

HMI Service Center

User's manual

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Publishing information

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1 Introduction

Information:

B&R makes every effort to keep documents as current as possible. The most current versions are available for download on the B&R website (www.br-automation.com).

1.1 Manual history

Version	Date	Change
3.01	May 2023	Corrections and adjustments.
3.00	April 2023	Added APC4100. Added HMI Service Center version 3.0.0. Added new chapter "Installation" on page 6. Updated Test reports. Added new chapter "Installation" on page 44 "HMI Service Center Maintenance tool".
2.10	April 2021	Corrections in the entire manual.
2.00	February 2021	Updated the entire manual.
1.15	2018-05-25	Renamed introduction heading to HMI Service Center. Documented section "HMI Service Center Maintenance tool" on page 44. Updated the following sections: <ul style="list-style-type: none"> • "Supported devices" on page 5. • "Order data" on page . • "Test system" on page 6. • "Target system" on page 6. • "Test reports" on page 11. • "Test overview" on page 12. • "Test cases" on page 13.
1.10	2016-07-06	Updated the pinout of the serial loopback adapter, see "COM" on page 15.
1.00	2015-06-03	First version.

1.2 Information about this document

This document is not intended for end customers! The safety guidelines required for end customers must be incorporated into the operating instructions for end customers in the respective national language by the machine manufacturer or system provider.

1.2.1 Organization of notices

Safety notices

Contain **only** information that warns of dangerous functions or situations.

Signal word	Description
Danger!	Failure to observe these safety guidelines and notices will result in death, severe injury or substantial damage to property.
Warning!	Failure to observe these safety guidelines and notices can result in death, severe injury or substantial damage to property.
Caution!	Failure to observe these safety guidelines and notices can result in minor injury or damage to property.
Notice!	Failure to observe these safety guidelines and notices can result in damage to property.

General notices

Contain **useful** information for users and instructions for avoiding malfunctions.

Signal word	Description
Information:	Useful information, application tips and instructions for avoiding malfunctions.

2 HMI Service Center

The HMI Service Center is software for testing B&R industrial PCs and Automation Panels. Testing covers different categories such as COM, network and SRAM (see "[Test overview](#)" on page 12). This document describes the use of version 3.0.0 and newer of the HMI Service Center.

Up to version 2.0.0, the HMI Service Center was a paid product and could be ordered with material number 5SWUTI.0001-000. The HMI Service Center was delivered preinstalled on a USB flash drive.

Since version 3.0.0, the HMI Service Center is available as a download at no cost and can be installed on any USB flash drive with the HMI Service Center Maintenance tool.

2.1 Supported devices

The HMI Service Center can be used on PCs from the following device families:

- Automation PC 910 (APC910)
- Automation PC 2100 (APC2100)
- Automation PC 2200 (APC2200)
- Automation PC 3100 (APC3100)
- Automation PC 3100 mobile (MPC3100)
- Automation PC 4100 (APC4100)
- Panel PC 900 (PPC900)
- Panel PC 1200 (PPC1200)
- Panel PC 2100 (PPC2100)
- Panel PC 2200 (PPC2200)
- Panel PC 3100 (PPC3100)
- Automation Panel 800 (AP800)
- Automation Panel 900 (AP900)
- Automation Panel 9x3 (AP9x3)
- Automation Panel 9xD (AP9xD)
- Automation Panel 1000 (AP1000)
- Automation Panel 5000 (AP5000)

The following interface options are specially supported by individual tests:

- 5AC901.I485-00
- 5AC901.ISRM-00
- 5AC901.IETH-00
- 5AC901.IUPS-00
- 5AC901.IUPS-01
- 5ACCIF01.FPLS-000
- 5ACCIF01.FPLS-001
- 5ACCIF03.CETH-000
- 5AC901.I232-00
- 5ACCMS01.MDT2-000
- 5ACCIFM0.CETH-000
- 5ACCIF02.CANE-000
- 5ACCIF02.ISS0-000
- 5ACCIF02.FPLS-000

2.2 Requirements

2.2.1 Test system

The test system consists of a USB flash drive with installed Windows PE operating system and the HMI Service Center.

Information:

The HMI Service Center was developed for use in Windows PE. If executed on a standard Windows operating system, some functions are not supported (e.g. automatic restart) or certain ADI driver versions are required.

2.2.2 Target system

The PC to be analyzed by the HMI Service Center must be a B&R industrial PC (see section "Supported devices" on page 5) that meets the following hardware requirements:

- Display (integrated or connected) with VGA resolution (640 x 480 pixels) or higher

Information:

The test system does not support widescreen display resolutions on the APC2100 and PPC2100.

PCs with single-touch or multi-touch can be operated with the touch screen. Otherwise, a mouse or keyboard is also required for operation.

The latest firmware and BIOS versions are always required for full testing support.

Information:

BIOS default settings are required for tests to be carried out properly. For information about loading BIOS default settings, please see the user's manual for the respective PC.

2.2.3 Test accessories

The following test accessories are required for the full range of testing functions:

- 1 serial loopback adapter for the COM test in manual mode or up to 2 in automatic mode (+1 for each serial interface on an interface option)
- 1 Ethernet cable for the network test and a remote station for the "ping" test
- 1 USB flash drive for the USB interface test

2.3 Installation

The following components are required for installing the HMI Service Center:

- USB flash drive with a size of at least 2 GB
- HMI Service Center Maintenance tool
- HMI Service Center update package

The HMI Service Center Maintenance Tool and HMI Service Center Update packages can be downloaded at no cost from the B&R website (www.br-automation.com).

2.3.1 Partitioning the USB flash drive

A bootable USB flash drive with a FAT32 partition is required to install the HMI Service Center. This can be created with the **diskpart** tool in Windows 10. This requires a PC with Windows 10 and a user with administrator rights.

1. Start program **diskpart**.
2. Enter command "list disk".
This command lists the disk numbers of the connected data storage media.
3. Note down the disk numbers of the USB flash drive ("Disk 1" in most cases).
4. Enter command "select disk [Disk number]".
Replace [Disk number] with the previously listed disk number.

Notice!

If an incorrect disk number is entered here, the incorrect data storage medium will be erased completely in the next step.

5. The USB flash drive is erased and prepared for installing the HMI Service Center with the following commands:

```
clean
create partition primary size=2048
format fs=fat32 label=WINPE quick
assign
exit
```

2.3.2 Installing the HMI Service Center

The HMI Service Center is installed using the HMI Service Center Maintenance tool (see ["HMI Service Center Maintenance tool" on page 44](#)).

