

OX9302-BUS

300 MHz PORTABLE DIGITAL OSCILLOSCOPE
2 ISOLATED CHANNELS



SCOPIX IV Bus

For testing the physical integrity
of fieldbuses

1 key to start analysing

4 steps to qualify a data bus

Verification of the transmission quality of signals using fieldbus protocols: KNX, DALI, CAN, LIN, FlexRay™, AS-i, Profibus®, RS-485, RS-232, ETHERNET, etc.

Intuitive, upgradable Human-Machine Interface

Multi-interface communication



Fieldbuses are a series of electrical wires which convey information in digital form between 2 remote devices. A large number of bus protocols are encountered in the field, in a variety of sectors: industry, automotive sector, automation for the construction sector, hospitals, etc.

This type of link replaces analogue transmissions via 4-20 mA links. In the field, various disturbances (damaged wiring, electromagnetic radiation, etc.) may cause signal transmission faults. The fieldbus comprises 7 "stacked" layers. The first layer, called the physical layer, transmits the data to the network.

In computer networking, the physical layer is the first layer of the OSI (Open Systems Interconnection) model and is responsible for effective transmission of the electrical or optical signals between elements. Measuring this physical electrical level is useful to optimize communication and arrive at a diagnosis: cable change, chassis-earth test, termination test, etc., for better data transmission quality.

The **SCOPIX IV BUS** function can be used to perform the electrical measurements needed to assess the integrity of the fieldbuses, or in other words the operation of the physical layer (electrical specifications, synchronization, etc.), according to the applicable standards.

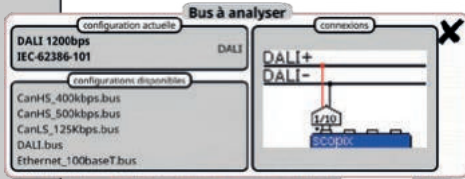
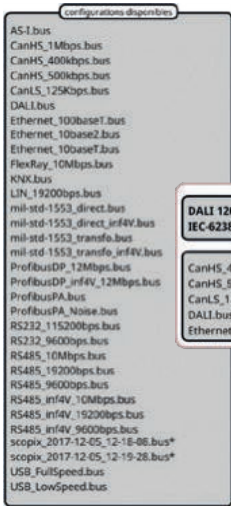
Once diagnosis of the bus has begun, it proceeds step by step, with the possibility of viewing the calculation of the various parameters imposed by the standard.

Efficiency: if the diagnosis stops before the measurements have ended, it means that the minimum level and amplitude criteria are not satisfied, so the other parameters cannot be calculated.



ScopiX IV

4 STEPS FOR QUICK, SIMPLE DIAGNOSIS



1 Choice of the bus to be analysed



In the SCOPIX IV menu, you must select the type of bus and its speed or level. The standard related to the bus is displayed alongside the connection diagram of the voltage probe measurement points. You must select one of these files to be able to start an analysis; the standard applicable to the bus is displayed automatically.

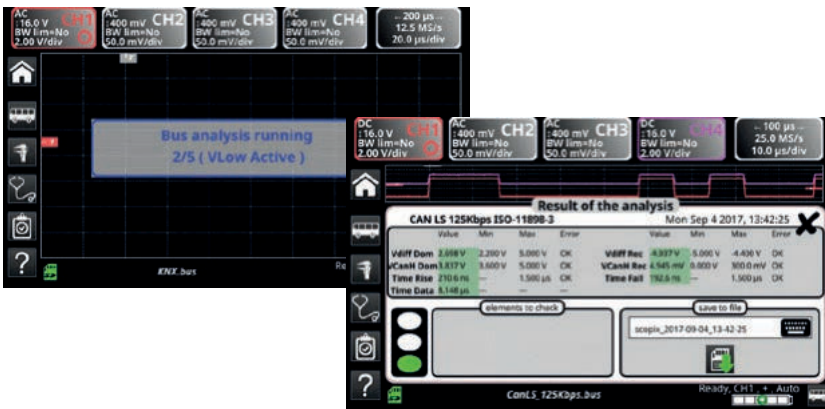
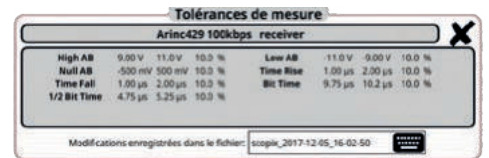
There are several speeds associated with the bus but, if the bus to be analysed is not in this list, it is possible to use the SX-BUS software to create a bus which will be displayed with filename accompanied by a "*".

2 Display of the measurement tolerances



The tolerances applied to the bus according to the applicable standard or directive are displayed on screen.

It is possible to modify these tolerances by clicking on the value that you want to modify. The min. and max. intervals of each measurement and the "acceptable" interval beyond the tolerance interval are displayed (as a percentage of the interval defined by the min. and max. values). This option helps you to optimize the tests.



