

ADI driver (Windows)

User's manual

Version: **1.30 (December 2018)**
Model no.: **ADI driver (Windows)**

Translation of the original documentation

All values in this manual are current as of its creation. We reserve the right to change the contents of this manual without notice. B&R Industrial Automation GmbH is not liable for technical or editorial errors and defects in this manual. In addition, B&R Industrial Automation GmbH assumes no liability for damages that are directly or indirectly attributable to the delivery, performance or use of this material. We point out that the software and hardware designations and brand names of the respective companies used in this document are subject to general trademark, brand or patent protection.

1 General information.....	3
1.1 Manual history.....	3
1.2 Organization of notices.....	4
1.3 Guidelines.....	4
1.4 Range of functions.....	5
1.5 Differences with the device-specific driver.....	5
1.6 Compatibility.....	6
2 Installation.....	7
3 Control Center.....	8
3.1 Tabs.....	9
3.1.1 Display.....	9
3.1.2 Keys.....	9
3.1.3 LEDs.....	10
3.1.4 Operating elements.....	10
3.1.5 Temperatures.....	11
3.1.6 Fans.....	11
3.1.7 Voltages.....	11
3.1.8 Statistics.....	11
3.1.9 Factory settings.....	11
3.1.10 User settings.....	11
3.1.11 Versions.....	11
3.1.12 Tools.....	12
3.2 Customization options.....	13
4 Display Brightness.....	14
5 HMI Report.....	15
6 UPS Manager.....	16
6.1 Status.....	17
6.2 Monitor.....	17
6.3 Information.....	17
6.4 Settings.....	17
6.4.1 Advanced settings.....	17
7 Guidelines for use.....	19
7.1 B&R Hypervisor operation.....	19
7.2 Software development.....	19

1 General information

Information:

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.

1.1 Manual history

Version	Date	Change
1.00	June 2017	First edition
1.10	September 2017	Updated company name and logo. Added chapter "B&R Hypervisor"
1.20	January 2018	Updated APC2200 and PPC2200.
1.30	December 2018	Updated for B&R ADI driver version 2.0. <ul style="list-style-type: none"> • Added chapters "Display Brightness", "HMI Report" and "UPS Manager". • Removed sections "UPS" and "Report" in chapter "Control Center". • Added section "Tools" in chapter "Control Center". • Renamed section "Factory settings" in chapter "Control Center" (German). • Revised text in chapter "Control Center". • Moved chapters "B&R Hypervisor" and "Software development" to chapter "Application notes". • Renamed section "B&R Hypervisor" to "B&R Hypervisor operation". Applied data to SMC.

1.2 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.

Table 1: Organization of safety notices

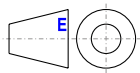
General notices

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

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

Table 2: Organization of general notices

1.3 Guidelines



European dimension standards apply to all dimension diagrams.

All dimensions in mm.

Unless otherwise specified, the following general tolerances apply:

Nominal dimension range	General tolerance per DIN ISO 2768 medium
Up to 6 mm	±0.1 mm
Over 6 to 30 mm	±0.2 mm
Over 30 to 120 mm	±0.3 mm
Over 120 to 400 mm	±0.5 mm
Over 400 to 1000 mm	±0.8 mm

Table 3: Nominal dimension ranges

1.4 Range of functions

This document contains technical information about the universal B&R ADI (Automatic Device Interface) driver. The description and figures refer to B&R ADI driver V2.0.

The ADI driver enables access to specific functions of B&R devices.

You can view and change the settings for B&R industrial PCs and Automation Panels with Control Center in the Control Panel.

Some functions of the ADI driver:

- Changing the display brightness
- Reading device-specific keys
- Switching device-specific LEDs
- Reading operating hours
- Reading operating elements

Some settings may be disabled depending on the B&R device being used.

1.5 Differences with the device-specific driver

There are several differences between the universal ADI driver and the device-specific ADI driver (e.g. APC910/PPC900):

- Display brightness and equalizer settings apply up to V1.4 per user and no longer systemwide. In version 2.0 and later, the settings once again apply systemwide.
- During a firmware download/upload, another firmware download/upload cannot take place.
- A current version of the ADI DLL is necessary to support new devices and functions in customer applications. This is installed on the device by the ADI driver installer.

1.6 Compatibility

Supported hardware

The B&R ADI driver supports the following devices:

- Automation PC 910 (APC910)
- Automation PC 2100 (APC2100)
- Automation PC 2200 (APC2200)
- Automation PC 3100 (APC3100)
- Panel PC 900 (PPC900)
- Panel PC 2100 (PPC2100)
- Panel PC 2200 (PPC2200)
- Panel PC 3100 (PPC3100)

The following panels are also supported:

- Automation Panel 800 (AP800)
- Automation Panel 830 (AP830)
- Automation Panel 900 (AP900)
- Automation Panel 9x3 (AP9x3)
- Automation Panel 9xD (AP9xD)
- Automation Panel 1000 (AP1000)
- Automation Panel 5000 (AP5000)

Supported operating systems

The B&R ADI driver supports the following operating systems:

- Windows 10 IoT Enterprise 2016 LTSB (64-bit)

2 Installation

Procedure for installing this software:

- Close all applications.
- Launch the installer.
- Follow the instructions.

