



# Windows 10 IoT Enterprise 2016 LTSC

## User's manual

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## I Version information

Version	Date	Comment	Responsible
1.00	2017-05-24	First edition	ROG
1.00a	2017-07-19	Updated model number texts. Added APC3100/PPC3100 Legacy model numbers. Added touch screen driver V1.4.2.	ROG
1.10	2018-03-08	Updated model number texts. Added APC2200/PPC2200. Added Version 1.1.5.	ROG
	2018-03-14	Adopted from working guide. Updated document template. Included Windows 10 description from introduction as separate sections. Combined "Activation notes" and "Activation". Included "Supported display resolutions" under "System requirements". Removed redundant sections "Important new features in B&R standard images" (this information is included in the version history). Removed redundant section "Content of delivery" (already partly included in "Installation" and "Drivers"). Combined "Assigning a standard image" and "Version history" under "Version overview". New section "Documentation". Removed "Unsupported interface options".	HOH
	2018-03-15	Added note on UEFI and legacy mode as well as GPT. Added note on Value, Entry and High End licenses. Included system requirements as body text instead of table.	HOH
	2018-04-16	Added Version 1.1.6.	ROG
	2018-09-10	Order numbers updated.	ROG
	2018-10-08	Download.NET Framework 3.5 offline installation added.	HOH
1.11	2018-11-22	Download Windows Settings Changer added.	HOH
	2018-11-27	Hypervisor operation added.	HOH

Table 1: Version information

## II Organization of safety notices

Safety notices in this document are organized as follows:

Safety notice	Description
Danger!	Failure to observe these safety guidelines and notices can result in death.
Warning!	Failure to observe these safety guidelines and notices can result in severe injury or substantial damage to property.
Caution!	Failure to observe these safety guidelines and notices can result in injury or damage to property.
Information:	These instructions are important for avoiding malfunctions.

Table 2: Organization of safety notices

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## 1 Introduction

B&R supports Windows 10 in the form of images based on Windows 10 IoT Enterprise 2016 LTSB on 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)

## 2 General information

Windows 10 IoT Enterprise 2016 LTSB is the successor to Windows 10 IoT Enterprise 2015 LTSB and based on new Windows 10 technology. The operating system also offers a higher level of protection for industrial applications through additional lockdown functions. Windows 10 IoT Enterprise 2016 LTSB is a special version of Windows 10 Enterprise for industrial use (Long-Term Servicing Branch) and based on Windows 10 Build 14393 (July 2016).

**Tip:**

**When searching the Internet for "Windows 10 IoT Enterprise 2016 LTSB", you will find more hits with the search term "Windows 10 Enterprise LTSB".**

LTSB (Long-Term Servicing Branch) means that, in contrast to a standard Windows 10 version, the range of features does not change over time. In a "standard" Windows 10 version, automatic feature updates and security updates cannot be completely prevented, but they can be delayed up to several months for certain versions. At some point, however, the time comes when a standard Windows 10 installs the feature updates or security updates and reboots automatically.

In a Windows 10 IoT Enterprise 2016 LTSB version, security updates and associated automatic reboots can be disabled. According to current Microsoft specifications, feature updates are not planned or possible at all, but are only carried out with a new LTSB version!

## 3 Order data

Model number	Short description
	<b>Windows 10 IoT Enterprise 2016 LTSC</b>
5SWW10.0542-MUL	W10IoT E 2016 64b APC2100 BYT
5SWW10.0543-MUL	W10IoT E 2016 64b PPC2100 BYT
5SWW10.0640-MUL	W10IoT V 2016 64b APC910 QM77/HM76
5SWW10.0649-MUL	W10IoT V 2016 64b APC910 QM170/HM170
5SWW10.0641-MUL	W10IoT V 2016 64b PPC900 QM77/HM76
5SWW10.0740-MUL	W10IoT H 2016 64b APC910 QM77/HM76
5SWW10.0749-MUL	W10IoT H 2016 64b APC910 QM170/CM236
5SWW10.0741-MUL	W10IoT H 2016 64b PPC900 QM77/HM76
5SWW10.0653-MUL	W10IoT V 2016 64b APC3100 KBU UEFI
5SWW10.0654-MUL	W10IoT V 2016 64b PPC3100 KBU UEFI
5SWW10.0655-MUL	W10IoT V 2016 64b APC3100 KBU Legacy
5SWW10.0656-MUL	W10IoT V 2016 64b PPC3100 KBU Legacy
5SWW10.0753-MUL	W10IoT H 2016 64b APC3100 KBU UEFI
5SWW10.0754-MUL	W10IoT H 2016 64b PPC3100 KBU UEFI
5SWW10.0755-MUL	W10IoT H 2016 64b APC3100 KBU Legacy
5SWW10.0756-MUL	W10IoT H 2016 64b PPC3100 KBU Legacy
5SWW10.0544-MUL	W10IoT E 2016 64b APC2200 APL UEFI
5SWW10.0545-MUL	W10IoT E 2016 64b PPC2200 APL UEFI
	<b>Optional accessories</b>
	<b>Windows 10 IoT Enterprise 2016 LTSC</b>
5SWW10.0800-MUL	Windows 10 IoT Enterprise 2016 LTSC - 64b - Language Packs DVD