3 Analysis



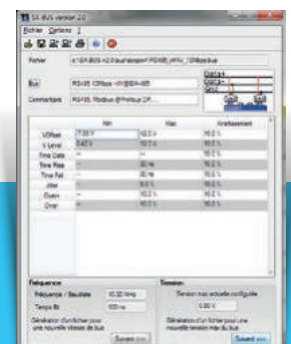
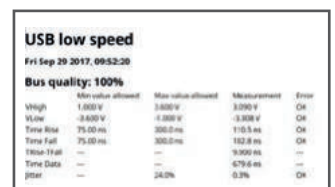
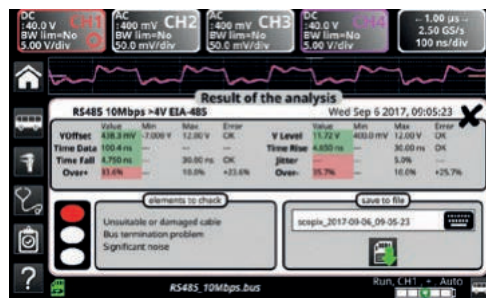
The test of the bus according to the parameters of the standard is started automatically with step-by-step display of the result.

At the end of the test, a summary table is displayed with a percentage and a colour which determines whether the test is within the correct interval (green), within the "acceptable" interval (yellow) or outside the intervals (red).

4 Results of the analysis



The result of the last analysis performed is stored in memory and is displayed on screen with the signal's waveform. These results can be saved in a ".htm" file in the internal memory or on the micro SD card.



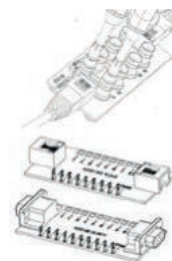
The list of the Bus screens can be enhanced using the SX-BUS bus creation and modification software.

SCOPIX BUS proposes help with connection according to the bus to be checked, along with the corresponding wiring diagram.

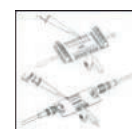
The five **HX0190** and **HX0191** boards delivered help you with the connections: these boards are equipped with SUBD9, RJ45 or M12 connectors or 8-wire screw connectors which are the main technologies used for connection to fieldbuses.

Busess frequently encountered in the field and already entered in the SCOPIX BUS

Protocol	Standard	Examples of applications
AS-I	EN 50295	Sensor, actuator
CanHighSpeed	ISO 11898-2	Electrical engineering system
CanLowSpeed	ISO 11898-2	Multiplexing, on-board electronics
DALI	IEC 62386-101	Testing of lighting equipment, lighting management
FlexRay	Spec V2.1	Automotive, aviation, agricultural vehicles
Profibus DP	EIA-485	Real-time control of sensors, actuators, PLCs
RS232	EIA-232	PLC, measuring instrument
RS485	EIA-485	Measuring equipment and instruments
Profibus PA	IEC 61158	Measuring and monitoring equipment in zones with risk of explosion
Knx	EN 50090-5-2	Home automation, building automation, heating, ventilation, air-conditioning
Ethernet 10 Base T	IEEE-802.3	IT network
Ethernet 100 Base T	IEEE-802.3	IT network
Ethernet 10 Base 2	IEEE-802.3	Local networks
Lin	Rev 2.2	Micro-actuators and sensors for the automotive sector, air-conditioning, electrically-operated windows, etc.
Arinc 429	Arinc 429	Aviation
MIL-STD-1553	MIL-STD-1553	Aviation
USB 1.1	USB 1.1	Computer connection



HX0190 (3 boards) with RS45- SUB D9 connector and 100base T BNC connector



HX0191 (2 boards) with M12 connector and 8-wire connector

Main specifications

Type of display	7" WVGA TFT colour LCD touch screen, 800x480- LED backlighting (adjustable standby mode)
Bandwidth	300 MHz
Number of channels	2 isolated channels
Vertical sensitivity	16 ranges from 2.5 mV-200 V/div and down to 156 μ V/div in vertical zoom mode (12-bit converter) – Accuracy \pm 2%
Sweep speed	35 ranges from 1 ns/div to 200 s/div, accuracy \pm [50ppm +500ps] – Roll mode from 100 ms to 200 s/div
Triggers	On all channels: automatic, triggered, one-shot, auto level 50% Edge, pulse width (16 ns-20 s), delay (48 ns to 20 s), counting (3 to 16,384 events) Continuous adjustment of Trigger position
Maximum sampling rate	2.5 GS/s in one-shot mode on each channel (max. 100 GS/s in ETS mode)
Vertical resolution	12 bits (vertical resolution 0.025 %)
Memory depth	100 kpts per channel and file viewer in the manager
User memory	Internal = 1 GB to store the files + high-capacity removable μ SD-Card : SD 2 GB, SDHC 4-32 GB and SDXC > 32 GB
Other functions	AUTOSET, FFT analyser & MATH functions, cursors, automatic measurements
PC – software link communication	Ethernet (100 baseT), WiFi-USB (device, 12 Mbs) – "ScopeNet" application software for PC
Safety / EMC	Safety as per IEC 61010-2-30, 2010 – 600 V CATIII / 1000 V CATII – EMC as per EN 61326-1, 2010
Mechanical specifications	292.5 x 210.6 x 66.2 mm – 2.1 kg with batteries – IP54 protection

State at delivery

Oscilloscope delivered in a bag with 1 mains adapter / charger, 1 LI-ION battery pack, 1 stylus, 2 x 1/10 Probix HX0130 probes, 1 Probix banana adapter diam. 4 mm, 1 set of cables + 4 mm banana test probe, 1 Ethernet cable, 1 USB cable, 1 μ SD card with 8 GB capacity and SD card adapter, HX0190 and HX0191 bus connection boards, 1 CD-Rom with user's manual, programming manual, SX-BUS 2.0 software