

# OPERATING INSTRUCTIONS

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## BTC Software

- Original operating instructions -



### NOTE

In case of doubt, the original German version of the operating instructions applies.

Issue date:  
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# 1 Operating principles

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This document deals exclusively with the operation of the BTC via the web interface. For technical data and commissioning, please read the document entitled „BA BTC-Tool Controller EN.pdf“ carefully.

## 2 Web browser

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Not every web browser offers the same range of functions, some of which are essential for processing the data provided by the BTC. To be able to use the full range of functions, we therefore recommend using one of the web browser applications listed below:

- Google Chrome
- Mozilla Firefox
- Opera
- Apple Safari
- Microsoft Edge from Version 83.0.478.xx

In some web browsers, different behaviours may be observed with BTC functions. In such cases, please contact Support: [support@hs-technik.com](mailto:support@hs-technik.com)

## 3 Web interface

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This section describes the BTC's user interface. A web browser is required to access the user interface. The BTC must also be connected via Ethernet cable or WiFi to the same network as the PC on which the web browser is running. We recommend using a web browser from the list above.

### 3.1 Navigation bar

The navigation bar is shown on the left in the web interface. For equipment with a very small display, e.g. mobile devices, the navigation bar may be collapsed and can then be opened with the „Menu“ button.



Wednesday  
10.11.2021  
13:56:56

Start

Results

State

Digio

Service

Settings



Produktion

Logged-in user

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„Date and time“	This is the current date and time of the device on which the web browser is running.
„Start“	This button takes you to the BTC overview with the current work orders.
„Results“	This button takes you to the saved results.
„State“	This button takes you to a status page with information on the tools set up and the BTC.
„Digio“	This button takes you to the summary page with the set extension modules (ProfiBus, ProfiNet, etc.).
„Service“	This button takes you to the password-protected area with various service options.
„Settings“	This button takes you to the password-protected area with settings for the various application modes.

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„SerialNo./Tool“	Once a work order has been started, the approved tool is displayed here.
„Cycle/Torque“	Cycle display, if applicable.
„Model/Count“	Once a work order has been started, the approved number of rivets / screws per work step is displayed here.
„State/M/F“	Once a work order has been started, the torque or force achieved is displayed after each individual step.
„Hint/Angle/Stroke“	Here, either information regarding the current status is displayed or, if a work order has been started, the angle of rotation or stroke achieved is displayed after each individual step.
„g: „Date“ „Time“:wait for scan“	Current time of the BTC and current information on its status.
„TBEC1“	Name of the set tool. If multiple tools are set, they are displayed next to each other.

### 3.3 Results

All results are stored on the BTC for 180 days. When you switch to the Results page, the current results of the day are displayed first.

The screenshot shows the 'BTC - Tool Controller' interface. On the left, there is a sidebar with a user profile icon, the name 'Produktion', and the date and time 'Wednesday 10.11.2021 14:12:36'. Below this are menu items for 'Start', 'Results', 'State', 'Digio', 'Service', and 'Settings'. The main area is titled 'BTC - Tool Controller' and 'Results'. It features a search bar with the filename '20210623\_res\_HS-Technik.json' and buttons for 'show' and 'Download'. Below the search bar is a table with the following columns: Date, Tool, ToolNo, PartNo., S/R No., Outputs, Progr, Result, Torque/Force, Setp.Torque/Force, Angle/Stroke, Setp.Angle/Stroke, Flags, and Link. The table contains several rows of data, with the most recent entry highlighted in red.

Date	Tool	ToolNo	PartNo.	S/R No.	Outputs	Progr	Result	Torque/Force	Setp.Torque/Force	Angle/Stroke	Setp.Angle/Stroke	Flags	Link
23.06.21-17:01:39	TBEC1	18360035	TEST	25963	4/4	1	IO	3.0	3.0	106	0	0	
23.06.21-17:01:36	TBEC1	18360035	TEST	25962	3/4	1	NIO	0.8	0.8	169	0	4000000	
23.06.21-17:01:35	TBEC1	18360035	TEST	25961	3/4	1	IO	3.2	3.0	60	0	0	
23.06.21-17:01:24	TBEC1	18360035	TEST	25960	2/4	1	IO	3.0	3.0	87	0	0	
23.06.21-17:01:13	TBEC1	18360035	TEST	25959	1/4	1	IO	3.1	3.0	581	0	0	

„Filename“	Automatically generated name of the results file. The name is composed of the date (YYYYMMDD), „_res_“ and the system name entered under „General“. The different results files can be selected via the drop-down list for display and download.
„show“	Pressing this button displays the selected results file in table form.
„Download“	Pressing this button downloads the selected results file.
„Date“	This column shows the time stamps of the individual results.
„Tool“	This column shows the name of the tool with which the process was carried out.
„ToolNo“	This column lists the serial number of the tool with which the process was carried out.
„PartNo.“	This column shows the identifier through which the approval was made.
„S/N No.“	The HS-Technik power tools have an internal counter. Each screw connection or riveting is counted up internally. This column shows the value of this counter for this process step.
„Outputs“	This column shows the number of screws/rivets out of the total number.
„Progr“	The program number with which the tool has worked is listed here.
„Result“	This column shows the process analysis of the individual step.
„Torque/Force“	Displays the actual torque or force achieved.
„Setp.Torque/Force“	Displays the target torque or force specified by the program.
„Angle/Stroke“	Shows the actual angle of rotation or stroke achieved.
„Setp.Angle/Stroke“	Displays the target angle of rotation or target stroke specified by the program.
„Flags“	In the case of a NOK, the step error is displayed here in code.
„Apply filter“	For each of the results parameters listed above, a filter can be applied to search for specific results.

### 3.4 Status

The Status page displays various pieces of status information about the BTC.

The screenshot shows the 'BTC - Tool Controller' status page. On the left, there is a sidebar with a user profile icon and the text 'Produktion', followed by the date and time 'Wednesday 10.11.2021 14:13:38'. Below this are menu items: Start, Results, State, Digio, Service, and Settings. The main content area is titled 'BTC - Tool Controller' and contains a 'System state' section with a table. The table has columns for 'System', 'Name', 'HS-Technik', 'Time stamp', and '10.11.21 15:13:21'. Below the table, there are sections for 'Tools', 'Board', and 'Service'. The 'Tools' section shows 'TBEC1' with IP '192.168.101.10:8041:8040:grp0:lm6'. The 'Board' section shows 'Keys 111'. The 'Service' section shows 'LAN1: IP=[192.168.100.5]', 'LAN2: not connected', 'AccessPoint: IP=[192.168.101.5] SSID=[btc-000000] Chn=[36]', and 'btc/tinet R 1.7.9 2021-09-02'.

„System“	Shows general system information.
„Name“	The name of the system, which is also shown on the BTC's LC display. The system name can be set under Settings in the „General“ tab.
„Time stamp“	Displays the date and time of the BTC.
„Tools“	Displays the information on all created tools.
„TBSOP1“	The tool name always consists of the tool designation of the HS-Technik tool names and a consecutive number.
„192.168.101.10“	IP address of the tool.
„8041“	Port of the tool.
„8040“	Port of the BTC for this tool.
„grp0“	Group affiliation of the tool.

„Im6“	Loosening mode set for the tool. -Im0: Never -Im1: Always -Im2: after NOK -Im3: Undef -Im4: free until 1st OK -Im5: free until 1st OK and after NOK -Im6: free until 1st OK and after OK/NOK
„Board“	Displays information about the BTC.
„Keys“	Indicates the status of the three buttons on the front of the BTC. A '1' means the button is not pressed, a '0' means the button is pressed.
„LAN1: IP=[xxx.xxx.xxx.xxx]“	Displays the IPv4 address of the left Ethernet socket (top view from below). This is the system network.
„LAN2: IP=[xxx.xxx.xxx.xxx]“	Displays the IPv4 address of the right Ethernet socket (top view from below). This is set to DHCP in the delivery state, but can be assigned a fixed IP address under the settings.
„AccessPoint: IP=[xxx.xxx.xxx.xxx]“	Displays the server IP address of the BTC for access via WiFi.
„SSID=[btc-000000]“	Displays the name of the WiFi network that the BTC is setting up.
„Chn=[xxx]“	Indicates which channel is used by the BTC to communicate with the tools.
„„Weekday“ „Month“ „Day“ „Time“ „Year“: ...“	Board-explicit information.
„Btc/tlnet R x.x.x JJJJ-MM-TT“	Displays the firmware version installed on the BTC.

### 3.5 Digio

This page displays the input and output bytes of the externally connected components. If a scan application, bit selector application or an OpenProtocol application is set, the page only shows a note that this display is not included in the system.

The screenshot shows a web interface for 'HS-Technik GmbH' with a 'Produktion' user. The page title is 'BTC - Tool Controller'. The main content area displays the message 'Digio: not contained in this system'. A sidebar on the left contains a menu with options: Start, Results, State, Digio, Service, and Settings. The date and time are Wednesday, 10.11.2021, 14:14:37.

#### 3.5.1 ProfiNet application

When the ProfiNet application is active, different parameters are displayed in the Digio display for each tool.

The screenshot shows the same web interface as above, but with the date and time updated to Thursday, 11.11.2021, 15:30:05. The main content area now displays a table under the heading 'Digio'. The table has the following columns: Tool, InStrg, ProgNo, Count, Part, OutStrg, Ready, Apply, OK, NOK, SingleRes, and TotalRes. A single data row is shown for tool 'TBEC1' with the following values: InStrg: 00000000, ProgNo: 1, Count: 4, Part: TEST, OutStrg: 00000010 00000000, Ready: 0, Apply: 1, OK: 0, NOK: 0, SingleRes: 0, TotalRes: 0. The time range for the data is 11.11.21-15:30:01.

Tool	InStrg	ProgNo	Count	Part	OutStrg	Ready	Apply	OK	NOK	SingleRes	TotalRes
TBEC1	00000000	1	4	TEST	00000010 00000000	0	1	0	0	0	0

„Tool“	This is the name of the tool to which the adjacent data refers.
„InStrg“	Shows the respective state of the byte that controls the tool.
„ProgNo“	The program number entered for the default is displayed here.
„Count“	Specifies how many cycles are to be run with the program.
„Part“	The freely configurable part number is displayed here which is sent with the program specification.
„OutStrg“	Displays the respective state of the two bytes representing the tool's working status.
„Ready“	Indicates that the tool is ready for the next specification.
„Apply“	Indicates that the preset has been successfully accepted and is being sent to the tool by the controller.
„OK“	Displays the assessment of the last result if it was OK. (Also in connection with the overall assessment)
„NOK“	Displays the assessment of the last result if it was NOK. (Also in connection with the overall assessment)
„SingleRes“	Indicates whether this result is a single result.
„TotalRes“	Indicates whether this result is an overall result.

The display of the digital inputs or outputs can be changed to a hexadecimal display using the key combination „Ctrl + Shift + H“. In this view, each byte is displayed as a two-digit hexadecimal number. This may be easier to interpret in some circumstances.

HS-Technik GmbH



Produktion

Thursday  
11.11.2021  
15:38:27

**BTC - Tool Controller**

Digio

Inputs		act. work state
0:	00 00 00 00 01 04 54 45 53 54 00 00 00 00 00 00	.....TEST.....
16:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
32:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
48:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
64:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
80:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
96:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
112:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
128:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
144:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
160:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
176:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
192:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
208:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
224:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
240:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....

11.11.21-15:38:23

HexBytes

### 3.5.2 ProfiBus application

When the ProfiBus application is active, different parameters are displayed in the Digio display for each tool.

