

OPERATING INSTRUCTIONS

NetBee

- Original operating instructions -



NOTE

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

Controller NetBee
Issue date: September 2023

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1 Operating principles

Dear customers,

thank you for choosing a HS-Technik GmbH product.

This quality product „Made in Germany“ fulfils the highest requirements with regard to performance, quality and accuracy. When used correctly the product will undoubtedly perform very well for many years.

This operating instructions contains information on safety and for the operation of the NetBee. In addition it contains information on the dimensions and technical data. Our team will be happy to assist you with any questions or additional information needed.

1.1 Scope of delivery

- NetBee
- Ferrite
- Charging cable
- Operating instructions

1.2 General information

Read the device operating manual before initial operation. **Please pay particular attention to Chapter 2 „General safety information for power tools“.**

This manual should make it easier for the operator to get used to the device and of its intended application possibilities. The operating instructions include important information related to the safe and proper operation of the device. Compliance with these instructions helps you to:

- Avoid hazards
- Avoid repair costs and downtimes
- Increase the reliability and the lifespan of the product

This manual must be read and applied by every person who is assigned to conduct work using this device.

In addition to this operating instructions the applicable regulations on accident prevention and environmental protection should be observed.



NOTE

After reading, keep the operating instructions in a place accessible to every operator. If you have any further questions, please feel free to contact us.

1.4 Structure of the warnings

The warnings are structured as follows:



DANGER

Indicates an immediate dangerous situation that can lead to serious or even deadly injuries and/or that could seriously damage or even destroy the device.



WARNING

Indicates a potentially dangerous situation that can lead to serious injuries and/or damage to the device.



NOTE

Important and useful information on using this device.

1.5 Technical terms and abbreviations used

Abbreviation	Meaning
AC	Alternate current
CCW	Counter clockwise
CW	Clockwise
DB	Database
Diff.	Difference
ID	Identification
I/O	Input/Output
IP	Internet Protocol
Mb	Megabit
MB	Megabyte
Max	Maximum
Min	Minimum

Abbreviation	Meaning
ms	Millisecond
MU	Measurement Unit
N.A.	Not Applicable
Nm	Newton meter
Nr.	Number
OK	Approved
NOK	Not approved
PC	Personal Computer
SC	Statistic Control
SW	Software
USB	Universal Serial Bus

1.6 Intended use

This device was designed to interface with the production line tools and to the production system.



WARNING

Intended use also includes

- following all indications of the operating instructions and
- observance of inspection and maintenance works.

Any other use or use beyond that is considered improper use. HS-Technik GmbH is not liable for any damage resulting from this.

1.7 Improper use



DANGER

The use of this device for other purposes is not permitted. Improper use or incorrect accessories can lead to dangers with unforeseeable consequences.

We do not assume any liability for damage and malfunctions resulting from non-observance of these operating instructions and improper use.

1.8 Duties of the operator

The operator commits to only allow people to work with this device, with the basic regulations on work safety and accident prevention and who have been trained on how to use this device at the workplace.

The safety awareness of the personnel while working will be reviewed at regular intervals.

1.9 Duties of personnel

Prior to its use all people who work with this device are obligated to inform themselves of the applicable workplace safety and accident prevention regulations for this device and to observe them.

1.10 Training of personnel

Only trained and instructed personnel should work with this device. The responsibilities of the personnel must be clearly defined. Trainees may only work with this device under the supervision of an experienced person.

1.11 Guarantee and liability

Guarantee and liability claims for personal injury and property damage are excluded, if caused by one or more of the following:

- improper use
- failure to observe these operating instructions
- improper installation, commissioning, operation and maintenance of the device
- operating the device with defective safety devices or improperly installed, or non-functioning safety and protective devices
- failure to observe the information in the operating instructions regarding transport, storage, assembly, commissioning, operation and maintenance of the device
- unauthorized structural modifications to the device
- improperly performed repairs
- catastrophes due to external influences and acts of God

1.12 Copyright

These operating instructions are intended solely for the operator and its personnel.

They contain guidelines and information which may not be fully, or partially

- reproduced
- distributed or
- otherwise shared.

The copyright of these operating instructions is retained by HS-Technik GmbH.

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2 General safety information for power tools



DANGER

Read all the safety information, instructions, illustrations and technical data which is provided with this device. Failure to follow the instructions below may result in electric shock, fire and/or serious injury.



WARNING

This device was manufactured in accordance with current state-of-the-art technology and recognized technological safety guidelines. However, its use may jeopardise the health and life of the user or third parties, or risk damage to other property.



WARNING

The workplace must only be used in accordance with its intended use and in technically perfect condition.



