

Instructions for Use

TIP0210-DVI

TIP0410

TIP0810

IP Transceiver

Important




Please read the safety information and all information delivered with the product carefully to familiarize yourself with safe and effective usage.



Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.


 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that material damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Use of EIZO products

 WARNING
EIZO products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by EIZO. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of their respective owners. Please refer to the trademarks listed in the appendix. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

Legal information	2
1 Introduction	5
1.1 Contents of this document	5
1.2 User groups	5
2 Safety information	6
2.1 General safety instructions	6
2.2 Product-specific safety instructions	9
3 Description	10
3.1 Scope of delivery	10
3.2 Intended use	11
3.3 Features.....	11
3.4 Applications	13
4 Setup and installation	14
4.1 Setup and installation location	14
4.2 Positioning as a desktop device	15
4.3 Installation.....	15
4.3.1 Installing in a rack	15
5 Connecting	17
5.1 Safety information for connection	17
5.2 Device connectors	18
5.3 Connection procedure	20
5.3.1 Connecting to the IP network.....	20
5.3.2 Power supply connection	20
6 Commissioning	22
7 Operation	23
7.1 Switching on / off	23
8 Cleaning and check settings	24
8.1 Cleaning.....	24
8.2 Maintenance	25
9 Troubleshooting	26
9.1 Status LED.....	26
9.2 Fault correction	26
10 Technical specifications	27
10.1 Inputs/Outputs	27
10.2 Supported video timing values.....	28

Table of contents

10.3	Interfaces	30
10.4	Power supply	30
10.5	Mechanical design	31
10.6	Climatic conditions	31
10.7	Safety regulations	31
11	Dimension drawings	32
11.1	View from in front, below, and rear	32
12	Appendix	35
12.1	Information on electromagnetic compatibility (EMC)	35
12.2	Markings and symbols	38
12.3	Warranty	39
12.4	Repairs	39
12.5	Environmental protection	39
12.6	Additional devices	39
12.7	Contact	39
12.8	Trademarks	40
	Index	41

1 Introduction

1.1 Contents of this document

Note

This documentation is available in electronic format only. It can be downloaded at www.eizo-or.com , or provided by the sales partner from whom you purchased the product.

This document explains the functionality and the intended use of the IP Transceiver. To ensure clarity, it does not contain all detailed information on this product.

You are additionally advised that the contents of this document are neither part of a previous or existing agreement, commitment, or legal relationship, nor does it modify such.

1.2 User groups

User

In the following, healthcare personnel such as surgeons or medical technicians are referred to as the "user".

Service / service personnel

"Service" or "Service personnel" identifies authorized personnel with knowledge of medical imaging technology, local standards for image quality requirements, and safety of medical products, for example a hospital technician or manufacturer of medical devices.

Cleaning staff

"Cleaning staff" refers to personnel responsible for cleaning medical devices.


2 Safety information

2.1 General safety instructions

Correct and safe operation of EIZO devices assume professional transport, storage, installation, and connection, as well as careful operation and service.

The devices may only be used for applications for which they are intended.

For safety reasons, the following precautions must be observed:

 DANGER
<p>Please observe all warning information present on the device and in the instructions for use</p> <p>There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur.</p> <p>Observe the safety requirements of EN 60601-1 (IEC 60601-1)</p> <p>To prevent injury to patients and users, connect the electrical system in accordance with the safety requirements of EN 60601-1 (IEC 60601-1) for "Safety requirements for medical electrical systems".</p> <p>Connecting the protective earth conductor</p> <p>If the device is connected to the line power, the device must be connected to a protective ground conductor. This is the only way to ensure that the touch leakage current in a first fault event does not exceed 500 µA.</p> <p>The interruption of the device's protective conductor is considered a first fault event in accordance with EN 60601-1.</p> <p>Use the following measures to ensure that the leakage currents remain below the specified limits:</p> <ul style="list-style-type: none">• Separators for signal input unit or signal output unit• Use of a safety isolating transformer• Use of the additional protective ground terminal <p>Mounting of the monitor: The monitor's suspension arm must have its own protective ground conductor. This protective ground conductor guarantees, together with the protective ground conductor of the monitor, that the housing leakage current always remains less than 500 µA, even in the event of a single fault condition.</p> <p>No unauthorized opening of the device / no unauthorized service or maintenance work</p> <p>The device may only be opened by qualified personnel. Likewise, service or maintenance work may only be carried out by qualified personnel. There is a risk of electric shock.</p> <p>No liability is accepted for death and injury to persons or damage to property resulting from work carried out by non-qualified personnel.</p> <p>Do not touch components in the device</p> <p>If the device is connected to the line power, components in the device are subjected to high voltages. Touching the components may be fatal.</p> <p>No contact between device and patients</p> <p>The device is not suitable for direct contact with a patient. The device and patient must never be touched simultaneously. Otherwise there is a danger to life and limb.</p>

 **DANGER**

Please observe all warning information present on the device and in the instructions for use

There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur.

Never use defective power cables

If a damaged or unsuitable power cable is used, it could result in a fire or electric shock. Only use power cables with PE contacts approved by the manufacturer.

Disconnect the power cable correctly

When disconnecting the power cable, always do so by holding the plug. Ensure that your hands are dry. There is a risk of electric shock.

Do not insert any objects into the housing

Objects inserted into the housing may result in an electric shock or damage to the device.

Do not place any objects on top of the device

If you place objects on top of the device, this can lead to overheating and fire.

Avoid penetration of liquid

Liquids seeping into the device may result in electric shock or device failure.

 **CAUTION**

Extensive damage to property may result if the device is not connected correctly

That is why you should observe the warning information:

Connection must be carried out by specialists

Please ensure that all steps are taken to avoid injuries or incorrect diagnoses.

- Only use the video cables specified by the manufacturer for the connection.
- Only use power cables with PE contacts.
- Only use power outlets with PE contacts.
- Do not connect too many devices to a power outlet or extension cable.
- Observe the information provided by the respective manufacturer.
- If required by the application or local regulations, QA software must be used for quality control and documentation.

Connection in the USA and Canada

Molded power plugs must comply with the requirements for "hospital grade attachments" CSA Std. C22.2 No. 21 and UL 498.

Connection in China

Only use power cables approved for China. These power cables are identified by the labels "CCC" or "CQC".

Observe the country-specific regulations

Observe all regulations of the country in which the device is used.