2.4 Startup

1. Connect the USB flash drive with the test system to the PC to be tested and remove any other USB flash drives that may be connected.
2. Switch on the PC.
3. Start the BIOS boot manager.¹⁾
4. Select the USB flash drive in the BIOS boot manager.
5. Windows PE starts up, and the HMI Service Center boot screen appears.
6. The HMI Service Center starts up.



HMI Service Center is loading...

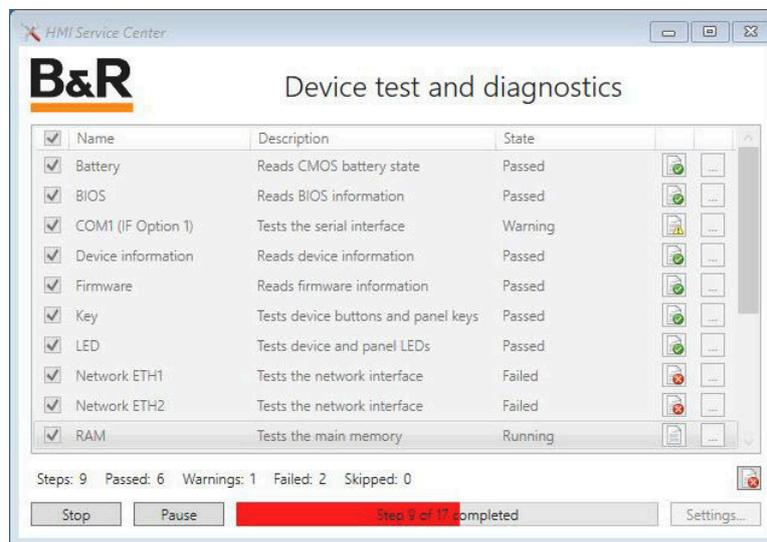


¹⁾ Which key is used to start the BIOS boot manager is explained in the user's manual for the PC.

2.5 Operation

2.5.1 User interface

The HMI Service Center displays the tests available for the PC along with a short description and the status of the most recent test cycle:



2.5.2 Selecting tests

Select the desired tests using the checkboxes.

The checkbox to the left of column "Name" can be used to select all tests.

2.5.3 Configuring test settings

General test settings can be changed by clicking on **Settings**:

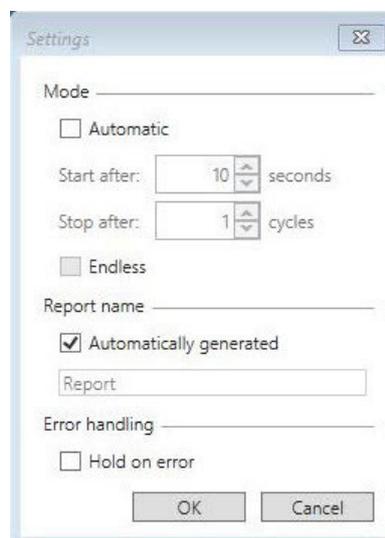


Figure 1: Settings window

Mode

- **Automatic:**

Automatic test mode. This starts after 10 seconds by default. All selected tests are completed automatically. However, not all tests can be performed at the same testing depth as in manual test mode, e.g. test of all Ethernet interfaces, since this requires user interaction. The test overview lists which tests can be executed in automatic testing mode. Any limitations or differences to manual testing mode are listed for each of the tests.

- **Start after / Stop after:**

Start after defines the start time in seconds; **Stop after** defines the number of test cycles. Alternatively, **Endless** can be used to perform an endless test. It is important to note that Windows PE automatically restarts after 72 hours.

Report name

- **Automatically generated:**

Enabled: Filenames of reports are generated automatically (see "Test reports" on page 11).

Disabled: Filenames of reports can be customized.

Error handling

- **Hold on error:**

If an error occurs, the test cycle is stopped.

If certain settings are needed for an individual test, they can be made to the right of the test state (**State**) using button . Possible settings are listed in the description of the tests.

2.5.4 Connecting test accessories

Necessary test accessories are listed before the tests are started in automatic mode or before each test step in manual mode. The testing mode can be configured under **Settings**.

2.5.5 Starting and pausing tests

Start starts a test cycle; the button changes to **Stop** so that the test cycle can also be ended again. The progress indicator displays the current testing progress, the current test step and the number of test steps that have been completed.

The test cycle can be paused and resumed by clicking **Pause** (changes to **Resume**). The number of test cycles is set under **Settings**.

Information:

If a test ends unexpectedly (PC restart, blue screen, etc.), the last completed test step is repeated automatically and the test cycle will resume.

2.5.6 Viewing test results

The summary bar shows the number of test steps that have been executed (**Cycles**), passed (**Passed**), failed (**Failed**) and skipped (**Skipped**) as well as test steps with warnings (**Warnings**). During endless testing, the number of test cycles is displayed.

The results of each test step are saved to individual reports as well as a summary report. Each report can be opened by clicking on the respective icon either directly for each test or in the summary bar:



= Report for passed test



= Report for test with warning



= Report for failed test

Information:

- **Only the summary report can be opened during a test cycle.**
- **If the PC is restarted, the individual report for a test step will only contain the information from the new cycle; the information from the old cycle is listed in the summary report.**

2.6 Test reports

Summary reports are stored after each test run in directory ".\Service Center\Reports" on the USB flash drive.

If option **Automatically generated** is selected in the settings, the filename of the report is formed with the material number and serial number of the PC's system unit: "<Model number>_<Serial number>.txt".

In addition, an error report is created as "<Model number>_<Serial number>_errors.txt". This error report contains all test reports with errors and warnings.

If a report already exists, a sequential number will be appended to the report's filename, for example "5PC910.SX01-00_D6DA010000_Report (2).txt".

