Data Sheet: BTR2.543.R1.ENG

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# BTR2 DIGITAL TORQUE BENCH














BTR2 is a torque bench for static measurements composed of a digital indicator and a strain gauge torque extremely rugged and compact with a precision better than 0.20 %.
It is ideal for the calibration and control of torque wrenches, screwdrivers direct reading and snap.
The indicator is powered by one Li-Ion rechargeable battery with an autonomy of 80 hours, with the AUTO POWER OFF function which occurs when there are no changes in measurements for a time of 30 minutes.
The new generation electronics section is composed by a particularly stable analog circuit and by an A / D converter 24 bit that allows, in static mode, a very high resolution and a acquisition frequency that in peak mode is 4800 Hz.
On the display is present an analogue bar indication for the torque, always active also inside the programming menu.

To increase the practicality of using the new BTR2 has the possibility to rotate the display by 90° to be able to work both horizontally and vertically using the special bracket option.

BTR2 can operate in two different modes:
• **STANDARD Mode** : Direct readout that displays the torque in real-time at high resolution
• **PEAK Mode**: ideal for measurements of trip torque clockwise and counterclockwise.

## MAIN FEATURES

- AUTONOMY: 80 HOURS WTHOUT RECHARGE
- BATTERY RECHARGE TROUGH USB PORT
- ORIENTABLE LCD DISPLAY with BACKLIGHT
- 9 MEASUREMENT UNIT
- PROGRAMMABLE RESOLUTION
- PROGRAMMABLE DIGITAL FILTER
- ZERO FUNCTION
- PEAK FUNCTION (clockwise and anti-clockwise)
- FIRST PEAK FUNCTION
- AUTOMATIC AUTO RESET OF THE PEAK
- AUTO POWER OFF FUNCTION
- USB COMMUNICATION PORT
- KEY BLOCK FUNCTION
- INTERNAL DATALOGGER (option)
- INTERNAL CLOCK CALENDAR (option)
- RS232 COMMUNICATION PORT (option)

**Complete** with ACCREDIA Calibration certificate (clockwise).

**ACCESSORIES and SOFTWARE APPLICATIONS**
For a full calibration system it is available a ATC support and the software TorqueKAL. The software acquires measures automatically, compute calibration errors and print Calibration report ACCREDIA referred and more….

# *TECHNICAL DATA*

| | |
|---|---|
| **PRECISION CLASS** UNI 113114 (EURAMET cg-14)<br>LINEARITY AND HYSTERESIS | **1** from 10% to 100% F.S.<br>$\leq \pm$ 0.20 % F.S. |
| **NOMINAL TORQUE** (F.S.) | 0.5 - 2.5 – 5 – 10 – 25 - 50 N•m<br>100 - 250 - 500 – 1000 - 2000 N•m |
| INTERNAL RESOLUTION<br>**DIRECT READING** : CONVERSION PER SECOND<br>**PEAK MODE** : CONVERSION PER SECOND | 24 bit<br>10 Hz<br>4800 Hz |
| REFERENCE TEMPERATURE<br>SERVICE TEMPERATURE RANGE<br>STORAGE TEMPERATURE RANGE | +23 °C<br>0 / +50 °C<br>-10 / +60 °C |
| 10°C TEMPERATURE EFFECT<br>a) on zero<br>b) on sensitivity | <br>$\leq \pm$ 0.015 %<br>$\leq \pm$ 0.005 % |
| CUSTOM LCD DISPLAY<br>CHARACTER HEIGHT 16 mm<br>PROGRAMMABLE BACKLIGHT from 1 to 60 seconds<br>BACKLIGHT : LED BLU<br>ANALOG BAR INDICATION |  |
| PROGRAMMABLE **RESOLUTION**<br>PROGRAMMABLE **DIGITAL FILTER**<br>**ZERO** FUNCTION<br>**PEAK** FUNCTION<br>**FIRST PEAK** FUNCTION PROGRAMMABLE<br>**PEAK AUTO RESET** PROGRAMMABLE<br>**AUTO POWER OFF** FUNCTION<br>**KEY BLOCK** FUNCTION (LOCK) 🔒 | 1, 2, 5, 10<br>from 0 to 10 (Direct reading)<br>100 % F.S.<br>Clockwise and counterclockwise<br>from 1 to 99 % F.S.<br>clear the PEAK after a set time<br>From 1 to 30 minutes (no changes)<br>To protect parameters from changes |
| MEASUREMENT UNIT | kN•m - N•m - N•cm - daN•m - kgf•m<br>ozf•ft - lbf•ft - ozf•inch - lbf•inch |
| COMMUNICATON PORT<br>MODE CONTINUOS TRANSMISSION MODE<br>ON DEMAND TRANSMISSION<br>MAX DISTANCE | USB 2.0<br>4800 values per second<br>On demand<br>5 m |
| POWER SUPPLY BY INTERNAL BATTERY<br>BATTERY RECHARGE<br>AUTONOMY<br>TIME TO RECHARGE | Li-Ion size 14500 3.6V RECHARGEABLE<br>Through USB<br>80 hours<br>~ 8 hours |

