



Manual

Beckhoff Service Tool (BST)

Beckhoff software

Version: 1.0
Date: 2017-12-15

BECKHOFF

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1 Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.

It is essential that the documentation and the following notes and explanations are followed when installing and commissioning the components.

It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.

We reserve the right to revise and change the documentation at any time and without prior announcement.

No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

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EP1590927, EP1789857, DE102004044764, DE102007017835

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1.1 Explanation of symbols

The following symbols with corresponding warnings or explanatory text are used in the documentation. Read and follow the warnings.


Symbols that warn of personal injury:

 DANGER	Serious risk of injury Note this warning. Hazard with high risk of death or serious injury.
 WARNING	Risk of injury Note this warning. Hazard with medium risk of death or serious injury.
 CAUTION	Personal injuries Note this warning. Hazard with a low degree of risk, which could lead to minor or moderate injury.

Symbols that warn of damage to property or equipment:

 Attention	Damage to the devices or environment Note this warning. Risk of damage to the environment and equipment.
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Symbols indicating further information or tips:

 Note	Tip or pointer This symbol indicates information that contributes to better understanding.
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1.2 Documentation issue status

Version	Changes
1.0	First Version

2 Overview

The Beckhoff Service Tool, BST for short, is an easy-to-use graphical backup and recovery program for Industrial PCs with a Windows operating system.

With the Beckhoff Service Tool (BST) you can create an image of your operating system at any time and use it to back up your operating system. You can then restore the created images in the event of an error, or you can use the images to create PC systems with identical configurations and settings.

The BST is supplied on a BST stick. The BST sticks are available in sizes of 4, 8, 16 or 32 GB. The BST starts as soon as you boot the Industrial PC from the BST stick. You can save the images on the Industrial PC, on a network drive or directly on the BST stick.

BST versions and supported platforms

The BST is available in two versions:

- With Flat Boot. Platforms with less than 2 GB and Legacy BIOS mode are supported.
- With RAM Boot. Platforms with 2 GB or higher and Legacy/UEFI (x64) BIOS mode are supported.

For a detailed listing of order numbers and a feature matrix, see [Supported Platforms \[► 9\]](#).

Updating the BST stick with the ApplyBST tool

You can use the ApplyBST tool to update a BST stick. You can download the latest BST versions from the Beckhoff website. [ApplyBST tool \[► 11\]](#)

Remote access with TightVNC

The program TightVNC enables remote access to the BST. TightVNC can be downloaded free of charge. Use remote access if no input and output devices are available for configuring the BST on an Industrial PC. [Remote access with TightVNC \[► 12\]](#)

2.1 Supported Platforms

The BST version information can be found in the file *BST_Version.txt* on the BST stick or at the top right on the BST start page.

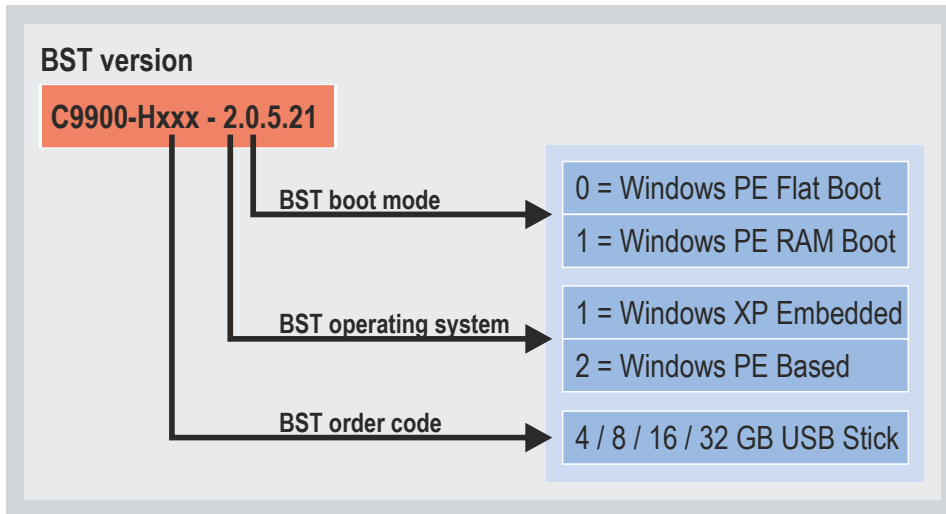


Fig. 1: Breakdown of BST versions.

The size of the RAM and the BIOS mode on the platform determine which BST version can be used.

Table 1: FLAT BOOT, supports platforms with less than 2 GB of RAM.

Order number	BST version	Acronis version	BST memory size	BIOS mode
C9900-H358 ¹⁾	2.0.x.xx	9.1	4 GB	Legacy
C9900-H361 ¹⁾	2.0.x.xx	9.1	8 GB	Legacy
C9900-H378 ¹⁾	2.0.x.xx	9.1	16 GB	Legacy

¹⁾ The CX1010 is not supported.

Table 2: RAM BOOT, supports platforms with 2 GB RAM or higher.

Order number	BST version	Acronis version	BST memory size	BIOS mode
C9900-H371	2.1.x.xx	11.x	4 GB	UEFI and Legacy
C9900-H372	2.1.x.xx	11.x	8 GB	UEFI and Legacy
C9900-H377	2.1.x.xx	11.x	16 GB	UEFI and Legacy
C9900-H391	2.1.x.xx	11.x	32 GB	UEFI and Legacy

Table 3: Beckhoff Service Tool (BST) Feature Matrix.

	C9900-H358	C9900-H361	C9900-H378	C9900-H371	C9900-H372	C9900-H377	C9900-H391
Flat Boot	x	x	x	-	-	-	-
RAM Boot	-	-	-	x	x	x	x
Size	4 GB	8 GB	16 GB	2 GB	8 GB	16 GB	31 GB
RAM (min.)	256 MB	256 MB	256 MB	2 GB	2 GB	2 GB	2 GB
Acronis version	9.1	9.1	9.1	11.x	11.x	11.x	11.x
Touch Screen	Single / PCT						
Network Drive	x						
Linked Buttons	x						
Easy Mode	x						
Password protection	x						
Fallback Images	x						
Platform Check	x						
Remote Connection	x						
Archive Splitting	x						
BIOS Mode	Legacy	Legacy	Legacy	Legacy/UEFI	Legacy/UEFI	Legacy/UEFI	Legacy/UEFI

2.2 BST start page

The start page of the Beckhoff Service Tool (BST) appears as soon as the Industrial PC has successfully booted from the BST stick.

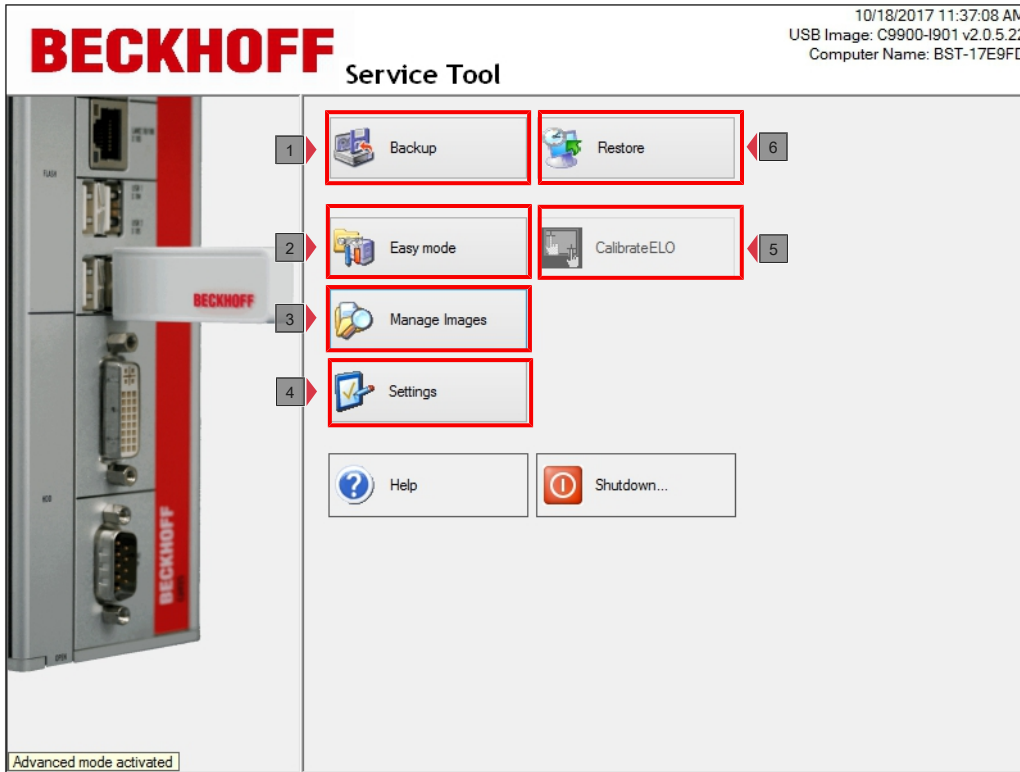


Fig. 2: Graphical user interface of the Beckhoff Service Tool (BST) after startup.