A report begins with the file header, which contains the date and time of the test, the system family, software component versions and testing mode:

```
*** HMI Service Center Report ***

Created on 2023-03-14 13:19:09
System family: Automation PC 4100

Service framework version: 3.0.0.0
ADI .NET SDK version: 3.4.0.0
ADI DLL version: 6.1.0.0
ADI DLL (generic interface) version: 2.1.0.0

Mode: Manual
```

The actual test reports follow the file header and are concluded by a summary at the end of the report:

```
--- Summary ---
Steps: 9
Passed: 5
Warnings: 1
Skipped: 3
Failed: 0
```

2.7 Test overview

Test name	Test instances	Automatic test	Supported devices	Test accessories necessary?
Battery	1	Yes	APC910, APC2200, APC3100, APC4100 PPC900, PPC2200, PPC3100, PPC1200 MPC3100	No
BIOS	1	Yes	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100	No
COM	1...x ¹⁾	Yes	APC910, APC2100 (interface option only), APC2200 (interface option only), APC3100 (interface option only), APC4100 (interface option only) PPC900, PPC2100 (interface option only), PPC2200 (interface option only), PPC3100 (interface option only) MPC3100	Yes
Device information	1	Yes	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	No
Fan	1	Yes	APC910, APC4100 PPC900 MPC3100	No
Firmware	1	Yes	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	No
Key	1	No	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	No
LED	1	No	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	No
Network	1...x ²⁾	Yes ³⁾	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100	Yes
RAM	1	Yes	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100	No
SRAM	1	Partial	APC910, APC3100, APC4100 PPC900, PPC3100	No
Statistics	1	Yes	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	No
Storage	1...x ⁴⁾	Partial	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100	No
Temperature	1	Yes	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	No
Touch screen	1	No	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	No
UPS	1	Partial	APC910, APC3100, APC4100 PPC900, PPC3100	No
USB	1...x ⁵⁾	Yes ⁶⁾	APC910, APC2100, APC2200, APC3100, APC4100 PPC900, PPC2100, PPC2200, PPC3100, PPC1200 MPC3100 AP800, AP900, AP9x3, AP9xD, AP1000, AP5000	Yes

- 1) The number of instances depends on the number of serial interfaces.
- 2) The number of instances depends on the number of Ethernet interfaces.
- 3) Automatic testing is only possible for one Ethernet interface.
- 4) The number of instances depends on the number of mass storage devices.
- 5) The number of instances depends on the number of USB interfaces and connected panels.
- 6) Automatic testing is only possible for one USB interface.

Automation Panels must be used as a panel or connected via SDL, SDL3 or SDL4. Some tests can only be performed on the "primary" panel. The primary panel is either the integrated panel (panel) or the first connected panel (search order: integrated panel > panel connected to the monitor/panel interface > panel connected to the display / AP Link). Connecting an Automation Panel via DVI or DisplayPort is not recommended since some tests will not be supported.

2.8 Test cases

2.8.1 Battery

Scope of testing:

Tests the PC's CMOS battery.

Test description:

This test reads the status of the CMOS battery. The states *Bad* and *Unknown* are treated as errors.

Automatic testing:

Yes

Supported devices:

- APC910, APC2200, APC3100, APC4100
- PPC900, PPC2200, PP3100, PPC1200
- MPC3100

Required test accessories:

None

Example report:

```
--- Battery ---  
  
Plug-in version: 3.0.0.0  
  
State: Good  
  
Test passed.
```

2.8.2 BIOS

Scope of testing:

Reads the PC's BIOS information.

Test description:

BIOS version, description and manufacturer (only for SMBIOS) are read and written to the report.

Automatic testing:

Yes

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100

Required test accessories:

None

Example report:

```
--- BIOS ---  
  
Plug-in version: 3.0.0.0  
  
Version: i0.17  
Description: i0.17  
Manufacturer: B&R Industrial Automation  
  
Test passed.
```

2.8.3 COM

Scope of testing:

Tests the serial interfaces on the PC and interface options.

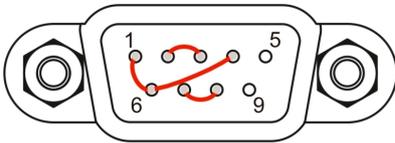
Test description:

The COM test checks data transfer at various baud rates (300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 56000, 57600, 115200) as well as the control lines (RTS, CTS, DTR, DSR) on the serial interface. If the serial interface is on an interface option, then the factory settings and statistical values of the module are also written to the report.

A loopback adapter is required for this test. When the test is started, the user is requested to connect the loopback adapter. To do this, connect the loopback adapter to the serial interface and click **OK**.

Notes:

- The serial port on an APC2100, APC2200, PPC2100, PPC2200 (on interface option 5ACCIF01.FPLS-000 or 5ACCIF01.FPLS-001), APC3100 or PPC3100 (on interface option 5ACCIF02.FPLS-000) does not have a standard connector (DSUB); refer to the PC user's manual for details.
- A loopback adapter is not included with this software. An adapter can be ordered from a retailer or built relatively easily by yourself. All that is necessary is to connect some of the pins on the serial interface:



Automatic testing:

Yes

Supported devices:

- APC910, APC2100²⁾, APC2200²⁾, APC3100²⁾, APC4100²⁾
- PPC900, PPC2100²⁾, PPC2200²⁾, PPC3100²⁾
- MPC3100

Supported interface options:

- 5AC901.I232-00
- 5AC901.I485-00
- 5ACCIF01.FPLS-000
- 5ACCIF01.FPLS-001
- 5ACCIF02.ISS0-000
- 5ACCIF02.FPLS-000

Required test accessories:

Manual mode: 1 serial loopback adapter

Automatic mode: 2 serial loopback adapters (+1 for each serial interface on an interface option)

Example report:

```
--- COM ---
```

```
Plug-in version: 3.0.0.0
```

```
Interface: COM3 (IF Option 1)
```

```
Vendor ID: 0x00000000
```

```
Device ID: 0x0000D84A
```

```
Compatibility ID: 0x0000
```

```
Hardware revision: D0
```

```
Serial number: D84A0169636
```

²⁾ Serial interface on an interface option only

Model number: 5AC901.I485-00

Power-on cycles: 41

Power-on hours: 372h 30min

Testing data lines (TX, RX) at 300 baud...

Passed.

Testing data lines (TX, RX) at 600 baud...

Passed.

Testing data lines (TX, RX) at 1200 baud...

Passed.

Testing data lines (TX, RX) at 2400 baud...

Passed.

Testing data lines (TX, RX) at 4800 baud...

Passed.

Testing data lines (TX, RX) at 9600 baud...

Passed.

Testing data lines (TX, RX) at 14400 baud...

Passed.

Testing data lines (TX, RX) at 19200 baud...

Passed.