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Produktion

Friday  
12.11.2021  
09:24:45

**BTC - Tool Controller**

Digio

Tool	InStrg	Proglo	Count	Part	OutStrg	Ready	Apply	OK	NOK	SingleRes	TotalRes
Start	TBEC1	00000000	1	4	TEST 00000001 00000000	1	0	0	0	0	0
Results	RBPF2	00000000	0	0	00000001 00000000	1	0	0	0	0	0
State	12.11.21-09:24:40 12.11.21-09:24:40										

„Tool“	This is the name of the tool to which the adjacent data refers.
„InStrg“	Shows the respective state of the byte that controls the tool.
„ProgNo“	The program number entered for the default is displayed here.
„Count“	Specifies how many cycles are to be run with the program.
„Part“	The freely configurable part number is displayed here which is sent with the program specification.
„OutStrg“	Displays the respective state of the two bytes representing the tool's working status.
„Ready“	Indicates that the tool is ready for the next specification.
„Apply“	Indicates that the preset has been successfully accepted and is being sent to the tool by the controller.
„OK“	Displays the assessment of the last result if it was OK. (Also in connection with the overall assessment)
„NOK“	Displays the assessment of the last result if it was NOK. (Also in connection with the overall assessment)
„SingleRes“	Indicates whether this result is a single result.
„TotalRes“	Indicates whether this result is an overall result.

The display of the digital inputs or outputs can be changed to a hexadecimal display using the key combination „Ctrl + Shift + H“. In this view, each byte is displayed as a two-digit hexadecimal number. This may be easier to interpret in some circumstances.

The screenshot shows the 'BTC - Tool Controller' interface. The top right corner displays 'HS-Technik GmbH'. On the left, a sidebar shows 'Produktion' with a user icon, the date 'Friday 12.11.2021', and the time '09:26:24'. The main content area is titled 'Diglo' and contains a table with two columns: 'Inputs' and 'act. work state'. The 'Inputs' column shows a list of 12 hexadecimal values (00-00) with a 'TEST' label. The 'act. work state' column shows a list of 12 hexadecimal values (00-00) with a 'Login' label. Below the table, there are two timestamps: '12.11.21-09:26:19' and '12.11.21-09:26:19'. At the bottom left, there is a checked checkbox labeled 'HexBytes'.

### 3.6 Service

This section describes the Service page. Access to the Service page is password-protected. The service password is „Serv“.

The screenshot shows the 'BTC - Tool Controller' interface. The top right corner displays 'HS-Technik GmbH'. On the left, a sidebar shows 'Produktion' with a user icon, the date '11.11.2021', and the time '16:25:03'. The main content area is titled 'Service' and contains a 'Service password' field with a text input box and a 'Login' button.

Produktion
HS-Technik GmbH



11.11.2021,  
16:26:57

### BTC - Tool Controller

Service

Start	Browser time	2021-11-11 16:26:57	<input type="button" value="Apply"/>	???
Results	Restart application	<input type="button" value="Restart application"/>		???
State	Restart device	<input type="button" value="Reboot device"/>		???
Diglo	Download logs	<input type="button" value="Download logs"/>		???
Service	Download old logs	Filename <input type="text" value="tt.mm.jjjj"/> <input type="button" value="📅"/>	<input type="button" value="Download logs"/>	<input type="text"/>
Settings	Load settings from SD card	Filename <input type="text" value="settps_20210823_113920"/>	<input type="button" value="Load settings"/>	<input type="text"/>
	Save settings to SD card		<input type="button" value="Save settings"/>	
	BTC-ID	WPQ1QXUQPTPTUYWX		
	Enable features	<input type="text"/>	<input type="text"/>	<input type="button" value="Apply licence"/>
	Upload application	<input type="button" value="Dateien auswählen"/>	Keine ausgewählt	<input type="button" value="Upload file"/>
	Next file	...		

- „Browser time“**

The „Apply“ button synchronises the time of the BTC with the browser time displayed here.
- „Restart application“**

Pressing the button restarts the controller application.
- „Restart device“**

Pressing the button restarts the BTC.
- „Download logs“**

Downloads the current log file.
- „Download old logs“**

Either a date can be entered via the input field or a day can be selected via the calendar symbol. The log data, if available, is then downloaded from this date.
- „Load settings from SD card“**

Via the drop-down list there is the option to load previously saved settings.
- „Save settings to SD card“**

By pressing the „Save settings“ button, the current settings are saved to the SD card.
- „BTC-ID“**

The adjacent ID is required to generate activation codes for application features.

---

„Enable features“	The BTC has three different applications as standard. Scan / bit selector application, ProfiNet and ProfiBus. Additional hardware is required for ProfiBus and ProfiNet. An activation code is required to activate an OpenProtocol or PFCS application. The desired feature is entered in the left-hand field and the corresponding activation code in the right-hand field. For further information, please contact our support: support@hs-technik.com
„Upload application“	<p>Clicking on the „Select file“ button opens the dialog box to specify the path to the update files. The corresponding file is uploaded via the „Upload file“ button. Next file“ indicates which file must be uploaded next.*</p> <p>When all the required files have been uploaded, the „Upload file“ button changes to „Update application“. If it is pressed, the update is carried out.</p> <p>*As of firmware version 1.5.x, several files can be uploaded simultaneously.</p>

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### 3.7 Settings

This section describes the Settings page. Access to the Settings page is password-protected. The password for the Settings page is „Admin“.

After entering the password and pressing the „Log in“ button, a list with several available settings pages appears to begin with. As the BTC provides different applications, you must choose the appropriate settings page for the desired application.

HS-Technik GmbH

Produktion  
 11.11.2021,  
 16:29:01

**BTC - Tool Controller**

Settings

Settings password

Start

Results

State

Digio

Service

Settings

HS-Technik GmbH

Produktion  
 11.11.2021,  
 16:29:51

**BTC - Tool Controller**

Settings

Start	Settings scan application	<input type="button" value="start"/>	???
Results	Settings Bitselect application	<input type="button" value="start"/>	???
State	Settings Profinet application	<input type="button" value="start"/>	???
Digio	Settings Profibus application	<input type="button" value="start"/>	???
Service	Settings PFCS application	<input type="button" value="start"/>	???
Settings	Settings OpenProtocol application	<input type="button" value="start"/>	???
	Settings TCP server application	<input type="button" value="start"/>	???
	Settings Sarissa application	<input type="button" value="start"/>	???
	Settings Digital IO application	<input type="button" value="start"/>	???
	Settings SignalR application	<input type="button" value="start"/>	???

### 3.7.1 Scan application settings

There are different sections in the settings for the scan application. In each section there is a button to apply the changes made. It is **NOT** possible to make changes in several sections and then apply them all via just one button.

If another application type is to be activated, the „General“ section must first be opened and the changes saved there via the „Apply“ button.

The controller then restarts and the desired application type is active.

BTC - Tool Controller	
Settings scan application	
General <span>Apply</span>	
Browser time	2021-11-1116:31:48 ???
Company label	HS-Technik GmbH ???
System name	HS-Technik
Language	English
Time format for results	%d.%m.%y-%H:%M:%S
Hostname	btc
BTC IP Adresse	DHCP
Default gateway	
WLAN Toolmanager	<input checked="" type="checkbox"/> with WLAN Toolmanager
external Scanner	<input type="checkbox"/> with external Scanner

„Browser time“ Displays the current time of the system on which the web browser is running. This time is transferred to the controller.

„Company label“ The text entered here is displayed at the top right of the browser.

„System name“ The text entered here is shown on the start page of the BTC's LC display. (Maximum 11 characters)

„Language“ Selection of the display language: German or English.

„Time format for results“ The format of the time stamp can be personalised here. The time stamp is saved with each individual result.

Example:

%d.%m.%y-%H:%M:%S leads to the time format

Day.Month.Year-Hour:Minute:Second

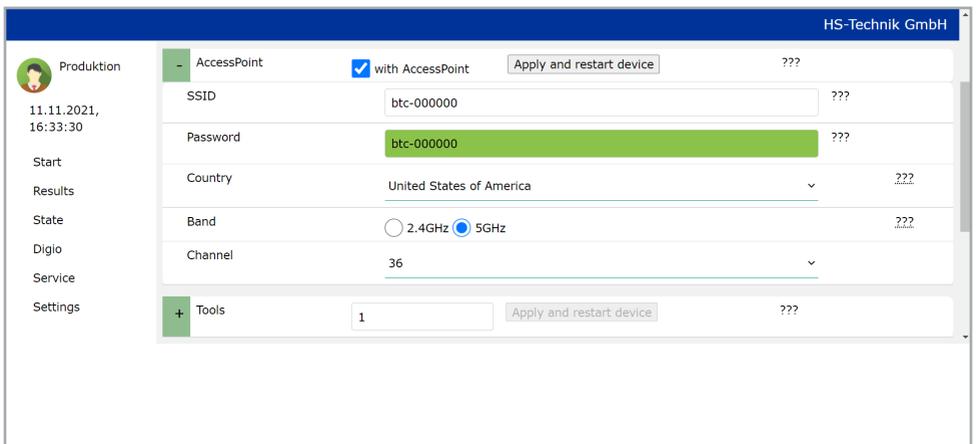
22.07.2020-11:23:31

„Hostname“ Name for the DHCP host.

„BTC IP Adresse“ Sets the IP address for the right Ethernet port (top view from below).

„Default gateway“	A default gateway can be specified here if the BTC is located in a different IP group.
„WLAN Toolmanager“	Feature that can be released to connect the tools to the tool manager via WiFi.
„external Scanner“	Feature that can be released to use an external USB scanner.
„Apply“	By pressing the „Apply“ button, the changes made are saved and the scan application is started.

In the AccessPoint section, the settings for the WiFi network through which the BTC communicates with the tools are made.



„Mit AccessPoint“	Activates/deactivates the BTC's internal access point. When deactivated, the BTC requires access to the company network, so an external access point can be used as a gateway.
„SSID“	Sets the name for the WiFi network.
„Password“	Sets the key for the WiFi network. (Minimum 8 characters)
„Country“	One of eight countries can be selected from the drop-down list. The available channels depend on the regulations of the respective country.
„Band“	Selection of the frequency band to be used.
„Channel“	Selection of the channel to be used within the frequency band.

„Apply and restart device“

This button saves the changes and reboots the BTC.

The tools that are to communicate with the BTC must be configured in the Tools section.

No.	Type	Name	IP Addr	Tool Port	BTC Port	NOK Strategy	Gruppe
1	TorqBee EC	TBEC1	192.168.101.10	8041	8040	Enabled till 1. PASS and after FAIL/PASS	0
2	RivBee PF-Series	RBPF2	192.168.101.11	8043	8042	Never	0

„Tools“

The number of tools that are to communicate with the BTC is entered here. Maximum 20 tools

„No“

Consecutive numbering of the tools.

„Type“

When creating a new tool, the correct tool type must be selected in the drop-down list.

„Name“

Name of the tool. The name is automatically generated from the number and type.

„IP Addr“

The IPv4 address under which the respective tool uniquely registers in the network. Only the first IP address can be entered here. All other IP addresses are incremented automatically.

„Tool Port“

Port used by the tool. This port is created automatically.

„BTC Port“

Port used by the BTC for the respective tool. This port is created automatically.

„NOK Strategy“

Selection of what happens in the case of an individual result assessed with NOK. Whether, for example, a screwdriver is allowed to loosen and retighten the fastener after a NOK.

