



# MAXWELLON TW4301

1MHz~4GHz/8GHz  
Cable & Antenna Analyzer  
2023

Maxwellon TW4301 series Cable & Antenna Analyzer adopted techniques of hybrid integration design of RF circuit and digital circuit, wideband fundamental-wave mixing, digital IF processing, intelligent power management; It has advantages of high-speed, high-accuracy, compact, lightweight, battery-powered, touch screen operation, automatic adjustment of backlight brightness. It supports to test VSWR, return loss, characteristic impedance, and phase, it can precisely locate the fault points as well.

Maxwellon TW4301 series Cable & Antenna Analyzer is developed for on-site test, which is mainly used for the test of cable & antenna system in various communication base stations, include trunking, GSM, PCS/DCS, CDMA, GPRS, WCDMA, CDMA2000, TD-SCDMA, LTE and paging system.

During the installation, calibration and routine maintenance of cable & antenna system, the cable& antenna analyzer can help users to quickly estimate the status of the transmission line and antenna system, improve the maintenance efficiency of the running base stations and speed up the installation and calibration of new base stations. Besides, it can also be used for the reflection parameter test of RF devices and components in scientific research, teaching and manufacturing.

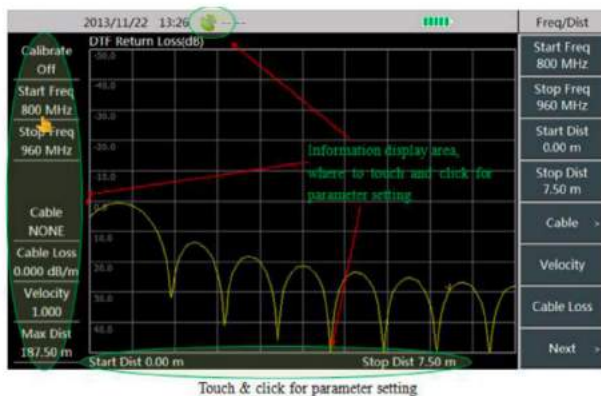
## ■ Key Feature

- Frequency range from 1 MHz to 4GHz/8GHz, high speed, high accuracy
- Build-in E-cal kit, easier and faster
- PC software available, easy data management
- Build-in GPS receiver, users can get the current location information through external GPS antenna
- 7-inch bright LCD touch screen, small size, low weight, robust, 8h battery life, perfect for site use
- Eight measurement functions: Return Loss, VSWR, Cable Loss, DTF Return Loss, DTF VSWR, Smith Chart, 1-Port Phase, Power Measurement

## Features To Boost Your Efficiency

### Touch screen operation

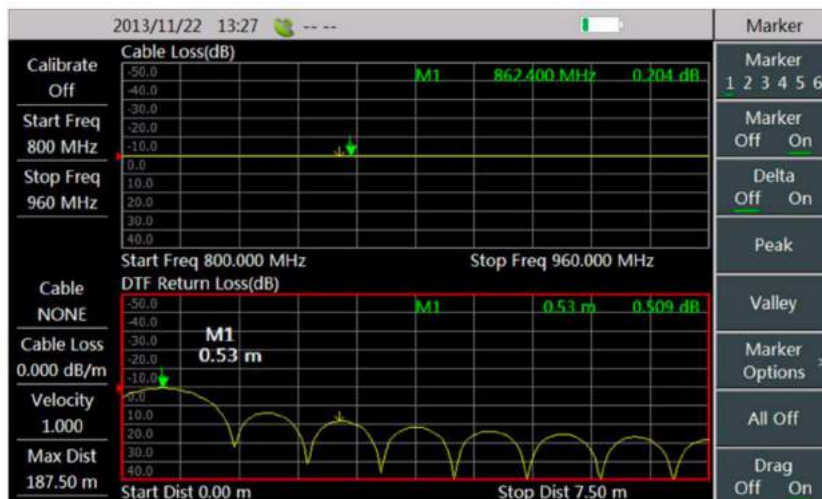
The instrument is designed with 7 inch LCD touch screen. Besides menu operation, users can also set the parameters by clicking all the displayed information on the touch screen.



Measurement type switch by finger sliding

## Double window display

Each window can display different measurement types, with its independent marker function.