Table 4: Legend for the start page setup.

No.	Button	Description
1	Backup [► 14]	Creates an Acronis image of storage media or individual partitions in *.tib format.
2	Easy mode [► 19]	Enables or disables Easy mode. With Easy mode enabled, the Backup or Restore button can be used to automatically create or restore an image with predefined default settings. The default settings for the Easy mode can be configured under Settings .
3	Manage Images [► 21]	Use this button to manage the images
4	Settings	Further settings, e.g. user-defined buttons, Easy mode, network drives and Fallback.
5	CalibrateELO	Starts the calibration program, e.g. to calibrate touchscreens directly from the BST.
6	Restore [► 16]	This button can be used to restore previously created images or to install Beckhoff images.

3 ApplyBST tool

The ApplyBST tool allows you to install current BST versions on a BST stick. The ApplyBST tool is only compatible with Beckhoff BST sticks. USB sticks from other manufacturers are not compatible and are not recognized.

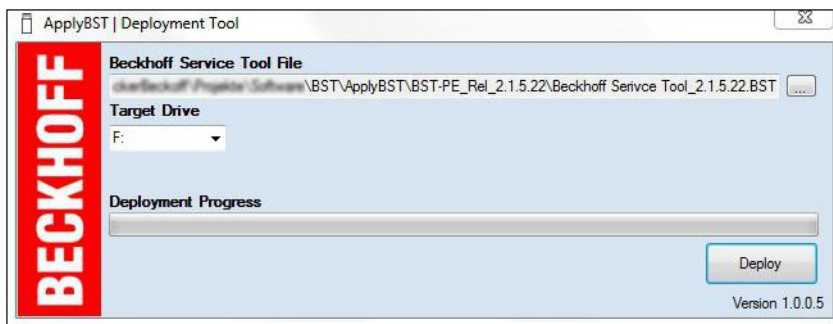
The ApplyBST tool and a current BST version can be downloaded from the Beckhoff website.

Requirements:

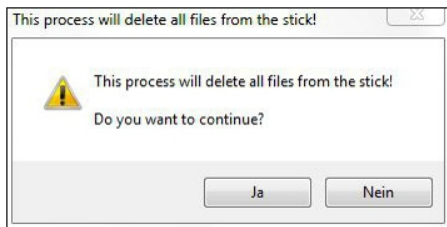
- Beckhoff BST stick.
- ApplyBST tool and a current BST image. Download under: ftp://ftp.beckhoff.com/software/Industrial_PC/Beckhoff_Service_Tool/Release_2.x/

Install a new BST version as follows:

1. Start the ApplyBST tool with **ApplyBST.exe**.



2. Select the current BST version under **Beckhoff Service Tool File**.
3. Select the BST stick under **Target Drive**.
4. Click **Deploy** to install the new BST version.



⇒ The new BST version is installed. In the next step you can boot from the BST stick and create or restore images.

4 Remote access with TightVNC

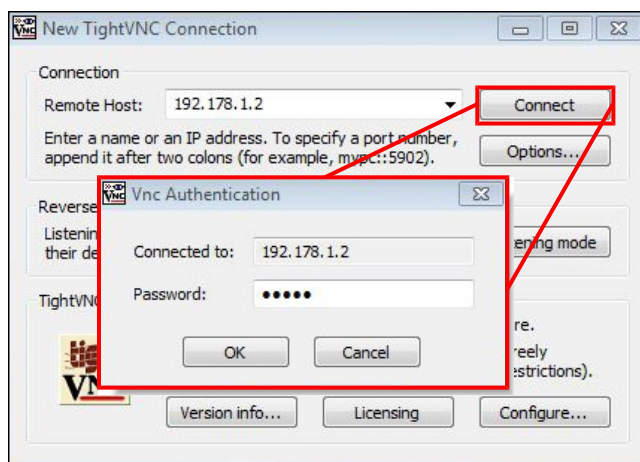
The TightVNC program enables remote access to the Beckhoff Service Tool (BST). Use remote access if no input and output devices are available for configuring the BST on an Industrial PC. To this end, install TightVNC on a configuration computer and make sure that the configuration computer and the Industrial PC are in the same network.

Requirements:

- The BST has already been started (see: [Start the Beckhoff Service Tool \(BST\) \[► 13\]](#)).
- TightVNC Download under: <http://www.tightvnc.com/download.php>
- Default IP address of the BST: DHCP is active for one of the ports. The other port has the fixed IP address 192.178.1.1

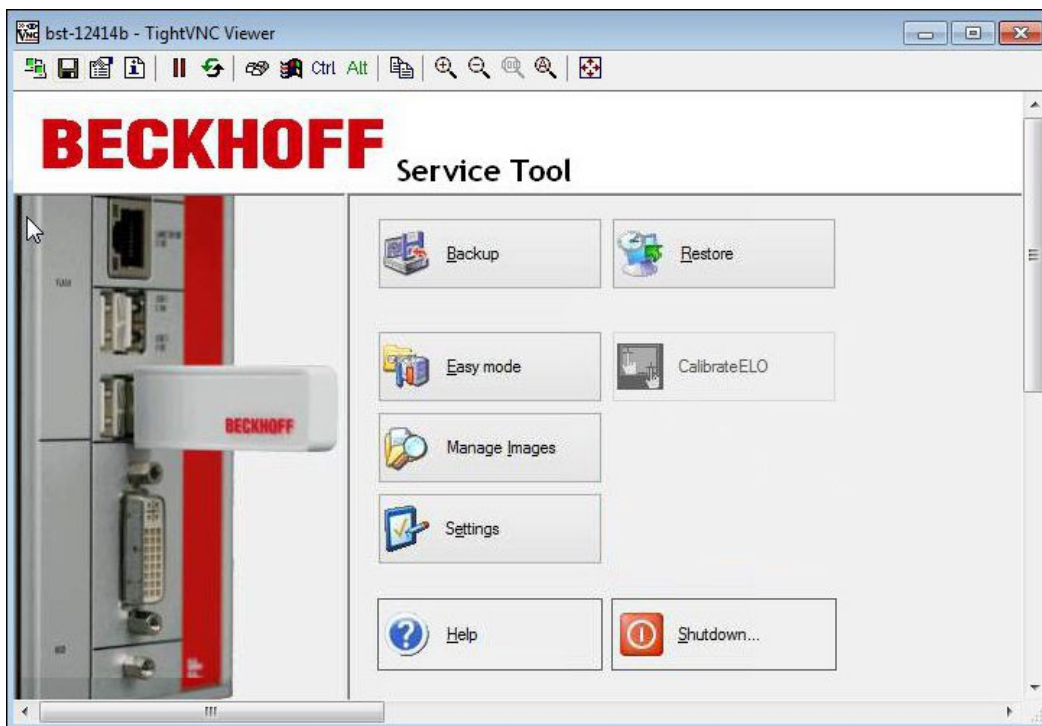
Configure remote access as follows.

1. Install TightVNC and start the **TightVNC Viewer**.
2. Enter the IP address of the BST under **Remote Host** and click **Connect**.



