

Instruction Manual • 10/2014

DVI Transmission Links
TDL-Single Link/TDL-Dual Link



display
SOLUTIONS





LCD monitors for
medical applications
DVI transmission links
TDL Single Link/TDL Dual Link




Instruction Manual

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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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the relevant information is not taken into account.


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.

Proper use of EIZO products

Note the following:

 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.

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Introduction

1.1 Contents of this document

This document describes the functionality and appropriate use of the DVI transmission links. TDL Single Link and TDL Dual Link.

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 Further documentation

Please also observe the information in the documentation of the connected monitor, the used PC, and the used graphics card.

Safety notes

Guaranteeing perfect operation

Please note that the TDL Single Link and TDL Dual Link DVI transmission links do not have a zero error rate and that the transmission parameters can change as time passes.

Ensure that all necessary steps are taken to avoid violations or incorrect diagnoses. Regular maintenance and calibration of the complete system are recommended.

Flawless, safe and reliable operation of the DVI transmission links requires proper transportation, storage, mounting and installation as well as careful operator control and service. The unit must only be used for applications in which a DVI transmission link is normally used. The technical specifications of the product must be observed.

2.1 General safety notes

Flawless, safe and reliable operation of the equipment assumes that it has been professionally transported, stored, mounted and installed as well as careful operator control and service. The units may only be used for applications for which monitors are normally used.

For safety reasons, the following precautions must be observed:

DANGER

There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur. Please observe all warning information present on the display and in the instruction manual.

Do not open the display

The display may only be opened by trained and qualified personnel. There is risk of an electric shock.

Components inside the displays are at high voltage. **Touching these components is extremely dangerous!**

Servicing and maintenance must be carried out by qualified personnel only.

No liability is accepted for damage to property or injury to persons if the display is opened by non-qualified personnel.

Never use defective power cables

A damaged power cable may result in fire or electric shock. Only use power cables approved by the manufacturer.

When disconnecting the power supply cable, always do so by holding the plug. Ensure that your hands are dry.

Route the cable such that it cannot be tripped over.

Do not insert any objects into the housing

Objects inserted into the housing may result in damage to the unit or personal injury.

Do not place any objects on top of the unit

If you place objects on top of the unit, the unit may overheat.

Liquid entering the unit may result in fire or electric shock.

Connecting

There must be no contact to a patient when handling the connection cables.

Overload

Do not connect too many devices to one socket or extension cable since this could result in a fire or electric shock.

Observe the information provided by the manufacturer.

CAUTION

Improper installation may result in extensive damage to property.

Installation must be carried out by specialists.

1. To avoid danger for patients and users, connect your electrical system in accordance with the safety requirements of EN 60601-1 (IEC 60601-1) "Safety requirements for medical electrical systems".
In order to guarantee that the housing discharge current in the event of a first fault does not exceed 500 μ A, the display must be connected to an additional PE connection. The bracket of the display's support mechanism has its own grounding (PE conductor). This grounding together with the PE conductor of the display means that the housing discharge current always remains less than 500 μ A, even in the event of a first fault. The PE conductors of the display and of the separate PC are considered as a first fault event.
 2. Use appropriate measures to ensure that the leakage currents in particular remain below the necessary limits:
Appropriate measures include:
 - Separators for signal input or signal output unit
 - Use of a safety isolating transformer
 - Use of the additional protective conductor terminal
 3. Device and patient must never be touched simultaneously.
 4. It must be specifically mentioned that the display is only suitable for a patient environment, but not for contact with a patient.
 5. Only use the video lines specified by the manufacturer for installation.
The serial interface cable must have a female Sub-D connector at the computer end.
 6. Use power cables with PE contacts. Only plug the device into sockets with protective grounding.
 7. For certain applications, the video ground can be connected separately to the protective ground via the additional PE connection in the plug panel.
Observe EN 60601-1 (IEC 60601-1).
 8. Close the connection panel using the cover provided, and secure with the screws.
 9. **Note for users:**
The closed connection panel may only be opened by trained and qualified personnel.
 10. **Servicing information:**
If housing parts have to be removed for servicing, this must not be carried out in the presence of the patient or user. Only connect displays with a VESA connection on the rear panel to the power supply when the VESA plate is screwed on.
 11. **Important:**
Note that displays can fail and that the image properties such as brightness, contrast or color location can change with time.
- Please ensure that all steps are taken to avoid injuries or incorrect diagnoses. Observe all regulations of the country in which the device is used.

CAUTION

Failure to observe warnings may result in substantial damage to property

Ensure sufficient heat dissipation

To ensure proper air circulation, observe appropriate spacing between neighboring objects when placing or mounting the devices.

Ventilation slots are provided on the housing base, the top of the cover, the rear panel and the side panels. The permissible ambient temperature range (see instruction manual) must not be violated.

- Installation on a desk:
Place the unit on a solid and level surface. The installed stand, as well as the mounting surface, must be suitable for the weight of the unit.
- For ceiling suspension:
The wall mount must be suitable for the weight of the unit.

Avoid sources of heat

Do not install the display in the vicinity of sources of heat, e.g. radiators, heating appliances or other devices which can generate or emit heat.

Do not subject display to excessive shocks

Take care when transporting! **Use the original packaging, and transport correctly oriented!**
Be sure to protect the LCD module in particular from shocks.

Care of display / Cleaning agents

- The screen surface (front panel) is extremely sensitive to mechanical damage. Absolutely avoid scratches, shocks, etc.
- Remove water drops immediately; extended contact with water discolors the surface.
- Clean the screen and the housing using only the cleaning agents referred to in the instruction manual.

CAUTION**Touching the screen surface can result in brief disturbances to the image**

Due to mechanical pressure or electrostatic discharging, touching the screen can result in brief disturbances to the image.

Only switch on cold displays following their adaptation to room temperature

If the display is brought into a room with a higher or rising temperature, condensation is formed inside and outside the unit. In such a case, do not switch on the display until the condensation has evaporated. The display will otherwise be damaged.

What to do if the display is faulty

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

- Damage to the plug or power cable.
- Following the entry of liquid into the unit.
- If the unit has been exposed to moisture.
- If the unit does not function or if you cannot eliminate a fault using the instruction manual.
- If the unit has been dropped and/or the housing damaged.
- If the unit smells of burning or produces peculiar noises.

Information for installations in the USA and Canada

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

Note for installations in China

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


See also

General connection information (Page 27)

Mounting of unit (Page 21)

Connecting the signal cables (Page 28)

2.2 Product-specific safety notes

 DANGER
<p>There is a danger to life if the warnings are not obeyed. Severe personal injury or damage to property may occur</p> <ul style="list-style-type: none">• Do not open the devices yourself.• Only use approved transmission cables. Cables not corresponding to the specification could lead to image faults or failures. Therefore only use the supplied cable or one specified by EIZO. <p>Connecting</p> <p>There must be no contact to a patient when handling the connection cables.</p>
CAUTION
<p>Failure to observe the warnings may result in substantial damage to property.</p> <p>Do not subject device to excessive shocks.</p> <p>Take care when transporting! Use the original packaging!</p>

See also

General connection information (Page 27)

Connecting the signal cables (Page 28)

Safety specifications (Page 43)

Description

3.1 Components of the product

Note

EIZO recommends that you keep the packaging material for subsequent transport of the monitor.

