

A high performance lab scope for the automotive technician.



The **Automotive scope ATS5004D** is a four channel automotive oscilloscope with **differential inputs.** Besides the standard available features of a professional USB oscilloscope, the Automotive scope ATS5004D has specific features like **Sure**Connect connection test and resistance measurement that are essential for automotive measurements.

Key specifications



Oscilloscope / Spectrum analyzer / Voltmeter	Amount	ltem
12 bit resolution (14 and 16 bit enhanced resolution)	1	Carry case BT341
50 MSa/s sampling	1	Automotive scope ATS5004D
500 kSa/s, 12 bit continuous streaming	4	Measure lead TP-C1812B
50 MHz bandwidth	4	Differential attenuator TP-DA10
128 Kpoints memory per channel	1	Instrument manual
0.3 % DC vertical accuracy	1	Software manual
100 ppm timebase accuracy		

Safe measuring using differential inputs

The Automotive scope ATS5004D is a four channel automotive oscilloscope with **differential inputs**. With the differential inputs it is possible to measure four totally unrelated signals simultaneously. It is not possible to create a short circuit through the oscilloscope or through a second device connected to your computer and to the car, like e.g. a fault code scanner.



Differential inputs: no risk of damaging the car, the oscilloscope or the computer.

Read more at www.tiepie-automotive.com/articles/differential-inputs

SureConnect connection test on each channel

TiePie engineering is the first oscilloscope manufacturer to implement **SureConnect** technology. While measuring, the revolutionary **Sure**Connect technology checks in real time whether a test probe is in physical and electrical contact with the test subject.

Assuring a good connection of a probe with a test subject may not always be easy. The subject under measurement may be dirty, oxidized or an (invisible) protective layer may be present. Or,

the test subject may be hidden, making visible contact confirmation impossible. Also, capacitive coupling between test probe and test subject can result in measuring a distorted version of the actual signal, wrongly suggesting a connection. Simply activate the SureConnect connection test and you know whether there is contact or not.

SureConnect: no more doubt whether your probe doesn't make contact or there really is no signal.

Watch the SureConnect video at www.tiepie-automotive.com/articles/sureconnect-connection-test

Resistance measurement on each channel

Many automotive sensors are based on variable resistors. Use your Automotive scope ATS5004D in the resistance setting to test them, no more need to take a separate ohm meter. Resistance values can be displayed as a number, but it is also possible to display the resistance variation in time, in a graph: an **Ohm scope**. Advantages of the Ohm scope are:



- Capture fast resistance changes in a graph.
- Detect and locate carbon track defects in a variable resistor.
- Create resistance graphs of special resistors like NTCs and PTCs. Use e.g. channel 1 to measure the resistance of the PTC and channel 2 to measure the temperature. An XY plot will then show the resistance variation as a function of the temperature.

The Ohm scope uses the same inputs as the oscilloscope. Changing the measure leads is not required. The advanced protection against over voltage ensures that the Ohm scope withstands high voltages.

The Ohm scope is an indispensable feature of the Automotive scope and a must for every automotive mechanic.

Read more at www.tiepie-automotive.com/articles/resistance-measurement

Fully supported by ATIS

All features of the Automotive scope ATS5004D are fully supported by **ATIS**, the Automotive Test and Information System. Select a specific diagnostic measurement in ATIS, click the measure button and the Automotive scope ATS5004D will be completely setup for that specific measurement and ready to perform it.

Watch the ATIS video at www.tiepie-automotive.com/automotive-oscilloscope/atis

Low noise differential measuring lead

The **Measure lead TP-C1812B** is the only **low noise differential measure lead** in the market. It is designed to be used with the Automotive scope ATS5004D. This 3 meter long measure lead splits in two individual ends of each 1.2 meter long. The BNC connector at one end plugs directly on the instrument. The two other ends each feature a single 4 mm banana plug, on which application specific test points, clamps or probes can be plugged. The Measure lead TP-C1812B is very flexible, uses shrouded banana plugs and a heat and oil resistant silicone isolation, designed for daily use in garage environments



interference. With a conventional oscilloscope with standard oscilloscope probes this is not possible. The maximum distance between the positive side and ground of a standard oscilloscope probe is usually limited to approximately 20 cm. The Measure lead TP-C1812B for the Automotive scope ATS5004D does not have this limitation and allows you to measure between points that are more than 2 meters apart, without picking up external interferences.