CAUTION

Extensive damage to property may result if the device is not connected correctly

That is why you should observe the warning information:

- Desktop installation:
Place the device on a solid and level surface. The attached stand, as well as the installation surface, must be suitable for the weight of the device.
- For mounting on a wall or ceiling suspension:
The mount unit must be suitable for the weight of the device.
- For installation in a rack:
Observe the installation sequence, and provide ventilation for the device.

Provide adequate air circulation

When installing the device, ensure that there is adequate air circulation for operation. The permissible ambient temperature range must not be violated. Otherwise, the device could be destroyed by overheating.

Avoid sources of heat

Do not install the device in the vicinity of sources of heat, such as radiators, heating appliances or other devices that can generate or emit heat.

Do not subject the device to jolting or shocks

The device contains sensitive electronic components that could be damaged by jolting or shocks.

Only switch on a cold device following adaptation to room temperature

If the device is brought into a room with a higher or rising temperature, condensed water will form in and on the device. Do not switch on the device until the condensed water has evaporated. Otherwise, the device could be damaged.

CAUTION

Extensive damage to property may result if the device is not connected correctly

That is why you should observe the warning information:

Transportation only in original packaging

Use the original packaging for transportation, and transport in the correct shipping position. Be sure in particular to protect the monitor LCD modules from shocks.

Care of device / cleaning agents

- Remove water drops immediately; extended contact with water discolors the surface.
- Only clean the surfaces using the cleaning agents referred to in the Instructions for Use.
- Monitor: The screen is extremely sensitive to mechanical damage. Absolutely avoid scratches, shocks, etc.

What to do if the device is faulty

If the following conditions exist, the device must be disconnected from the line power and checked by qualified personnel:

- Damage to the plug or power cable.
- After liquid seeps into the device.
- If the device has been exposed to moisture.
- If the device does not function or if a fault cannot be eliminated using the Instructions for Use.
- If the device has been dropped and/or the housing damaged.
- If the device smells of burning or makes peculiar noises.

2.2 Product-specific safety instructions

NOTICE
Network security <ul style="list-style-type: none">• Make sure the network environment is secure.• Follow the information in 60601-1, Chap. 16, ME Systems.

3 Description

3.1 Scope of delivery

The scope of delivery includes the device, and in some versions various components. After unpacking, check the scope of delivery for correctness and completeness.

Note
Keep the packaging material for subsequent transport of the device.

Device

The IP Transceiver is offered in the following versions.

Product	Order number	Description
IP-Transceiver TIP0210-DVI	6GF60700AE01	IP Transceiver for simultaneous encoding and decoding of signals with DVI interfaces and resolutions of up to 1920x1200 at 60 Hz.
IP-Transceiver TIP0210-DVI (Bulk)	6GF60700AE00	Like IP-Transceiver TIP0210-DVI, but the scope of delivery does not include components.
IP-Transceiver TIP0410	6GF60700AE03	IP Transceiver for simultaneous encoding and decoding of signals with HDMI interfaces and resolutions of up to 4K (UHD) at 30 Hz.
IP-Transceiver TIP0410 (Bulk)	6GF60700AE02	Like IP-Transceiver TIP0410, but the scope of delivery does not include components.
IP-Transceiver TIP0810 (Bulk)	6GF60700AE04	IP Transceiver for encoding and decoding of signals with HDMI interfaces and resolutions of up to 4K (UHD) 60 Hz (scope of delivery without components).

Components

- 1 power supply unit
- 1 power cable
- Safety information

3.2 Intended use

The IP Transceiver was designed to distribute and switch video, audio, and control signals in real time. It can be used as an encoder or decoder, and is the core component of CuratOR Alipe, the IP-based solution from EIZO.

CuratOR Alipe is intended for use in the operating room, for flexible forwarding and distribution of medical images and corresponding audio, data, and control information during surgery, in digital operating rooms, control rooms, and other medical environments.

CuratOR Alipe is to be used by healthcare professionals, trained service personnel, and MTAs (system integrators and OEMs), and has to be installed according to the instructions in the manual, the directives, and local laws. It is mostly invisible to the end users of such systems.

Ensuring overall system security is the responsibility of system integrators and OEMs are experienced with the requirements and security risks associated with the integrated system.

3.3 Features

Tested and developed for CuratOR Alipe from EIZO

The IP Transceiver is the central element of the CuratOR Alipe system. CuratOR Alipe is an IP-based solution for flexible data transmission in the operating room (OR). With this EIZO system, image and video data can be transmitted without compression, both within and outside the OR.

Loss-free data transmission with optimum image quality

The IP Transceiver allows for a transmission speed of up to 10 Gbit/s as well as picture transmission of up to 4K UHD resolution (only TIP0410 or TIP0810).

The IP Transceiver works without compression and fully retains the color space, ensuring the optimum possible image quality.

Immediate image display

Images are transmitted without visible delay, enabling excellent hand-eye coordination for the working physician. He obtains a direct visual response to his activity, for example, during endoscopic interventions.

Far Distances

The data are transmitted via fiber-optic cable. Transmission distances of up to 10 km are possible. As a result not only rooms, but also whole buildings can be linked to one another. This enables the transmission of image and audio data not only within the OR, but also to conference rooms or lecture halls.

Universal device

The TIP0210-DVI and TIP0410 can be used simultaneously as an encoder and decoder. The TIP0810 can be used both as an encoder and as a decoder.

The number of devices and versions can thus be reduced. In addition, planning can be more flexible and storage and maintenance expenditures lower.

Two video signals simultaneously

With the TIP0210-DVI and TIP0410, up to two video links can be processed in parallel. As such, the video interfaces can be used as input and output at the same time. In addition, a connected FHD signal can be looped through.

Integrated video management

Various video sources can be displayed on screen simultaneously using one cable. This enables various multiple views.

Passive cooling

The IP Transceiver works with passive cooling and is thus noiseless and without mechanical wear.

Integration in existing systems

The IP Transceiver is compatible with commercially available network components and can be integrated into existing systems and applications.

Operation via CuratOR Caliop

The IP Transceiver can be operated using the CuratOR Caliop control software. At the click of a mouse or simple touch, a video source can be selected or assigned to one or more monitors. An existing connection is displayed visually. If needed, the transmission can be logged on a recorder, and stored in the patient folder. for example.

3.4 Applications

WARNING


Service personnel

- The IP Transceiver may only be used by service personnel that perform technical installations either in medical environments or of signal processing systems.
- When the IP Transceiver is used with the Large Monitor Manager (LMM), service personnel must also have knowledge of LMM operation.


CuratOR Alipe system example



4 Setup and installation

 CAUTION
Changes to device Do not make any mechanical or electric changes to the device. Otherwise the device warranty becomes invalid. The manufacturer is not liable for changes made to the device.