3. Enter the password "admin" to start remote access to the BST.

⇒ Remote access is started and the BST start page is displayed. In the next step, you can remotely configure the BST or create and restore images.



5 Create and restore images

5.1 Start the Beckhoff Service Tool (BST)

The Industrial PC must be booted from the BST USB flash drive in order to start the BST. Observe the boot order in the BIOS.

If the BST doesn't start, this means that the boot order has been changed or you are not using the correct BST version for the Industrial PC in use. Check the boot order in the BIOS and whether you are using the correct BST version.

Requirements

- BST USB flash drive is connected to an Industrial PC. The BST USB flash drive must be connected directly to the Industrial PC without a USB hub or a USB extension.
- The USB flash drive is the first boot medium in the BIOS.
- Correct BST version for the Industrial PC in use (see: [Supported Platforms \[► 9\]](#)).

Start the BST as follows:

1. Connect the BST USB flash drive to the Industrial PC and start the Industrial PC.
2. The BST is started and the start page is displayed.

- if the BST doesn't start -
3. Restart the Industrial PC and press **[Del]**.
The BIOS is started.
4. Check under **Boot > FIXED BOOT ORDER Priorities** whether the option **Beckhoff Stick** is set under **Boot Option #1**.
5. Check under **Boot > Boot mode select** whether the correct boot mode is selected for your BST. In DUAL mode the correct boot mode is selected automatically, depending on the BST.
6. Save the settings and exit from the BIOS.

⇒ The BST is started with the correct boot order and the correct BST for Legacy or UEFI BIOS.

5.2 Create image

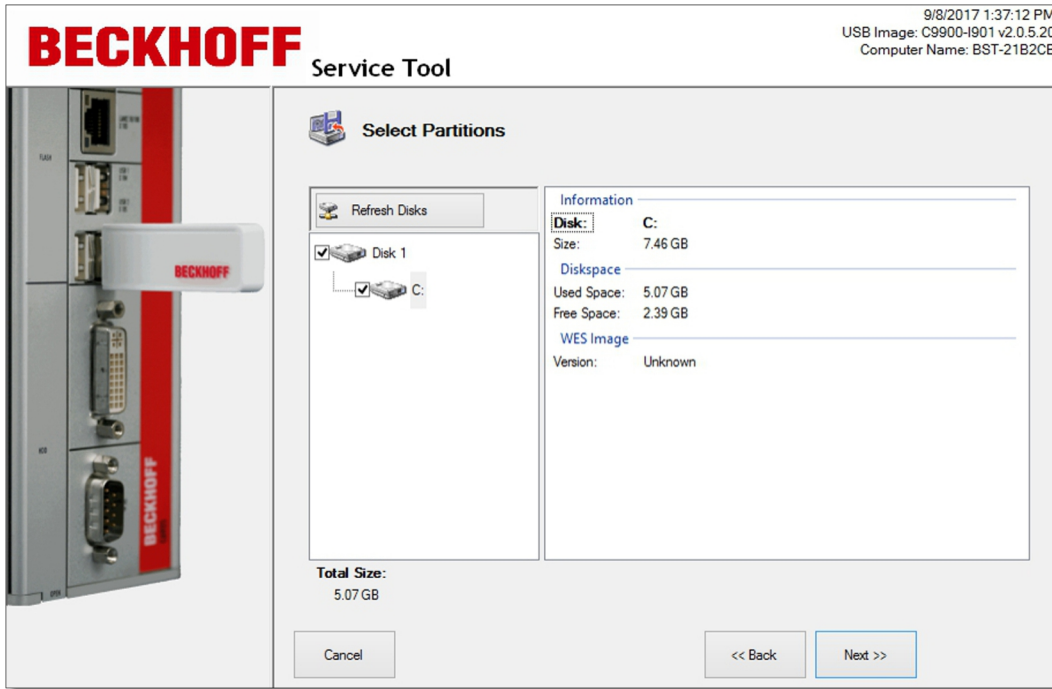
You can create an image of complete storage media or individual partitions in *.tib format. You can save the image on the BST stick, locally on the Industrial PC or on a network drive.

Requirements:

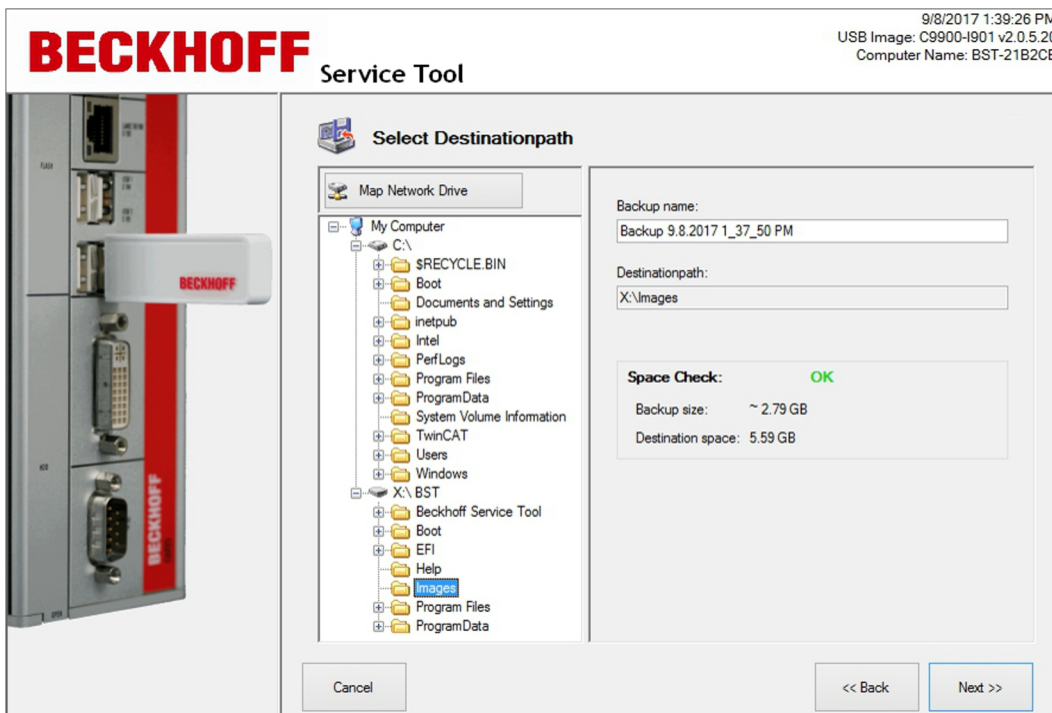
- Sufficient space on the BST stick or network drive.

Create an image as follows:

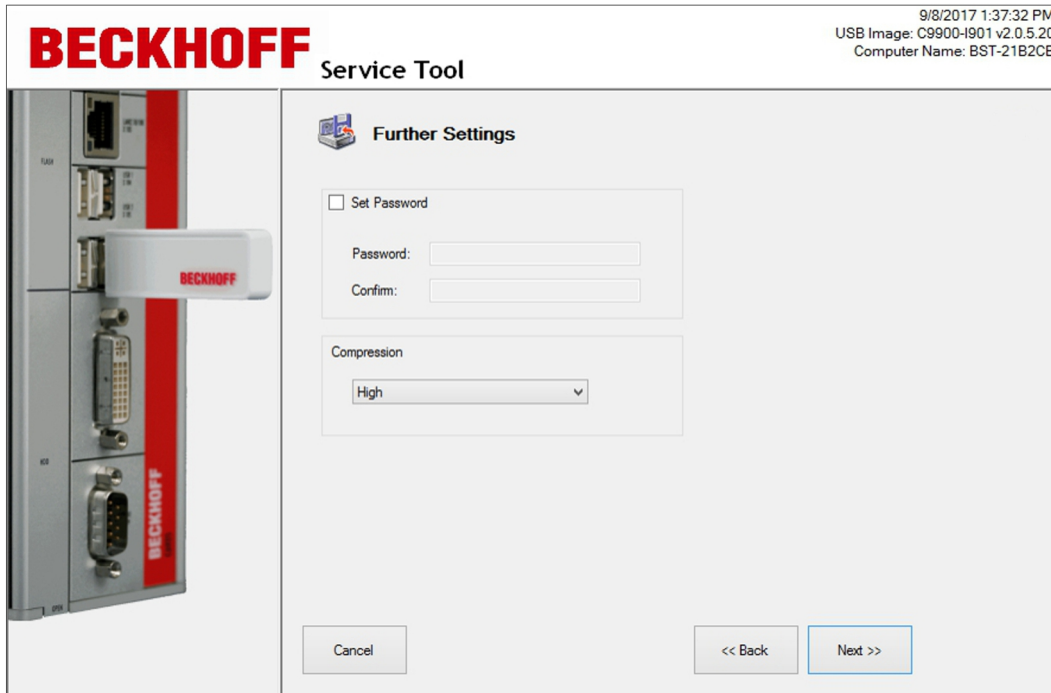
1. Click the **Backup** button, then click **Next**.
2. Select the drives and partitions you want to back up as an image.