You must have administrator rights to perform the installation!

Execute the installer with parameter /S for a silent/unattended installation.

For a detailed description of parameters, see the NSIS website.

http://nsis.sourceforge.net/Command_line_usage

During installation, an existing ADI driver is detected and updated automatically.

Information:

If the ADI driver is still in use by an application or service, it cannot be updated. In this case, close all applications and end all services accessing the ADI driver.

The following components are installed on the PC:

- MTCX driver
- ADI DLL
- ADI system service
- Control Center
- Display Brightness
- HMI Report
- UPS service
- UPS Manager

The ADI driver is installed in category **System devices** under the name **Maintenance Controller Extended (MTCX)** in the Device Manager.

3 Control Center

You can use the [Control Center](#) to view and change the settings for a B&R industrial PC and Automation Panels. The Control Center can be opened from the Control Panel or Start menu.

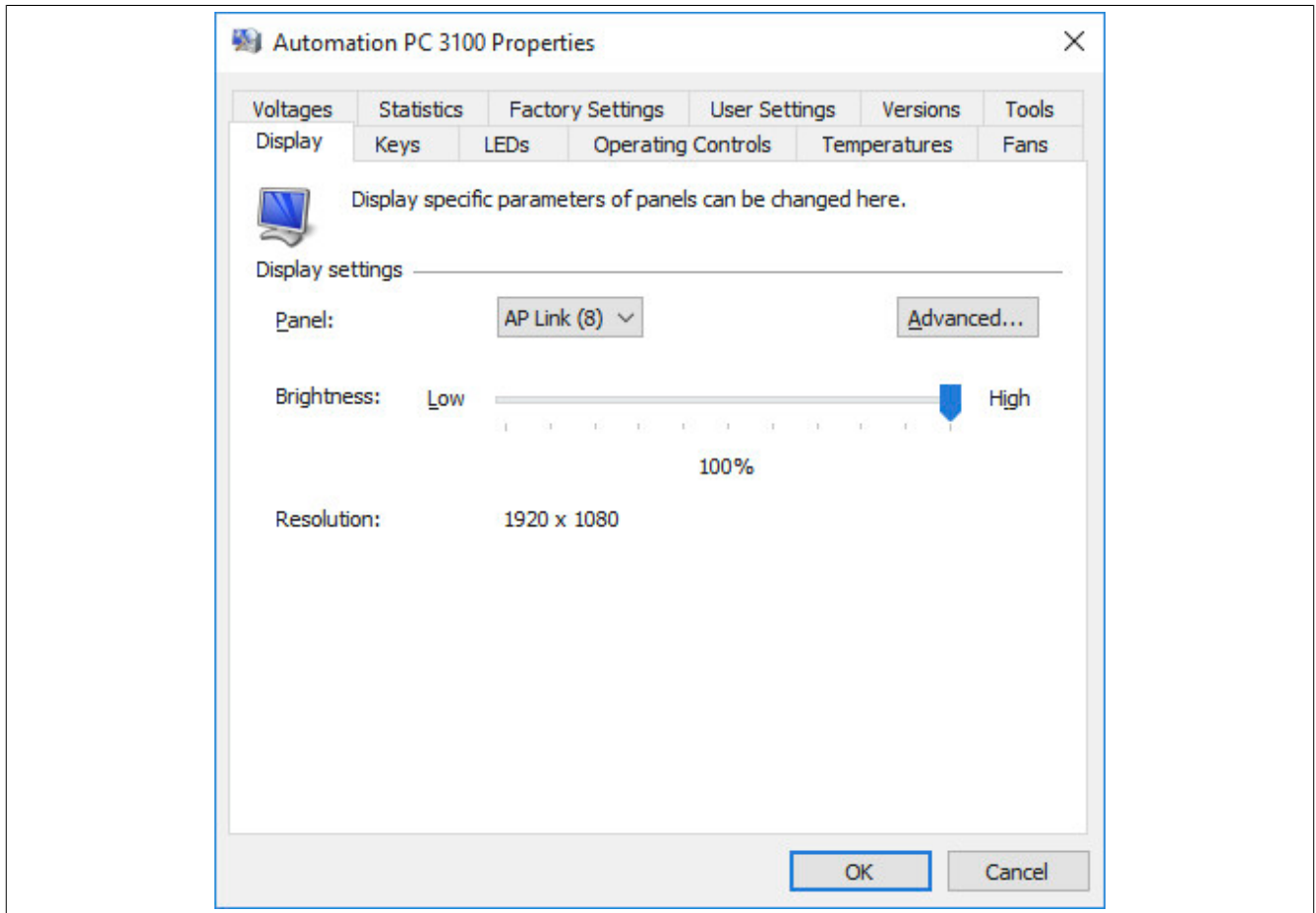


Figure 1: Control Center

3.1 Tabs

The following tabs can be selected:

- Display
- Keys
- LEDs
- Operating elements
- Temperatures
- Fans
- Voltages
- Statistics
- Factory settings
- User settings
- Versions
- Tools

The individual tabs are described in the following sections.

