DT Series Hand-Held Digital Tension Meters

DT Series Features

- Large, backlight LCD with 3 different displays *(see diagram at right below)*
- The display automatically rotates in 90° steps for optimal viewing
- New, unique, force reduced material-catching system
- Automatic Zero-Setting in all measuring positions
- Material memory locations for customer calibrations: 4 (DTS) and 9 (DTX)
- Flexible menu set-up to meet operators demand
- Selectable units of measurement: cN, daN, g, kg, N, lb
- Hi-speed data sampling & recording of Min, Max, Hi-Peak, Lo-Peak, Average & Standard Deviation
- User-set High/Low Limits with Alarm Indication shown on display
- Cal. adjustment for fine tuning the calibration if material differs from the selected calibration material

Built-In Diameter Compensator allows user to set material thickness for highest accuracy.

12 tension ranges from 0.2 – 200 cN to 0.6 – 60 daN

Check-Line® **DTS Digital Tension Meter** and **DTX Data Logging Digital Tension Meter** accurately measure the running line tensions of yarns, fibers, wires, cables, optic fibers, carbon fibers and similar materials. Both feature auto-rotating display and auto-zeroing to permit measuring material running in any orientation. Special versions of DTS and DTX meters are available for tapes and films, narrow access and larger diameter applications.

Depending on the measuring position the LCD displayautomatically rotates in 90° steps

Large backlit LCD with 3 user-selected display modes

Numeric

Numeric, bar graph with set point markers

Numeric and X-Y diagram

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DT Series Specifications

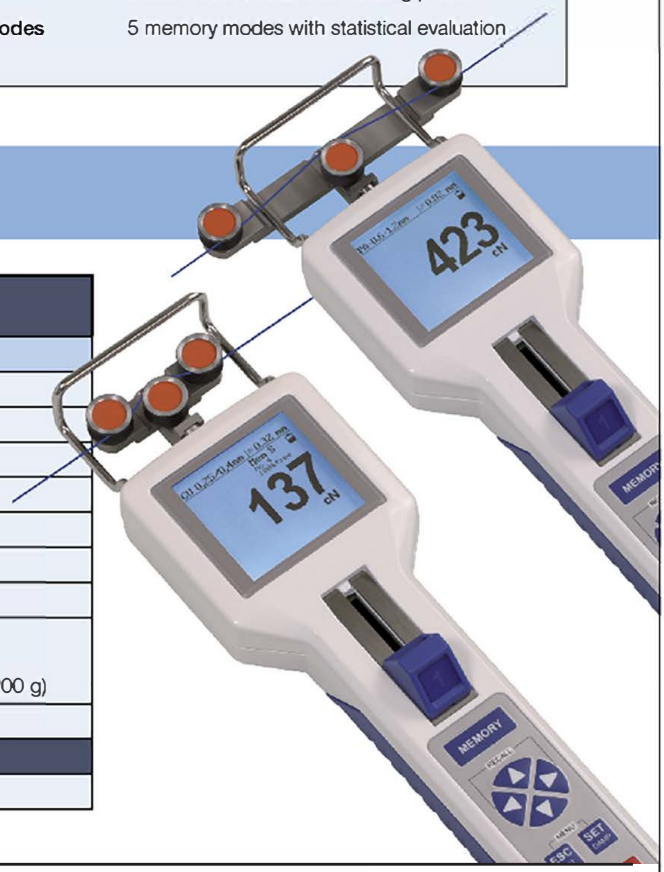
Calibration	According to factory procedure
Accuracy	For PA from 5% up to 100% FS*: ± 0.5% FS* ±1 digit remaining tension range and other calibration materials: ± 3% FS* ±1 digit
Calibration Memory	
DTS:	1 for factory calibration plus 4 for customized calibrations
DTX:	2 for factory calibration plus 9 for customized calibrations
Measuring units	Force (switchable): cN, daN, g, kg, N, lb Thickness (switchable): mm, inch
Overrange	Approx. 10% FS*, full scale, without accuracy guarantee
Overload protection	100% FS*
Measuring principle:	Strain gauge bridge
Measuring roller deflection	0.2mm, maximum
Signal processing	Digital, 16 bit A/D converter
Measuring frequency	1 kHz, max (1000 samples/sec)
Graphic LCD displays (3)	Large Numeric, Numeric with bar graph Numeric with trend graph (tension vs time)
Display update rate	Approx. 2 times per second
Memory	Min, Max, Hi-Peak, Lo-Peak, Average & Standard Deviation (per measuring interval)