„Group“

The tool can be assigned to one of 5 groups. If the tools are assigned to different groups, several processes can be started and the tools from different groups can work simultaneously.

---

„QR Code“

The „QR Code“ button can be used to generate a two-dimensional data matrix code that can be scanned with the tool in scan mode. Scanning automatically writes the network settings to the tool. This is only possible with RivBee/NutBee2 series riveters and TorqBee series tools.

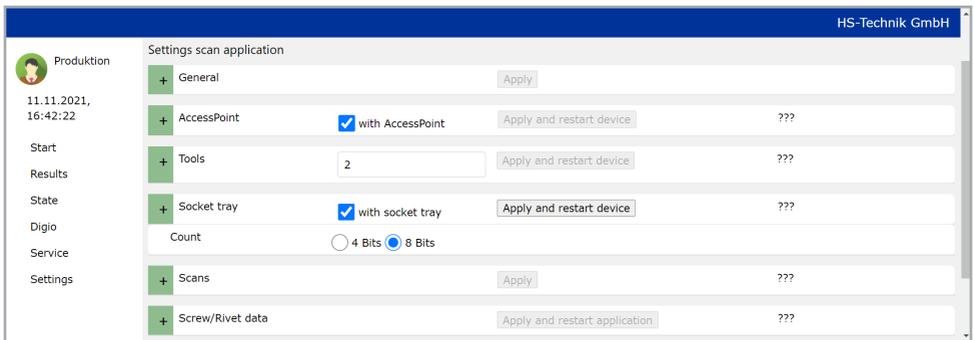
---

„Apply and restart device“

This button saves the changes and reboots the BTC.

---

An external socket selector can be activated in the Socket tray section.



---

„with socket tray“

Activates/deactivates the external socket selector.

---

„Count“

Sets the size of the socket selector.

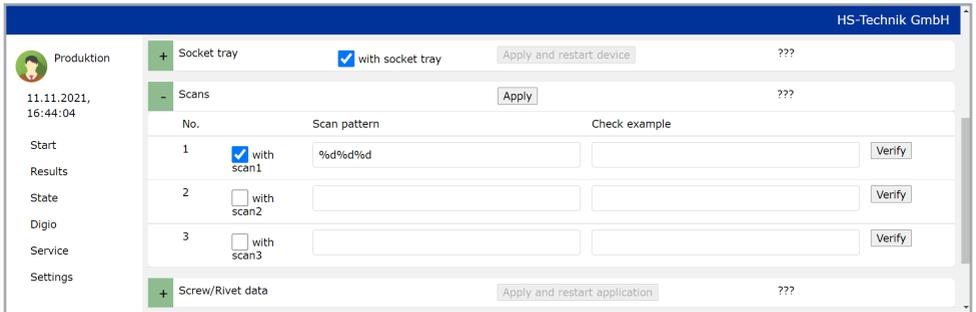
---

„Apply and restart device“

This button saves the changes and reboots the BTC.

---

The masks for the barcodes are defined in the Scans section. Up to three scans can be defined in succession.



„No.“

Indicates the position in the scan order.

„with scan x“

Activates / deactivates the scan mask. If more than one scan mask is activated, all activated scans are required in the correct order for a release.

„Scan pattern“

The barcode mask is stored here. The number of possible barcodes can be limited or extended using placeholders or fixed ranges.

The permitted placeholders are:

- . = All characters
- %a = letters
- %c = control characters
- %d = digits
- %g = printable characters, except spaces
- %l = lower case
- %p = punctuation marks
- %s = empty characters
- %u = upper case

Characters with special function:

( ), % + - \* ? [ ] ^ \$

If these characters are used in the masking, they must be preceded by a % character.

Modification:

- + 1 or more repetitions
- \* 0 or more repetitions
- ? optional (0 or 1 occurrence)

„Check example“

Once the barcode mask has been created, a test barcode can be entered here to check whether the mask fits. The field then turns either green if the code matches the mask, or red if the code does not match the mask. In addition, the entered code is output as a QR code in a separate window (pop-up windows must be allowed for this function).

„Apply and restart application“

This button saves the changes and reboots the BTC.

In the Screw/riquet data section, the programs and program sequences to be executed are assigned to the barcodes. Each scan pattern may only be assigned once, otherwise the controller cannot decide which screw/riquet data set to execute.

The screenshot shows the 'Screw/Rivet data' configuration window. At the top, there is a header with 'HS-Technik GmbH' and a user profile icon. Below the header, there is a section for 'Screw/Rivet data' with an 'Apply and restart application' button. The main area contains two data sets, each with a 'No.' field, a 'Scan pattern' field, and a 'Check example' field. Data set 1 has 'No. 1', 'Scan pattern 1%d%d', and a 'Verify' button. Below it is a table with columns 'No.', 'Tool', 'Progr', 'Count', 'Bit', and 'Comments'. The table contains one row: '1', 'TBEC1', '1', '5', '5', 'Program 1 on TBEC1 enabled for 5 fasteners'. Data set 2 has 'No. 2', 'Scan pattern 2%d%d', and a 'Verify' button. Below it is another table with columns 'No.', 'Tool', 'Progr', 'Count', 'Bit', and 'Comments'. The table contains one row: '1', 'RBPF2', '3', '1', '1', 'Program 3 on RBPF2 enabled for one rivet'. A 'Simultaneously' checkbox is located to the right of the 'Check example' field for data set 1.

„No“

Number of the screw/riquet data set. The number is assigned consecutively as soon as a new data set is created.

„Scan pattern“

The scan pattern that activates the data set is entered here. As soon as you click with the cursor in the empty scan pattern field of a newly created data set, the barcode mask entered under „Scans“ is entered. The mask can now be customised further. For example, for the two data sets shown in the illustration on page 23, the first placeholder „%d“ was replaced with a unique digit „1“ or „2“. This means that any barcode from „100 - 199“ will activate screw data set No. 1, while any barcode from „200 - 299“ will activate rivet data set No. 2.

„Check example“

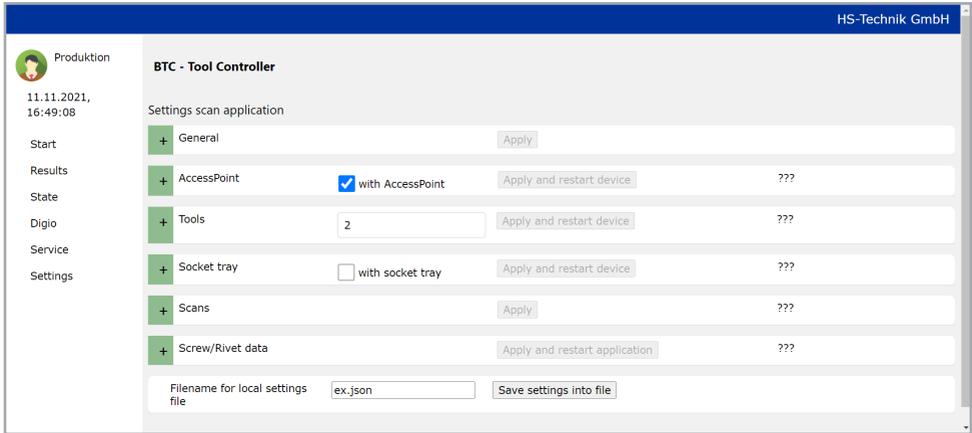
Similar to the test function under „Scans“, a test barcode can be entered in this field and the „Verify“ button can be used to check whether this barcode would activate the data set.

„Simultaneously“

By activating this option, all tools in a screw/riquet data set can work simultaneously.

„+“ Button“	The top „+“ button creates a new screw/rievet data set.
„-“ Button“	The „+“ button within the screw/rievet data set adds another process step to the data set.
„Tool“	The „-“ button, which is located directly next to the „Verify“ button in each screw/rievet data set, is used to delete the entire data set.
„Progr“	The „-“ button next to the „+“ button for adding a new process step has exactly the opposite effect. If it is pressed, the last process step of the respective screw/rievet data set is deleted.
„Count“	Drop-down list for selecting the tool to be enabled in the respective process step.
„Bit“	The number entered here corresponds to the program that is to be enabled on the tool.
„Comments“	Specifies how many cycles are to be run with the enabled program.
„Apply and restart application“	When working with a socket tray, it is possible to specify here which attachment must be used → Slot number.
„Comments“	A free text can be entered here as a comment.
„Apply and restart application“	This button saves the changes and restarts the application with the changes.

The settings can also be saved in a file on the computer on the page.



„Filename for local settings file“

A name for the settings file to be saved in .json format can be entered in the field.

„Save settings into file“

By pressing this button, the current settings are saved in a .json file locally on the computer.

### 3.7.2 Bit selector application settings

There are different sections in the settings for the bit selector application. In each section there is a button to apply the changes made. It is **NOT** possible to make changes in several sections and then apply them all via just one button. If another application type is to be activated, the „General“ section must first be opened and the changes saved there via the „Apply“ button. The controller then restarts and the desired application type is active.

„Browser time“ Displays the current time of the system on which the web browser is running. This time is transferred to the controller.

„Company label“ The text entered here is displayed at the top right of the browser.

„System name“ The text entered here is shown on the start page of the BTC's LC display. (Maximum 11 characters)

„Language“ Selection of the display language: German or English.

„Time format for results“ The format of the time stamp can be personalised here. The time stamp is saved with each individual result.

Example:

%d.%m.%y-%H:%M:%S leads to the time format

Day.Month.Year-Hour:Minute:Second

22.07.2020-11:23:31

„Hostname“ Name for the DHCP host.

„BTC IP Adresse“ Sets the IP address for the right Ethernet port (top view from below).

„Default gateway“ A default gateway can be specified here if the BTC is located in a different IP group.

---

„WLAN Toolmanager“ Feature that can be enabled to connect the tools to the tool manager via WiFi.

---

„Apply“ By pressing the „Apply“ button, the changes made are saved and the bit selector application is started.

---

In the AccessPoint section, the settings for the WiFi network through which the BTC communicates with the tools are made.

The screenshot displays the configuration page for the AccessPoint. The top right corner shows the company name 'HS-Technik GmbH'. On the left, a sidebar contains a user profile icon and the name 'Produktion', along with a timestamp '11.11.2021, 16:52:43' and a vertical menu with items: Start, Results, State, Digio, Service, and Settings. The main configuration area is titled 'AccessPoint' and features a 'with AccessPoint' checkbox that is checked. Below this, there are several input fields: 'SSID' with the value 'btc-000000', 'Password' with 'btc-000000', 'Country' set to 'United States of America', 'Band' with radio buttons for '2.4GHz' and '5GHz' (the latter is selected), and 'Channel' set to '36'. Each field has a '???' placeholder to its right. At the bottom of this section is a button labeled 'Apply and restart device'. Below the AccessPoint section is a 'Tools' section with a text input field containing the number '2' and another 'Apply and restart device' button with a '???' placeholder to its right.

---

„with AccessPoint“ Activates/deactivates the BTC's internal access point. When deactivated, the BTC requires access to the company network, so an external access point can be used as a gateway.

---

„SSID“ Sets the name for the WiFi network.

---

„Password“ Sets the key for the WiFi network. (Minimum 8 characters)

---

„Country“ One of eight countries can be selected from the drop-down list. The available channels depend on the regulations of the respective country.

---

„Band“ Selection of the frequency band to be used.

---

„Channel“ Selection of the channel to be used within the frequency band.

---

„Apply and restart device“ This button saves the changes and reboots the BTC.

---

The tools that are to communicate with the BTC must be configured in the Tools section.