3.1.1 Display

Here you can change the display brightness and equalizer value of B&R Automation Panels and read the native resolution of the display.

Under **Panel**, you can select the built-in display (local) and panels connected via SDL. Only panels that are currently connected are displayed.

Under **Brightness**, you can use the slider to set the brightness value that the display is to be operated with. You can only set the brightness within the limit values specified for the display. This also means that changing by a certain percentage will have different effects on different display types.

Information:

A changed brightness value is only saved in the system (and used when the system is restarted) if the Control Center is closed with OK.

The configured brightness is independent of the value configured in BIOS Setup, i.e. the value set in BIOS is used until Windows boots. The value set in BIOS is only used the first time the Control Center is launched.

You can then change the SDL equalizer settings for a connected panel in the **advanced display settings**. The equalizer is built into the panel and adjusts the DVI signal for different cable lengths. The equalizer value is automatically calculated based on the cable length.

It is possible to set a manual equalizer value in order to obtain the best possible display quality (e.g. in the event of low-quality cables or poor DVI signal quality). To do this, disable **Use automatic settings** and use the slider to set the equalizer value that the display is to be operated with.

The equalizer setting can only be changed on panels that are connected via SDL (not with SDL3 and SDL4). Otherwise, the dialog fields will be disabled.

3.1.2 Keys

Here, you can configure and test the device-specific keys on B&R Automation Panels. Some dialog fields are only enabled if the selected panel supports keys.

The **key configuration** contains the key code for the device-specific keys, the mode for toggling between key layers and the definition of the key switches. The key configuration can be created as a KCF file with the B&R Key Editor or B&R KCF Editor and stored permanently on the PC. For additional information about both programs, see the B&R website.

Use **Update** to update the key configuration. Select the key configuration file in dialog box "File".

You can cancel the transfer by clicking on **Cancel** in dialog box "Transfer". **Cancel** is disabled while writing to flash memory.

Erasing the data in flash memory can take several seconds depending on the memory module used. During this time, the progress indicator is not updated.

With **Save**, you can save the installed key configuration on a data storage medium. In dialog box "File", select the destination folder and filename. You can cancel the transfer by clicking on **Cancel** in dialog box "Transfer".

With **Delete**, you can delete the key configuration installed on the PC.

The currently set layer number (0 to 3) is displayed in the right field under **key layer**. To make a change, enter the desired layer number in the left field and then click **Apply**.

The key layer can only be changed if there is a valid key configuration.

The key layer will be set back to 0 when the system is restarted.

Under **Panel** in **Panel settings and keys**, you can select the built-in display (local) and panels connected via SDL. Only panels that are currently connected are displayed. On the right, you can see whether the selected panel is locked (in this case, it is not possible to enter data using keys and single-touch).

The state of the optional key switches is displayed under **Key switch**: The representation begins with switch 8 (bit 7) on the left side. This field is disabled if the panel does not support keys.

Under **Lock time** in **Advanced panel settings**, you can specify how long all other panels will be locked if input to panel is entered using keys or single-touch. The valid range is 0 (no lock) to 65535 ms. Enter a **lock time** of either 0 or a value greater than 500 ms. The panel locking time is set back to the value configured in the key configuration when the system is restarted or the key configuration is updated. The locking time only affects keys for which a key code is defined in the key configuration, single-touch on panel PCs and single-touch on panels connected via SDL.

If you enable **Disable key codes**, no key codes from the keys on the selected panel will be transmitted to the system. You can still read out the state of the keys, however.

If you enable **Manual panel lock**, then the selected panel will be locked. Key or single-touch input is then no longer possible. Key codes and the panel are freed back up after the system is restarted.

The key states are displayed in **dialog box "Keys"**. This field is disabled if the panel does not support keys.

Pressed keys are indicated by "1"; released keys are indicated by "0".

First pressed key shows the number of the first pressed key in the matrix.

The key codes do not have to be configured for key matrix display. Evaluating keys that have already been configured is disabled while dialog box "Keys" is displayed so that the keys can be pressed without Windows having to respond.

3.1.3 LEDs

You can test the device-specific LEDs of B&R Automation Panels here.

These dialog fields are only enabled if the selected panel supports LEDs. If a valid key configuration exists, the LED state can only be set for LEDs that are not configured as LED status indicators (HDD, panel locking, etc.). The LEDs can only be set here for testing purposes and are switched off again after restarting the system.

