RTMe Rope Tension Meter

User Manual translation of original instructions

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Contents

Introduction

Intended use

The RTM*e* rope tension meter is an instrument specifically designed to measure the forces in different kinds of ropes. Measurement is carried out quickly, without any extra preparation (unloading, etc.), and accurately on the tensioned rope. Avoid measuring near the rope attachments. Measurements can be carried out on ropes of different diameters, materials and designs.

The RTM*e* can include up to 20 different calibrations, i.e. measurements can be carried out on 20 different ropes (Rope Nos) without using conversion tables. The display shows the correct force for these ropes. The correct "Rope No." (calibration) can be selected by using the rope list in the instrument. To increase the accuracy of the readings, each rope is calibrated at four points. These are: 0%, 30%, 60% and 100% of the "Cal Cap" (maximum capacity).

Gigasense AB does not accept responsibility for any use of the product other than that for which it is intended.

Scrapping and recycling

Comply with local recycling regulations when disposing of this product. The product must be disposed of separately, and not with normal household rubbish. Replaced and discarded parts can be sent to Gigasense AB for destruction.

CE marking

Gigasense AB hereby declares that this product complies with the EU's essential health, environmental and safety requirements.

Manufacturer

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Safety

Read the safety instructions before use. If you have questions about the safety or operation of the product, contact Gigasense or your authorised dealer.

General safety information

To ensure safe operation, this user manual and the applicable local industrial safety rules and regulations must be complied with. It is also important to comply with the applicable national laws and safety regulations and directives relevant to the use of this product. The warranty is void if sealed screws are adjusted or if other changes not described in this manual are made.

Warning levels

The warning levels in this document have the following meaning and formatting:

⚠️ **Caution**

Indicates a risk that may occur. If the risk is not avoided, this may result in personal injury or damage to the product.

Important!

Used to reinforce important information that can facilitate understanding or the performance of a particular task.

Remaining risks

⚠️ **Caution**
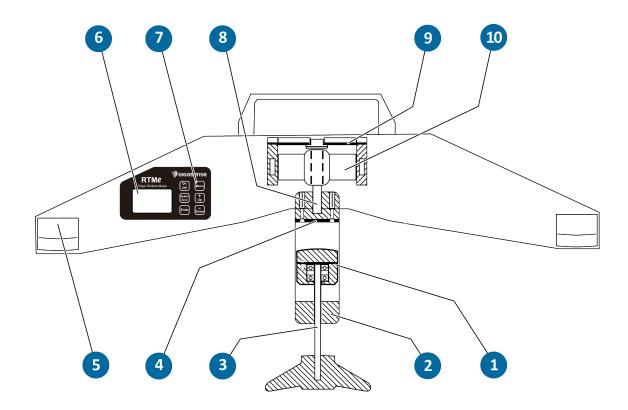
The system must be taken out of service in the event of damage.

Personnel working with, installing and using the system are responsible for ensuring that they understand the instructions relating to its functions and the installation described in this manual. If there are any questions or uncertainties, Gigasense AB should be contacted before the system is put into operation.

Correct functioning must be verified before the system is put into normal operation.

Design and function

Overview

Fig. 1

1. Clamping jaw

2. Tightening device

3. Tightening screw

4. Centre support (flat)

5. Outer rope support

6. Display

7. Pushbuttons

8. Pull rod

9. Leaf spring unit

10. Load cell

Measurements

The RTM*e* can be used to carry out measurements in two different ways:

1. Tensioned rope.

   The rope to be measured is loaded to the force X. The RTM*e* is installed and the rope force is read on the display.

2. Slack rope.

The RTM*e* is installed on the rope when it is slack. The rope is loaded to force X and then the rope force is read on the display.

Experience has shown that a better measurement result is obtained when using method 1 above. All RTM*e* ("rope numbers") are normally calibrated for measurement using method 1.

Different types of ropes

The best accuracy is obtained when measurement is carried out on a rope that is identical to the calibration rope. Different types of ropes can be calibrated for the instrument. For example, steel ropes, copper ropes, parallel filament ropes, textile ropes etc.

Gigasense recommends using the instrument against a calibrated rope.