**BTC - Tool Controller**

Settings bit select application

**General** Apply

**AccessPoint**  with AccessPoint Apply and restart device ???

**Tools**  Apply and restart device ???

No.	Type	Name	IP Addr	Tool Port	BTC Port	NOK Strategy	
1	TorqBee EC	TBEC1	192.168.101.10	8041	8040	Enabled till 1. PASS and after FAIL/PASS	<span>QR Code</span>
2	RivBee PF-Series	RBPF2	192.168.101.11	8043	8042	Never	<span>QR Code</span>

„Tools“ The number of tools that are to communicate with the BTC is entered here. Maximum 20 tools.

„No.“ Consecutive numbering of the tools.

„Type“ When creating a new tool, the correct tool type must be selected in the drop-down list.

„Name“ Name of the tool. The name is automatically generated from the number and type.

„IP Addr“ The IPv4 address under which the respective tool uniquely registers in the network. Only the first IP address can be entered here. All other IP addresses are incremented automatically.

„Tool Port“ Port used by the tool. This port is created automatically.

„BTC Port“ Port used by the BTC for the respective tool. This port is created automatically.

„NOK Strategy“ Selection of what happens in the case of an individual result assessed with NOK. Whether, for example, a screwdriver is allowed to loosen and retighten the screw after a NOK.

„Group“ The tool can be assigned to one of 5 groups. If the tools are assigned to different groups, several processes can be started and the tools from different groups can work simultaneously.

„QR Code“ The „QR Code“ button can be used to generate a two-dimensional data matrix code that can be scanned with the tool in scan mode. Scanning automatically writes the network settings to the tool. This is only possible with RivBee/NutBee2 series riveters and TorqBee series screwdrivers.

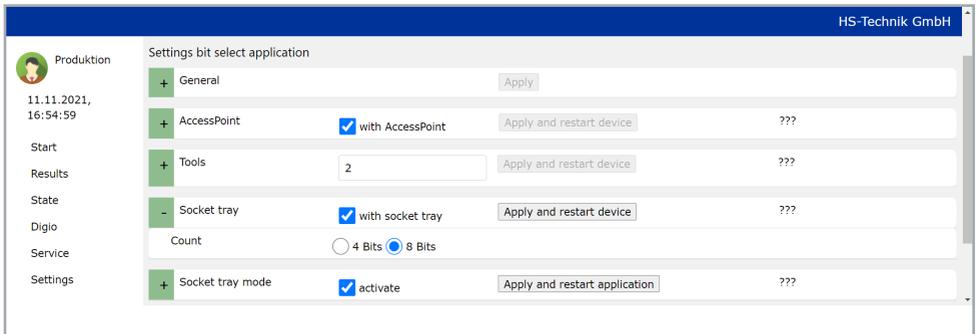
---

„Apply and restart device“

This button saves the changes and reboots the BTC.

---

An external socket selector can be activated in the Socket tray section.



---

„with socket tray“

Activates/deactivates the external socket tray.

---

„Count“

Sets the size of the socket tray.

---

„Apply and restart device“

This button saves the changes and reboots the BTC.

---

In the Socket tray mode section, an action to be performed can be defined for each socket. When working in this mode, the program is not selected via barcode scan, but by removing a socket. It should be noted that only one socket may be removed at a time. As soon as more than one socket is removed, the controller locks the tool.

Bit No.	Tool	Progr	Count
1	TBEC1	1	2
2	TBEC1	2	2
3	TBEC1	3	3
4	TBEC1	4	4
5	TBEC1	5	5
6	TBEC1	6	6
7	TBEC1	7	7
8	TBEC1	8	8

- 
- „activate“                      Activates/deactivates Bit selector mode.
- 
- „Bit No.“                        Indicates the position of the socket/bit.
- 
- „Tool“                            Drop-down list for selecting the tool to be enabled by removing the corresponding nut.
- 
- „Progr“                          The number entered here corresponds to the program that is to be enabled on the tool.
- 
- „Count“                         Specifies how many cycles are to be enabled. After all cycles have been completed, another release is automatically sent for the number of cycles entered until the socket or bit is plugged back in.
- 
- „Apply and restart application“      This button saves the changes and restarts the application with the changes.
-

The settings can also be saved in a file on the computer on the page.

Produktion  
11.11.2021,  
16:58:52  
Start  
Results  
Digio  
Service  
Settings

**BTC - Tool Controller**

Settings bit select application

+	General		Apply	
+	AccessPoint	<input checked="" type="checkbox"/> with AccessPoint	Apply and restart device	???
+	Tools	<input type="text" value="2"/>	Apply and restart device	???
+	Socket tray	<input checked="" type="checkbox"/> with socket tray	Apply and restart device	???
+	Socket tray mode	<input checked="" type="checkbox"/> activate	Apply and restart application	???

Filename for local settings file  Save settings into file

„Filename for local settings file“

A name for the settings file to be saved in .json format can be entered in the field.

„Save settings into file“

By pressing this button, the current settings are saved in a .json file locally on the computer.

### 3.7.3 ProfiNet application settings

There are different sections in the settings for the ProfiNet application. In each section there is a button to apply the changes made. It is **NOT** possible to make changes in several sections and then apply them all via just one button.

If another application type is to be activated, the „General“ section must first be opened and the changes saved there via the „Apply“ button.

The controller then restarts and the desired application type is active.

„Browser time“	Displays the current time of the system on which the web browser is running. This time is transferred to the controller.
„Company label“	The text entered here is displayed at the top right of the browser.
„System name“	The text entered here is shown on the start page of the BTC's LC display. (Maximum 11 characters)
„Language“	Selection of the display language: German or English.
„Time format for results“	The format of the time stamp can be personalised here. The time stamp is saved with each individual result.  Example: %d.%m.%y-%H:%M:%S leads to the time format  Day.Month.Year-Hour:Minute:Second  30.09.2020-10:51:44
„Hostname“	Name for the DHCP host.
„BTC IP Adresse“	Sets the IP address for the right Ethernet port (top view from below).
„Default gateway“	A default gateway can be specified here if the BTC is located in a different IP group.
„WLAN Toolmanager“	Feature that can be released to connect the tools to the HST Tool Manager via WiFi.

---

„Apply“

By pressing the „Apply“ button, the changes made are saved and the ProfiNet application is started.

---

In the AccessPoint section, the settings for the WiFi network through which the BTC communicates with the tools are made.

The screenshot shows the 'BTC - Tool Controller' web interface. The top navigation bar is blue with 'HS-Technik GmbH' on the right. On the left, there is a sidebar with a user profile icon and the text 'Produktion', along with a timestamp '11.11.2021, 17:03:54' and a list of menu items: Start, Results, State, Digio, Service, and Settings. The main content area is titled 'BTC - Tool Controller' and 'Settings Profinet application'. It features a 'General' section with an 'Apply' button. Below that is the 'AccessPoint' section, which is expanded to show a checked checkbox for 'with AccessPoint' and an 'Apply and restart device' button. The 'AccessPoint' section contains several configuration fields: 'SSID' (text input with 'btc-000000' and a '???' placeholder), 'Password' (text input with 'btc-000000' and a '???' placeholder), 'Country' (dropdown menu with 'United States of America' and a '???' placeholder), 'Band' (radio buttons for '2.4GHz' and '5GHz', with '5GHz' selected and a '???' placeholder), and 'Channel' (dropdown menu with '36' and a '???' placeholder).

---

„With AccessPoint“

Activates/deactivates the BTC's internal access point. When deactivated, the BTC requires access to the company network, so an external access point can be used as a gateway.

---

„SSID“

Sets the name for the WiFi network.

---

„Password“

Sets the key for the WiFi network. (Minimum 8 characters)

---

„Country“

One of eight countries can be selected from the drop-down list. The available channels depend on the regulations of the respective country.

---

„Band“

Selection of the frequency band to be used.

---

„Channel“

Selection of the channel to be used within the frequency band.

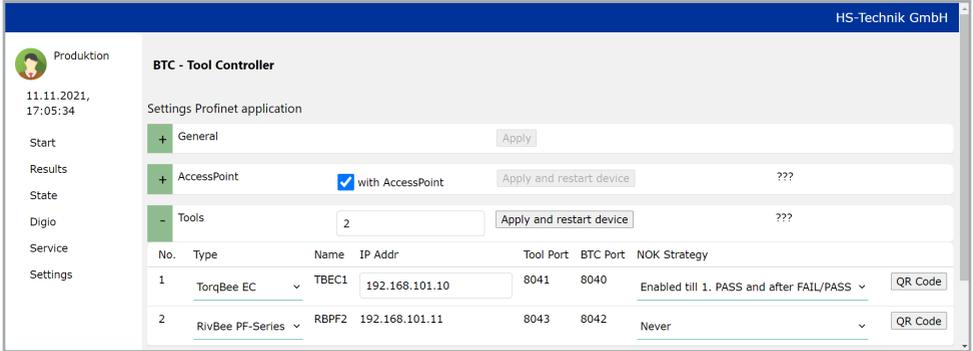
---

„Apply and restart device“

This button saves the changes and reboots the BTC.

---

The tools that are to communicate with the BTC must be configured in the Tools section.



„Tools“	The number of tools that are to communicate with the BTC is entered here. Maximum 8 tools
„No. “	Consecutive numbering of the tools.
„Type“	When creating a new tool, the correct tool type must be selected in the drop-down list.
„Name“	Name of the tool. The name is automatically generated from the number and type.
„IP Addr“	The IPv4 address under which the respective tool uniquely registers in the network. Only the first IP address can be entered here. All other IP addresses are incremented automatically.
„Tool Port“	Port used by the tool. This port is created automatically.
„BTC Port“	Port used by the BTC for the respective tool. This port is created automatically.
„NOK Strategy“	Selection of what happens in the case of an individual result assessed with NOK. Whether, for example, a screwdriver is allowed to loosen and retighten the screw after a NOK.
„QR Code“	The „QR Code“ button can be used to generate a two-dimensional data matrix code that can be scanned with the tool in scan mode. Scanning automatically writes the network settings to the tool. This is only possible with RivBee/NutBee2 series riveters and TorqBee series screwdrivers.

---

„Apply and restart device“

This button saves the changes and reboots the BTC.

---

The settings can also be saved in a file on the computer on the page.

The screenshot shows the 'BTC - Tool Controller' settings page. On the left, a sidebar displays 'Produktion' with a user icon, the date '11.11.2021, 17:08:14', and a list of menu items: Start, Results, State, Digio, Service, and Settings. The main content area is titled 'Settings Profinet application' and contains several sections. The 'General' section has an 'Apply' button. The 'AccessPoint' section has a checked checkbox for 'with AccessPoint' and an 'Apply and restart device' button. The 'Tools' section has a text input field containing '2' and an 'Apply and restart device' button. At the bottom, there is a 'Filename for local settings file' field containing 'ex.json' and a 'Save settings into file' button.

---

„Filename for local settings file“

A name for the settings file to be saved in .json format can be entered in the field.

---

„Save settings into file“

By pressing this button, the current settings are saved in a .json file locally on the computer.

