



The Profibus Tester 4 (BC-600-PB) is a powerful tool that allows the testing of bus segments during operation. It can also test the bus – or individual devices of interest – if no PLC is running.

State-of-the-art quality controller

“Never again without the Profibus Tester”

At Deckel Maho Pfronten, no machine leaves the premises without a detailed test report on the bus physics and bus communication. Softing's Profibus Tester 4 (BC-600-PB) plays a vital role in this process by ensuring reliable fault detection and quality assurance.

High-precision operation and maximum system reliability are essential for modern machines if their manufacturers are to succeed in the tough competition of the machine building industry. In addition to horizontal and universal milling machines Deckel Maho Pfronten GmbH, a company based in Pfronten in Germany, also develops complex machining centers. The company is renowned for its ground-breaking developments in 5-axis milling and milling-drilling

technology. The machine manufacturer is known just as much for its technical innovations as for its quality and reliability. A major focus is on the machines' fieldbus systems. “Our customers, particularly from the automotive and supply industries, want proof of the signal quality. Previously, it was only possible to create oscilloscope dumps to supply with the machine. Today, we use test equipment like the Profibus Tester 4 (BC-600-PB) from Softing Industrial Automation GmbH

at Deckel Maho Pfronten to provide a detailed documentation for our machines,” explains Klaus Asen, head of the electrical assembly department at Deckel Maho Pfronten.

Profibus Tester comes out on top

Profibus Testers are today part of the standard equipment of every assembly department at Deckel Maho Pfronten, and of the field service staff. Klaus Asen did not make the decision on



Fig. 2: The Profibus Tester 4 combines four test instruments into a single compact tool: a signal tester, a storage oscilloscope, a protocol analyzer, and a master simulator.

the appropriate fieldbus tester easy for himself. Before the purchase decision was made, all the available test tools on the market that met the requirement profile were ordered and tested in typical

use scenarios, such as testing the signal quality, detecting sporadic faults on the Profibus, or carrying out the final quality control. Softing's solution, the Profibus Tester, came out on top in the end. "The

Profibus Tester 4 in Operation

The Profibus Tester 4 combines a signal tester, a storage oscilloscope, and a protocol analyzer into a single tool. An integrated master simulator allows testing the bus – or individual devices of interest – even with no PLC running. The tool can be used both in stand-alone mode and for PC-based tests. Its simple use and clear, easy-to-understand display of the test results make the tool ideal even for less experienced users. It takes just one push of a button or a single mouse click to start testing. The Profibus Tester 4 automatically detects the baud rate and the open circuit voltage in the bus system immediately after connection. In stand-alone mode, the bus status can be tested and displayed using the **Live Mode** function. In PC-based mode, the Profibus Diagnostics Suite provides many additional features for performing and analyzing bus tests. The Network Status functionality allows running both Quick Tests and User-Defined Tests. The Topology Scan determines the cable lengths and distances in the bus system. In the Oscilloscope and Frame Analyzer modes, experts can perform an in-depth, detailed analysis of the bus system. All test results can be output as detailed test reports for documentation purposes.

winning factor for us was that the Profibus Tester offered better data visualization capabilities. The tools from the competitor could only output the analysis data as hex code dumps. What we also liked a lot about the Profibus Tester was that it displayed the quality level, and instantly showed the signal quality. This way, you can immediately draw conclusions on the cause, whether it's a missing terminating resistor, a defective cable or an incorrect connection. The cherry on the cake for us was the tool's sophisticated technical design," adds Asen. Another key aspect was the possibility to log the data while testing – as a quality proof for the customer that the machine has been shipped with a fully functioning bus system, or in order to file the log in the machine documentation.