Testing data lines (TX, RX) at 38400 baud...

Passed.

Testing data lines (TX, RX) at 56000 baud...

Passed.

Testing data lines (TX, RX) at 57600 baud...

Passed.

Testing data lines (TX, RX) at 115200 baud...

Passed.

Testing control lines (RTS, CTS)...

Passed.

Testing control lines (DTR, DSR)...

Passed.

Test passed.

2.8.4 Device information

Scope of testing:

Reads information about the hardware used on the PC and connected panels.

Test description:

This test reads the factory settings (including material number, serial number, etc.) of the PC and panels and writes this information to the report.

Automatic testing:

Yes

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100
- AP800, AP900, AP9x3, AP9xD, AP1000, AP5000

Required test accessories:

None

Example report:

```

--- Device information ---

Plug-in version: 3.0.0.0

System Unit:
Present: True
Vendor ID: 0x00000000
Device ID: 0x00002D1C
Compatibility ID: 0x0000
Hardware revision: A0
Serial number: 2D1C0110822
Model number: 5APC4100.TGL4-000

Panel (local):
Present: False

Bus Unit:
Present: False

IF Module 3:
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000ECCC
Compatibility ID: 0x0000
Hardware revision: C0
Serial number: ECCC0169359
Model number: 5ACCLI02.SD40-000

IF Module 1:
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000D851
Compatibility ID: 0x0000
Hardware revision: C0
Serial number: D8510176442
Model number: 5AC901.IUPS-00

IF Module 2:
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000D84C
Compatibility ID: 0x0000

```

Hardware revision: A0
Serial number: D84C0168423
Model number: 5AC901.ICAN-01

Memory Module 1:
Present: False

Memory Module 2:
Present: False

Climate Module:
Present: True
Vendor ID: 0x00000000
Device ID: 0x00000000
Compatibility ID: 0x0000
Hardware revision: 00
Serial number: 00000000000
Model number: APC4100_FANKIT

Slide-in 1:
Present: False

Slide-in 2:
Present: False

CPU Board:
Present: False

Fan Kit (Bus):
Present: False

Expansion Unit (local):
Present: False

Panel 0:
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000E16A
Compatibility ID: 0x0000
Hardware revision: B2
Serial number: E16A0168515
Model number: 5AP933.156B-00

Panel Link 0:
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000ECE3
Compatibility ID: 0x0000
Hardware revision: C5
Serial number: ECE30171224
Model number: 5DLS4.1001-00

SDL Converter 0:
Present: False

Expansion Unit 0:
Present: False

HDBaseT 0:
Present: True

Panel 1:
Present: False

Panel 2:
Present: False

Panel 3:
Present: False

Panel 4:
Present: False

Panel 5:
Present: False

Panel 6:
Present: False

Panel 7:
Present: False

Panel 8:
Present: False

Panel 9:
Present: False

Panel 10:
Present: False

Panel 11:
Present: False

Panel 12:
Present: False

Panel 13:
Present: False

Panel 14:
Present: False

Test passed.

2.8.5 Fan

Scope of testing:

Tests integrated fans in the PC.

Test description:

The test reads the speed, factory settings, state and log entries of each available fan and performs a fan test. The fan test switches the fans to operate at 100% speed. After a startup phase, the speed and status of the fans are checked before they are switched back to automatic mode.

Notes:

- The limit values for fan speeds are defined in the PC and not written to the report.
- Fan speeds are only listed in the report.

Automatic testing:

Yes

Supported devices:

- APC910, APC4100
- PPC900
- MPC3100

Required test accessories:

None

Example report:

```

--- Fan ---

Plug-in version: 3.0.0.0

Fan Kit (System):
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000D6E7
Compatibility ID: 0x0000
Hardware revision: D0
Serial number: D6E70183453
Model number: 5AC901.FA02-00

Fan Kit (Bus):
Present: False

Fan Kit (System) - fan 1:
Current: 0 rpm, State: OK
Running: 2h 45min (34 cycles), Too slow: 0h 0min, Alarm: 0h 0min

Fan Kit (System) - fan 2:
Current: 0 rpm, State: OK
Running: 2h 45min (34 cycles), Too slow: 0h 0min, Alarm: 0h 0min

Fan Kit (System) - fan 3:
Current: 0rpm, State: OK
Running: 2h 45min (34 cycles), Too slow: 0h 0min, Alarm: 0h 0min

Fan Kit (System) - fan 4:
Current: 0 rpm, State: OK
Running: 2h 45min (34 cycles), Too slow: 0h 0min, Alarm: 0h 0min

Fan test

Fan Kit (System) - fan 1:
Current: 5302 rpm, State: OK

```

Fan Kit (System) - fan 2:
Current: 5186 rpm, State: OK

Fan Kit (System) - fan 3:
Current: 2137 rpm, State: OK

Fan Kit (System) - fan 4:
Current: 5441 rpm, State: OK

Test passed.

2.8.6 Firmware

Scope of testing:

Reads information about the firmware used on the PC and connected panels.

Test description:

This test reads all firmware versions and writes them to the report.

Automatic testing:

Yes

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100
- AP800, AP900, AP9x3, AP9xD, AP1000, AP5000

Required test accessories:

None

Example report:

```
--- Firmware ---  
  
Plug-in version: 3.0.0.0  
  
BIOS: i0.17  
System Unit: 1.01  
IF Module 3: 1.04  
Panel Link (panel 0): 6.18  
HDBaseT (panel 0): 1.04  
  
Test passed.
```

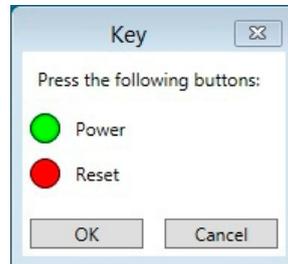
2.8.7 Key

Scope of testing:

Tests the PC buttons and optional keys on the primary panel.

Test description:

The following dialog box appears to test the power and reset buttons:



Perform the following steps:

1. Press the power button on the PC and check whether the red *Power* indicator in the dialog box changes to green.
2. Press the reset button on the PC and check whether the red *Reset* indicator in the dialog box changes to green.
3. End the test with **OK**. The system will check whether all buttons were pressed.

The test is canceled with **Cancel**.

This dialog box is only displayed if the test is supported by the firmware on the PC. Otherwise, a note is written to the report.

