

Installation instructions
RFID compact unit

DTE601

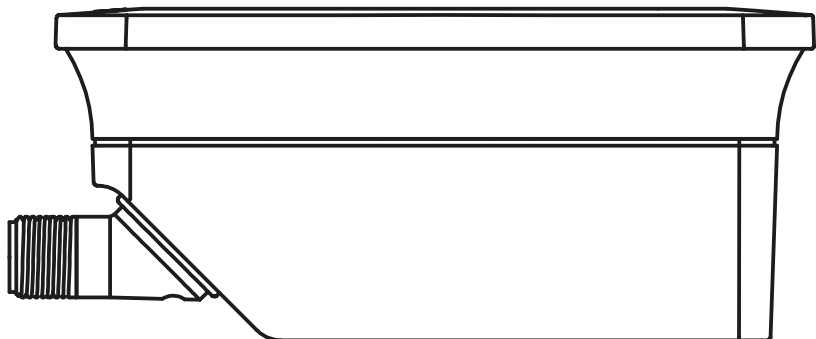
DTE602

DTE604

DTE605

UK

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1 Preliminary note

Technical data, approvals, accessories and further information → www.ifm.com.

1.1 Symbols used

- ▶ Instruction
- > Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note
Non-compliance may result in malfunction or interference.
-  Information
Supplementary note

1.2 Warnings used

ATTENTION!

Kind and source of the hazard

- > Possible consequences.
- ▶ Actions to refrain from.
- ▶ Measures to take.

1.3 Copyright and trademarks

© All rights reserved by ifm electronic gmbh. No part of these instructions may be reproduced and used without the consent of ifm electronic gmbh.

All product names, pictures, companies or other brands used on our pages are the property of the respective rights owners.

2 Safety instructions

- The device described is a subcomponent for integration into a system.
 - The manufacturer is responsible for the safety of the system.
 - The system manufacturer undertakes to perform a risk assessment and to create a documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator,

the user and, if applicable, for any service personnel authorised by the manufacturer of the system.

- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Functions and features).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, operation and maintenance of the product must be carried out by qualified personnel authorised by the machine operator.
- Protect the device and the cables against damage.
- Use the device outside petrol stations, fuel depots, chemical plants or blasting operations.
- Do not transport and store any flammable gases, liquids or explosive substances near the device.
- Operation of the device can affect the function of electronic devices that are not correctly shielded.
 - Disconnect the device in the vicinity of medical equipment.
 - Contact the manufacturer of the corresponding device in case of any interference.
- Because of the requirements for electromagnetic interference emissions, the device is intended for use in industrial environments. The device is not suitable for use in domestic areas.
- Device safety: Use the device indoors only.

3 Functions and features

The DTE60x device is composed of an evaluation unit and an integrated RFID compact unit with the following functions:

- read and write ID tags which conform to the system without contact,

- DTE601: communication with the control level via PROFINET IO,
- DTE602: communication with the control level via EtherNet/IP,
- DTE604: communication with the control level via EtherNet TCP/IP,
- DTE605: communication with the control level via EtherNet IoT protocol,
- can be configured via a web server.

Example applications:

- material flow control in production lines
- warehouse management by the automatic detection of stored products
- tank management, order picking or product tracking



The device may only be used under the operating conditions specified in the data sheet.

3.1 Configuration via Ethernet interface

- 10 Mbps and 100 Mbps
- TCP/IP - Transport Control Protocol / Internet Protocol
- IT functionality: HTTP server
- M12, twisted pair

4 Items supplied

- DTE60x RFID compact unit
- Installation instructions



The device is supplied without installation and connection accessories.



In the event of incomplete or damaged items supplied, please contact ifm electronic.

5 Function

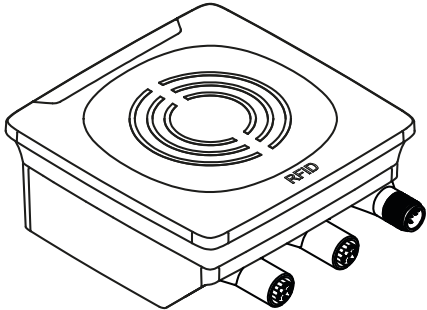
5.1 Operating principle

The ID tags are operated passively, i.e. without battery. The energy required for operation is supplied by the RFID compact unit.

The physical principle of the energy transfer is based on inductive coupling. The integrated antenna coil in the RFID compact unit generates a magnetic field

which partly penetrates the antenna coil of the ID tag. A voltage is generated by induction that supplies the data carrier with energy.

