

CAN

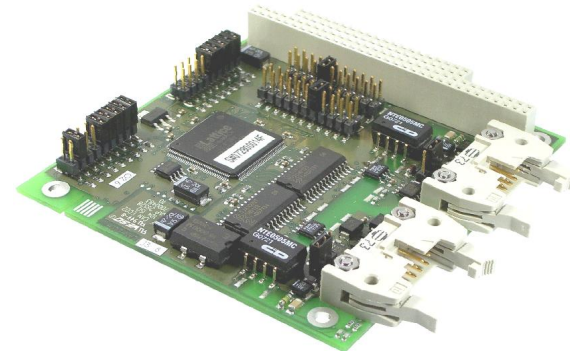
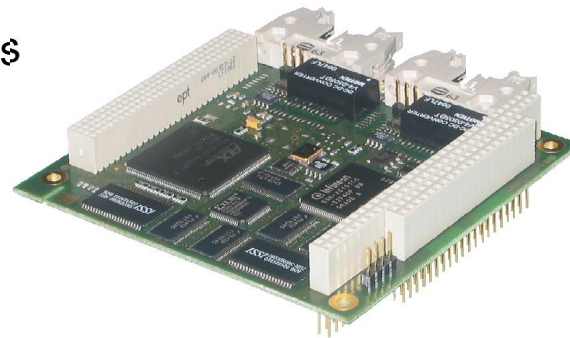


**Christian Bräutigam, Softing AG
Product Manager**

Product update

CAN interface boards

- current year is very successful
- sales concentrate on CAN-ACx-PCI, CANusb and CAN-AC2-104
- Please be also aware of our younger products
 - **CAN-PRO-104+**
 - PC/104plus and PCI/104
 - powerful active boards
 - **CAN-OEM-104**
 - PC/104 (ISA)
 - cost-effective passive boards



CAN products - Outlook

CE.NET 6.0 drivers

- for
 - CANpro (PCI/104, PCIe)
 - CAN-OEM (PC/104)
 - CAN-ACx-PCI
 - CANusb
- release is planned for end 2008

BC-200-CAN

- CAN tester - Softing branding
- final negotiations regarding DeviceNet version
- release scheduled for end 2008
- J1939 planned for May 2009

CAN Tester BC-200-CAN

BC-200-CAN is a universal measuring instrument for

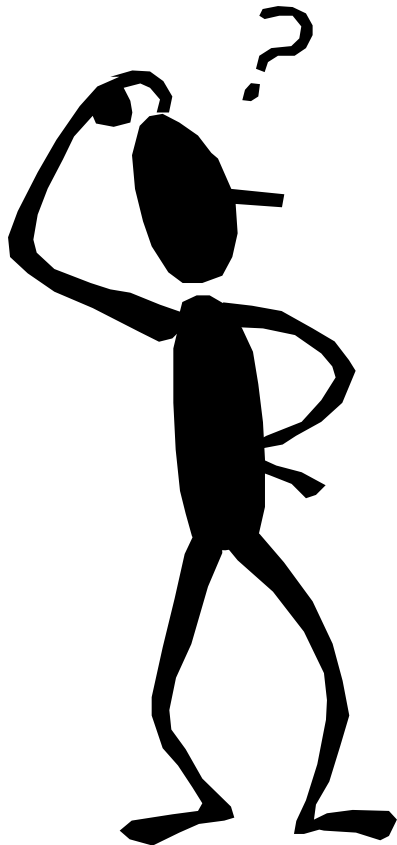
- commissioning,
- analysis,
- monitoring,
- troubleshooting
- and service/maintenance

of CAN based networks.



CAN Tester BC-200-CAN

Typical communication problems on a CAN network include:

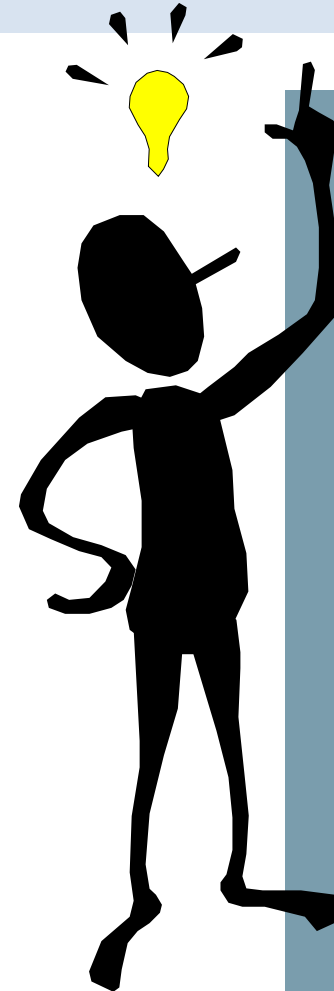


- Missing or too many bus terminations
- Bus-cable and/or spurs too long, wrong cable types
- Defective bus drivers
- Excessive contact resistances at the connectors/terminals due to aging/corrosion
- Transient breaks on moving cables
- Cable routed through environments with strong interference