4.1 Setup and installation location

 CAUTION
Overheating of the device Safe operation is endangered. <ul style="list-style-type: none">• Never place the device near a radiator.• During installation, ensure sufficient heat dissipation for the device to prevent overheating.• To ensure proper and safe operation of the device, the ambient temperature must remain within the permissible ambient temperature range.• When installing the device in a rack in particular, observe the permissible ambient temperature range.

NOTICE
Area surrounding the installation location Protect the device from: <ul style="list-style-type: none">• Dirt• Dust penetration• Moisture

NOTICE
Device connections accessible at all times The power supply connector of the IP Transceiver is the only way to fully disconnect the transceiver from the power network. <ul style="list-style-type: none">• The power supply connection or the cable to the external power supply unit has to be installed such that it is accessible to the user at all times.• If this is not possible, a separator accessible to the user must be designed and installed in accordance with applicable safety standards.

NOTICE

Condensation

If the device is brought into a warm environment from a cold one, condensation may form in the device. This could result in a short circuit when switching on the device, damaging it.

- Wait until the condensed water has evaporated, including that inside the device, before you switch it on. This can take several hours.

4.2 Positioning as a desktop device

The IP Transceiver can be set up as a desktop device. Make sure the surface where it is to be placed is solid and even.

4.3 Installation

Note

Mounting holes of the IP Transceiver

- The mounting holes have a distance of 115 x 155 mm. See also [Dimension drawings](#) [▶ 32].
- The mounting holes have no threads. You must use thread-cutting screws to install the IP Transceiver.

4.3.1 Installing in a rack

Using the holders available as an option, the IP Transceiver can be installed vertically in a 19" rack.

Horizontal installation is possible as well. In this case use the installation rail, which is available as an accessory.

CAUTION

Tightening torque

Excessive tightening torque when installing the device can damage the mounting surface. The tightening torque depends on the material of the selected mount. Adapt the tightening torque to the mount material accordingly.


Screw specifications for the holder

No.	4
Thread	M3
Strength	8.8
Screw length	8 mm
Maximum tightening torque	3 Nm

Screw specifications for the rack	
No.	2
Thread	M4
Strength	8.8
Screw length	8 mm
Maximum tightening torque	3 Nm

Procedure

1. Attach the two holders on the back of the IP Transceiver using the four M3 screws provided.
CAUTION: Comply with the maximum tightening torque of the screws.
2. Using the two M4 screws provided, install the IP Transceiver vertically in the rack.
Note: Follow the safety information for installing devices in the rack.

 CAUTION
Installing devices in the rack <ul style="list-style-type: none">• To prevent the rack from tipping over, arrange the devices so that the center of gravity of the rack and devices is below the center of the rack.• Always install the devices from bottom to top.• To prevent extreme operating temperatures within the rack, ensure that the maximum temperature does not exceed the rated ambient temperature for the device.• To prevent extreme operating temperatures due to reduced ventilation, ensure adequate ventilation of the respective device for safe operation.• You must install the devices such that the respective power switch, plug connector, and connection panel are accessible to the user. If this is not the case, install an additional element ensuring access. The installation has to comply with applicable safety standards.

5 Connecting

5.1 Safety information for connection

Observe all safety information and warnings for the device to ensure danger-free operation.

 **CAUTION**

Shielding measures

Follow all shielding measures in accordance with local EMC directives. If these guidelines are not observed, device malfunction may result.

 **CAUTION**

Excessive currents, short circuits, and ground faults

In accordance with national standards and regulations, protection against excessive currents, short circuits, and ground faults must be incorporated into the building installation.

NOTICE

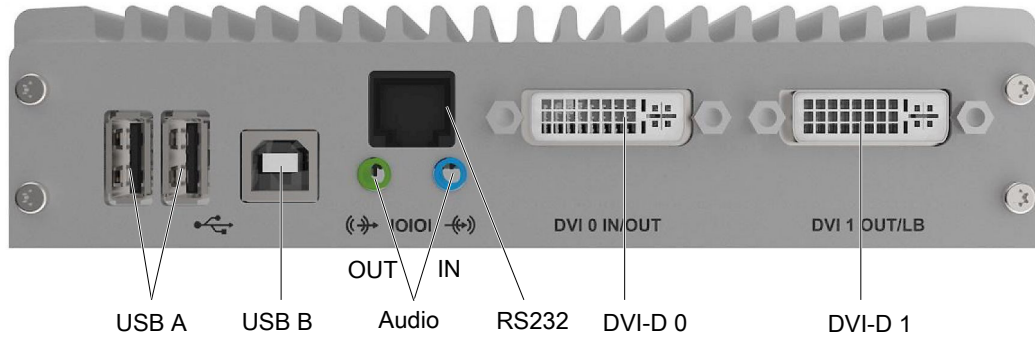
Cable installation

Observe the following instructions:

- Only shielded cables are to be used for all signal connections.
- The connecting cables must not be kinked.
- The minimum bending radius of a connecting cable generally equals five times the cable diameter.
- Do not route signal cables and power cables next to one another. Otherwise, line power subject to heavy interference could result in reversible pixel errors.
- The device must not share a line power supply with motors or valves (interference!).
- Externally connected cables can represent a trip hazard. Make sure that all incoming cables are safely routed.
- If the device offers strain relief mechanisms for the cables, use them to prevent unintended loosening of connected cables.