5.2 Overview DTE601

	Art. no.:	DTE601
	Function:	RFID compact unit
	Type designation:	DTRHF HLRWPNUS03
	Operating frequency:	13.56 Mhz
	Type:	rectangular
	Max. transmitter power:	2 watts

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Fig. 1: Overview DTE601

5.3 Overview DTE602

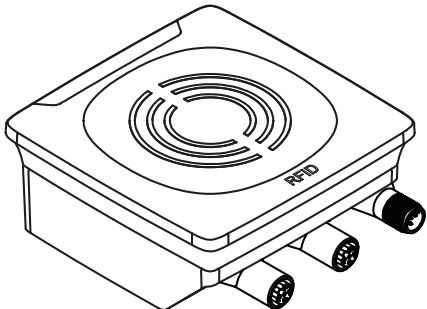
	Art. no.:	DTE602
	Function:	RFID compact unit
	Type designation:	DTRHF HLRWEIUS03
	Operating frequency:	13.56 Mhz
	Type:	rectangular
	Max. transmitter power:	2 watts

Fig. 2: Overview DTE602

5.4 Overview DTE604

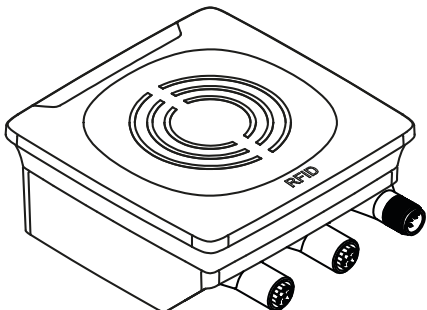
	Art. no.:	DTE604
	Function:	RFID compact unit
	Type designation:	DTRHF HLRWENUS03
	Operating frequency:	13.56 Mhz
	Type:	rectangular
	Max. transmitter power:	2 watts

Fig. 3: Overview DTE604

5.5 Overview DTE605

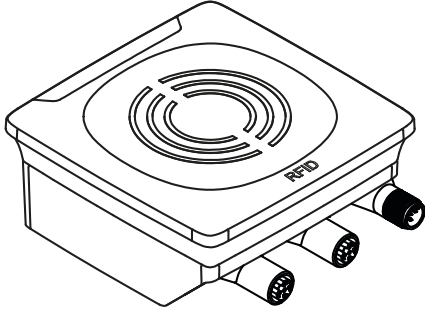
	<table><tr><td>Art. no.:</td><td>DTE605</td></tr><tr><td>Function:</td><td>RFID compact unit</td></tr><tr><td>Type designation:</td><td>DTRHF HLRWITUS03</td></tr><tr><td>Operating frequency:</td><td>13.56 Mhz</td></tr><tr><td>Type:</td><td>rectangular</td></tr><tr><td>Max. transmitter power:</td><td>2 watts</td></tr></table>	Art. no.:	DTE605	Function:	RFID compact unit	Type designation:	DTRHF HLRWITUS03	Operating frequency:	13.56 Mhz	Type:	rectangular	Max. transmitter power:	2 watts
Art. no.:	DTE605												
Function:	RFID compact unit												
Type designation:	DTRHF HLRWITUS03												
Operating frequency:	13.56 Mhz												
Type:	rectangular												
Max. transmitter power:	2 watts												

Fig. 4: Overview DTE605

6 Installation

6.1 General installation instructions

-  When mounting several RFID compact units adhere to the minimum distances between the systems.
-  Installing a RFID compact unit in or on metal reduces the read and write distance.
-  The immediate vicinity of powerful HF emission sources such as welding transformers or converters can affect operation of the RFID compact units.
-  Available accessories: www.ifm.com

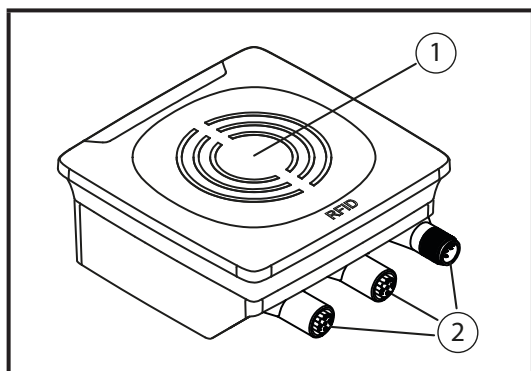
6.2 Notes on ID tag mounting

-  Installation of the ID tags in and on metal reduces the read and write distances.
-  For positioning the ID tags the RFID compact units are marked with an antenna symbol on the active face. It designates the middle of the integrated antenna coil and has to correspond with the middle of the ID tag.
-  The orientation of the RFID compact unit axis must correspond with the axis of the ID tag coil.

6.3 Avoiding interference

The device generates a modulated electrical field with a frequency of 13.56 MHz. To avoid interference of the data communication no other devices generating interference emission in this frequency band must be operated in its vicinity. Such devices are for example frequency converters and switched-mode power supplies.

6.4 Mechanical design



- 1: sensing face
- 2: connection (can be rotated by 270°)

Fig. 5: Mechanical design

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6.5 Installation options

For installation, the following optional accessories are available.



The device can be mounted without the accessories. For installation, please use the threaded sleeves on the back of the device. The necessary screws are not supplied with the device.

