myon
SIMPLY WIRELESS

Radio Frequency Transmitting Devices
Models RFTD-Exx / RFTD-Axx

User Manual

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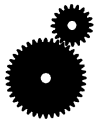
Introduction

In this manual you will find important information, needed for the commissioning and operation of the device.
Always adhere to the safety instructions in the manual of your computer or other systems involved and the ones in this handbook! If you experience any problems, please contact your sales agency or the respective manufacturer.

Conventions used in this text

Throughout this manual the following conventions are used.

	indicates important information that may damage your health, the functioning of the device or the safety of your data if not adhered to.
	indicates additional information and tips.
	indicates a step, you will need to carry out.
	"Quotation marks" indicate names of chapters and terms that should be emphasized.
	Italics font identifies file names and menu items.
	`This font` indicates screen outputs.

Important Information

Please follow these safety instructions,
to ensure your safety and the optimal functioning of the device.

The product may be used only as intended and in compliance with the instructions, by appropriately trained and qualified personnel. Maintenance and repairs have to be carried out by the manufacturer or authorized personnel.

The product may only be used in combination with accessories and spare parts, that are specified in the manual or by other means by the manufacturer. Other combinations, accessories and consumable parts may only be used if they are specifically designed for the intended application and do not affect performance, and security requirements.

Safety instructions regarding power supply

- The device is disconnected by pulling the power plug from the power outlet.
- The power cord in devices with mains plugs is used for separation from the mains. The power outlet must be located in the vicinity of the device and must be easily accessible.
- This device may only be operated on a power grid in conformity with the specifications indicated on the device's label or mark tor in the section "Technical data". If you are not sure whether these requirements are met, please contact the manufacturer or your local power company.
- The device is not suitable for use outdoors.

Cleaning and care

- Unplug the power cord from the outlet before cleaning the device.
- The device can be cleaned with a slightly water moistened, soft, lint-free cloth. Do not use harsh cleaners, aerosol cleaners or glass cleaners.
- Objects or liquids must not get into the interior of the device.
- Check the device after each cleaning to its functions and to possibly damage occurred. If you notice any damage, please do not make any repair attempts, but contact your sales agency or the manufacturer.

Maintenance

Do not open or remove the protective housing yourself as you might expose yourself to dangerous voltages and other risks. In case of abuse or accident (such as dropping the unit or improper use) please contact the manufacturer or authorized service personnel for maintenance.

Content

1 Preface

1.1 Proper use

The product is designed to capture and wirelessly transmit different sensor signals such as electromyograms, accelerations, forces, temperatures, pressures, etc. using a number of transmission units transmitting to a receiving unit.

All product models and types of the product may, unless expressly stated otherwise, only be used externally and noninvasively. Only the supplied components (sensors, power supply, etc.) are to be used. Additional sensors or spare parts are available upon request from the manufacturer.

1.1.1 Products series RFTD-Exx

The models RFTD-Exx (e.g. RFTD-E08, RFTD-E16) are designed for capturing and wireless transmission of electrical signals (electromyograms) resulting from the contraction of muscles by means of bipolar electrodes applied on the skin surface over the muscle of interest.

1.1.2 Products series RFTD-Axx

The models RFTD-Axx (e.g. RFTD-A01, D02-RFTD) are designed to capture and wirelessly transmit data of any sensor type (e.g. accelerometers), that has a digital interface with compatible communication protocol and power supply where applicable. The currently available sensor types for the series RFTD-Axx can be requested from the manufacturer.

1.2 Contraindications

Contraindications that relate directly to the product, are currently unknown. The medical practitioner or user needs to decide on the basis of the general condition of the patient or subject whether or not the intended application can take place. Further information is accessible in current literature.

1.3 Possible combinations

In addition to these instructions, the instructions of those products used in combination must also be observed.

Potential electromagnetic or other interference that occurs between the product and other products may lead to disturbances or malfunctions.

2 Illustrations

The images shown below
do not claim to be true to scale.