## *Mechanical features*

| | |
|---|---|
| PROCESS COUPLING (UNI ISO 1174-1):<br>0.5 - 2.5 – 5 - 10 N•m<br>25 - 50 N•m<br>100 – 250 N•m<br>500 – 1000 N•m | <br>☐ 1/4” female<br>☐ 3/8” female<br>☐ 1/2” female<br>☐ 3/4” female |
| MECHANICAL LIMIT VALUES:<br>a) service pressure<br>b) max. permissible pressure<br>c) breaking pressure | <br>100 % F.S.<br>150 % F.S.<br>>300 % F.S. |
| TIGHTENING WRENCH<br>TIGHTENING TORQUE | 27 mm<br>28 N•m |
| PROTECTION CLASS (EN60529)<br>SENSOR EXECUTION MATERIAL<br>CASE EXECUTION MATERIAL | IP40<br>INOX 17-4 PH<br>ALLUMINIUM and STEEL |

## *Options*

The **DATA LOGGER** function works in 2 different mode:

- **AUTOMATIC** registration of the measures on the basis of a time, in direct reading mode.
- **MANUAL** registration of the measures in PEAK mode.

| | |
|---|---|
| Programmable Acquisition Interval | from 1 second to 10 hour |
| Max number of acquisition point | 60.000 points |
| Internal Clock Calendar | Year-month-day-hour-minutes-seconds |

The stored measurements can then be displayed on the display or downloaded directly to a PC via the Quick Analyzer software that allows you to have a graphical representation and export data into Excel for a customized analysis.

The RS232 port is used as an alternative to the USB and allows you to connect with a PC, Tablet or PC up to 15 meters away.

| | |
|---|---|
| COMMUNICATION PORT | RS232C |
| BAUD RATE | 19200, 9600, 4800 |
| TYPE OF COMMUNICATION | ON DEMAND |
| REAR PANEL CONNECTOR | DB9 Female |


OPTION

For special applications, you can have the BTR2 sensor and the indicator DTR2 separate and connected by a cable.

## *Accessorie Supplied*

USB Power Supply(5VDC @700mA)
USB cable.
CD with MANUAL and USB DRIVER.

## ***Accessories*** (to be purchased separately)

**ATC:** Mechanical support, with dual linear guide, for the calibration and verification of torque wrenches snap or direct reading.
It allows you to apply the load gradually continuously, in compliance with the UNI EN ISO 26789 (2004).
There are 2 models:
**ATC1K** field with up to 1000 N•m.
**ATC2K** that allows you to work up to 2000 N•m.

Additional plate to install more BTR2 on the generator manual ATC.

Bracket for vertical mounting.
Code: **ST**

Carrying case in ABS.

RS232C cable

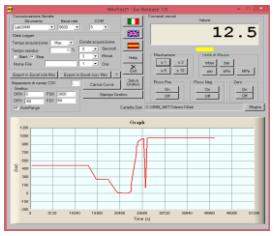
CALIBRATION CERTIFICATE ACCREDIA ANTI-CLOCKWISE.
Calibration report CLOCKWISE (as an alternative to ACCREDIA Certificates).
Calibration report ANTI-CLOCKWISE (as an alternative to ACCREDIA Certificates).

## ***Sofftware Applications*** (to be purchased separately)

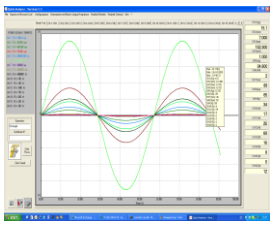
**TorqueKAL:** Software for the calibration and metrological confirmation for torque wrenches, wrenches and torque screwdrivers.
The calibration procedure is performed according to the UNI EN ISO 6789.
Evaluation of the uncertainty of calibration is performed according to the requirements of the UNI CEI ENV 13005.

**WinTEST1:** Software allows to menage the basic commands of the instrument, create test graphs, export data to Microsoft Excel format, printing and archiving of tests.