## List sweep

The instrument supports list sweep function. Multiple frequency segments can be simultaneously measured, and each sweep segment can be set with different points and frequency range. The list edit is convenient: directly click the parameters to be edited. Each segment can be opened or closed through "on/off" setting.

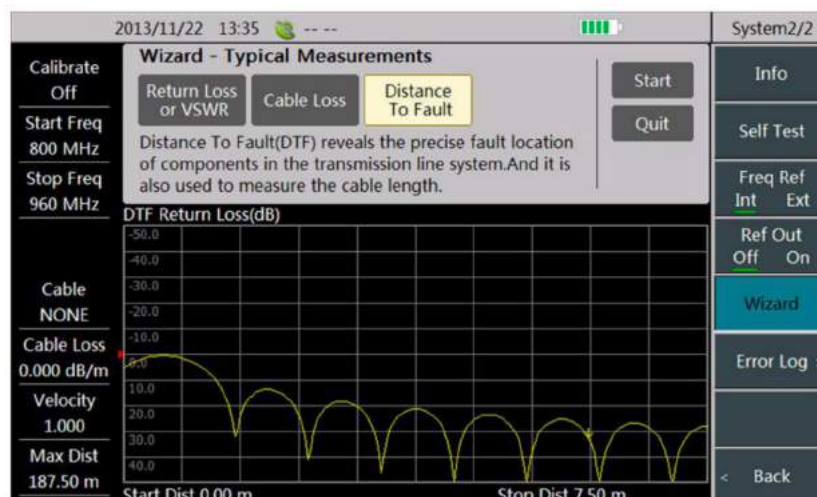


List Sweep

Edit Sweep

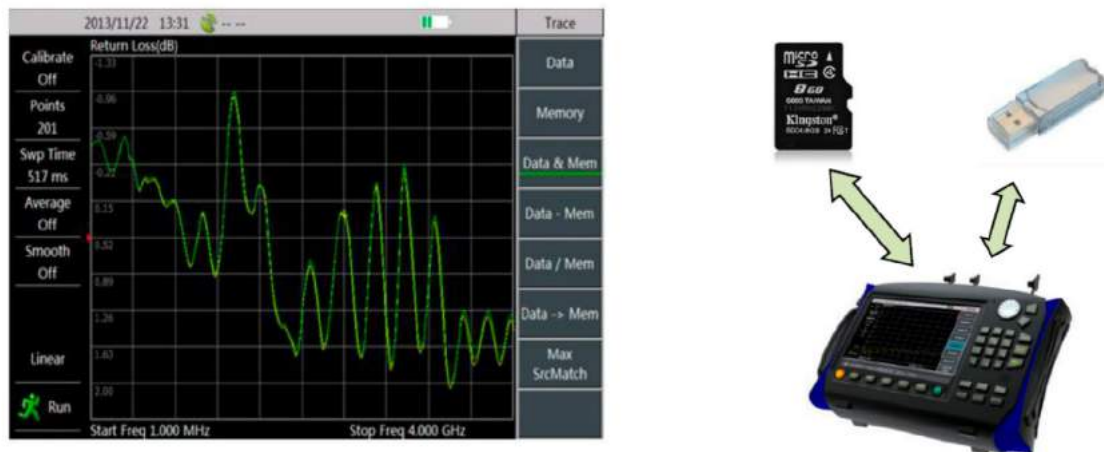
## Measurement wizard

The measurement wizard illustrates the operation steps of typical measurements to guide users to finish the measurement and helps them to rapidly get familiar with the instrument operation.