NOTE

Keep all safety information and instructions for the future.



NOTE

Only have your device repaired by qualified professional staff and only with original replacement parts which are available at HS-Technik GmbH. This ensures that the safety of the device is maintained.

3 Important information about this device

3.1 Structural modifications

No changes, additions or conversions to the device may be made without the approval of the manufacturer.

All conversion measures require written permission and confirmation by **HS-Technik GmbH**.



WARNING

In the event of the replacement of wear and tear parts only original replacement parts may be used.

3.2 Cleaning the device and disposal



WARNING

Do not open the NetBee internal parts. Maintenance must be done by HS-Technik authorized personnel only.

It is OK to use common disinfectants to clean HS-Technik products in order to follow their decontamination protocols that they have put together for their facility. Therefore, wiping the exterior surface with a cloth or wipe that contains a disinfectant is reasonable. If a disinfectant must be sprayed onto the product, care should be taken not to spray the disinfectant in points where it could enter the inside of the product.

Information on Waste of Electrical and Electronic Equipment:

This product and its information meet the requirements of the WEEE Directive (2002/96/EC) and successive modifications. At end of life the products must be treated as WEEE. The product is marked with a crossed trashcan. See picture below:



In the European Union, this symbol indicates that products must not be disposed of as

unsorted municipal waste but must be dealt with separately, in accordance with the WEEE Directive (2012/19/EU). At the end of its life, this product must be wasted according to local regulations. Collecting properly equipment to be wasted for consequent environmental compatible dismissing, recycling, and treatment processes contributes to prevent possible negative effects on the environment, on health and helps re-using and/or recycling of the equipment raw materials.

3.3 Information on Waste of Batteries

This product and its manuals meet the requirements of the Battery Directive (2006/66/EC) and successive modifications. At end of life the internal wasted battery must be dismissed according local regulations. The abusive product dismissing by the user implicates administrative sanctions according to the above indicated Directives.

4 Start-up and use

DANGER

Risk of injury from damaged devices

Damaged devices can lead to injuries or damages.

- All damaged parts must be repaired before use.



Risk of injury from falling devices

Falling devices can lead to injuries or damages.

- Avoid dropping the device.

Risk of injury due to improper use

Improper use can lead to injuries or damage.

- Use the device only for the intended purposes.



NOTE

Maintain your device with care. Follow the operating instructions during maintenance and cleaning.



NOTE

Do not drop the device, and do not let any other objects fall onto the device. Protect it from impacts.

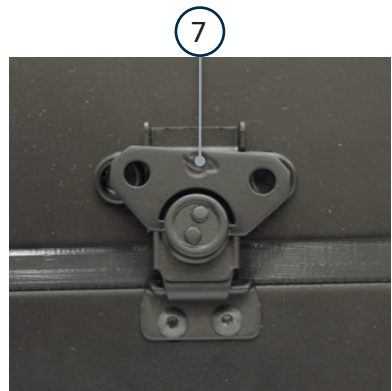
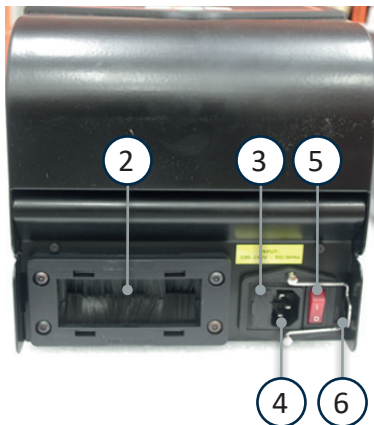