The unique Measure lead TP-C1812B is your first requirement to measure between two distant points.

Differential attenuator

Increase the input range of your Automotive scope ATS5004D. The Differential attenuator TP-DA10 is a differential 1:10 attenuator, specially designed to be used with the Automotive scope ATS5004D. The Differential attenuator TP-DA10 is placed directly on the input of the instrument and the measuring lead on the other end of the attenuator.



The Differential attenuator TP-DA10 is required when measuring high voltages, like e.g. measurements on injectors or in hybrid systems.

Multi Channel oscilloscope software

The Automotive scope ATS5004D is standard delivered with the Multi Channel oscilloscope software, **the world's most versatile measuring software package.** Together with the Automotive scope ATS5004D, it can be used as Oscilloscope, Spectrum analyzer, Data logger, Multimeter and Protocol analyzer.

TiePie engineering Automotive scope ATS5004D



When knowledge or experience are insufficient to setup a measurement instrument correctly and quickly, using **measurement templates** is a must. The TiePie engineering Multi Channel oscilloscope software provides a large amount of ready to use measurement templates. This includes templates for measurements at all common automotive sensors and actuators. Most measurement templates are designed to allow performing an advanced measurement in just a few mouse clicks.



You select the measurement template from a tree structure and the instrument will be fully set up. A measurement template contains all settings for a specific measurement as well as additional information regarding the selected template, like e.g. how the instrument and/or accessories need to be connected. Templates can also contain reference signals that show what to expect. Just a few mouse clicks allow to perform a complex measurement. No need to worry or even know about the complex and difficult settings of the instrument itself, you can focus completely on the car you are working on.

Work efficiently and save your precious time using the unique measurement templates.

Read more about the Multi Channel oscilloscope software at www.tiepie.com/software

A large library with practical measurements on all automotive sensors and activators is online available. It shows all essential information for the automotive mechanic: connection diagrams, sensor and actuator information, downloadable setting files with instrument setups and example signals, and diagnostic information.

Browse the comprehensive automotive measurements library at www.tiepie-automotive.com/articles

Specifications

Acquisition system			
Number of input channels	4 analog, isolated BNC		
Туре	Differential		
Resolution	user selectable via software		
Native	12 bit		
Enhanced	14 and 16 bit		
DC Accuracy	0.3 % of full scale \pm 1 LSB		
Bandwidth (-3dB)	50 MHz		
AC coupling cut off frequency (-3dB)	±1.5 Hz		
Noise			
200 mV range, 12 bit, 50 MSa/s	135 μ V _{RMS}		
200 mV range, 16 bit, 195 kSa/s	$50 \mu V_{RMS}$		
Input ranges (full scale)	±200 mV ±2 V ±20 V ±400 mV ±4 V ±40 V ±800 mV ±8 V ±80 V		
Coupling	AC/DC		
Impedance	2 MΩ / 40 pF		
Maximum voltage	200 V (DC + AC peak < 10 kHz)		
Maximum voltage with 1:10 attenuator	300 V (DC + AC peak < 10 kHz)		
Maximum Common Mode voltage	200 mV to 800 mV ranges 2 V 2 V to 8 V ranges 20 V 20 V to 80 V ranges 200 V		
Common Mode Rejection Ratio	-48 dB		
Channel Isolation	500 V		
Channel Separation	-80 dB		
SureConnect			
Maximum voltage on connection	200 V (DC + AC peak <10 kHz)		
Resistance measurement			
Ranges	100 Ohm to 2 MOhm full scale		
Accuracy	3 %		
Response time (to 95 %)	<5 ms		
Maximum sampling rates	12 bit 14 bit 16 bit		
Oscilloscope block mode	50 MSa/s 3.125 MSa/s 195 kSa/s		
Continuous streaming mode	500 kSa/s 480 kSa/s 195 kSa/s		
Sampling source			
Internal	Quartz		
Accuracy	±0.01 %		
Stability	±100 ppm over -40 °C to 85 °C		
Time base aging	±5 ppm per year		
External	LVTTL, on extension connector		
Input range	100 MHz ± 2 %		
Memory	128 Kpoints per channel		
Trigger			
System	Digital, 2 levels		
Source	CH I, CH2, CH3, CH4, digital external, AND, OR		
I rigger modes	Rising / falling edge, inside / outside window		
Level adjustment	0 to 100 % of full scale		
mysteresis adjustment	0 to 100 % of full scale		
Resolution	0.024 % (12 bits)/0.006 % (14/16 bits)		
Pre trigger	υ το 128 κροints (full record length), 1 sample resolution		
Digital external trigger	E des des secondos		
Input	Extension connector		
Range	0 to 3.3 V (11L)		
Coupling	UL.		