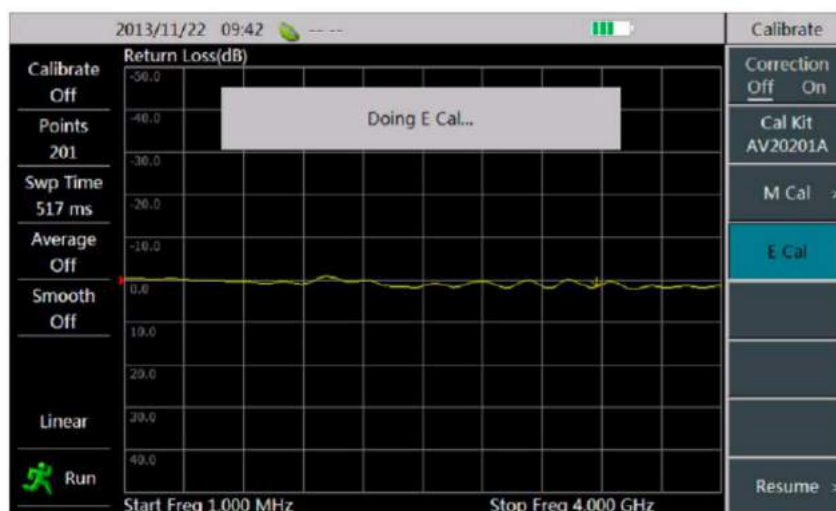
## Data save / recall

To save measurement traces or state, FLASH memory inside the instrument, SD card, and USB device are all available to choose.



## Embedded electronic calibration

TW4301 has embedded electronic calibration kit to realize "one-click" operation, without any external connection.



*Embedded Electronic Calibration*

## Power measurement

Power measurement option is provided, which can realize accurate power measurement along with external power sensor options



*Power Measurement*



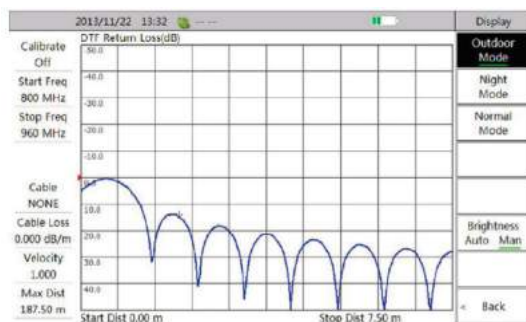
## Resistant to wind & sand

The instrument is suitable for field operation with its resistance to sand, dust, impact and vibration

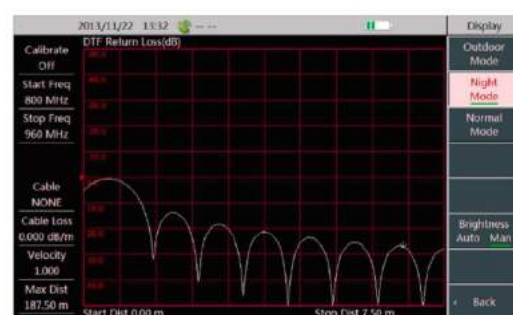


## Multiple display modes

The instrument has multiple display modes and function of screen brightness adjustment, which can offer the best display result in different environments.



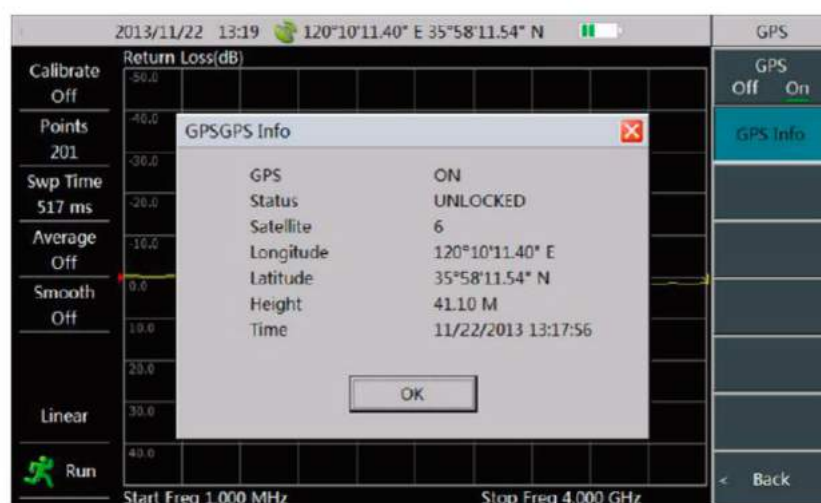
Outdoor Mode



Night Mode

## GPS location

The instrument has built-in GPS receiver, with which users can get the current location information through externally added GPS antenna



## High-capacity battery

The built-in high-capacity lithium-ion rechargeable battery can support to operate 8 hours. The battery replacement is easy and convenient.