Damping	Adjustable electronic damping (averaging)
Cal. adjustment	±10 steps in 1% increment
Thickness compensation	Max. 2.5 mm (not available for all models)
Auto power off	Approx. 3 minutes of non-use
Temperature coefficient	Gain: less than ±0.01% FS* /°C
Zero point	less than ±0.3% FS* /°C
Temperature range	10 – 45 °C
Air humidity	85% RH, max.
Built-in Battery	Lithium Polymer
- Battery Life	20 hours continuous use (approx.)
- Recharging Time	3½ hours (approx.)
- Battery Charger	100~240V AC, swappable plug adapters
- Plug Adapters	USA, Euro and UK
Housing material	Die-cast aluminium
Housing dimensions	265 x 78.5 x 46mm
Weight, net (gross)	Up to DTX-50K approx. 875 g / 1550 g DTX-60K-V1 approx. 1040 g / 2700 g
Additional specifications model DTX	
Output signal	USB
Memory	60.000 values at 255 measuring periods
Memory modes	5 memory modes with statistical evaluation

* FS = Full Scale

DT Series Guide Rollers

V-grooved	Line Speeds v_{max}...m/min	Roller Material
Standard	2000	Hard-coated aluminium
Code K	3500	Hard-coated aluminium
Code H	5000	Plasma-coated aluminium
Code T	1000	Plastic (POM) black
Code W	1000	Nickel-plated steel
Code ST	1000	Hardened steel
Code B	1000	Tempered steel for tire cord
Code CE 2	1000	Aluminium ceramic-coated
Code ASY **Code ASYB**	1000 1000	Hard-coated aluminium Tempered steel for tire cord asymmetrical groove Gauge is without filament guide (not for tension range 200 g)
Code V1	1000	Hard-coated aluminium (only for tension range 60 Kg)
U-grooved		
Code U	2000	Hard-coated aluminium (not for tension range 200 g)



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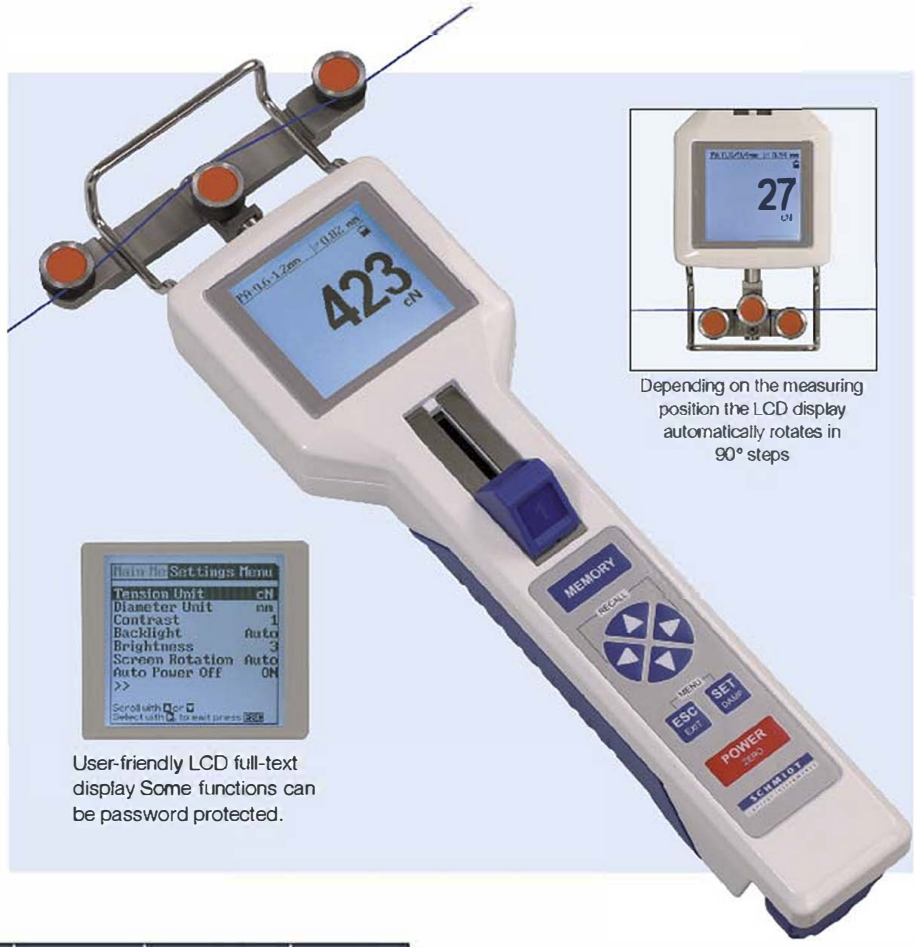
Model DTS