CAN Tester BC-200-CAN

Product features:

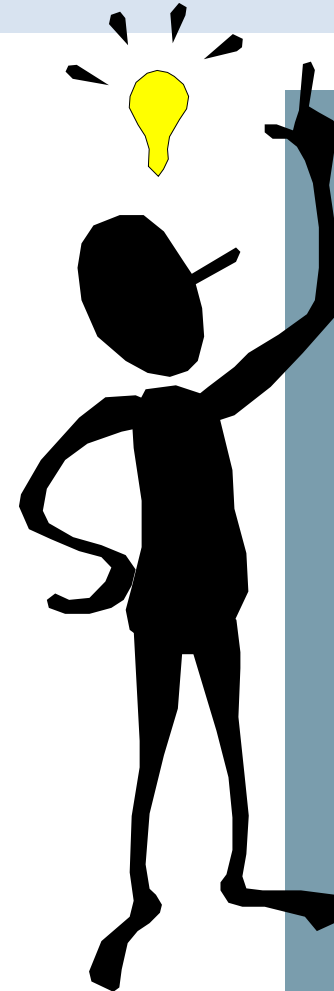
- Bus systems: CAN bus, CANopen and DeviceNet
- Automatic baud rate detection
- Automatic detection of connected devices
- Device and measuring-point related display of the signal conditions:
 - overall quality level (0 ... 100 %)
 - disturbance-free voltage range
 - rising and falling edges
 - oscilloscope display with frame analysis for the complete message frame



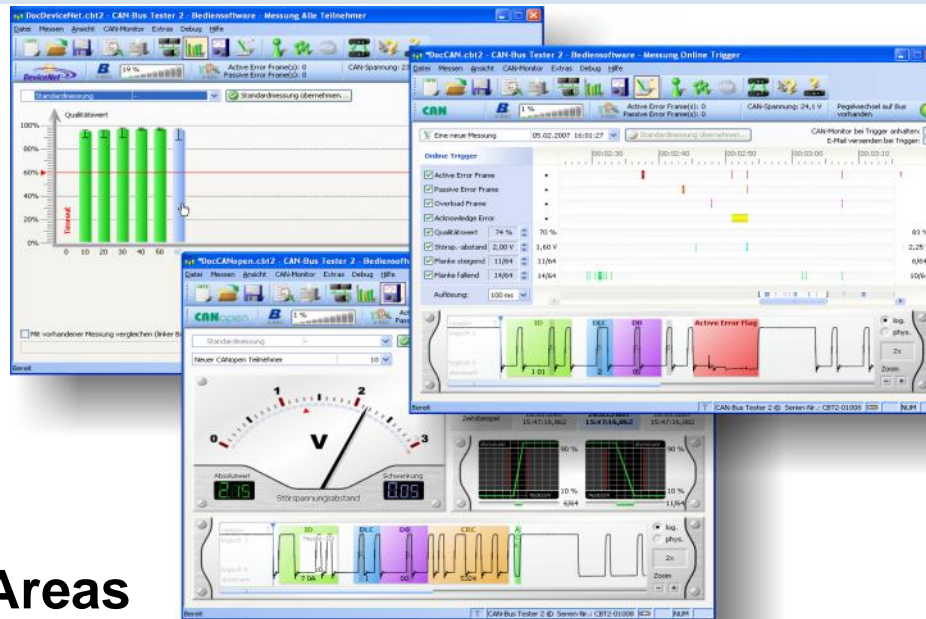
CAN Tester BC-200-CAN

Product features:

- Real-time monitoring of physical and logical errors (online logger)
- Continuous monitoring of CAN bus status, CAN bus traffic-load, error frames (active/passive errors)
- Real-time capable hardware trigger output for user or error-related analysis by way of external DSO
- Easy-to-use compare feature with previous measurements
- Detailed test report
- Integrated CAN bus monitor (transmit/receive functions)
- Wiring test (line short-circuits, line breaks, bus termination, the loop resistances)