0 to 3.3 V (TTL) DC

USB 2.0 High Speed (480 Mbit/s) (USB 1.1 Full Speed (12 Mbit/s) and USB 3.0 compatible)

Interface Interface

Front	
CH1 CH4	Isolated BNC
Rear	
USB	Fixed cable with USB type A plug, 1.8 m

Power Requirements		
Power from USB port	500 mA max (2.5 W max)	
Power via external power input	1500 mA max (7.5 W max)	
Minimum voltage	4.5 VDC	
Maximum voltage	14 VDC	
0		
Physical		
Instrument height	25 mm (1 inch)	
Instrument length	170 mm (6.7 inch)	
Instrument width	140 mm (5.2 inch)	
Cord length	1.8 m (70 inch)	
Weight	460 g (16 ounce)	
System Requirements		
PC I/O connection	USB 2.0 High Speed (480 Mbit/s) (USB 1.1 Full Speed (12 Mbit/s) and USB 3.0 compatible)	
Operating System	Windows 10 / 11, 64 bit Linux, 64 bit (only via SDK)	
Operating Environment		
Ambient temperature	0°C to 55°C	
Relative humidity	10 % to 90 % pop condensing	
Relative numbery	To wite so when condensing	
Storage Environment		
Ambient temperature	-20°C to 70 °C	
Relative humidity	5 % to 95 % non condensing	
Certifications and Compliances		
CE mark compliance	Yes	
RoHS	Yes	
EN 55011:2016/A1:2017	Yes	
EN 55022:2011/C1:2011	Yes	
IEC 61000-6-1:2019 EN	Yes	
IEC 61000-6-3:2007/A1:2011/C11:2012	Yes	
Differential attenuators	TP-DA10	
Attenuation settings	X10 differential	
Bandwidth	25 MHz	
Maximum input voltage	300 V (DC + peak AC)	
Input impedance	10 MΩ / 15 pF	
Input connector	female BNC	
Output connector	male BNC	
Dimensions		
Length	79 mm	
Diameter	19 mm	
Weight	30 g	
Measure lead		



Connectors		
Instrument side	isolated female BNC connector	
Test point side	red and black 4 mm shrouded banana plugs	
Bandwidth	4 MHz	
Safety	CAT III, 1000 V, double isolated	
Dimensions		
Total length	3000 mm	
Length to split	1800 mm	
Length individual ends	1200 mm	
Weight	100 g	
Color	black	
Certifications and compliances		
CE conformity	yes	
RoHS	yes	
Accessories		
Color coding rings	5 x 3 rings, various colors	

Specifications (continued)



Warranty Warranty

Customer service

Total package weight

TiePie engineering instruments are designed, manufactured and tested to provide high reliability. In the un-likely event you experience difficulties, the TiePie engineering instruments are fully warranted for two years. This warranty includes:

Approx. 3 kg

Two years, covering all parts and labor, excluding measure leads

- No charge for return shipping
 Long-term 7-year support
 Upgrade to the latest software at no charge



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