Speed up your diagnostics with a Automotive Scope

This powerful USB 3.0 super speed automotive oscilloscope combines fast sampling up to 1 GSa/s with high resolutions of 12, 14 and 16 bit and a large memory of 64 Mpoints on all four channels. Additionally, the automotive oscilloscope supports continuous streaming measurements up to 200 MSa/s.

The Automotive Test Scope ATS610004D-XMSG is delivered with SureConnect connection test and resistance measurement on each channel.

Also, the Automotive Test Scope ATS610004D-XMSG is delivered with SafeGround. With SafeGround you can switch the differential inputs of the Automotive Test Scope ATS610004D-XMSG into single ended inputs with ground protection. It allows to make measurements using standard attenuating probes and protects the scope when a short circuit to ground is created.

Safe measuring

The Automotive Test Scope ATS610004D-XMSG 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 no longer 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. So no risk of damaging the car, the oscilloscope or the computer.


SureConnect

The SureConnect connection test feature of the Automotive Test Scope ATS610004D-XMSG tells you immediately whether your test probe or clip actually makes electrical contact or not. No more doubt whether your probe doesn't make contact or there really is no signal.

This is useful when surfaces are oxidized and your probe cannot get a good electrical contact. Simply activate the SureConnect and you know whether there is contact or not. Also when back probing connectors in confined places, SureConnect immediately shows whether the probes make contact or not.

SureConnect is default available on each channel of the Automotive Test Scope ATS610004D-XMSG.

Scientech

## Differential / single ended switchable inputs with SafeGround protection

SafeGround gives the possibility to use the oscilloscope inputs both as single ended and as differential. When SafeGround is active and you accidentally create a wrong connection that causes a short circuit, SafeGround will disconnect the ground of the input channel without damaging the oscilloscope or PC. You can therefore simply switch from a differential input to a single ended input without worrying if anything will damage because of a short circuit current. The Automotive Test Scope ATS610004D-XMSG is the only automotive oscilloscope in the world with this unique SafeGround protection. And as you all know, a connection mistake is easily made, which will now have no more strange and financial consequences because of SafeGround as the short circuit current is limited thanks to SafeGround.
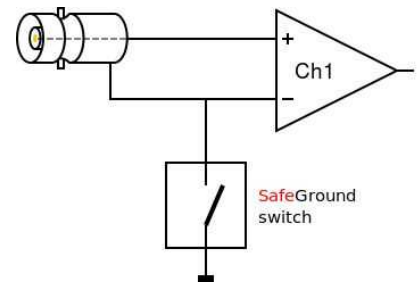
SafeGround is default available on each channel of the Automotive Test Scope ATS610004D-XMSG.

Resistance measurement

Many automotive sensors are based on variable resistors. Use your Automotive Test Scope ATS610004D-XMSG 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.
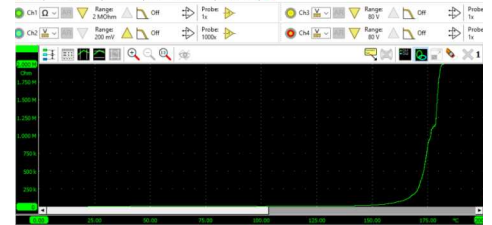
The unique Automotive Test Scope ATS610004D-XMSG Ohm scope is the first fast automotive Ohm scope in its class.

Large memory

When measuring at high sample rates, a large memory is necessary to be able to record a complete signal in the acquisition buffer. Where most oscilloscopes have 2.5 kSamples or 100 kSamples memory, the Automotive Test Scope ATS610004D-XMSG has up to 256 MSamples memory per channel. An advantage of a large memory is that once-only fast phenomena can be captured accurately or complete serial communication signal blocks can be measured all at once.