Battery

The RTM*e* rope tension meter is powered by a rechargeable 1-cell 3.7 V lithium-ion battery with a battery life of 60 hours. The battery is charged via a USB-C charger. The charger must have a capacity of at least 0.5 A.

⚠️ **Caution**

The RTM*e* only works with an 850 mAh rechargeable battery type 14500. The battery must have a built-in protection circuit. The RTM*e* is supplied with a Nitecore NL1485 battery.

Operation and use

Before use

- Check that the instrument's battery is charged.

- Check that the threads of the tightening screw are clean and well lubricated.

Resetting the instrument to zero

The instrument can be reset to zero in two different ways:

1. Hold the RTM*e* in a vertical position suspended from the handle.

   Then press and hold the **Select**/**Zero** button for about 2 seconds.
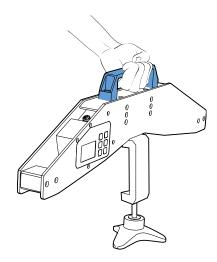
Fig. 2

2. Let the RTM*e* rest on the upper supports – not tightened.

   Then press and hold the **Select**/**Zero** button for about 2 seconds.

Important!

When zeroing, make sure that the tightening screw is loose and does not pinch the rope.
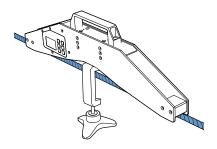
Fig. 3

Measurement instructions
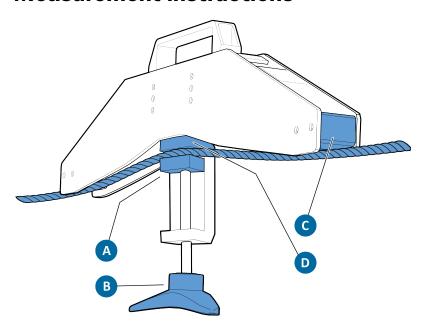
Fig. 4

1. Reset the instrument to zero in accordance with *Resetting the instrument to zero*, page 8.

2. Select the correct "Rope No.", depending on the rope to be measured. See also *Multipoint measurement*, page 13.

3. Using the tightening screw (B), unscrew the clamping jaw (A) sufficiently to make room for the rope.

4. Attach the RTM*e* so that the outer rope supports (C) are in contact with the rope.

⚠️ **Caution**

Avoid measuring near the rope attachments.

5. Turn the tightening screw (B) until the rope is in contact with the centre support (D).

6. Turn the tightening screw another 1/4 to 1/2 a turn to obtain the correct clamping force.

⚠️ **Caution**

Note that the rope must not be deformed. For copper rope, no additional tightening is required.

7. The measurement result on the display shows the tension force in the rope. The reading on the screen must be obtained within a 2–4 second time period. After this period of time, depending on the type of rope, the value starts to slowly decrease.

Multipoint measurement
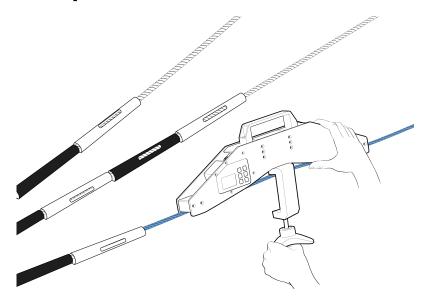
Fig. 5

Important!

You can save up to 6 measurement points in the instrument.
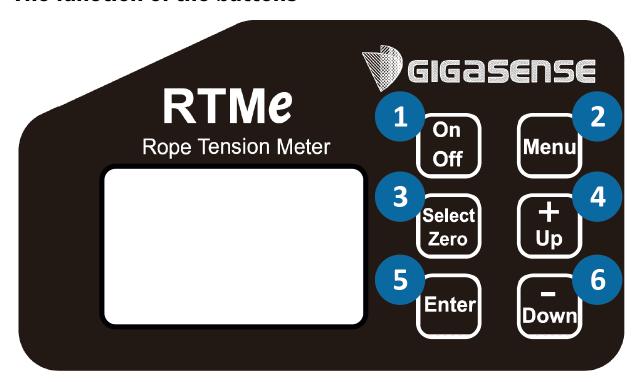
1. Reset all measurement points to zero by placing the cursor on "Clear all" (*Multipoint measurement*, page 13) and pressing the **Enter** button.

