

9 Good Reasons For Choosing the Profibus Tester 4



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The NEW Profibus Tester 4

Profibus troubleshooting has never been so easy!

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Rapid Network Analysis without a PC

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Essential for all networks!

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The most important information is just one click away

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Displayed in plain text instead of decoding HEX strings

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Records all significant events

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Generates a detailed report with only a few clicks!

1 – Stand-Alone-Mode

rapid network analysis without a PC



Display and keyboard of Profibus Tester 4

DP Segment
 R=0 Qmin = 4248
 E=0 Qmax = 4942
 Bus device(s) ->

Measured from Master (left end):
 All signals are good from this end

DP Segment
 R=3 Qmin = 217
 E=0 Qmax = 4942
 Bus device(s) ->

Measured from Slave (right end):
 3 frame repetitions and a bad minimum signal from other end:
 Here you need to start analysing with your PC

This is unique:

You do not need a PC to prove whether your network is good or whether maintenance is required.

Use the **Quick-Test** with **Stand-Alone-Mode** to make a first and simple check on communication and signal quality from both ends of a network:

Communication:

R=3: there were 3 frame repetitions during **Quick-Test**

E=0: there were no error frames during **Quick-Test**

Signal Quality:

Qmin: indicates the minimum signal quality in the network

Qmax: indicates the maximum signal quality in the network

Conclusion:

- If R=0 and E=0 and all signals are fine in both tests your segment is good. There is no need for further tests
- If there are repetitions, error frames or bad signals while measured from one end this tells you that you will have to do further testing from there.

Now you know from where to trace the problem and you can connect your PC for troubleshooting

2 – Disturbance-Free Measurement

Essential for all networks



Consider the following „worst-case“ situation:

While checking a critical Profibus network during operation the network breaks down when connecting your analysing tool.

This is the „nightmare“ for all maintenance personal and might cause severe trouble.

To avoid this Profibus Tester 4 is especially designed for disturbance-free online monitoring of Profibus networks:

- Profibus Tester 4 is acting as a „sniffer“ and will not be detected as a device on the network
- Profibus Tester 4 features full galvanic isolation
- Profibus Tester 4 comes with an optional advanced adapter cable (BC-600-PB-CB-DSUB1) which minimizes any impact on the network

Quote from Fieldbus-Specialist Hans-Ludwig Göhringer:

My special focus is on EMC, so I highly appreciate that the unit features appropriate electrical isolation. Speaking from my own experience I cannot stress enough how important it is to use a bus tester with electrical isolation.

BC-600-PB-CB-DSUB1:

Low Impact Adapter Cable

3 – Overview Window

The most important information is just one click away

See at a glance:

- is your network OK or do you need more detailed analysis ?
- in case of problems: are they related to communication or to bus physics ?

The screenshot displays the PROFIBUS Diagnostics Suite interface. The main window is titled "1-Netzstatus_NetworkStatus.npb" and shows a "Test Location: Busende-15". The interface is divided into several sections:

- OVERALL DIAGNOSTICS:** Shows a warning icon and the text "With restrictions" and "Detail diagnosis required". A blue callout box points to this section with the text: "First indication: There is a problem !".
- Bus Communication:** Shows a green traffic light icon and the text "For details see tab 'Protocol'". A blue callout box points to this section with the text: "Communication is okay => Traffic Light is green".
- Bus Physics:** Shows a yellow traffic light icon and the text "For details see tab 'Signal Quality'". A blue callout box points to this section with the text: "Bus Physics are critical: Some nodes show bad signal quality => Traffic Light is yellow => Further Analysis required".

