PACKING LIST

Welcome to buy our products, when you open the package, please check the following:

NO.	ITEMS	QUANTITY	REMARKS
1	Handheld Digital Tension Meter	1	Standard configuration
2	Charger	1	Standard configuration
3	Product Manual	1	Standard configuration

Note: Check all parts. If you find any defective or missing parts contact your local dealer when you opening the package.

Accessed External Device

If you need external device,prior notice shall be given before ordering.

Charger   Thermal printer Computer
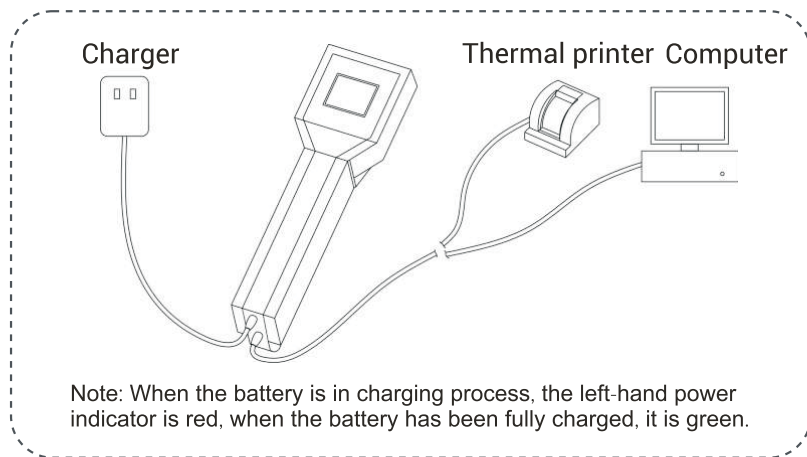
Note: When the battery is in charging process, the left-hand power indicator is red, when the battery has been fully charged, it is green.

This instruction was revised in August 2011,You will not be noted if any content changed.

For any enquiry, Please call our customer service hotline or visit our website.

ESCORT

DTM SERIES
Handheld Digital Tension Meter
PRODUCT MANUAL

Product appearance depends on goods, the picture only supplies the reference!

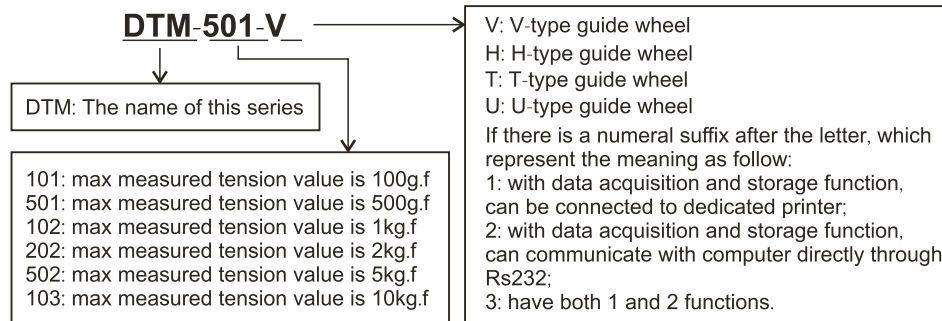| Series name	Model	Guide wheel	Other Function
DTM	□ 101	□ V	□ 1
	□ 501		
	□ 102	□ U	□ 2
	□ 202	□ H	
	□ 502		□ 3
	□ 103	□ T	

❶ Overview & Features

Tension measuring 128*64 LCD display, late-model design, comfortable handfeel, easy operation, measure the value of direct display tension, maximum, minimum, and can store records of measurements to determine the quality control of the actual tension values. It can be widely used in wire, strip processing time of tension measurements (such as: yarn, steel wire, copper wire, copper strip, tape, film, fiber-optic cable, carbon fiber lines, etc.).

The maximum and minimum measurement data to maintain and lift with automatic functions, so as to facilitate the dynamic peak data observation(4 seconds after relieving). Real-time measurement values(unit, maximum, minimum, average and record value) record (the largest group to record 200 value). 30,60 seconds optional backlight-free operation shut down automatically to save battery power, auto-off time can be set.

❷ Definition

**DTM**-**501**-**V**_ ⟶

DTM: The name of this series

101: max measured tension value is 100g.f
501: max measured tension value is 500g.f
102: max measured tension value is 1kg.f
202: max measured tension value is 2kg.f
502: max measured tension value is 5kg.f
103: max measured tension value is 10kg.f

V: V-type guide wheel
H: H-type guide wheel
T: T-type guide wheel
U: U-type guide wheel
If there is a numeral suffix after the letter, which represent the meaning as follow:
1: with data acquisition and storage function, can be connected to dedicated printer;
2: with data acquisition and storage function, can communicate with computer directly through Rs232;
3: have both 1 and 2 functions.