DTS Additional Features

- Everything in operator's view:
  - the guide rollers
  - the measured material
  - the readings
- Filament guide and roller shifting mechanism ensure easy acquisition of the running material
- Ball-bearing mounted, V-grooved guide rollers
- Rubberized handle provides a secure gripin the operator's hand
- Rugged aluminium housing
- Lithium Ion rechargeable battery provides 40 hours of continuous use (approx.)
- CE certified, protected against damage from Electrostatic Discharge (ESD)
- NIST-traceable Calibration Certificate and Report optionally aavailable



Depending on the measuring position the LCD display automatically rotates in 90° steps

User-friendly LCD full-text display Some functions can be password protected.

Available Models

Type	Tension Range (g)	Measuring Head Width* mm	Factory Calibration** Material Curve 1 Polymid (PA) Monofil	Textive Industry Applications e.g. yarn count	Wire Industry Applications e.g., soft annealed copper wire	Thickness Compensator included
DTS-200	0.2 - 200	66	0.12 mm Ø	max. 200 TEX	max. 0.15 mm Ø	
DTS-500	0.5 - 500	66	0.12 + 0.20 mm Ø	max. 500 TEX	0.05 - 0.25 mm Ø	✔
DTS-1000	10 - 1000	66	0.20 + 0.40 mm Ø	max. 1000 TEX	0.10 - 0.40 mm Ø	✔
DTS-2000	20 - 2000	66	0.40 + 0.70 mm Ø	max.2000 TEX	0.30 - 0.60 mm Ø	✔
DTX-2500	25 - 2500	116	0.40 + 0.70 mm Ø	max. 2500 TEX	0.30 - 0.60 mm Ø	✔
DTS-4000	40 - 4000	66	0.50 + 0.80 mm Ø	max. 4000 TEX	0.35 - 0.80 mm Ø	✔
DTS-5000	50 - 5000	116	0.60 + 1.20 mm Ø	max. 5000 TEX	0.40 - 1.00 mm Ø	✔
DTS-10K	0.1 - 10Kg	116	0.80 + 1.40 mm Ø	max. 10000 TEX	0.70 - 1.20 mm Ø	✔
DTS-20K	0.2 - 20 Kg	166	1.20 + 1.80 mm Ø	max. 20000 TEX	1.00 -1.70 mm Ø	✔
DTS-30K	0.3 - 30 Kg	216	1.40 + 2.00 mm Ø	max. 30000 TEX	1.20 - 2.00 mm Ø	✔
DTS-50K	0.5 - 50 Kg	216	steel rope1.5 mm Ø (7 x 7 x 0.20)	max. 50000 TEX	1.40 - 2.00 mm Ø	
DTS-60K-V1	0.6 - 60 Kg	280	steel rope 2.0 mm Ø (7 x 7 x 0.30)	max. 60000 TEX	1.80 - 3.00 mm Ø	

* Depending on model, either width of filament guide or outer distance between outside guide rollers

Delivery of DTS Includes
Tension meter in foam-fitted carrying case, internal rechargeable batery, AC-Adapter/ Charger (with US and Euro plug adapters) and operating instruction manual.