High accuracy

The Automotive Test Scope ATS610004D-XMSG measures with high resolutions of 14 and 16 bit. A signal measured with the Automotive Test Scope ATS610004D-XMSG therefore has 256 times more resolution than most standard automotive oscilloscopes, which usually have a low resolution of 8 or 9 bit. The input circuit of the Automotive Test Scope ATS610004D-XMSG has a high accuracy of 0.25 % of the full scale input range, where most standard automotive oscilloscopes have an accuracy of 2 - 3 % of the full scale range. The precision Automotive Test Scope ATS610004D-XMSG allows for measuring signals with much more accuracy.
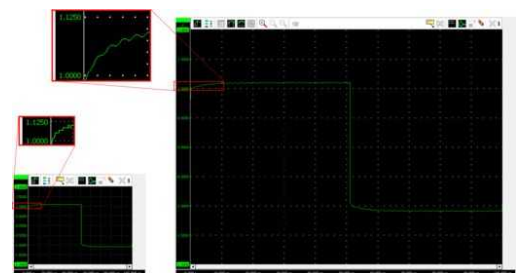
Technical Specification

Acquisition system

Number of input channels	:	4 analog
CH1, CH2, Ch3, CH4	:	Isolated Female BNC

Type	:	Differential input
Resolution	:	12, 14, 16 bit user selectable
DC Accuracy	:	0.25 % (0.1 % typical) of full scale ± 1 LSB at 20°C to 25°C

Ranges (Full scale)	:			
		±200mV	±2V	±20V
		±400mV	±4V	±40V
		±800mV	±8V	±80V

Coupling	:	AC/DC
Impedance	:	2 MOhm / 12 pF ± 1 %
		1 MOhm / 20 pF ± 1 % when **Safe**Ground enabled
Maximum voltage	:	200 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 80V ranges : 200 V
Common Mode Rejection Ratio	:	-47 dB

Bandwidth

-3dB at 75 % of full scale input	:	250 MHz
Limit, selectable per channel	:	Off (250 MHz), 150 MHz, 100 MHz, 50 MHz
AC coupling cut off frequency (-3dB)	:	±1.5 Hz

SureConnect

Maximum voltage on connection	:	200 V (DC + AC peak < 10 kHz)

Resistance measurement

Ranges (Full scale)	:					
		100 kΩ	1 kΩ	10 kΩ	100 kΩ	1 MΩ
		200 kO	2 kΩ	20 kΩ	200 kΩ	2 MΩ
		500 kΩ	5 kΩ	50 kΩ	500 kΩ	

Accuracy	:	1 % of full scale
Response time (to 95%)	:	< 10 μs

SafeGround

Maximum voltage on connection	:	200 V (DC + AC peak < 10 kHz)
Maximum switch off current	:	500 mA
Response time	:	< 100 ns

Maximum sampling rate	:	8 bit	12 bit	14 bit	16 bit
measuring one channel	:	1 GSa/s	500 MSa/s	100 MSa/s	6.25 MSa/s
measuring two channels	:	500 MSa/s	200 MSa/s	100 MSa/s	6.25 MSa/s
measuring three or four channels	:	200 MSa/s	100 MSa/s	100 MSa/s	6.25 MSa/s

Maximum streaming rate [1]	:	8 bit	12 bit	14 bit	16 bit
measuring one channel	:	200 MSa/s [2]	100 MSa/s [3]	100 MSa/s [3]	6.25 MSa/s [6]
measuring two channels	:	100 MSa/s [3]	50 MSa/s [4]	50 MSa/s [4]	6.25 MSa/s [6]
measuring three or four channels	:	50 MSa/s [4]	25 MSa/s [5]	25 MSa/s [5]	6.25 MSa/s [6]

Sampling clock source		
Internal	:	TCXO
Accuracy	:	± 0.0001 %
Stability	:	± 1 ppm over 0°C to 55°C
Time base aging	:	±1 ppm/year
External	:	LVDS, on CMI connectors
Input range	:	10 MHz ± 1 %
	:	16.369 MHz ± 1 %

Memory	:	8 bit	12, 14, 16 bit
Measuring one channel	:	256 Mpoints per channel	128 Mpoints per channel
Measuring two channels	:	128 Mpoints per channel	64 Mpoints per channel
Measuring three or four channels	:	64 Mpoints per channel	32 Mpoints per channel

