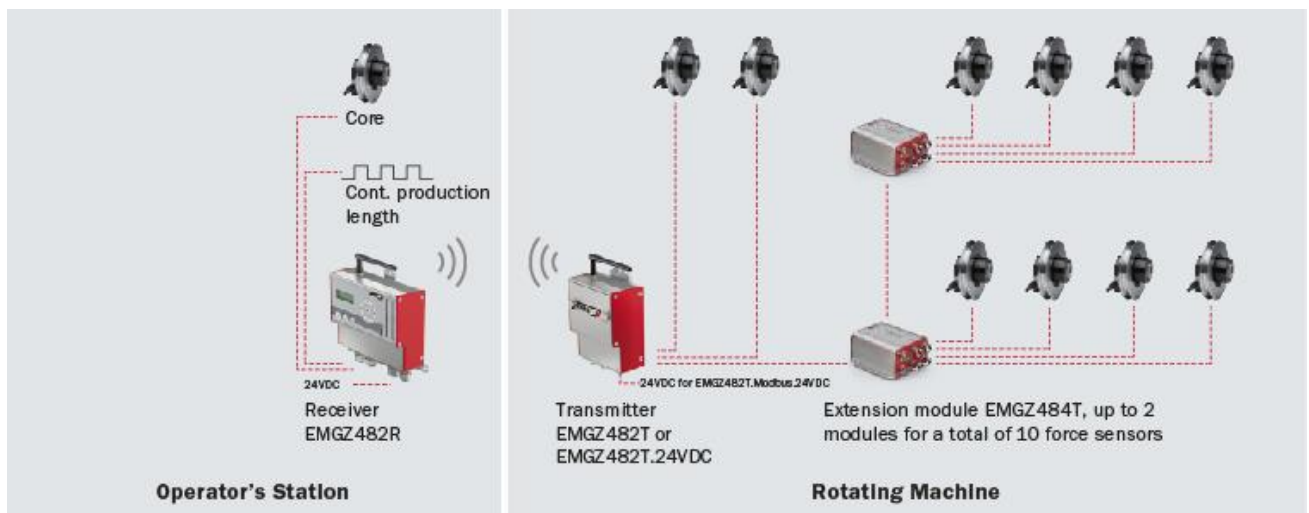




# Installation Manual and Operating Instructions RTM IO

Telemetry System for Wire Tension Monitoring in Cage and  
Tubular Stranders – with analogue outputs up to 10  
channels

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**Diese Bedienungsanleitung ist auch in Deutsch erhältlich.  
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## 2 Safety Information

All safety information, operating and installation regulations listed here ensure proper function of the device. Safe operation of the system requires compliance at all times. Noncompliance with the safety information or using the device outside of the specified performance data can endanger the safety and health of persons.

Work with respect to operation, maintenance, retrofit, repair, or setting the device described here must only be performed by expert personnel.

### 2.1 Presentation of Safety Information

#### 2.1.1 Danger that Could Result in Minor or Moderate Injuries



Danger, warning, caution

Type of danger and its source

Possible consequences of nonobservance

Measure for danger prevention

#### 2.1.2 Note Regarding Proper Function



Note

Note regarding proper operation

Simplification of operation

Ensuring function

### 2.2 General Safety Information



Flying parts

If the battery is not secured correctly, it can be ejected in the case of rotating machines.

Secure the battery using the knurled screws



Changes or modification to this device that have not been expressly approved by FMS AG, will result in the FCC approval for operation of this device being voided.



This device complies with the FCC Rules Part 15 as well as the RSS standards issued in Canada not requiring approval. Operation is

subject to the following two conditions:

- The device may not cause any harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation of the device

***Information about radio frequency radiation***



This device complies with the FCC limit values for an uncontrolled environment. This device should be installed and operated such that a minimum distance of 20 cm is maintained between radiation source and your body. This transmitter must not be operated near or in connection with another antenna or transmitter



The function of this system is only ensured with the components in the specified layout to one another. Otherwise, severe malfunctions may occur. Thus, the installation information on the following pages must be followed.



The local installation regulations ensure the safety of electrical systems. They are not considered in these operating instructions. However, they must be met.



Poor grounding can result in electric shocks for persons, malfunctions of the overall system or damage to the control electronics! Proper grounding must always be ensured.



It is of utmost importance to compensate for the centrifugal forces generated through the rotation of the strander. Non-compensated force-measuring rollers lead to faulty measurements.



Electrical connections must be implemented by an expert.



All system components are sensitive components that can be damaged in the case of improper installation! Installation must be performed by trained service personnel!

### 3 Product Information

#### 3.1 Functional Description

The RTM IO Telemetry System provides the tension value of single strands or wires in cage or tubular type stranding machines. All personnel involved in the production environment gain easy access to the to these important process parameters. For controlling purposes, a PLC can be interfaced via analogue outputs. Many OEMs currently deliver their new machines with preinstalled RTM IO systems, but due to the modular concept and the compact components, retrofitting our system to your existing machinery is also straightforward. Reliable radio transmission of the data and optional battery-packs make slip rings obsolete. The typical RTM IO system can handle the measurement of up to 10 individual wires or strands, but it is also possible to interconnect multiple telemetry systems to allow for an unlimited number of force sensors.

#### 3.2 Main Components

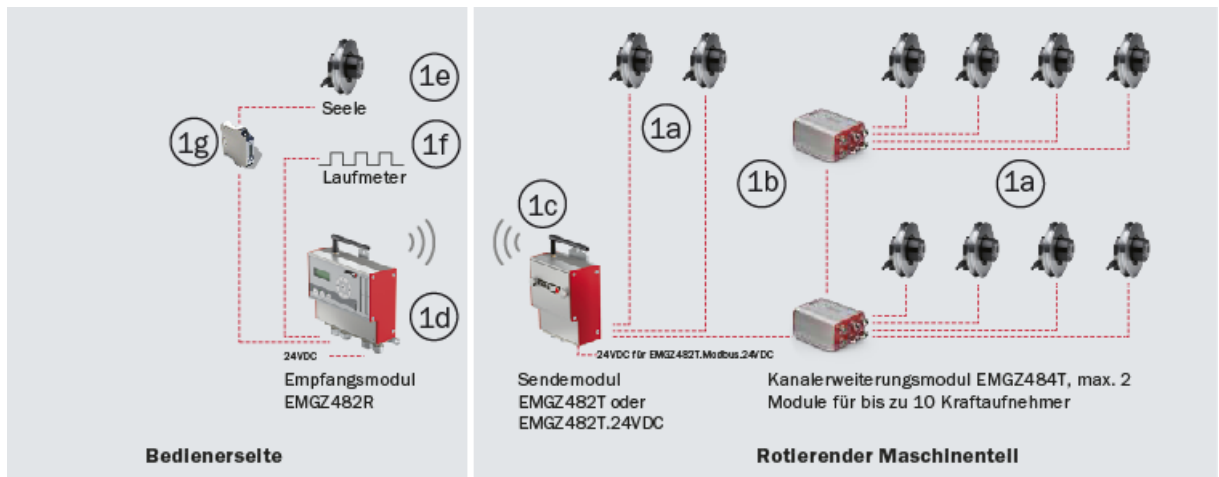


Figure 1: RTM IO main components RTM\_IO\_BA\_Manual.ai

Main component designations	
Item	Description
<b>1a to 1f</b>	<b>Telemetry system RTM IO</b>
1a	Force sensor(s), according to your specifications
1b	Channel extension module(s) (max 2)
1c	Transmitter module
1d	Receiver module
1e	Force sensor (for core)
1f	Dig. input for production length (e.g. proximity switch)
not shown	Battery for transmitter module and charger for battery
not shown	Connection cable from force sensors to transmitter module resp.

	extension modules
1g	Measuring amplifier for core

*Table 1: Main Components*

### 3.3 Scope of Supply

**Scope of supply:**

Force sensors, model and size according to specification; transmitter module(s) with 20 Ah battery/ies and charger, channel extension module(s); receiver module(s); pre-fabricated connection cables, force sensor to channel extension module and/or to receiver module; pre-fabricated connection cables of the channel extension modules to transmitter module

**Options:**

Transmitter module with 24VDC power supply instead of battery

**The following is not included in the scope of supply:**

Pulleys, installation material; 24VDC power supply for receiver module, cable for power supply

**Accessories:**

Patch cable for web browser

## 4 Installation and Electrical Connections

### 4.1 Installation of Force Sensor for Core



Core measurement in static part of machine

The following information describes the installation of the core sensor when installed outside the rotating part of the machine

The red point should be aligned in the direction of the resulting force. Further installation information can be found in the installation manual of the force sensor.

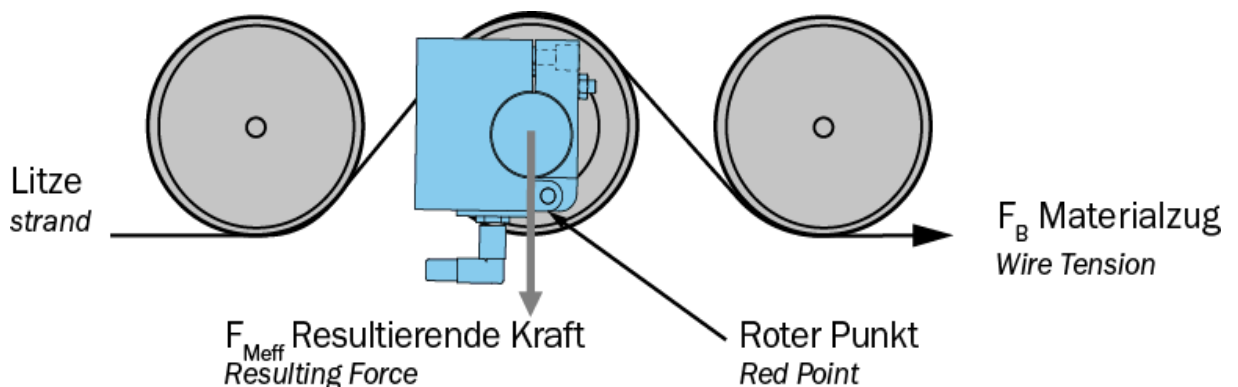


Figure 2: Force sensor alignment in static area RTM\_X42\_Modbus\_BA\_Manual.ai

### 4.2 Installation of the Force Sensor in the Rotating Part of the Machine

In rotating applications, the force sensors are installed such that the centrifugal forces are compensated.