Options

Code MH Mounting thread for online use (2 x M5 on rear panel)

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Model DTX

DTX Additional Features

- **Memory for 60,000 readings**
- USB interface
- 5 different memory modes:
  - Mode D: on-demand (single values)
  - *Mode S:* statistics only
  - *Mode H:* storage of the X-Y diagram for reviewing after finishing a series of measurement (e.g. short time spooling)
  - *Mode C:* continuous logging over a user set time and different series of measurement (2 Hz)
  - *Mode F:* fast, continuous logging over a user set time and different series of measurement (1000 Hz)
- Tension Inspect 3 software displays real-time readings on a PC or stores them in a file
- *Option:* Wi-Fi module for wireless communication with a PC

Depending on the measuring position the LCD display automatically rotates in 90° steps

User-friendly LCD full-text display Some functions can be password protected.

Available Models

Type	Tension Range (g)	Measuring Head Width* mm	Factory Calibration** Material Curve 1 Polymid (PA) Monofil	Textive Industry Applications e.g. yarn count	Factory Calibration** Material Curve 2 Copper Wire	Wire Industry Applications e.g., soft annealed copper wire	Thickness Compensator included
DTX-200	0.2 - 200	66	0.12 mm Ø	max. 200 TEX	0.10 mm Ø	max. 0.15 mm Ø	
DTX-500	0.5 - 500	66	0.12 + 0.20 mm Ø	max. 500 TEX	0.16 + 0.25 mm Ø	0.05 - 0.25 mm Ø	✔
DTX-1000	10 - 1000	66	0.20 + 0.40 mm Ø	max. 1000 TEX	0.25 + 0.40 mm Ø	0.10 - 0.40 mm Ø	✔
DTX-2000	20 - 2000	66	0.40 + 0.70 mm Ø	max.2000 TEX	0.40 + 0.60 mm Ø	0.30 - 0.60 mm Ø	✔
DTX-2500	25 - 2500	116	0.40 + 0.70 mm Ø	max. 2500 TEX	0.40 + 0.60 mm Ø	0.30 - 0.60 mm Ø	✔
DTX-4000	40 - 4000	66	0.50 + 0.80 mm Ø	max. 4000 TEX	0.50 + 0.80 mm Ø	0.35 - 0.80 mm Ø	✔
DTX-5000	50 - 5000	116	0.60 + 1.20 mm Ø	max. 5000 TEX	0.60 + 1.00 mm Ø	0.40 - 1.00 mm Ø	✔
DTX-10K	0.1 - 10Kg	116	0.80 + 1.40 mm Ø	max. 10000 TEX	0.70 + 1.20 mm Ø	0.70 - 1.20 mm Ø	✔
DTX-20K	0.2 - 20 Kg	166	1.20 + 1.80 mm Ø	max. 20000 TEX	steel rope 1.5 mm Ø steel rope 2.0 mm Ø	1.00 - 1.70 mm Ø	✔
DTX-30K	0.3 - 30 Kg	216	1.40 + 2.00 mm Ø	max. 30000 TEX	steel rope 1.5 mm Ø steel rope 2.0 mm Ø	1.20 - 2.00 mm Ø	✔
DTX-50K	0.5 - 50 Kg	216	steel rope1.5 mm Ø (7 x 7 x 0.15)	max. 50000 TEX (7 x 7 x 0.30)	steel ropel 2.0 mm Ø	1.40 - 2.00 mm Ø	
DTX-60K-V1	0.6 - 60 Kg	280	steel rope 2.0 mm Ø (7 x 7 x 0.30)	max. 60000 TEX (7 x 7 x 0.40)	steel rope 2.5 mm Ø	1.80 - 3.00 mm Ø	

* Depending on model, either width of filament guide or outer distance between outside guide rollers
** Suitable for 95 % of applications

Delivery of DTX includes Tension Meter in foam-fitted carrying case, internal rechargeable battery, AC-Adapter/ Charger (with US and Euro plug adapters) USB cable, Tension Inspect software and operating instruction manual.