NOTE

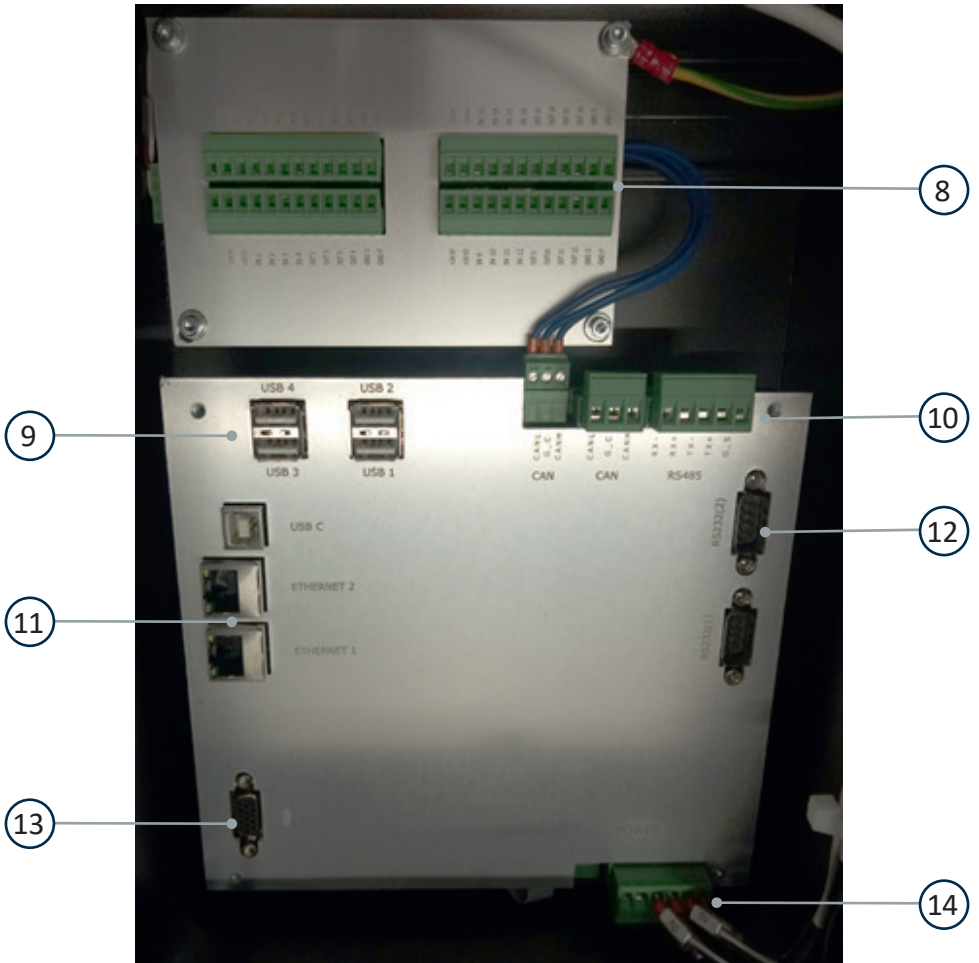
Ensure that the device does not come into contact with splashing water or oil.

4.1 Device structure

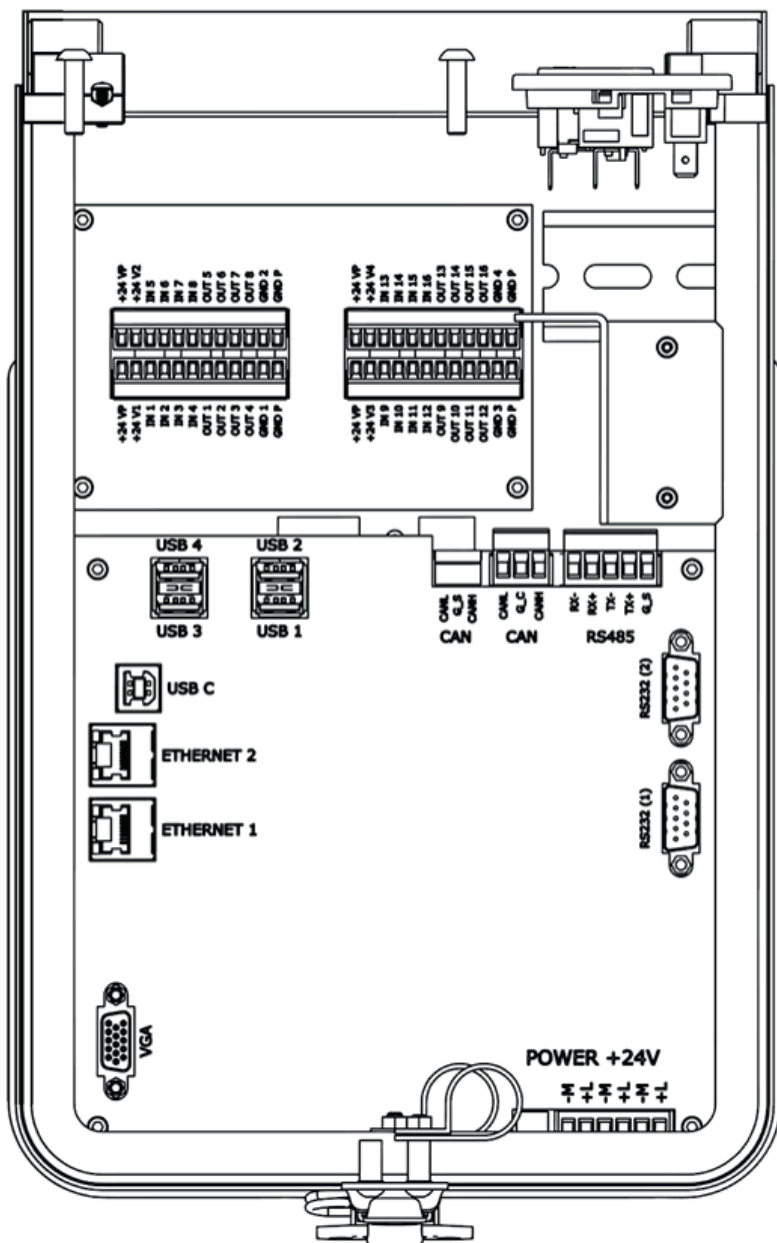
1. Touchscreen
2. Passage for cable tray
3. AC Power fuse
4. Input AC power
5. Main switch
6. Clamp for AC power cable
7. Locking mechanism