❸ Specifications

Model	DTM-101	DTM-501	DTM-102	DTM-202	DTM-502	DTM-103
Unit	g.f/cN	g.f/cN	g.f/kg.f/N/lb	g.f/kg.f/N/lb	kg.f/N/lb	kg.f/N/lb
Resolution	0.1/1	0.5/1	1/5/10	1/5/10	10	20
Duration	2s-40s	2s-40s	2s-40s	2s-100s	2s-20s	2s-40s
Wire range	0.01-0.10	0.01-0.25	0.01-0.35	0.01-0.65	0.01-1.2	0.01-1.2
Sensor	100g.f	500g.f	1kg.f	2kg.f	5kg.f	10kg.f
Accuracy	±1% FS				±2% FS	
Dimension(mm)	(W)59×(D)78×(L)183				(W)100×(D)78×(L)183	
Weight	320g				350g	
Display&sampling frequency	1/2/5/10/20Hz are optional					
Max line speed	1000m/min					
Output signal	RS232C or analog & digital output (optional)					
Memory	unit/max/min/average/record value: 200 value at most					
Power supply	NIMH battery 6V/750mAH *					
Working temperature	Temperature:0-50℃ Relative humidity＜90%					

* It can works around 10 hours to achieve a full charge.

1. Determine the wire/strip type

Determine wire diameter or strip width to be measured before choosing the tpye of handheld digital tension meter. We have three types of guide wheel —— V, H, Uand T to match different wire diameter or strip width, user depending on your needs, select the appropriate type.
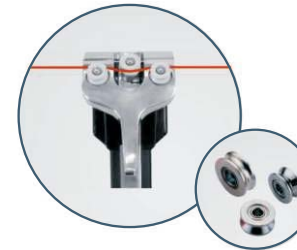
V-type guide wheel

It is used in yarn, steel wire, copper wire, fiber-optic cable, carbon fiber lines processing time of tension measurements.
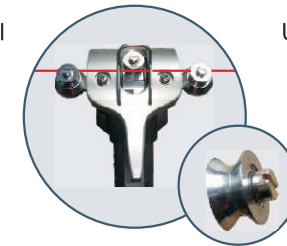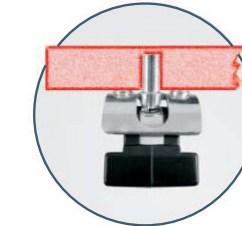
U-type guide wheel

It is tailored for the wire which sections near to the elliptical shape.

H-type guide wheel

It is used in narrower strip, film, tape processing time of tension measurements.

T-type guide wheel

It is used in wider strip, film, roll film processing time of tension measurements.

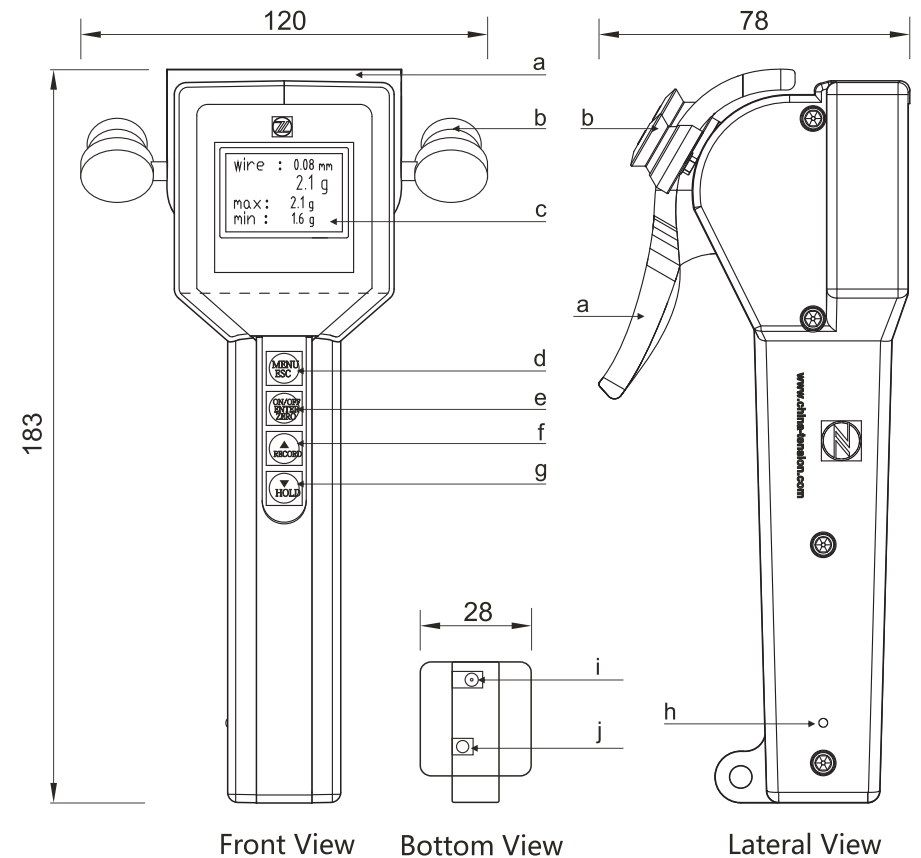### 2. Determine the needed measuring range