6.5.1 Installation with angle bracket E80335

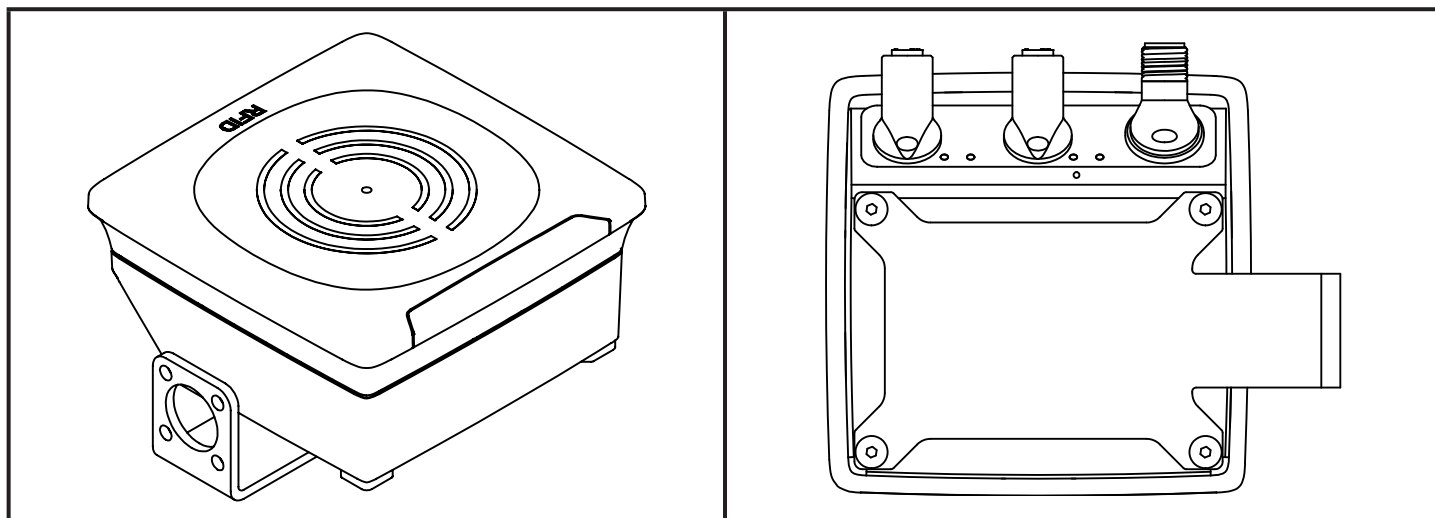


Fig. 6: Installation with angle bracket E80335

6.5.2 Installation with mounting device E80336

The mounting device is used to fix the device to a clamp. The following clamps can be used:

- E21110 with a rod diameter of 12 mm
- E20795 with a rod diameter of 14 mm
- E21109 with a rod diameter of 14 mm