Observe the information in the documentation of the connected monitor, the used PC, and the used graphics card.

Single-link versions

Product	Order number	Description
TDL0000-T	6GF6010-9DA01	DVI single-link transmitter unit for connection to the DVI output of a graphics card.
TDL0000-R0	6GF6010-9DA02	DVI single-link receiver unit for connection to the DVI socket of a monitor, entry for cable and power supply at back (0°).
TDL0000-R9	6GF6010-9DA03	DVI single-link receiver unit for connection to the DVI socket of a monitor, entry for cable and power supply at side (90°).
TDL0000-C13	6GF6010-9DA13	13 m cable with RJ 45 connector and ferrites
TDL0000-C30	6GF6010-9DA30	<ul style="list-style-type: none"> • 30 m cable with RJ 45 connector • 4 ferrites
TDL3600-SL	6GF6010-0DA36	<ul style="list-style-type: none"> • DVI single-link transmitter unit for connection to the DVI output of a graphics card. • DVI single-link receiver unit for connection to the DVI socket of a monitor, entry for cable and power supply at side (90°). <ul style="list-style-type: none"> – 36 m cable with RJ 45 connector – 4 ferrites

Description

3.1 Components of the product

Product	Order number	Description
TDL3600-SL	6GF6010-1DA36	<ul style="list-style-type: none">• DVI single-link transmitter unit for connection to the DVI output of a graphics card.• DVI single-link receiver unit for connection to the DVI socket of a monitor, entry for cable and power supply at side (90°).<ul style="list-style-type: none">– 36 m cable with RJ 45 connector– 4 ferrites– Power supply unit for the receiver
TDL2300-SL	6GF6010-1DA23	<ul style="list-style-type: none">• DVI single-link transmitter unit for connection to the DVI output of a graphics card.• DVI single-link receiver unit for connection to the DVI socket of a monitor, entry for cable and power supply at side (90°).<ul style="list-style-type: none">– 23 m cable with RJ 45 connector– 4 ferrites– Power supply unit for the receiver

Dual-link versions

Product	Order number	Description
TDL3600-DL	6GF6010-2DB00	<ul style="list-style-type: none"> • DVI dual-link transmitter unit for connection to the dual-link DVI socket of a graphics card, outputs for the cables at the back (0). • DVI dual-link receiver unit for connection to the dual-link DVI socket of a monitor, entry for cables at back (0°), power supply input at the side (90°).
TDL3600-DL	6GF6010-2DB36	<ul style="list-style-type: none"> • 1 x DVI dual-link transmitter units for connection to the dual-link DVI output of a graphics card, outputs for the cables at the back (0). • 1 x DVI dual-link receiver unit for connection to the dual-link DVI socket of a monitor, entry for the cables at back (0°), power supply input at the side (90°). • 2x 36 m cable with RJ 45 connector.
TDL3600-QL	6GF6010-4DB36	<ul style="list-style-type: none"> • 2 x DVI dual-link transmitter units for connection to the dual-link DVI output of a graphics card, outputs for the cables at the back (0). • 2 x DVI dual-link receiver unit for connection to the dual-link DVI socket of a monitor, entry for the cables at back (0°), power supply input at the side (90°). • 4 x 36 m cable with RJ 45 connectors • Fixing materials for installation of the receiver module in the EIZO RadiForce® LS560W monitor • Fixing materials for installation of the transmitter modules on the EIZO LMM56800 Large Monitor Manager

3.2 Applications

The TDL transmission links serve as the connection between DVI graphics cards and monitor, for both single-link and dual-link connections. The TDL transmission links allow the maximum standard distance to be exceeded for image transmissions when using conventional cables. The maximum distance for conventional connecting cables is 5 m between PC and monitor.

Approved and tested monitors

The TDL transmission link is always compatible with all EIZO monitors. You need only observe that you require a single-link, dual-link or quad-link version.

You can request additional information using the e-mail contact address.

Further applications

TDL0000-SL versions with power supply unit (Order Nos.: 6F6010-1DA36, 6F6010-1DA23)

With these versions it is also possible to operate monitors that have not been released by EIZO. No guarantee of function can be accepted, however, as not all monitors on the market can be tested by EIZO.

3.3 Important features

The DVI transmission link has the following features which permit a wide range of applications:

Covering of long distances between picture source and monitor

With the TDL transmission links you obtain error-free transmission of picture data at a distance of up to 36 m between the PC and monitor. This makes it possible to route DVI to ceiling-mounted monitors.

Compact design

Low weight and small dimensions are features of the transmitter and receiver modules. The modules are simply screwed onto the DVI interfaces.

The small RJ 45 connectors on the cable mean that it is possible to insert it through small tubes and openings.

DVI compatibility

The TDL transmission links allow transmission of image signals according to the DVI standard. The monitor-specific characteristic data (EDID) is also transferred over the link.

Screen resolution

The TDL transmission links can be used to transmit digital image signals with a resolution of up to 1920 x 1200 at a image refresh rate of 60 Hz. Higher resolutions are also possible at a reduced refresh rate.

Description

3.3 Important features

Application planning

Ensure unimpeded access to power supply unit and connections

CAUTION
Power supply unit and connections must be accessible at all times
When assembling or installing the device, ensure that the power supply unit and the connections are accessible at all times.

Observe the permissible ambient temperature range

The unit must not be operated outside the permissible ambient temperature range.

Change of environment

If the unit is brought into a warm environment from a cold one, condensation may form in the unit. The device may therefore be damaged if it is switched on.

- Wait until the condensed water has evaporated, including that inside the device, before you switch it on again. The warming-up process may possibly take several hours.

See also

Climatic conditions (Page 43)

4.1 Cable routing

Only use supplied cable

The cable properties have a major influence on the transmission quality. Therefore only the supplied cable or a specified cable may be used.

Note

Observe the enclosed documentation

Please observe any documentation provided with the cable.

Observation of minimum bending radii

- To retain the special transmission properties, the cable must not be kinked.
- The bending radius must not be less than five times the outer diameter of the cable.

Routing the cable

- Signal cables have to be routed separately from power supply cables to avoid mutual influencing. This particularly applies to the routing of cables used to transmit picture signals.
- Avoid potential differences between PC and monitor as well as ground loops.