Different models correspond to different tension measuring range. Please choose the most appropriate one according to following table. Prohibit the use of out-of-range, otherwise, it will lead to equipment failure or shorten operating life.

COMPARISON TABLE							
	Model	DTM-101	DTM-501	DTM-102	DTM-202	DTM-502	DTM-103
V	Measuring range	0.1-100g.f	0.5-500g.f	1-1000g.f	0.01-2kg.f	0.01-5kg.f	0.1-10kg.f
	Steel wire (Φmm)	＜0.06	0.01-0.15	0.05-0.25	0.1-0.4	0.2-0.6	0.4-0.8
	Copper wire (Φmm)	＜0.1	0.05-0.25	0.1-0.4	0.15-0.5	0.3-1.0	0.5-1.2
	Yarn (Φmm)	＜0.1	0.05-0.25	0.1-0.4	0.1-0.6	0.3-1.2	0.5-1.4
H	Wire range	The size of the wheel can be customized.					
T	Strip width	The size of the wheel can be customized.					
U	Wire range	The size of the wheel can be customized.					

⓫ Cautions

1, The handheld digital tension meter only apply to tension measurement of wire and strip.
2, Press the "ON/OFF ENTER ZERO" key before each use it, which will guarantee the most accurate readings possible.
3, Please take it shade and dry place and avoid the fiercely vibration when the tension meter is not used.
4, The LCD and buzzer will display warning message when the load beared by tension sensor (the middle guide wheel in tension meter) exceed the rated load. At this moment, you should reduce the load on the sensor immediately to avoid damaging it. (Prohibit the use of out-of-range!)
5, Do you touch tension sensor (the middle guide wheel in tension meter) with hands or sharp objects. Otherwise, it may be damaged and influence measurement accuracy.
6, Please use DC9V power adapter supplied with the tension meter for charging. When the battery is in charging process, the power indicator is red, when the battery has been fully charged, it is green. Normally, it will take about two hours to recharge these batteries. The meter built-in high performance rechargeable Ni/MH battery, which cannot be substituted by other battery.

④ External Structure

Front View   Bottom View   Lateral View

ⓐ Swing arm of guide wheel   ⓑ Guide wheel   ⓒ LCD   ⓓ "MENU ESC" button
ⓔ "ON/OFF ENTER ZERO" button   ⓕ "▲RECORD" button   ⓖ "▼HOLD" button
ⓗ Power indicator   ⓘ BCI battery charge interface   ⓙ RS232C interface

⑤ Introduction Of LCD

1, Display wire or strip
2, Symbol stands for data lock, press button "▼HOLD" again the symbol will disappear.
3, Plus or minus
4, The maximum value of dynamic measurement (hold 4 seconds)
5, The minimum value of dynamic measurement (hold 4 seconds)
6, Optional unit — Kg/N/lb
7, Real-time measurement value
8, Display the remaining battery

❻ Introduction Of Button

1, **Start a press**
Press ON/OFF ENTER ZERO button and boot into default measuring mode.

2, **The function keys at measuring mode**
Press MENU ESC button can enter the select menu mode.
Press ON/OFF ENTER ZERO button can adjust the measured values to zero, and press the button for 1 second will complete the shutdown.
Press ▲RECORD button can record the measured values.
Press ▼HOLD button can lock the measured values.

3, **The function keys at select menu mode**
Press MENU ESC button can return to top-level menu.
Press ON/OFF ENTER ZERO button can select current menu and enter into submenu.
Press ▲RECORD or ▼HOLD button can switch between different menu or submenu.