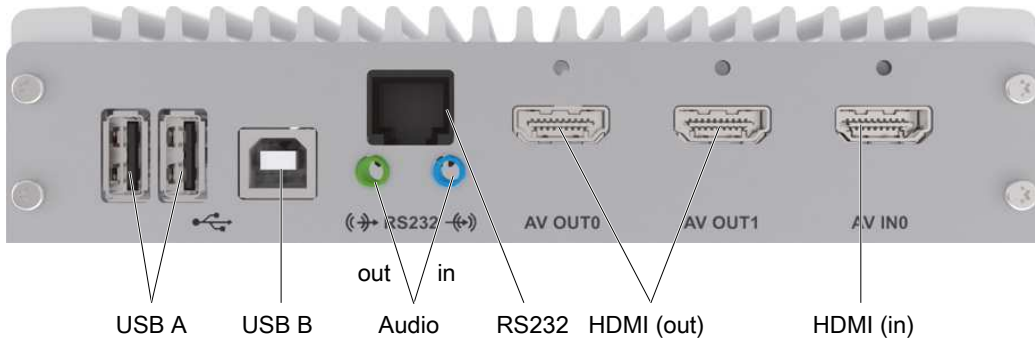
5.2 Device connectors

Front connectors TIP0210-DVI



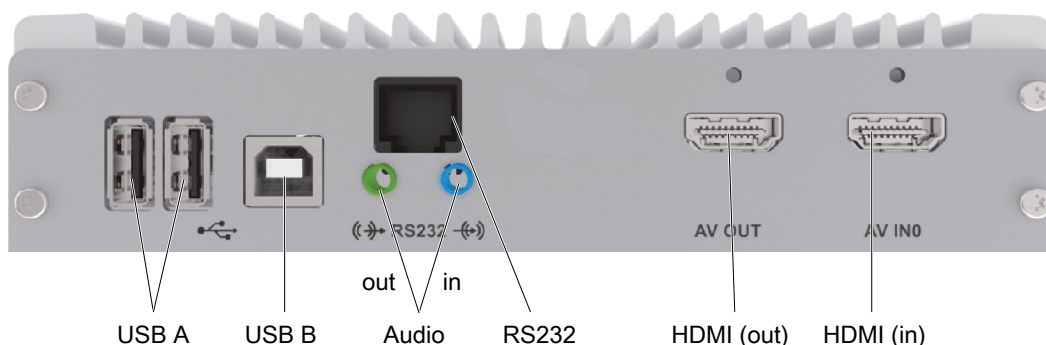
Connector	Type	Function
USB A	USB Downstream	For connecting external USB HID devices.
USB B	USB Upstream	For connecting to the USB HID host.
Audio	Jack	For connecting analog audio devices.
RS232	Serial interface	Communications interface for service activities.
DVI-D 0	DVI-D Single Link	Input or output: to connect signal source or monitor.
DVI-D 1	DVI-D Single Link	Output or loop through: to connect a monitor.

Front connectors TIP0410



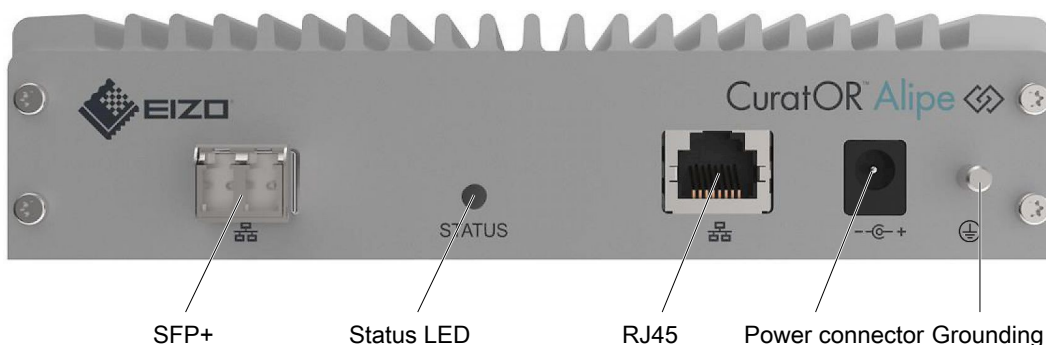
Connector	Type	Function
USB A	USB Downstream	For connecting external USB HID devices.
USB B	USB Upstream	For connecting to the USB HID host.
Audio	Jack	For connecting analog audio devices.
RS232	Serial interface	Communications interface for service activities.
HDMI (out)	HDMI port	Output or loop through: to connect up to two monitors.
HDMI (in)	HDMI port	Input: to connect a signal source.

Front connectors TIP0810



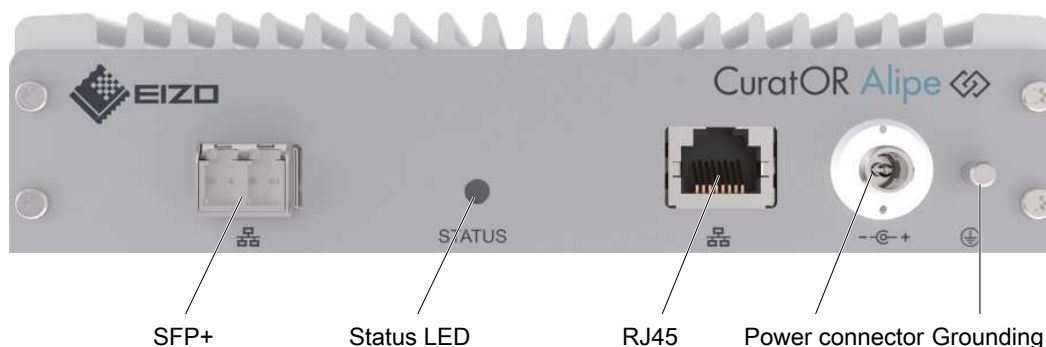
Connector	Type	Function
USB A	USB Downstream	For connecting external USB HID devices.
USB B	USB Upstream	For connecting to the USB HID host.
Audio	Jack	For connecting analog audio devices.
RS232	Serial interface	Communications interface for service activities.
HDMI (out)	HDMI port	Output: to connect a monitor.
HDMI (in)	HDMI port	Input: to connect a signal source.

Rear connectors TIP0210-DVI



Connector	Type	Function
SFP+	SFP+ chassis	For inserting the SFP+ module (available separately) for optical network connections. CAUTION: To prevent malfunctions, only the SFP+ modules listed in chapter Inputs/Outputs [▶ 27] may be used.
Status LED	Light emitting diode	Indicates the device status. See also Status LED [▶ 26].
RJ45	RJ connector	To connect to the IT network (up to 1 Gbit/s).
Power connector	P1J barrel connector	For connecting the external 12 V DC power supply unit provided.
Grounding	Screw	To connect a protective conductor.

Rear connectors TIP0410 and TIP0810



Connector	Type	Function
SFP+	SFP+ chassis	For inserting the SFP+ module (available separately) for optical network connections. CAUTION: To prevent malfunctions, only the SFP+ modules listed in chapter Inputs/Outputs [▶ 27] may be used.
Status LED	Light emitting diode	Indicates the device status. See also Status LED [▶ 26] .
RJ45	RJ connector	To connect to the IT network (up to 1 Gbit/s).
Power connector	P2S barrel connector (secured)	For connecting the external 12 V DC power supply unit provided.
Grounding	Screw	To connect a protective conductor.

5.3 Connection procedure

5.3.1 Connecting to the IP network

Note

Service personnel connect the IP Transceiver to the network when installing the CuratOR Alipe.

5.3.2 Power supply connection

⚠ CAUTION

Certified external power supply unit

- Use a certified external power supply unit, taking into account the applicable international standards and regional regulations.
- For a medical environment, use only a power supply unit tested in accordance with medical standards, such as the external power supply unit offered in the scope of delivery.