Under **Panel**, you can select the built-in display (local) and panels connected via SDL. Only panels that are currently connected are displayed.

With option **Set all LEDs**, you can select whether you want to set or display the status of a single LED or all LEDs.

Under **Number**, you can select an LED number between 0 and 127. When the number is changed, the current state is displayed under **LED state**.

Under **Layer**, you can select the layer number between 0 and 3. When the number is changed, the current state is displayed under **LED state**. The LED layer can only be changed if there is a valid key configuration.

Under **LED state**, the current state (off, slow blinking, fast blinking, on) of an LED is displayed; with option **Set all LEDs** enabled, the state of all LEDs is displayed. Clicking on another state sets the state of the selected LED or of all LEDs. In order for the new LED state to be displayed immediately when the entered layer is not the same as the active layer, enable **Automatic layer change**.

Under **Automatic test** you can start an automatic LED test. The test begins with the specified LED number and layer and ends when it reaches LED number 127. Each LED is switched on for 2 seconds. If **Quick** is enabled, each LED is switched on for 200 milliseconds.

3.1.4 Operating elements

You can view operating elements such as handwheels, selector switches and rotary encoders here. The displayed values are updated automatically.

You must enable the optional rotary encoder display of the Automation Panel via the Windows registry, see ["Customization options"](#) on page 13.

3.1.5 Temperatures

Here you can display temperature values for the B&R industrial PCs and B&R Automation Panels. The displayed values are updated automatically. If a temperature value cannot be read, it will be indicated by "****".

For information about assigning the temperature values to the sensor positions, see the PC's user's manual.

Temperature values of panels are only displayed for the built-in display (local) and panels connected via SDL.

3.1.6 Fans

Here you can view and test the fan speeds of the B&R industrial PC. The displayed values are updated automatically.

You can test the fans using **System fan test** or **Bus fan test**. Select a value for this (Auto, Min, 25%, 50%, 75%, Max).

With **Auto**, the fans operate in automatic mode. All other settings specify the minimum speed of the fans (as a percentage of the possible speed range). In automatic mode, the fans will increase in speed automatically if the temperature of the device increases.

The settings that can be selected here do not always have a linear relationship to the fan's speed. For example, setting the speed to 50% does not mean that it is exactly between the minimum and maximum values.

The selected setting is only applied after the system is restarted. If you want the fan to constantly operate at a certain minimum speed, change setting "Fan control" in BIOS Setup.

3.1.7 Voltages

You can view voltage values for the B&R industrial PCs here. The displayed values are updated automatically.

3.1.8 Statistics

You can view statistical information about the B&R industrial PCs and B&R Automation Panels here, e.g. operating hours and number of switch-on procedures. The displayed values are updated automatically. If a statistical value cannot be read, it will be indicated by "****".

Statistical values of panels are only displayed for the built-in display (local) and panels connected via SDL.

3.1.9 Factory settings

You can view the factory settings of the B&R industrial PC or a connected B&R Automation Panel here. The factory settings include the material number, serial number and hardware revision of the device.

For a complete list of factory settings, see B&R HMI Report (["HMI Report"](#) on page 15).

Factory settings of panels are only displayed for the built-in display (local) and panels connected via SDL.

3.1.10 User settings

You can configure a user serial ID here. You can use this ID to mark the B&R industrial PC with your own identification number.

Under **User serial ID** you can enter a value between 0 and FFFFFFFF hexadecimal.

3.1.11 Versions

You can view the version of the Control Center and BIOS as well as the firmware installed on the B&R Industrial PC and connected B&R Automation Panels. You can also update and save the firmware being used by the PC and panel components.

Dialog box "Info" displays the version of the Control Center and the installed ADI driver modules.

With **Update** you can update the firmware of a PC or panel component. Select the firmware file in dialog box "File".

You can cancel the transfer by clicking on **Cancel** in dialog box "Transfer". **Cancel** is disabled while writing to flash memory.

Erasing the data in flash memory can take several seconds depending on the memory module used. During this time, the progress indicator is not updated.

The firmware update (download) is entered in the Windows event log (under "Application", "ADI DLL").

Information:

If the transfer on the Automation Panel 800 or Automation Panel 900 has been aborted due to an error, you must repeat the procedure until the firmware is updated successfully. Otherwise, the panel will not work after being switched on!

Information:

After updating the firmware of a PC component (MTCX, SDL), you must switch off the PC's power supply and then switch it back on again in order for the new firmware to take effect and the updated version to be displayed. When you close the Control Center, a dialog box is displayed requesting you to do so.

If a UPS is installed, you must switch off the PC either from the operating system or with the power button or disconnect the UPS battery before switching off the power supply.

After the firmware update on an Automation Panel 800 or Automation Panel 900, you must switch off the panel's power supply and then switch it back on again in order for the new firmware to take effect and the updated version to be displayed. When you close the Control Center, a dialog box is displayed requesting you to do so.