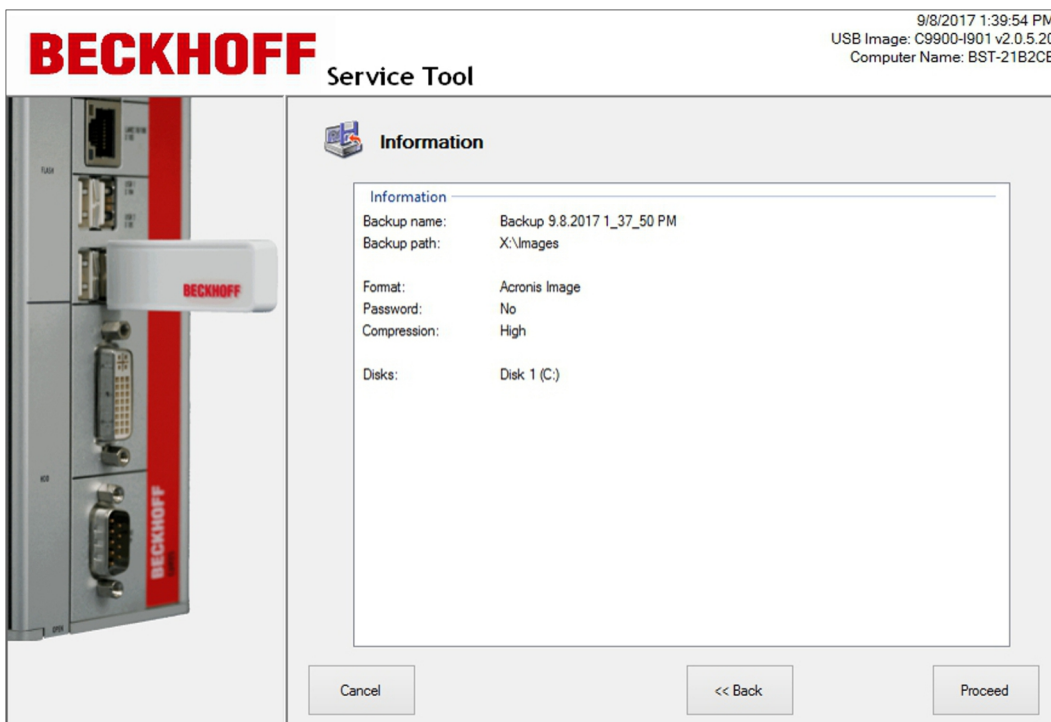
3. In the tree view, select the destination directory where you want to save the image. Use the **Map Network Drive** button to integrate a network drive.



4. In the next step you can set a password and the compression level.



5. Check the settings and click **Proceed**.



⇒ The image is created. Click **Close** to return to the start page.

5.3 Restore image



Attention

Loss of data

In this step the data on the storage media is deleted.
Back up your data before restoring an image.

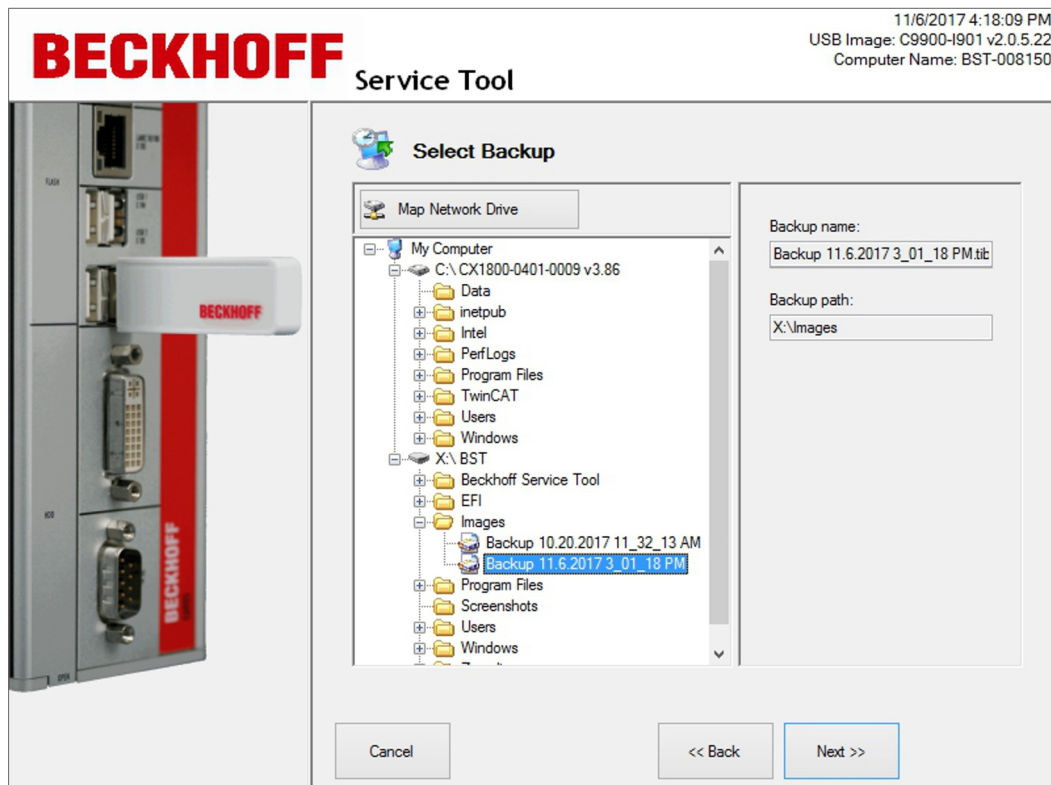
You can restore an image from a storage medium or a single partition. You can use this function in the event of an error or to create PC systems with identical configurations and settings.

Requirements:

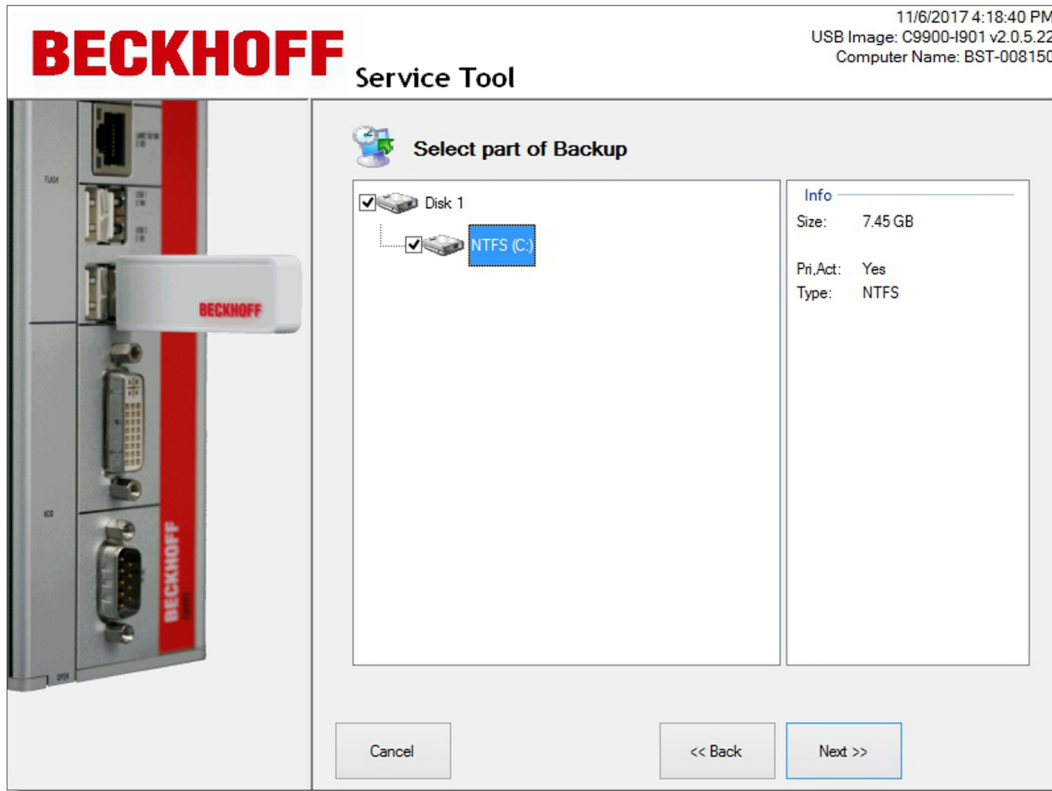
- A previously created image on the BST stick or a network drive.