**Table 3: Order data**

Three difference licenses are available for Windows 10 IoT Enterprise 2016 LTSC depending on the CPU performance class used:

License	Code in short description	CPUs
Entry	W10IoT <b>E</b> 2016 ...	Intel Atom
Value	W10IoT <b>V</b> 2016 ...	Intel Celeron and Core i3/i5
High End	W10IoT <b>H</b> 2016 ...	Intel Core i7 and Xeon E3

Windows 10 provides the same functionality for all licenses.

## 4 System requirements

Minimum size of data storage device: 20 GB<sup>1</sup>

Minimum size of RAM: 2 GB<sup>2</sup>

Windows 10 IoT Enterprise 2016 LTSC requires XGA resolution (800 x 600) or higher per Microsoft requirements to enable full operation of the Windows interface (e.g. system dialog boxes). A lower resolution can be selected for applications.

<sup>1</sup> The minimum size of the data storage device does not take into account the memory requirements of additional language packs.

<sup>2</sup> The specified memory size is a minimum requirement according to Microsoft. However, B&R recommends the use of at least 4 GB RAM for 64-bit operating systems.

## 5 Features

Windows 10 IoT Enterprise 2016 LTSB supports the following Microsoft features:

Feature	Windows 10 IoT Enterprise 2016 LTSB
Range of functions of Windows 10 Enterprise	✓ See also "Issues and limitations".
Internet Explorer 11, including Enterprise Mode	✓
Windows Touch	✓
Multilingual support	Can be installed using Language Packs DVDs (default language is English)
Page file	Configurable (disabled in the image by default by UWF)
Hibernate file	Configurable (disabled in the image by default)
System restore	Configurable (disabled in the image by default by UWF)
SuperFetch	Configurable (disabled in the image by default by UWF)
File indexing service	Configurable (disabled in the image by default by UWF)
Fast boot	Configurable (disabled in the image by default by UWF)
Defragmentation service	✓ (disabled when enabling the UWF)
<b>Additional lockdown features (excerpt)</b>	
Assigned access	Configurable
AppLocker	Configurable
Shell Launcher	Configurable
Unified Write Filter	✓
Keyboard Filter	Configurable

**Table 4: Feature overview**

For more information about later installation of languages, enabling features and lockdown features, see the B&R Windows 10 IoT Enterprise 2016 LTSB working guide.

### 5.1 Issues and limitations

The following are some of the differences:

- Unlike standard Windows 10 Enterprise, Windows 10 IoT Enterprise 2016 LTSB does not include Cortana, the Microsoft Edge browser or the Microsoft Store.
- The LTSB version is based on Windows 10 Build 14393 and does not receive any feature updates.

The version installed by B&R contains optimized settings for operation in industrial environments. These are described in detail in the Windows 10 IoT Enterprise 2016 LTSB working guide.

### Information:

**These settings, as well as all features not included in the LTSB version, result in different behavior compared to a standard Windows 10 Enterprise installation.**

## 6 Installation

B&R installs and pre-activates Windows 10 IoT Enterprise 2016 LTSB on a suitable data storage device (64-bit: minimum 20 GB). After the system is switched on for the first time, it runs through the out-of-box experience (OOBE), which allows the user to make various settings (e.g. language, region, keyboard, computer name, username, etc.).