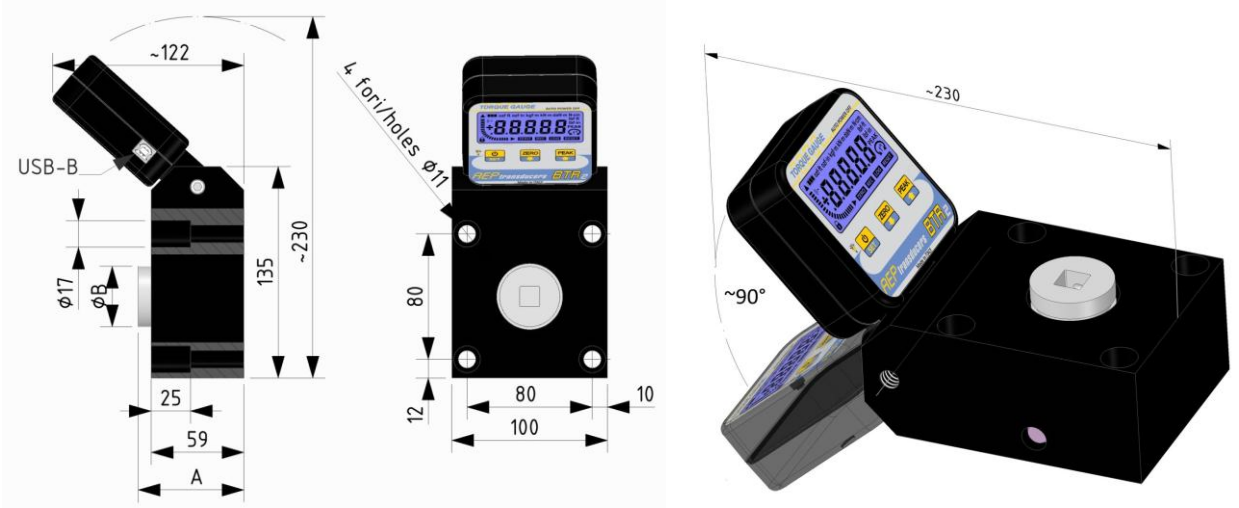
**LOW COST** version.




**Quick Analyzer Light**: Professional software that interfaces directly to BTR2 and supports the operator in the various test functions, analysis, monitoring over time, data storage, **DATA LOGGER** management, transfer of measures on Microsoft Excel etc ...
Ideal to see the trend of tightening torque.