Options

Code MH Mounting thread for online use (2 x M5 on rear panel)
Code WL Wi-Fi Module for wireless data transfer

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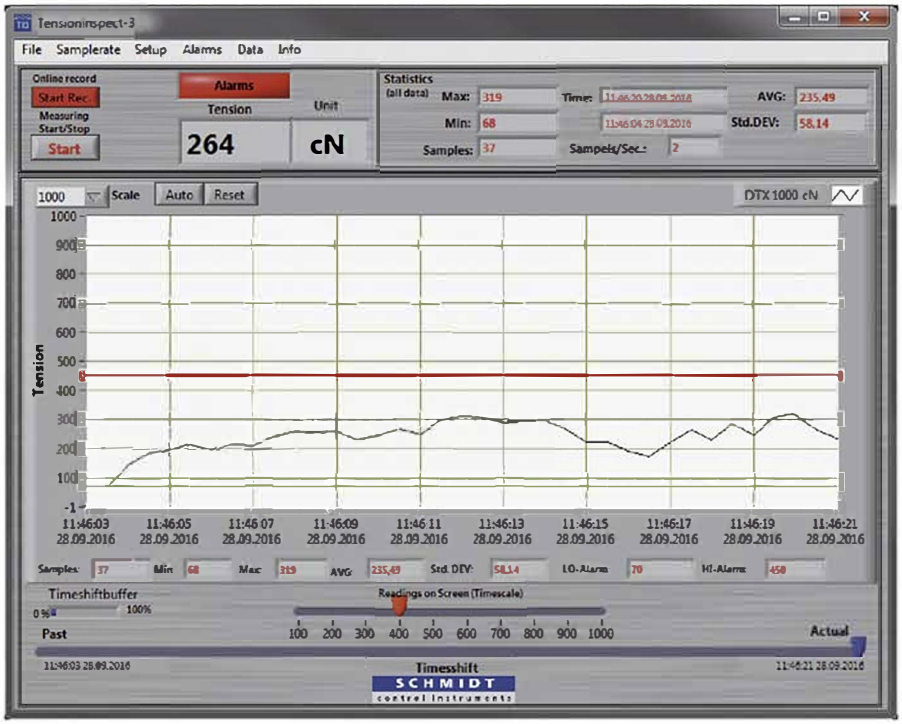
Tension Inspect 3 Software (DTX models only)

Tension Inspect 3 Software to display and store measurement data on a PC. The DTX models can be connected to a PC using the USB output or the optional Wi-Fi module.

Features

- Real-time reading
- The readings are also shown in a X-Y- diagram (time/date-tension)
- For data analysing the buffered diagram can be zoomed and scaled
- Recording of the buffered readings as CSV-file
- Online recording with automatic storage of the readings as CSV file
- Two different statistics:
  - All recorded values
  - Buffered diagram readings
- Adjustable set-points with protocol
- Timeshift function for subsequent detailed data viewing of the diagram
- Reloading and displaying of stored readings (PC file and memory of DTX)
- Creating of a HTML report
- Download of values to Excel
- Printing of stored values using Excel functions



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Special Purpose Models

Special purpose models are available for a wide variety of materials and applications including tapes/bands, fiberglass and carbon fiber tows, etc.

DTSB & DTXB

Fitted with flat cyclindrical rollers with flanges for use with tapes/bands, ribbon cables, carbon fiber and fiberglass tows and similar flat materials.

DTSF & DTSX

Fitted with 32mm (1.3") lightweight rollers fabricated from anodized aluminum or Delrin plastic for optical fibers, speciality wires and similar fragile filaments.

DTSE & DTXE

For measurement in areas with limited space or tightly grouped filaments. Four tension ranges available from 1 – 200g up to 20 – 2000g.

DTSL & DTXL

Fitted with 29.5mm (1.2") diameter heavy-duty rollers fabricated from hardened steel for use with wires, cables and similar materials with diameters up from 6mm (1/4").

DTSB & DTXB

DTSF & DTXF

DTSE & DTXE

DTSL & DTXL

DTS gauges are the basic models. DTX gauges include datalogging capability.

Note: These models do not include a filament guide and material thickness compensator. When selecting the instrument for your specific application, please keep in mind that:

1. Rollers of different widths are not interchangeable by the user.
2. The roller width should correspond with the width of the material to be measured. Otherwise incorrect measuring result may occur and the instrument may be damaged.

To assist you in selecting the right tension meter for your specific application, please furnish:

- Detail description of material
- Diameter of material
- Relative "rigidity" of material
- Speed of material (ft/min or meters/min)
- If tow, tape or band advise width of material

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