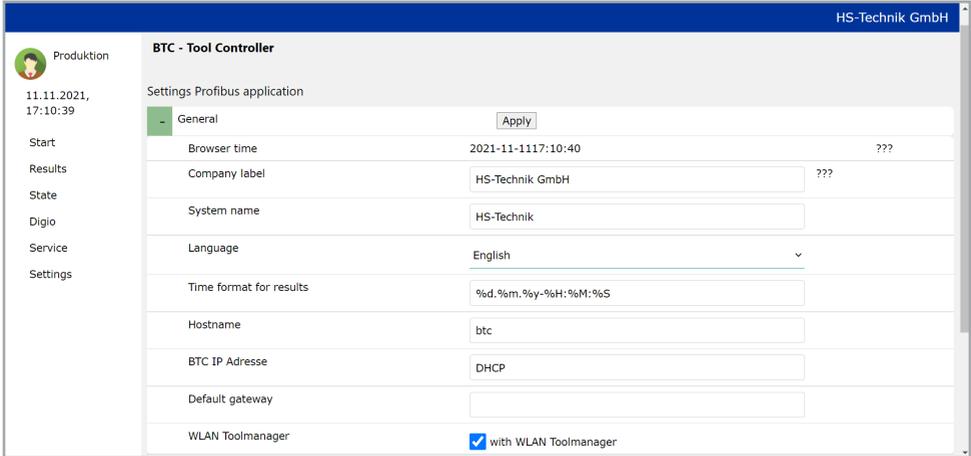
---

### 3.7.4 ProfiBus application settings

There are different sections in the settings for the ProfiBus application. In each section there is a button to apply the changes made. It is **NOT** possible to make changes in several sections and then apply them all via just one button.

If another application type is to be activated, the „General“ section must first be opened and the changes saved there via the „Apply“ button.

The controller then restarts and the desired application type is active.



„Browser time“	Displays the current time of the system on which the web browser is running. This time is transferred to the controller.
„Company label“	The text entered here is displayed at the top right of the browser.
„System name“	The text entered here is shown on the start page of the BTC's LC display. (Maximum 11 characters)
„Language“	Selection of the display language: German or English.
„Time format for results“	The format of the time stamp can be personalised here. The time stamp is saved with each individual result.  Example: %d.%m.%y-%H:%M:%S leads to the time format  Day.Month.Year-Hour:Minute:Second  30.09.2020-13:19:24
„Hostname“	Name for the DHCP host.
„BTC IP Adresse“	Sets the IP address for the right Ethernet port (top view from below).
„Default gateway“	A default gateway can be specified here if the BTC is located in another IP group.

---

„WLAN Toolmanager“ Feature that can be enabled to connect the tools to the tool manager via WiFi.

---

„Apply“ By pressing the „Apply“ button, the changes made are saved and the ProfiBus application is started.

---

In the AccessPoint section, the settings for the WiFi network through which the BTC communicates with the tools are made.

The screenshot displays the 'BTC - Tool Controller' settings for the 'Settings Profibus application'. The interface includes a sidebar with a user profile 'Produktion' and a timestamp '11.11.2021, 17:11:41'. The main settings area is divided into sections: 'General' (with an 'Apply' button), 'AccessPoint' (with a checked 'with AccessPoint' checkbox and an 'Apply and restart device' button), and fields for SSID (btc-000000), Password (btc-000000), Country (United States of America), Band (5GHz selected), and Channel (36). Each field has a '???' placeholder on the right.

---

„With AccessPoint“ Activates/deactivates the BTC's internal access point. When deactivated, the BTC requires access to the company network, so an external access point can be used as a gateway.

---

„SSID“ Sets the name for the WiFi network.

---

„Password“ Sets the key for the WiFi network. (Minimum 8 characters)

---

„Country“ One of eight countries can be selected from the drop-down list. The available channels depend on the regulations of the respective country.

---

„Band“ Selection of the frequency band to be used.

---

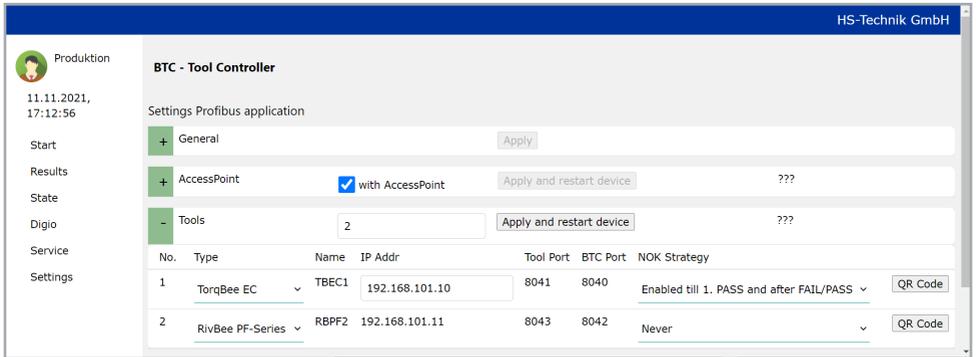
„Channel“ Selection of the channel to be used within the frequency band.

---

„Apply and restart device“ This button saves the changes and reboots the BTC.

---

The tools that are to communicate with the BTC must be configured in the Tools section.



„Tools“ The number of tools that are to communicate with the BTC is entered here. Maximum 8 tools

„No.“ Consecutive numbering of the tools.

„Type“ When creating a new tool, the correct tool type must be selected in the drop-down list.

„Name“ Name of the tool. The name is automatically generated from the number and type.

„IP Addr“ The IPv4 address under which the respective tool uniquely registers in the network. Only the first IP address can be entered here. All other IP addresses are incremented automatically.

„Tool Port“ Port used by the tool. This port is created automatically.

„BTC Port“ Port used by the BTC for the respective tool. This port is created automatically.

„NOK Strategy“ Selection of what happens in the case of an individual result assessed with NOK. Whether, for example, a screwdriver is allowed to loosen and retighten the screw after a NOK.

„QR Code“ The „QR Code“ button can be used to generate a two-dimensional data matrix code that can be scanned with the tool in scan mode. Scanning automatically writes the network settings to the tool. This is only possible with RivBee/NutBee2 series riveters and TorqBee series screwdrivers.

„Apply and restart device“ This button saves the changes and reboots the BTC.

The settings can also be saved in a file on the computer on the page.

The screenshot shows the 'BTC - Tool Controller' settings page. On the left sidebar, there is a user profile for 'Produktion' with a timestamp of '11.11.2021, 17:13:57'. The main content area is titled 'Settings Profibus application' and contains several expandable sections: 'General' with an 'Apply' button; 'AccessPoint' with a checked checkbox for 'with AccessPoint' and an 'Apply and restart device' button; 'Tools' with a text input field containing '2' and an 'Apply and restart device' button; and 'Filename for local settings file' with a text input field containing 'ex.json' and a 'Save settings into file' button.

„Filename for local settings file“

A name for the settings file to be saved in .json format can be entered in the field.

„Save settings into file“

By pressing this button, the current settings are saved in a .json file locally on the computer.

### 3.7.5 PFCS application settings

There are different sections in the settings for the PFCS application. In each section there is a button to apply the changes made. It is **NOT** possible to make changes in several sections and then apply them all via just one button.

If another application type is to be activated, the „General“ section must first be opened and the changes saved there via the „Apply“ button.

The controller then restarts and the desired application type is active.

\*An activation code is required to run the PFCS application (see Section 3.6 from page 16).

The screenshot displays the 'BTC - Tool Controller' settings page. The top right corner shows 'HS-Technik GmbH'. The left sidebar includes a 'Produktion' header with a user icon, a timestamp '11.11.2021, 17:44:00', and a list of menu items: Start, Results, State, Digio, Service, and Settings. The main content area is titled 'BTC - Tool Controller' and contains 'Settings PFCS application'. Under the 'General' tab, there is an 'Apply' button and several configuration fields: 'Browser time' (2021-11-11 17:44:00), 'Company label' (HS-Technik GmbH), 'System name' (HS-Technik), 'Language' (English), 'Time format for results' (%d.%m.%y-%H:%M:%S), 'Hostname' (btc), 'BTC IP Adresse' (DHCP), 'Default gateway' (empty), and 'WLAN Toolmanager' (checked with 'with WLAN Toolmanager').

---

„Browser time“                      Displays the current time of the system on which the web browser is running. This time is transferred to the controller.

---

„Company label“                      The text entered here is displayed at the top right of the browser.

---

„System name“                      The text entered here is shown on the start page of the BTC's LC display. (Maximum 11 characters)

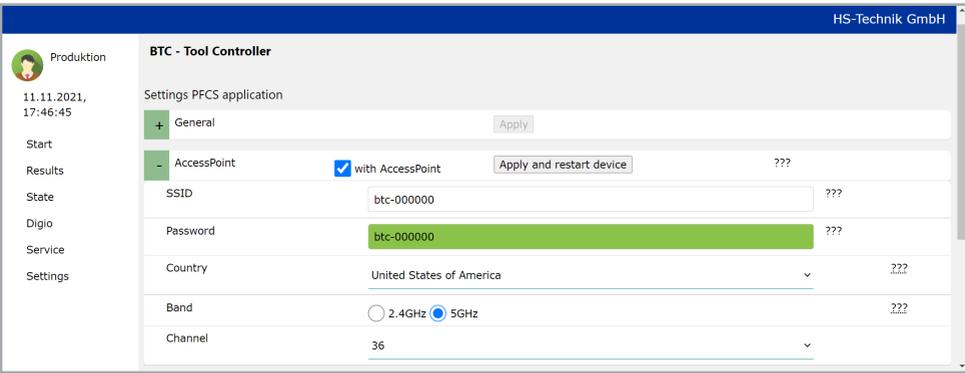
---

„Language“                              Selection of the display language: German or English.

---

„Time format for results“	<p>The format of the time stamp can be personalised here. The time stamp is saved with each individual result.</p> <p>Example: %d.%m.%y-%H:%M:%S leads to the time format Day.Month.Year-Hour:Minute:Second 30.09.2020-14:07:56</p>
„Hostname“	Name for the DHCP host.
„BTC IP Adresse“	Sets the IP address for the right Ethernet port (top view from below). This is used for communication with the PFCS server.
„Default gateway“	A default gateway can be specified here if the BTC is located in another IP group.
„WLAN Toolmanager“	Feature that can be released to connect the tools to the tool manager via WiFi.
„Apply“	By pressing the „Apply“ button, the changes made are saved and the PFCS application is started.

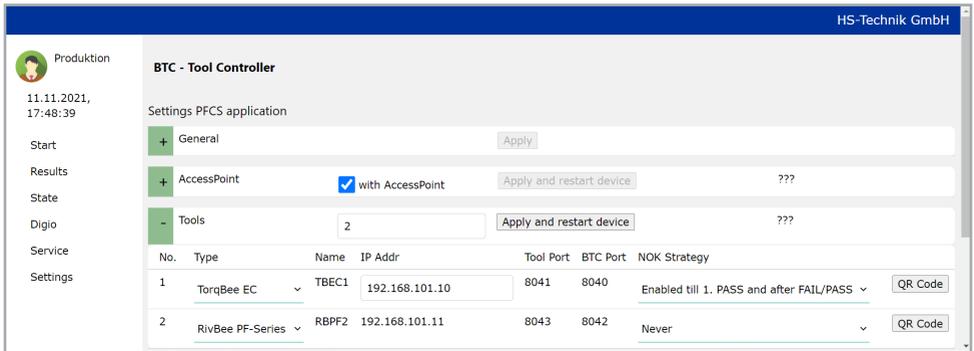
In the AccessPoint section, the settings for the WiFi network through which the BTC communicates with the tools are made.