- 8. Inputs/Outputs
- 9. USB ports
- 10. RS 485 port
- 11. Ethernet ports
- 12. RS 232 ports
- 13. VGA port
- 14. Internal 24 VDC




NetBee-16IO





Touchscreen	NetBee monitor providing information on the tightening operation.
Input AC power	Connect input AC power cable (ensure that the power line is properly grounded). Use the clamp to lock the power cable to avoid unwanted disconnection. To main switch turns on/off the NetBee. In the fuse box, there is one spare fuse.

Locking mechanism The locking mechanism must always be closed after the NetBee installation.

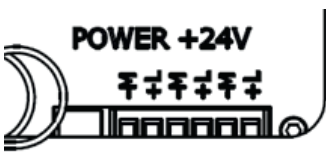
 **WARNING**
Make sure to properly lock the device again after opening.

During installation or maintenance, unlock to open the NetBee and access the connectors.

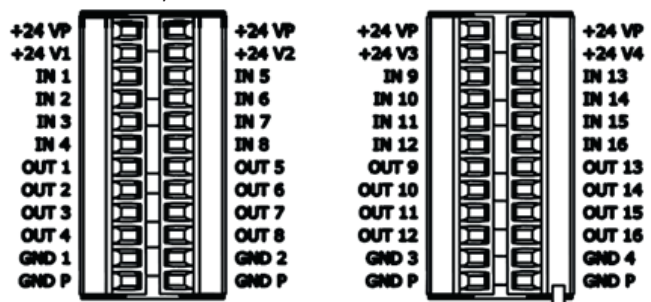
 **WARNING**
When unlocking, hold onto the NetBee housing to prevent it from falling over.

 **DANGER**
Disconnect power cable before release of the locking mechanism.

Internal 24 VDC Internal NetBee power



Inputs / Output connectors Number of inputs/outputs depending on the NetBee option chosen. Connectors for I/O.



Each output provides, when activated, +24 VDC, 0.7A maximum.

+24 VP / GND P is the NetBee internal voltage.

For each group of outputs (Out 1 to Out 4, Out 5 to Out 8, Out 9 to Out 12, Out 13 to Out 16), the power +24 V1 / GND 1, +24 V2 / GND 2, +24 V3 / GND 3, +24 V4 / GND 4 can be taken from + 24 VP and GND P (with jumpers between the pins), or can be from an external system.

Inputs are opto-isolated:

- Low: 0 VDC

- High: 24 VDC

Inputs and outputs must be connected in a coherent way to the external system (see the example below).

0 V = input low
24 VDC = input high

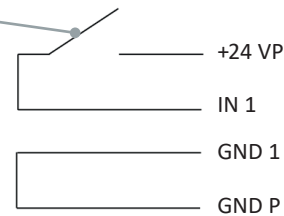
Example of connection:

- Input from external system which provides the input voltage

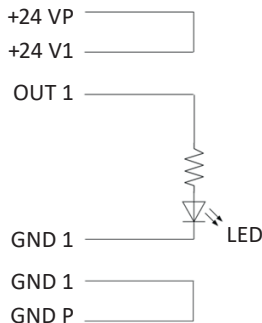


- Input from a switch

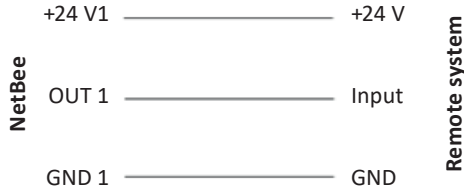
open = input low
closed = input high



- Output driving a LED with internal NetBee power:



- Output to a remote system (for example PLC) with its own power:



Ethernet ports



One port is used to connect to plant network, and the other is available to connect to tools.