The "Measurement at test location 'Busende-15'" table shows the following data:

Status	Test finished!
Date	4/26/2010
Start Time	3:35:12 PM
Duration	00:00:10

The "Protocol analysis at test location 'Busende-15'" table shows the following data:

Baudrate	1.5 Mbit/s (AUTO)
Active stations (Masters/MPI)	2
Slaves	5
- hereof not answering	0
- hereof with configuration or parametrization faults	0
- hereof not configured in PLC	0

The "Quality indexes at test location 'Busende-15'" table shows the following data:

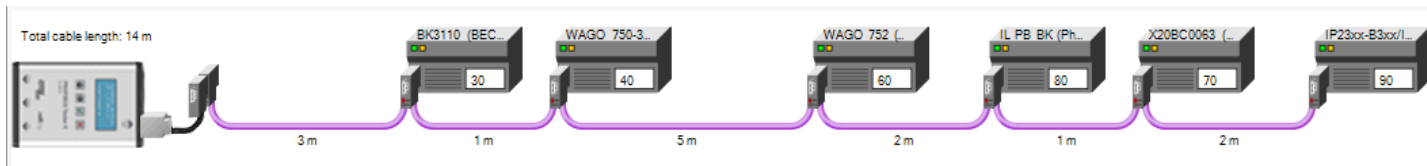
Minimum	200
Average	1835
Maximum	4950
Critical quality index	2500
Stations with quality index below critical limit	5 of 7
Stations not measured (time-out)	0

The "Topology" table shows the following data:

Topology	1/26/2010 7:21:28 PM
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4 – Topology Scan

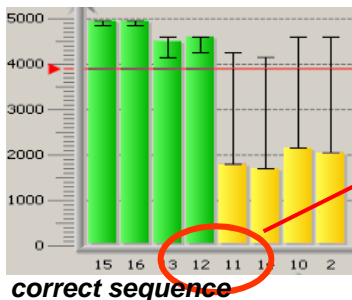
Why a correct topology scan is so important



In most Profibus networks the physical layout bears little or no relation to the Profibus addresses.

Profibus Tester 4 gives you:

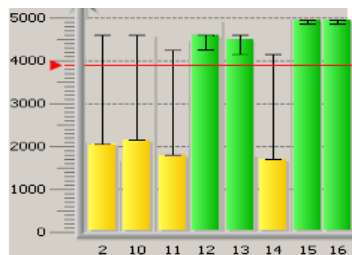
- the correct sequence of the Profibus nodes for easy location of failures
- the complete cable length: is your network too long for your baudrate?
- the distance between the nodes



Correct Sequence as shown by Profibus Tester 4:

Here you can see a significant drop between node 11 and 12 due to high transient resistance (e.g. corrosion in the Profibus cable).

This feature is a great help to localize problems!



Wrong Sequence:

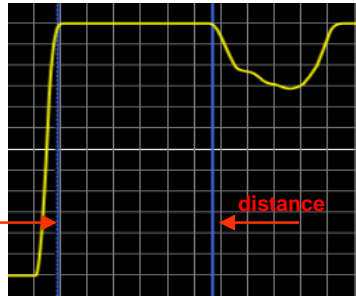
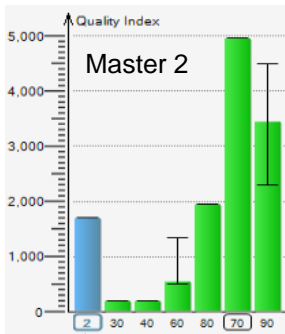
This view shows the same network sorted by node-No.

The sequence of the nodes is wrong!

Would you be able to localize the problem in this view?

5 – Oscilloscope

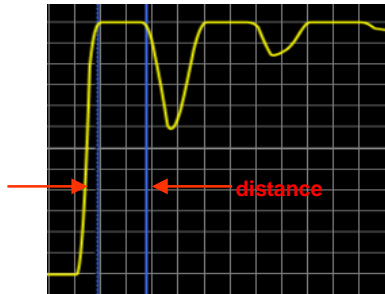
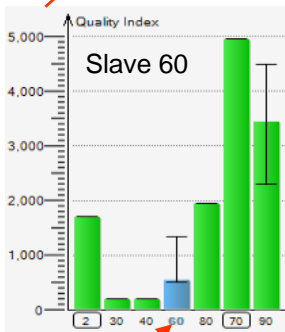
Identify and localise potential failures by wave form analysis



