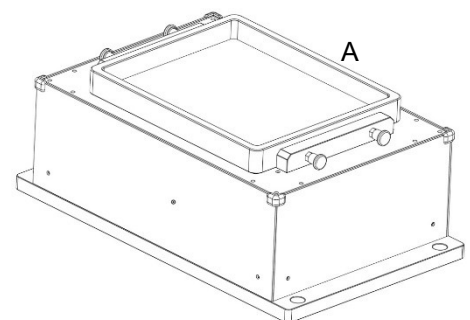


Figure 2-8: Platform

2.5.3. Cables

The following cables are available:

- Power cable
- RJ45 Ethernet cable
- Synchro backlight cable



Note:

For more information on these cables, please contact Industry Devices.



Important!

There is no suitable cable for the cable chains.

3. Transportation, handling and installation

3.1. Packaging of the product, transportation and handling

The product must be transported in accordance with the specific terms indicated on the package (top, bottom and fragile...). In addition, pay particular attention to the following points:



Important!

- Be aware of the weight and take care when transporting the machine.
- The heavy shipping boxes must not be carried by just one person.
- If the shipping box needs to be put down, it should be in a horizontal position.

The PART X1 is shipped in a cardboard box.



Note:

If the items received do not match your order, or are damaged, do not sign the delivery note, and contact Industry Devices as soon as possible.

3.2. Unpacking instructions



Note:

Do not remove the PART X1 from its packaging until you are ready to install it.



Important!

Keep the packaging material and the shipment box in case of return.

Locate the identification label

at the back of the product

and check that the serial number corresponds to the delivery note.

You need this serial number

for any correspondence with Industry Devices.



Figure 3-1: Product label

3.3. Installation and storage environment



Important!

The PART X1 must be mounted on a smooth, flat and strong surface.

3.3.1. Installation environment

The PART X1 can be used under following conditions:

- Protection rating IP50
- Working temperature: +5°C to +40°C
- Humidity: 30% to 80% max. non-condensing



Warning!

Variations in humidity or temperature may affect the global performance of the PART X1.

Do not expose the PART X1 to water or other liquids.



Important!

Do not use the product in an atmosphere or corrosive gases. Rust may form and reduce the structural strength of the device.

3.3.2. Storage environment

The storage environment should be similar to the operating environment. In addition, it is important to protect the PART X1 against dust.

4. Maintenance and repair

4.1. Safety instructions



Important!

The product does not contain any parts which can be repaired by the user. Contact Industry Devices or your local supplier to carry out maintenance. Failure to follow this instruction will invalidate the warranty.



Danger!

Do not operate the system when it is damaged. Ensure that no visual defects are detected before use.



Danger!

Turn the system off and unplug it from the mains before any kind of maintenance.



Danger!

Do not pour water or liquid over the PART X1.

4.2. Maintenance



Important!

For any kind of maintenance, always use PART X1 products.

4.2.1. Periodic maintenance schedule

Our products are largely maintenance-free. However, simple inspections should be performed at regular intervals to ensure optimal performance and safety levels of our equipment.

Element	Period	Reference
Cleaning the machine	Weekly	
Visual inspection and cleaning the platform	Weekly	4.2.3.

Table 4-1: Periodic maintenance schedule



Note:

The information given in the “Table 4-1”: Periodic maintenance schedule” is only informative, maintenance and times must be modified by operator in accordance with their particular system, its operating environment and the amounts of usage.

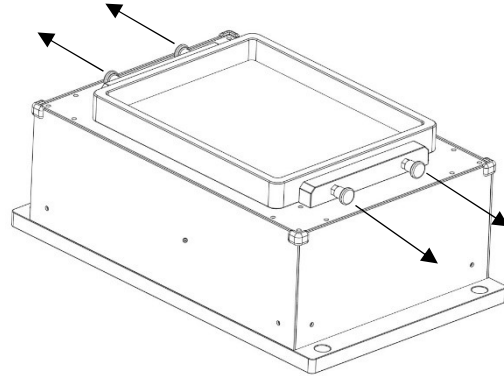
4.2.2. Removing/ replacing the platform



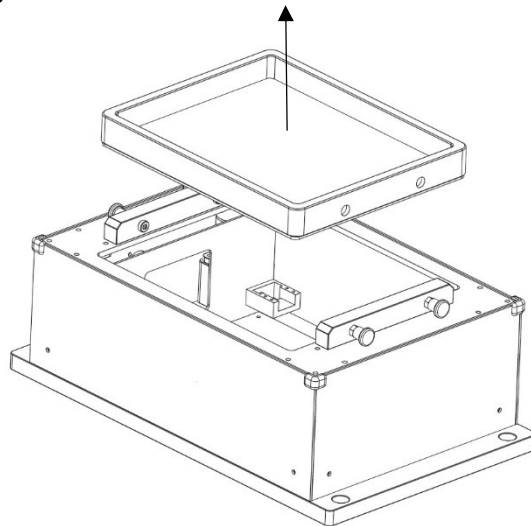
Danger!

Make sure that the backlight is off before removing the platform module.

Step 1: Unscrew the 4 handle screws



Step 2: Remove the PART X1 platform assembly



4.2.3. Checking and cleaning the platform

Material needed:

- Lint-free cloth
- Isopropanol alcohol



Important!

Replace the surface if it is damaged to the extent that it obstructs the vision or behaviour of the parts.

4.3. Repairs

This section gives a list of the components, which can be replaced directly by the customer. For any other repair, the product must be returned to the manufacturer.



Important!

For the kind of repair, always use PART X1 products.

Part name
Platform and platform replacement (see 4.2.2.)

Table 4-2: Replaceable parts

4.4. Technical support

4.4.1. For better service...

Have you read the relevant manuals and not found the answers to your questions?

Before calling the support service, gather the following information for your system:

- Serial number and product key your equipment
- Software version

4.4.2. Contact

A wealth of information is available on our website: www.industry-devices.com

You can also contact us by mail or by phone number.

- Mail: info@industry-devices.com
- Phone number: +386 40 846 645

5. Annexes

It is declared that the following essential requirements of the Machinery Directive 2006/42/EC have been fulfilled:

1.1.1, 1.1.2, 1.1.3, 1.2.1, 1.3.7, 1.5.1, 1.5.5, 1.5.6, 1.5.8, 1.6.1, 1.7.1, 1.7.3, 1.7.4

It is also declared that the relevant technical documentation has been compiled in accordance with part B of Annex VII.

It is expressly declared that the partly completed machinery fulfils all relevant provisions of the following EU Directives or Regulations:

2006/42/EC	Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast) (1) Published in L 157/24 of 09.06.2006
2014/30/EU	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast) Published in 2014/L 96/79 of 29.03.2014

Reference to the harmonised standards used, as referred to in Article 7 (2):

EN ISO 12100:2010-11	Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)
EN 62471:2008	Photobiological safety of lamps and lamp systems (IEC 62471:2006, modified)
EN ISO 13732-1:2008	Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces (ISO 13732-1:2006)
EN ISO 13849-1:2015	Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)
EN 62061:2005	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
IEC 61000-6-2:2016	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2007/A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards; Emission standard for industrial environments
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016, modified)

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