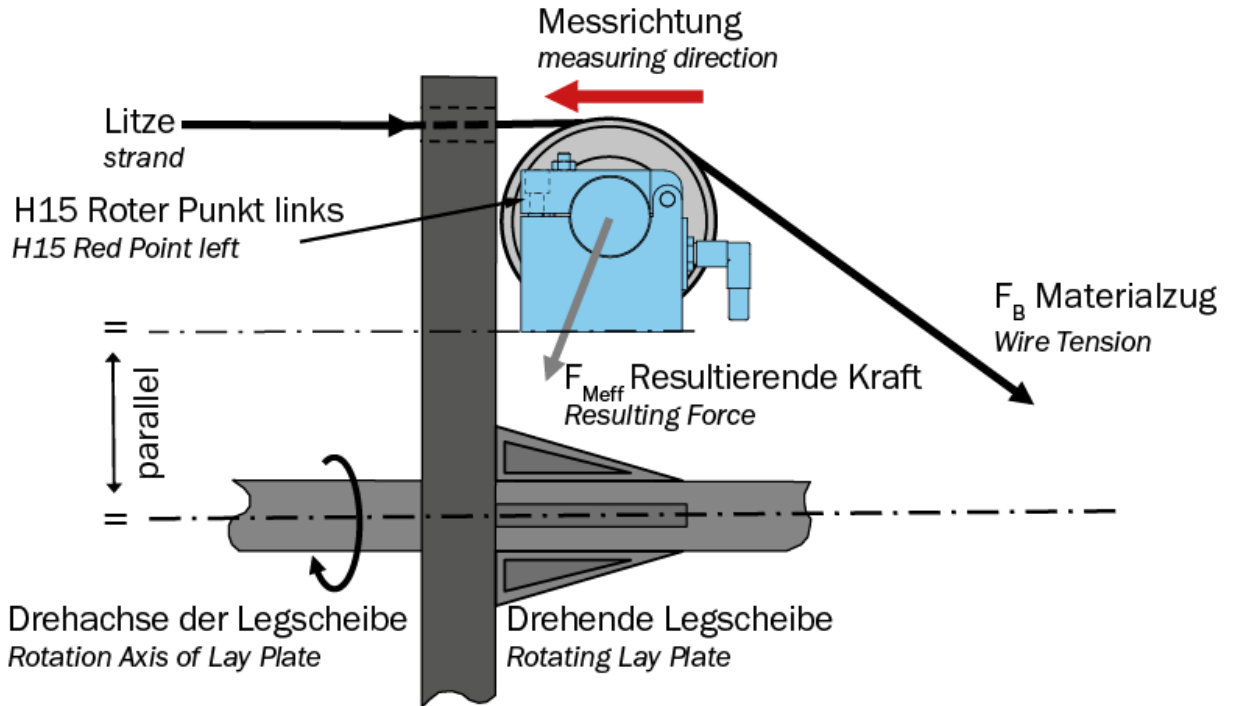


Note

It is of utmost importance to compensate for the centrifugal forces generated through the rotation of the strander. Non-compensated force-measuring rollers lead to faulty measurements,

In the case of FMS force sensors of the RMGZ series, this is achieved by aligning the force sensor such that the measuring direction is exactly parallel to the axis of rotation of the strander. The red point of the force sensor points in the direction of the positive force component.

Correct alignment of the red point can be tested after offset compensation and calibration. If the display of an unloaded force sensor is always 0 N in all positions (e.g., in 12 o'clock or 6 o'clock position), the force measuring roller is aligned correctly.



**Figure 3: Force sensor alignment, here RMGZ200**  
*RMGZ200\_NEU\_2017\_BA\_Manual.ai*

#### Parallel alignment

The exact, parallel alignment of the measuring direction to the axis of rotation of the machine is decisive for achieving precise measured data.

Otherwise, measured value fluctuations occur during machine operation due to the high sensitivity of the FMS force sensors. These interfere with the assessment of the product quality later.

Due to irregularities in the installation surfaces, the alignment may have to be readjusted very precisely. Some FMS force sensors feature an integrated mechanism facilitating this fine adjustment. For force sensors without such features, we recommend the use of shims or thin metal strips.



### 4.3 Installation of the Electronics Components in the Rotating Part of the Machine

The transmitter module and the channel extension modules should be mounted as closely as possible to the axis of rotation of the strander. This reduces the influencing centrifugal forces.

During installation of the transmitter module, make sure that the centrifugal forces do not act in the direction of the fastening screws of the battery.

Make also sure that the transmission path to the receiver module is free from obstacles.

Mount the receiver as high as possible.

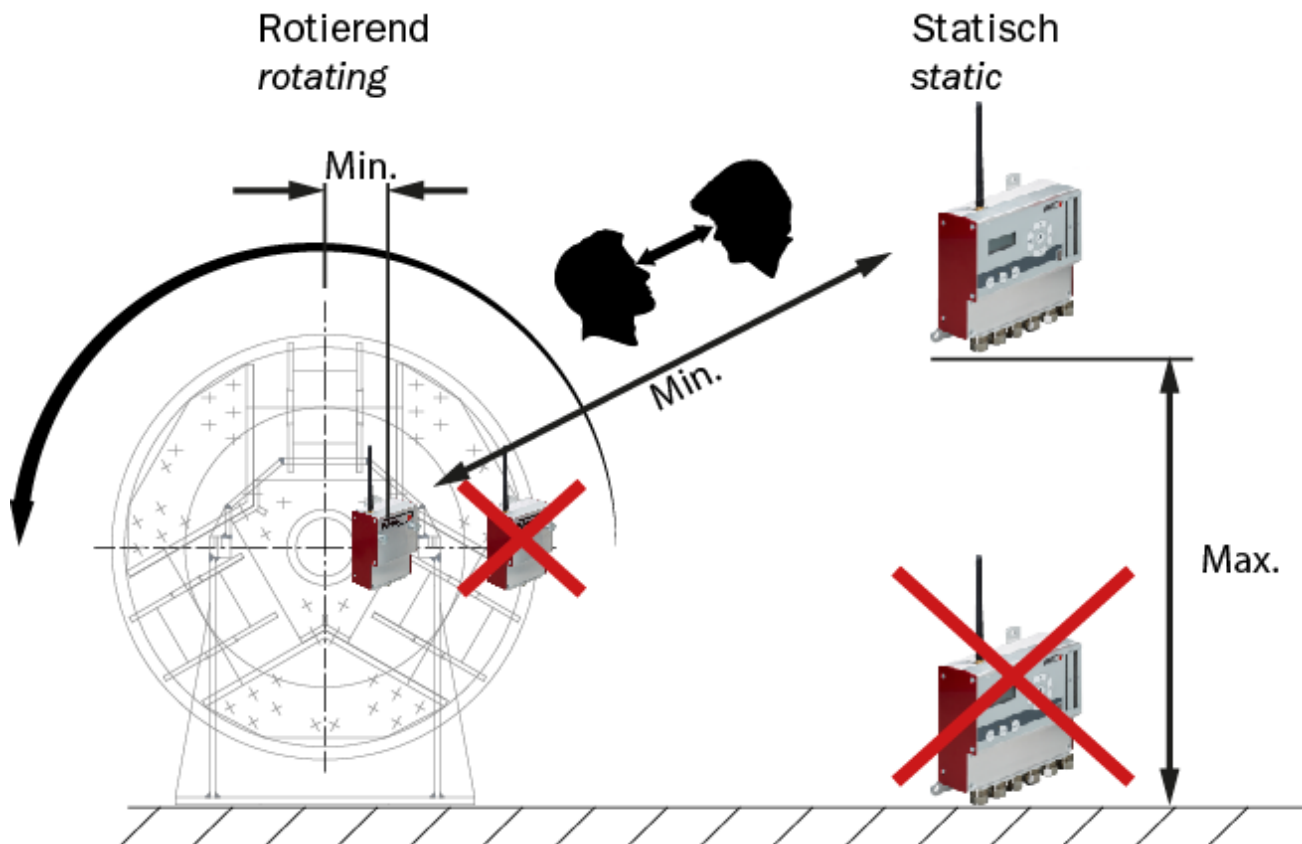


Abbildung 4: Installation

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## Sicherheitskäfig safety housing

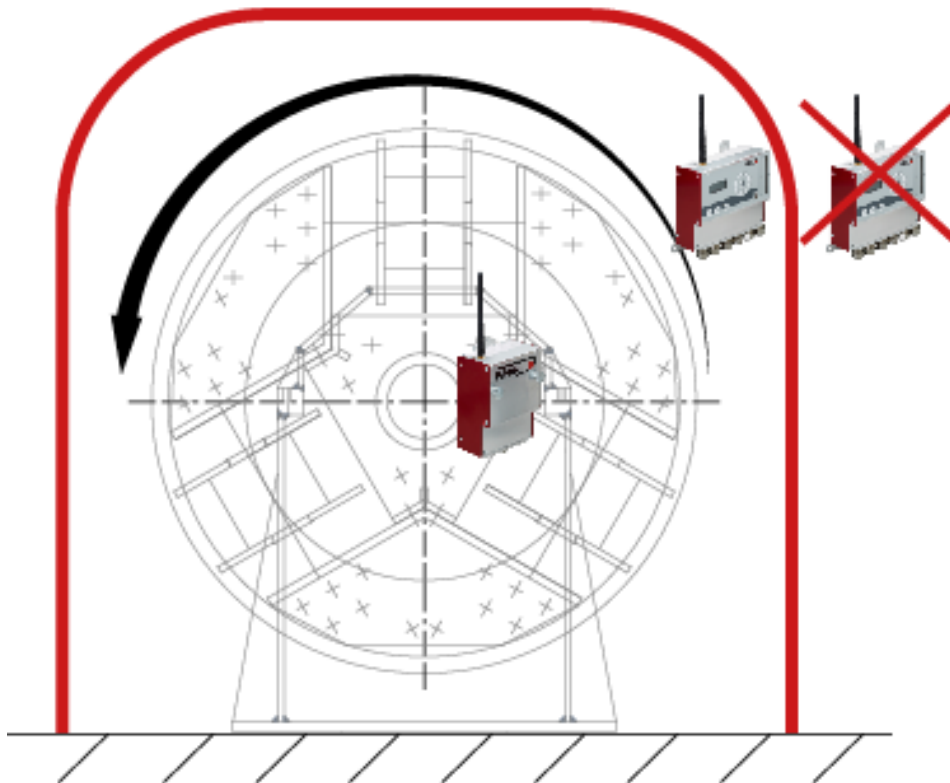


Abbildung 5: Installation safety housing

RTM\_X42\_Modbus\_BA\_Manual.ai

- Mount receiver inside the housing
- Route the cables from the receiver to the outside
- Use e.g. remote displays

## 4.4 Electrical Connection

### 4.4.1 EMGZ482T Receiver Module (with battery)

The connection cables are pre-fabricated with respective connectors.

#### **Re-tighten connector periodically**



Due to vibration on the machine, the connector can become loose. Re-tighten them regularly to avoid communication errors and malfunctions.