 **CAUTION**

Neutral conductor

The power supply unit provided is designed for line power with a grounded neutral conductor.

- To avoid risk of electric shock, this device must only be connected to line power with a protective conductor.
- Contact the responsible building technician or a qualified electrician if you are uncertain whether the line power is equipped with a protective conductor.

Procedure

To connect the IP Transceiver to line power:

1. Connect the power supply unit to the power connector on the back of the IP Transceiver.
2. Connect the power supply unit to the line power.
 - ⇒ Upon connecting the power cable to line power, the IP Transceiver starts automatically with the preinstalled firmware version. After a few seconds, the Status LED shows the status of the device. In normal mode, the [Status LED \[▶ 26\]](#) flashes once per time interval of about 3 seconds.

6 Commissioning

Note

Service personnel put the IP Transceiver into operation when installing the CuratOR Alipe.
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7 Operation

After start-up of the IP Transceiver, user operation consists of switching the power on and off.

After switching on the IP Transceiver, the Status LED flashes green. In normal mode, the Status LED flashes once per time interval of about 3 seconds.

7.1 Switching on / off

The IP Transceiver is connected to line power with a power supply unit.

 CAUTION
Certified external power supply unit
<ul style="list-style-type: none">• Use a certified external power supply unit, taking into account the applicable international standards and regional regulations.• For a medical environment, use only a power supply unit tested in accordance with medical standards, such as the external power supply unit offered in the scope of delivery.


Full separation from line power

To fully separate the IP Transceiver from line power, the power cable of the power supply unit must be disconnected from the line power. Either pull the power cable plug from the line power socket or use a separator.


To switch on the IP Transceiver again after complete disconnection from the power supply, insert the power cable plug in the line power socket or deactivate the separator.

8 Cleaning and check settings

8.1 Cleaning

 CAUTION
<p>Device maintenance, cleaning and disinfecting</p> <ul style="list-style-type: none"> • The device is sensitive to mechanical influences. Avoid mechanical shocks or similar. • Make sure liquids do not seep into the device. Liquids that seep into the device may result in an electric shock or failure of the device. • Clean the dirty housing with a damp cloth and, if necessary, with a commercially available cleaning agent. • Remove all cleaning agent and disinfectant residue. • Use only tested disinfectants.

Recommended cleaning agents and disinfectants

 CAUTION
<p>Use of cleaning agents and disinfectants</p> <p>When handling the recommended cleaning agents and disinfectants, observe the information in the respective safety data sheet.</p>

Agent class	Tested cleaning agents and disinfectants	Further examples
Aldehyde	Melsitt	Aldasan 2000 Kohsolin Gigasept FF Cidex
Chlorine derivatives	Terralin	Quartamon Med
Disinfectants	Mikrozid Sensitive Liquid	TaskiDS5001 (Diverseylever Labs) Morning Mist Surfanios Fraicheur Citron (Anios Labs)
Guanidine derivatives	Lysoformin	
Quaternary compounds	Incidur spray, undiluted	
Peroxide compounds	Perform	Dismozon pur
Standard household washing-up liquid	denk mit	Fairy Ultra, Pril, Palmolive
Pyridine derivatives	Activ spray, undiluted	
Water	Tap water Distilled water	
Spray disinfectant	Nocolyse	Test conditions: Contact test according to MFR890/009

Prohibited cleaning agents and disinfectants

The following cleaning agents and disinfectants could lighten the finish and are therefore prohibited.

Agent class	Tested cleaning agents and disinfectants	Further examples
Alcohol	Ethyl alcohol, 96 %	Hospiset cloth
Disinfectants	Mikrozid liquid	
Petroleum spirit	Petroleum spirit close to boiling	Petroleum ether

Note
Cleaning other components Information on cleaning or disinfection of other system components can be obtained from the respective instructions for use.

8.2 Maintenance

The IP Transceiver is maintenance free.

9 Troubleshooting

9.1 Status LED

In IP Transceiver normal mode, the Status LED flashes once per time interval of about three seconds. After each flash there is a brief pause so that the number of flashes can be counted.

The indicators have the following meanings:

Indicator	Status	Measure
Continuously green	FPGA is starting (approx. 2 seconds)	<ul style="list-style-type: none"> None
Flashing green (single)	Normal operation	<ul style="list-style-type: none"> None. The network connection is established, the IP address configured, and the server connected.
Flashing green (double)	The network connection is established and the IP address has been configured.	<ul style="list-style-type: none"> Establish the connection to the server
Flashing green (triple)	Network connection is established	<ul style="list-style-type: none"> Configure the IP address
Flashing green (quadruple)	No network connection	<ul style="list-style-type: none"> Establish network connection
Flashing red	Hardware error	<ul style="list-style-type: none"> Contact Service
No display	No power	<ul style="list-style-type: none"> Connect / replace external power supply unit

9.2 Fault correction

Fault	Cause	Measure
Device does not start correctly after a restart	Capacitive components not complete offloaded	<ul style="list-style-type: none"> Switch the unit off and wait with the restart at least 15 Seconds.

10 Technical specifications

10.1 Inputs/Outputs

Type	No.
Network connection SFP+ (10 Gbit/s - Ethernet)	1 CAUTION: To avoid malfunctions, only the following SFP+ modules may be used: <ul style="list-style-type: none"> • Avago AFBR-708SMZ • Avago AFBR-709SMZ • FCI TRX10GVP2010C1 • FCI TRX10GVP2010C2 • Fiberstore SFPP-SR
DVI-D	2 (TIP0210-DVI)
HDMI	3 (TIP0410) 2 (TIP0810)
USB Type A (downstream)	2
USB Type B (upstream)	1
Jack 3.5 mm (audio)	1x In, 1x Out
RS232 (for service purposes)	1
RJ45 (Ethernet, 1 Gbit/s)	1

10.2 Supported video timing values

Input	Output								
CEA-861 format	CEA-861 format					VESA format			
	VGA	FHD (p60)	FHD (p50)	UHD (p30)	UHD (p60)	VGA	SXGA	UXGA	WUXGA
VGA	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
SDTV 480i	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
SDTV 576i	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
EDTV 480p	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
EDTV 576p	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
HD (720p60)	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
HD (720p50)	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
FHD (1080p60)	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
FHD (1080p50)	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
UHD (2160p30)*	TIP0410 TIP0810	TIP0410 TIP0810	TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0410 TIP0810	TIP0410 TIP0810	TIP0410 TIP0810	TIP0410 TIP0810
UHD (2160p60)*	TIP0810	TIP0810	TIP0810	TIP0810	TIP0810	TIP0810	TIP0810	TIP0810	TIP0810