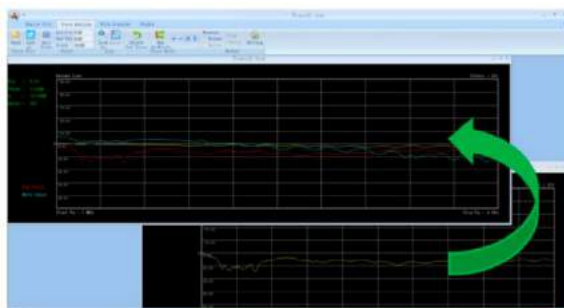


## Remote operation & tool software

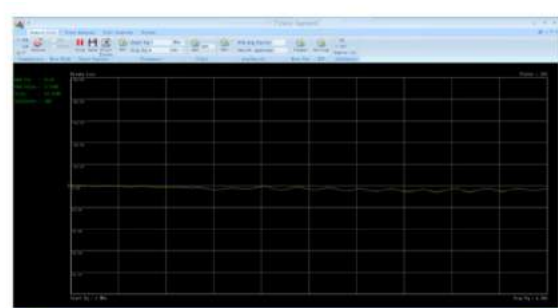
The instrument can be connected to PC via USB or Ethernet to realize remote operation. Tool software is also provided for data analysis, real-time data acquisition, and curve save & recall.



By trace dragging and comparison, traces from different windows can be moved to the same window for math operations.



Trace Match Operation



Data Acquisition

## Test Interface



## Specification

Model	TW4301A		TW4301B	
Frequency				
Frequency Range	1MHz ~ 4GHz		1MHz ~ 8GHz	
Frequency Uncertainty	±2 x 10 <sup>-6</sup> (23 °C )		±2.5 x 10 <sup>-6</sup> (23 °C )	
Frequency Temperature Stability	±1 x 10 <sup>-6</sup> / 10 °C			
Frequency Resolution	1kHz			
Corrected Performance				
Directivity	≥42dB (Mechanical Calibration) ≥35dB (Embedded Electronic Calibration)		≥42dB (1MHz - 6GHz) ≥36dB (6GHz - 8GHz)	
Source Match	≥31dB (Mechanical Calibration)		≥31dB	
Reflection Track	±0.08dB (Mechanical Calibration)		±0.08dB	
Measurement Function Parameter				
Output Power Range	0 to ~30dBm			
Return Loss Range	-100dB to 100dB			
Return Loss Resolution	0.01			
VSWR Range	1 ~ 65			
VSWR Resolution	0.01			
Cable Loss Range	0 ~ 30dB			
Cable Loss Resolution	0.01 dB			
Sweep Points	2-1001			
Sweep Time (10k IF bandwidth)	1ms/point			
Reflection Magnitude Uncertainty	<div><div><div></div><div>&lt;4GHz</div></div><div><div></div><div>4-8GHz</div></div></div> 			

Model	TW4301A		TW4301B																		
Measurement Function Parameter																					
<div>Reflection Magnitude Uncertainty</div> <div><div><div></div></div><div>&lt;4GHz</div></div> <div><div><div></div></div><div>4-8GHz</div></div>		<div>Reflection Phase Uncertainty</div> <table border="1"><caption>Approximate data for Reflection Phase Uncertainty</caption><thead><tr><th>Return Loss (dB)</th><th>Uncertainty (deg) &lt;4GHz</th><th>Uncertainty (deg) 4-8GHz</th></tr></thead><tbody><tr><td>-40</td><td>30</td><td>40</td></tr><tr><td>-30</td><td>12</td><td>15</td></tr><tr><td>-20</td><td>5</td><td>7</td></tr><tr><td>-10</td><td>2.5</td><td>3.5</td></tr><tr><td>0</td><td>2</td><td>2.5</td></tr></tbody></table>		Return Loss (dB)	Uncertainty (deg) <4GHz	Uncertainty (deg) 4-8GHz	-40	30	40	-30	12	15	-20	5	7	-10	2.5	3.5	0	2	2.5
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Power Meter Function																					
Measurement Power Range	-50dBm to +20dBm																				
Input VSWR	1.15																				
Accuracy(0dBm)	±0.16dB																				
Power Linearity	<table><tr><td>-50dBm to -40dBm</td><td>±0.79dB</td></tr><tr><td>-40dBm to +10dBm</td><td>±0.14dB</td></tr><tr><td>+10dBm to +20dBm</td><td>±0.18dB</td></tr></table>			-50dBm to -40dBm	±0.79dB	-40dBm to +10dBm	±0.14dB	+10dBm to +20dBm	±0.18dB												
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Offset Range	20dB																				
Damage Level	23dBm																				
Interfaces																					
Test Port	N type (F) 50Ω																				
10 Ref In/Ref Out	BNC																				
GPS Antenna Port	BNC																				
Data Storage	USB, Mini USB, Mini SD																				
Network Port	LAN RJ 45																				
Audio Out	Headphone port																				
General																					
Storage	4GB SD card																				
Battery Life	8h (without embedded E-cal kit) 6h (with embedded E-cal kit)	4h																			
Input Port Damage Level	27dBm																				
Consumption	≤15W (no battery charging) ≤54W (with battery charging)	≤18W (no battery charging) ≤54W (with battery charging)																			
Power Adaptor	110V/220V, 50Hz AC																				
Dimension (W x H x D)	Approx. 2.5kg (with battery)																				
Operation Temp.	-10°C to +55°C																				
Storage Temp.	-40°C to +70°C																				