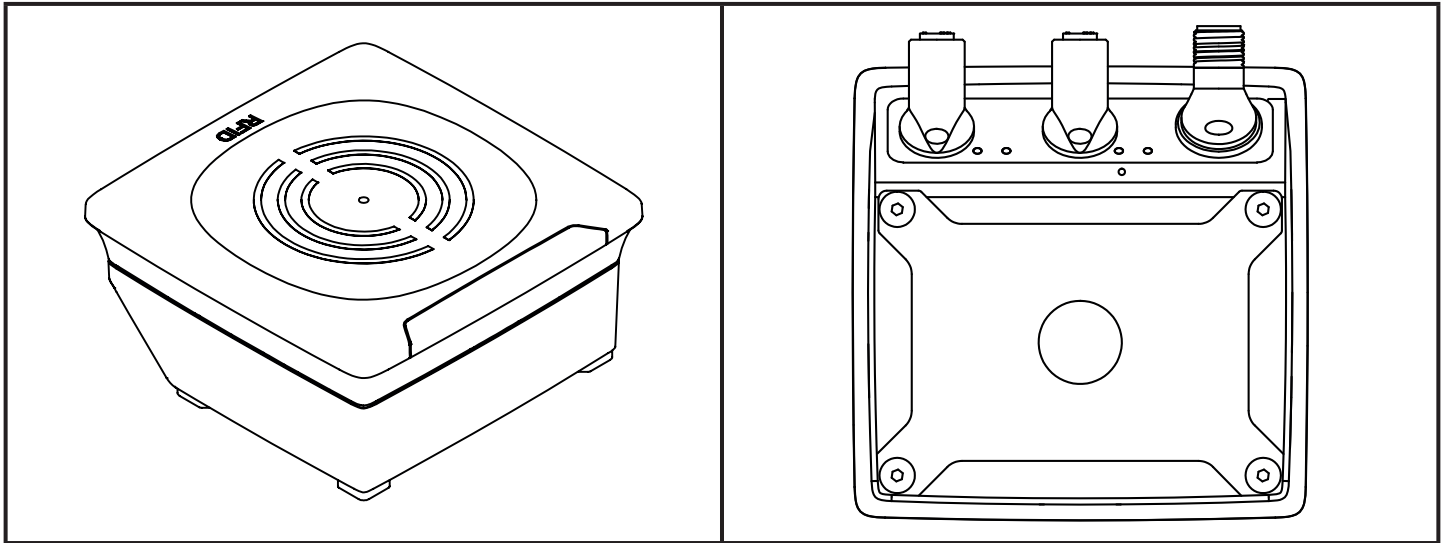


Fig. 7: Installation with mounting device E80336

6.5.3 Installation with fixing bars E80337

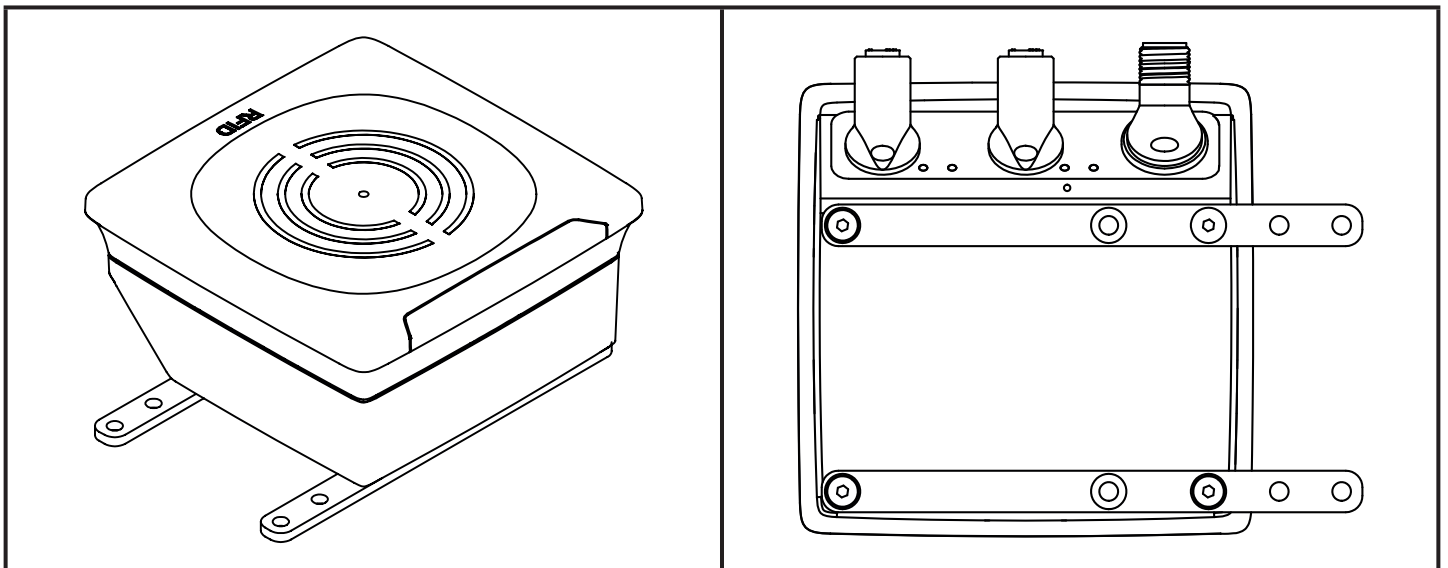


Fig. 8: Installation with fixing bars E80337

► Fix the device with fixing screws to the designated location.

6.6 Mounting distances

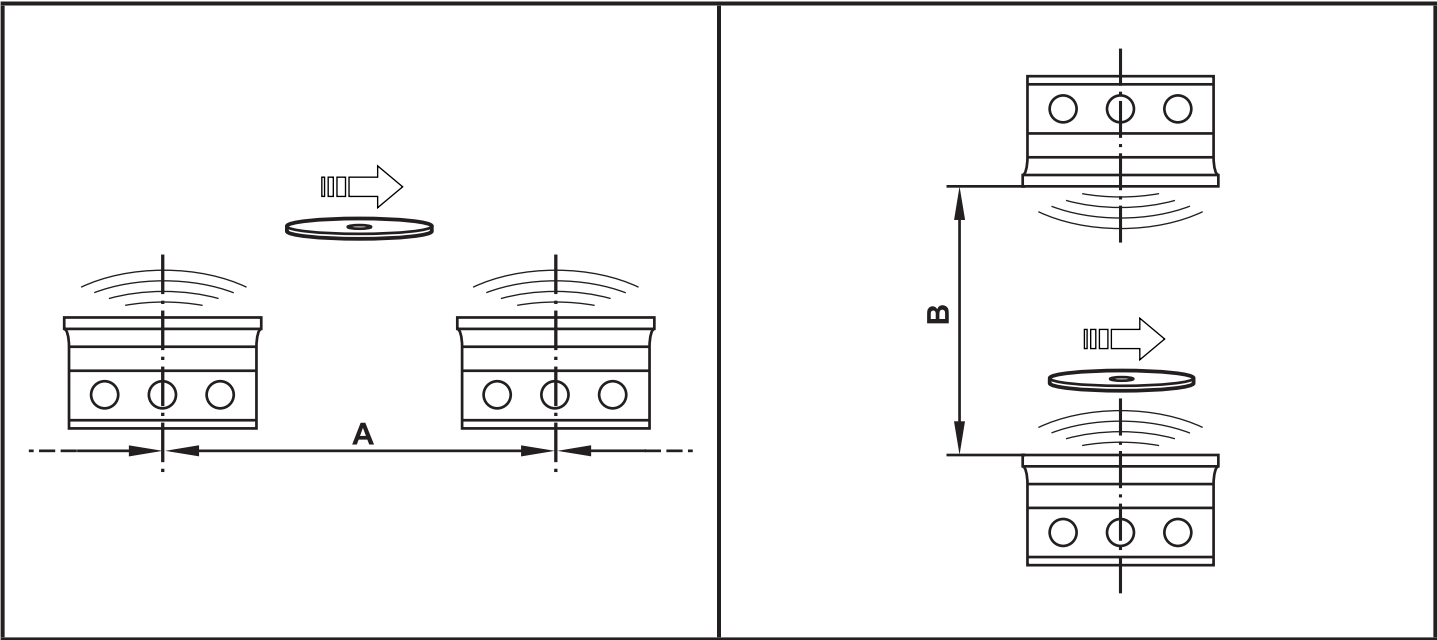
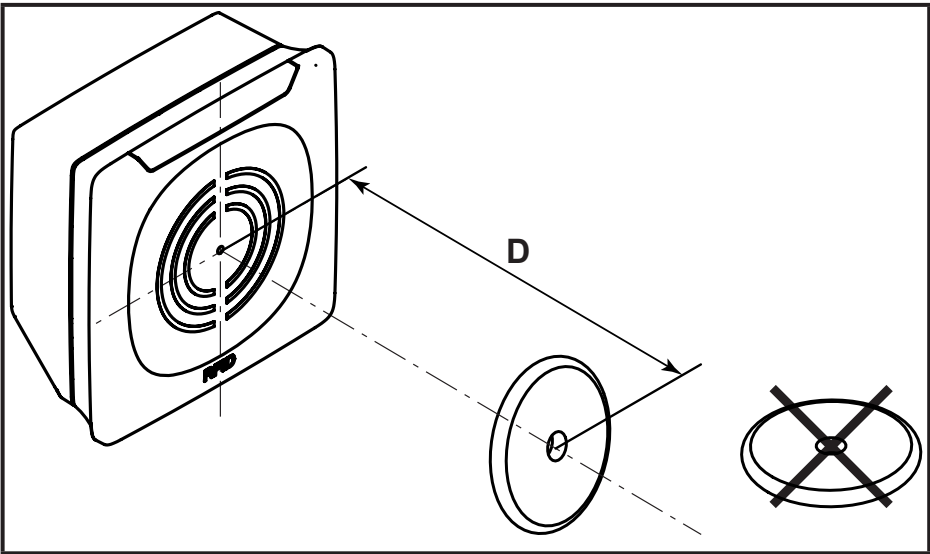