❼ Introduction Of Menu Item

Main menu	Secondary menu		Submenu	Introduction
Select Menu Mode	Material Select	type	wire/filament	Optional
		wire diameter*	see ❸ specifications	It will change correspond to different specifications
	Setup	unit		see ❸ specifications
		resolution		see ❸ specifications
		backlight	30S/60S/off/on	Set the duration of backlight
		contrast	0-30	Optional
		audio	off/on	Optional
		off time	off/5min-4h	Optional
	Date Logging	view date log	show the last record	Press ENTER button again can switch to other records
		print date	yes/no	Optional
		clear date	no/yes	Optional
		duration		see ❸ specifications
		frequency	1/2/5/10/20Hz	Optional
	Connect Computer	connect	off/on	Audio shut down automatically after connecting
		frequency	1hz-100hz	Update display frequency
	Accuracy	sensor		see ❸ specifications
		wire accuracy	0%-255%	Factory default 100%
		fila accuracy	0%-255%	Factory default 100%
		set password	set password	Optional
		factory settings	no/yes	Optional

*When tension meter have compensation hole of wire diameter, the item does not exist in the menu.

❽ Sampling Time & Sampling Frequency

Sampling time: The time from pressing ▲RECORD button to stop sampling.
Sampling frequency: It is the number of tension values that are measured per second. With the change of sampling frequency, the refresh rate of LCD display can change automatically.
The maximum storage measurement value(200)≤Sampling time×Sampling frequency. When the sampling time is set to 2 seconds, the max sampling frequency can be set to 100Hz. Similarly, when the sampling time is set to 200 seconds, the max sampling frequency can only be set to 1Hz.

❾ Password Setting

If you want to enter into the "Accuracy" menu , you must enter a correct password. The factory-default password is 1111. The method of setting password is as follow: press MENU ESC button can move the cursor, press ▲RECORD or ▼HOLD button can increase or decrease number, press ON/OFF ENTER ZERO button complete the current setting. If password right you can enter the secondary menu of "Accuracy", otherwise return to main menu.
Note: Please contact distributor if you forget password.

❿ Operational Process

Please set the wire diameter and unit in menu as before after rebooting, and then back to measuring mode. Press the swing arm of guide wheel and inserts a 50mm sample whose specifications are the same as measured wire into the compensation hole of wire diameter. When the wire protruding from the other side, you should bend the ends to prevent it's falling out, which can reduce the measuring error caused by different wire diameter size. Then grip the measured wire as below, and press ▼HOLD button to lock the measured values after processing.(to facilitate record after instrument leave the wire.)

STEP 1
Compensation hole of wire diameter

STEP 2

STEP 3

Press swing arm of guide wheel

Grip the measured wire by tension meter

Record measuring value
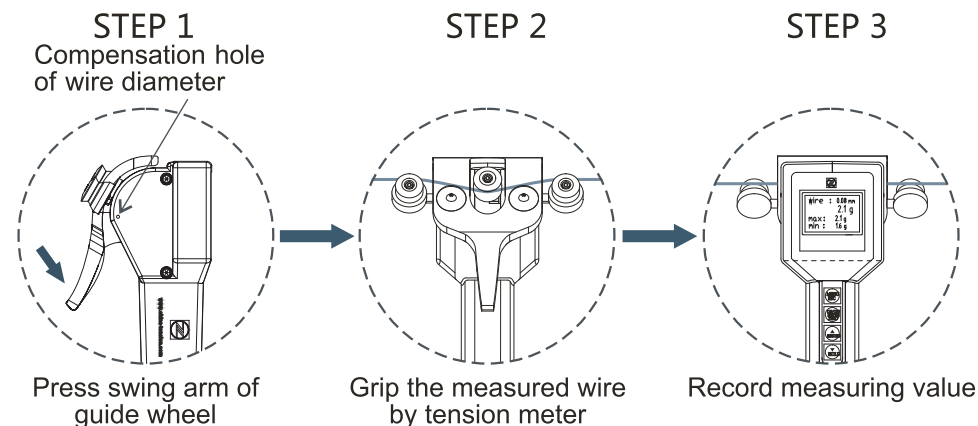
The tension value have a litter run-out error when measuring, you can Press ▲RECORD button to record measured values. The record time and the number of value are connected with sampling time and sampling frequency on the "Date logging" menu. According to user demand, matching of thermal printer and special software. You can connect thermal printer or other portable printer via RS232C port, and also connect computer through special software to achieve control of tension curve.