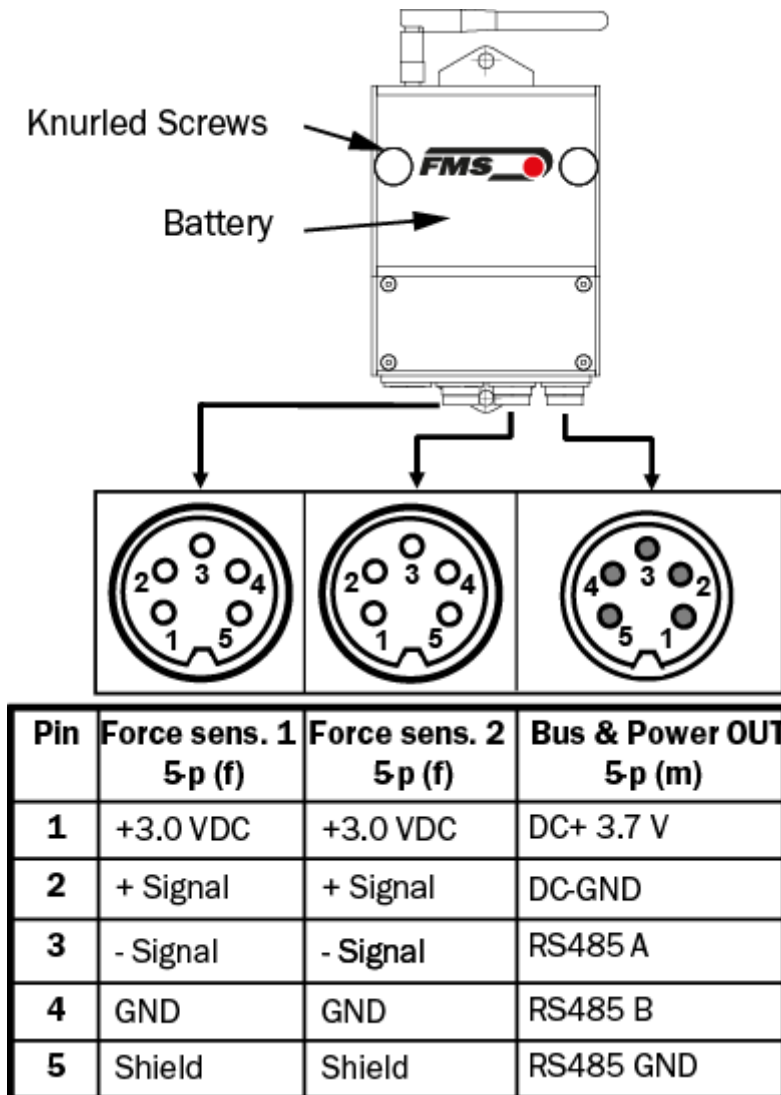


Figure 6: EMGZ482T electrical connection

RTM\_X42\_Modbus\_BA\_Manual.ai

#### 4.4.1 EMGZ482T.24VDC Receiver Module (version without battery, with 24VDC power supply via slip rings on the strander)

The connections between the force measuring rollers and transmitter are realized using a 2x2x0.25 mm<sup>2</sup> [AWG 23] cable with 2 shielded, twisted pairs of strands.

The cables have connectors on both sides to facilitate installation.

##### **Electrical noise and fluctuating voltage**



Protect the power lines from electrical noise and ensure that all components are supplied with adequate, stable 24 (18 to 24) VDC to avoid communication errors and malfunctions.

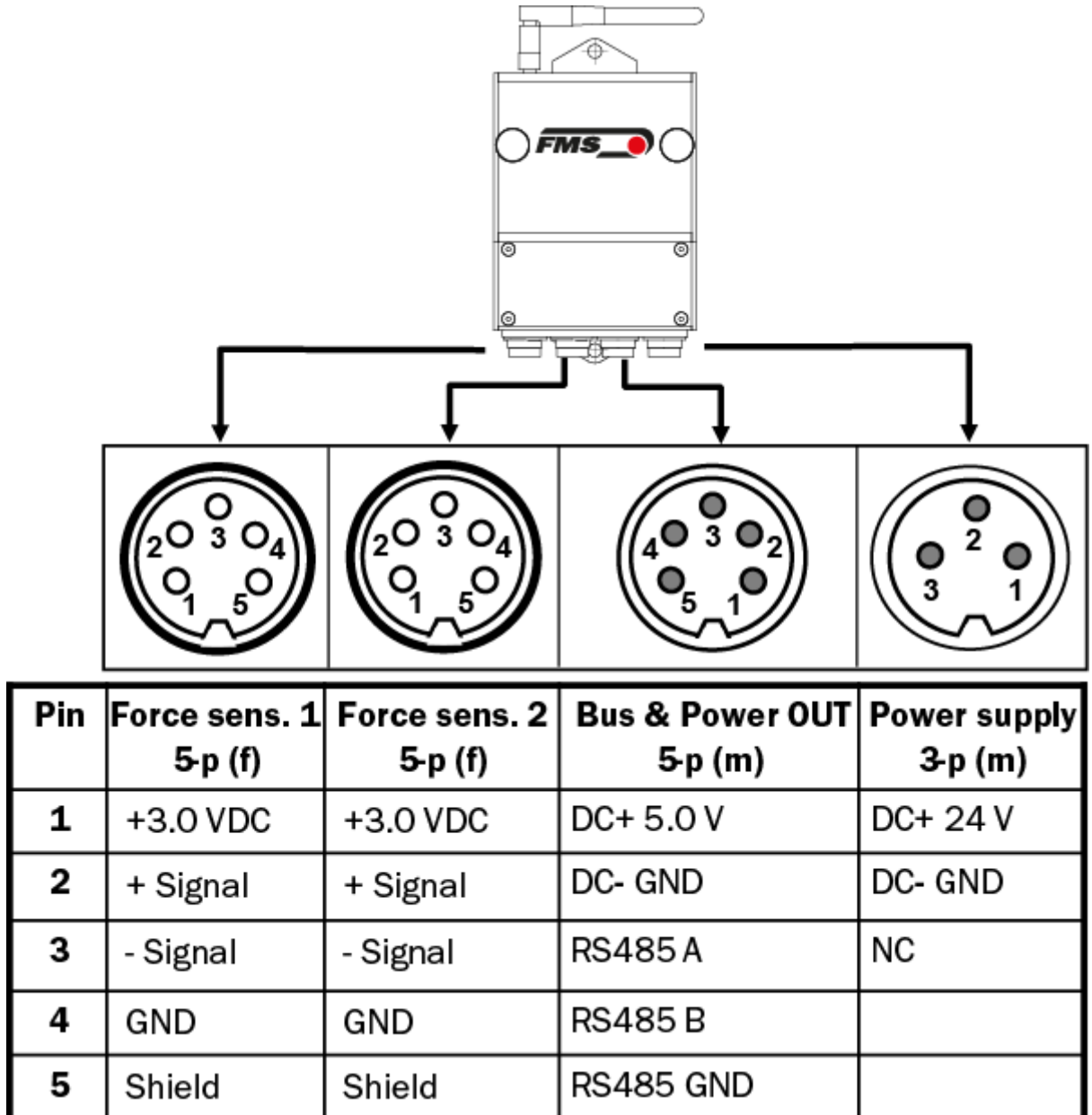


Figure 7: EMGZ482T.24VDC electrical connection  
 RTM\_X42\_Modbus\_BA\_Manual.ai

### 4.5 EMGZ484T Channel Extension Module

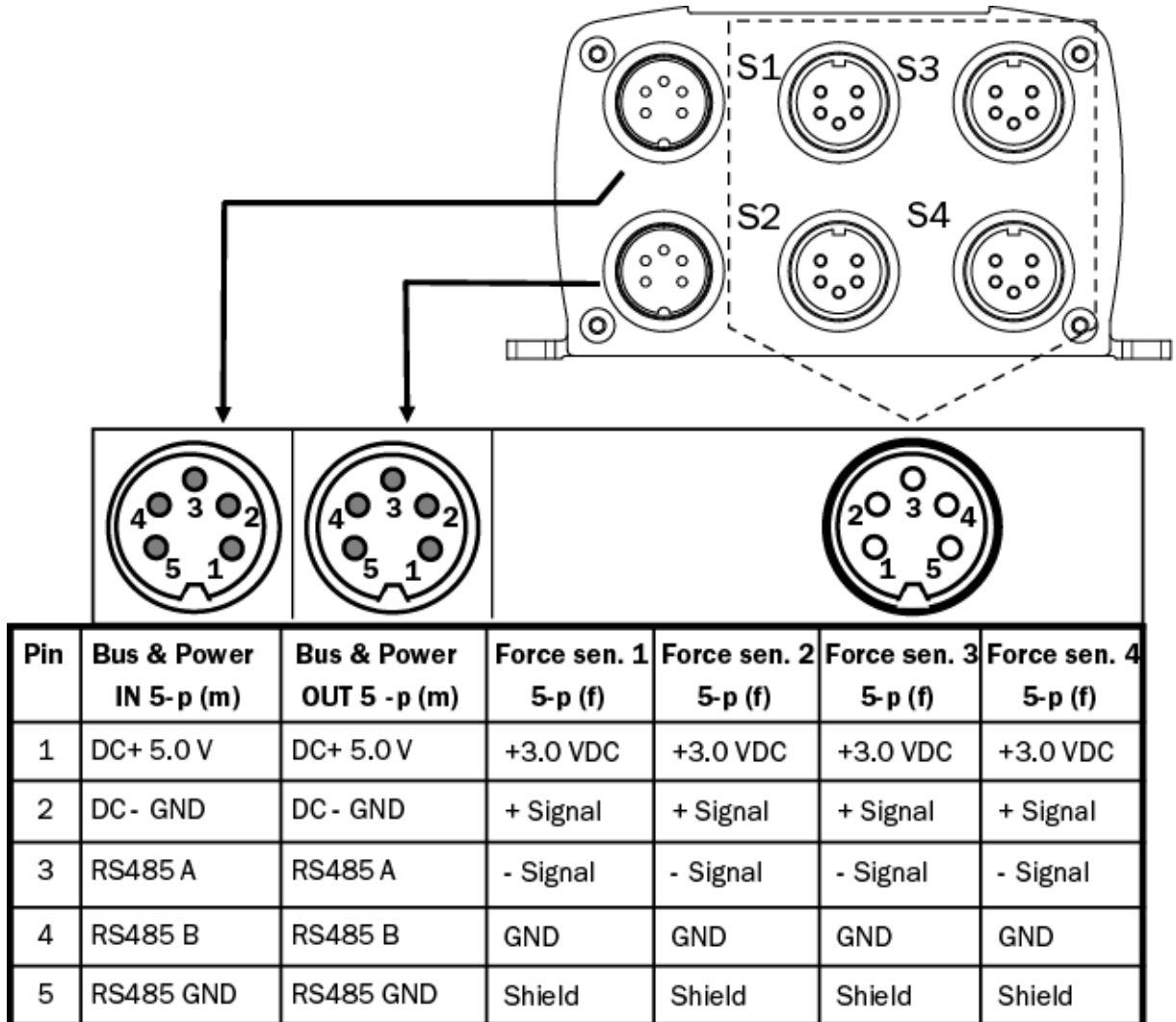


Figure 8: EMGZ484T electrical connection

RTM\_X42\_Modbus\_BA\_Manual.ai

#### Bus Termination Plug



All Bus & Power Socket have to be connected. Otherwise errors in communication may occur.

