metrix®

OX 7202 BUS - OX 7204 BUS

OSCILLOSCOPES
RECORDERS - MULTIMETERS
BUS ANALYSERS

Handheld and stand-alone,
2 or 4 channels, 200 MHz

SCOPIX BUS for testing the physical integrity of field buses

Verification of signal transmission quality for 14 Field Bus protocols:
KNX, DALI, CAN, LIN, FlexRay™, AS-i, Profibus®, RS-485, RS-232, ETHERNET, etc.

- Simple to use: only 3 steps for quick bus diagnostics
- Intuitive, upgradable Human-Machine Interface
- Multi-interface communication: µSD, USB, Ethernet, Web server, FTP server/client, etc.
- Plus the high performance offered by the SCOPIX III models
  - Oscilloscope: 600 V, 2.5 GS/s sampling rate in one-shot mode and 50 GS/s in ETS mode
  - Memory depth of up to 2.5 k
  - Two or four 8,000-count TRMS multimeters & recorder
  - "Real-time" FFT analysis as a standard feature plus calculation functions on the channels

metrix® A Brand of CHAUVIN ARNOUX GROUP

THE FIELD BUS

The BUS function on the SCOPIX® III models can be used to perform the electrical measurements needed to assess the integrity of the field buses, i.e. the operation of the physical layer (electrical specifications, synchronization, etc.), according to the applicable standards.

Comprising a series of electrical wires, the field bus conveys information in digital form between 2 remote devices. This type of link will replace analogue transmissions via 4-20 mA links. In the field, various disturbances (deterioration of the wiring, electromagnetic radiation, etc.) may cause signal transmission faults. The field bus comprises 7 "stacked" layers, with the first, "physical" layer transmitting the data to the network.

2 or 4 **totally-isolated** 600 V CAT III channels

5.7" **TFT LCD colour touch screen** with LED backlighting, resolution 320 x 240 pixels

Exceptional storage capacity! 1 MB + 2 GB SD card + Ethernet

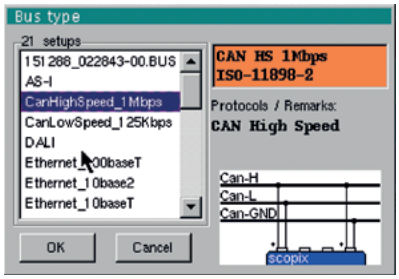
4 in 1: oscilloscope, recorder, multimeter and bus analyser. All the modes are accessible directly.

For your measurements, PROBIX HX0130 electronic probes

Quick field bus diagnostics

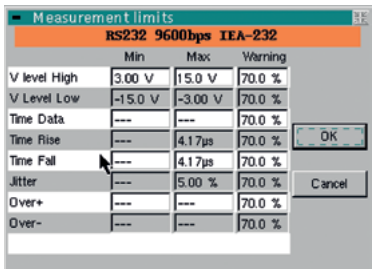
3 STEPS to check field bus integrity

Choose the type of bus that you wish to test and the corresponding standard



14 buses, 21 available configurations and several protocols (IP, TCP, Modbus, Profinet, etc.) selectable from a drop-down menu and already integrated in the SCOPIX BUS models.

Because the instrument is upgradable, it is possible to create buses with the software or by using the SCOPIX menu directly. The tolerance thresholds can also be modified, e.g. to refine the results obtained.

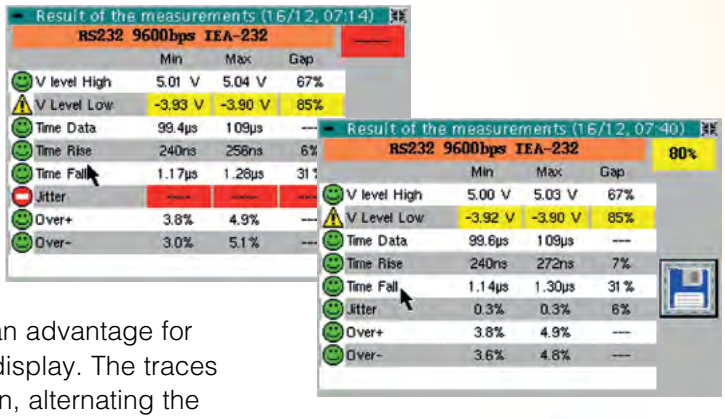


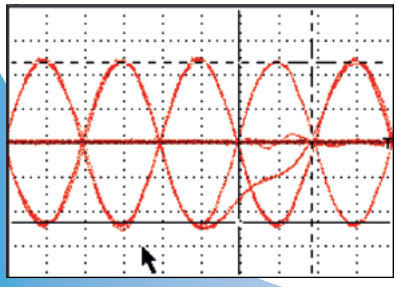
Start the bus diagnostic

which is performed step by step, offering the possibility of viewing the calculation of the various parameters in the standard.