* Single Out only

Technical specifications
10.2 Supported video timing values

Input	Output								
VESA format	CEA-861 format					VESA format			
	VGA	FHD (p60)	FHD (p50)	UHD (p30)	UHD (p60)	VGA	SXGA	UXGA	WUXGA
VGA	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
SVGA	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
XGA	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
SXGA	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
UXGA	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
WXGA	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
WSXGA+	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810
WUXGA*	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0410 TIP0810	TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810	TIP0210 TIP0410 TIP0810

* Single Out only

10.3 Interfaces

TIP0210-DVI

Type	No.
DVI-D (in / out)	1
DVI-D (out / loop through)	1

TIP0410

Type	No.
HDMI (in)	1
HDMI (out / loop through)	2

TIP0810

Type	No.
HDMI (in)	1
HDMI (out)	1

10.4 Power supply

Power supply	External power supply, 230 V AC
Rated voltage	12 VDC
Consumption	17 W (optional: 5 W for USB)
Current consumption	max. 2 A

External power supply unit (if included in scope of delivery)

Power connector	2-Pin AC socket IEC320-C8 (small device socket)
Line voltage (input)	80 V AC - 230 V ($\pm 10\%$)
Line frequency (input)	47 Hz - 63 Hz
Line voltage (output)	12 V / 5.2 A P1J barrel connector for power supply(TIP0210-DVI)
Line voltage (output)	12 V / 5.2 A P2S barrel connector (secured) for power supply(TIP0410, TIP0810)
Power	60 W

10.5 Mechanical design

Housing	Aluminum (color: silver)
Degree of protection	IP20
Dimensions (W x H x D) in mm	164 x 166 x 38.5 mm (height of cooling fins: 6 mm)
Weight	1.05 kg

10.6 Climatic conditions

In operation	
Temperature range	0 °C - 40 °C ambient temperature
Temperature gradient	Maximum 5 °C/h, without condensation
During transport and storage (packed)	
Temperature range	-10 °C - +50 °C ambient temperature
Temperature gradient	Maximum 10 °C/h, without condensation

10.7 Safety regulations

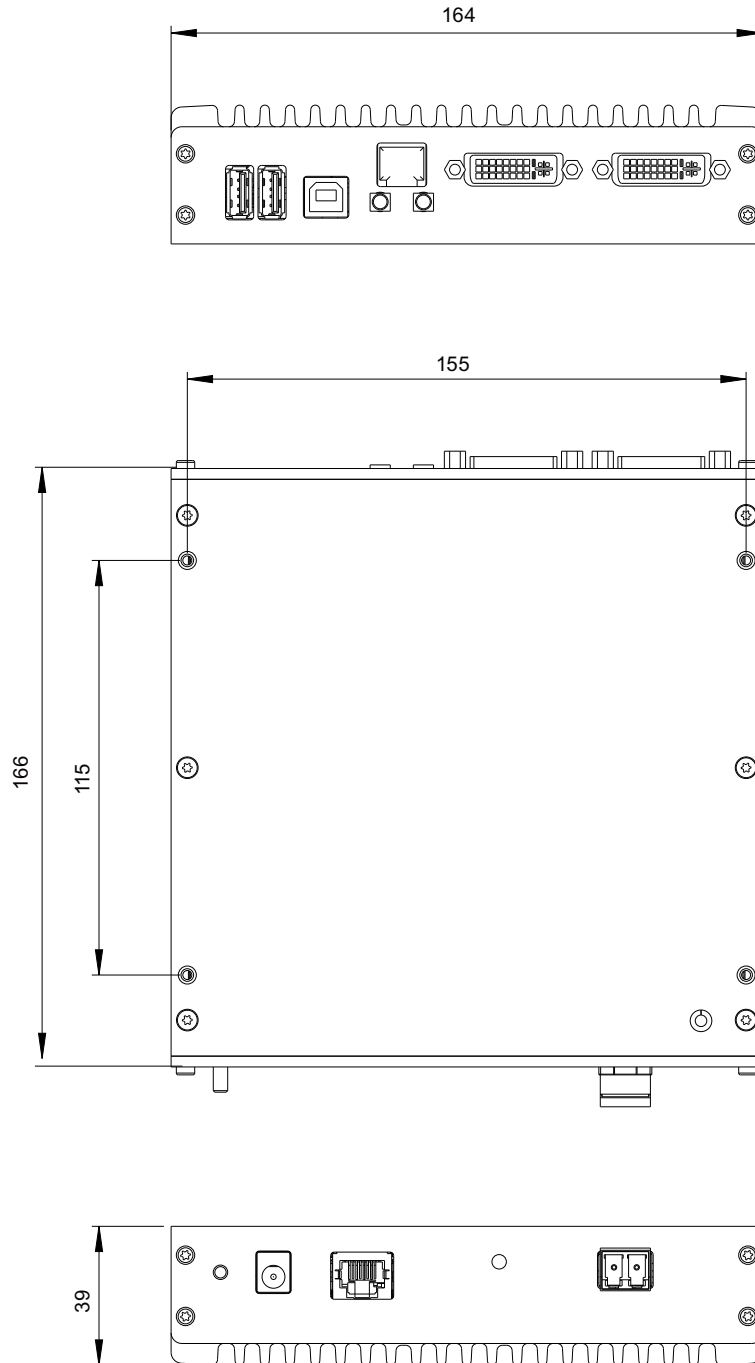
Safety standards	IEC60950-1
Protection class	Protection class I
Degree of protection	IP20 in accordance with DIN EN 60529