Fig. 9: Mounting distances

Operating mode	Distance side (A)	Distance front (B)
Read and write (at 100% transmitter power)	$\geq 850\text{ mm}$	$\geq 600\text{ mm}$

6.7 Positioning of the ID tags



- ▶ Align the ID tag on the antenna central axis.
- > Distance D see data sheet

Fig. 10: Position of the ID tag

7 Electrical connection

NOTE

- The device must be connected by a qualified electrician.
Device of protection class III (PC III)
Electric supply via SELV circuits only.
- ▶ Disconnect power before connecting the device.
 - ▶ For cable lengths > 30 m use an additional protection against surge voltages to IEC 61000-4-5.
 - ▶ A total current consumption of the device of 0.5 A must not be exceeded.

NOTE

- The IP rating indicated in the data sheet is only guaranteed if the M12 connectors are firmly screwed.
The unit can be damaged by insufficiently tightened M12 connectors.
- ▶ Firmly screw the M12 connectors to the device.

7.1 Voltage supply PWR

- ▶ Connect the device to the voltage supply using an M12 connection cable.

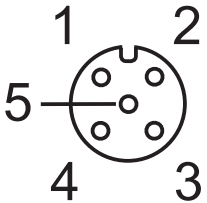
	Pin	Connection
	1	24 V DC
	2	digital input / output 2
	3	0 V
	4	digital input / output 1
	5	not connected

Fig. 11: Pin connection voltage supply

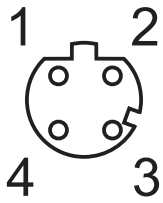


Matching connection cables are available: www.ifm.com

7.2 Ethernet

► Connect the device to a PC using a suitable M12 Ethernet connection cable.

 The M12 Ethernet cable must be screened to ensure interference-free operation.

	Pin	Connection
	1	TD+
	2	RD+
	3	TD-
	4	RD-

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Fig. 12: Pin connection fieldbus connection

7.2.1 Factory setting of the Ethernet parameters

The following values are preset at the factory:

Parameter	Factory setting
IP address	192.168.0.79
Gateway address	192.168.0.100
Subnet mask	255.255.255.0
Auto-negotiation	on
DHCP	off

The settings can be changed via the web server of the device or via the PC.

7.3 Functional earth connection



To ensure interference-free operation, the device must be connected to an earth potential free from external voltage.

7.3.1 Mounting plate

When the device is fixed on a mounting plate, the connection is made via one of the four mounting bolts on the back. Note that the plate must be connected with the earth potential.