These graphs show the signal shape from 3 different stations:

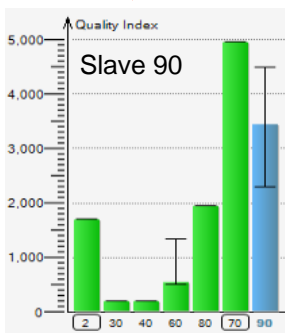
- Master No. 2 at the left end of the network
- Slave No. 60 in the middle of the network
- Slave No. 90 at the right end of the network

In the oscilloscope view you can clearly see that the signals of the respective nodes are distorted by reflections.



Please note:

The distance between the rising edge of the signal and the position of the reflection indicates the distance between the respective node and the cause of the reflection



These three oscilloscope views show that the distance to the cause of the reflection is decreasing the closer you come to the right end of the network at slave No. 90.

In this case the reflections are caused by a missing terminator at slave No. 90

6 – Retries, Diagnostic Frames, Restarts

What they tell you for preventive maintenance

Provides an easy way to predict potential breakdown situations

Problems can build up even if the network appears to be functioning normally.

Breakdowns can be predicted by monitoring specific frames like

- Retries,
- Set Parameter (restarts),
- Get Diagnosis

Profibus Tester 4 offers you an overview of these specific frames at a glance!

	0	1	2	3
0	0	1	M	3
10	1	1	149	1
20	20	21	22	23
30	30	31	32	33
40	40	41	42	43

Preventive Maintenance becomes easy!

- small number of events (Retries, Set Param, Get Diag) can be tolerated by the bus
- larger numbers indicate potential failures

Station Statistics on Retries, Set Param and Get Diag

7 – Display of Diagnostic Messages

Displayed in plain text instead of HEX strings

Below are examples of diagnostic messages in plain text from a WAGO slave and from a Siemens Diagnose Repeater.

Reading the log gives a simple indication of the problem.

There never has been an easier way of troubleshooting!

The image displays two screenshots of the 'Diagnose View' software interface. Both screenshots show a tree view on the left and a diagnostic log on the right. The 'Diagnosis' tab is selected in both, indicated by a red circle. Red arrows point to specific diagnostic messages in the log.

Top Screenshot: WAGO Slave Diagnostic Message

- Tree View: (2) Master, (10) Diagnostic Repeater (SIEMENS AG), (11) Slave, (12) WAGO 750-343 (WAGO Kontakttechnik), (13) Slave, (14) Slave.
- Log Entry: 2/12/2008 11:00:29.669000
- Device: (12) WAGO 750-343 (WAGO Kontakttechnik GmbH)
- GSD file: "Wag_B757.GSE" found for ident number B757
- Vendor and model from GSD file WAGO 750-343 (FW: 06 ...) PRO WAGO
- Diagnostic Message: The device has not been parametrized by any master
- Other messages: Device not ready for data exchange, Invalid parameters (device did not accept last parametrization request), Device requires parametrization.

Bottom Screenshot: Siemens Diagnose Repeater Diagnostic Message

- Tree View: (2) Master, (10) Diagnostic Repeater (SIEMENS AG), (11) Slave, (12) WAGO 750-343 (WAGO Kontakttechnik), (13) Slave, (14) Slave.
- Log Entry: 2/12/2008 11:00:14.799000
- Device: (10) Diagnostic Repeater (SIEMENS AG)
- GSD file: "si0380a7.gse" found for ident number 80A7
- Vendor and model from GSD file Diagnostic Repeater SIEMENS AG
- Diagnostic Message: The device has not been parametrized by any master
- Other messages: Device not ready for data exchange, Device requires parametrization, Device reports error (see below for details)
- Segment DP2: Segment ON, Topology scan ON, Error rate 100 %
- Error location: 7.1 m from station 10 and 49 m from station 13
- Error location: 7.1 m from diagnostic repeater
- Break in signal line A and/or B or no terminating resistor

Diagnose View

8 – The Communication Log View

Records all significant events

Profibus Tester 4 features the unique Log-View

It provides you with an easy overview of significant messages between the master and the slaves

The screenshot displays three communication segments, each with a tree view on the left and a log table on the right. Red circles highlight specific slave entries in the tree view and their corresponding log entries.