2. Select "=> 1" and place the instrument on the first measurement point. Carry out the measurement as described in steps 3-7 *Measurement instructions*, page 9. Save the value by pressing the **Enter** button. Carry out the same procedure for measurement points 2–6.

After use

- Any dirt in the threads of the tightening screw must be removed. Lubricate if necessary.

- Clean and charge the instrument if necessary.

- Store and transport the instrument in the transport box provided.

Menu operation

The function of the buttons

Fig. 6

1. Starts/turns off the instrument

2. Starts and exits menu operation

3. Select: Selects the selected indication
   Zero: zeroes the display

4. Moves up a value/moves cursor upwards. Scrolls between menus.

5. >1s saves the parameter

6. Moves down a value/moves cursor downwards. Scrolls between menus.

When scrolling in the menus, a cursor, "->", is used to indicate the selected function or menu. If the selected function is password protected, the cursor changes to "- -".

Menu tree


```
              RTMe
          Rope Tension Meter          [GIGASENSE]

                                  On    Menu
                                  Off
          Capacity  16.54  t
                                  Select   +
            15.12                  Zero    Up

          Rope  011  7.3mm  1x7    Enter   -
                                          Down
```

```
RTM charge
Est.op.time 22h
Battery      3.80V
Capacity     39%
Charging     450mA
Measurement disabled,
remove charger
to start a measurement
```

[- Down]

```
Multipoint measuring

   10.00          kN

=>1=3.00      2=5.00
  3=7.00      4=9.00
  5=11.00     6=12.00
  Clear all
Sel=step, Enter=save
```

```
Battery info.

    Est.op.time 22h
    Battery=  3.80V
    Capacity=   39%
    Not charging

Use +, - or Menu
```

```
   RTM load

Instr. value     9997
Rope value       9966
Zero corr.(%)    0.00
Load kN  value  14.28
Load ton value  1.453
Rope 018 17.7mm 1x19
```
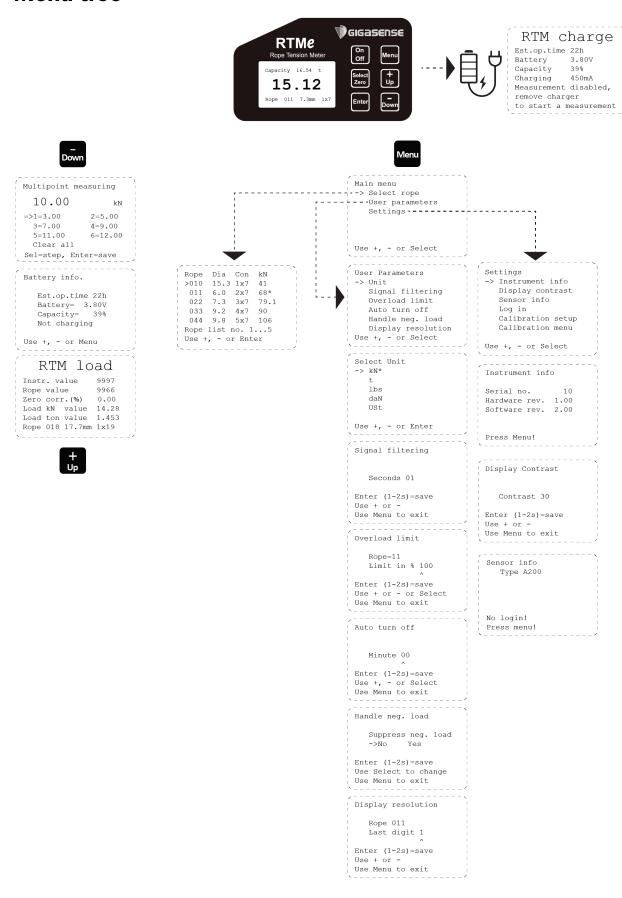
[+ Up]