RS 232 ports



RS 232 Serial ports are for:

- Barcode reader (up to 2)
- Printer
- Serial Out (to send results via serial interface)
- **COM 2 only:** Fieldbus communication



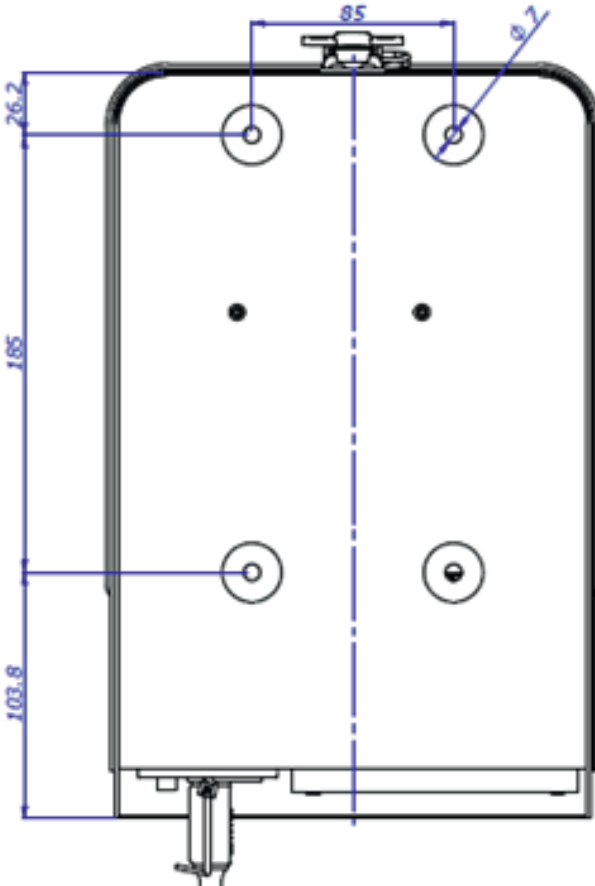
NOTE

When the serial (COM) ports are used for a certain function, they are not available for others. For example, if one serial port is used for barcode and one for Fieldbus, it is not possible to use a port for serial out, and vice versa.

CAN BUS	Can Bus interface, not active in this version
RS485/RS422	Serial port, not used in this version
USB ports	USB can be used e.g. for a barcode reader
110 - 230 VAC power cable	Power cable, compliant with electrical standards of respective destination countries.

4.2 Assembly of the NetBee

The NetBee is intended for wall mounting.



Specifications in mm
Not shown to scale



NOTE

Please install the controller so that the connection socket is easily accessible in order to ensure a quick and safe disconnection from the network in a case of emergency.

4.3 NetBee programming with Web interface

Simply connect to the Netbee from any remote computer on the same network.

The screenshot displays the HST NetBee web interface. At the top, the status is 'Idle' and the operation is 'None'. The VIN and Tool fields are empty. The network settings show Network1: 192.168.1.10 and Network2: 192.168.0.100. The interface is divided into several sections:

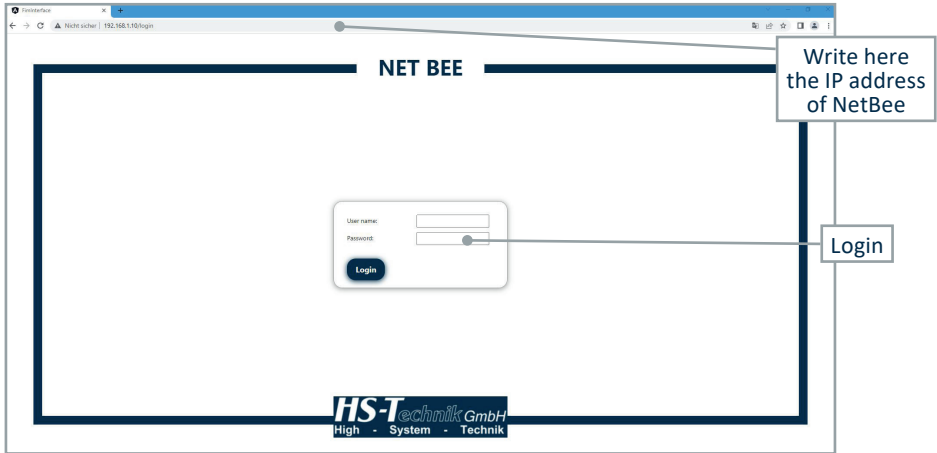
- Station status:** Two boxes show 'Station: STATION 1' and 'Station: STATION 2', both with 'Operation: None' and 'Socket: None'.
- Last VINs:** A table with columns for VIN, Date / Time, Station, Sequence, Batch, Torque, Angle, and Status. A 'Filter' button is present above the table.
- Tools Status:** A table with columns for Tool, Station, and Status.