Windows 10 IoT Enterprise 2016 LTSC can be installed on the APC3100 and PPC3100 in UEFI or Legacy BIOS mode; starting with the APC2200 and PPC2200, it can only be installed in UEFI mode. In UEFI mode, the data storage device containing the Windows partition is formatted with a GUID Partition Table (GPT) file system. For other drives, it is possible to use either the GPT or Master Boot Record (MBR) file format. A GPT drive can have up to 128 partitions.

## Information:

**Note that when installing in UEFI mode, the GPT file system must be supported by the software being used when backing up and restoring the installation.**

## 7 Drivers

The B&R standard image contains all drivers necessary for operation. If an older driver version is installed, the latest version of it can be downloaded and installed from the B&R website ([www.br-automation.com](http://www.br-automation.com)). Note that the Unified Write Filter (UWF) must be disabled for this.

## Information:

**Only download necessary drivers from the B&R website, not from vendor websites!**

## 8 Activation

Windows 10 IoT Enterprise 2016 LTSC behaves very similar to Windows 10 IoT Enterprise 2015 LTSC in terms of activation (although Microsoft does not document differences), which raises new problems described below.

### Ideally:

In principle, as long as a system does not connect to the Internet, no activation is required. As soon as a connection to the Internet is established, activation will take place.

### Reality:

The ideal case can actually only be ensured if a network connection is never established to some other system during the lifetime of a Windows 10 IoT Enterprise 2016 LTSC system.

If for some reason a network connection is temporarily or permanently available, Windows 10 IoT Enterprise 2016 LTSC tries to access the Internet cyclically so that activation can be performed.

If Windows 10 IoT Enterprise 2016 LTSC believes that Internet access is possible, it will attempt activation.

## Information:

**If potential Internet access is detected, it does not necessarily mean that activation is possible. If activation is not possible, e.g. due to IT company policies or other reasons, the previous version Windows 10 IoT Enterprise 2015 LTSC still suspected activation manipulation and went into the "deactivated" state.**

**As a result, a permanent watermark was displayed and various personalization options such as creating a new user, etc. were no longer possible.**

**This behavior could not be reproduced with Windows 10 IoT Enterprise 2016, but this does not mean that this behavior can no longer occur (Microsoft does not document anything about this).**

To avoid unpredictable problems as far as possible, B&R delivers its standard images for Windows 10 IoT Enterprise 2016 LTSC pre-activated and stores the activation-relevant data for reuse on the device in nonvolatile memory.

You can check the activation status in the Control Panel:



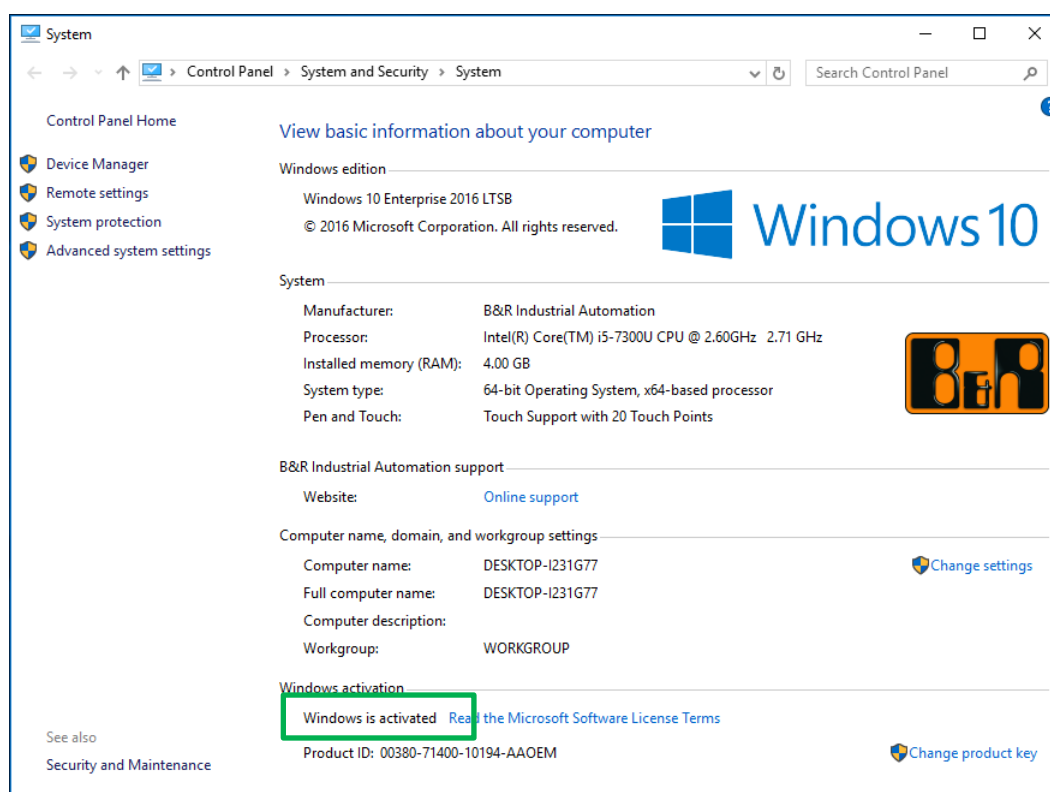


Figure 1: Activation status in the system properties

The activation performed by B&R is supported by special B&R extensions in the operating system and, in contrast to Windows 10 IoT Enterprise 2015 LTSP, theoretically should not be lost in the event of hardware changes (e.g. replacement of components in the event of repair) and when reinstalling the system (Microsoft reserves the right to make technical changes).

## Information:

**It is not necessary to enter a product key for activation. If activation via telephone or online is not possible, please contact B&R Support.**

**For backing up or restoring activation, see also the Windows 10 IoT Enterprise 2016 LTSP working guide.**

## 9 Languages

Like Windows 10 IoT Enterprise 2015 LTSB, Windows 10 IoT Enterprise 2016 LTSB is multilingual and covers all major languages, including those with Arabic and Chinese character sets.

Supported languages:	Language code
• Arabic	ar-SA
• Bulgarian	bg-BG
• Chinese (Simplified)	zh-CN
• Chinese (Traditional,Taiwan)	zh-TW
• Croatian	hr-Hr
• Czech	cs-CZ
• Danish	da-DK
• Dutch	nl-NL
• English (United Kingdom)	en-GB
• English (United States)	en-US
• Estonian	et-EE
• Finnish	fi-FI
• French	fr-FR
• French (Canada)	fr-CA
• English	de-DE
• Greek	el-GR
• Hebrew	he-IL
• Hungarian	hu-HU
• Italian	it-IT
• Japanese	ja-JP
• Korean	ko-KR
• Latvian	lv-LV
• Lithuanian	lt-LT
• Norwegian	nb-NO
• Polish	pl-PL
• Portuguese (Brazil)	pt-BR
• Portuguese (Portugal)	pt-PT
• Romanian	ro-RO
• Russian	ru-RU
• Serbian (Latin)	sr-Latn-RS
• Slovak	sk-SK
• Slovenian	sl-SI
• Spanish	es-ES
• Spanish (Mexico)	es-MX
• Swedish	sv-SE
• Thai	th-TH
• Turkish	tr-TR
• Ukrainian	uk-UA

**Table 5: Supported languages on the Language Packs DVD**

Installing languages later is described in the Windows 10 IoT Enterprise 2016 LTSB working guide.

## 10 Touch screen support

### 10.1 Single-touch

Current B&R single-touch panels (analog resistive with ELO or B&R touch controller) are supported by B&R touch screen driver V1.4 and later. This is already included in the B&R standard images and installed automatically on Panel PCs.

### 10.2 Multi-touch

Current B&R multi-touch panels (PCT) are supported by the included Microsoft driver; installing an extra driver is not necessary.

Windows 10 IoT Enterprise 2016 LTSC has better support for multi-touch devices:

- After login, multi-touch operation is possible without delay; in Windows 7, it was necessary to wait at least 5 seconds.
- In a "customized shell", multi-touch operation is also possible immediately; in Windows 7, delays of 120 seconds or more had to be expected.

## 11 Version overview

The following table shows the assignment of B&R standard images to the B&R Windows 10 IoT Enterprise 2016 LTSC version used:

Model number	Order code	Revision	Version
5SWW10.0542-MUL	W10IoT E 2016 64b APC2100 BYT	C0	V1.0.12
5SWW10.0543-MUL	W10IoT E 2016 64b PPC2100 BYT	C0	V1.0.12
5SWW10.0640-MUL	W10IoT V 2016 64b APC910 QM77/HM76	C0	V1.0.12
5SWW10.0649-MUL	W10IoT V 2016 64b APC910 QM170/HM170	C0	V1.0.12
5SWW10.0641-MUL	W10IoT V 2016 64b PPC900 QM77/HM76	C0	V1.0.12
5SWW10.0740-MUL	W10IoT H 2016 64b APC910 QM77/HM76	C0	V1.0.12
5SWW10.0749-MUL	W10IoT H 2016 64b APC910 QM170/CM236	C0	V1.0.12
5SWW10.0741-MUL	W10IoT H 2016 64b PPC900 QM77/HM76	C0	V1.0.12
5SWW10.0653-MUL	W10IoT V 2016 64b APC3100 KBU UEFI	C0	V1.0.12
5SWW10.0654-MUL	W10IoT V 2016 64b PPC3100 KBU UEFI	C0	V1.0.12
5SWW10.0655-MUL	W10IoT V 2016 64b APC3100 KBU Legacy	C0	V1.0.12
5SWW10.0656-MUL	W10IoT V 2016 64b PPC3100 KBU Legacy	C0	V1.0.12
5SWW10.0753-MUL	W10IoT H 2016 64b APC3100 KBU UEFI	C0	V1.0.12
5SWW10.0754-MUL	W10IoT H 2016 64b PPC3100 KBU UEFI	C0	V1.0.12
5SWW10.0755-MUL	W10IoT H 2016 64b APC3100 KBU Legacy	C0	V1.0.12
5SWW10.0756-MUL	W10IoT H 2016 64b PPC3100 KBU Legacy	C0	V1.0.12
5SWW10.0544-MUL	W10IoT E 2016 64b APC2200 APL UEFI	A5	V1.1.6
5SWW10.0545-MUL	W10IoT E 2016 64b PPC2200 APL UEFI	A5	V1.1.6

Table 6: Version overview

### 11.1 Version 1.1.6

The following B&R standard images are based on B&R Windows 10 IoT Enterprise 2016 LTSC V1.1.6:

Model number	Order code	Revision	Version
5SWW10.0544-MUL	W10IoT E 2016 64b APC2200 APL UEFI	A5	V1.1.6
5SWW10.0545-MUL	W10IoT E 2016 64b PPC2200 APL UEFI	A5	V1.1.6

Table 7: Standard images based on V1.1.6

-----  
Version 1.1.6 / 2018-06-05 / ROG  
-----

- The following QFEs (WinVer 14393.2068) are installed:
  - +KB4074590, KB4074595, KB4049065
- Additional included drivers:
  - +Audio Realtek HDA Codec V281
  - +B&R Devices V1.5.0.0
  - +Chipset APL V10.1.1.38
  - +Chipset APL TXE V3.0.0.1115
  - +Chipset HM76\_QM77\_BYT V10.0.27
  - +Chipset HM170\_QM170\_CM236 V10.1.1.38
  - +Chipset HM170\_QM170\_CM236 MEI V11.8.50.3434
  - +Chipset KBU V10.1.1.38
  - +Chipset KBU MEI V11.8.50.3434
  - +Graphics HM76 V15.28.24.64.4229
  - +Graphics HM170\_QM170\_CM236\_KBU\_APL V15.65.4.1.64.4973
  - +Graphics QM77\_BYT V15.33.46.64.4885
  - +Network Bluetooth LM811 V3.887.893.051816
  - +Network Intel 82573\_574\_567\_579\_I210\_I219 V23.1
  - +Network WLAN LM811 V1030.15.0901.2016
  - +RapStorTech HM170\_QM170\_CM236\_KBU V15.7.0.1014

```
+UniversalADI APC910_PPC900 V1.4
+UniversalADI APC2200_PPC2200 V1.4
+UniversalADI APC2100_PPC2100 V1.4
+UniversalADI APC3100_PPC3100 V1.4
+Touch screen driver V1.4.3
```

## 11.2 Version B1.1.5

The following B&R standard images are based on B&R Windows 10 IoT Enterprise 2016 LTSC version B1.1.5:

Model number	Order code	Revision	Version
5SWW10.0544-MUL	W10IoT E 2016 64b APC2200 APL UEFI	A0	B1.1.5
5SWW10.0545-MUL	W10IoT E 2016 64b PPC2200 APL UEFI	A0	B1.1.5