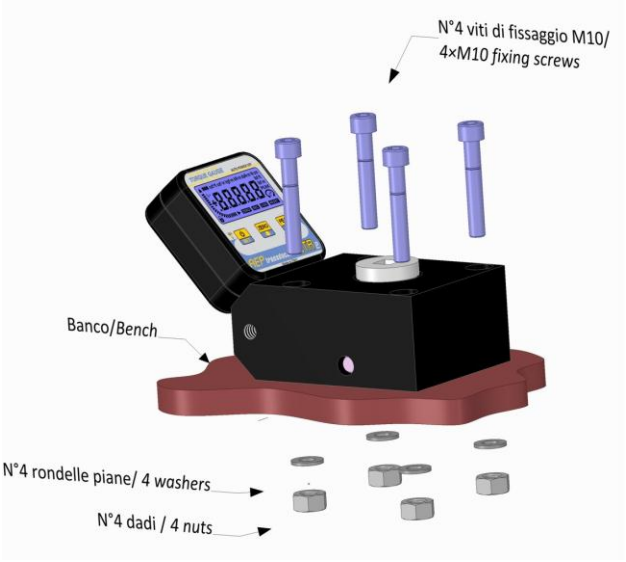


## ***Dimensions (mm)***




## ***ORIENTABLE DISPLAY***

**HORIZONTAL mounting**




**VERTICAL attachment via BRACKET (purchase separately)**

## *STANDARD INDICATIONS*

| Nominal Torque | Display | Resol. | Display | Resol. | Display | Resol. | Display | Resol. |
|---|---|---|---|---|---|---|---|---|
| N•m | N•m | N•m | kN•m | kN•m | N•cm | N•cm | daN•m | daN•m |
| 0,5 | 0,5000 | 0,0001 | 0,0005 | 0,0001 | 50,000 | 0,010 | 0,0500 | 0,0001 |
| 2,5 | 2,5000 | 0,0005 | 0,0025 | 0,0001 | 250,00 | 0,05 | 0,2500 | 0,0001 |
| 5 | 5,000 | 0,001 | 0,0050 | 0,0001 | 500,00 | 0,10 | 0,5000 | 0,0001 |
| 10 | 10,000 | 0,002 | 0,0100 | 0,0001 | 1000,0 | 0,2 | 1,0000 | 0,0002 |
| 25 | 25,000 | 0,005 | 0,0250 | 0,0001 | 2500,0 | 0,5 | 2,5000 | 0,0005 |
| 50 | 50,00 | 0,01 | 0,0500 | 0,0001 | 5000,0 | 1,0 | 5,0000 | 0,0010 |
| 100 | 100,00 | 0,02 | 0,1000 | 0,0001 | 10000 | 2 | 10,000 | 0,002 |
| 250 | 250,00 | 0,05 | 0,2500 | 0,0001 | 25000 | 5 | 25,000 | 0,005 |
| 500 | 500,0 | 0,1 | 0,5000 | 0,0001 | 50000 | 10 | 50,000 | 0,010 |
| 1000 | 1000,0 | 0,2 | 1,0000 | 0,0002 | --------- | ---------- | 100,00 | 0,02 |
| 2000 | 2000,0 | 0,5 | 2,0000 | 0,0005 | --------- | ---------- | 200,00 | 0,05 |

| Nominal Torque | Display | Resol. | Display | Resol. | Display | Resol. |
|---|---|---|---|---|---|---|
| N•m | kgf•m | kgf•m | ozf•ft | Ozf•ft | lbf•ft | lbf•ft |
| 0,5 | 0,0500 | 0,0001 | 5,9000 | 0,0020 | 0,4000 | 0,0001 |
| 2,5 | 0,2500 | 0,0001 | 29,500 | 0,010 | 2,0000 | 0,0005 |
| 5 | 0,5000 | 0,0001 | 59,000 | 0,020 | 4,0000 | 0,0010 |
| 10 | 1,0000 | 0,0002 | 118,00 | 0,05 | 8,0000 | 0,0020 |
| 25 | 2,5000 | 0,0005 | 295,00 | 0,10 | 20,000 | 0,005 |
| 50 | 5,0000 | 0,0010 | 590,00 | 0,20 | 40,000 | 0,010 |
| 100 | 10,000 | 0,002 | 1180,0 | 0,5 | 80,000 | 0,020 |
| 250 | 25,000 | 0,005 | 2950,0 | 1,0 | 200,00 | 0,05 |
| 500 | 50,000 | 0,010 | 5900,0 | 2,0 | 400,00 | 0,10 |
| 1000 | 100,00 | 0,02 | 11800 | 5 | 800,00 | 0,20 |
| 2000 | 200,00 | 0,05 | 23600 | 5 | 1600,0 | 0,5 |

| Nominal Torque | Display | Resol. | Display | Resol. |
|---|---|---|---|---|
| N•m | ozf•inch | ozf•inch | lbf•inch | lbf•inch |
| 0,5 | 71,000 | 0,020 | 5,000 | 0,001 |
| 2,5 | 355,00 | 0,10 | 25,000 | 0,005 |
| 5 | 710,00 | 0,20 | 50,000 | 0,010 |
| 10 | 1420,0 | 0,5 | 100,00 | 0,05 |
| 25 | 3550,0 | 1,0 | 250,00 | 0,05 |
| 50 | 7100,0 | 2,0 | 500,0 | 0,1 |
| 100 | 14200 | 5 | 1000,0 | 0,2 |
| 250 | 35500 | 10 | 2500,0 | 0,5 |
| 500 | 71000 | 20 | 5000,0 | 1.0 |
| 1000 | --------- | ---------- | 10000 | 2 |
| 2000 | --------- | ---------- | 20000 | 5 |

## *How to configure a complete standard system*

To calibrate a wide range of instrument you need to determine:

- MINIMUM torque of the torque wrench smaller.
- MAXIMUM torque of torque wrench bigger.

With this information we can determine how many standard instruments are needed to cover the entire field ensuring Class 1 UNI 113114.

**Example**

To cover a range of 1 to 1000 N•m need 3 instruments:

- BTR2 from 1000 N•m covering the range from 1000 to 100 N•m.
- BTR2 100 N•m covering the range from 100 to 10 N•m.
- BTR2 by 10 N•m covering the range from 10 to 1 N•m.

## *PURCHASE CODES*

| MBTR2 | Full Scale | | | Option | Option |
|---|---|---|---|---|---|
| | 0N5[1] | 25N | 500N | D = Data logger | R = RS232 OUTPUT |
| | 2N5[1] | 50N | 1Kn | | |
| | 5N | 100N | 2kN | | |
| | 10N | 250N | | | |

Example: **MBTR250ND**

[1] Calibration ACCREDIA CAN NOT be performed by the Center LAT N ° 093, on request can be commissioned to other centers accredited calibration.