You can restore an image as follows:

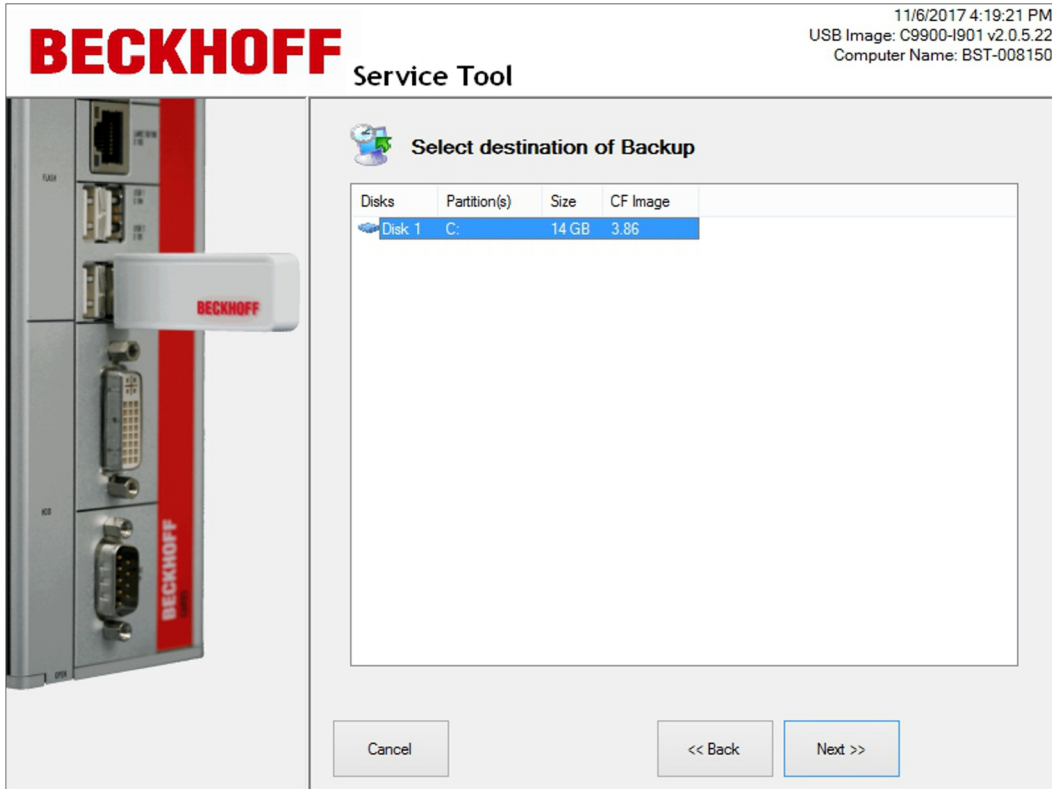
1. Click the **Restore** button, then click **Next**.
2. In the tree view, select the image you want to restore. Use the **Map Network Drive** button to integrate a network drive.



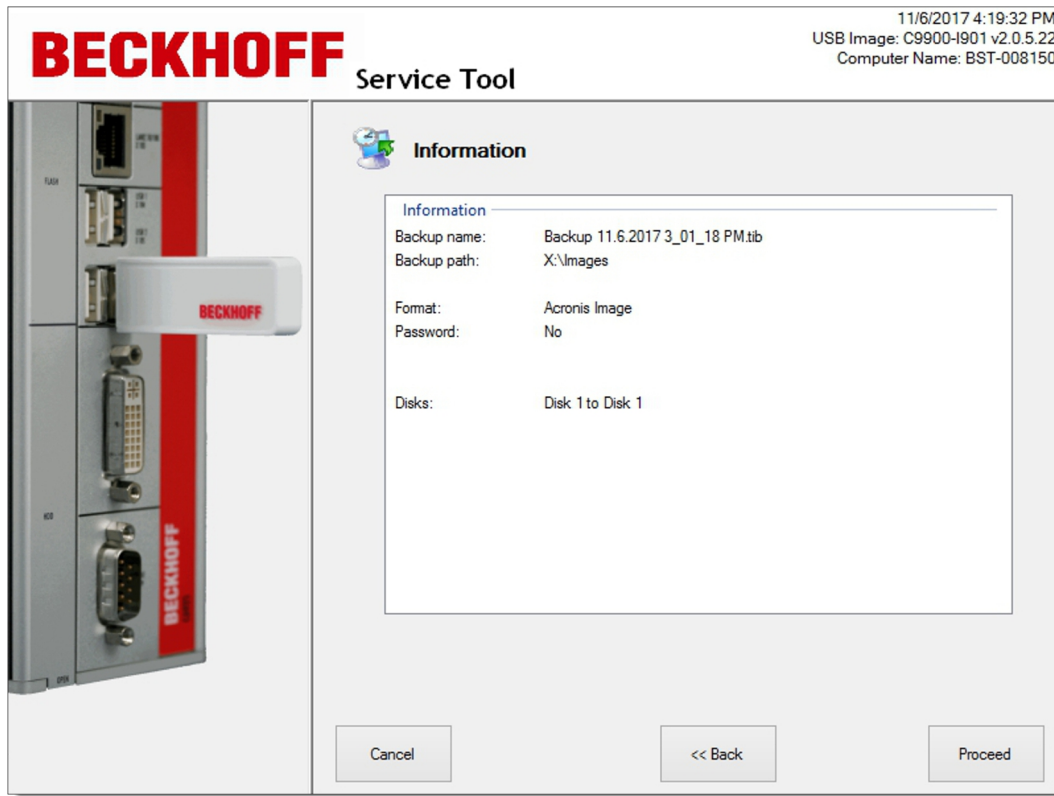
- 3. In the next step, the hard disks and partitions available in the selected image are displayed. You can select individual partitions or complete storage media to restore.



- 4. Select the storage medium on the Industrial PC on which the image is to be restored.



5. Check the settings and click **Proceed**.



- ⇒ Once the image has been restored, click **Close** to return to the start page. Click the **Shutdown** button, remove the BST stick and restart the Industrial PC.