**Table 8: Standard images based on V1.1.5**

```
-----
Version 1.1.5 / 2018-03-13 / ROG
-----
- The following Microsoft QFEs are installed:
+KB4074595,KB4077525,KB4049065
- Additional included drivers:
+Audio Realtek HDA Codec V281
+B&R Devices V1.5.0.0
+Chipset APL V10.1.1.38
+Chipset APL TXE V3.0.0.1115
+Chipset HM76_QM77_BYT V10.0.27
+Chipset HM170_QM170_CM236 V10.1.1.38
+Chipset HM170_QM170_CM236 MEI V11.8.50.3434
+Chipset KBU V10.1.1.38
+Chipset KBU MEI V11.8.50.3434
+Graphics HM76 V15.28.24.64.4229
+Graphics HM170_QM170_CM236_KBU_APL V15.65.4.64.4958
+Graphics QM77_BYT V15.33.46.64.4885
+Network Bluetooth LM811 V3.887.893.051816
+Network Intel 82573 574 567 579 I210 I2190 V23.1
+Network WLAN LM811 V1030.15.0901.2016
+RapStorTech HM170_QM170_CM236_KBU V15.7.0.1014
+UniversalADI APC910_PPC900 V1.3
+UniversalADI APC2200_PPC2200 V1.3
+UniversalADI APC2100_PPC2100 V1.3
+UniversalADI APC3100_PPC3100 V1.3
+Touch screen driver V1.4.3
```

**Listing 1: Version B1.1.5 - History**

## 11.3 Version 1.0.12

The following B&R standard images are based on B&R Windows 10 IoT Enterprise 2016 LTSC V1.0.12:

Model number	Order code	Revision	Version
5SWW10.0542-MUL	W10IoT E 2016 64b APC2100 BYT	C0	V1.0.12
5SWW10.0543-MUL	W10IoT E 2016 64b PPC2100 BYT	C0	V1.0.12
5SWW10.0640-MUL	W10IoT V 2016 64b APC910 QM77/HM76	C0	V1.0.12
5SWW10.0649-MUL	W10IoT V 2016 64b APC910 QM170/HM170	C0	V1.0.12
5SWW10.0641-MUL	W10IoT V 2016 64b PPC900 QM77/HM76	C0	V1.0.12
5SWW10.0740-MUL	W10IoT H 2016 64b APC910 QM77/HM76	C0	V1.0.12
5SWW10.0749-MUL	W10IoT H 2016 64b APC910 QM170/CM236	C0	V1.0.12
5SWW10.0741-MUL	W10IoT H 2016 64b PPC900 QM77/HM76	C0	V1.0.12
5SWW10.0653-MUL	W10IoT V 2016 64b APC3100 KBU UEFI	C0	V1.0.12
5SWW10.0654-MUL	W10IoT V 2016 64b PPC3100 KBU UEFI	C0	V1.0.12

Model number	Order code	Revision	Version
5SWW10.0655-MUL	W10IoT V 2016 64b APC3100 KBU Legacy	C0	V1.0.12
5SWW10.0656-MUL	W10IoT V 2016 64b PPC3100 KBU Legacy	C0	V1.0.12
5SWW10.0753-MUL	W10IoT H 2016 64b APC3100 KBU UEFI	C0	V1.0.12
5SWW10.0754-MUL	W10IoT H 2016 64b PPC3100 KBU UEFI	C0	V1.0.12
5SWW10.0755-MUL	W10IoT H 2016 64b APC3100 KBU Legacy	C0	V1.0.12
5SWW10.0756-MUL	W10IoT H 2016 64b PPC3100 KBU Legacy	C0	V1.0.12

**Table 9: Standard images based on V1.0.12**

-----  
Version 1.0.12 / 2017-07-19 / ROG  
-----

- The following Microsoft QFEs are installed:
  - +KB4013418,KB4015217,KB4018483
- Additional included drivers:
  - +Audio Realtek HDA Codec V281
  - +B&R Devices V1.5.0.0
  - +Chipset HM76\_QM77\_BYT V10.1.1.38
  - +Chipset KABYLAKE V10.1.1.38
  - +Chipset HM170\_QM170\_CM236 V10.1.1.38
  - +Chipset KABYLAKE ManagementEngine V11.7.0.1002
  - +Graphics HM76 V15.28.24.64.4229
  - +Graphics HM170\_QM170\_CM236 KBYxPC3100 V15.45.16.64.4627
  - +Graphics QM77\_BYT V15.33.43.64.4425
  - +Network Bluetooth V3.887.893.051816
  - +Network Intel\_82573\_574\_567\_579\_I210\_I2190 V22.0.1
  - +Network WLAN V1030.15.0901.2016
  - +RapStorTech HM170\_QM170\_CM236 15.2.0.1020
  - +UniversalADI APC910\_PPC900 V1.0
  - +UniversalADI APC2100\_PPC2100 V1.0
  - +UniversalADI APC3100\_PPC3100 V1.0
  - +Touch screen driver V1.4.2

**Listing 2: V1.0.12 - History**

## 12 Planning a modified customer image

If a modified customer image should be created that is then used on several devices, you should always create a complete backup using the image program of your choice before starting the B&R standard image for the first time. This allows you to begin making your modifications from a defined starting point more often, if necessary.