Always insert the included bus termination plug to last channel extension module in the row (out).

Indication LEDs	
LED	Description
POWER	Lights up green: Voltage supply is present Not lit: power supply interruption for > 60 ms Flashing green: regular power supply interruptions
BUS	Lights up green: communication OK. Not lit: communication interrupted for > 3 sec. Flashing green: regular interruption of supply voltage (5 VDC from EMGZ482T) - all EMGZ484T flash synchronously

Table 2: LEDs on EMGZ484T

### 4.5.1 EMGZ482R Receiver Module

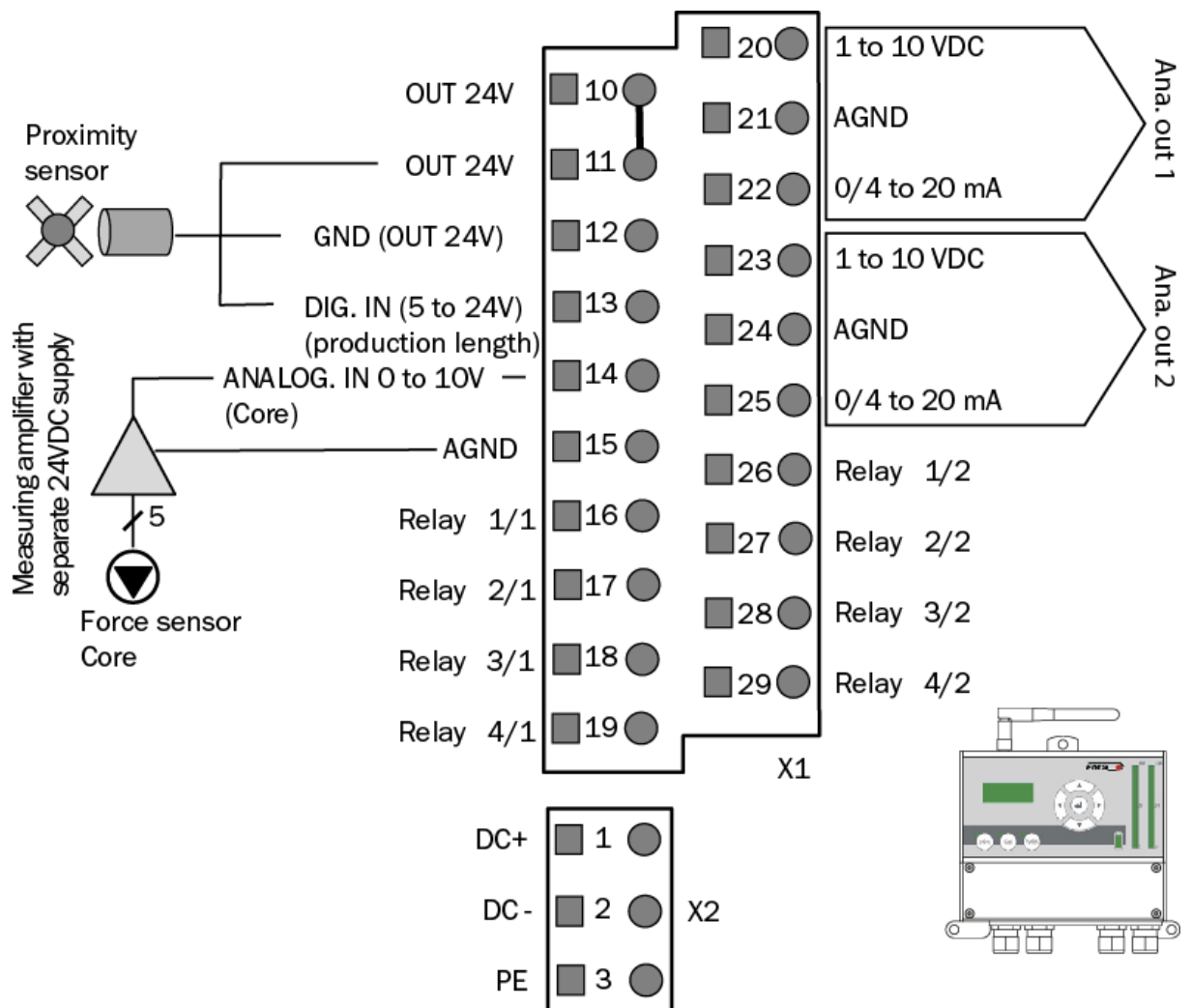


Figure 9: EMGZ482R electrical connection

RTM\_IO\_BA\_Manual.ai

EMGZ482R pin assignment		
Pin(s)	Description	
1	24 VDC+	
2	24 VDC-	
3	PE	
10, 11	24 VDC output	
12	GND for 24 VDC	
13	Digital input for production length	
14	Analog input for force sensor core	
16, 26	Relay 1/1 - 1/2	Configurable relay outputs 1 to 4: Tension value limits channel 1, 2; tension value limits collective alarm, limit pre alarm collective alarm, radio connection, battery state of charge, core tension value
17, 27	Relay 2/1 - 2/2	
18, 28	Relay 3/1 - 3/2	
19, 29	Relay 4/1 - 4/2	

**Table 3: EMGZ482R pin assignment**

The RTM IO system has pre-configured relay outputs. The respective alarm output is activated if the assigned function condition occurs.



***Electrical noise and fluctuating voltage***

Protect the power lines from electrical noise and ensure that all components are supplied with adequate, stable (24 18 to 24) VDC to avoid communication errors and malfunctions.

### 4.5.1 EMGZ48R Extension Modules

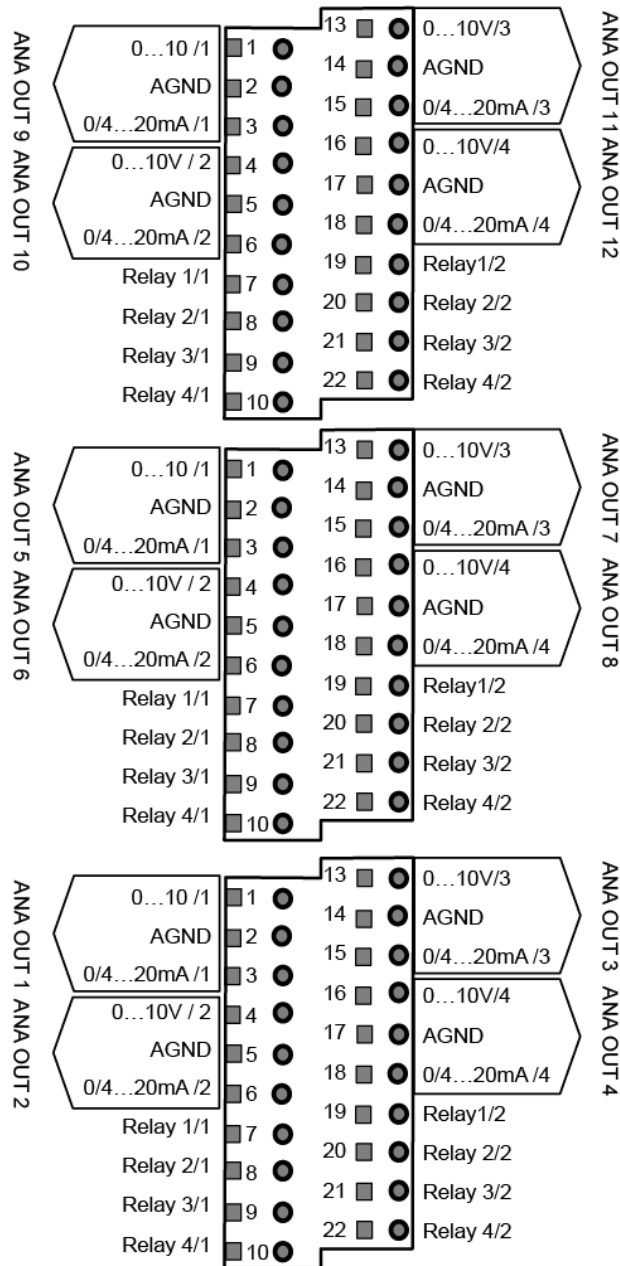


Figure 10: EMGZ482R electrical connection RTM\_IO\_BA\_Manual.ai

Pin assignment EMGZ484R	
Pin (s)	Description
1 bis 3	Output 0 to 10 VDC; 0/4 to 20 mA
4 bis 6	Output 0 to 10 VDC; 0/4 to 20 mA
7 / 19	Relay 1/1 - 1/2
8 / 20	Relay 2/1 - 2/2



<b>Pin assignment EMGZ484R</b>	
<b>Pin (s)</b>	<b>Description</b>
9 / 21	Relay 3/1 - 3/2
10 / 22	Relay 4/1 - 4/2
13 bis 15	Output 0 to 10 VDC; 0/4 to 20 mA
16 bis 18	Output 0 to 10 VDC; 0/4 to 20 mA

*Table 4: EMGZ484R pin assignment*

# 5 Operation and Display of the receiver module EMGZ482R

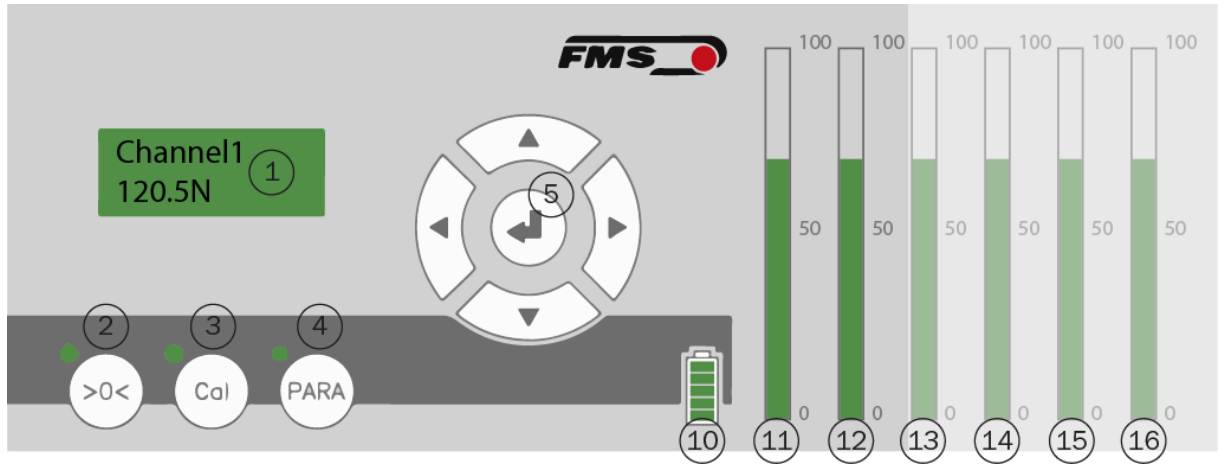





Figure 11: Receiver module operation and display

RTM\_IO\_BA\_Manual.ai

Operation and Display	
Pos.	Description
1	Display, 2 x 8 Digits
2	Start offset compensation
3	Cal - Calibration
4	Para - access to parameter menu
5	Main operating field with  Navigation button (scroll within a menu)  Change button (change values up or down)  Confirmation button (confirm a selection, select)
10	Battery status of transmitter module EMGZ482T 5 bar segments - 100% charge 4 bar segments - 80% charge 3 bar segments - 60% charge 2 bar segments - 40% charge 1 bar segments - 20% charge, exchange / re-charge battery
11, 12	LED bars of tension values channels 1 and channel 2
13 to 16	Additional, optional LED bars for max. of 10 channels, depending on

Operation and Display	
Pos.	Description
	system size.