6 Configuration

6.1 Using Easy mode

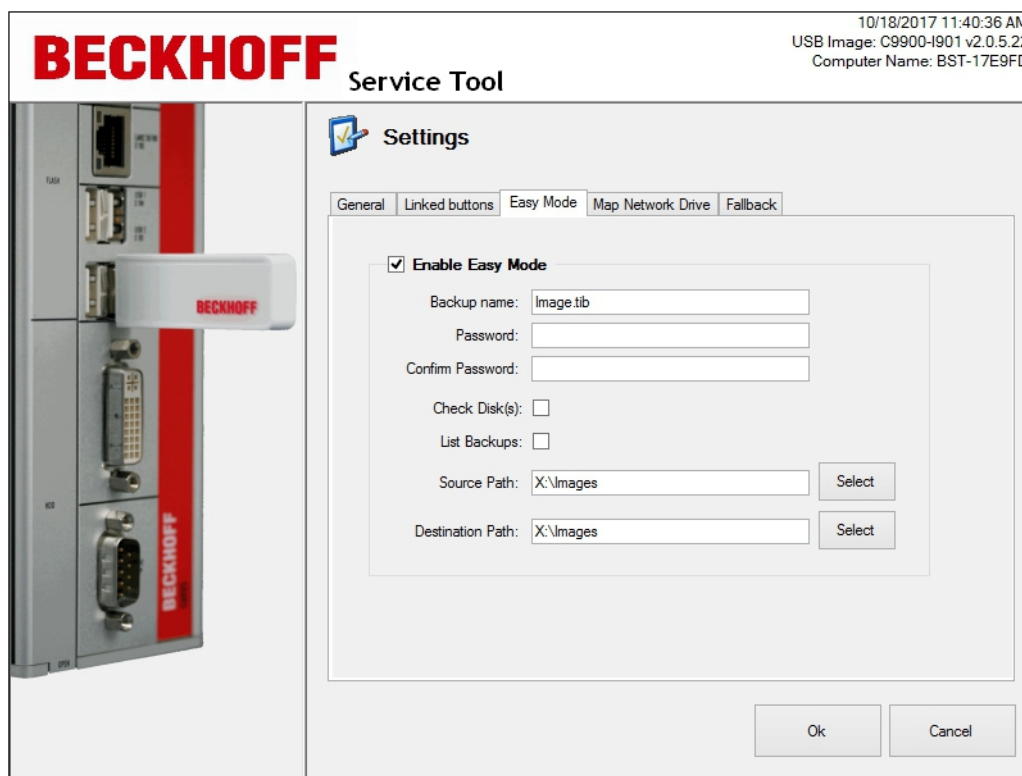
With Easy mode enabled, you can create or restore images by clicking the **Backup** or **Restore** button. The installation dialog is omitted, and the procedure is automated. To this end, you need to configure the BST with default settings.

Requirements:

- A previously created image on the BST stick or a network drive, if you want to restore an image.

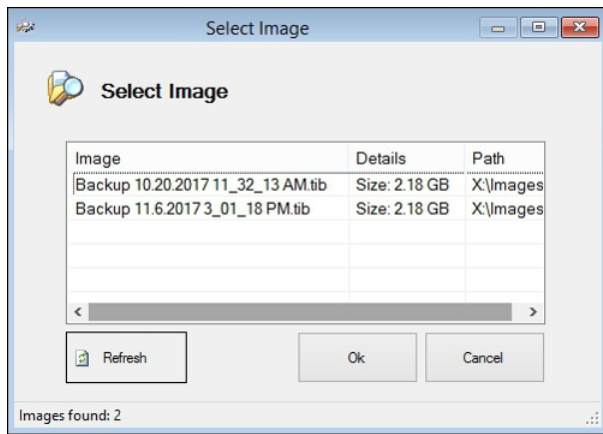
Use the Easy mode as follows:

1. Click the **Settings** button, and then click the **Easy mode** tab.
2. Click **Enable Easy Mode**.



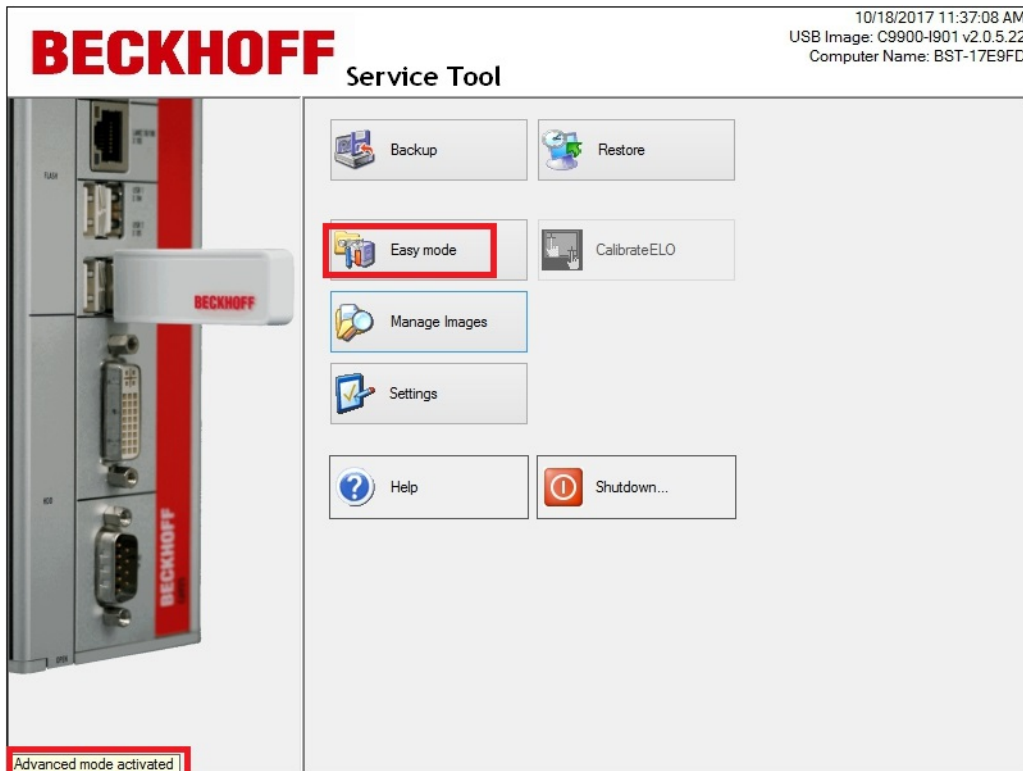
3. In the **Backup name** field, enter the file name for the image to be created.
4. If required, enter a password to encrypt the image.
5. You can enable the **Check Disk** option to scan the file system for errors and correct them as required.

6. Enable **List Backups** to display all images located in the directory under **Source Path**. You do not need this option if you have just one image.
If enabled, the **Select Image** window appears when you click **Restore** on the start screen.



7. Under **Source Path**, specify the directory from which the image is to be restored.
If there are multiple images in the directory, the most recent image is recovered from the directory by default. Alternatively, you can activate the option **List Backups**.
8. Under **Destination Path**, specify the path under which the image is to be stored.

⇒ Check the settings and click **OK**. In the next step, you can create or restore images automatically using the **Backup** and **Restore** buttons, i.e. without the installation dialog.
Easy mode can be enabled or disabled on the start page with the **Easy mode** or **Advanced mode** button.



6.2 Manage images

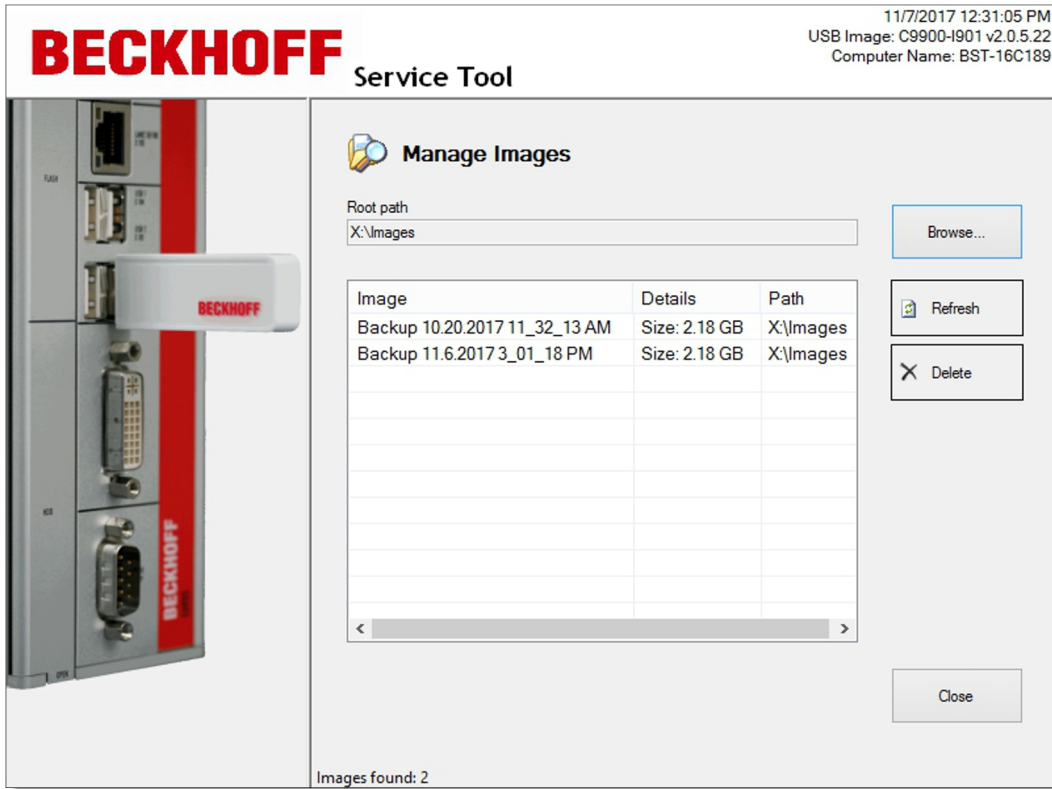
In this step, the images stored on the BST stick or in the network are displayed. If required, you can delete the images. Additional information such as file name, size and path is displayed, depending on the images.