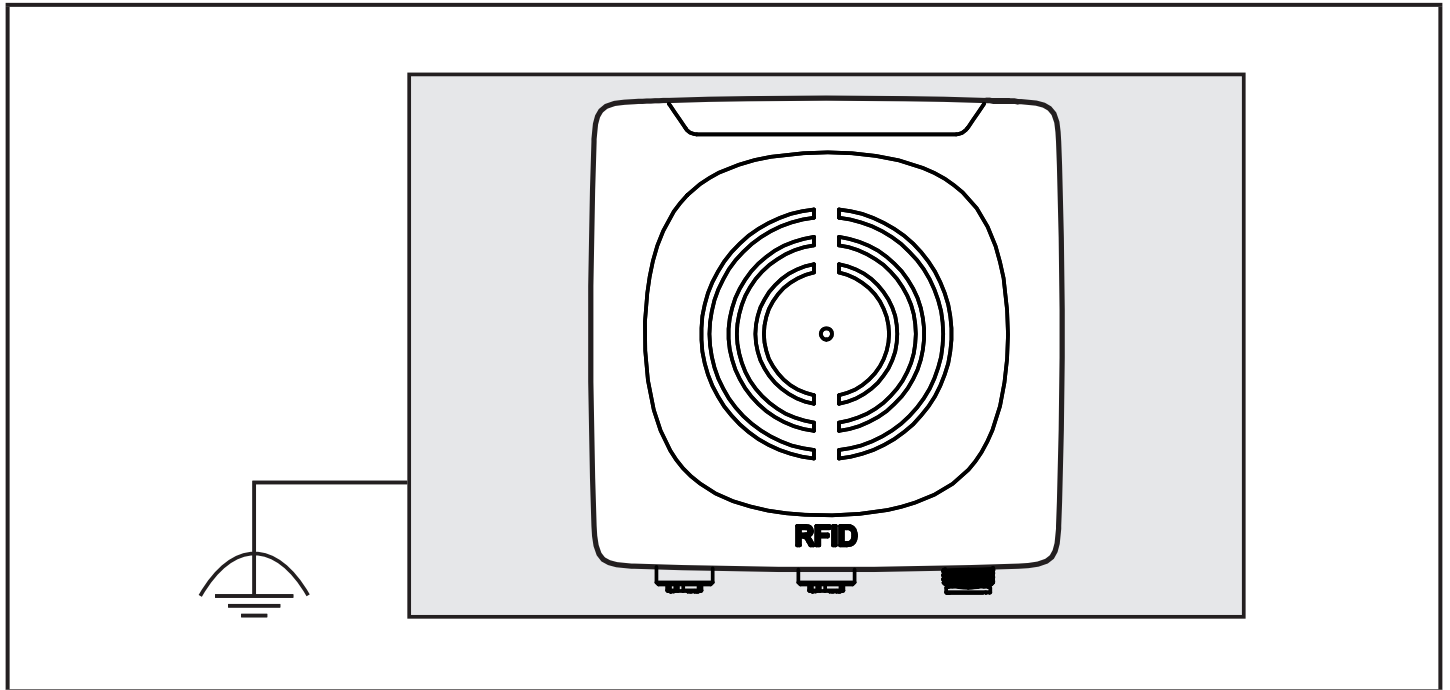
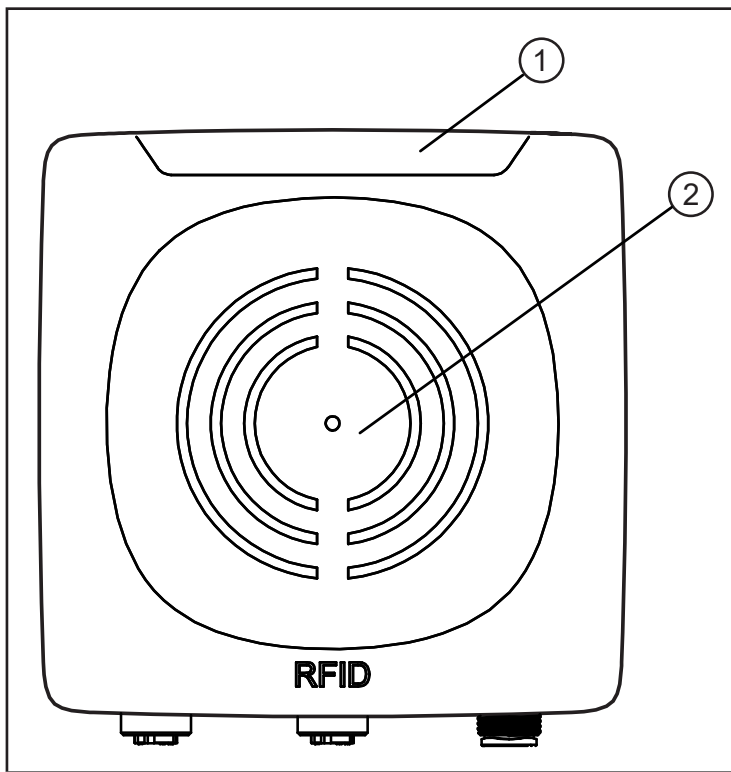


Fig. 13: Mounting plate

8 Operating and display elements



- ①: 1 power LED (green)
4 LEDs on signal bar (yellow)
2 fieldbus LEDs (green/red)
- ②: sensing face

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Fig. 14: Operating and display elements

8.1 Reset to factory settings

The Ethernet parameters can be reset to factory setting. To do so, proceed as follows:

- ▶ Remove all cable connections from the device.
- ▶ Insert an electrically conductive bridge between pin 2 and pin 4 on the process connection voltage supply PWR.
- ▶ Connect the device to the voltage supply.
 - > The LEDs of the signal bar (yellow) are on one after the other. Then LED 4 of the signal bar (yellow) flashes at 8 Hz.
- ▶ As soon as the LEDs of the signal bar (yellow) flash at 8 Hz, disconnect the device.
- ▶ Remove the bridge.
- ▶ Connect the device to the voltage supply.
 - > The parameters are reset.