Table 5: Receiver module operation and display

## 5.1 Offset Compensation of the Force Sensors

Offset compensation is used to compensate for the weight of the pulley on the force sensor. The measuring system is practically "zeroed."

Observe the following:

- The force sensor may only be loaded with the pulley (no wire on the pulley)
- Rotate the lay-plate until the desired force sensor, for which the offset compensation is performed, is vertically over the axis of rotation (12 o'clock position)

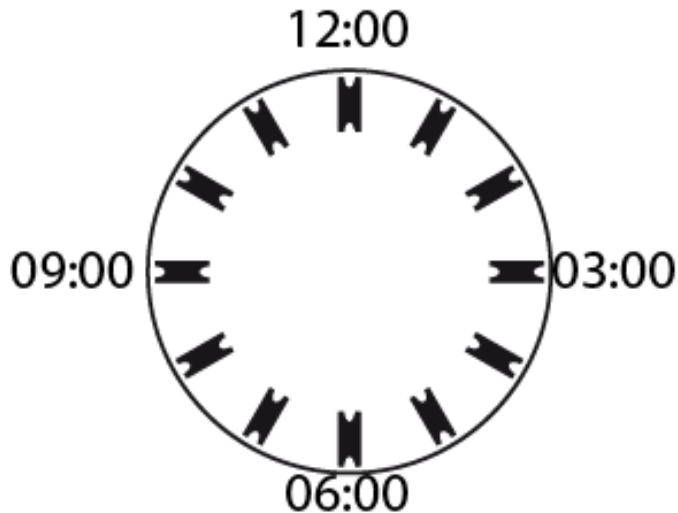


Figure 12: Lay-plate alignment *RTM\_X42\_Modbus\_BA\_Manual.ai*

- Press and hold the button >0< for min. 3 sec.
- Force sensor number is displayed
- Select the desired number by pressing the navigation buttons
- Press confirmation button to select the desired channel
- The display shows "Offset running" and "Offset complete"
- The calculated offset value is stored automatically
- For other channels, repeat the steps

Press  to return to the main menu



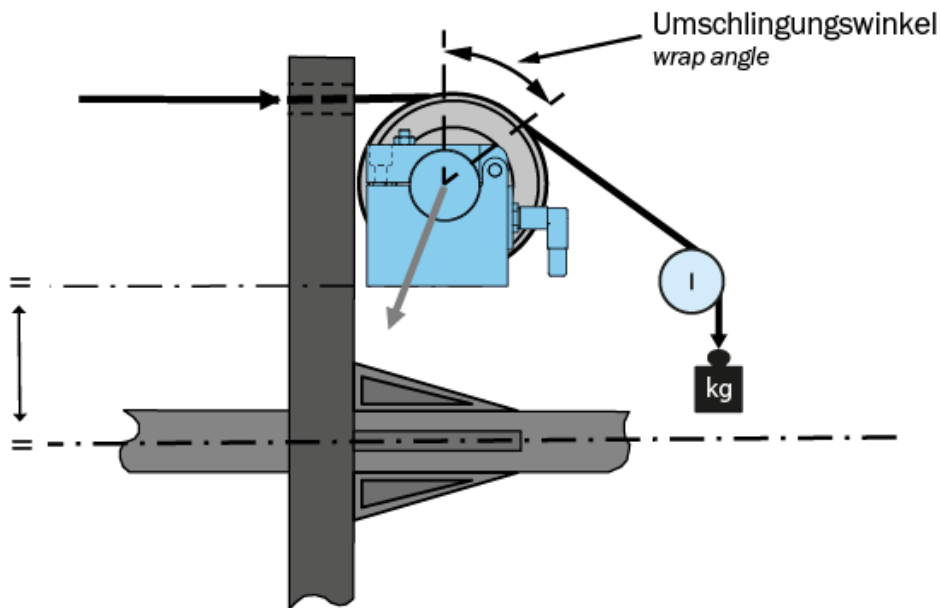
Please note

The offset compensation must be carried out individually for each channel on the 12 clock position of the base plate.

The offset compensation of the force sensor for the core strand can either be done via the measuring amplifier connected to this force sensor or the EMGZ482R. If you do it via the amplifier, please follow the instruction of the operating manual of the measuring amplifier.

## 5.2 Force Sensor Calibration

Calibration is used for matching the measuring amplifier with the force sensor. The so-called gain factor is determined. After calibration, the displayed force corresponds to the force effectively affecting the material. Two calibration methods are possible; one computational method and calibration with a defined weight force. The defined weight-based calibration method is simple and delivers more accurate results as it replicates the material profile and considers the actual circumstances in the machine.



*Figure 13: Application of a defined weight force to the force sensor  
RTM\_X42\_Modbus\_BA\_Manual.ai*

To adjust the gain, load the measuring roller with a rope or wire with a defined weight attached to its end. The cable must correspond to the real material course in the machine (wrap angle, distances between the rollers, etc.). The displayed/determined digit value must now be assigned in the PLC to the weight force corresponding to the calibration weight.

Please note that the force sensor which is to be calibrated shall be on the 12 o'clock position.

- Press and hold the button "Cal" for min. 3 sec.
- Channel number and Gain is displayed
- Select the desired number by pressing the < or > buttons
- Press confirmation button to select the desired channel
- The display shows "NomForce" and respective channel number. Enter the nominal force in N of the force sensor. This value can be found on product label of the sensor.
- Adjust the value with the Change button and press the confirmation button.
- "Calibra" is displayed now. Here you enter the defined weight in the displayed unit that is attached to the rope or wire on the force sensor.

- Adjust the value with the Change button and press the confirmation button.
- The calibration start and shows "Calibra complete" if it is finished.
- The calculated gain value is stored automatically
- For other channels, repeat the steps

Press  to return to the main menu

For the calibration of the force sensor for the core can either be done via the measuring amplifier connected to this force sensor or the EMGZ482R. If you do it via the amplifier, please follow the instruction of the operating manual of the measuring amplifier.

### 5.3 Charger



Figure 14: Charger with battery *RTM\_Ladegerät\_Akku\_10Ah\_01.png*

- Connect battery to charger
- The state of charge LED lights up red if the battery is discharged
- The safety circuit protects the batteries from overcharging.
- Charging is finished as soon as the battery pack reached its maximum charge capacity. The charging process takes 3-4 hours.
- The state of charge LED lights up green if the battery is charged
- The battery must be connected in the battery compartment of the EMGZ482T prior to start-up.
- If a battery is not needed for the moment, it may remain in the charger



Flying parts

If the battery is not secured correctly, it can be ejected in the case of rotating machines.

Secure the battery using the knurled screws. Tighten the knurled screws sufficiently.

## 6 Configuration

### 6.1 Quick Start

- Insert the battery into the EMGZ482T transmitter module and secure with both knurled screws. The screws must be tightened sufficiently otherwise, the centrifugal forces caused by cage rotation could eject the battery.
  - o Connect the 24VDC power supply of the machine if a version without battery is used
- Connect the EMGZ482R.Modbus receiver module to the power supply 24 (18 bis 36) VDC
- Switch on the power supply
- The radio connection of the RTM IO system is established automatically. This can take approx. 5 to 10 seconds.
- After system start and establishment of the radio connection, the display in the receiver module, e.g., shows "RTM IO V 3.60". This describes the currently loaded firmware.
- The RTM IO system is now ready and can be configured.

### 6.2 Menu and navigation

All configurable parameters are defined in multiple levels.

To access the navigation, follow these steps:

- Press and hold the Para button for min. 3 sec.
- Press the navigation buttons to the point System
- Press the confirmation button

#### **System parameters**

The system parameter group contains the general parameters that control the operation of the RTM IO system, but do not influence the actual measurement.

#### **Channel parameters 1 to 10**

Configuration of the force sensors in the machine

#### **Core parameters**

Configuration of the core force sensor

#### **Parameters for relay outputs**

Configuration of the relay outputs

#### **Default**

reset the system to factory setting

### 6.3 List of System Parameters

System Parameters	
Parameter	Description
Language	<p>Language on the display of the operating panel</p> <p>Unit [-]</p> <p>Values German, English</p> <p>Default English</p>
Inv.Sign	<p>Inverts the signal of all force sensors</p> <p>Unit [-]</p> <p>Values Yes, No</p> <p>Default No</p>
RL CTRL	<p>Restrictions for access to configuration.</p> <p>RTM IO – full configuration via operating panel</p> <p>PC – full configuration only via web browser. Only limited configuration via operating panel ( parameters: LANSpeed, Gateway, IP Adres, Supnet RL CTRL)</p> <p>Unit [-]</p> <p>Values RTM X42, PC</p> <p>Default RTM X42</p>
FiltMode	<p>Off:</p> <ul style="list-style-type: none"> <li>- Deactivated</li> </ul> <p>N-Linear:</p> <ul style="list-style-type: none"> <li>- Non-linear filter of second order</li> </ul> <p>Low pass</p> <ul style="list-style-type: none"> <li>- Filter of first order</li> </ul> <p>Unit [-]</p> <p>Values Off; N-Linear; Low pass</p> <p>Default Off</p>
Filt_Out	<p>Frequency for N-Linear and Low pass filter</p> <p>Unit Hz</p> <p>Min 0.1</p> <p>Max 100</p> <p>Default 10</p>
LANSpeed	Data rate of LAN connection