If the diagnostic stops before the measurements are finished, it means that the minimum level and amplitude criteria are not fulfilled, so the other parameters cannot be calculated.

The result of the measurements is displayed as a coloured pictogram ☺, ⚠ **or** ⛔ for visual analysis and as a percentage for finer analysis. All the results are then saved in a ".htm" file in the internal memory, on the SD Card or on an FTP server.





Eye diagram: an advantage for recurrent data display. The traces are cumulated on screen, alternating the trigger-edge polarity.

The particularly practical eye diagram can be used to check and assess digital transmission quality at a glance: noise, distortion, jitter.

Applications

The SCOPIX BUS models are used in a large number of industrial and tertiary sectors:

- **Industry**
  - Maintenance
  - Automation, industrial processes, electronic equipment
  - Networking of complex instruments
  - Computer networks
- **Automotive sector**
  - Communication with computer, dashboard
  - Control of electric windows
- **Automation for industrial or commercial buildings**
  - Building automation, lighting
- **Medical sector**
  - Links between medical equipment

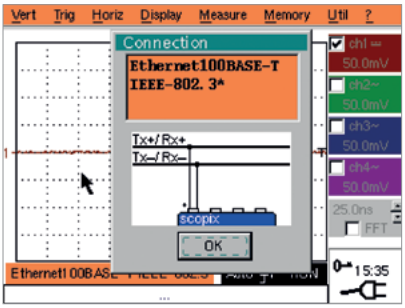
14 buses frequently encountered in the field and already available in the SCOPIX BUS

Protocol	Standard	Examples of applications
AS-I	EN 50295	Sensor, actuator
CanHighSpeed	ISO 11898-2	Electro-technical system
CanLowSpeed	ISO 11898-2	Multiplexing, on-board electronics
DALI	IEC 62386-101	Lighting control and management
FlexRay	Spec V2.1	Automotive, aviation, agricultural vehicles
Profibus DP	EIA-485	Real-time control of sensors, actuators, PLCs
RS232	EIA-232	PLCs, measuring instruments
RS485	EIA-485	Measuring equipment and instruments
Profibus PA	IEC 61158	Measuring and monitoring equipment in explosive environments
Knx	EN 50090-5-2	Home automation, building automation, heating, ventilation, air-conditioning
Ethernet 10 Base T	IEEE-802.3	Computer networks
Ethernet 100 Base T	IEEE-802.3	Computer networks
Ethernet 10 Base 2	IEEE-802.3	Local area networks
Lin	Rev 2.2	Automotive micro-actuators and sensors, air-conditioning, electric windows, etc.

Upgradable thanks to the SX-BUS bus creation and modification software

For better adaptation to the standards and any changes to them, it is possible to modify the standard limits and the MIN/MAX and percentage measurement tolerances in SCOPIX BUS. This can help to refine an analysis by reducing the tolerances, for example. Furthermore, with SX-BUS, users can add new buses to the SCOPIX BUS instrument to meet their specific requirements.

Assistance and accessories for greater simplicity



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

The four HX0190 and HX0191 boards provide help with connection: these boards are equipped with SUBD9 connectors, RJ45 connectors, M12 connectors or 8-wire screw connectors.

"Bus Analysis" booklet
A comprehensive table of the diagnostics by type of bus: step-by-step user guide.