CAN Tester BC-200-CAN



Application Areas

- Commissioning of CAN bus installations, wiring test, module check
- Service/maintenance of CAN bus installations
- Analysis and troubleshooting of the physical bus characteristics
- Development of CAN bus modules
- Final testing in the production

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CAN Bus-Applications:



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BC-200-CAN Connectors



CAN Tester BC-200-CAN

Configure CAN bus segment

The screenshot displays the 'Configure segment' window of the CAN-Bus Tester 2 software. The window title is '*Untitled - CAN-Bus Tester 2 - Application Software - Configure segment'. The interface includes a menu bar (File, Measure, View, CAN Monitor, Tools, Help) and a toolbar with various icons. A status bar at the top shows 'Active Error Frame(s): 0', 'Passive Error Frame(s): 0', 'CAN supply voltage: 23,9 V', and 'Level change detected on the bus'. The main configuration area is divided into several sections:

- Segment:** Designation: Demo, Baud rate: 125 kBit/s, Timeout: 20 s. Buttons for 'Wiring Test', 'Baud Rate Scan', and 'Station Scan' are present.
- Record online monitoring:**
 - Bus traffic load: min 20 %, act 20 %, max 20 %
 - Active Error Frame(s): 0
 - Passive Error Frame(s): 0
- Evaluation:**
 - Automatic evaluation: Crit. quality level: 60 %
 - Crit. disturbance-free voltage range: 1,60 V
 - Crit. edge rising: (recessive - dominant) 14/64
 - Crit. edge falling: (dominant - recessive) 28/64
- Wiring Test:** Show results button, Wiring Test not completed.

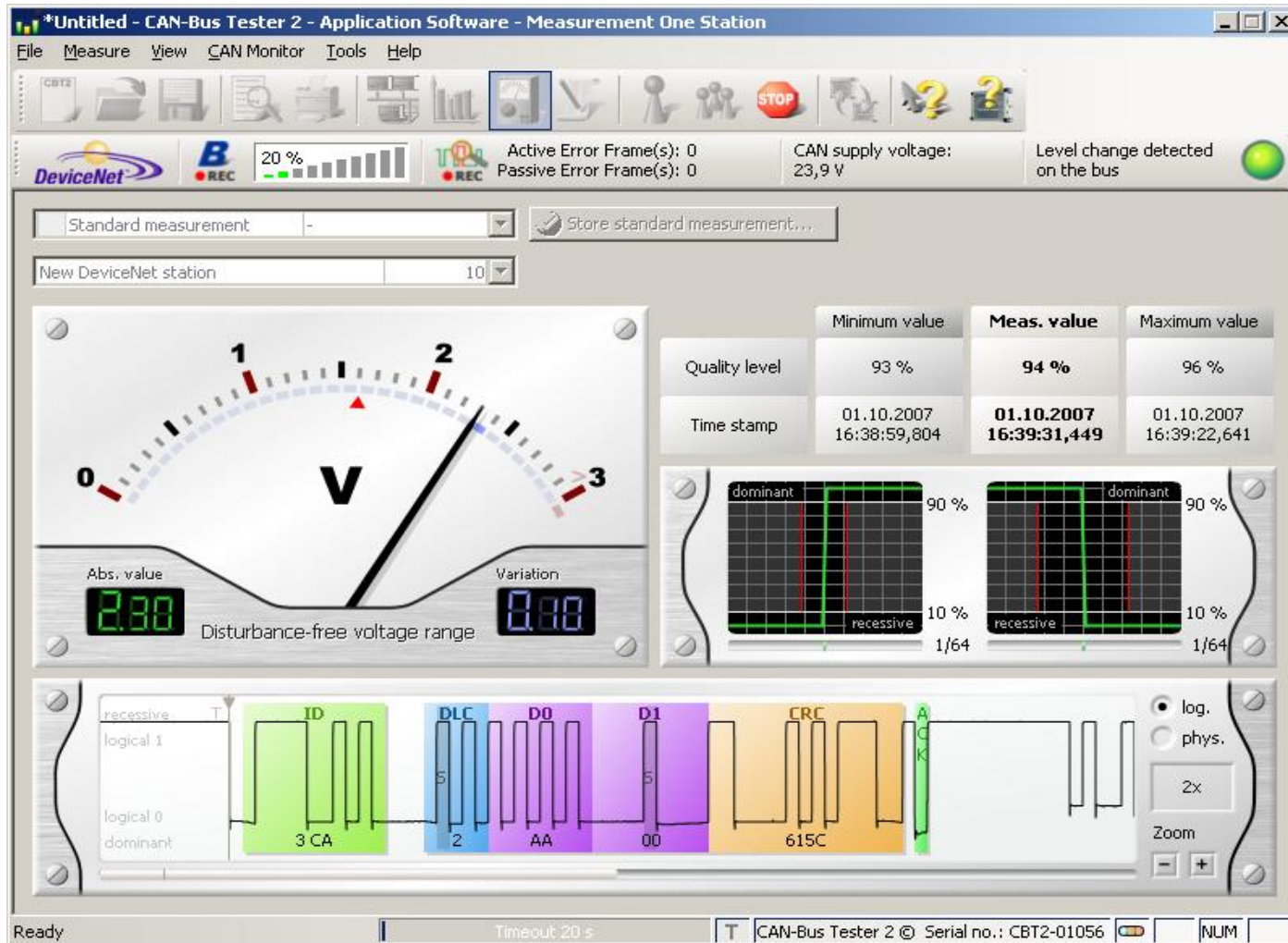
The 'Stations' tab is active, showing a table of configured stations:

Designation	MAC ID (dec)
<input checked="" type="checkbox"/> New DeviceNet station	10
<input checked="" type="checkbox"/> New DeviceNet station	20
<input checked="" type="checkbox"/> New DeviceNet station	30
<input checked="" type="checkbox"/> New DeviceNet station	40
<input checked="" type="checkbox"/> New DeviceNet station	60
<input checked="" type="checkbox"/> New DeviceNet station	50

The status bar at the bottom shows 'Ready', 'CAN-Bus Tester 2 © Serial no.: CBT2-01056', and 'NUM'.

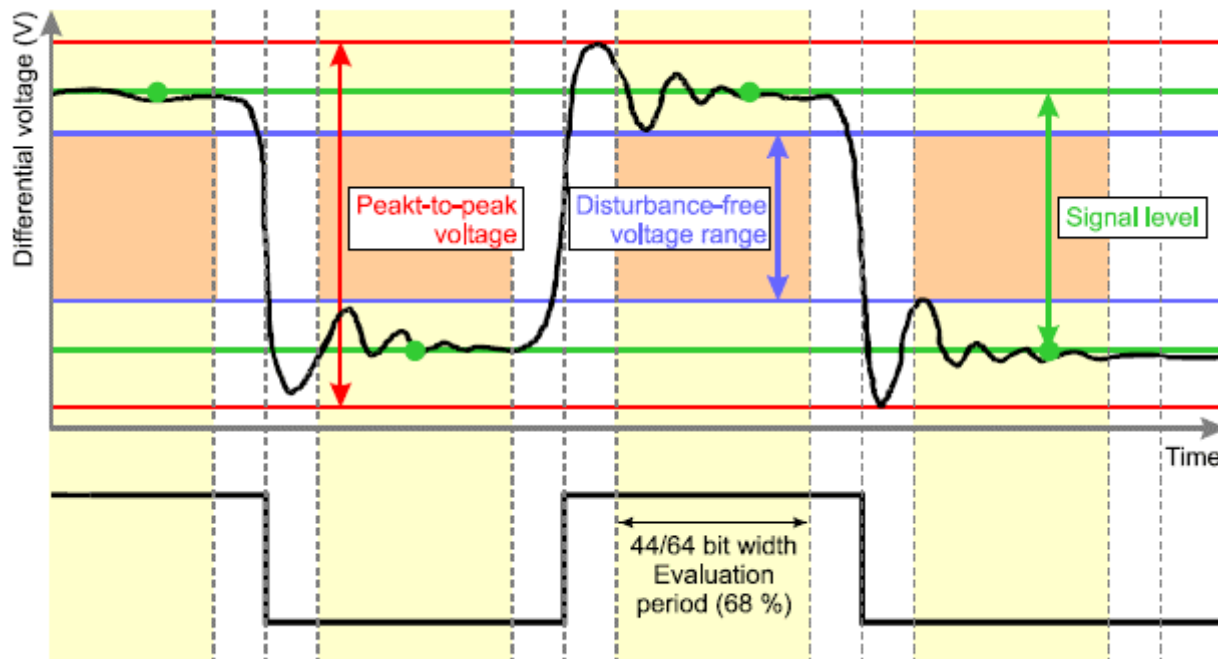
CAN Tester BC-200-CAN

Disturbance-free voltage range



CAN Tester BC-200-CAN

Definition of disturbance-free voltage range, peak-to-peak voltage, and signal level