11 Dimension drawings

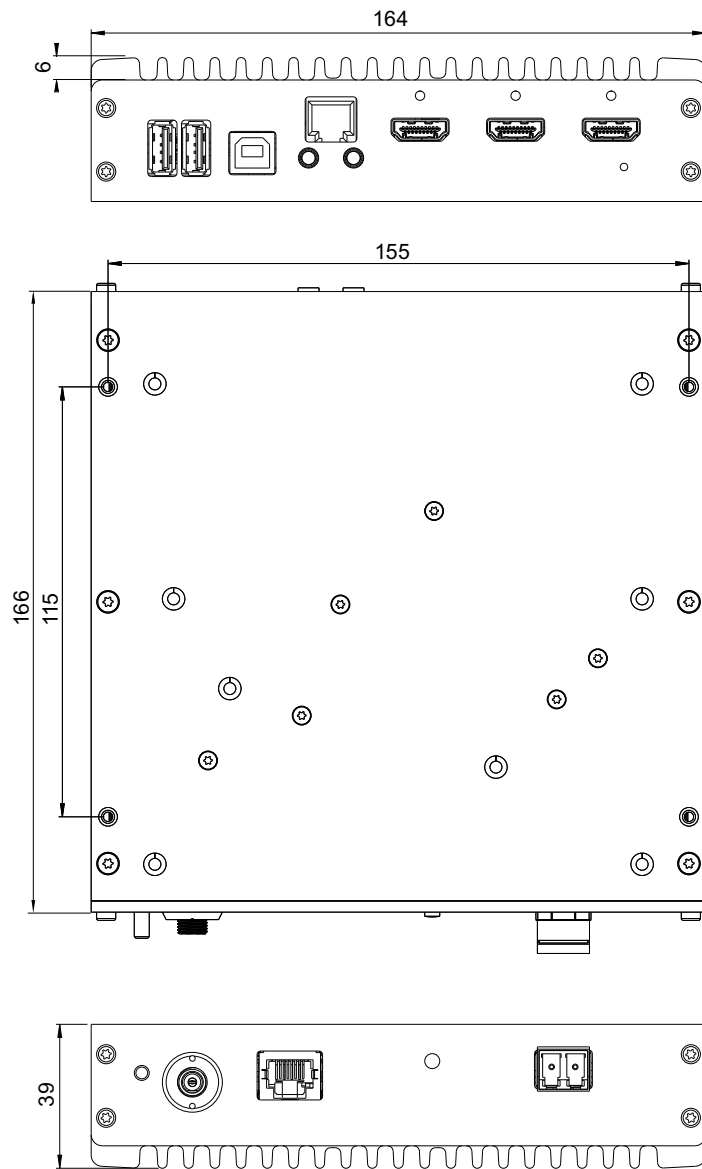
All dimensions in mm

11.1 View from in front, below, and rear

TIP0210-DVI



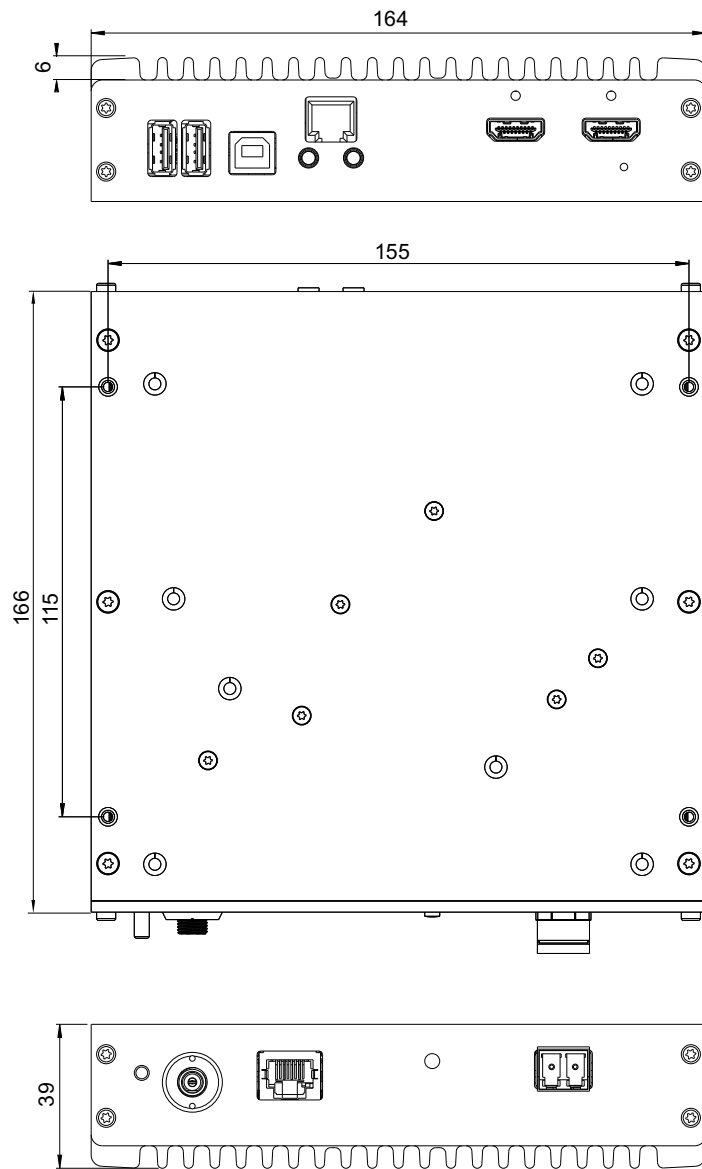
TIP0410



Dimension drawings

11.1 View from in front, below, and rear

TIP0810



12 Appendix

12.1 Information on electromagnetic compatibility (EMC)

IP Transceiver were designed to distribute and switch video, audio, and control signals in real time.

NOTICE
<p>Special EMC provisions are required for use of the IP Transceiver. Installation, assembly, and use must take place in compliance with the following instructions:</p> <ul style="list-style-type: none"> • Only use the cables included in the scope of delivery or recommended by the manufacturer. The use of other cables increases the risk of electromagnetic radiation and negatively impacts on electromagnetic interference immunity. Cable length: max. 3 m • Do not position any portable or mobile RF communication devices in the immediate vicinity of the device. Otherwise, problem-free function of the device cannot be guaranteed. • The device should not be placed on other devices or positioned in their immediate vicinity. If devices have to be operated on or in the immediate vicinity of one another, the device or system must be monitored to ensure proper operation for the defined configuration. • Persons connecting additional devices to the signal input or output when configuring a medical system are responsible for ensuring compliance with standard IEC/EN 60601-1-2.