8.2 LED indicators

The following LED indicators apply to all DTE60x devices.

8.2.1 Power LEDs and signal bar

LED PWR (1x green)	LED signal bar (4x yellow)	Status	Note
on	off	voltage supply OK	$18\text{ V} \leq U_{\text{AUX}} \leq 36\text{ V}$
flashing at 2 Hz	off	antenna (HF field) is deactivated	
on	flashes twice	ID tag read/written successfully	
on	flashing quickly	ID tag read/written incorrectly	



If the ID tag has a high receive signal strength, all LEDs of the signal bar are on (configurable).



The maximum receive signal strength depends on the type of the ID tag.

8.2.2 LED LINK/ACT ETH 1 / ETH 2

LED green	LED yellow	Status	Note
off	off	no connection to another Ethernet counterpart	link status "no link"
on	off	connection to Ethernet counterpart exists, no data exchange	link status "link", "no traffic"
on	flashes sporadically	connection to Ethernet counterpart exists, data exchange running	link status "link", "traffic"

8.2.3 Special device LED indicators

LED	Status	Note
PWR LED (green) on LEDs of signal bar (yellow) flashing at 8 Hz	device is in the service mode "emergency system started"	A firmware update is necessary and can be executed via the web server.
PWR LED (green) on LEDs of signal bar (yellow) flashing at 8 Hz	major error, device has to be returned	hardware fault or permanent data in the device are corrupt
PWR LED (green) on The LEDs of the signal bar (yellow) are on one after the other. Then LED 4 of the signal bar (yellow) flashes at 8 Hz.	reset to factory settings	-

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8.3 LED indicators DTE601

The following LED indicators only apply to DTE601.

8.3.1 LED SF

LED red	LED green	Status	Note
off	off	no voltage supply	check the voltage supply
off	flashing	"node flash test", initiated by PROFINET IO controller	-
off	on	normal operation	-
flashing	off	error at channel level	- overload - temperature - internal fault
on	off	error at device level	- undervoltage - temperature
flashing	flashing	self-test	starting phase of the device

8.3.2 LED BF

LED red	LED green	Status	Note
off	off	no voltage supply	check the voltage supply
off	flashing	PROFINET IO controller is in STOP mode	-
off	on	PROFINET IO controller is in RUN mode	-
flashing	off	connection to the PROFINET IO controller is established, no valid configuration	check configuration
on	off	no connection to the PROFINET IO controller	check connection
flashing	flashing	self-test	starting phase of the device

8.4 LED indicators DTE602

The following LED indicators only apply to DTE602.

8.4.1 LED Mod (module status)

LED red	LED green	Status	Note
off	off	no voltage supply	check the voltage supply
off	flashing	ready for operation	Device is not configured. There is no exchange of data: ▶ Check the connection of the Ethernet/IP scanner. ▶ Check the parameter setting of the configuration assembly.
off	on	normal operation	Connection to the EtherNet/IP scanner is established. The device is configured. The data transfer is running.
flashing	off	minor error	A connection to the EtherNet/IP scanner was not established: ▶ Check the voltage supply. ▶ Check the configuration of the device.
on	off	major error	Software / hardware error of the device: ▶ Reboot the device. > If the error remains, send the device to the service.
flashing	flashing	self-test	starting phase of the device

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8.4.2 LED Net (network status)

LED red	LED green	Status	Note
off	off	no IP address or no voltage supply	► check the voltage supply ► If DHCP is activated, check presence of a DHCP server in the network.
off	flashing	no connection	The device has received an IP address. An EtherNet/IP connection was not established. ► Check the configuration of the device via EtherNet/IP scanner.
off	on	connection exists	At least one EtherNet/IP connection to the device was established.
flashing	off	timeout of the connection	A timeout was found with one of the existing EtherNet/IP connections. ► Check the status of the connection in the EtherNet/IP scanner.
on	off	IP address exists already	The same IP address as that of the device was detected in the EtherNet/IP network. ► Activate DHCP.
flashing	flashing	self-test	starting phase of the device

8.5 LED indicators DTE604 / DTE605

The following LED indicators only apply to DTE604 / DTE605.