2.1 Illustrations of the myon RFTD

2.1.1 Receiving unit

Product label with serial number

Sub-D 25 socket for analogue output signals

Socket for wall power supply with
mechanical reverse voltage protection

2.1.2 Transmitting unit

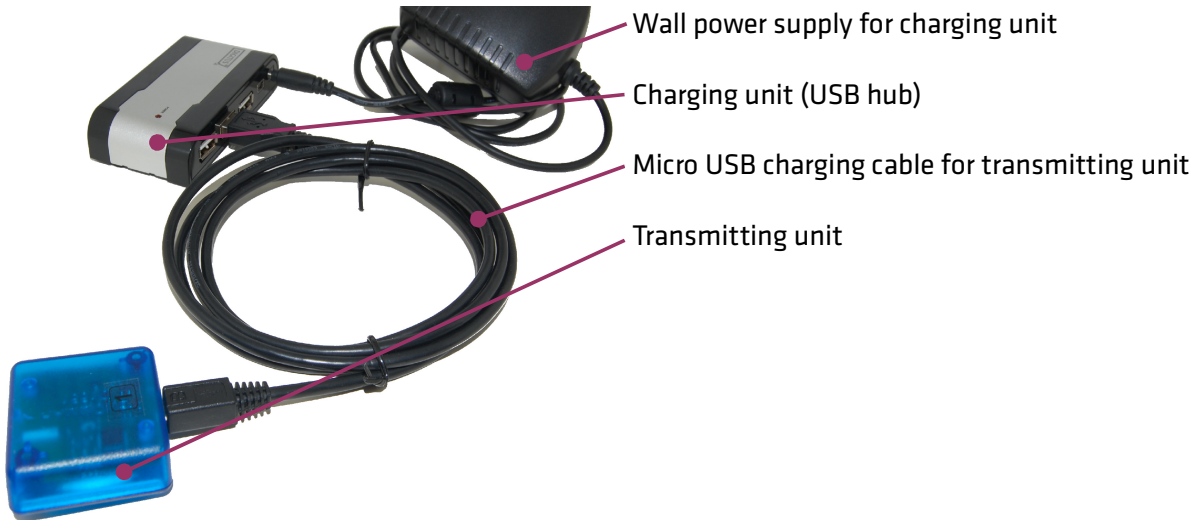
Product label with channel number

LED indicator

Micro USB socket for connection of sensors and
charging cables

2.1.3 Power supply for receiving unit

2.1.4 Charging unit for transmitting units



2.2 Illustrations of sensor modules

2.2.1 Connection of sensor adapter cables to transmitter unit (all product series)

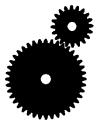
On the long side of the trapezoid connector on one side there are two small hooks.
For the correct insertion these must face downwards.

When disconnecting the sensor adapter cable, please do not pull on the sensor cable, but the connector housing.

3 Operation

The device is not explosion-proof. Danger of explosion. Do not operate in flammable atmosphere. When operating for the first time, make sure all devices are separated from the electricity grid.

3.1 Unpacking the device



Remove the device and accessories from the box and check the completeness of the delivery. The scope of delivery is dependent on the model series and the model type supplied. If you suspect that parts are missing, please contact your sales representative.

3.2 Preparing the device

3.2.1 Placement and installation of cable connections

a) Place the receiving unit on a flat surface.

b) Plug the power connector for the receiving unit into the power socket on the receiving unit.

c) Connect the socket for analog output signals to your specific recording system (e.g. Vicon). Please make sure you chose the correct assignment of the individual pins (see chapter 6.1.2 /Description of interfaces on page 15).

For the preparation of this interface specific technical knowledge may be required. If you do not have the necessary skills, please consider consulting an expert.

For this connection a specifically adaptor cable may be required.

d) Plug the power adapter of the receiving unit into a power outlet.

e) Turn on your specific recording system (e.g. Vicon) as well as all other interacting systems (e.g. force plates, etc.).