Requirements:

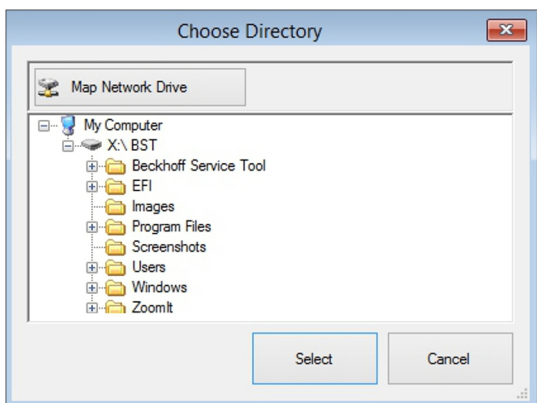
- You have already created images.

Proceed as follows:

1. Click the **Manage Images** button.



2. Click the **Browse** button to change the path to the images. Use the **Map Network Drive** button to integrate a network drive.



3. Click an image and then click the **Delete** button to delete an image.

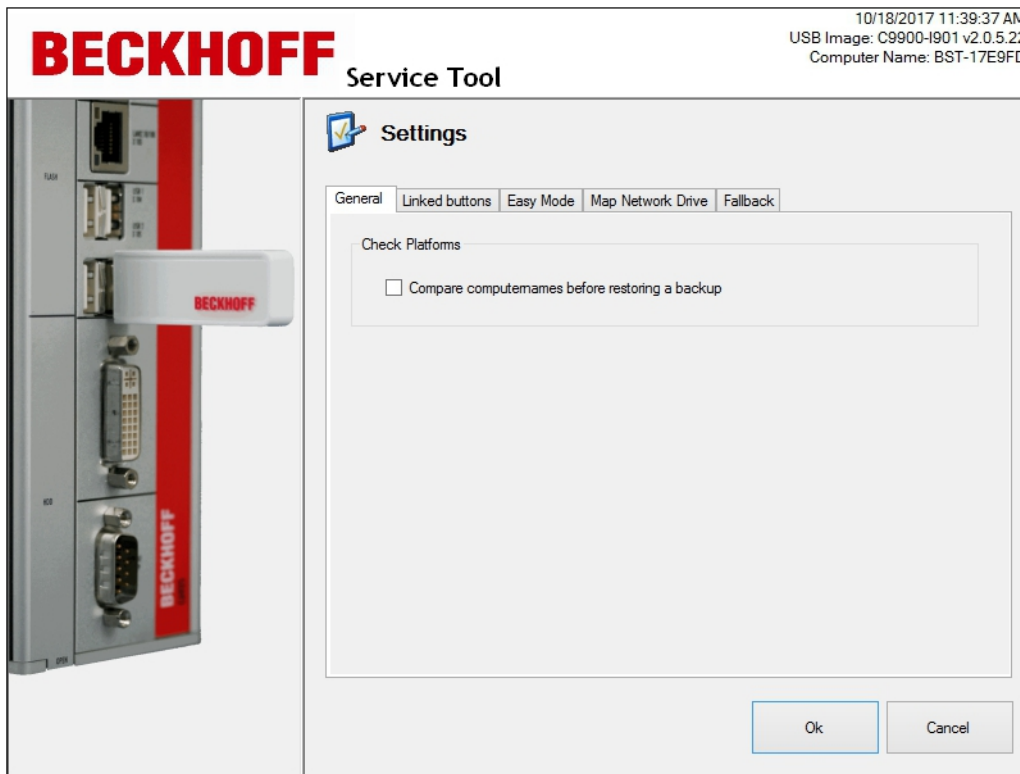
6.3 Enable General – Check Platforms

With this option you can ensure that on an Industrial PC only the image is restored that belongs to the Industrial PC. The computer name of the Industrial PC is compared with that of the image. If the names do not match, you are asked to confirm whether the image should be restored. After the confirmation it is still possible to install an image with a different computer name.

Use this control function if it is important that only a particular image is installed on an Industrial PC.

Proceed as follows:

1. On the start screen, click **Settings**, then click the **General** tab.



2. Enable the option **Check Platforms**.

⇒ From now on, the computer name of the Industrial PC is compared with the name from the image.

6.4 Configuring Linked buttons

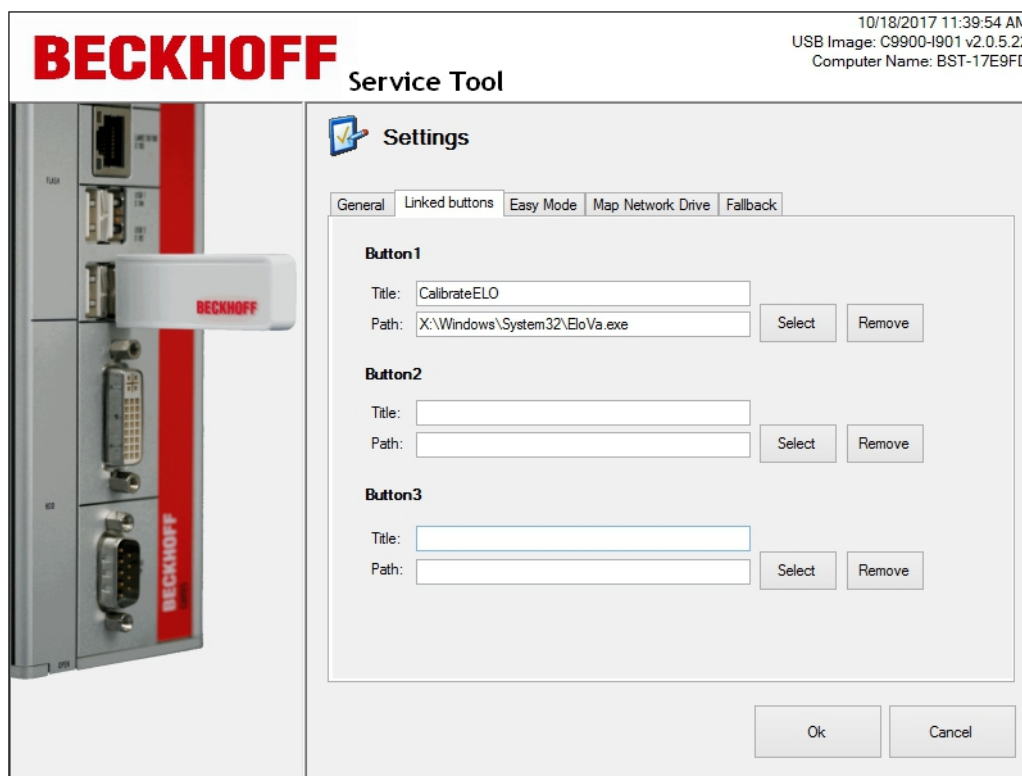
Linked Buttons can be used to create up to three custom buttons on the start page for running additional programs. You can set the label and path to match the program to be executed. You must first copy the additional programs to the BST stick.