Trigger		
System	:	Digital, 2 levels
Source	:	CH1, CH2, CH3, CH4, OR, digital external
Trigger modes	:	Rising edge, falling edge, any edge, inside window, outside window, enter window, exit window, pulse width
Level adjustment	:	0 to 100 % of full scale
Hysteresis adjustment	:	0 to 100 % of full scale
Resolution	:	0.006 % (14, 16 bits) / 0.025% (12 bits)
Pre trigger	:	0 to selected record length, 1 sample resolution
Post trigger	:	0 to selected record length, 1 sample resolution
Trigger hold-off	:	0 to 63 MSamples, 1 sample resolution
Trigger delay	:	0 to 8 GSamples, 1 sample resolution

Digital external trigger		
Input	:	Extension connector pins 1 and 2
Range	:	0 to 2.5 V (TTL)
Coupling	:	DC

Jitter	:	≤ 1 sample

Multi-instrument synchronization

Maximum number of instruments	:	Limited by number of available USB ports
Synchronization accuracy	:	0 ppm
CMI interface	:	2x, CMI 1, CMI 2
Required coupling cable	:	TP-C50H Coupling cable CMI
Maximum coupling cable length	:	50 cm

Probe Calibration

Output	:	Extension connector pins 3 (signal) and 6 (ground)
Signal	:	Square wave
Level	:	-1 V to 1 V
Frequency	:	1 kHz

Interface

Interface	:	USB 3.0 SuperSpeed (5 Gbit/s);
		(USB 2.0 HighSpeed compatible)
Network support	:	Yes, via TPISS Instrument Sharing Server

Power Requirements

Power	:	From USB port or external input
Consumption	:	5 VDC 1200 mA max
External power	:	From second USB port or power adapter

Physical

Instrument

Height	:	25 mm (1 inch)
Length	:	170 mm (6.7 inch)
Width	:	140 mm (5.2 inch)
Weight	:	500 g (17.6 ounce)
USB cord length	:	1.8 m (70 inch)

I/O connectors

Channel 1, 2, 3, 4	:	Isolated BNC
USB	:	Fixed cable with USB 3.0 type A connector, 1.8 m
Extension connector	:	D-sub 9 pins female
Power	:	3.5 mm power socket
CMI I/O connectors	:	2 x HDMI type C socket

System requirements

PC I/O connection	:	USB 2.0, USB 3.0 or USB 3.1
Operating system	:	Windows 10, 32 and 64 bits
		Linux (via own software based on LibTiePie SDK)

Environment Condition

Operating

Ambient temperature	:	20°C to 25°C (10°C to 40°C without specifications)
Relative humidity	:	10 % to 90 %, non condensing

Storage

Ambient temperature	:	-20°C to 70°C
Relative humidity	:	5 % to 95 %, non condensing

Certification and Compliances

CE mark compliance	:	Yes
RoHS	:	Yes

Package contents

The Automotive Test Scope ATS610004D-XMSG is delivered with:

Carry case	:	Carry case BB391
Instrument	:	Automotive Test Scope ATS610004D-XMSG
Measure leads	:	4 x Measure lead TP-C1812B, Differential BNC -> 4 mm banana plug
Differential attenuator	:	4 x Differential attenuator TP-DA10
Alligator clips, large	:	Alligator Clip TP-AC80I - Set, 8 large alligator clips
Alligator clips, medium	:	Alligator Clip TP-AC10I - Set, 8 medium alligator clips
Alligator clips, small	:	Alligator Clip TP-AC5 - Set, 8 small alligator clips
Accessories	:	Handyscope power supply, external power cable for USB port, Probe compensation cable TP-DB9-BNC-30
Software	:	for Windows 7/8/10, via website
Drivers	:	for Windows 7/8/10, via website
Manuals	:	instrument manual and software user's manuals
		color printed and digital, via website

Related Products

Current clamp
TP-CC80

Current clamp
TP-CC600

Current clamp
TP-CC400

Measure Lead
TP-C812B

Measure Lead
TP-C1812B

Back Probe
TP-BP85

Alligator Clip
TP-AC80I

Test Probe
TP-TP90 Set

Alligator Clip
TP-AC50B Set

Diesel Return
Flow Sensor RFS400

Ignition Pickup
TP-IP250

Accelerometer
TP-ACC20

Differential attenuator
TP-DA10

ATIS

Coil-on-Plug
probe TP-COP750

Milliohm Meter
TP-MM3000

Handyscope/WiFiScope
Power supply

Carry case
BB453

Ground compensation Cable
TP-GCC150

Subject to Change