On an Automation Panel 9x3, Automation Panel 9xD, Automation Panel 1000, Automation Panel 5000 and SDL Converter, the panel or SDL Converter is restarted automatically after the firmware is updated.

With **Save**, you can save the installed firmware of a PC or panel component on a data storage medium. In dialog box "File", select the destination folder and filename. You can cancel the transfer by clicking on **Cancel** in dialog box "Transfer".

3.1.12 Tools

The following tools can be used to view/change settings or create a report.

Use the **Display Brightness** tool (see "[Display Brightness](#)" on page 14) to change the brightness setting of the B&R Automation Panel.

Use the **HMI Report** tool (see "[HMI Report](#)" on page 15) to create a report containing device-specific information.

Use the **UPS Manager** tool (see "[UPS Manager](#)" on page 16) to display UPS status values and operating data or change its settings.

3.2 Customization options

Some Control Center functions can be locked for the user by writing to entries in the Windows registry:

```
[HKEY_CURRENT_USER\Control Panel\ADI]
; Cannot update firmware
"DisableFirmwareUpdate"=dword:00000000
; Cannot update key configuration
"DisableKcfUpdate"=dword:00000000
; Cannot lock key codes"
DisableKeyLock"=dword:00000000
; Cannot change panel lock time
"DisableLockTime"=dword:00000000
; Cannot lock panels
"DisablePanelLock"=dword:00000000
; Cannot change user serial ID
"DisableUserSerialId"=dword:00000000
```

All tabs and some dialog boxes can also be hidden using entries in the Windows registry:

```
[HKEY_LOCAL_MACHINE\Software\BR_Automation\Adi\Driver]
"ShowAdvancedPanel"=dword:00000001
"ShowDisplay"=dword:00000001
"ShowFactorySettings"=dword:00000001
"ShowFans"=dword:00000001
"ShowKeys"=dword:00000001
"ShowLeds"=dword:00000001
"ShowOperatingControls"=dword:00000001
"ShowStatistics"=dword:00000001
"ShowTemperatures"=dword:00000001
"ShowTools"=dword:00000001
"ShowUserSettings"=dword:00000001
"ShowVersions"=dword:00000001
"ShowVoltages"=dword:00000001
```

The default value for all entries is 1, meaning display the tab or dialog box.

The display of the optional rotary encoder of Automation Panels in tab "Operating elements" can be enabled via the Windows registry.

```
[HKEY_LOCAL_MACHINE\Software\BR_Automation\Adi\Driver]
"ShowHandwheel"=dword:00000001
```

4 Display Brightness

You can use [Display Brightness](#) to change and display the display brightness of connected B&R Automation Panels and to change the display settings. Display Brightness can be opened by clicking on an icon in the notification area of the taskbar or from the Start menu.

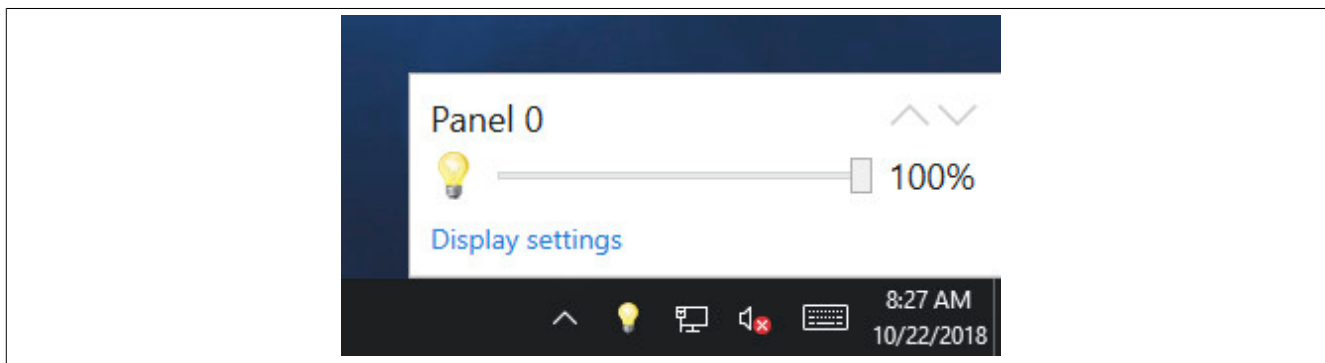


Figure 2: Display Brightness

The icon is hidden after reinstallation; see the figure below. Using drag-and-drop, the icon can be displayed via the Windows settings.