Do not cascade TDL transmission links

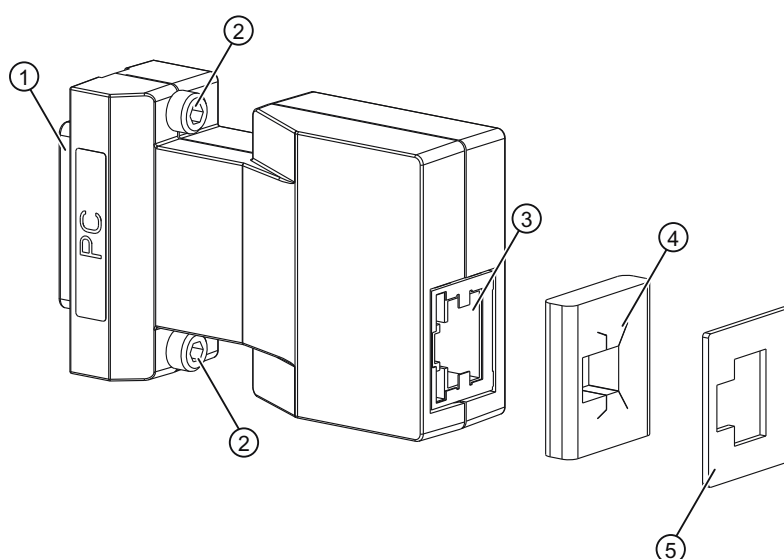
The cascading of several TDL transmission links results in a deterioration in picture quality: Interferences and artifacts occur in the pictures.

Assembly

5.1 Mounting of unit

Attachment to a PC

1. Plug the transmitter module directly onto the DVI socket of the graphics card.
2. Tighten hexagon socket screws.



- ① DVI connector to PC
- ② Hexagon socket screws
- ③ RJ 45 socket for connection of the data cable
- ④ EMC-cushion
- ⑤ EMC holder

Attachment to a monitor

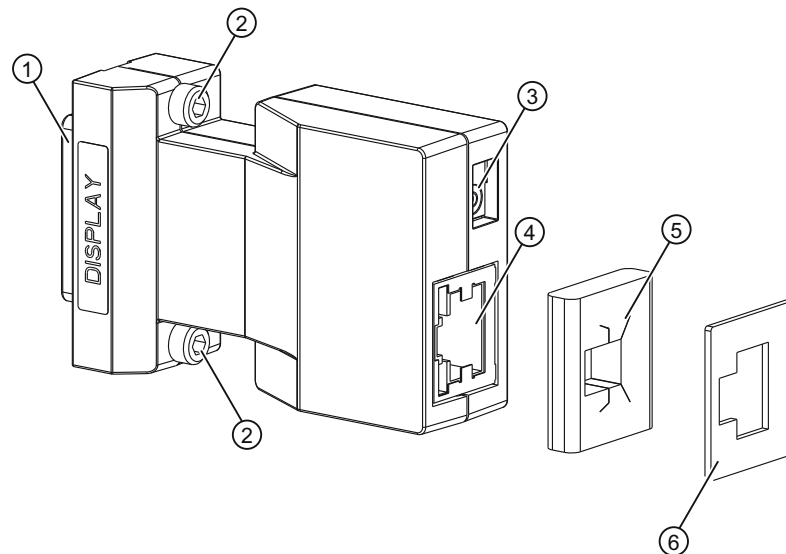
CAUTION

Avoiding EMC faults

The EMC cushion must be placed on a conducting surface of the monitor to avoid electromagnetic interference.

1. Plug the receiver module onto the DVI socket of the monitor.
2. Tighten hexagon socket screws.

If necessary use a small screwdriver.



- ① DVI connector to monitor
- ② Hexagon socket screws
- ③ 5 V connection
- ④ RJ 45 socket for connection of the data cable
- ⑤ EMC-cushion
- ⑥ EMC holder

Figure 5-1 Receiver module with straight input socket

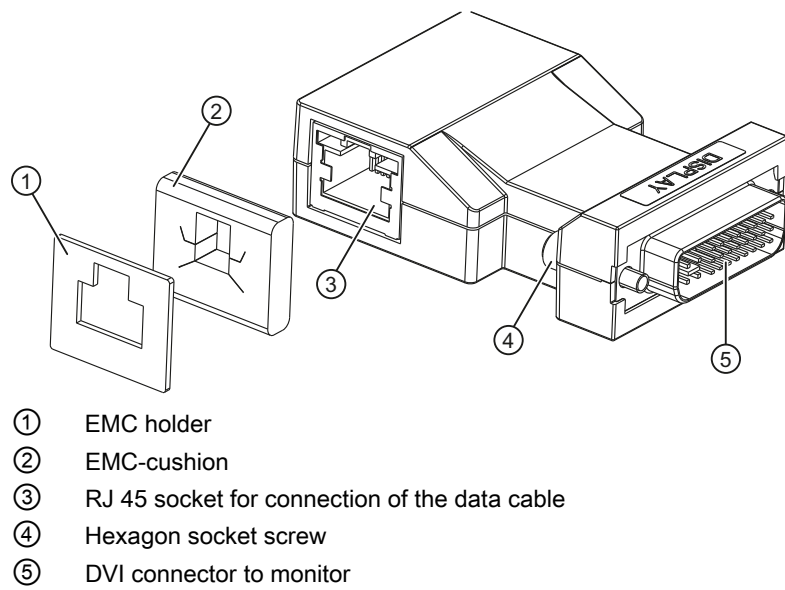
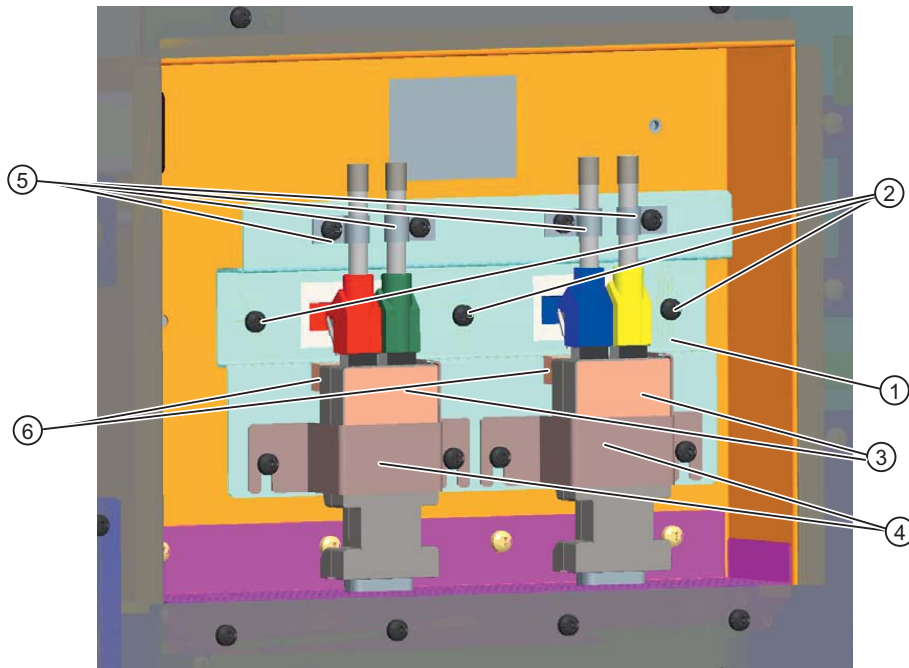