## Ordering Information

### Model

No.	Name	Description
TW4301A	Cable and Antenna Analyzer	1 MHz to 4 GHz
TW4301B	Cable and Antenna Analyzer	1 MHz to 8 GHz



## Standard Package

No.	Name	Qty.
1	AC Adaptor	1 PC
2	Standard Three-phase Power Cord	1 PC
3	Built-in Rechargeable Battery	1 PC
4	USB Cable	1 PC
5	Car-mount Charger	1 PC
6	CD (PC software and User Manual)	1 PC
7	Certificate of Calibration	1 PC

## Option Information

No.	Name	Description
TW4301-05	Programming Manual in English	/
TW4301-06	USB Power Measurement	/
TW4301-07	S87230 USB Continuous Wave Power Sensor	Frequency range 9kHz - 6GHz
TW4301-08	S87231 USB Continuous Wave Power Sensor	Frequency range 10MHz - 18GHz
TW4301-09	S87232 USB Continuous Wave Power Sensor	Frequency range 50MHz - 26.5GHz
TW4301-10	S87233 USB Continuous Wave Power Sensor	Frequency range 50MHz - 40GHz
TW4301-11	Rechargeable Battery	Spare Battery
TW4301-12	Type N Male Calibration Kit 31101A	Frequency range DC -18GHz
TW4301-13	Type N Female Calibration Kit 31101B	Frequency range DC - 18GHz
TW4301-14	Type N Male Calibration Kit 20201A	Frequency range DC - 9GHz
TW4301-15	Type N Female Calibration Kit 20201B	Frequency range DC - 9GHz
TW4301-18	Hard Case (Carrying Case)	For safety transportation
TW4301-19	N-DIN Adapter	L29/N-KJ-T
TW4301-20	N-DIN Adapter	L29/N-JJ-T
TW4301-21	GPS Antenna	GPS External Antenna
TW4301-22	Test Port Extension Cable (Low Loss)	N-JK (80cm)
TW4301-23	Test Port Extension Cable (Low Loss)	N-JJ (80cm)
TW4301-24	Cat5e cable	Point-to-Point Cable, 2m length
TW4301-25	MicroSD Class4	8G
TW4301-25	Power Adapter	Power Adapter
TW4301-27	Electronic calibration kit (Embedded)	For TW4301A
TW4301-28	Economical Calibration Kits (Male) 20201AE	DC~9GHz Calibration
TW4301-29	Economical Calibration Kits (Female) 20201BE	DC~9GHz Calibration
TW4301-31	Electronic calibration kit (Embedded)	For TW4301B



**Maxwellon Electronic Instruments Co.,LTD.**

Factory: No.6 Xiangjiang Road, Qingdao 266000, China  
Tel: 0086 13816527810

Sales Office: NO.153 Zhuzhou Rd.,Laoshan District, Qingdao 266100, China.  
Tel: 0086-532-80977508  
Fax: 0086-532-80977508

Sales: [Sales@Maxwellon.com](mailto:Sales@Maxwellon.com)  
Web: [www.maxwellon.com](http://www.maxwellon.com)