### Information:

**Resetting the PC ("Reset this PC") does not reset the device to the B&R factory settings and should therefore not be used! Only a complete backup of the data storage device before the initial startup of the device can ensure this!**

For more information about creating customer images, see the Windows 10 IoT Enterprise 2016 LTSC working guide (see 17 Downloads).

## 13 Initial startup

### 13.1 Creating a backup image

#### Information:

**B&R recommends creating a separate backup image for each device series before starting the PC for the first time.**

With this backup image, the B&R factory settings can be restored again and again.

### 13.2 Checking the date and time

Before initial startup, check the date and time in BIOS and correct them if there's a large deviation.

#### Information:

**If the date and time deviate by +/- 1 day, it is possible that Windows Update will no longer work! In addition, there may also be problems performing or restoring an activation.**

### 13.3 Creating a user

B&R standard images are configured so that a freely definable username can be entered during initial startup (OOBE).

#### Information:

**Functionality of B&R standard images is only ensured with a local user profile; "Microsoft account" user profiles on the web are not supported!**

**To avoid accidentally defining a "Microsoft account" as a user profile on the web, it is recommended not to have the network cable connected during the OOBE.**

If a built-in administrator should be used, the device can be put into audit mode during the initial startup (see "Windows 10 IoT Enterprise 2016 LTSC working guide").

## 14 Guidelines for use

### 14.1 Hypervisor operation

In order to share the MTCX with Windows and Automation Runtime, the hypervisor mode must be enabled in the ADI driver (see ADI driver user's guide).

This requires an ADI driver version 1.2 or higher. The current ADI driver can be downloaded for free from the B&R website [www.br-automation.com](http://www.br-automation.com).

## 15 Limitations

### 15.1 Touch screen operation

Windows 10 is optimized for operation with capacitive multi-touch devices. Resistive touch devices are only conditionally suitable for Windows 10 IoT Enterprise 2016 LTSC devices due to the poor accessibility of the edges since some gestures and operating options (e.g. Action Center) may be difficult or impossible to perform.

### 15.2 RAID operation

PCI SATA controllers 5ACPCI.RAIC-01, 5ACPCI.RAIC-03, 5ACPCI.RAIC-05 and 5ACPCI.RAIC-06 are not supported due to missing drivers.

The SATA RAID controller on the APC910 and PPC900 with chipset QM77 is also not supported by Intel due to a missing driver and Control Panel support.

## 16 Known problems

### 16.1 MLC CFast - Older revisions

Functionality of Windows 10 IoT Enterprise 2016 LTSC is only ensured with MLC CFast data storage devices with Rev. D0 or later:

- 5CFAST.032G-10
- 5CFAST.064G-10
- 5CFAST.128G-10

### 16.2 Internet Connection Sharing (ICS)

In 2016 LTSC, ICS only works correctly immediately after the configuration.

In 2016 LTSC, ICS does not work after a reboot/restart.

In this case, ICS must be completely disabled once and then reassigned. ICS then works correctly until the next reboot/restart.

#### Information:

**The ICS problem is not limited to LTSC 2016, but also occurs in "normal" Windows 10 1607 Build 14393 (Redstone 1). Even with new Windows 10 Redstone 2 builds, this problem has not yet been corrected! With 2015 LTSC, ICS still worked without problems.**

B&R has therefore developed a workaround that automates the disabling/enabling of ICS after each reboot:

To automatically enable the ICS workaround after each reboot, simply launch file "IcsPatchAsTaskSchedulerAutoAsAdmin.cmd" in path "C:\Program Files (x86)\BrAutomation\IcsPatch" once as an administrator:



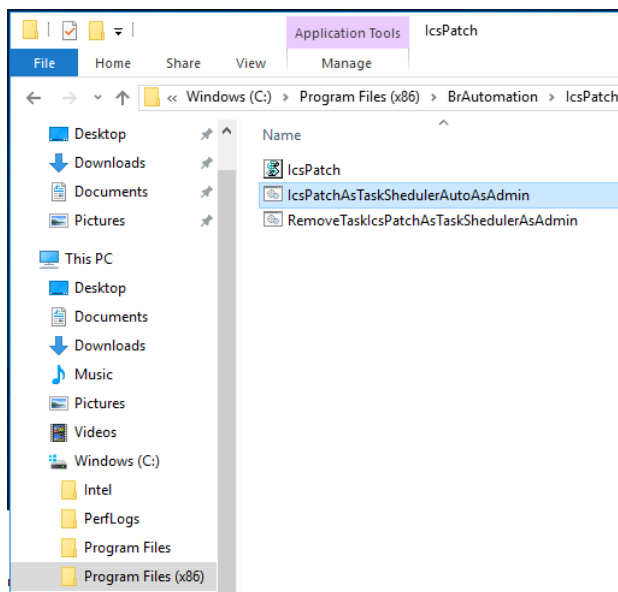


Figure 2: Enabling the ICS workaround

In the Task Scheduler, you can check whether the B&R ICS patch has been enabled:

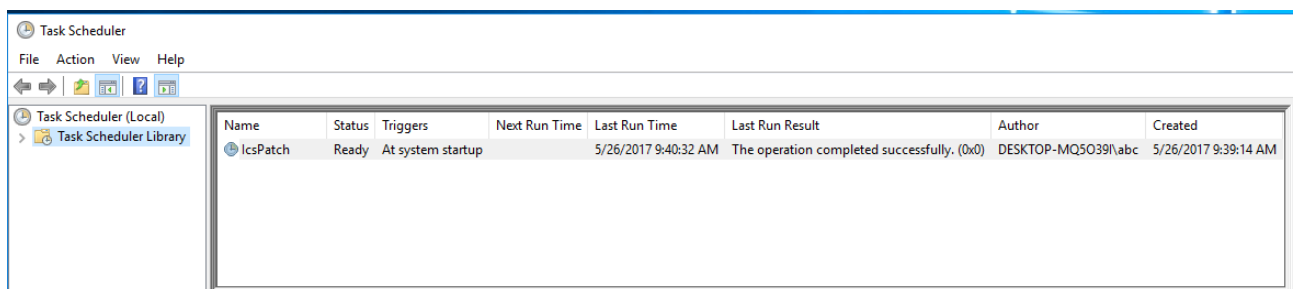


Figure 3: ICS patch enabled in the Task Scheduler

## Information:

The B&R ICS patch should only be enabled if ICS has been enabled and problems have been detected after a reboot.

To disable the ICS workaround again, simply launch file "RemoveTaskIcsPatchAsTaskShedulerAsAdmin.cmd" once as an administrator.

## 16.3 "Memory error" with "Automatically hide the taskbar"

When shutting down or restarting the system, error message "The memory could not be written" can appear in Windows Explorer.

This error message occurs if "Automatically hide the taskbar on desktop mode" has been selected and "Volume" is switched off under "Turn system icons on or off".

## Information:

This is system-dependent behavior of Windows 10 IoT Enterprise 2016 LTSB.

This can be avoided if "Volume" is not switched off under "Turn system icons on or off".

## 17 Downloads

The following downloads are available on the B&R website ([www.br-automation.com](http://www.br-automation.com)).<sup>3</sup>

### 17.1 Documentation

In addition to this description, the following documentation is also available:

#### **Windows 10 IoT Enterprise 2016 LTSB working guide**

Describes how a B&R Windows 10 IoT Enterprise 2016 LTSB image can be modified.

### 17.2 Tools

Following tools are available:

#### **.NET Framework 3.5 offline installation**

Files for installation of .NET Framework 3.5 offline without Internet connection in Windows 10 IoT Enterprise 2016 LTSB.

#### **UWF management**

Dialog-guided Windows program for configuring the Unified Write Filter.

#### **Windows 10 IoT Enterprise 2016 LTSB lockdown scripts**

PowerShell scripts for configuring the lockdown features Shell Launcher, Unified Write Filter and Keyboard Filter.

#### **Windows Settings Changer**

Dialog-guided Windows program for changing Windows settings.

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<sup>3</sup> Login is required for some downloads.

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