3.2.2 Re-charging of the transmitting units

a) Connect the wall power supply for the charging unit to the charging unit.

b) Plug the wall power supply for the charging unit into a power outlet. The control LED of the charging unit will light up.

c) Plug one end of the included micro USB charging cables into one of the transmitting units and the other end into a free USB port of the charging unit (USB hub).

d) After a short time the blue indicator LED of the transmitting unit will light up shortly, indicating the beginning of the re-charging process. The re-charging process is completed when the blue indicator LED lights up continuously.

e) Please repeat steps Fehler: Referenz nicht gefunden to c) until all transmitting units are com-

pletely re-charged.

Depending on the charge condition of the battery, the re-charging process can take between 30 and 60 minutes. When the battery is charged for the first time, the charging process may take a little longer.

All transmitting modules are equipped with newest generation LiPo batteries that do not suffer the problem of “memory effect” common to older batteries. Therefore the transmitting modules can be recharged anytime regardless of their current charge condition without reducing the performance of the battery.

3.3 Conduction of measurements

3.3.1 Establishing a wireless connection

a) To establish a wireless connection between transmitting modules and receiving module, just detach the charging cables from the respective transmitting modules.

b) By this procedure, the transmitting unit is being activated and after 1 – 4 seconds the blue indicator LED will start flashing.

The time between each LED flash gives you an idea of how much charge is left in the battery. The faster the LED flashes, the less charge is left.

3.3.2 Capturing and transmission of sensor signal

With the steps listed in chapter 3.3.1 the wireless connection is established and the device is ready to start measuring.

4 Turning off the device

To turn off the device, please switch off all interacting devices and disconnect all devices from the mains.

Unplug the wall power supply for the charging unit and for the receiving unit from the power outlet.

If the transmitting modules are connected via the charging cable to the charging unit, these are also automatically switched off. Otherwise, the transmitter modules will keep transmitting until their battery capacity is exhausted.

Disconnect the cables between the device and other interacting devices (e.g. Vicon motion capture systems).

5 Checks

Please follow the suggested checks before each use of the device.

- Check the instrument for potential damage and completeness. If you notice any damage, do not use the device and contact your sales agency or the manufacturer.
- Check all connecting cables and accessories for damage. If you notice any damage, do not use the device and contact your sales agency or the manufacturer.
- Avoid excessive bending and stretching when positioning the cables, and make sure that the cables never pose a tripping hazard.
- Check all connectors fit properly.
- Check that all connection contacts are clean.
- Check that the labels are complete and legible.

6 Technical description

6.1 Technical data

6.1.1 General technical data

		Receiving unit	Transmitting unit
Manufacturer		myon AG, Baar, Switzerland	
Model series		RFTD-E RFTD-A	
Types		RFTD-E04, RFTD-E08, RFTD-E16, RFTD-E32. RFTD-A01, RFTD-A02. Radio Frequency Transmitting Devices	
Operating voltage		220 V / 50 Hz (external wall power supply)	Operation via built-in battery.
Power consumption		800 mA	23 mA (during transmission)
Properties	Weight	340 g	19 g
	Housing color	blue	
	Dimensions	194 x 114 x 59 mm	40 x 40 x 15 mm
	Inputs / outputs	25 Pin Sub-D socket, power supply socket	Micro USB socket
	Sampling rate	N/A	4000 Hz (adjustable)
	Resolution	14 bit	12 bit
	Bandwidth	5...1000 Hz (adjustable)	
	Range	N/A	up to 30 m
	Transmission protocol	2,4 GHz, proprietary	
	Battery life	N/A	up to 8 hours
	Battery re-charging time	N/A	30-60 min
	Latency	16 ms, fixed	
	Inter channel offset	none	
	Included accessories	Wall power supplies, charging unit(s), charging cables, sensors (model series RFTD-A, only), sensor adapter cable, 25 Pin D-Sub connector (open ends)	N/A
Environment	Operation	+ 5 ~ +40°C ; 20 ~ 90% humidity	
	Storage	-20 ~ +60°C ; 10 ~ 90% humidity	
Certifications		ED 199915/EC (R&TTE), ED 1993/42, CE.	