Segment 1: 500.00 kbit/s Segment

- (2) Master
- (10) Diagnostic Repeater (SIEMENS AG)
- (11) Slave
- (12) WAGO 750-343 (WAGO Kontakttechnik)** (highlighted)
- (13) Slave
- (14) Slave

(12) WAGO 750-343 (WAGO Kontakttechnik GmbH)	
Date and Time	Message
2/12/2008 11:00:29.669493	Slave (12) Slave State Pm Error(Slave State Need New Pm)
2/12/2008 11:00:29.669493	Slave (12) Slave State Pm Error(Slave State Need New Pm)
2/12/2008 11:00:29.683030	Slave (12) performing start-up sequence(Slave State Pm Error)(Slave State Need New Pm)
2/12/2008 11:00:29.683030	Slave (12) performing start-up sequence(Slave State Pm Error)(Slave State Need New Pm)

Segment 2: 500.00 kbit/s Segment

- (2) Master
- (10) Diagnostic Repeater (SIEMENS AG)
- (11) Slave
- (12) WAGO 750-343 (WAGO Kontakttechnik)
- (13) Slave** (highlighted)
- (14) Slave

(13) Slave	
Date and Time	Message
2/12/2008 11:00:29.669493	Slave (13) Not responding to Master requests
2/12/2008 11:00:29.669493	Slave (13) Not responding to Master requests
2/12/2008 11:00:30.856193	Slave (13) Slave State Need New Pm
2/12/2008 11:00:30.856193	Slave (13) Slave State Need New Pm
2/12/2008 11:00:30.871486	Slave (13) performing start-up sequence
2/12/2008 11:00:30.871486	Slave (13) performing start-up sequence
2/12/2008 11:00:30.874850	Slave (13) Data Exchange

Segment 3: 500.00 kbit/s Segment


- (2) Master
- (10) Diagnostic Repeater (SIEMENS AG)
- (11) Slave
- (12) WAGO 750-343 (WAGO Kontakttechnik)
- (13) Slave
- (14) Slave** (highlighted)

(14) Slave	
Date and Time	Message
2/12/2008 11:00:29.669493	Slave (14) Not responding to Master requests
2/12/2008 11:00:29.669493	Slave (14) Not responding to Master requests


Log View


9 – Automatical Report Generator

Generates a detailed report with only a few clicks



Test Report



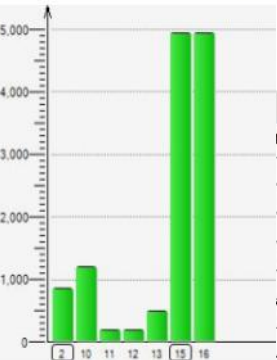


PROFITEST Inc., 1 Fieldbus Plaza, 12000 Profibus City

Softing AG
Bernie Buscheck
 Richard-Reitzner-Allee 6
 85540 Haar

Quality Indexes (Charts)

Test Location: Busende (15)



The test was performed by:

Tester: Tom Tester
Address: PROFITEST Inc.
 1 Fieldbus Plaza
 12000 Profibus City

Address	Model	Vendor	GSD-File	Expected Ident Number?	Status
10	Diagnostic Repeater	SIEMENS AG	si0280a7.gsg	Yes	Data Exchange
11	WAGO 750-333	WAGO Kontakttechnik GmbH	Wagob754.gsd	Yes	Data Exchange
12	ET 200M	SIEMENS	Siem801e.gsd	Yes	Data Exchange
13	WAGO 750-333	WAGO Kontakttechnik GmbH	Wagob754.gsd	Yes	Data Exchange
15	DP/PA-Link	SIEMENS			

Topology

Start: 1/26/2010 19:21:28

Total cable length: 30 m