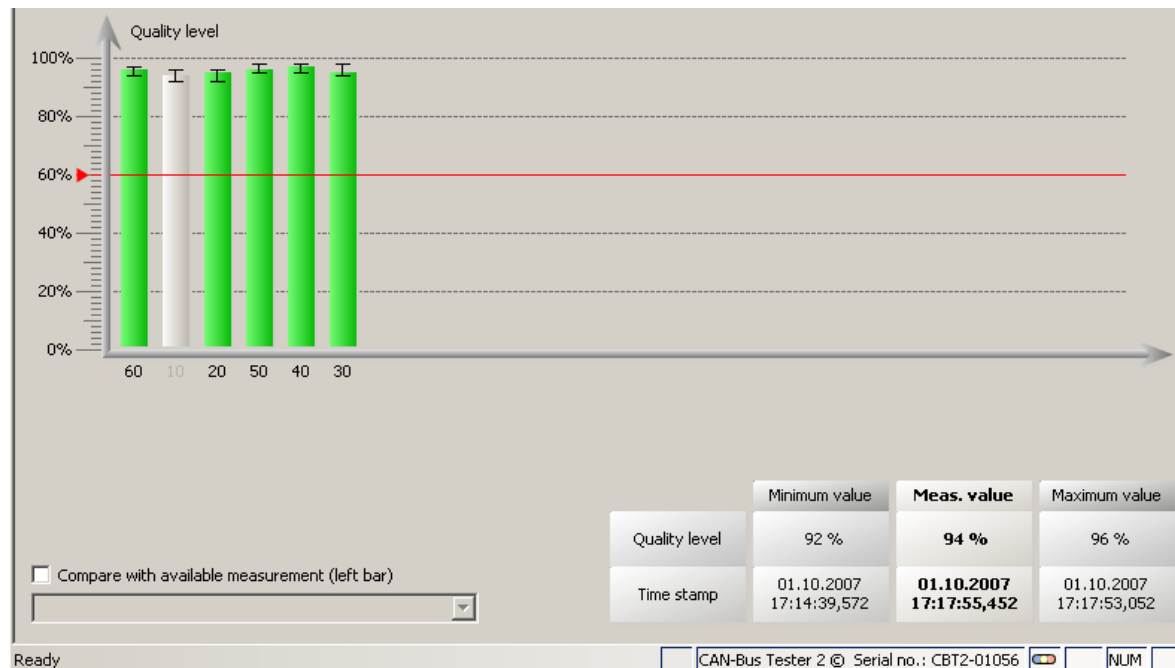


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Quality level

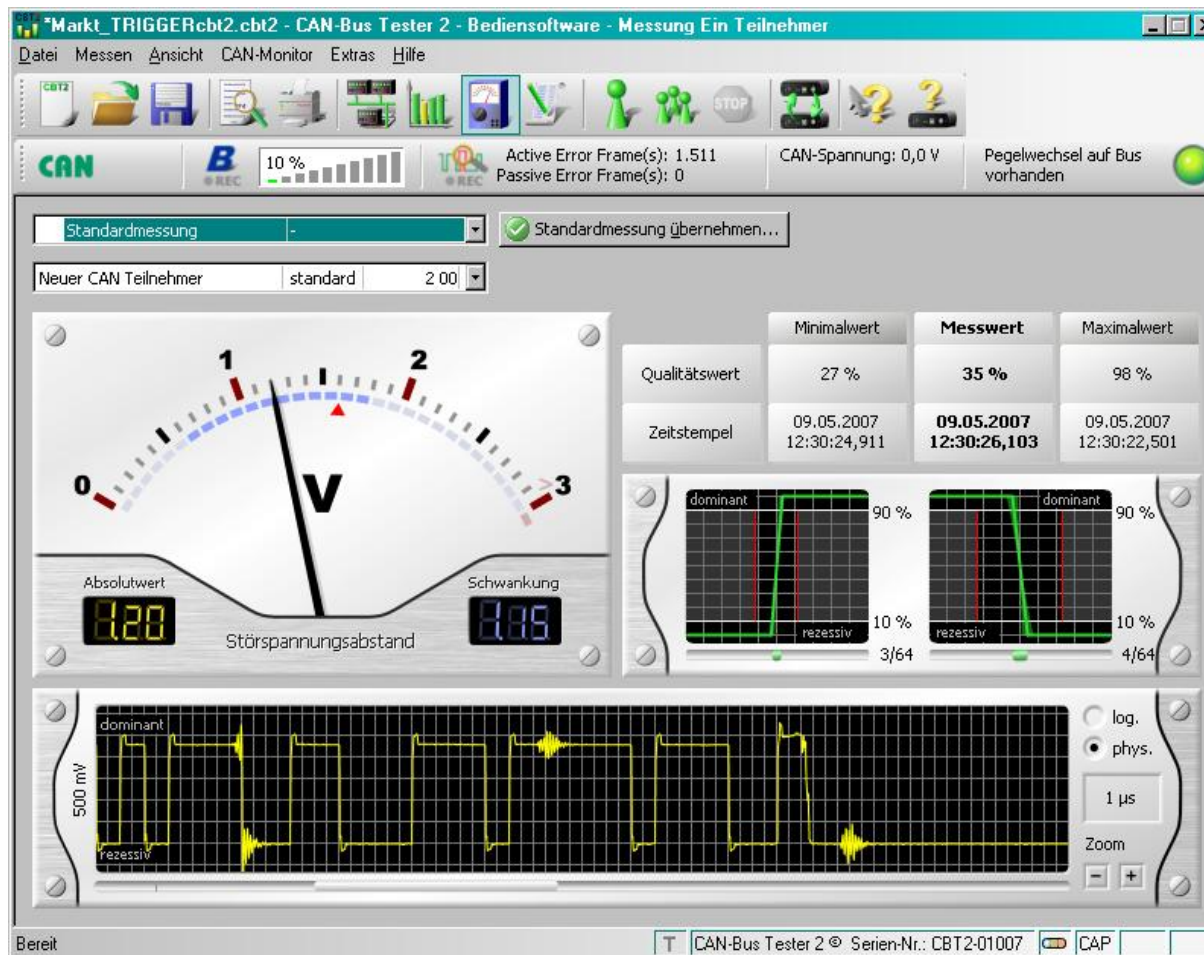
The quality level is a general expression of the signal quality on the bus. The value range is 0...100%. The value is determined from the following three components of the signal quality:

- Edge steepness
- Disturbance-free voltage range
- Reflection



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Error example: Cyclic disturbance every 40 μ s



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Online-trigger



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Online trigger and monitor

The screenshot displays the CAN-Bus Tester 2 software interface. The main window is titled "Untitled - CAN-Bus Tester 2 - Application Software - Measurement Online Trigger". The interface includes a menu bar (File, Measure, View, CAN Monitor, Tools, Help), a toolbar, and a