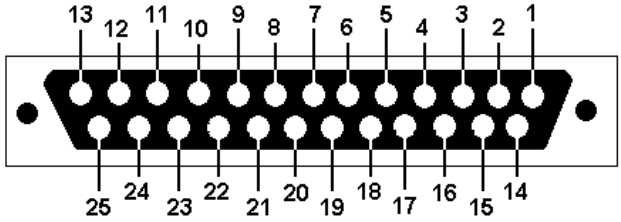
		The corresponding EC Declaration of Conformity can be obtained free of charge by the manufacturer.

6.1.2 Description of interfaces

The interface layout can differ from the ones presented below in RFTD systems that have been specifically adapted to your needs. In this case, you may contact your sales agency or the manufacturer for further assistance. Please have your serial number ready.

6.1.2.1 Model series RFTD-Exx

The analog output is provided via a female DSUB25 socket. For the numbering of the individual pins, please refer to the following figures.

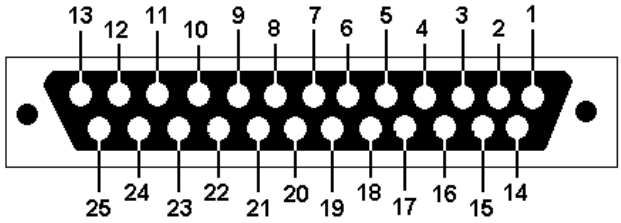


Female DSub25 socket.
View from outside into the socket.

Pin No.	Signal
1 ... 16	Signal of transm. module 1 ... 16
17 ... 24	NC
25	GND

6.1.2.2 Model series RFTD-Axx

The analog output is provided via a female DSUB25 socket. For the numbering of the individual pins, please refer to the following figures.

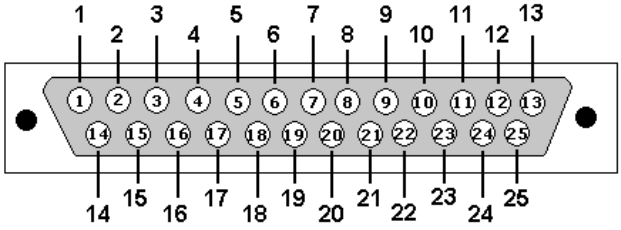


Female DSub25 socket.
View from outside into the socket.

Pin No.	Signal
1 ... 16	NC
17 ... 24	Signal of transm. module 17 ... 24
25	GND

6.1.2.3 Pin assignment for DSub25 connector

The pin assignment of the DSub25 connector is shown in the following figure.



Male DSub25 connector.
View from outside into connector.

6.2 Disposal of product, packaging and accessories.

In order to dispose of the product, packaging and/or accessories, the existing country-specific regulations and laws must be respected. More information may be requested from the manufacturer of the product.

6.3 Troubleshooting

No.	Symptom	Solution
1	Blue indicator LED on the transmitting module is not flashing.	If after a full re-charge cycle (the blue indicator light is on continuously), the LED indicator is not flashing after removal of the transmitter module from the charging unit, please plug the transmitter module back into the charger, wait a minute and detach the charger again.
2	One / several blue indicator LEDs on the receiving unit do not flash blink even though the channel modules do flash correctly. In addition, on some transmission channels only a sine wave with large amplitude profile is visible.	Please separate the receiving unit from the mains by pulling the power adapter out for about one minute. Then plug the power adapter into the power outlet again.
3	On one or more transmission channels there is no sensor signal visible, but only a sine wave profile with large amplitude.	This is an intended process provided for the visualization of transmission errors. If the wireless connection between one / several transmitting modules and the receiving unit is broken (e.g. because of battery drainage or because the distance between the transmitting module and receiving unit is too large), the receiving unit will output a 400 Hz sine signal on the affected channels. Solution: • re-charge the transmitting modules • reduce the distance between transmitters and receivers • temporarily switch off any wireless LAN and / or Bluetooth devices in the vicinity of the measurement system and check whether this has any effect on the signals measured
4	Strong noise / hum on one / multiple channels (particularly applies to model series RFTD-Exx)	Check that all interacting systems (laptops, Vicon, etc.) are connected correctly to their earthing of the mains. Model series RFTD-Exx: Ensure optimum connection of the EMG electrodes. Make sure that you are using fresh electrodes from a newly opened package and that their date of expiry is not exceeded.