Requirements:

- Additional programs are already on the BST stick.

Linked buttons can be configured as follows:

1. Click **Settings**, then click the **Linked buttons** tab.



2. Click **Select** and search for an executable file of the desired program (e.g. *.exe or *.bat) on the BST stick.
3. The file name is automatically inserted under **Title**. You can change the title if required.
4. Confirm the settings with **Ok**.

⇒ The custom buttons are displayed with the set captions on the BST start page. You can use **Remove** to delete the buttons at any time.

6.5 Connect to network drive

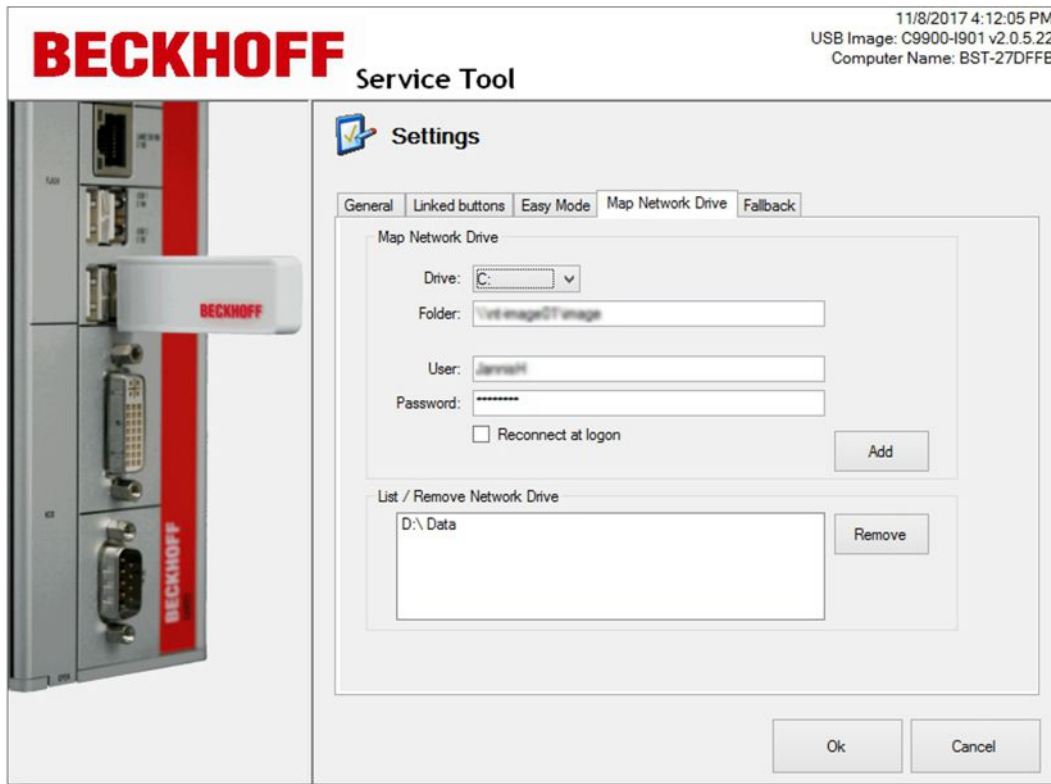
In this step you can connect your BST stick to a network drive. You can temporarily connect network drives to the BST stick, i.e. limited to the duration of the session. Or you can save a connection permanently, which is then still available after a restart of the Industrial PC.

Requirements:

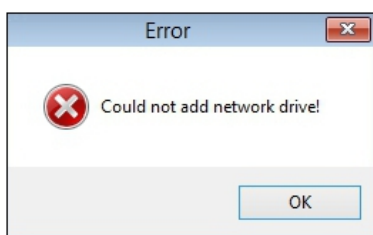
- The Industrial PC is connected to a local network.

Connect a network drive as follows:

1. Click **Settings**, then click the **Map Network Drive** tab.



2. Select a drive letter under **Drive**.
3. Under **Folder**, specify the UNC path to the directory containing the images.
4. Enter a user with password if access to the directory is restricted.
5. You can use the **Reconnect at logon** option to permanently store a network drive and reuse it after restarting the Industrial PC.
6. Click **Add** to connect the network drive.
If an error message appears, check whether the path or login information is correct.



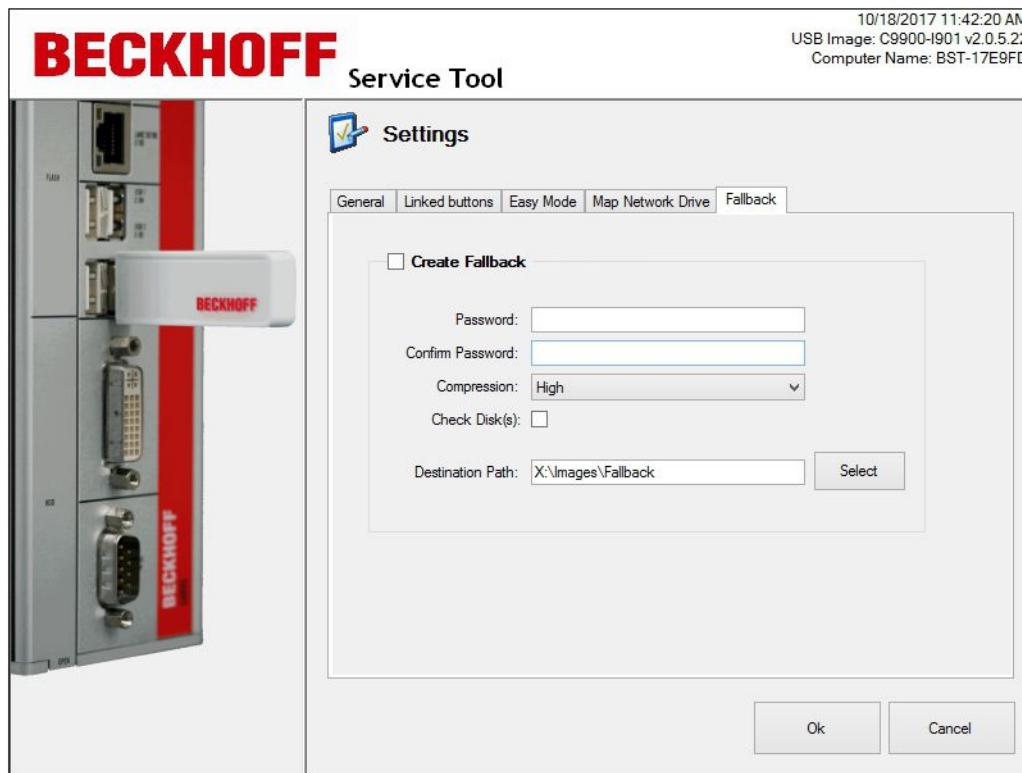
⇒ The connected network drive is displayed under **List / Remove Network Drive**. Permanently stored network drives can be deleted. To do this, select the network drive and click **Remove**.

6.6 Set up Fallback

With the Fallback option, a backup is always created from the Industrial PC before a new image is restored on the Industrial PC. This allows the original image to be restored in case of an error, so that the Industrial PC remains functional.

Proceed as follows:

1. Click **Settings**, then click the **Fallback** tab.



2. Enable the **Create Fallback** option for additional settings.
3. You can enter a password to encrypt the image.
4. Under **Compression**, select the compression level for the image.
5. You can enable the **Check Disk** option to scan the file system for errors and correct them as required.
6. Under **Destination Path**, specify the directory in which the backup is to be saved.

⇒ If an error occurs, a backup is created from the original image and stored under the specified directory.

7 Appendix

7.1 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for [local support and service](#) on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on her internet pages:

<http://www.beckhoff.com>

You will also find further [documentation](#) for Beckhoff components there.

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- design, programming and commissioning of complex automation systems
- and extensive training program for Beckhoff system components

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- spare parts service
- hotline service

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