Figure 5-2 Receiver module with lateral input socket

Attachment of TDL3600-QL to RadiForce LS560W

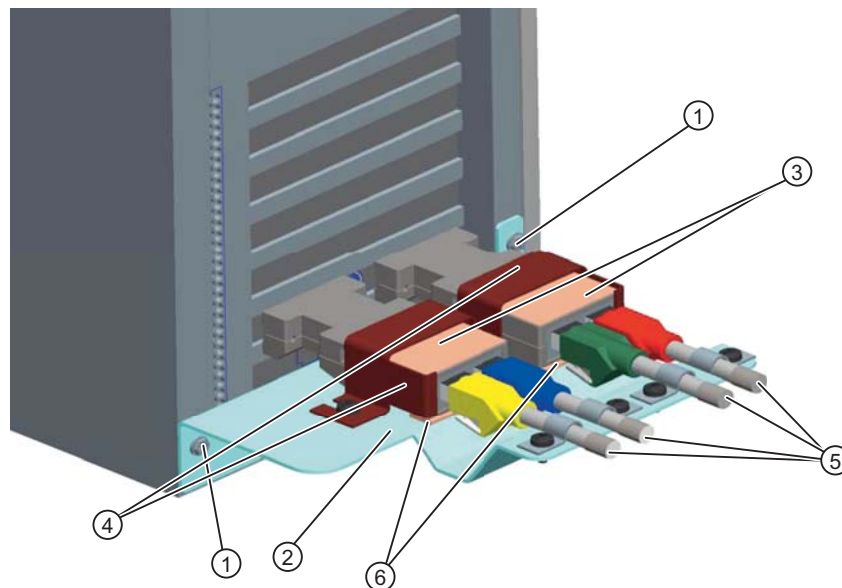


- ① Mounting bracket
- ② 3 screws for attaching the mounting bracket
- ③ Receiver modules
- ④ Holding plates
- ⑤ Cable clips
- ⑥ EMC-cushion

In order to achieve an optimum attachment to the 56" RadiForce LS560W monitor, a special mounting kit has been designed.

1. First attach the mounting bracket ① in the connection recess of the monitor using the three screws ②.
2. Stick the EMC cushions ⑥ on the top edge of the receiver module as shown in the drawing.
3. Then insert the receiver modules ③ in the DVI sockets and screw down the holding plates ④.
4. Then connect the cables according to the color coding and secure with the cable clips ⑤.

Attachment of TDL3600-DL to the large monitor manager LMM56800



- ① Screws for attaching the mounting bracket
- ② Mounting bracket
- ③ Transmitter modules
- ④ Holding plates
- ⑤ Cable clips
- ⑥ EMC-cushion


1. First remove the screws at position ① on the LMM56800.
2. Attach the mounting bracket ② using the longer screws provided at positions ①.
The screws are included in the scope of delivery of the TDL3600-QL.
3. Stick the EMC cushions ⑥ on the top edge of the transmitter modules as shown in the drawing.
4. Then insert the transmitter modules ③ into the DVI sockets and screw down the holding plates ④.
5. Connect the cables according to the color coding and secure with the cable clips ⑤.

See also

- General safety notes (Page 8)
- General connection information (Page 27)
- Connecting the signal cables (Page 28)

Connecting

6.1 General connection information

 CAUTION
All information and warnings related to this product must be observed to ensure danger-free operation.

CAUTION
Changes to device <ul style="list-style-type: none">• Device settings may only be adjusted by trained service personnel; otherwise, the warranty is void.• Do not make any changes to the device without prior approval from the manufacturer.

The unit does not have its own power supply, it is powered from the monitor or PC.

CAUTION
Observe shielding measures <p>Please observe all local EMC guidelines pertaining to shielding. If these requirements are not observed, interference signals could penetrate the monitor.</p> To guarantee perfect image reproduction, the following instructions should be observed: <ul style="list-style-type: none">• Only shielded cables are permitted for all signal connections.• Screw tight or lock all plug-in connections.• Signal and power cables must not be routed through the same duct.• The display must not share a power supply with motors or valves (interference peaks!).

CAUTION

Completely disconnect device from the supply mains

To completely disconnect the device from the supply mains, you must disconnect the power supply unit from the supply mains.

- Remove the plug of the power supply unit from the socket.
- Switch off the monitor and signal source.

The device is now switched off and disconnected from the supply mains.

See also

General safety notes (Page 8)

Product-specific safety notes (Page 12)

Electromagnetic compatibility (Page 44)

6.2 Connecting the signal cables



DANGER

Only connect device to a supply mains with a PE conductor

WARNING: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.



CAUTION

Ensure that routed cables do not result in tripping hazards

When routing the cable, make sure that it cannot be tripped over.

CAUTION

Mechanically relieve cable strain on the PC and monitor

At the PC end, make sure that the cable on the PC and monitor is not subject to any mechanical strain. There should be no tension on the RJ 45 sockets or on the power supply sockets.

CAUTION
Power supply unit with approval for medical applications required
In the case of monitors not obtained from EIZO, a power supply unit is required with approval for medical applications in order to power the receiver module. The power supply unit is only included in the TDL versions TDL3600-SL (Order No. 6F6010-1DA36) and TDL2300-SL (Order No. 6F6010-1DA23).

- Insert the cable at the PC and monitor ends into the RJ45 socket of the transmitter or receiver module.

The attached detent lug prevents the cable from working loose. To improve the cable routing, the RJ45 socket on the receiver end is secured either at the side or rear.

- In the case of 18" monitors of type SMD 18101, SMD 18102, DSB 1803-DC, DSB 1804-DC, DSB 1805-D use a version with a power supply.

Connecting the external power supply unit

If you connect an external power supply unit, all requirements for a medical electrical system (ME system) must be observed.

See also

General safety notes (Page 8)

Product-specific safety notes (Page 12)

Mounting of unit (Page 21)

Commissioning

7.1 Switching on the device

- The TDL modules do not have their own power switch and are switched on together with the PC or monitor.

Operation

8.1 Note for users

The TDL modules do not have any operator controls. Manual settings are not required. All parameters required for operation are optimized automatically. All relevant signals are transmitted without operator intervention.

Service and maintenance

The TDL modules and cables require no service or maintenance.

Troubleshooting

CAUTION

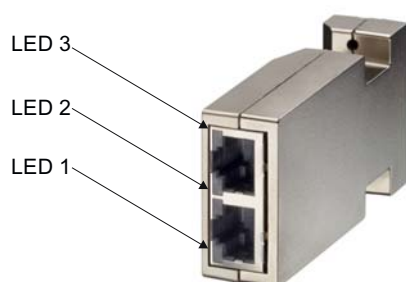
In the event of a fault, also refer to the documentation for the monitor

Whenever a fault occurs, also refer to the monitor's instruction manual since important information on operating states can be found there.