<b>System Parameters</b>	
<b>Parameter</b>	<b>Description</b>
	<b>Unit BPS</b> <b>Min</b> <b>10</b> <b>Max</b> <b>100</b> <b>Default</b> <b>100</b>
<b>IP Addr.</b>	<b>IP address (static) of the EMGZ482R.Modbus receiver module. Address is entered in 4 blocks.</b> <b>Unit [-]</b> <b>Min</b> <b>0</b> <b>Max</b> <b>255</b> <b>Default</b> <b>192.168.000.090</b>
<b>Subnet</b>	<b>Address of subnet mask. Is entered in 4 blocks</b> <b>Unit [-]</b> <b>Min</b> <b>0</b> <b>Max</b> <b>255</b> <b>Default</b> <b>255.255.255.0</b>
<b>Gateway</b>	<b>Gateway IP address (static). Is entered in 4 blocks</b> <b>Unit [-]</b> <b>Min</b> <b>0</b> <b>Max</b> <b>255</b> <b>Default</b> <b>192.168.000.100</b>
<b>RM unit</b>	<b>Unit of production length</b> <b>Unit</b> <b>[-]</b> <b>Values</b> <b>m, ft</b> <b>Default</b> <b>m</b>
<b>RMpulses</b>	<b>Pulses per rotation of the capstan for the detection of the production length</b> <b>Unit</b> <b>[-]</b> <b>Values</b> <b>0</b> <b>Default</b> <b>10.000</b>
<b>RMdiam.</b>	<b>Capstan diameter for the production length</b> <b>Unit</b> <b>[mm]</b> <b>Min</b> <b>0</b> <b>Max</b> <b>10.000</b>



System Parameters	
Parameter	Description
RMactive	Activation of the production length
	Unit [-]
	Values ja, nein
	Default nein

Table 6: System Parameter Overview

## 6.4 List of channel 1 to 10 and core parameters

Channel and Core Parameters	
Parameter	Description
Offset	Compensation of pulley weight
	Unit [Digit]
	Min. -9999
	Max. 9999
	Default 0
Gain	Gain factor
	Unit [-]
	Min. 0.001
	Max. 20.000
	Default 1.000
F_Nenn	Nominal force of the sensor
	Unit [N]
	Min. 0.001
	Max. 99'999
	Default 1000
F@OutMax	Scaling of the maximum force of the bar graph.
	Unit [N]
	Min. 0.001
	Max. 99'999
	Default 1000
FiltMode	Filter characteristic of output filter. Prevents noise overlaying the output signal. Unit [-]
	Values N-Linear, Lowpass, Bypass,

Channel and Core Parameters	
Parameter	Description
	Default    N-Linear
<b>Filt_Out</b>	Cut off frequency of filter Unit        [Hz] Min.        0.1 Max.        100.0 Default     10.0
<b>Out_Mode</b>	Mode selection for current output Unit        mA Values      0...20, 4...20 Default     0...20
<b>Alarm</b>	Activate threshold for alarm Unit        [-] Values      ja, nein Default     nein
<b>AlarmMin</b>	Lower threshold Unit        [N] Min.        -99'999 Max.        99'999 Default     0
<b>AlarmMax</b>	Upper threshold Unit        [N] Min.        -99'999 Max.        99'999 Default     0
<b>AlarmT</b>	Alarm pending time Unit        [s] Min.        0.0 Max.        600.0
<b>Active</b>	Activate channel Unit        [-] Values      Nein, Ja Default     Ja

Table 7: channel parameters

## 6.5 List of relay output parameters

System Parameters	
Parameter	Description
Alarm	<p>Definition of the relay activation status of the 4 relay outputs</p> <p>Unit [-]</p> <p>Values CH 1, CH 2, CH 3, CH 4, Core, SumPreA, SumAlarm, Radio ok, Batt ok</p> <p>CH 1, CH 2, CH 3, CH 4 – violation of a single threshold</p> <p>Core – violation of core threshold</p> <p>SumPreA – collective, violation of one pre-alarm thresholds</p> <p>SumAlarm – collective, violation of one threshold</p> <p>Radio ok – bad radio signal quality</p> <p>Batt ok – violation of minimum battery charge level</p>

Table 8: relay output parameters

## 6.6 Reset to default parameters

System Parameters	
Parameter	Description
Default	<p>Reset to default settings</p> <p>Einheit [-]</p> <p>Values No, yes</p> <p>Default Np</p>

Table 9: reset to default parameters

## 7 Configuration via web browser

When embedding the EMGZ482R in an Ethernet network it must be certain that the receiver uses an IP address in a static block (not assigned by the server). For the integration of EMGZ482R in your Ethernet network please contact your IT system administrator. Once the receiver was integrated in the network you can address the device e.g. with `http://192.168.0.90`.

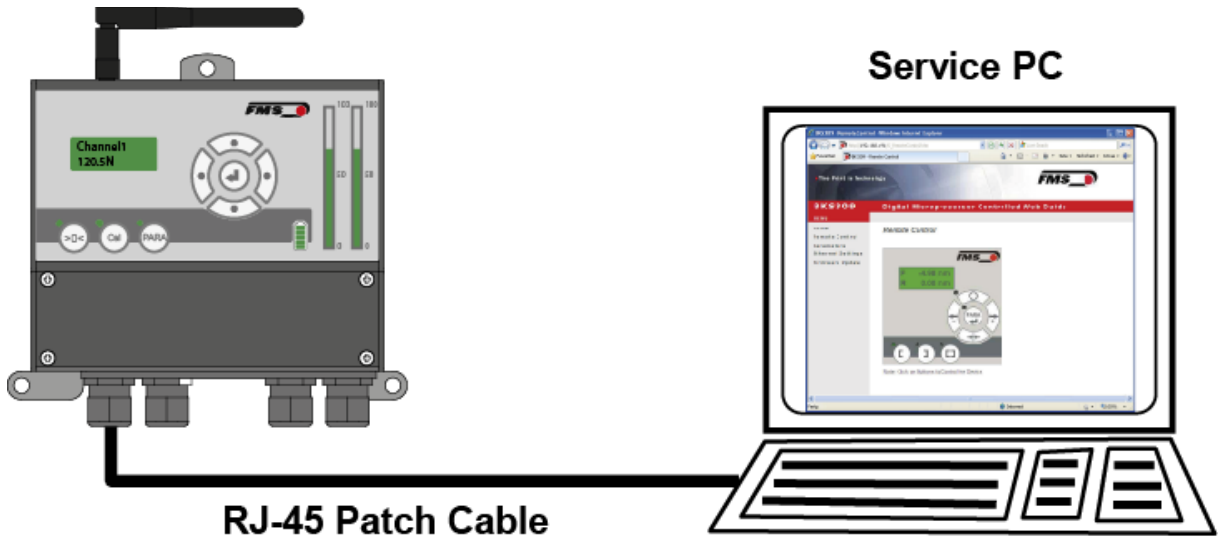


Figure 15: Ethernet connection

PROPERTIES	VALUE
Serial number	7365
Firmware Version	3.60

Figure 16: Ethernet connection

The Point Is Technology

## RTM X42 The Cost-Effective System for Wireless Tension Control

**MENU**

- Home
- Current Reading
- Parameters
- Ethernet Settings
- System Settings
- Relais Settings
- Default Settings

### Current Reading

PROPERTIES	VALUE
Process time	00:00:00
Tension core	0.0 N
Tension channel 1	11.8 N
Tension channel 2	5.9 N
Tension channel 3	0 N
Tension channel 4	0 N
Tension channel 5	0 N
Tension channel 6	0 N
Tension channel 7	0 N
Tension channel 8	0 N
Tension channel 9	0 N
Tension channel 10	0 N

Figure 17: current reading

The Point Is Technology

## RTM X42 The Cost-Effective System for Wireless Tension Control

**MENU**

- Home
- Current Reading
- Parameters
- Ethernet Settings
- System Settings
- Relais Settings
- Default Settings

### Parameters

Channel 1..2

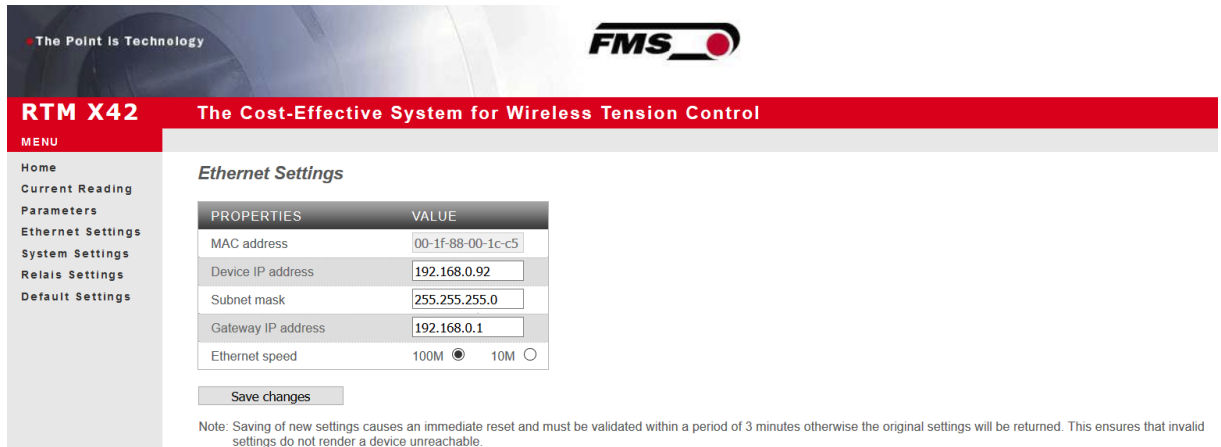
	UNIT	CORE	CHANNEL 1	CHANNEL 2
Channel 1..2		<input type="text" value="0"/>	<input type="text" value="-200"/>	<input type="text" value="-350"/>
Channel 3..6		<input type="text" value="1.000"/>	<input type="text" value="3.500"/>	<input type="text" value="1.000"/>
Channel 7..10	N	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>
Channel 11..14	Output		<input type="text" value="20.0"/>	<input type="text" value="1000.0"/>
Channel 15..18	N	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>
Channel 19..22	N	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>
Channel 23..26	N	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>	<input type="text" value="100.0"/>
Channel 27..30	Hz	<input type="text" value="10.0"/>	<input type="text" value="10.0"/>	<input type="text" value="10.0"/>
Channel 31..34	Output mode		<input type="text" value="0..20"/>	<input type="text" value="0..20"/>
Channel 35..38		<input type="text" value="no"/>	<input type="text" value="no"/>	<input type="text" value="no"/>
Channel 39..42	N	<input type="text" value="1000.0"/>	<input type="text" value="1000.0"/>	<input type="text" value="1000.0"/>
Alarm min.	N	<input type="text" value="0.0"/>	<input type="text" value="0.0"/>	<input type="text" value="0.0"/>
Alarm min.	s	<input type="text" value="0.0"/>	<input type="text" value="0.0"/>	<input type="text" value="0.0"/>
Channel active		<input type="text" value="no"/>	<input type="text" value="yes"/>	<input type="text" value="yes"/>

Save changes

**Figure 18: parameters (channel and core)**

Select the channels from the dropdown menu

Always store you changes with "Safe changes"!