Information and manufacturer's declaration – electromagnetic radiation		
<p>The IP Transceiver is intended for use in the electromagnetic environments noted below. The customer or user of the IP Transceiver has to ensure that the device is used in such an environment.</p>		
Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions according to CISPR 22	Group 1	The device uses RF radiation for internal operation only. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic devices.
RF emissions according to CISPR 22	Class B	The device is suitable for use in all establishments, including domestic establishments and those directly connected to the public line power that supplies buildings used for domestic purposes.
Harmonic emissions according to IEC 61000-3-2	Class D	
Voltage fluctuations / flicker emissions according to IEC 61000-3-3	Complies	

Appendix

12.1 Information on electromagnetic compatibility (EMC)






Information and manufacturer's declaration – electromagnetic radiation			
The IP Transceiver is intended for use in the electromagnetic environments noted below. The customer or user of the IP Transceiver has to ensure that the device is used in such an environment.			
Interference immunity test	IEC/EN 60601 Measurement level	Compliance level	Information regarding the electromagnetic environment
Electrostatic discharge (ESD) IEC/EN 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	It is recommended to use the device on wood, concrete, or ceramic floors. If the floor is made of synthetic material, the relative humidity should be at least 30 %.
Fast transient electric disturbance (burst) IEC/EN 61000-4-4	±2 kV for power lines ±1 kV for input / output lines	±2 kV for power lines ±1 kV for input / output lines	The power supply quality has to correspond to that of typical industrial environments or hospitals.
Surge voltage IEC/EN 61000-4-5	±1 kV line(s) against line(s) ±2 kV line(s) against ground	±1 kV line(s) against line(s) ±2 kV line(s) against ground	The power supply quality has to correspond to that of typical industrial environments or hospitals.
Voltage dips, brief interruptions, and voltage fluctuations along power supply lines IEC/EN 61000-4-11	<5 % V_T (>95 % dip in V_T) for 0.5 cycles 40 % V_T (60 % dip in V_T) for 5 cycles 70 % V_T (30 % dip in V_T) for 25 cycles <5 % V_T (>95 % dip in V_T) for 5 seconds	<5 % V_T (>95 % dip in V_T) for 0.5 cycles 40 % V_T (60 % dip in V_T) for 5 cycles 70 % V_T (30 % dip in V_T) for 25 cycles <5 % V_T (>95 % dip in V_T) for 5 seconds	The power supply quality has to correspond to that of typical industrial environments or hospitals. If the device has to continue operation even if the power supply is interrupted, it is recommended to connect the device to an uninterruptible power supply or battery.
Magnetic fields with energy technology frequencies (50/60 Hz) IEC/EN 61000-4-8	3 A/m	3 A/m	The magnetic fields with energy technology frequencies must be in an area that is representative of a typical location in a typical industrial environment or hospitals.
Note: V_T is the alternating current voltage before application of the measurement level.			

12.1 Information on electromagnetic compatibility (EMC)

Information and manufacturer's declaration – electromagnetic radiation			
The IP Transceiver is intended for use in the electromagnetic environments noted below. The customer or user of the IP Transceiver has to ensure that the device is used in such an environment.			
Interference immunity test	IEC/EN 60601 Measurement level	Compliance level	Information regarding the electromagnetic environment
Conducted disturbances IEC/EN 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communication devices may only be operated in the vicinity of the monitor when in compliance with the recommended minimum distance. It is determined using the formula for calculating the frequency of the transmitter.
High-frequency electromagnetic fields IEC/EN 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	Recommended minimum distance $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P}$, 80 MHz to 800 MHz $d = 2.3 \sqrt{P}$, 800 MHz to 2.5 GHz In this case, "P" stands for the measured maximum nominal output power in watts (W) of the transmitter recommended by the transmitter manufacturer, and "d" for the recommended minimum distance in meters (m). The field strengths of fixed transmitters according to electromagnetic location measurement ^a have to be less than the compliance level in each individual frequency range ^b . Interference can occur when used in the vicinity of devices identified with the following symbol. 
Note: The higher frequency range applies at 80 MHz and 800 MHz.			
Note: This information may not be applicable in all situations. Absorption and reflection by structures, objects, and people impact the propagation of electromagnetic waves.			
^a The field strengths of fixed transmitters, for example the base station for cordless and mobile telephones, radio, land mobile radio, ham radio, and television cannot be determined precisely in advance. To evaluate the electromagnetic environment using fixed transmitters, an electromagnetic location measurement should be included. If the measured field strength in the environment where the device is used exceeds the applicable RF compliance level, observe the LMM to ensure its proper operation. If improper operation is observed, in some circumstances additional measures may be necessary, such as reorienting or repositioning the device.			
^b The field strength beyond the frequency range 150 kHz to 80 MHz should be less than 3 V/m.			

Recommended minimum distance between portable and mobile RF communications devices and the IP Transceiver			
The IP Transceiver is intended for use in an electromagnetic environment in which interference due to electromagnetic radiation is controlled.			
The customer or user of the LMM can help prevent electromagnetic interference by maintaining the recommended minimum distance between portable and mobile RF communications devices (transmitter) and the monitor as shown below. This is based on the maximum output power of the communication device.			
Maximum nominal output power of the transmitter (W)	Recommended minimum distance according to the frequency of the transmitter (m)		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters whose maximum nominal output power is not shown above, the recommended minimum distance "d" in meters (m) can be determined using the formula for calculating the frequency of the transmitter. "P" here stands for the transmitter's maximum measured nominal output power in watts (W), as recommended by the transmitter's manufacturer.			
Note: For 80 MHz and 800 MHz, the recommended minimum distance for the higher frequency range applies.			
Note: This information may not be applicable in all situations. Absorption and reflection by structures, objects, and people impact the propagation of electromagnetic waves.			

12.2 Markings and symbols

Marking/symbol	Meaning
	Symbol for "Caution, observe accompanying documents".
	CE marking (EU conformity mark).
	UKCA marking (UK conformity mark).
	Symbol for manufacturer of the product, supplemented by the date of manufacture.
	WEEE marking: Product must be disposed of separately; materials may be recycled.

12.3 Warranty

Opening of the housing, or electrical or mechanical changes on or in the device, result in cancellation of the warranty. For warranty details, please contact the sales partner from whom you purchased the product. These warranty conditions are neither extended nor limited by the contents of this instruction manual.

12.4 Repairs

Please contact the sales partner from whom you purchased the product.

12.5 Environmental protection

Comply with all local requirements and laws pertaining to the disposal of devices.

The device is in compliance with directive 2011/65/EU for limiting the use of specific hazardous materials in electric and electronic devices.

12.6 Additional devices

Connected devices such as network routers must meet the relevant safety standards.

12.7 Contact


Support during installation and for technical questions


www.eizo-or.com

12.8 Trademarks

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Index

A

Ambient temperature	31
---------------------	----

C

Cleaning	24
Cleaning staff	5
Connector	18, 19
Contact	39

D

Disposal	39
----------	----

G

General safety instructions	6
-----------------------------	---

I

Input	18, 19
-------	--------

O

Output	18, 19
Overheating	14

P

Power connector	21
-----------------	----

R

Rack	15
------	----

S

Scope of delivery	10
Service personnel	5
Shielding measures	17
Status LED	26

U

User	5
------	---

W

Warranty	39
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Instructions for Use, 12/2022
TIP0210-DVI
1083173-004