Fault	Cause	Remedy
No picture appears on the monitor, operation LED off	Monitor not switched on. Power cable is not plugged in or incorrectly plugged in.	Switch on monitor or plug in power cable.
No picture appears on the monitor, operation LED on	No picture signal.	Check correct seating of transmitter and receiver modules. Check that the cable is inserted correctly at both ends.
	Picture source not supplying a signal.	Check picture source.
	Picture source is sending a signal which cannot be output on the monitor.	Set the picture source correctly.
	Older unit from EIZO Display Technologies; receiver module is not powered.	Obtain power supply cable between monitor and receiver module from servicing department.
	Not an EIZO Display Technologies unit.	Obtain power supply unit from servicing department.

Operating state for 6F6010-2DB00 (transmitter)

Fault	Cause	Remedy
All LEDs off	Normal state	No problem
LED 2 flashing	Data traffic DDC	No problem
LED 3 lit	Single-link mode	No problem
	Cable to Link 2 defective or not connected	Check cable, replace if necessary
LED 1 and 3 are lit	Receiver not connected	Connect receiver



Technical specifications

11.1 General data

	TDL0000-SL	TDL0000-DL
Type	DVI transmission link	DVI-Dual Link transmission link
DVI signal	LVD signal, regenerated at receiver end	LVD signal, regenerated at receiver end
DDC transfer	<ul style="list-style-type: none"> • DDC CI • EDID (even if the monitor is switched off) 	<ul style="list-style-type: none"> • DDC CI • EDID (even if the monitor is switched off)
Maximum distance between transmitter and receiver modules	36 m	36 m
Maximum DVI clock frequency	Up to 36 m long cable at 165 MHz, only for approved cable	Up to 36 m long cable at 165 MHz, only for approved cable
Screen resolutions	Up to 1920 x 1200 pixels at 60 Hz Higher resolutions are also possible at a reduced refresh rate	Up to 2560 x 1600 or 2160 x 1920 at 60 Hz Higher resolutions are also possible at a reduced refresh rate
Approved transmission cable	Only use cables included in the scope of supply or those recommended by Eizo.	Approved transmission cable

11.2 Power supply

CAUTION

External power supplies for the TDL receiver modules must be approved according to IEC 60601, and comply with the country-specific directives. The power and current of this power supply must not exceed 25 VA or 5 A respectively.

Single-link versions

Transmitter module

5 V DC	Via DVI interface, max. 50 mA
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Receiver module

5 V DC	Via DVI interface, max. 200 mA
5 V DC	Via external power supply
Assignment	5 V DC ± 5 %



Dual-link versions

Transmitter module

5 V DC	Via DVI interface, max. 20 mA
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Receiver module

5 V DC	Via DVI interface, max. 400 mA
5 V DC	Via external power supply or supplementary cable from monitor
Assignment	5 V DC ± 5 %



Optional power supply unit

Input	
• Voltage	100 ... 240 V AC, -10 %, +10 %
• Frequency	47 ... 63 Hz
• Max. current	0.35 A with 90 V AC input voltage
DC output	
• Voltage	5 V ± 1 %
• Max. current	2 A
Approvals	CULus2601, IEC 60601-1

11.3 Inputs/outputs, connection elements

Transmitter module

Single-link versions	
DVI-D input	DVI-D plug (analog pins are not assigned)
RJ 45 output	<ul style="list-style-type: none"> • DVI picture signal (single link) • DDC signal • Hotplug detect
Dual-link versions	
DVI-D input	DVI-D plug dual-link (analog pins are not assigned)
RJ 45 output, primary	<ul style="list-style-type: none"> • DVI picture signal (channel 1 ... 3) • DDC signal • Hotplug detect
RJ 45 output, secondary	DVI picture signal (channel 4 ... 6)

Receiver module

Single-link versions	
RJ 45 input	<ul style="list-style-type: none"> • DVI picture signal (single link) • DDC signal • Hotplug detect
DVI-D output	Restored DVI signal via DVI-D plug (analog pins are not assigned)
Dual-link versions	
RJ 45 input, primary	<ul style="list-style-type: none"> • DVI picture signal (channel 1 ... 3) • DDC signal • Hotplug detect
RJ 45 output, secondary	DVI picture signal (channel 4 ... 6)
DVI-D output	Restored dual-link DVI signal via DVI-D plug (analog pins are not assigned)

11.4 Mechanical design

Housing components	ABS metallized, TPE
Degree of protection	IP20 acc. to DIN 40050
Weight	Approx. 0.1 kg (without cable)
Dimensions (W x H x D) in mm	
• TDL SL transmitter (without cable)	65 x 40 x 18
• TDL SL receiver, versions with cable connection at side and cable connection at rear (without cable)	65 x 40 x 18
• TDL DL transmitter (without cable)	83 x 40 x 18
• TDL DL receiver (without cable)	83 x 40 x 18

11.5 Mechanical requirements

During operation

Vibrations	To EN 60068-2-6 10 ... 58 Hz at ± 0.075 mm deflection 58 ... 500 Hz at 10 m/s ²
Shock	To EN 60068-2-27 (single impact) 5g, 11 ms Under operating conditions, the device must not be exposed to continuous or repeated shocks.

Packed unit

Vibrations	To EN 60068-2-6 5 ... 9 Hz at ± 3.5 mm deflection 9 ... 500 Hz at 10 m/s ²
Shock	To EN 60068-2-27 (single impact) 250 m/s ² , 6 ms (in storage packaging) To EN 60068-2-29 (continuous shocks)

11.6 Climatic conditions

During operation

Temperature range	5 °C to 50 °C ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Humidity	Max. 85 %, relative
Atmospheric pressure	1060 to 600 hPa

Transport and storage (packed)

Temperature range	-20 °C ... +60 °C ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Humidity	Max. 95 %, relative
Atmospheric pressure	1060 to 600 hPa

11.7 Safety specifications



This product has been assigned a CE marking in compliance with the stipulations of directives 93/42/EEC and 2011/65/EU, concerning medical products.

Safety standards	<ul style="list-style-type: none"> • IEC/EN 60601-1 (Second Edition) • IEC/EN 60601-1 (Third Edition) • CAN/CSA - C 22.2 No. 601.1-M90 • CAN/CSA - C 22.2 No.60601-1-08
Degree of protection according to DIN 40050	IP20
Classification of medical device	Class I according to 93/42/EEC

11.8 Electromagnetic compatibility

Interference voltage/interference noise	EN 60601-1-2
Voltage fluctuations	EN 61000-4-11
Static discharge on casing parts (ESD)	EN 61000-4-2 8 kV air, 4 kV contact
RFI	EN 61000-4-3 80 MHz ... 2.5 GHz, 3 V/m 80 % AM 1 kHz
Noise immunity	EN 61000-4-6 150 kHz ... 80 MHz 3 V/m 80 % AM 1 kHz
Magnetic constant fields	EN 61000-4-8 Max. 4000 A/m
Magnetic alternating fields	EN 61000-4-8 Max. 10 A/m

Dimensional drawings

All dimensions in mm.