VIN	Date / Time	Station	Sequence	Batch	Torque	Angle	Status
20220420096400	20/04/2022 09:54:24	1 - STATION 1	Schrauben 2.0Nm	1/2	2.5 Nm	1226.0 °	Red X
20220331093727	31/03/2022 09:39:15	1 - STATION 1	Schrauber in Folge	3/3	2.53 Nm	211.0 °	OK
20220308112456	08/03/2022 11:25:05	1 - STATION 1	Schrauber in Folge	3/3	2.53 Nm	57.0 °	OK
20220307133500	07/03/2022 13:35:06	1 - STATION 1	Niekmutter setzen	1/1	14.13 kN	7.0 °	OK
20220307133434	07/03/2022 13:34:43	1 - STATION 1	Schrauber in Folge	3/3	2.57 Nm	45.0 °	OK
20220307132942	07/03/2022 13:29:48	1 - STATION 1	Niekmutter setzen	1/1	14.12 kN	7.0 °	OK
20220307132932	07/03/2022 13:29:39	1 - STATION 1	Niekmutter setzen	1/1	14.27 kN	7.0 °	OK

4.3.1 Connecting to the NetBee

The NetBee is delivered with a default network setting (192.168.1.10 for Network 1. DHCP for network 2), provided with the NetBee documents.

Open the internet browser and connect to the NetBee IP Address:



Enter the default **User Name** and **Password**, provided with the NetBee documents. Click on **Login** to connect. The main menu is shown:

Station status: Idle Running Alarm

Station: STATION 1 VIN: Tool:
Operation: None Socket: None

Station: STATION 2 VIN: Tool:
Operation: None Socket: None

Last VINs: Filter Q

VIN	Date / Time	Station	Sequence	Batch	Torque	Angle	Status
20220420095400	20/04/2022 09:54:24	1-STATION 1	Schrauben 2,0Nm	1/2	2,5 Nm	1226,0°	OK
20220301092727	31/03/2022 09:38:15	1-STATION 1	Schrauben in Fridge	3/3	2,55 Nm	219,0°	OK
20220308112456	08/03/2022 11:25:05	1-STATION 1	Schrauben in Fridge	3/3	2,55 Nm	87,6°	OK
20220307105500	07/03/2022 10:35:06	1-STATION 1	Nachnutzer setzen	1/1	14,13 kN	7,6°	OK
20220307103434	07/03/2022 10:34:43	1-STATION 1	Schrauben in Fridge	3/3	2,57 Nm	45,6°	OK
20220307102942	07/03/2022 10:29:48	1-STATION 1	Nachnutzer setzen	1/1	14,12 kN	7,6°	OK
20220307102932	07/03/2022 10:29:39	1-STATION 1	Nachnutzer setzen	1/1	14,27 kN	7,6°	OK

Tools Status:

Tool	Station	Status

4.3.2 Main menu

In the main menu, the active stations are shown:

The screenshot displays the HIS-T software interface. The top navigation bar includes 'Status running', 'Operation TRIFIC 1218', 'VIN 2022054112315', 'Tool TRIFIC 1218', and network information. The main content area is divided into several sections:

- Station status:** Shows two active stations. Station 1 (VIN: 2022054112315) and Station 2 (VIN: Tool) are both in a 'Running' state. Callouts point to this section as 'Network status' and 'Station information'.
- Last VINs:** A table listing recent VINs with columns for VIN, Date / Time, Station, Sequence, Batch, Torque, Angle, and Status. Callouts point to this section as 'Stations' and 'Last VINs'.
- Tools Status:** A table showing tool status for TRIFIC 1218 at Station 1, with a status of 'Programmed'. A callout points to this section as 'Menu'.

A second screenshot below shows a similar view for a different date range (17/05/2022 to 18/05/2022), with a callout pointing to the 'Tools Status' section as 'Tools Status'.

Stations



Here the stations are shown (one or more), with the ongoing operation information displayed.