**Figure 19: ethernet settings**

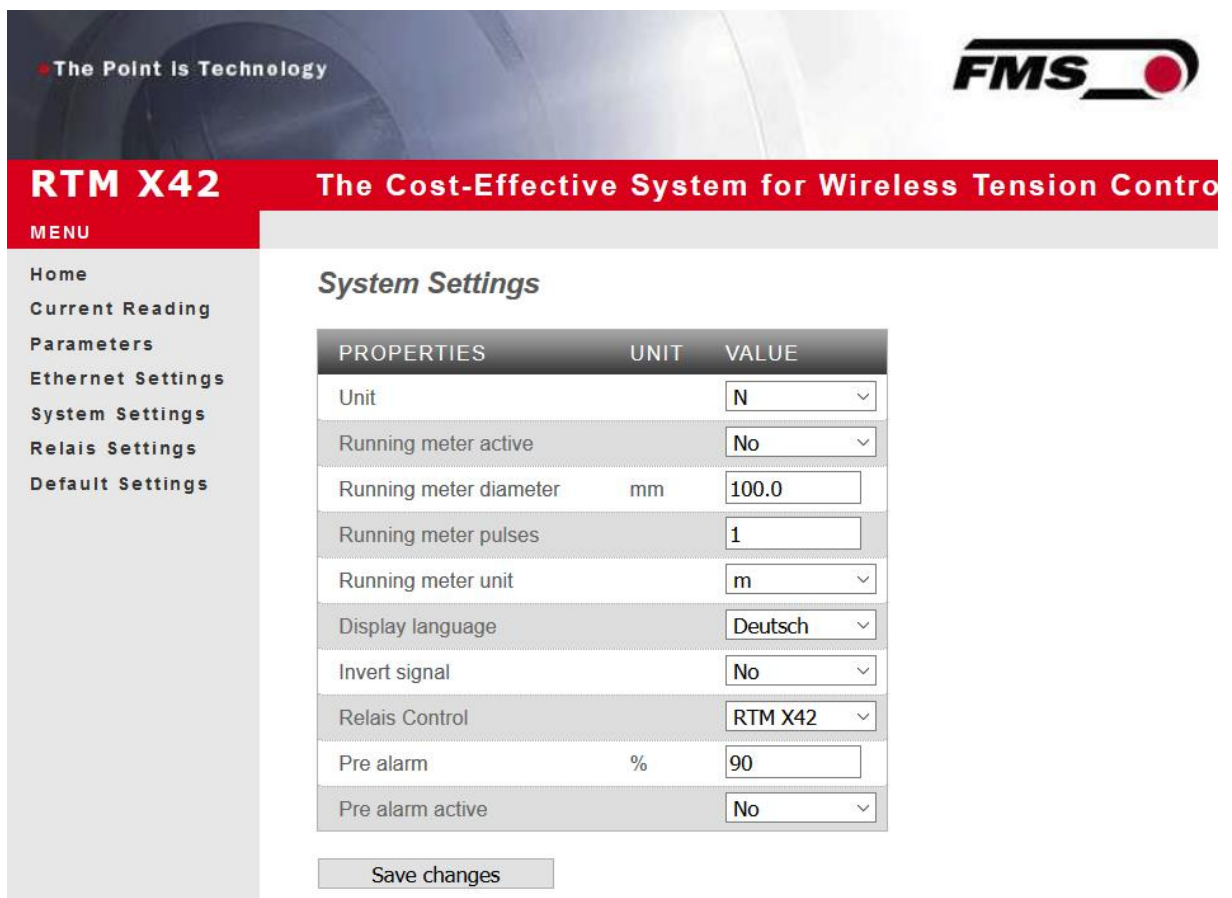


Figure 20: system parameters

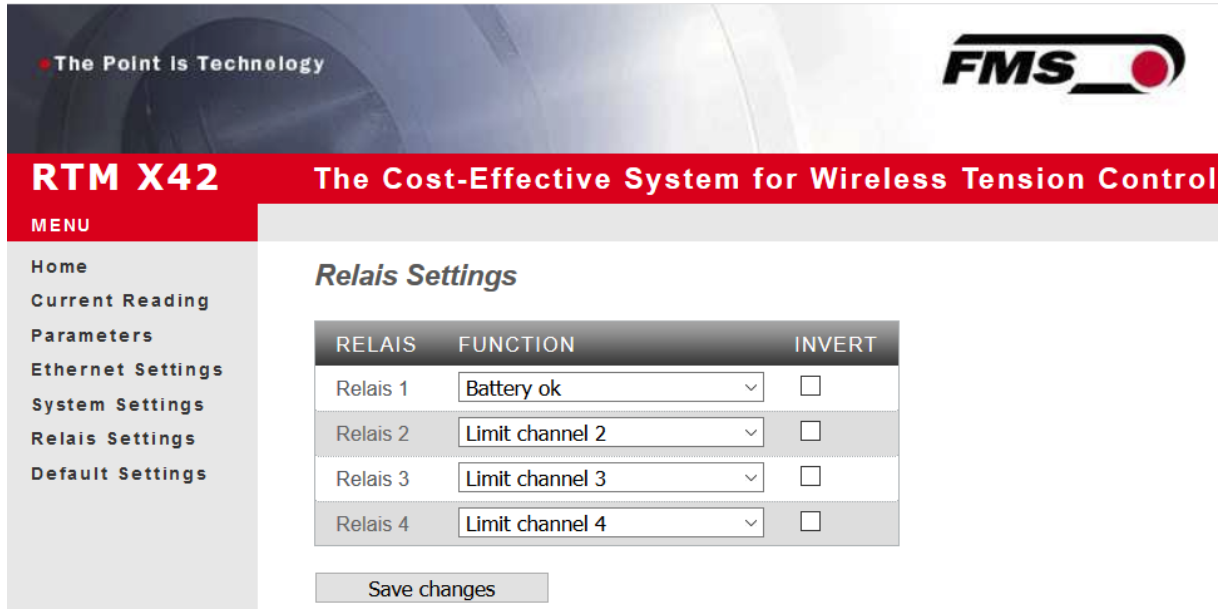


Figure 21:relay parameters

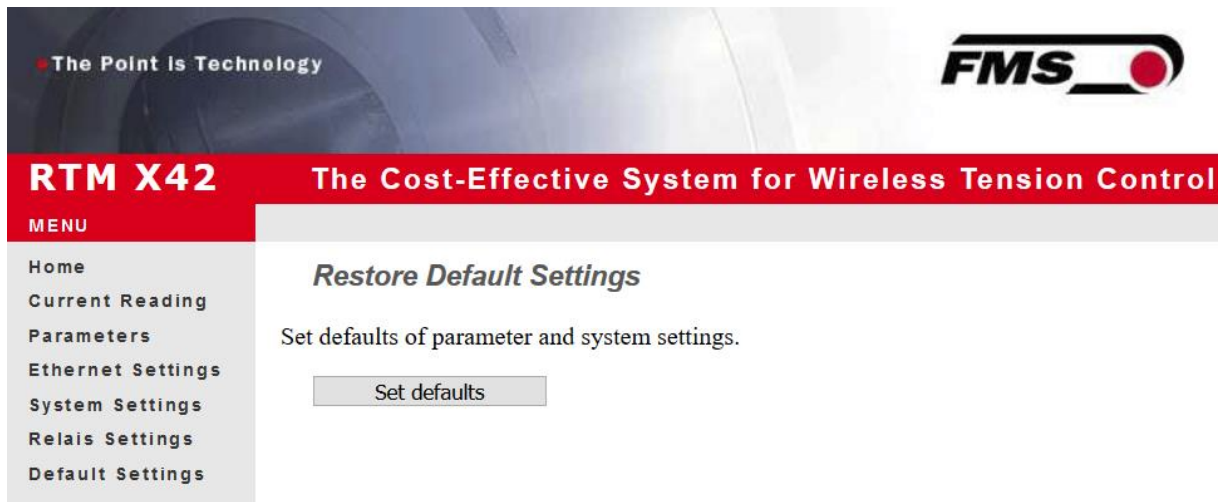


Figure 22:default settings

# 8 Dimensions

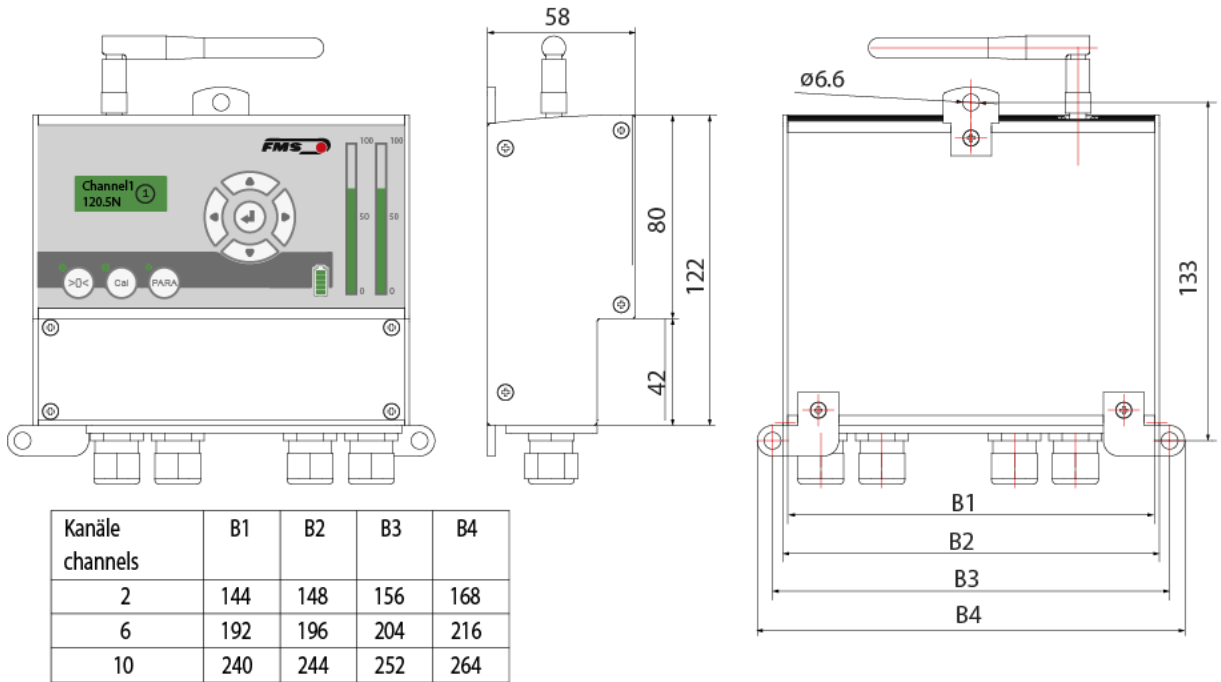


Figure 23: Dimensions of the EMGZ482R receiver module

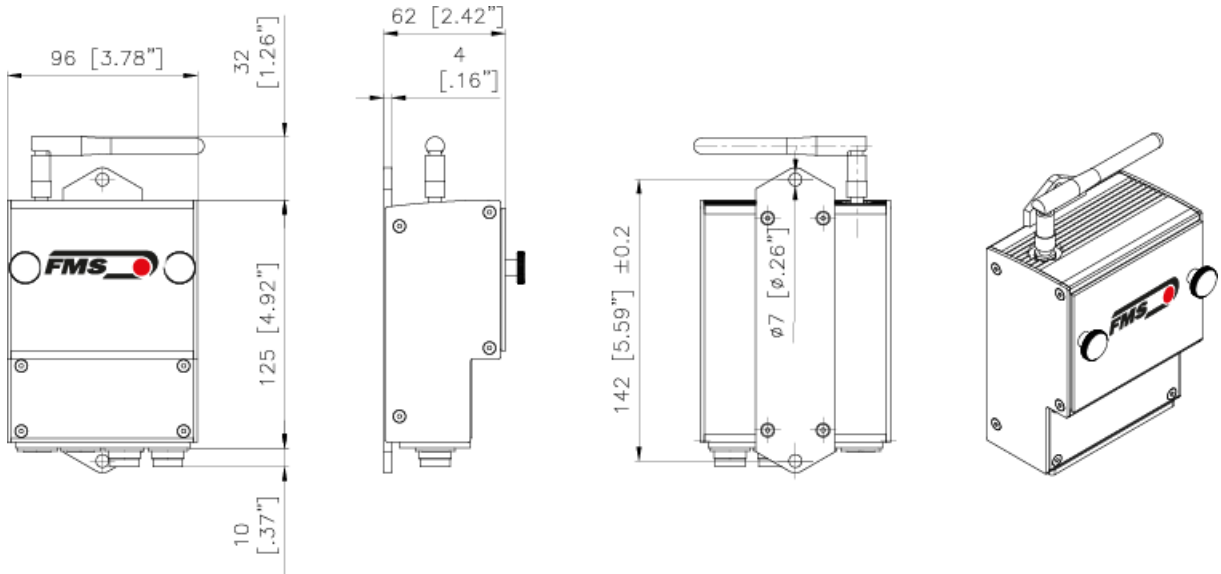
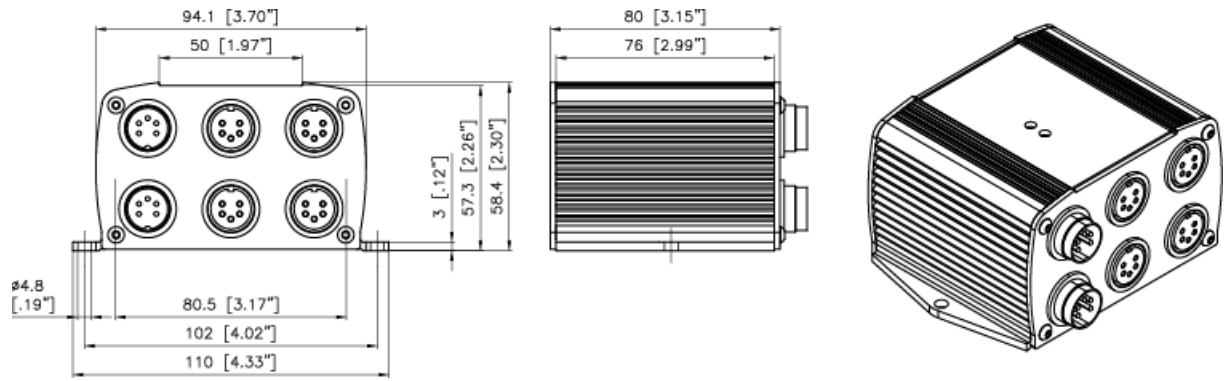


Figure 24: Dimensions of the EMGZ482T transmitter module





**Figure 25: Dimensions of the EMGZ484T channel extension module**

## 9 Error Causes and Troubleshooting

Tips for sequential analyzing order:

- Check battery status
- Restart RTM system components
- Transmitter: remove battery, wait for appr. 10 seconds, insert battery again
- Receiver: disconnect 24 VDC power, wait for appr. 10 seconds, re-connect power again
- Check software version of the receiver
- Check connectors
- Check cables
- Check cable routing
- Check force sensors
- Check transmitter
- Check receiver (via web browser)

Troubleshooting		
Message / Indication	Cause	Remedy
Radio lost + battery indicator flashing	Occurs with with a (re-) start of the transmitter while the receiver is switched on.	
Radio lost, battery indicator off	Occurs only after a (re)start of the receiver while the transmitter is switched on	
Radio lost Radio connection is interrupted.	<p>Battery in transmitter empty, not plugged in</p> <p>Unstable 24 VDC supply to transmitter</p> <p>Radio link disturbed by objects</p> <p>Transmitter and receiver are too far apart</p>	<p>Check battery, replace, plug in</p> <p>Check voltage, 18 to 36 VDC, no interruptions &gt;20 ms.</p> <p>Check power supply connections in receiver</p> <p>Remove objects from interference area.</p> <p>Mount the receiver and transmitter so that they can "see" each other.</p> <p>Mount the receiver as high as possible.</p> <p>Always mount the receiver inside a protective or safety grid. Lead the cables out of the safety area to the outside.</p>

<b>Troubleshooting</b>		
<b>Message / Indication</b>	<b>Cause</b>	<b>Remedy</b>
	<p>Missing bus termination plug</p> <p>Overloaded 2.44 GHz band, non-certified devices in use</p> <p>Receiver and transmitter are not compatible, due to different software status. Not possible with new delivery</p> <p>Different ID or radio frequency at transmitter and receiver</p>	<p>A bus terminating plug is included in the scope of delivery. Insert this into the last expansion module.</p> <p>Check the other devices in the network. If necessary, you can deactivate one after the other.</p> <p>Send the serial numbers of the devices to FMS for checking.</p> <p>Check the settings of the DIP switches in the device. Special instructions required. These are available from FMS on request.</p>
Frequent losses of communication between modules on the machine	Loose connectors	Re-tighten connectors periodically
“Channel X >min. limit” “Core >min. limit”	The faulty channel is active, however not connected to a force sensor.	Connect force sensor to the respective connector of the EMGZ482T or EMGZ484T.