12.1 Single-link versions

Transmitter module

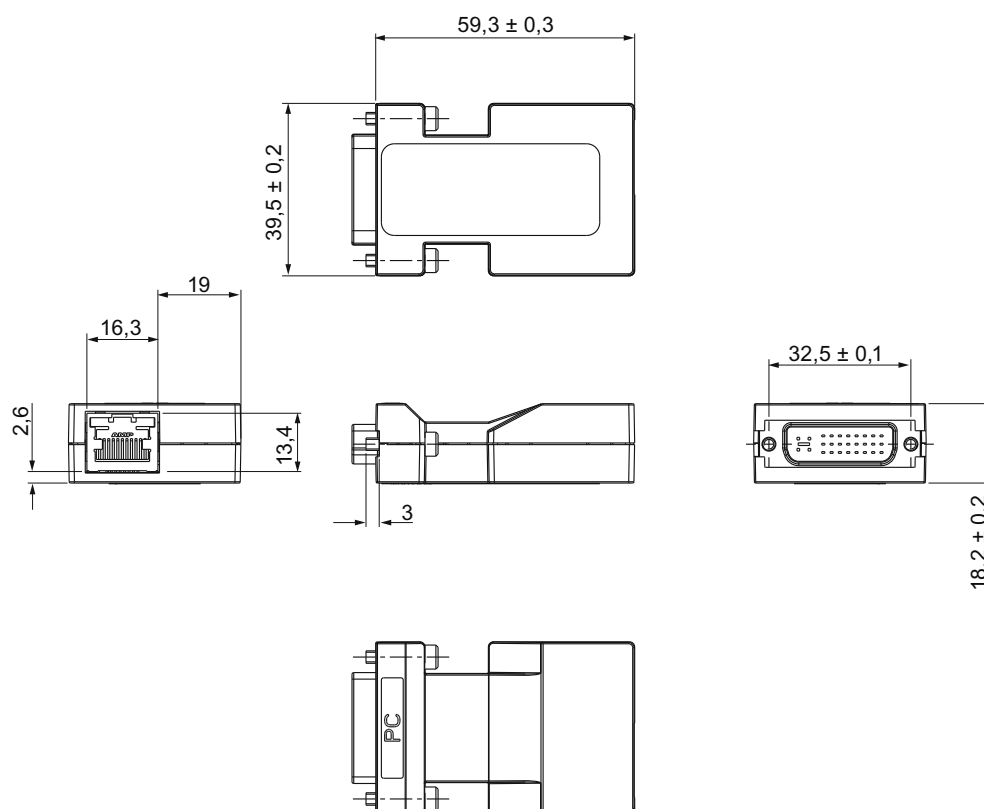


Figure 12-1 Views of the transmitter module

Receiver module with lateral cable connection

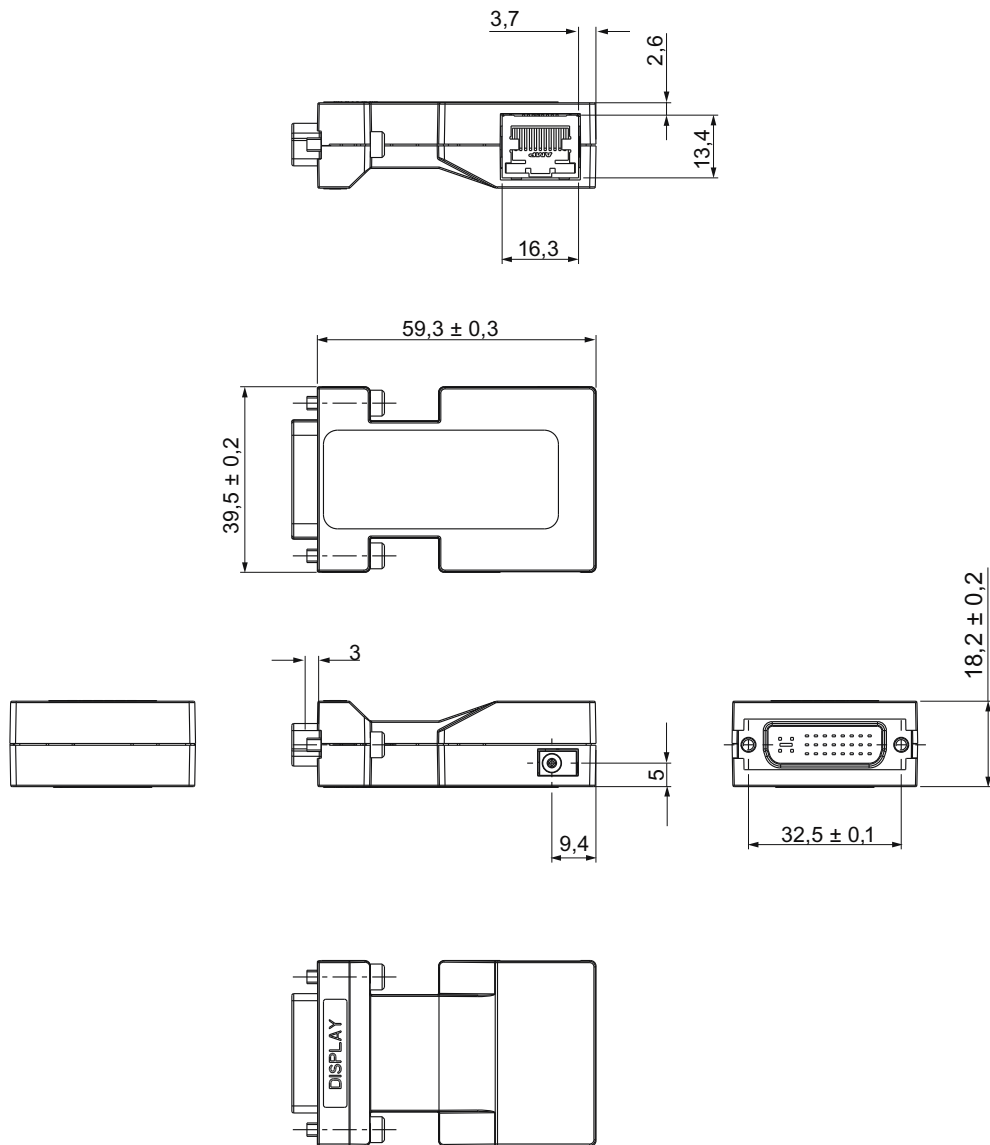


Figure 12-2 Views of the receiver module, cable connection at side

Receiver module with cable connection at rear

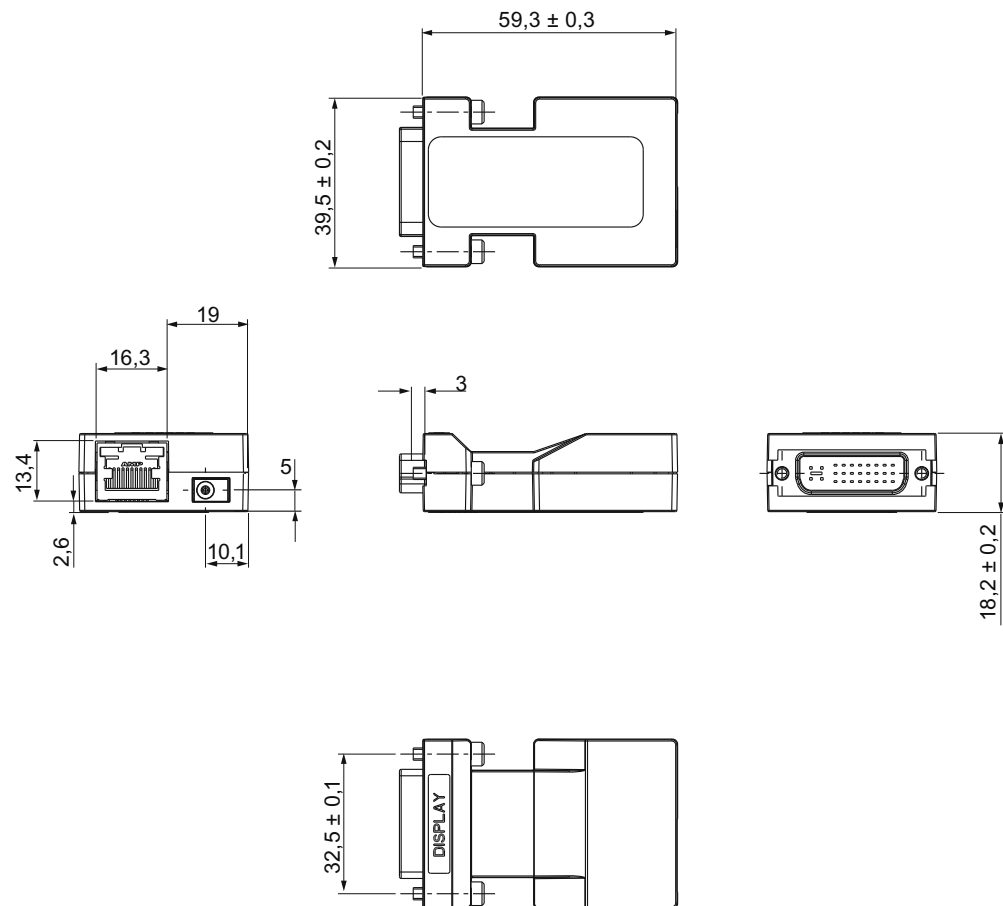


Figure 12-3 Views of the receiver module, cable connection at rear

12.2 Dual-link versions

Transmitter module

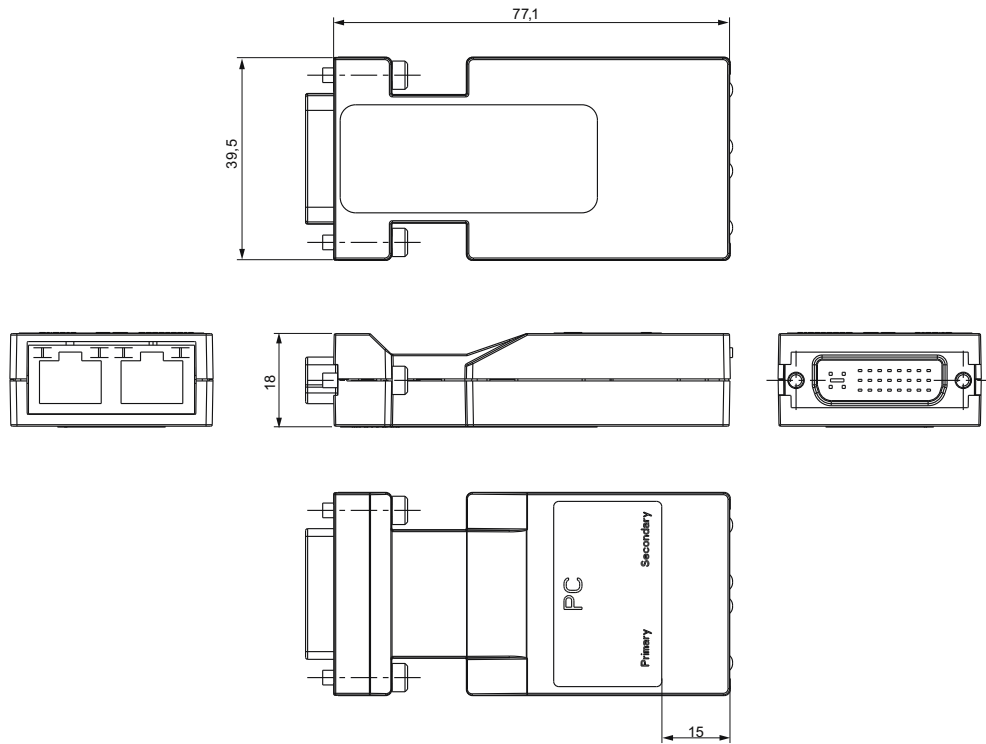


Figure 12-4 Views of the dual-link transmitter module

Receiver module

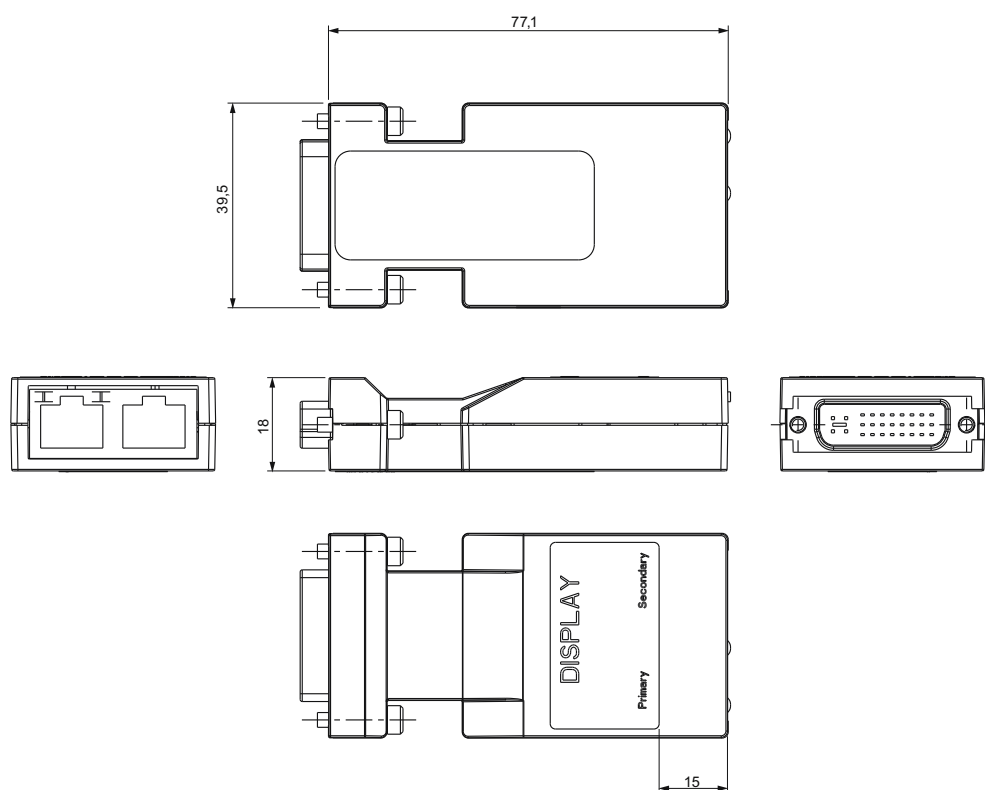


Figure 12-5 Views of the dual-link receiver module

Appendix

A.1 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.

A.2 Repairs

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

A.3 Environmental protection

Please observe all local requirements and laws pertaining to the disposal of displays.



A.4 Accessory devices

Devices used together with DVI transmission links TDL (e.g. monitor or PC) must also comply with the relevant safety specifications.

A.5 Markings

Because of the module size, not all relevant identifications can be provided on the housing. Article number and respective serial number are printed.

TDL module	Order number
TDL0000-T	6GF6010-9DA01
TDL0000-R0	6GF6010-9DA02
TDL0000-R9	6GF6010-9DA03
TDL3600-SL	6F6010-0DA36
TDL3600-SL	6F6010-1DA36
TDL2300-SL	6F6010-1DA23
TDL3600-DL	6F6010-2DB00
TDL3600-QL	6F6010-4DB36

The following markings apply for the TDL modules listed in the table:







Operation is subject of the following conditions (1) device must accept any interference received including interference that may cause undesired operation. This device complies with Part 15 of the FCC rules und meets all requirements of the Canadian Interference-Causing-Equipment Regulations



EIZO GmbH, Siemensallee 84, D-76187 Karlsruhe/Germany

MADE IN GERMANY

Markings and symbols

Marking/symbol	Description
	Symbol for "Caution, observe accompanying documents".
	CE marking (EU mark of conformity)
	CSA marking, accounting for U.S. and Canadian national regulations.