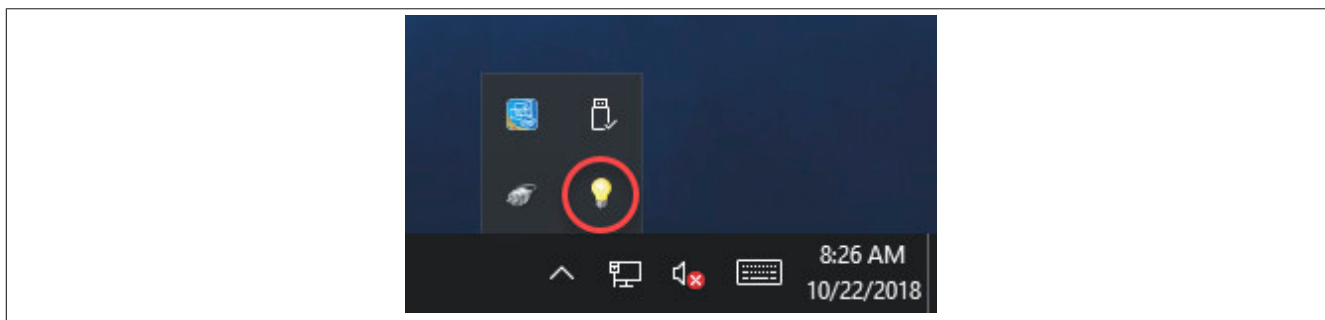


Figure 3: Displaying the brightness icon

The icon can be disabled in the Windows **Task Manager** under tab **Autostart**.

Use the **{142}^** and **{144}v** buttons to select a panel. If no panel with a higher or lower panel number is connected, the corresponding button is disabled.

You can open the Control Center display settings by clicking on **Display settings**. If the Control Center is already open, it is brought to the foreground and the last selected tab is displayed.

5 HMI Report

Using the [HMI Report](#), you can create a report with device-specific information. This report can then be used for support purposes or system documentation. HMI Report can be opened from the Start menu.

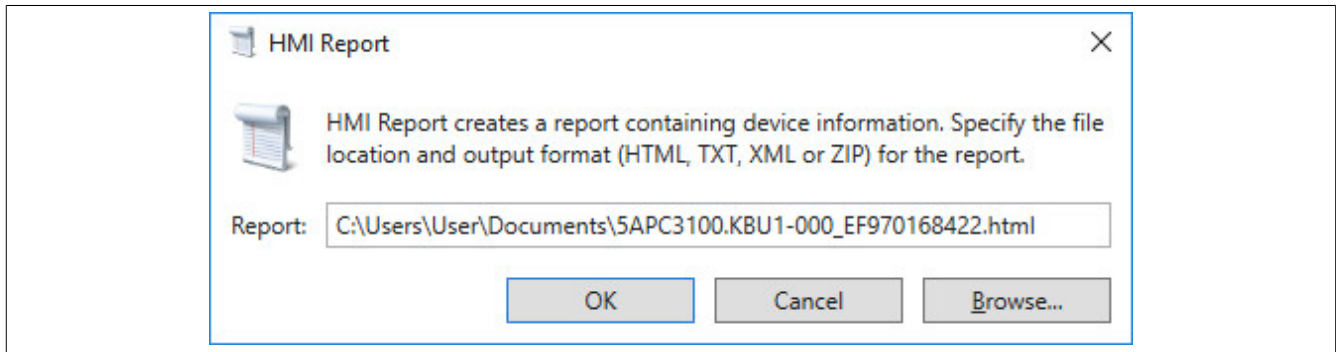


Figure 4: HMI Report

The following output formats are available:

- HTML Report (HTML) - Report in HTML format for display in the browser.
- Text Report (TXT) - Report in text format for display in the text editor.
- XML Report (XML) - Report in XML format for display in the browser.
- Diagnostic package (ZIP) - The diagnostic package contains a text report and log files for troubleshooting by B&R.

Under **Report**, you can specify the location, filename and output format of the report. By clicking on **Browse**, you can also use dialog box "File".

Alternatively, you can create the report from the **command line** using command "`C:\Programs\BrAutomation\Adi\System\HmiReport\BR.Hmi.Report.Cli.exe <Filename>`".

If no filename is specified, a text report is created with file name "`<material number>_<serial number>.txt`".

Information:

Administrator rights are required to read the SMART values from data storage media. Start HMI Report as administrator if you need SMART values in the report.

6 UPS Manager

With the [UPS Manager](#), you can view status values and operating data (e.g. battery voltage and charging current or factory settings) for an installed UPS in addition to changing settings for the UPS. The UPS Manager can be opened by clicking on a symbol in the notification area of the taskbar or from the Start menu. The symbol is only displayed if a UPS exists.