[Menu]

```
Main menu
-> Select rope
   User parameters
   Settings



Use +, - or Select
```

```
Rope  Dia  Con  kN
>010  15.3 1x7  41
 011  6.0  2x7  68*
 022  7.3  3x7  79.1
 033  9.2  4x7  90
 044  9.8  5x7  106
Rope list no. 1...5
Use +, - or Enter
```

```
User Parameters
-> Unit
   Signal filtering
   Overload limit
   Auto turn off
   Handle neg. load
   Display resolution
Use +, - or Select
```

```
Select Unit
-> kN*
   t
   lbs
   daN
   USt

Use +, - or Enter
```

```
Signal filtering


   Seconds 01

Enter (1-2s)=save
Use + or -
Use Menu to exit
```

```
Overload limit

   Rope=11
   Limit in % 100
         ^
Enter (1-2s)=save
Use + or - or Select
Use Menu to exit
```

```
Auto turn off


   Minute 00
       ^
Enter (1-2s)=save
Use +, - or Select
Use Menu to exit
```

```
Handle neg. load

   Suppress neg. load
   ->No     Yes

Enter (1-2s)=save
Use Select to change
Use Menu to exit
```

```
Display resolution

   Rope 011
   Last digit 1
           ^
Enter (1-2s)=save
Use + or -
Use Menu to exit
```

```
Settings
-> Instrument info
   Display contrast
   Sensor info
   Log in
   Calibration setup
   Calibration menu

Use +, - or Select
```

```
Instrument info

Serial no.       10
Hardware rev.  1.00
Software rev.  2.00


Press Menu!
```

```
Display Contrast


   Contrast 30

Enter (1-2s)=save
Use + or -
Use Menu to exit
```

```
Sensor info
   Type A200




No login!
Press menu!
```

Fig. 7

Normal view

At start-up, the normal view is displayed. The following are presented:

- Capacity (in the selected unit).

- Current measured value (in the selected unit).

- Rope selected.

Press **Up/Down** to scroll between *Multipoint measurement*, *Battery indication*, and *Detailed view*.

```
Capacity  16.54  t

  15.12

Rope   011  7.3mm  1x7
```

Multipoint measurement

- Multi-point measurement is used to measure and obtain an overview of several measurement points at the same time. The pointer "=>" is moved using **Select**. When **Enter** is pressed for 2 seconds, the current measured value is saved for the selected position. When the pointer is set to "Clear all" and **Enter** is pressed, all saved points are reset to zero.

```
Multipoint measuring
  10.00         kN
=>1=3.00     2=5.00
  3=7.00     4=9.00
  5=11.00    6=12.00
  Clear all
Sel=step, Enter=save
```

Battery indication

The following is displayed:

- **Est. op.time**: Expected remaining operating time in hours.

- **Battery**: Current battery voltage. The battery should not be charged to more than 4.20 V. Below 3.50 V, the instrument will automatically switch off.

- **Capacity**: Remaining battery capacity.

- **Not charging**: Information as to whether the battery is charging or not.

```
Battery info.

  Est.op.time 22h
  Battery=  3.80V
  Capacity=   39%
  Not charging

Use +, - or Menu
```

Detailed view

The following is displayed:

- **Instr. value**: Value after instrument calibration. The normal range is 0–10,000 scale units.

- **Rope value**: Value after calibration on the rope, 0–10,000 scale units.

- **Zero corr. (%)**: Shows what percentage of the capacity has been reset.

- **Load value**: Value after conversion according to the rope capacity in kN.

- **Grade value**: Conversion from kN to the selected unit.

- **Rope**: rope selected.

```
  RTM load
Instr. value    9997
Rope value      9966
Zero corr.(%)   0.00
Load kN  value  14.28
Load ton value  1.453
Rope 018 17.7mm 1x19
```

Display messages

- The measured value is displayed in large text. In the event of an overload, the measured value alternates with the text "Rope overload! > 50%" on the screen. 50% means that the overload parameter is set to 50%.

```
Rope overload!

  >    50%
```

- If the battery voltage is too low, "Low battery" is displayed on the line below the measured value.

```
Low battery 3.50V
```

- If there is a sensor alarm, no measured value is displayed, instead "Sensor Alarm!" is displayed.

```
Sensor
alarm!
```

- Zero taring, press and hold **Zero** for 1 second. The display shows 0. The zeroed value in % is displayed for 2 seconds.

```
Zeroing ok 0.01%
```

- If zeroing fails, the signal value is outside a permitted range, "Zeroing failed" is displayed.

```
Zeroing failed 1.09%
```

- Zeroing is reset when the instrument is restarted.