The test for the panel keys (function keys, system keys, key switches, etc.) is carried out with the following dialog box:



Perform the following steps:

1. Press all panel keys and check the key number³⁾ displayed in the dialog box.
2. End the test with **OK** and then confirm that all keys worked.

The test is canceled with **Cancel**.

The dialog box is displayed only if the panel reports a key count greater than zero.

Notes:

Automation Panels always report having keys, even if the panel has none. A message is displayed that must be confirmed to start the panel key test.

Automatic testing:

No

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100
- AP800, AP900, AP9x3, APC9xD, AP1000, AP5000

³⁾ For key numbers, see the user's manual for the PC or panel.

Required test accessories:

None

Example report:

```
--- Key ---  
  
Plug-in version: 3.0.0.0  
  
Testing power button...  
Passed  
Testing reset button...  
Passed  
  
Testing panel keys...  
Pressed keys:  
1, 2, 8, 9, 10, 11, 12, 13, 14, 40, 56, 72, 105  
Passed  
  
Test passed.
```

2.8.8 LED

Scope of testing:

Tests the LED status indicators on the PC and optional LEDs on the primary panel.

Test description:

The LED status indicators on the PC (e.g. LED "Power") are switched on one after the other. The function of each LED must be confirmed.



LEDs are only switched on if the test is supported by the firmware on the PC. Otherwise, a note is written to the report.

All panel LEDs are then switched on simultaneously. The function of the LEDs must also be confirmed.



This message is only displayed if the panel reports having more than zero LEDs.

Notes:

- Automation Panels always report having LEDs, even if the panel has none. A message is displayed that must be confirmed to start the panel LED test.
- Not all PCs are equipped with the LEDs described above.
- LED "HDD" can only be tested by performing write operations on a drive. Not all mass storage devices (e.g. RAID or M.2 option) are supported for this test. If a supported mass storage device cannot be found, a corresponding note is written to the report.

Automatic testing:

None

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100
- AP800, AP900, AP9x3, AP9xD, AP1000, AP5000

Required test accessories:

None

Example report:

```
--- LED ---  
  
Plug-in version: 3.0.0.0  
  
Testing "Run (green)" LED...  
Passed  
Testing "Run (red)" LED...  
Passed  
Testing "Link" LED...  
Passed  
Testing "Power (green)" LED...  
Passed  
Testing "Power (red)" LED...  
Passed  
Testing "Disk" LED...  
Passed  
  
Testing panel LEDs...  
Passed  
  
Test passed.
```

2.8.9 Network

Scope of testing:

Tests the Ethernet interface on the PC and interface options.

Test description:

This test configures and checks the integrated Ethernet interfaces as well as Ethernet interfaces on interface options. The network settings must be configured in dialog box "Settings" for the test step before testing starts (button "Settings" is displayed on the right side of the test list):

Either enable DHCP or enter the IP address (**IP address**) and subnet mask (**Subnet mask**) of the Ethernet interface to be tested. The remote IP address (**Remote IP address**) specifies the remote station that is connected and used for the ping test. The settings are saved and can be used for subsequent test cycles as well.

Connect the Ethernet cable to the interface being tested. All other Ethernet cables must be disconnected (prompted by a message).

The configured IP address is then set for the first connected Ethernet interface. The adapter name and MAC address of the Ethernet interface are written to the report. If the Ethernet interface is on an interface option, then the factory settings of the module are also read and written to the report.

In the next step, confirm that the LEDs on the Ethernet interface are lit up.

Next, the network test is started: 10 pings are transmitted to the remote IP address with a packet size of 8000 bytes and timeout of 4 seconds. When all pings have been sent successfully, the test has successfully completed.

Notes:

- It is not possible to assign the Ethernet interface to the housing label.
- A loopback test between two Ethernet interfaces on one PC (without a remote station) is not possible for technical reasons.

Automatic testing:

Yes (for one Ethernet interface only)

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100

Supported interface options:

- 5AC901.IETH-00
- 5ACCIF03.CETH-000
- 5ACCIFM0.CETH-000
- 5ACCIF02.CANE-000

Required test accessories:

Network cable

Example report:

```
--- Network ---
```

```
Plug-in version: 3.0.0.0
```

```
Interface name: ETH1
```

```
Adapter name: Intel(R) EC1000S 1.0GbE Connection & Intel(R) EC2500S 2.5GbE Connection
```

```
Physical address: 88:AA:CD:11:01:23
```

```
Testing network LEDs...
```

```
Passed
```

```
Pinging 192.168.178.1 with 8000 bytes of data.
```

```
Reply from 192.168.178.1: bytes=8000 time<1ms TTL=64
```

```
Test passed.
```

2.8.10 RAM

Scope of testing:

Tests the PC's main memory (RAM).

Test description:

This test reads the size and factory settings⁴⁾ of the RAM and tests the memory using 6 patterns:

- **Sequence**
A sequence of numbers from 0 to 255 is written from the lowest to the highest address and read back from the lowest to the highest address.
- **Binary 1**
Hexadecimal value 0xAA is written from the lowest to the highest address and read back from the lowest to the highest address.
- **Binary 2**
Hexadecimal value 0x55 is written from the lowest to the highest address and read back from the lowest to the highest address.
- **Zeros**
A sequence of zeros (0x00) is written from the lowest to the highest address and read back from the lowest to the highest address.
- **Ones**
A sequence of ones (0xFF) is written from the lowest to the highest address and read back from the lowest to the highest address.
- **Cell adjacency test**
Hexadecimal value 0xA5 is written from the lowest to the highest address and read back from the highest to the lowest address. Binary pattern 0x5A is then written from the highest to the lowest address and read back from the lowest to the highest address.

Automatic testing:

Yes

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100

Required test accessories:

None

Example report:

```

--- RAM ---

Plug-in version: 3.0.0.0

Memory size: 16324 MB.

Memory module 1:
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000EC40
Compatibility ID: 0x0000
Hardware revision: A0
Serial number: EC400168425
Model number: 5MDDR.8192-04

Memory module 2:
Present: True
Vendor ID: 0x00000000
Device ID: 0x0000EC40
Compatibility ID: 0x0000

```

⁴⁾ Only supported on the APC910 and PPC900

Hardware revision: A0
Serial number: EC400168422
Model number: 5MMDDR.8192-04

Sequence (0, 1, 2, ..., 255)...

Passed

Binary 1 (10101010)...

Passed

Binary 2 (01010101)...