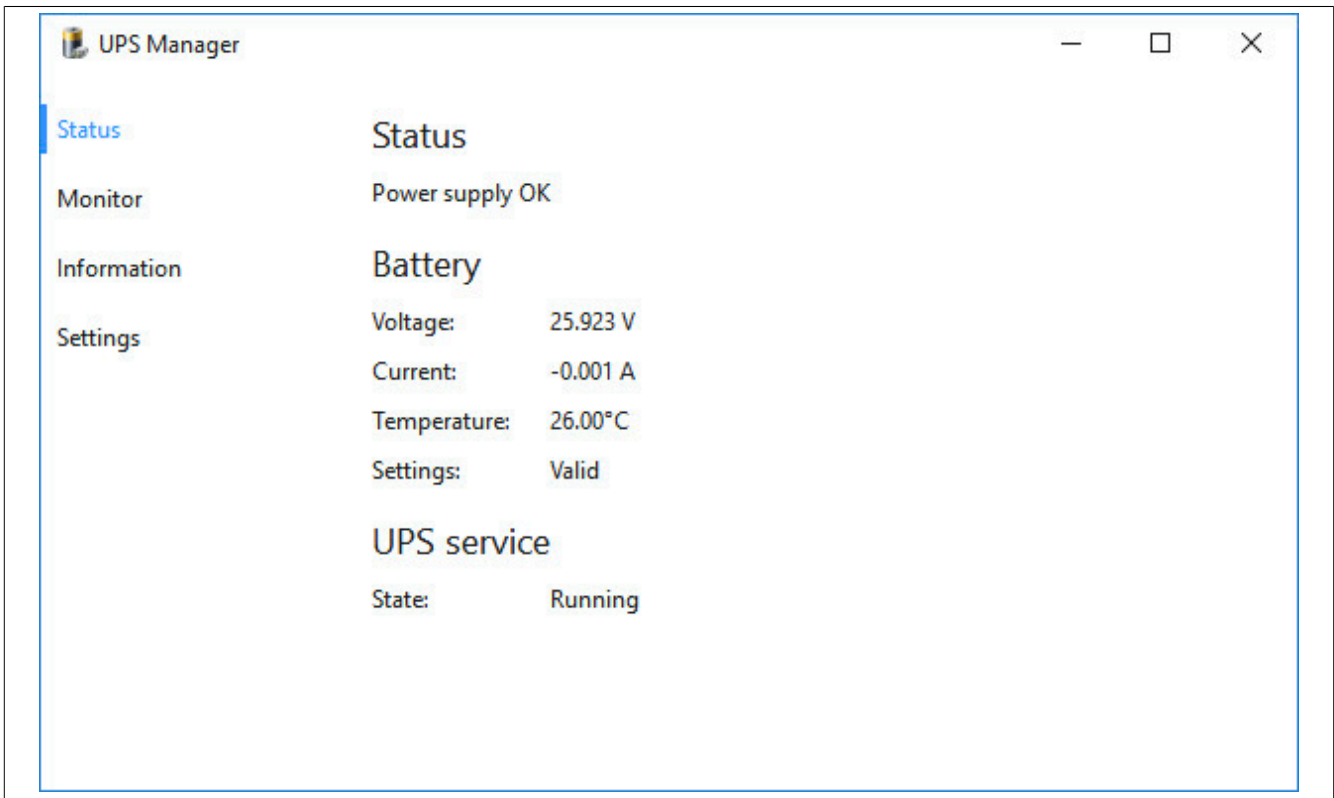


Figure 5: UPS Manager

The UPS Manager displays the UPS status (e.g. mains operation, battery operation) in the notification area symbol. After the reinstallation, the [UPS Manager symbol](#) is hidden. Using drag-and-drop, the icon can be displayed via the Windows settings.

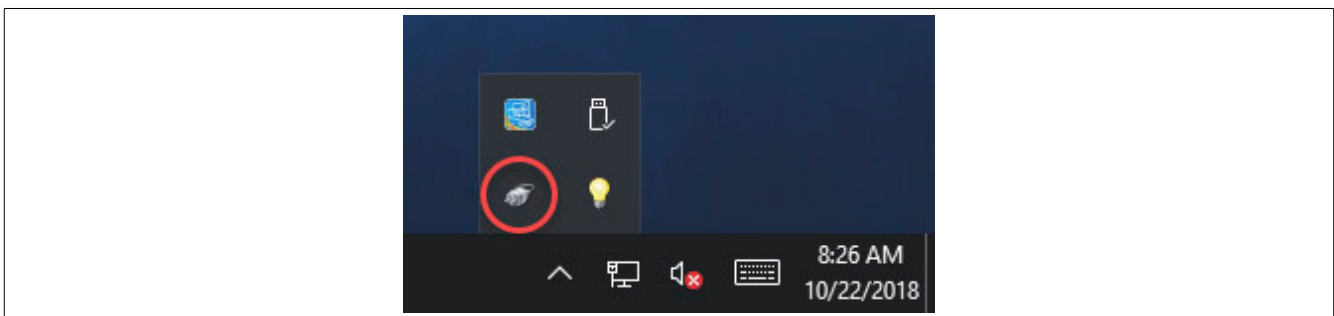


Figure 6: UPS Manager symbol

The icon can be disabled in the Windows **Task Manager** under tab **Autostart**.

The following menu options are available in the UPS Manager:

- Status
- Monitor
- Information
- Settings

The individual menu options are described in the following sections.