„With AccessPoint“	Activates/deactivates the BTC's internal access point. When deactivated, the BTC requires access to the company network, so an external access point can be used as a gateway.
--------------------	--

„SSID“	Sets the name for the WiFi network.
„Password“	Sets the key for the WiFi network. (Minimum 8 characters)
„Country“	One of eight countries can be selected from the drop-down list. The available channels depend on the regulations of the respective country.
„Band“	Selection of the frequency band to be used.
„Channel“	Selection of the channel to be used within the frequency band.
„Apply and restart device“	This button saves the changes and reboots the BTC.

The tools that are to communicate with the BTC must be configured in the Tools section.



„Tools“	The number of tools that are to communicate with the BTC is entered here. Maximum 5 tools
„No. “	Consecutive numbering of the tools.
„Type“	When creating a new tool, the correct tool type must be selected in the drop-down list.
„Name“	Name of the tool. The name is automatically generated from the number and type.

---

„IP Addr“	The IPv4 address under which the respective tool uniquely registers in the network. Only the first IP address can be entered here. All other IP addresses are incremented automatically.
„Tool Port“	Port used by the tool. This port is created automatically.
„BTC Port“	Port used by the BTC for the respective tool. This port is created automatically.
„NOK Strategy“	Selection of what happens in the case of an individual result assessed with NOK. Whether, for example, a screwdriver is allowed to loosen and retighten the screw after a NOK.
„QR Code“	The „QR Code“ button can be used to generate a two-dimensional data matrix code that can be scanned with the tool in scan mode. Scanning automatically writes the network settings to the tool. This is only possible with RivBee/NutBee2 series riveters and TorqBee series screwdrivers.
„Apply and restart device“	This button saves the changes and reboots the BTC.

---

All settings for communication with the PFCS server are made in the PFCS settings section.

Setting	Value	Additional Info
PFCS IP Address	192.168.57.100	
BTC IP Adresse	192.168.57.166	
Solicited PFCS Port	16101	<input checked="" type="checkbox"/> Port active
Unsolicited PFCS Port	16102	<input checked="" type="checkbox"/> Port active
Solicited Port: main MID	BE01	
Unsolicited Port: main MID	TM0A	
Data collection mode: forever Progr 88 with no VIN	<input type="checkbox"/> Data collection mode active	
Spool results if no connection to PFCS	<input checked="" type="checkbox"/> Spool active	
Timeout waiting for ACK in s	3	
Timeout waiting for vehicle data in s	5	
Alive Timeout in s	120	
Connect timeout in s	10	

„PFCS IP Address“	The IPv4 address of the PFCS server is entered here.
„BTC IP Adresse“	The IPv4 address of the BTC as client (PFD) is entered here. The address is also automatically entered in the „General“ section.
„Solicited PFCS Port“	Here the port of the server is entered via which process data is requested and to which the corresponding results data is sent.
„Port active“	Activates / deactivates the solicited PFCS port.
„Unsolicited PFCS Port“	Here the port of the server is entered via which unsolicited process data is received.
„Port active“	Activates / deactivates the unsolicited PFCS port.
„Solicited Port: main MID“	The Main Machine Identifier (MID) is entered here. Other MIDs can be generated by the BTC if specified in the screw/rivet data.
„Unsolicited Port: main MID“	Main machine identifier for the unsolicited port.
„Data collection mode: forever Progr 88 with no VIN Data collection mode active“	Activates/deactivates the „Data collection mode“ in which program 88 is permanently activated on the tool and the results data is linked to the parts in the PFCS system.

„Spool results if no connection to PFCS Spool active“ Activates / deactivates the results spool. Results data is buffered and resent if reception is not confirmed by the PFCS server.

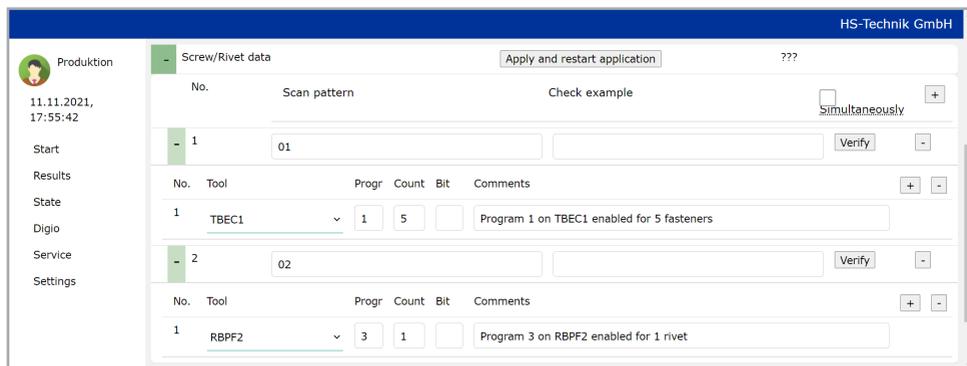
„Timeout waiting for ACK in s“ The time in seconds that the BTC waits for confirmation from the PFCS server is entered here. When the time is up, the BTC will make three more attempts and then close the connection if no confirmation is received.

„Timeout waiting for vehicle data in s“ The time in seconds that the BTC waits for data from the PFCS server is entered here. If the time has expired, the BTC sends its request, or its results data, three more times.

„Alive timeout in s“ The interval in seconds during which the BTC sends an alive telegram to the PFCS server.

„Connect timeout in s“ The time in seconds after which the BTC reconnects with the PFCS server.

In the Screw/rivet data section, the PFCS codes transmitted in response to the VIN at the solicited port or arriving unsolicited via the unsolicited port must be assigned.



„No.“ Number of the screw/rivet data set. The number is assigned consecutively as soon as a new data set is created.

„Scan pattern“ Here, the PFCS code is entered that activates the data set.

„Check example“ The activation code of the PFCS server for the test can be entered in this field.

„Simultaneously“ In PFCS mode, this function is meaningless. All tools that are entered in a screw/rivet data set are always released at the same time.

„+“ Button“	<p>The top „+“ button creates a new screw/rivet data set.</p> <p>The „+“ button within the screw/rivet data set adds another process step to the data set.</p>
„-“ Button“	<p>The „-“ button, which is located directly next to the „Verify“ button in each screw/rivet data set, is used to delete the entire data set.</p> <p>The „-“ button next to the „+“ button for adding a new process step has exactly the opposite effect. If it is pressed, the last process step of the respective screw/rivet data set is deleted.</p>
„Tool“	Drop-down list for selecting the tool to be enabled in the respective process step.
„Progr“	The number entered here corresponds to the program that is to be enabled on the tool.
„Count“	Specifies how many cycles are to be run with the enabled program.
„Bit“	In PFCS mode, it is not possible to work with the socket tray. This field therefore has no meaning in this mode.
„Comments“	A free text can be entered here as a comment.
„Apply and restart application“	This button saves the changes and restarts the application with the changes.

The settings can also be saved in a file on the computer on the page.

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Produktion

12.11.2021,  
13:25:38

Start

Results

State

Digio

Service

Settings

### BTC - Tool Controller

Settings PFCS application

+	General	Apply
+	AccessPoint <input checked="" type="checkbox"/> with AccessPoint	Apply and restart device ???
+	Tools <input type="text" value="2"/>	Apply and restart device ???
+	PFCS Settings	Apply and restart device ???
+	Screw/Rivet data	Apply and restart application ???

Filename for local settings file  Save settings into file

---

„Filename for local settings file“	A name for the settings file to be saved in .json format can be entered in the field.
„Save settings into file“	By pressing this button, the current settings are saved in a .json file locally on the computer.

---

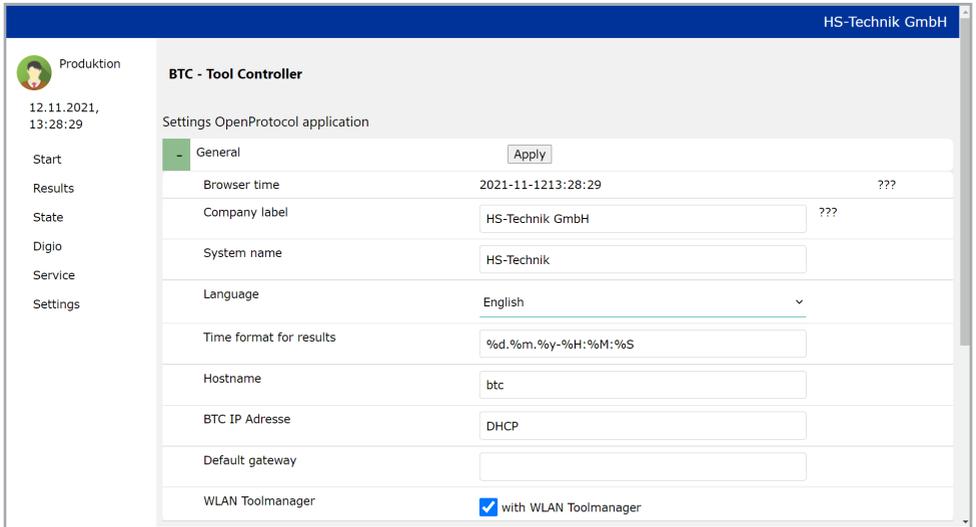
### 3.7.5 OpenProtocol application settings

There are different sections in the settings for the OpenProtocol application. In each section there is a button to apply the changes made. It is **NOT** possible to make changes in several sections and then apply them all via just one button.

If another application type is to be activated, the „General“ section must first be opened and the changes saved there via the „Apply“ button.

The controller then restarts and the desired application type is active.

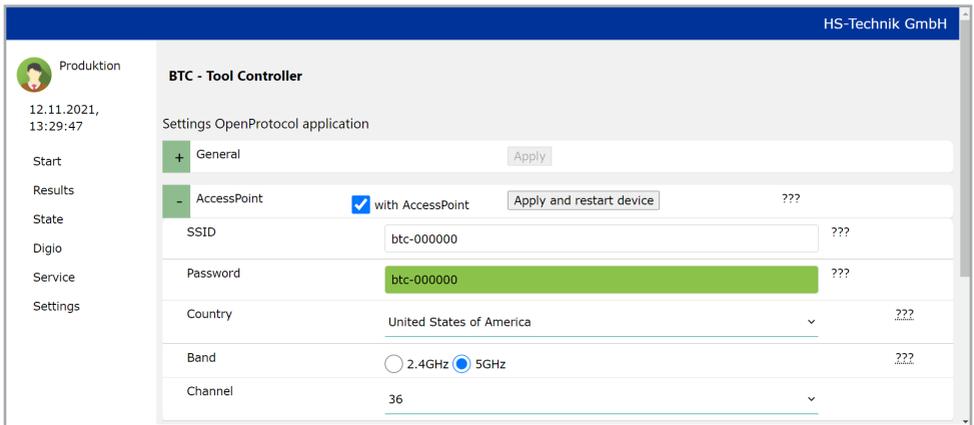
\*An activation code is required to run the OpenProtocol application (see Section 3.6 from page 16).



„Browser time“	Displays the current time of the system on which the web browser is running. This time is transferred to the controller.
„Company label“	The text entered here is displayed at the top right of the browser.
„System name“	The text entered here is shown on the start page of the BTC's LC display. (Maximum 11 characters)
„Language“	Selection of the display language: German or English.
„Time format for results“	The format of the time stamp can be personalised here. The time stamp is saved with each individual result.  Example: %d.%m.%y-%H:%M:%S leads to the time format  Day.Month.Year-Hour:Minute:Second  02.10.2020-14:52:37
„Hostname“	Name for the DHCP host.
„BTC IP Adresse“	Sets the IP address for the right Ethernet port (top view from below). This is used for communication with the OpenProtocol server.
„Default gateway“	A default gateway can be specified here if the BTC is located in another IP group.