Changed parameters cannot be saved in the web browser	Change procedures was not completed correctly	The change must be confirmed with “Save parameters” and “OK” after parameter inputs

## 10 Technical Data

### 10.1 EMGZ482T Transmitter Module

EMGZ482T.MODBUS	
Number of measuring points	2 channels for 2 force sensors
Measuring inaccuracy	<0.05% F <sub>System</sub>
Sensor excitation	3.0 VDC, max. 20mA, highly stable
Power supply	3.7V battery Li Ion (20Ah) or 24VDC via slip rings (18 to 36VDC /10W max. 0.5A)
Variants	EMGZ482T.MODBUS.24V for 24V supply via slip rings
Radio interface	2.44 GHz
A/D converter resolution	±8192 digit (14 bit)
Analog inputs 1 and 2	1 strain gauge force sensor @ 350 Ω (0 to 5.4 mV, max. 7.4 mV)
Temperature range	0 to 50 °C [32 to 122 °F]
Protection class	IP52
Weight	0.52 kg [1.15 lbs] (without battery)

Table 10: Transmitter module technical data

### 10.2 EMGZ482R Receiver Module

EMGZ482R	
Display	LCD 2x 8 characters (5mm) 2 (+8) LED bar indicators, graphical force presentation Battery state of charge or power supply
Propagation delay	≤10ms
Control interface	Ethernet via web browser (Internet Explorer 7 or higher)
Radio interface	2.44 GHz
Relay outputs (alarms)	4 relay contacts DC: 24V/0.5A/12W; AC: 24V/0.5A/62.12VA
Power supply	24VDC (18 to 36VDC) / 10W (max. 0.5A)
Digital input	5 to 24 VDC

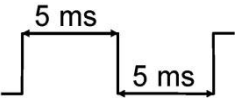
EMGZ482R	
(tachometer impulses for production length)	Cycle time: $\geq 10\text{ms}$ , Max. frequency: $\leq 100\text{ Hz}$  Conditions: 5ms on / 5ms off 
Analog input	0 to 10 VDC; min. 1.2k $\Omega$ (for core)
Temperature range	0 to 50 °C [32 to 122 °F]
Protection class	IP52
Weight	0.65 kg [1.43 lbs]

Table 11: Receiver module technical data

### 10.3 EMGZ484T Channel Extension Module (max 2 pcs.)

EMGZ484T	
Number of measuring points	4 channels for 4 force sensors
Measuring inaccuracy	<0.05% FS
Sensor excitation	3.0 VDC, max. 20mA, highly stable
Power supply	24 VDC supply via bus & power cable from EMGZ482T.MOVBUS
A/D converter resolution	$\pm 8192$ digit (14 bit)
Analog inputs 1 to 4	1 strain gauge force sensor each @ 350 $\Omega$ (0 to 5.4 mV, max. 7.4 mV)
Temperature range	0 to 50 °C [32 to 122 °F]
Protection class	IP52
Weight	0.45 kg [1.0 lbs]

Table 12: Channel extension module technical data

### 10.4 Certifications

Certified tests (copy of certificates provided upon request)	
Magnitude of Test (Coverage)	Article 3.2 of Directive 1999/5/EC (R &TTE Directive)
Certification	ETSI EN 300 440-2 V1.5.1 (2009-03); ETSI EN 300 440-1 V1.3.1 (2009-03)
RTM IO	FCC Certification USA, Canada
Magnitude of Test	Class A digital device, pursuant to Part 15 of the FCC

(Coverage)	Rules
Certification	FCC Registration #: 0020311882
RTM IO	CAB Radio Certification for Japan
Magnitude of Test (Coverage)	Low power data communi. FXD; Art. 38 - 24, Paragraph 1 of radio law
Certification	Article 2, Clause 1 Item 19, Certification ID #: 202WWSM10126721

*Table 13: Radio Certification*

## 10.5 Lloyd's Register Type Approval

Certificate available upon request.





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