status bar. The status bar shows "Active Error Frame(s): 0", "Passive Error Frame(s): 0", "CAN supply voltage: 23,9 V", and "Level change detected on the bus".

The "Online Trigger" section is active, showing the following settings:

- Active Error Frame:
- Passive Error Frame:
- Overload Frame:
- Acknowledge Error:
- Quality Level: 82 %
- DF Volt. Range: 1,60 V
- Edge rising: 14/64
- Edge falling: 28/64
- Resolution: 100 ms

The "CAN Monitor Receive" window is open, displaying a table of received CAN frames:

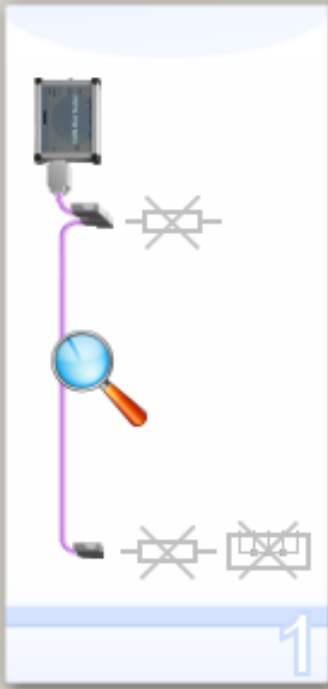
No	Time stamp (absolute)	CAN ID	Data
9866	02.10.2007 10:15:26,843	4 A5	0B 00
9867	02.10.2007 10:15:26,843	3 D4	
9868	02.10.2007 10:15:26,853	4 55	
9869	02.10.2007 10:15:26,854	3 CA	AA 00
9870	02.10.2007 10:15:26,855	4 A5	0B 00
9871	02.10.2007 10:15:26,855	3 D4	
9872	02.10.2007 10:15:26,865	4 55	
9873	02.10.2007 10:15:26,866	3 CA	AA 00
9874	02.10.2007 10:15:26,866	4 A5	0B 00