8.5.1 LED SF

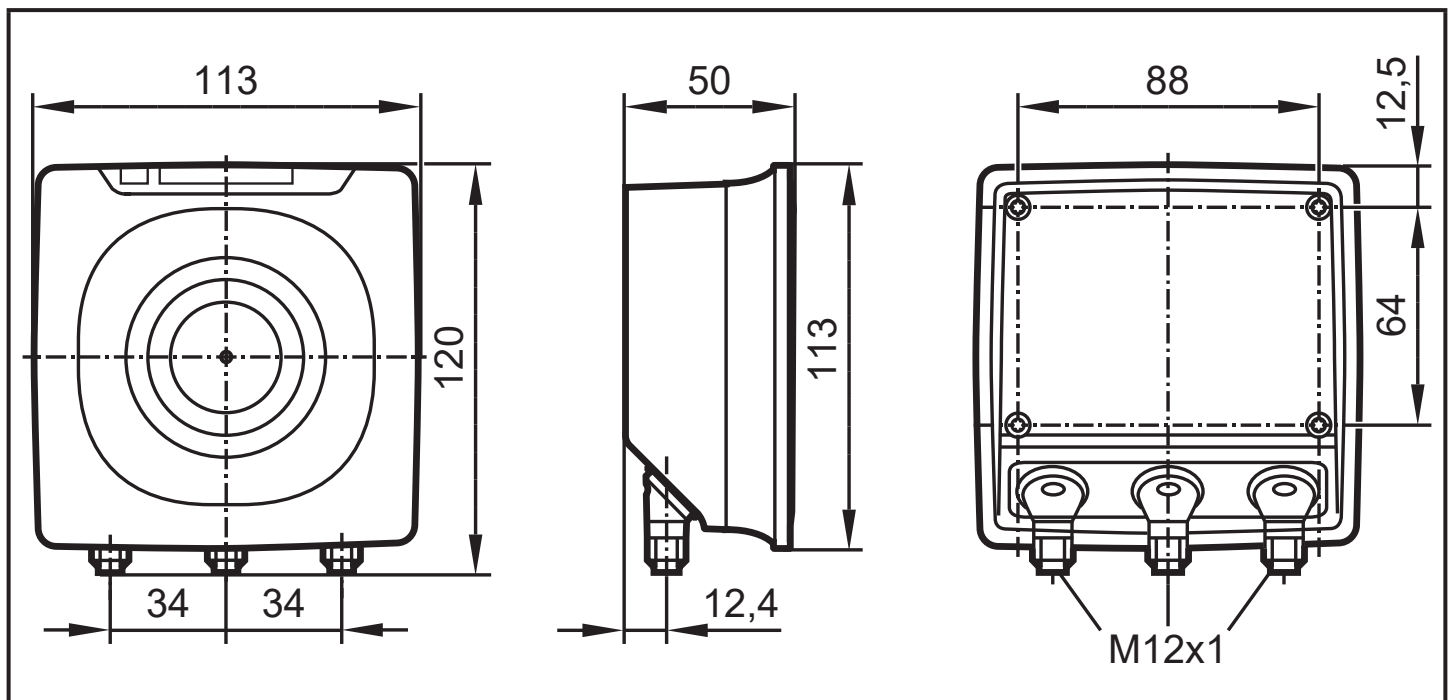
LED red	LED green	Status	Note
off	off	no voltage supply	check the voltage supply
off	on	normal operation	-
flashing	off	error at channel level	- overload - temperature - internal fault
on	off	error at device level	- undervoltage - temperature
flashing	flashing	self-test	starting phase of the device

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8.5.2 LED BF

LED red	LED green	Status	Note
off	off	no voltage supply	check the voltage supply
off	flashing	connection to host controller exists, there is no data exchange	-
off	on	connection to host controller exists, data exchange running	-
flashing	off	connection to host controller exists, there is no valid configuration	check configuration
on	off	no connection to the host controller	check connection
flashing	flashing	self-test	starting phase of the device

9 Scale drawing



10 Technical data

10.1 Data sheet

The data sheet is available on our website: www.ifm.com

10.2 Device manual

The device manual is available on our website: www.ifm.com

11 Maintenance, repair and disposal

If used correctly, no maintenance and repair measures are necessary.

- The device must only be repaired by the manufacturer.
- After use dispose of the device in an environmentally friendly way in accordance with the applicable national regulations.
- Keep the device free from soiling.
- Use glass cleaner as cleaning agent.
- Do not open the device.

12 Approvals/standards



If approval is granted the approval text of the respective countries applies (→ 12 Approvals/standards).

Information about the approvals granted: www.ifm.com

12.1 Radio approvals

12.1.1 Overview

The overview of the approval status of a unit is available on our website at www.ifm.com.

12.1.2 Europe / EC declaration of conformity

ifm electronic gmbh hereby declares that the DTE60x radio system corresponds to the directive 2014/53/EU.

You can find the EC declaration of conformity on our website at: www.ifm.com

12.1.3 USA

FCC note:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device must not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications made to this equipment not expressly approved by ifm may void the FCC authorization to operate this equipment.

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

12.1.4 Canada

IC note:

This device complies with Industry Canada license-exempt RSS standards. Operation is subject to the following two conditions:

1. The device may not cause interference, and
2. the user of the device must accept any interference received, including interference that may cause undesired operation.

12.1.5 Taiwan

Administrative Regulations on Low Power Radio Wave Devices warning

Article 12

Unless granted permission by NCC, no company, firm, or user shall alter the frequency, increase the transmitting power, or alter the original design characteristics or operating functions of an approved low-power radio-frequency device.

Article 14

Low-power radio-frequency devices shall not affect aircraft security nor interfere with legal communications. If such interference occurs, the user shall immediately cease operating the device until improvement is made and the interference no longer exists.

Legal communications refers to the wireless telecommunication operations that comply with the Telecommunications Act. Low-power radio-frequency devices must accept any interference received from legal communications and ISM radio wave devices.

Below are the Taiwanese legal regulations in Chinese.

低功率電波輻射性電機管理辦法：

- 第十二條
經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
- 第十四條
低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信法規定作業之無線電通信。
低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

12.1.6 Australia

Use in Australia:



12.1.7 Singapore

Complies with
IDA Standards
DB 103032

The “Equipment Registration” is available on our website at: www.ifm.com

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