	WEEE Product must be disposed of separately; materials can be recycled.
	Marking in accordance with ACPEIP (Administration on the Control of Pollution Caused by Electronic Information Products) (China RoHS).
	Symbol for "Observe instruction manual". Present on the device.

A.6 Trademarks

The EIZO Logo is a registered trademark of EIZO Corporation in Japan and other countries.

EIZO is a registered trademark of EIZO Corporation in Japan and other countries.

RadiForce is a registered trademark of EIZO Corporation in Japan and other countries.

RadiCS is a registered trademark of EIZO Corporation in Japan and other countries.

RadiNET is a registered trademark of EIZO Corporation in Japan and other countries.

ScreenManager is a registered trademark of EIZO Corporation in Japan and other countries.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

Apple is a registered trademark of Apple Inc.

Macintosh is a registered trademark of Apple Inc.

Mac is a registered trademark of Apple Inc.

VESA is a registered trademark or a trademark of Video Electronics Standards Association in the United States and other countries.

All other trademarks are the properties of their respective owners.

A.7 Contact

Support during installation and for technical questions

Medical Monitor Solutions www.eizoglobal.com

A.8 China RoHS

TDL/SDL-Series: 6GF6010-#D\$## with \$ = A...Z, # = 0...9

根据SJ/T11364-2006

《电子信息产品污染控制标识要求》特提供如下有关污染控制方面的信息。

The following product pollution control information is provided according to SJ/T11364-2006 Marking for Control of Pollution caused by Electronic Information Products.

电子信息产品污染控制标志说明 Explanation of Pollution Control Label



该标志表明本产品不含有超过中国标准SJ/T11363-2006《电子信息产品中有毒有害物质的限量要求》中限量的有毒有害物质。该标志还表示本产品废弃后可以回收利用，不应随意丢弃。

This symbol indicates the product does not contain any toxic or hazardous materials in excess of the limits established by the Chinese standard SJ/T11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products. The symbol also signifies that the product can be recycled after being discarded, and should not be casually discarded.

有毒有害物质或元素的名称及含量 Name and Concentration of Hazardous Substances