The square around the station is colored as following:

Orange: NetBee in idle (waiting) mode

Green: NetBee running

Red: Alarm. In that case a detailed warning message is shown

Upper bar

Here the information about the status of the first station is shown (updated every 3 seconds):



Menu

The menu on the left gives access to the following functions:

Results: View the results

Statistics: View the statistics on the operation executed

Stations: Programming the stations

Tools: Define the for each station

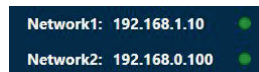
Operations: Define all the tightening operations

Sequence: Define the sequence of the operations performed to execute the assembly procedure

Settings: Define the NetBee settings

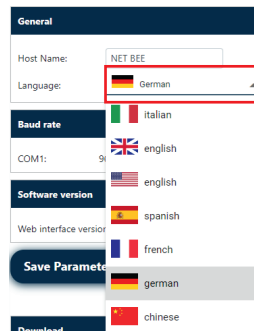
Network status

This box shows the status of the 2 network ports of the NetBee



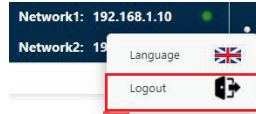
Language

To select the interface language, click on the icon on the top-right



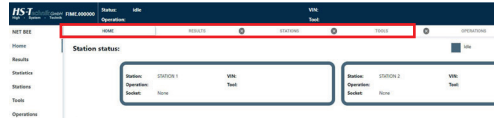
Logout

To logout from the interface, click on the icon on the top-right



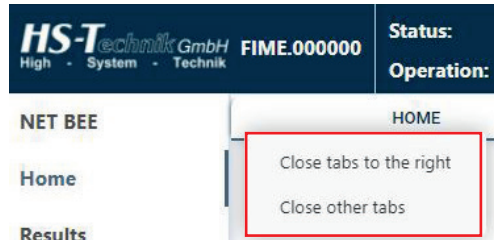
Last visited menu

In this bar the last visited menu are shown



Click on the x icon to delete one item.

Right-click to close the tabs on the right or all tabs except the current tab:



Tools status

List of the tools defined, and their status (online or offline).

Last VINs

Last operations executed are visible here, grouped by VIN.

Last VINs: Date from: 27/12/2021 To: 18/05/2022 Filter

VIN	Y	Date / Time	Station	Sequence	Batch	Torque	Angle	Status
3022007702234		07/01/2022 13:25:31	1 - STATION 1	Schrauber in Folge	3/3	2,37 Nm	38,0°	OK
3022007702170		07/01/2022 13:25:37	1 - STATION 1	Werkzeuge laden	5/1	14,21 Nm	8,0°	OK
3022007702524		07/01/2022 13:25:40	1 - STATION 1	Schrauber in Folge	3/3	1,7 Nm	0,0°	OK
3022007702060		07/01/2022 13:26:15	1 - STATION 1	Schrauber in Folge	3/3	0,22 Nm	42,0°	OK
3022007702889		07/01/2022 13:26:12	1 - STATION 1	Schrauber in Folge	3/3	0,22 Nm	807,0°	OK
3022007702162		07/01/2022 13:26:39	1 - STATION 1	Werkzeuge laden	5/1	14,27 Nm	7,0°	OK
3022007702042		07/01/2022 13:26:48	1 - STATION 1	Werkzeuge laden	5/1	14,12 Nm	7,0°	OK

Click on a VIN to open the results associated to that VIN.

It is possible to filter the items in this window with the date filter on the top.

4.3.3 Result view

In this menu the results are shown:

The screenshot shows the main results window of the HS-T software. At the top, there are navigation buttons: 'Filter', 'Reset Grid', and 'Collapse rows'. Below the table, there are icons for 'Export', 'Compare traces', 'Select for export or compare traces', and 'View result details and trace'. The table contains columns for 'Identifier', 'Description', 'VIN', 'VIN2', 'Bal.', 'Tool', 'Station', 'Sequence', 'Torque Result', 'Angle result', 'Date / Time', and 'Status'.