Start-up with a low battery voltage

- When the instrument is started with a battery voltage below 3.50 V, a warning text is displayed for about 5 seconds and then the instrument switches off automatically.

```
Critically
low battery
voltage

Forcing turn off!
```

- If the battery voltage is too low, the instrument will not start. Charge the battery and then start the instrument again.

Menu

Press **Menu** to display a list of functions. Move the cursor using **Up/Down** and then press **Select** to start the selected function.

Select rope

A submenu of calibrated ropes is displayed. Move the cursor using **Up/Down** between pre-calibrated ropes.

• Press **Enter** for about 1 second to select the highlighted rope.

```
Main menu
-> Select rope
   User parameters
   Settings



Use +, - or Select
```

Rope selection

One of up to 20 pre-programmed ropes can be selected. The rope number, diameter, structure and maximum permitted load are displayed.

The activated rope is marked with an "*" on the far right. Move the cursor ">" using **Up** or **Down**. If the last line is selected, the next 5 lines are displayed if **Down** is pressed.

```
Rope   Dia   Con   kN
>010   15.3  1x7   41
 011   6.0   2x7   68*
 022   7.3   3x7   79.1
 033   9.2   4x7   90
 044   9.8   5x7   106
Rope list no. 1...5
Use +, - or Enter
```

User parameters

Change parameters that affect the display and function. Move the cursor using **Up/Down** between functions. Press **Select** when the desired function is highlighted.

```
User Parameters
-> Unit
   Signal filtering
   Overload limit
   Auto turn off
   Handle neg. load
   Display resolution
Use +, - or Select
```

Unit

Select an appropriate unit from the following: 'kN', 't', 'lbs', 'daN' and 'USt'. An * indicates the unit that has already been selected. Select view using **Up** or **Down**. Press **Enter** for about 1 second to save the selected unit.

```
Select Unit
-> kN*
   t
   lbs
   daN
   USt

Use +, - or Enter
```

Signal filtering

Select the filtering value for the selected rope: 1–10 s. The instrument calculates the average value during the set time, which means that increasing the filter time increases the inertia in the display. The setting applies to the selected rope.

```
Signal filtering


   Seconds 01

Enter (1-2s)=save
Use + or -
Use Menu to exit
```

Overload limit

Select the limit at which the instrument should indicate an overload. The limit is set as a percentage of the capacity. The setting only applies to the selected rope.

```
Overload limit

   Rope=11
   Limit in % 100
           ^
Enter (1-2s)=save
Use + or - or Select
Use Menu to exit
```

Auto turn-off

Select the number of minutes until the device automatically switches off when not in use: 0–60 min. The minute counter is reset to zero each time the button is pressed.

```
Auto turn off


   Minute 00
          ^
Enter (1-2s)=save
Use +, - or Select
Use Menu to exit
```

Handle neg. load

Select "Yes" to not indicate a negative load. Any load below zero is indicated as 0.

```
Handle neg. load

   Suppress neg. load
   ->No    Yes

Enter (1-2s)=save
Use Select to change
Use Menu to exit
```

Display resolution

To limit the resolution, select one of the following values: 1, 2, 5. The setting is unique to each rope.

```
Display resolution

   Rope 011
   Last digit 1
             ^
Enter (1-2s)=save
Use + or -
Use Menu to exit
```

Settings

View and change general settings on the instrument. Move the cursor using **Up/Down** between functions. Press **Select** when the desired function is highlighted.

```
Settings
-> Instrument info
   Display contrast
   Sensor info
   Log in
   Calibration setup
   Calibration menu

Use +, - or Select
```

- **Instrument info**: Information about the instrument.

```
Instrument info

Serial no.       10
Hardware rev.  1.00
Software rev.  2.00


Press menu!
```

- **Display contrast**: Change the contrast for optimum readability. Selectable between 0 and 63.

```
Display Contrast


   Contrast 30

Enter (1-2s)=save
Use + or -
Use Menu to exit
```

- **Sensor info**: Information about the sensor.
- **Log in**: For Gigasense use only.
- **Calibration setup**: For Gigasense use only.
- **Calibration menu**: For Gigasense use only.

```
Sensor info
   Type A200




No login!
Press Menu!
```

Charging

- Charging starts when a USB-C cable is plugged into the socket.