The bottom part of the interface shows a waveform display with the following parameters: ID (4 A5), DLC (2), D0 (0B), D1 (00), and CRC (1030). The status bar at the bottom indicates "Ready" and "CAN-Bus Tester 2 © Serial no.: CBT2-01056".

CAN Tester BC-200-CAN

Wiring Test: Step 1

Wiring Test - Step 1 [X]



Prepare plant for measurement ...

The wiring measurement occurs in four sequent steps. There are some user interactions necessary:

- Shut down the plant
- Disconnect all bus stations from the bus
- Remove both bus terminations (at the beginning and end)
- Connect the CAN-Bus Tester 2 at the beginning of the plant
- Do NOT connect the shorting plug

Measure supply voltage lines in the cable

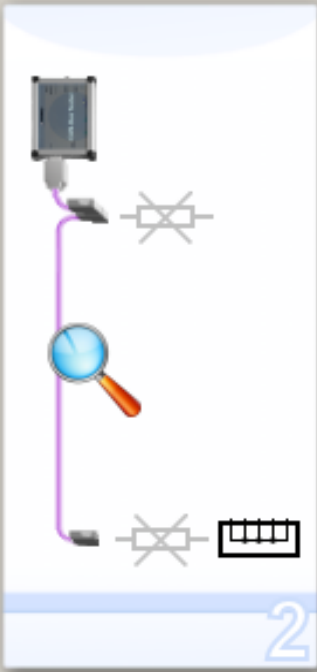
Start measurement by clicking on "Continue >"

Weiter > **Abbrechen**

CAN Tester BC-200-CAN

Wiring Test: Step 2

Wiring Test - Step 2 [X]



Connect the shorting plug ...

The following user interactions are necessary for the next step:

- Connect the provided shorting plug at the end of the bus

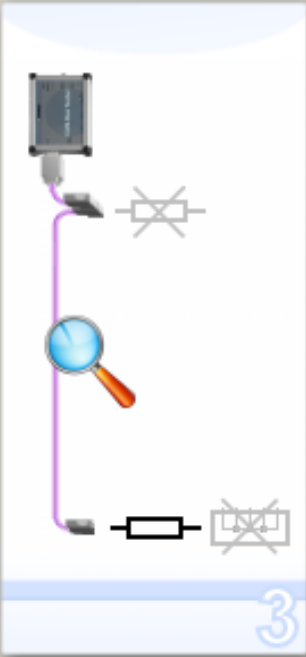
Get on with the measurement by clicking on "Continue >"

< Zurück Weiter > Abbrechen

CAN Tester BC-200-CAN

Wiring Test: Step 3

Wiring Test - Step 3



Connect the termination at the end ...

The following user interactions are necessary for the next step:

- Remove the shorting plug
- Connect the termination at the end

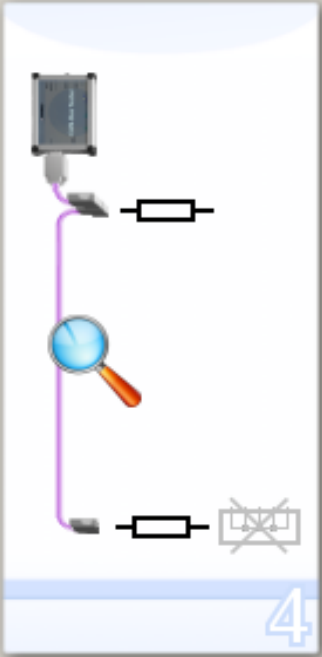
Get on with the measurement by clicking on "Continue >"

< Zurück Weiter > Abbrechen

CAN Tester BC-200-CAN

Wiring Test: Step 4

Wiring Test - Step 4 [X]



Connect the termination at the beginning ...

The following user interactions are necessary for the next step:

- Connect the termination at the beginning too

Get on with the measurement by clicking on "Continue >"

< Zurück Weiter > Abbrechen