One tool for all tests

A full bus test previously required at least two separate tools, for physical tests and for analyzing the bus communication. Today the Profibus Tester 4 combines the functionalities of a signal tester, a storage oscilloscope, a master simulator, and a protocol analyzer into a single tool. This makes the Profibus Tester 4 ideal for the commissioning and final acceptance of the machines, and for troubleshooting the fieldbus. The compact Profibus Tester 4 can be used both in stand-alone mode and for PC/notebook based tests using the Profibus Diagnostics Suite. Other items on Klaus Asen's wish list included simple use and a clear, easy-to-understand display of the test results. Again, the Profibus Tester 4 left no wishes

Deckel Maho Pfronten GmbH Company Profile

Deckel Maho Pfronten GmbH develops and produces the universal milling machines, horizontal milling machines and machining centers for the DMU, DMU P/FD, DMC U/FD and DMC H lines. In this field, the company is the innovative leader and trend-setter in the market for 5-axis milling and turning-milling technology. Deckel Maho Pfronten supplies the global market with CNC universal milling machines and horizontal machining centers with a working envelope of 400 mm to 3400 mm. The milling machines and machining centers are universal both in respect of horizontal and vertical 5-sided and 5-axis integrated machining on one machine, and in respect of the modular machine design from various product lines and their technological solutions in hardware and software. A wide range of technologies and equipment variations, such as 5-axis simultaneous machining, milling and turning by one machine or high-speed cutting, complement the features of the basic machines.

unfulfilled. To run a test, all it takes is one push of a button, or a single mouse click in PC mode. The test results are presented in a clear and very intuitive manner on the integrated display, but can also be viewed and managed on a notebook with the Profibus Diagnostics Suite. The tool enables even less experienced users to test the bus. The Profibus Tester 4 automatically detects the baud rate and the open circuit

voltage immediately after connection to the bus system. In stand-alone mode, the tool's Live Mode function allows easy bus testing. In PC-based mode, the Profibus Diagnostics Suite provides many additional features for performing and analyzing bus tests. For example, the status bar of the Diagnostics Suite continuously indicates the current bus status. Using the Network Status function, the bus can be tested with a

Profibus Tester 4 (BC-600-PB)

At a glance...

... in stand-alone mode (bus test without notebook)

- Automatic detection of baud rate and open circuit voltage
- Display of the current bus status for:
 - Bus physics and bus communication
 - 10 memory locations for quick tests of the bus
 - Trend logs over a maximum of 41 days
 - Master simulator

... and additionally in PC-based mode

- Import of quick tests and trend tests stored in the tool
- Network status at a glance
- User-controlled tests
- Topology scan
- Output of detailed test reports
- Oscilloscope
- Classical frame analysis
- Easy and efficient management of test data

Quick Test or a User-Controlled Test. A useful feature to determine the overall cable length of the bus and the cable lengths between slaves is the Topology Scan. The Trend Test function is ideal for detecting and identifying sporadic faults. For experts, the Profibus Tester 4 provides the Oscilloscope and Frame Analyzer modes that allow an in-depth, detailed analysis of the bus system.

Never again without the Profibus Tester

"We can't imagine our assembly departments here in Pfronten without the twelve Profibus Testers. We primarily use the tools in final acceptance in order to document that a machine is in perfect working condition, but also if a problem occurs when commissioning a machine," explains Asen. "In most cases the problems are caused by sporadic faults, which after a certain run time lead to an emergency stop on the machine and are acknowledged with the Profibus error message. In those cases, we connect the Profibus Tester to the fieldbus system and check the levels of all Profibus devices. If a device returns a low level, there's probably something wrong there." How easy it is to find bus faults with the Profibus Tester is demonstrated by Klaus Asen by way of example: an incorrectly configured machine in which one device has two terminating resistors, an internal and an external one. The two resistors cause sporadic faults that normally cannot be explained right off. The commissioning and service staff of Deckel Maho Pfronten GmbH today simply connect the Profibus Tester to the machine's communication system – and can see immediately that the level of a device is lower compared to the other devices. After a close inspection of the identified component, the surplus termi-

nating resistor can be quickly found and the problem solved.

Conclusion

As the key advantage of using Softing's Profibus Tester 4, Klaus Asen states the reduced time to find a bus fault in the communication system of a machine, if one should happen to occur. The state-of-the-art test equipment makes fault analysis much faster – and thus saves costs. "Softing has made a highly professional impression at Deckel Maho Pfronten in every respect: from demonstrating the tools face-to-face during the purchase decision stage to the extensive test and analysis functionality of the Profibus Tester itself, and also regarding the excellent support to our service team in evaluating the analysis dumps," he summarizes the experiences gained at Deckel Maho Pfronten's electrical assembly department.

Bibliography

[1] Softing Industrial Automation GmbH, Haar, Germany:
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