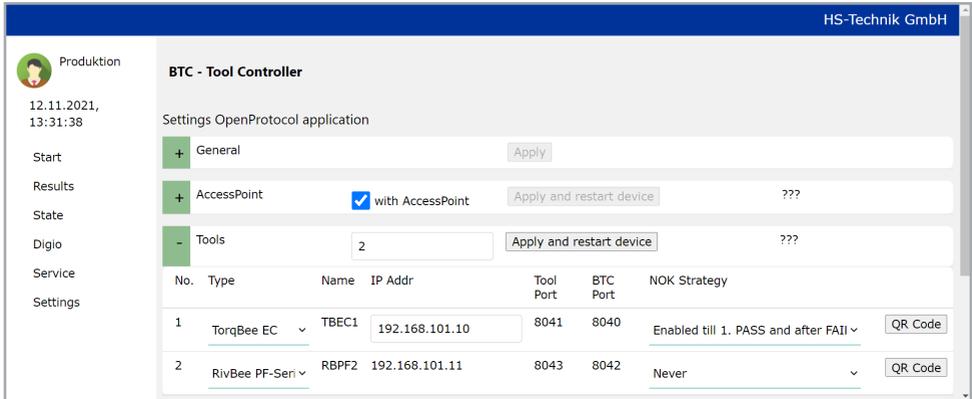
„WLAN Toolmanager“	Feature that can be released to connect the tools to the tool manager via WiFi.
„Apply“	By pressing the „Apply“ button, the changes made are saved and the OpenProtocol application is started.

In the AccessPoint section, the settings for the WiFi network through which the BTC communicates with the tools are made.



„With AccessPoint“	Activates/deactivates the BTC's internal access point. When deactivated, the BTC requires access to the company network, so an external access point can be used as a gateway.
„SSID“	Sets the name for the WiFi network.
„Password“	Sets the key for the WiFi network. (Minimum 8 characters)
„Country“	One of eight countries can be selected from the drop-down list. The available channels depend on the regulations of the respective country.
„Band“	Selection of the frequency band to be used.
„Channel“	Selection of the channel to be used within the frequency band.
„Apply and restart device“	This button saves the changes and reboots the BTC.

The tools that are to communicate with the BTC must be configured in the Tools section.



„Tools“	The number of tools that are to communicate with the BTC is entered here. Maximum 5 tools
„No. “	Consecutive numbering of the tools.
„Type“	When creating a new tool, the correct tool type must be selected in the drop-down list.
„Name“	Name of the tool. The name is automatically generated from the number and type.
„IP Addr“	The IPv4 address under which the respective tool uniquely registers in the network. Only the first IP address can be entered here. All other IP addresses are incremented automatically.
„Tool Port“	Port used by the tool. This port is created automatically.
„BTC Port“	Port used by the BTC for the respective tool. This port is created automatically.
„NOK Strategy“	Selection of what happens in the case of an individual result assessed with NOK. Whether, for example, a screwdriver is allowed to loosen and retighten the screw after a NOK.
„QR Code“	The „QR Code“ button can be used to generate a two-dimensional data matrix code that can be scanned with the tool in scan mode. Scanning automatically writes the network settings to the tool. This is only possible with RivBee/NutBee2 series riveters and TorqBee series screwdrivers.
„Apply and restart device“	This button saves the changes and reboots the BTC.

In the OpenProtocol Application Settings section, the parameters for communication with the OpenProtocol server are set.

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Produktion

12.11.2021,  
13:34:00

Start

Results

State

Diglo

Service

Settings

**BTC - Tool Controller**

Settings OpenProtocol application

+ General

+ AccessPoint  with AccessPoint  ???

+ Tools   ???

- Settings OpenProtocol  ???

TBEC1 OpenProtocol Port

RBPf2 OpenProtocol Port

---

„XXXX OpenProtocol Port“      A port is defined here for each tool.

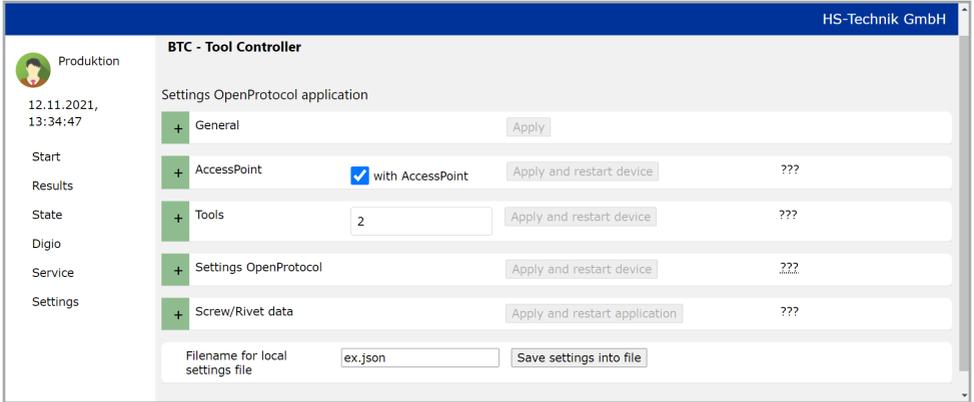
---

„Apply and restart device“      This button saves the changes and reboots the BTC.

---

No settings relevant to the OpenProtocol application can be made in the screw/rievet data section.

The settings can also be saved in a file on the computer on the page.



„Filename for local settings file“

A name for the settings file to be saved in .json format can be entered in the field.

„Save settings into file“

By pressing this button, the current settings are saved in a .json file locally on the computer.

## 4 Example scan application

This section shows an example of how the barcode masks can be configured for the scan application.

### 4.1 Example 1

In this example, the barcode for program release is to consist of the serial number of the workpiece. The structure of the serial number is as follows:

**SN + (year) + KWxx + xxxx**

The beginning of a serial number consists of the letter combination „SN“. This is followed by a two-digit number combination indicating the year. This is followed by the letter combination „CW“ and the number of the calendar week. Last is a consecutive 4-digit number. A valid serial number could therefore look like this:

**SN20KW420001**

The unchanging elements of the barcode are therefore the two letter combinations „SN“ and „CW“. The remaining digits of the barcode can consist of (almost) any numbers.

No.	Scan pattern	Check example
1	SN%d%dKW%d%d%d%d%d%d	???
2		???
3		???

In our example, the same work step is always to be carried out on each workpiece. There is no need to distinguish between different batches or anything else. The release by barcode scan serves above all to restrict the worker to only carry out the specified work steps with

the tool and to carry out documentation. This is now entered in the „Scans“ section as follows, the unchangeable elements „SN“ and „CW“ are transferred over one to one, and a placeholder „%d“ is entered inbetween for each digit. The controller expects a number from 0 - 9 at this point. The entered pattern can now be tested by entering the sample barcode.

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Produktion  
12.11.2021,  
13:41:01

Start  
Results  
State  
Digio  
Service  
Settings

- + AccessPoint  with AccessPoint  ???
- + Tools   ???
- + Socket tray  with socket tray  ???
- Scans  ???

No.	Scan pattern	Check example
1	<input checked="" type="checkbox"/> with scan1 <input type="text" value="SN%d%dKW%d%d%d%d%d%d"/>	<input type="text" value="SN20KW420001"/> <input type="button" value="Verify"/>
2	<input type="checkbox"/> with scan2 <input type="text"/>	<input type="text"/> <input type="button" value="Verify"/>
3	<input type="checkbox"/> with scan3 <input type="text"/>	<input type="text"/> <input type="button" value="Verify"/>

By pressing the „Test“ button, the entered code is checked for validity. For our example, the created barcode mask is valid. A pop-up window also opens in which the entered code is output as a QR code. \*\*Pop-ups must be allowed.

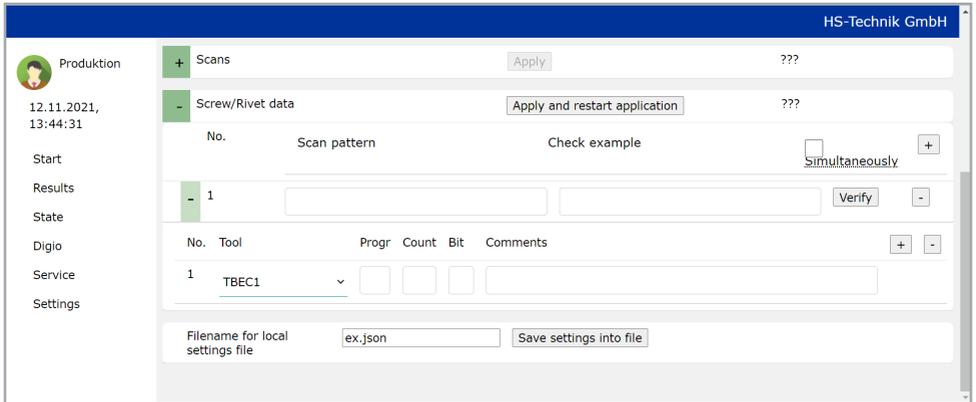
SN20KW420001



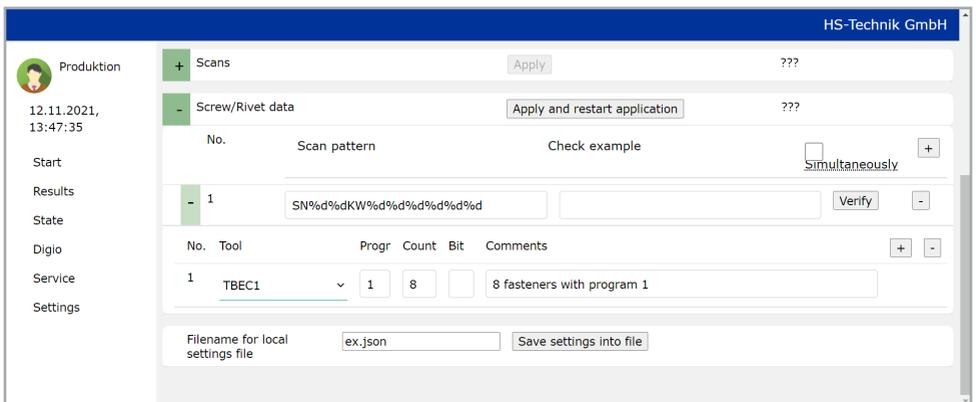
The changes in the „Scans“ section must only be saved by pressing the „Apply and restart application“ button.

In the next step, a screw/riquet data set must be created which contains the information about which work steps are to be carried out.

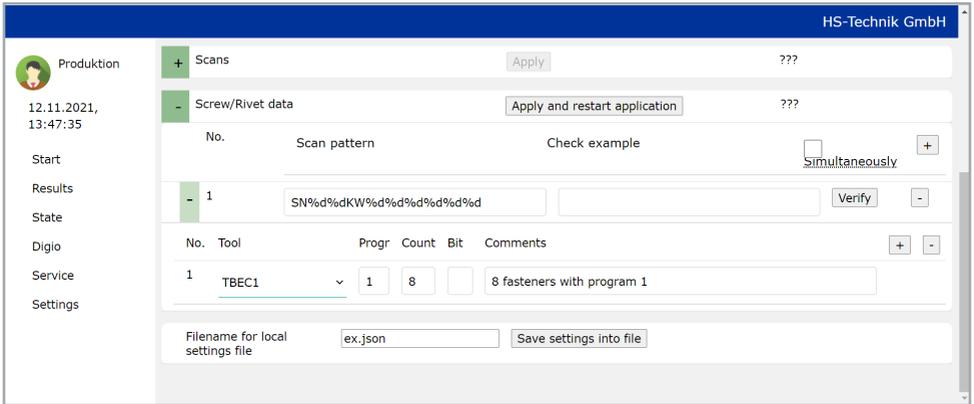
A new, empty screw/riquet data set is created for this purpose.