6.1 Status

Here you can display the status values of the UPS, the battery and the UPS service. The displayed values are updated automatically; critical values are displayed in red.

UPS status **Battery failure**, for example, indicates that the UPS battery is not properly connected, defective or has an impermissible voltage. **No backup possible** indicates that UPS battery operation is currently not possible.

The UPS status can also be read via a symbol in the notification area of the taskbar. An optional notification appears for each status change. This can be enabled or disabled via menu option **Settings**, see "[Settings](#)" on page 17.

The UPS service is responsible for monitoring the UPS status and shutting down the system after a power failure. If a UPS exists, the UPS service is started automatically.

6.2 Monitor

Here you can display the UPS status changes, the battery and the UPS service. To update the values, click the **Update** button or press the **F5** key.

You can export the displayed monitor values as a text file by clicking the **Save as...** button.

6.3 Information

Here you can display device information and statistical information of the UPS. The displayed values are updated automatically.

6.4 Settings

You can display and change UPS settings here.

Enable **Display notifications** if you want to receive a notification for each status change. All changes made to the UPS status are also displayed independently of these options via a symbol in the notification area of the taskbar and entered in the Windows event log (under "Application", "ADI UPS").

The status changes can be displayed via menu option **Monitor**.

6.4.1 Advanced settings

You can display and change advanced UPS settings here.

Information:

Administrator rights are required to change the advanced settings!

Enable **Display shutdown notification** if you want a notification to be displayed when the system is shut down.

Enable **Limit maximum time in battery operation** if you want to limit the maximum time in battery operation. The PC normally only shuts down automatically when the battery is low. Here you can specify the time the PC should be operated on battery power before the system shuts down. The default value is 5 minutes; the valid range of values is between 10 and 180 minutes.

Information:

If the battery is nearly empty, then the system will shut down before the defined time.

Enable **Shut down UPS on shutdown after** if the UPS should be switched off during shutdown. The UPS is automatically switched off when the PC is shut down properly. Here you can limit the time the PC should be operated on battery power in the event of a fault before the UPS is shut down. The specified time must be greater than the time needed to shut down the operating system. The default value is 180 seconds; the valid range of values is between 10 and 1200 seconds.

Tip: To change a value in individual steps using the slider, you can click on the scale to the left and right of the slider.

Enabling this option is also necessary to restart the PC automatically if power is restored at shutdown.

For the **UPS shutdown time**, specify the shutdown time to wait in the event of low battery level or UPS errors (e.g. overtemperature) before the power supply is shut down. The specified time must be greater than the time needed to shut down the operating system. The default value is 180 seconds; the valid range of values is between 10 and 1200 seconds.

Tip: To change a value in individual steps using the slider, you can click on the scale to the left and right of the slider. This prevents the UPS battery from discharging too much if the UPS service is not active and the operating system thus does not shut down or does not shut down properly.

Information:

Note that a self-initiated shutdown by the UPS at a low battery level cannot be canceled, even if the power supply is restored.

A shutdown initiated by the UPS has higher priority than a shutdown command from the UPS service (see also "Shut down UPS on shutdown after").

7 Guidelines for use

This chapter describes application notes for the ADI driver.

7.1 B&R Hypervisor operation

ADI must be switched to hypervisor mode in order use the B&R Hypervisor. This mode is enabled via the Windows registry:

```
[HKEY_LOCAL_MACHINE\Software\BR_Automation\Adi]
"Hypervisor"=dword:00000001
```

Hypervisor mode ensures that Windows and Automation Runtime Embedded do not access the MTCX interface at the same time. If the MTCX is blocked by Automation Runtime Embedded, ADI will wait a defined amount of time for the interface to be freed up. This waiting time can be adjusted via the registry. Value MtcxBusyWaitTime indicates the duration of how long ADI waits for the interface to be enabled by Automation Runtime Embedded (default value: 500 ms). Value MtcxSyncWaitTime specifies the length of time ADI waits for the interface to be enabled by another instance of ADI (default value: 500 ms). If the interface is blocked by another ADI instance and by the MTCX, then these two waiting times are added together (default value: 1 s).

```
[HKEY_LOCAL_MACHINE\Software\BR_Automation\Adi\Driver]
"MtcxBusyWaitTime"=dword:000001f4
"MtcxSyncWaitTime"=dword:000001f4
```

Updating and backing up firmware in hypervisor mode is not possible for performance and security reasons!

Information:

Hypervisor mode changes the timing for accessing the ADI interface and therefore the timing of the customer application!

7.2 Software development

In order to access ADI driver functions from your Windows application, you must use the ADI Development Kit or ADI .NET SDK.

Both of these can be downloaded at no cost from the B&R website (<http://www.br-automation.com>).

Publishing information

B&R Industrial Automation GmbH

B&R Strasse 1

5142 Eggelsberg

Austria

Telephone: +43 7748 6586-0

Fax: +43 7748 6586-26

office@br-automation.com