部件名称 Component Name	有毒有害物质或元素 Hazardous substances' name					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电源 Power Supply	O	O	O	O	O	O
其他 电路板 Other Circuit Boards	O	O	O	O	O	O
其他 (电缆等) Others (cables, etc.)	O	O	O	O	O	O
机架、底盘 Housing, Chassis	O	O	O	O	O	O
附件 (信号电缆、 输电线等) Accessories (signal cable, power line, etc.)	O	O	O	O	O	O
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求</p> <ul style="list-style-type: none"> 此表所列数据为发布时所能获得的最佳信息。 由于缺少经济上或技术上合理可行的替代物质或方案，此医疗设备运用以上一些有毒有害物质来实现设备的预期临床功能，或给人员或环境提供更好的保护效果。 <p>O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006. X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006</p> <ul style="list-style-type: none"> Data listed in the table represents best information available at the time of publication. Applications of hazardous substances in this medical device are required to achieve its intended clinical uses, and/or to provide better protection to human beings and/or to environment, due to lack of reasonably (economically or technically) available substitutes. 						

产品中有毒有害物质或元素的名称及含量 Table of hazardous substances' name and concentration.

List of abbreviations

B	
Composite video signal	Composite video signal
C	
CRT	Cathode Ray Tube
D	
DDC	Display Data Channel
DIN	German Institute for Standardization
DPMS	Display Power Management Signaling
DVI	Digital Visual Interface
DVI-A	Digital Visual Interface - Analog
DVI-D	Digital Visual Interface - Digital
DVI-I	Digital Visual Interface - Integrated
E	
ESD	Electrostatic Discharge
EMC	Electromagnetic compatibility
EN	European standard
F	
FCC	Federal Communications Commission
H	
HF	High Frequency
L	
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LUT	Look Up Table
M	
MDD	Medical Device Directive
O	
OSD	On-screen display
P	
PE	Protective Earth
S	
SMPTE	Society for Motion Picture and Television Engineers
SVGA	Super Video Graphics Array
T	
TN-S mains	Terre Neutre-Separé
TFT	Thin Film Transistor
V	

VGA	Video Graphics Array
VESA	Video Electronics Standards Association
X	
Measuring units	
Cd/m ²	candela/m ² (photometric measurement for brightness)
ftL	Footlambert; 1ftl = 3.426 cd/m ²

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Order No.: 1029106-003

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