Passed

Zeros (00000000)...

Passed

Ones (11111111)...

Passed

8-bit cell adjacency test...

Passed

Test passed.

2.8.11 SRAM

Scope of testing:

Tests the PC's SRAM.

Test description:

The test reads out the device ID, firmware version and SRAM size as well as the factory settings and statistical values.

The following test steps are carried out:

1. The complete contents of SRAM are backed up.
2. Random values are written to SRAM.
3. The SRAM data is read again and compared with the written values.

A data retention test is also performed in manual mode:

- The PC is switched off, and the power supply must be disconnected.
- After the PC restarts, the SRAM data is read again and compared with the written values.

The original contents of SRAM are restored at the end.

Automatic testing:

Partial (without the data retention test)

Supported devices:

- APC910, APC3100, APC4100
- PPC900, PPC3100

Supported interface options:

- 5AC901.ISRM-00 (+ customized versions)

Required test accessories:

None

Example report:

```

--- SRAM ---

Plug-in version: 3.0.0.0

Vendor ID: 0x00000000
Device ID: 0x0000D850
Compatibility ID: 0x0000
Hardware revision: B0
Serial number: D8500168667
Model number: 5AC901.ISRM-00

Power-on cycles: 655
Power-on hours: 2899h 15min

Firmware version: 3
SRAM size: 2048 kB

Backing up original SRAM data...
Passed
Writing random values to SRAM...
Passed
Reading SRAM data...
Passed
Verifying data...
Passed
Restart the PC to perform the SRAM retention test.
Reading SRAM data...
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```

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Passed

Verifying data...

Passed

Restoring original SRAM data...

Passed

Test passed.

2.8.12 Statistics

Scope of testing:

Reads statistical information about the PC and connected panels.

Test description:

This test reads statistical values (e.g. power-on cycles and operating hours) from the PC and connected panels and writes the information to the report.

Automatic testing:

Yes

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100
- AP800, AP900, AP9x3, AP9xD, AP1000, AP5000

Required test accessories:

None

Example report:

```

--- Statistics ---

Plug-in version: 3.0.0.0

System Unit:
Power-on cycles: 724
Operating hours: 844h 45min

IF Module 3:
Power-on cycles: 147
Operating hours: 317h 0min

IF Module 1:
Power-on cycles: 314
Operating hours: 677h 0min
On-battery cycles: 66
Battery operating hours: 0h 0min

IF Module 2:
Power-on cycles: 1412
Operating hours: 6014h 45min

Fan 1:
Fan-on cycles: 102
Fan operating hours : 5h 15min

Fan 2:
Fan-on cycles: 102
Fan operating hours : 5h 15min

Fan 3:
Fan-on cycles: 102
Fan operating hours : 5h 15min

Fan 4:
Fan-on cycles: 102
Fan operating hours : 5h 15min

Panel 0:
Power-on cycles: 80745
Operating hours: 79946h 30min
Backlight-on cycles: 89291

```

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Backlight operating hours: 73094h 0min

Test passed.

2.8.13 Storage

Scope of testing:

Tests the mass storage device (CFexpress/HDD/SSD/CFast/NVMe) in the PC.

Test description:

This test first reads information such as the material number, serial number, firmware version and location from the drive and writes it to the report. The SMART values and SMART state are then determined.

The last step in manual mode is a disk check. The disk check only performs a check of the drive; it does not correct any errors it finds.

Automatic testing:

Partial (disk check only performed in manual mode)

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100

Supported interface options:

- 5ACCMS01.MDT2-000

Required test accessories:

None

Example report:

```

--- Storage ---

Plug-in version: 3.0.0.0

Model number: SFCE060GW1EB2TO-I-5E-111-BR1
Serial number: 000060225851A7000006
Firmware version: ACVBGQ
Size: 55 GB
Location: CFexpress1

SMART:
Available spare space low: No
Temperature alarm: No
Reliability degraded: No
Read only mode: No
Volatile memory backup device failed: No
ID Attribute Name                               Data
 1 Critical Warning                               0
 2 Composite Temperature                         316
 3 Available Spare                               100
 4 Available Spare Threshold                     10
 5 Percentage Used                               0
 6 Data Units Read                               583562
 7 Data Units Written                           214517
 8 Host Read Commands                           4744275
 9 Host Write Commands                          1989664
10 Controller Busy Time                          242
11 Power Cycles                                  46
12 Power On Hours                               54
13 Unsafe Shutdowns                             21
14 Media and Data Integrity Errors               0
15 Number of Error Information Log Entries       0
16 Warning Composite Temperature Time           0
17 Critical Composite Temperature Time          0
18 Temperature Sensor 1                         320
19 Temperature Sensor 2                         317
20 Temperature Sensor 3                         0

```

```
21 Temperature Sensor 4 0
22 Temperature Sensor 5 0
23 Temperature Sensor 6 0
24 Temperature Sensor 7 0
25 Temperature Sensor 8 0
```

Reading test...

500 MB

Passed

Run "Check Disk" on drive D: "Windows"...

The type of the file system is NTFS.

Class not registered

Volume label is Windows.

WARNING! /F parameter not specified.

Running CHKDSK in read-only mode.

Stage 1: Examining basic file system structure ...

472064 file records processed.

File verification completed.

Phase duration (File record verification): 3.50 seconds.

2313 large file records processed.

Phase duration (Orphan file record recovery): 1.24 milliseconds.

0 bad file records processed.

Phase duration (Bad file record checking): 0.04 milliseconds.

Stage 2: Examining file name linkage ...

1286 reparse records processed.

737772 index entries processed.

Index verification completed.

Phase duration (Index verification): 13.13 seconds.

0 unindexed files scanned.

Phase duration (Orphan reconnection): 1.28 seconds.

0 unindexed files recovered to lost and found.

Phase duration (Orphan recovery to lost and found): 0.02 milliseconds.

1286 reparse records processed.

Phase duration (Reparse point and Object ID verification): 7.51 milliseconds.

Stage 3: Examining security descriptors ...

Security descriptor verification completed.

Phase duration (Security descriptor verification): 14.54 milliseconds.

132855 data files processed.

Phase duration (Data attribute verification): 0.03 milliseconds.

CHKDSK is verifying Usn Journal...

39959816 USN bytes processed.

Usn Journal verification completed.

Phase duration (USN journal verification): 196.23 milliseconds.

Windows has scanned the file system and found no problems.

No further action is required.

58329775 KB total disk space.

32580524 KB in 333862 files.

221088 KB in 132856 indexes.

0 KB in bad sectors.

580315 KB in use by the system.

65536 KB occupied by the log file.

24947848 KB available on disk.

4096 bytes in each allocation unit.

14582443 total allocation units on disk.

6236962 allocation units available on disk.

Total duration: 18.14 seconds (18149 ms).

Unable to obtain a handle to the event log.

Passed

Test passed.

2.8.14 Temperature

Scope of testing:

Reads temperatures from the PC and connected panels.

Test description:

This test reads the values, status and log entries of each available temperature sensor. The status is reported as an "Alarm" if the sensor value exceeds the limit value defined in the PC. Log entries also include the time period in which the temperature range was violated.

Notes:

- The limit values for temperatures are defined in the factory settings and not written to the report.
- Minimal temperature values $\leq 0^{\circ}\text{C}$ are written to the logbook by the PPC900 until MTCX version 1.17 for CPU board sensor 0 and system unit sensor 3.

Automatic testing:

Yes

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100
- AP800, AP900, AP9x3, AP9xD, AP1000, AP5000

Required test accessories:

None

Example report:

```

--- Temperature ---

Plug-in version: 3.0.0.0

System Unit (sensor 1):
Current: 27.00°C / 80.60°F, State: OK
Max.: 42.00°C / 107.60°F, Log: 0h 0min, Alarm: 0h 0min
Min.: 23.00°C / 73.40°F, Log: 0h 0min, Alarm: 0h 0min

System Unit (sensor 2):
Current: 30.00°C / 86.00°F, State: OK
Max.: 46.00°C / 114.80°F, Log: 0h 0min, Alarm: 0h 0min
Min.: 25.00°C / 77.00°F, Log: 0h 0min, Alarm: 0h 0min

System Unit (sensor 3):
Current: 35.00°C / 95.00°F, State: OK
Max.: 50.00°C / 122.00°F, Log: 0h 0min, Alarm: 0h 0min
Min.: 29.00°C / 84.20°F, Log: 0h 0min, Alarm: 0h 0min

System Unit (sensor 4):
Current: 31.00°C / 87.80°F, State: OK
Max.: 100.00°C / 212.00°F, Log: 0h 0min, Alarm: 0h 0min
Min.: -128.00°C / -198.40°F, Log: 0h 0min, Alarm: 0h 0min

IF Module 3 (sensor 1):
Current: 48.25°C / 118.85°F, State: OK
Max.: 67.75°C / 153.95°F, Log: 0h 0min, Alarm: 0h 0min
Min.: 24.50°C / 76.10°F, Log: 0h 0min, Alarm: 0h 0min

Panel 8 (sensor 1):
Current: 29.50°C / 85.10°F, State: OK
Max.: 42.50°C / 108.50°F, Log: 0h 0min, Alarm: 0h 0min
Min.: 23.25°C / 73.85°F, Log: 0h 0min, Alarm: 0h 0min

```

Test passed.

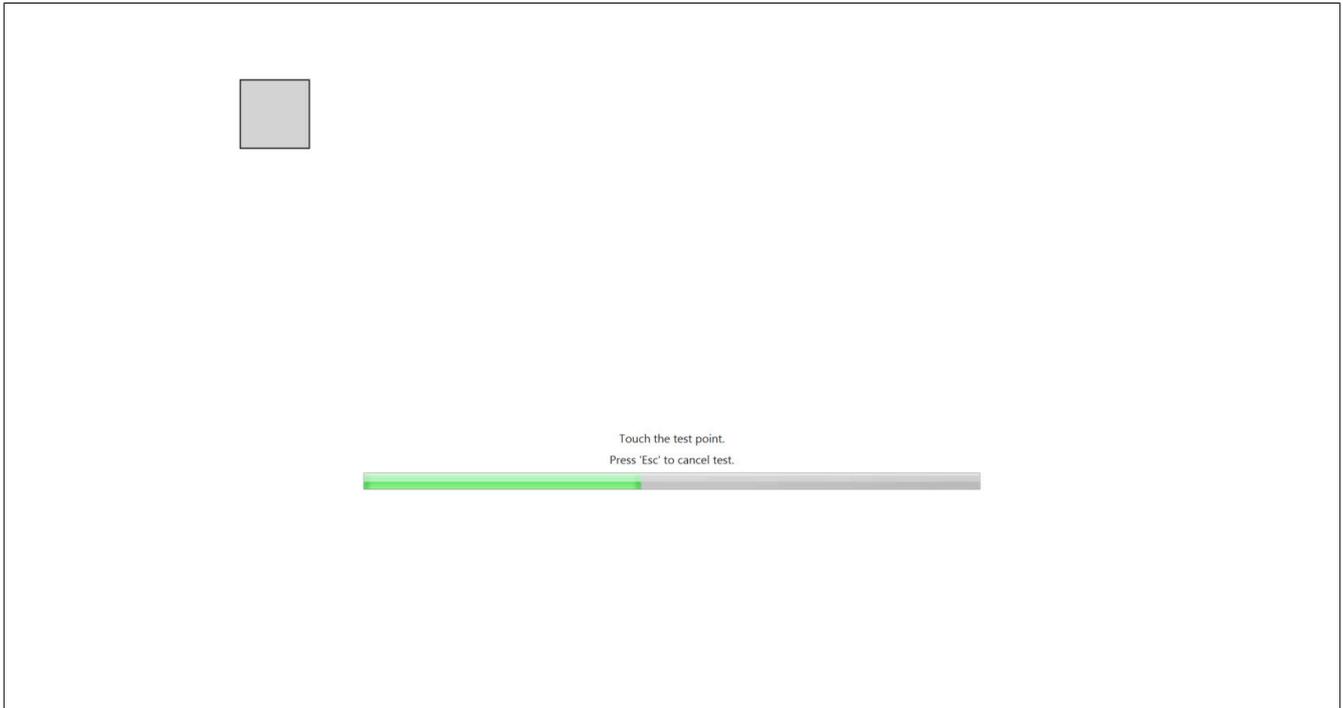
2.8.15 Touch screen

Scope of testing:

Tests the touch screen of the primary panel.

Test description:

This test first checks whether a serial (resistive) single-touch screen or USB (capacitive) multi-touch screen is present. If no touch screen was detected, an entry is written to the report and the test is ended with status "Passed". If a touch screen has been detected, it must be confirmed that the touch screen test can be started. In this test, five test points on the touch screen must be pressed: top left, top right, lower left, lower right and center of the screen. The test can be canceled with "ESC"; it will also time out automatically after 20 seconds of inactivity.



Information:

On devices that do not support widescreen resolutions (APC2100, PPC2100), the test image is either "stretched" or centered and an accurate touch screen test is not possible; it is necessary to "find" the correct points on the touch screen.

A message is displayed at the end of the touch screen test that must be confirmed with OK if the test was successful.

Automatic testing:

No

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- AP800, AP900, AP9x3, AP9xD, AP1000, AP5000

Required test accessories:

None

Example report:

```
--- Touch ---

Plug-in version: 3.0.0.0

Test point 1 of 5 touched.
Test point 2 of 5 touched.
```

Test point 3 of 5 touched.
Test point 4 of 5 touched.
Test point 5 of 5 touched.
User was asked "Did the touch screen work correctly?". User confirmed with "Yes".

Test passed.

2.8.16 UPS

Scope of testing:

Tests the optional UPS.

Test description:

This test reads factory settings, statistics, voltages, state of the UPS and performs a UPS test.

The PC's power supply is switched off during the UPS test. The system then checks whether the UPS takes over supplying power or the PC restarts. This test is only possible in manual mode since the power supply must be switched off manually (a corresponding prompt message is displayed).

Automatic testing:

Partial (without PC restart)

Supported devices:

- APC910, APC3100, APC4100
- PPC900, PPC3100

Supported interface options:

- 5AC901.IUPS-00
- 5AC901.IUPS-01

Required test accessories:

None

Example report:

```
--- UPS ---

Plug-in version: 3.0.0.0

Vendor ID: 0x00000000
Device ID: 0x0000D851
Compatibility ID: 0x0000
Hardware revision: A5
Serial number: D8510168533
Model number: 5AC901.IUPS-00

Power-on cycles: 1149
Operating hours: 10306h 0min
On-battery cycles: 67
Battery operating hours: 0h 30min

Battery voltage: 29.497 V
Battery current: 0.106 A

Status: PowerOk

UPS function test passed.

Test passed.
```

2.8.17 USB

Scope of testing:

Tests the USB interfaces on the PC and connected panels.

Test description:

A message to connect a USB flash drive to the USB interface being tested is displayed. If the Service Center USB flash drive is already connected to the USB interface, it can be left there. Confirm this with **OK** to continue.

The system then checks whether a new USB flash drive was connected. If not, the USB interface to which the HMI Service Center USB flash drive is connected is tested.

Information:

Testing with the HMI Service Center USB flash drive connected can only be done once since the USB flash drive should not be disconnected and reconnected during a system cycle.

Data is read from the USB flash drive in the next step.

This test cannot determine how many USB interfaces are actually on an Automation Panel or Panel PC panel, or if there are any at all. Press **OK** to confirm the message as to whether the panel has a USB interface.

A message box will be shown after each tested USB interface. If an additional USB interface exists on the panel, this message box must be confirmed with **OK**.

Notes:

It is not possible to assign the USB interfaces to the housing label.

Automatic testing:

Yes (for one USB interface only)

Supported devices:

- APC910, APC2100, APC2200, APC3100, APC4100
- PPC900, PPC2100, PPC2200, PPC3100, PPC1200
- MPC3100
- AP800, AP900, AP9x3, AP9xD, AP1000, AP5000

Required test accessories:

USB flash drive

Example report:

```
--- USB ---

Plug-in version: 3.0.0.0

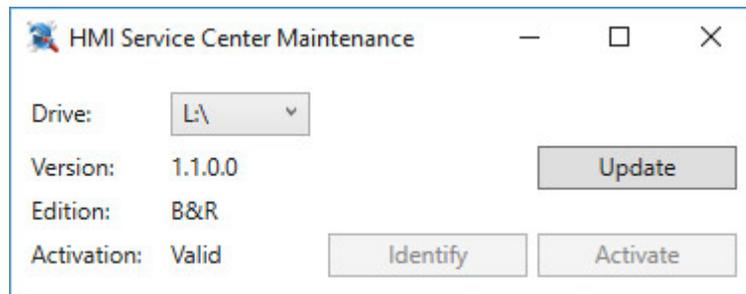
USB interface: 1

Testing USB interface...
Passed

Test passed.
```

3 HMI Service Center Maintenance tool

The HMI Service Center Maintenance tool displays information about the HMI Service Center USB flash drive (e.g. version, edition and activation status) and offers the possibility to install or update the HMI Service Center on a USB flash drive and to perform activation of the paid version in two steps. The HMI Service Center Maintenance tool can be downloaded from the B&R website (www.br-automation.com).



3.1 Requirements

Microsoft .NET Framework 4.7.2. is required to execute the tool. This can be downloaded from the Microsoft website (www.microsoft.com).

3.2 Installation

The USB flash drive must be correctly partitioned before installing the HMI Service Center (see "[Partitioning the USB flash drive](#)" on page 6).

A Service Center Update Package (SCU) file is required to install the HMI Service Center. This can be downloaded from the B&R website (www.br-automation.com).

Click **Install** and select the SCU file. The HMI Service Center is then installed on the USB flash drive.

Information:

Installing HMI Service Center version < 3.0.0 is only possible on an HMI Service Center flash drive (5SWUTI.0001-000).

3.3 Update

To update the HMI Service Center, a Service Center Update Package (SCU) file is required. This can be downloaded from the B&R website (www.br-automation.com).

Click **Update** and select the SCU file. The HMI Service Center flash drive is then updated.

It is possible to update to a newer or older version.

Information:

An activated HMI Service Center flash drive (5SWUTI.0001-000) is required to upgrade to a version < 3.0.0.

3.4 Activation

Activation of the flash drive is only necessary for HMI Service Center versions < 3.0.0.

Activation is required if the HMI Service Center Maintenance tool shows status "Invalid" under **Activation**.

Click on **Identify** to generate a Service Center Identification (SCI) file.

Send this file with the serial number of the HMI Service Center flash drive to B&R Support. This can generate a Service Center Activation (SCA) file using the SCI file and serial number.

After receiving the SCA file, click **Activate** and select the SCA file. The HMI Service Center flash drive is now reactivated and ready for use.