TECHNICAL SPECIFICATIONS	OX 7202 BUS	OX 7204 BUS
HUMAN-MACHINE INTERFACE		
Type of display	5.7" LCD TFT colour screen (115 x 86 mm) - 320 x 240 – LED backlighting (adjustable automatic shutdown)	
Display mode	500 real acquisition points on screen – Vectors with Interpolation	
On-screen display of curves	4 curves + 4 references – Split Screen & Full Screen modes (trace area 110 x 74)	
Screen commands	Touch screen – "Windows-like" menus and graphic commands	
Choice of language	5 complete languages, menus & online help (French, English, German, Spanish and Italian)	
OSCILLOSCOPE MODE	**2 or 4 channels**	
Vertical deflection		
Bandwidth	200 MHz 15 MHz, 1.5 MHz or 5 kHz bandwidth limiter	
Number of channels	2 isolated channels	4 isolated channels
Input impedance	1 MΩ ± 0.5 %, approx. 12 pF	
Maximum input voltage	600 V / CAT III, 1000 V / CAT II – Probix safety connectors – Derating of -20 dB per decade from 100 kHz	
Vertical sensitivity	16 calibres from 2.5 mV-200 V/div and up to 156 µV/div in vertical zoom mode (12-bit converter) – Accuracy ± 2 %	
Vertical zoom	"One-Click Winzoom" (12-bit converter and graphic zoom directly on screen) – x 16 max	
Probe factors	1 / 10 / 100 / 1,000 or scaling as required - definition of the measurement unit	
Horizontal deflection		
Sweep speed	35 calibres from 1 ns/div to 200 s/div., accuracy ± [50 ppm +500 ps] - Roll mode from 100 ms 200 s/div	
Horizontal zoom	"One-Click Winzoom" (graphic zoom directly on screen) – x 1 to x 5	
Triggering		
Mode	On all channels: automatic, triggered, one-shot, auto level 50 %	
Type	Edge, pulse width (16 ns - 20 s), delay (48 ns to 20 s), counting (3 to 16,384 events), TV frame or line no. (525 = NTSC or 625 = PAL/SECAM) – Continuous adjustment of Trigger position	
Coupling	AC, DC, HFR, LFR, noise – Adjustable Hold-Off from 64 ns to 15 s	
Sensitivity	≤ 1.2 divisions p-p up to 50 MHz	
On measurement window	With one of the 20 automatic measurements - Acquisition and automatic storage of faults	
Digital storage		
Maximum sampling rate	50 GS/s in ETS mode – 2.5 GS/s in one-shot mode on each channel	
Vertical resolution	12 bits (vertical resolution 0.025 %)	
Memory depth	2,500 points/channel	
User storage "Windows-like" file management	1 MB for file storage: trace, text, configuration, Math functions, print files, image files, etc. + high-capacity removable SD-Card (512 MB to 2 GB)	
GLITCH mode	Duration ≥ 2 ns – 1,250 Min/Max pairs	
Display modes	Envelope, Averaging (Factors 2 to 64) and XY (vector)	
Other functions		
AUTOSET	Completed in less than 5 s, with channel recognition – Frequency > 30 Hz	
FFT analyser & MATH functions	FFT (Lin or Log) with measurement cursors – Functions: +, -, x, / and mathematical function editor	
Cursors	2 or 3 cursors: simultaneous V and T or Phase – 12-bit resolution, 4-digit display	
Automatic measurements	19 time or level measurements, Phase measurement – 12-bit resolution, 4-digit display	
MULTIMETER MODE	**2 or 4 channels**	
General specifications	2 or 4 channels – 8,000 cts max. + min/max bargraph – TRMS – Time/date-stamped graphic recording (5 min to 31 days)	
AC, DC and AC + DC voltages	600.0 mV to 600.0 VRMS, 800.0 mV to 800.0 VDC – VDC accuracy 0.5 %R + 5 D – 200 kHz bandwidth	
Resistance	80.00 Ω to 32.00 MΩ – accuracy 0.5 %R + 25 D – 10 ms quick continuity test	
Other measurements	Temperature (HX0035 = TCK, HX0036 = Pt100) / Capacitance from 5 nF to 5 mF / Frequency 200.0 kHz / Diode test 3.3 V	
Triggering on measurement window	2 or 4 monitored channels, adjustable fault duration – Up to 100 time/date-stamped faults stored in a ".TXT" file	
BUS ANALYSIS MODE	**2 channels only: CH1 and CH4**	
BUS analysis	RS232/485-2 /ETHERNET 10 base T 100 base T 10 base 2 - CAN high and lowspeed-LIN-ASI-DALI-KNX-FLEXRAY-PROFIBUS PA and DP	
Protocols	TCP-IP - MODBUS - UDP - PROFINET - PROFIBUS	
Standards	IEE802.3 - ISO11898-2 and -3 - IEA232-485 - EN50090-2-5 - spec v 2.1 - EN50285 - IEC61158	
OPTION for board connection	**HX0190 with RJ45 and SUBD9 or HX0191 with M12 or generic 8-wire**	
INTEGRATED RECORDER MODE	**2 or 4 channels**	
Duration / sampling rate	2 s to 1 month / 800 µs to 18 min	
Recording conditions	On thresholds or window, simultaneous conditions on several channels, with adjustable duration from 160 µs	
Analysis of recordings	Scale and physical units, cursor or automatic measurements, search for time/date-stamped faults, zoom, etc.	

State at delivery:

OX7202 BUS and OX7204 BUS
1 oscilloscope with built-in recorder function, 1 stylus, 1 strap, 1 operating manual and 1 programming manual on CD-ROM, 1 external power supply (battery charger), NiMH battery, 1 µSD card with a minimum capacity of 1 GB and SD-Card adapter, 2 x 1/10 Probix HX0130 probes, 1 BNC Probix adapter, 1 banana-Probix adapter, 1 set of banana leads, 1 BNC tee connector, 1 crossed Ethernet cable, 1 straight Ethernet cable, 1 USB communication cable, processing software, 1 carrying case, 1 booklet containing "Presentation/implementation/measurements/diagnosis of each bus".

Ref for ordering:

OX7202-BUS: oscilloscope OX7202 BUS - 2 channels
OX7204-BUS: oscilloscope OX7204 BUS - 4 channels
Options
HX0190: connection board, RJ45 and 9-pin SUBD
HX0191: connection board, M12 and generic 8-wire
HX0130: PROBIX 1/10 electronic probe, 500 MHz 300 V Cat III

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