As soon as you click in the „Scan pattern“ field, the created barcode mask is automatically entered.



Since there is no case distinction in our example, but the same work steps must be carried out for each workpiece, only the necessary work steps now need to be edited.



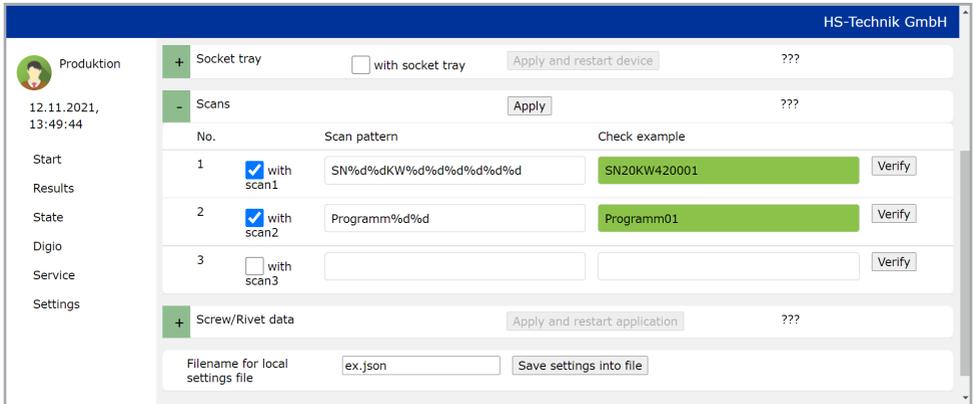
When the screw/rievet data set is fully edited, the changes are saved via the „Apply and restart application“ button. Program release via the barcode is now fully configured.

## 4.2 Example 2

In this example, the program release is to take place via two successive scans. The first scan will again be a serial number, which corresponds to the structure from example 1. The second scan defines the work step that is to be carried out. It consists of **Programm + xx**. A valid code in this case would look like this:

### Programm01:

The unchangeable part of the barcode is the „Programm“ and the changeable part is the two-digit number. In the "Scans" section, tick „With Scan 2“ and enter the Programm plus „%d%d“ for the two undefined digits.



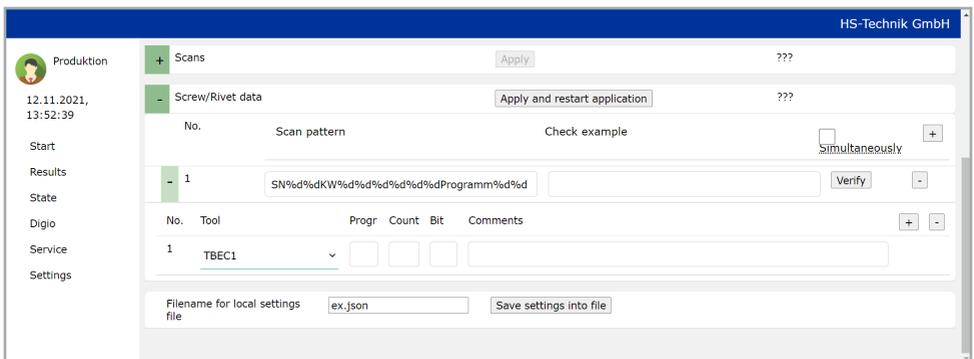
Again, our sample code for the test is entered here. The entered code is valid and a QR code is generated.

Programm01

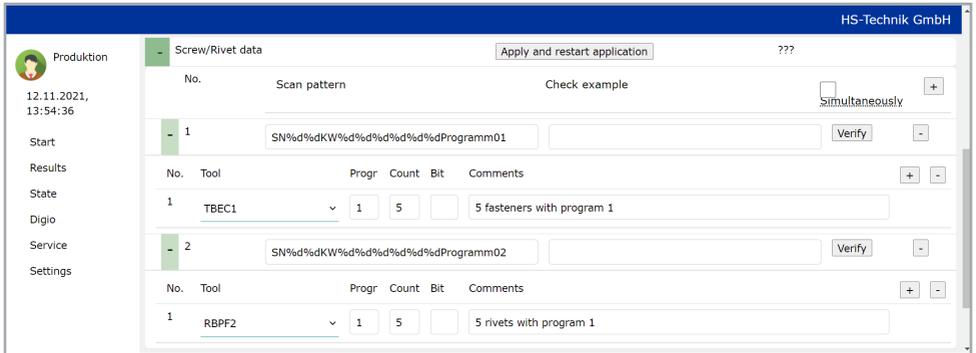


The additional scan can now be saved with the „Apply and restart application“ button.

Now the various screw/rievet data sets still need to be created. First a new data set is created. If you now click in the „Scan pattern“ field, the entire code mask, i.e. the code for the serial number + the code for the work step, is automatically entered.



Now we want to specify that, if the code „Programm01“ is scanned, a screw connection is carried out, and if the code „Programm02“ is scanned, a riveting operation is carried out. We achieve this by replacing the two „%d“ in the second scan mask with „01“ and „02“ as soon as they are entered in the screw/rivet data.



By pressing the „Apply and restart application“ button, the screw/rivet data sets are transferred. For program release, the serial number must now be scanned first and then the code for the work step to be released. So either „Programm01“ or „Programm02“.

A coherent ID consisting of a serial number and Programmxx is then entered in the results.

# 5 Example of simultaneous working

This section explains how to work with several tools simultaneously.

## 5.1 Tools in different groups

It is possible to specify a group when creating the tools. By dividing the tools into different groups, the different groups can simultaneously process screw/riquet data.

In this example, two tools are created: a screwdriver TBSOP1 in group 0 and a riveting tool RBPF2 in group 1.

The screenshot shows the 'BTC - Tool Controller' interface. On the left, a sidebar contains a user profile icon, the name 'Produktion', and a clock showing '12.11.2021, 14:03:37'. The main area is titled 'Settings scan application' and contains three expandable sections: 'General' with an 'Apply' button, 'AccessPoint' with a checked 'with AccessPoint' checkbox and an 'Apply and restart device' button, and 'Tools' with a dropdown set to '2' and another 'Apply and restart device' button. Below these sections is a table with the following data:

No.	Type	Name	IP Addr	Tool Port	BTC Port	NOK Strategy	Gruppe
1	TorqBee EC	TBEC1	192.168.101.10	8041	8040	Enabled till 1. PASS and after FAIL/PASS	0
2	RivBee PF-Series	RBPF2	192.168.101.11	8043	8042	Never	1

By pressing the „Apply and restart device“ button, the group settings for the tools are saved. The start page has now changed.

The screenshot shows the 'BTC - Tool Controller' interface in a different state. The sidebar now shows 'Friday 12.11.2021 14:07:49'. The main area is titled 'Actual work order state' and contains a table with the following data:

PartNo.	SerialNo./Tool	Cycle/Torque	Model/Count	State/M/F	Hint/Angle/Stroke	No.
				g	12.11.21 14:07:44:wait for scan	
				g1	12.11.21 14:07:44:wait for scan	
			TBEC1			RBPF2

The field for manual input and the list of valid scans have disappeared. Two fields are now displayed that show the current status for the respective group.

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Produktion

Friday 12.11.2021 14:21:03

**BTC - Tool Controller**

Actual work order state

PartNo.	SerialNo./Tool	Cycle/Torque	Model/Count	State/M/F	Hint/Angle/Stroke	No.
				g	12.11.21 14:20:57:wait for scan	
				g1	12.11.21 14:20:57:wait for scan	

Start

Results

State

Diglo

Service

Settings

TBEC1

RBPF2

With both tools you can now scan the first code, the serial number. If it is a valid code, it is displayed with a green background in the respective group.

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Produktion

Friday 12.11.2021 14:25:16

**BTC - Tool Controller**

Actual work order state

PartNo.	SerialNo./Tool	Cycle/Torque	Model/Count	State/M/F	Hint/Angle/Stroke	No.
				g	12.11.21 14:25:11:wait for scan	SN20KW420001
				g1	12.11.21 14:25:11:wait for scan	SN20KW420001

Start

Results

State

Diglo

Service

Settings

TBEC1

RBPF2

Next, a scan of the code „Programm01“ follows with group 0, which prompts the release. Group 1 is still waiting for the second scan.

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Produktion

Friday 12.11.2021 14:25:45

**BTC - Tool Controller**

Actual work order state

PartNo.	SerialNo./Tool	Cycle/Torque	Model/Count	State/M/F	Hint/Angle/Stroke	No.
	SN20KW420001	Programm01				
	TBEC1		0/5			
				g1	12.11.21 14:25:40:wait for scan	SN20KW420001

Start

Results

State

Diglo

Service

Settings

TBEC1

RBPF2

Now the code „Programm02“ is scanned with group 1, which also results in a release for group 1. Now you can work with the tools of both groups.

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Produktion

Friday  
12.11.2021  
14:26:11

Start

Results

State

Digio

Service

Settings

### BTC - Tool Controller

Actual work order state

PartNo.	SerialNo./Tool	Cycle/Torque	Model/Count	State/M/F	Hrnt/Angle/Stroke	No.
SN20KW420001Programm01						
	TBEC1		0/5			
SN20KW420001Programm02						
	RBPF2		0/5			
	TBEC1					
						RBPF2

## 5.2 Simultaneous working within a screw/rivet data set

It is also possible to activate simultaneous working of all tools within a screw/rivet data set. It is important here that the tools are in the same group.

As an example, a scanning application with a barcode scan as in example 1 is used again.

Now, however, the tick is set next to „Simultaneously“ in the screw/rivet data. A total of two steps are created in the data set. The first consists of 5 screw connections with the TB SOP1, the second of 5 riveting operations with the NBPF2. Use the „Apply and restart application“ button to apply these settings.

The screenshot shows the 'Screw/Rivet data' configuration screen. The 'Simultaneously' checkbox is checked. Below, a table lists two tasks:

No.	Tool	Progr	Count	Bit	Comments
1	TBEC1	1	5		5 fasteners with program 1
2	RBPF2	1	5		5 rivets with program 1

At the bottom, there is a field for 'Filename for local settings file' with the value 'ex.json' and a 'Save settings into file.' button.

If the example code SN20KW420001 is now scanned with one of the two tools, the screw/ rivet data set and the tasks defined in it are released for both tools.

The screenshot shows the 'BTC - Tool Controller' screen. The 'Actual work order state' is displayed as follows:

Part/No.	Serial/No./Tool	Cycle/Torque	Model/Count	State/M/F	Hint/Angle/Stroke	No.
SN20KW420001						
	TBEC1		0/5			
	RBPF2		0/5			

Below the table, there are two colored bars: a green bar for TBEC1 and a red bar for RBPF2.

Corresponding partial results are displayed in the respective line.

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Produktion

Friday  
12.11.2021  
14:39:52

- Start
- Results
- State
- Diglo
- Service
- Settings

### BTC - Tool Controller

Actual work order state

PartNo.	SerialNo./Tool	Cycle/Torque	Model/Count	State/M/F	Hint/Angle/Stroke	No.
SN20KW420001						
	TBEC1		1/5	3.05Nm	158°	
	RBPF2		0/5			
	TBEC1		RBPF2			

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