- When charging is started, the instrument enters charging mode regardless of its previous state.

- When charging ends, the instrument always switches off.

- Note that the indicated voltage increases during charging and decreases when charging ends.

- When the battery voltage is above 4.20 V, the text "Remove charger!" is displayed.

- If the battery voltage goes above 4.3 V, charging is switched off. The display shows the charging current being used.

```
 RTM charge
Est.op.time 22h
Battery    3.80V
Capacity     39%
Charging   450mA
Measurement disabled,
remove charger
to start a measurement
```

Maintenance

The RTM*e* is designed to be maintenance-free. When cleaning the equipment, this should be done by gently wiping it with a dry or damp cloth.

Recalibration

To maintain the measurement accuracy of the RTM*e*, it is recommended that the instrument be sent to Gigasense for recalibration on a regular basis. How often it needs to be recalibrated depends on how often it is used. In general, it is recommended that the instrument be sent in for recalibration every two years. If the instrument is in frequent use, such as several times a day, it is recommended that it be sent in for recalibration every year.

Troubleshooting

If the RTM*e* does not work, please check the following before contacting Gigasense or your local authorised dealer:

Error	Cause	Solution
"Zeroing failed" is displayed during zeroing.	The sensor's zero value has changed by more than 1.5%.	Recalibration at Gigasense required.
The RTM*e* does not start.	1. The battery is discharged. 2. The battery is defective. 3. The electronics have "hung". 4. The battery is fitted in the wrong orientation.	1. Charge the battery. 2. Replace the battery with a new one of the same type and charge. 3. Remove and refit the battery. 4. Turn the battery so that + terminal is facing the battery hatch. If none of the above works, send the RTM*e* to Gigasense for repair and troubleshooting.
Charging does not work.	1. The USB-C connector is not inserted properly. 2. Faulty charging cord or power adapter. 3. Charging function error in RTM*e*.	1. Push the USB-C connector in until it stops. 2. Replace the charging cord or power adapter. 3. The RTM*e* needs to be repaired at Gigasense. If none of the above works, send the RTM*e* to Gigasense for repair and troubleshooting.
The RTM*e* does not respond to button presses.	The electronics have "hung".	1. Remove and reinsert the battery. 2. Electronics fault, send to Gigasense.
"Sensor alarm!"	The connector to the sensor has come loose.	Make sure the sensor connector is tightened. If none of the above works, send the RTM*e* to Gigasense for repair and troubleshooting.

Technical data

	RTM*e* 5 t	RTM*e* 20 t
RTM*e* Max.cap. kN/t/lbs	50/5/11,000	200/20/44,000
Rope diameter	Approx. 0.23"–1.5"/6 mm–38 mm	
Main dimensions of RTM*e*	(LBH) 26.97" x 5.51" x 14.96"/685 x 135 x 380 mm	
Net weight of RTM*e*	6 kg	6 kg
Main dimensions of transport box	(LBH) 29.92" x 6.69" x 15.75"/760 x 170 x 400 mm	
Weight (RTMe + transport box)	11.2 kg	11.2 kg
Inaccuracy (depending on rope type and characteristics)	Up to a maximum of ±2% for steel ropes and ±6% for copper ropes.	
Maximum number of calibrated ropes	20	
Permitted ambient temperature	-4°F–140°F/-20°C–60°C	
Display	LCD screen	
Digit size	0.47"/~12 mm for load display. 0.157"/4 mm for other display text	
Battery service life (hours)	60 hours rechargeable	
Battery specifications	Nitecote NL1485 Lithium ion 1-cell 3.7 V 850 mAh type 14500	
Protection class (IEC 529, NEMA)	IP65	
Material	Anodised aluminium	

Max Cap = Max. capacity of RTMe

Cal Cap = Max calibrated capacity for each rope