Identifier	Description	VIN	VIN2	Bal.	Tool	Station	Sequence	Torque Result	Angle result	Date / Time	Status
EC-Schrauber	3,0Nm	2022042005460		1 / 2	TRPECO-120W	1 - STATION 1	1 - Schrauber 3,0Nm	2,5 Nm	125,6°	20/04/2022 09:54	OK
EC-Schrauber	3,0Nm	2022042005460		1 / 2	TRPECO-120W	1 - STATION 1	1 - Schrauber 3,0Nm	2,5 Nm	2,5°	20/04/2022 09:54	OK
EC-Schrauber	3,0Nm	2022042005460		1 / 2	TRPECO-120W	1 - STATION 1	1 - Schrauber 3,0Nm	2,51 Nm	106,6°	20/04/2022 09:54	OK
EC-Schrauber	EC Programm 5	2022030109372		3 / 3	TRPECO-120W	1 - STATION 1	1 - Schrauber in Folge	2,53 Nm	215,1°	31/03/2022 09:39	OK
EC-Schrauber	EC Programm 5	2022030109372		2 / 3	TRPECO-120W	1 - STATION 1	1 - Schrauber in Folge	2,53 Nm	196,5°	31/03/2022 09:39	OK
EC-Schrauber	EC Programm 5	2022030109372		1 / 3	TRPECO-120W	1 - STATION 1	1 - Schrauber in Folge	2,53 Nm	80,2°	31/03/2022 09:39	OK
EC-Schrauber	EC Programm 5	2022030112456		3 / 3	TRPECO-120W	1 - Schrauber in Folge	1 - Schrauber in Folge	2,53 Nm	52,7°	05/02/2022 11:10	OK
EC-Schrauber	EC Programm 5	2022030112456		2 / 3	TRPECO-120W	1 - Schrauber in Folge	1 - Schrauber in Folge	2,53 Nm	45,7°	05/02/2022 11:10	OK
EC-Schrauber	EC Programm 5	2022030112456		1 / 3	TRPECO-120W	1 - Schrauber in Folge	1 - Schrauber in Folge	2,51 Nm	84,7°	05/02/2022 11:10	OK
Mischer	MHPF Mix seton	2022000713030		1 / 1	MHPF-200W	1 - STATION 1	0 - Mischer seton	14,13 Nm	7,9°	07/02/2022 13:24	OK
EC-Schrauber	EC Programm 5	2022000713034		3 / 3	TRPECO-120W	1 - STATION 1	1 - Schrauber in Folge	2,57 Nm	49,5°	07/02/2022 13:24	OK
EC-Schrauber	EC Programm 5	2022000713034		2 / 3	TRPECO-120W	1 - STATION 1	1 - Schrauber in Folge	2,52 Nm	69,1°	07/02/2022 13:24	OK
EC-Schrauber	EC Programm 5	2022000713034		1 / 3	TRPECO-120W	1 - STATION 1	1 - Schrauber in Folge	2,59 Nm	37,7°	07/02/2022 13:24	OK
Mischer	MHPF Mix seton	2022000713242		1 / 1	MHPF-200W	1 - STATION 1	0 - Mischer seton	14,12 Nm	7,9°	07/02/2022 13:29	OK

Click on the icons on the right to view the result details.

- Reset Grid:** Reset filtering and grouping options
- Refresh Data:** Refresh this window with latest results available

The **Q** icon shows more information on the result:

The detailed view shows the following data:


Torque Min	Torque target	Torque Max
2,32	2,5	2,67

Torque: **2.53 N·m**

Angle Min	Angle target	Angle Max
0,0	0,0	0,0

Angle: **211,0 °**

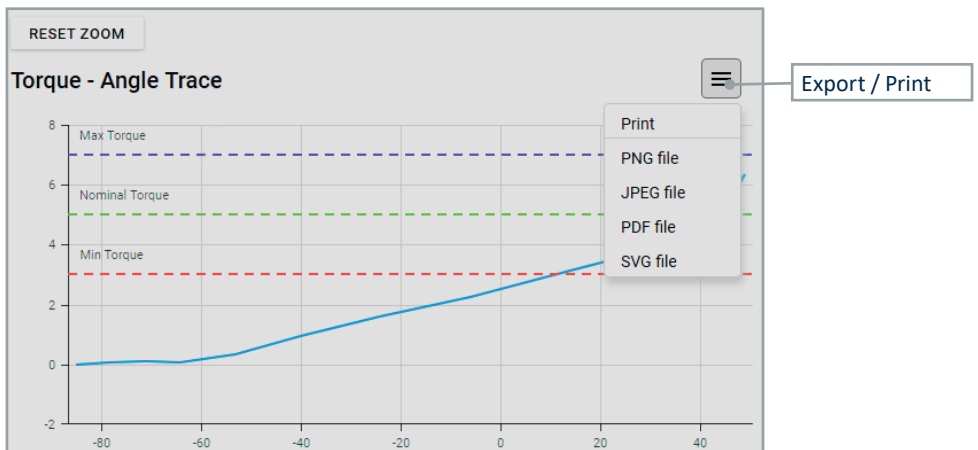
VIN: 2022033109372		Operation: EC Programm 5		Batch: 3 / 3		Status: OK																			
<table border="1"> <tr> <td>Station:</td> <td>STATION 1</td> </tr> <tr> <td>Sequence:</td> <td>Schrauber in Folge</td> </tr> <tr> <td>Phase:</td> <td>1 / 3</td> </tr> <tr> <td>Operation:</td> <td>EC-Schrauber</td> </tr> <tr> <td>Operation description:</td> <td>EC Programm 5</td> </tr> <tr> <td>Tool:</td> <td>TRPECO-120W</td> </tr> <tr> <td>VIN2:</td> <td></td> </tr> <tr> <td>Operator code:</td> <td></td> </tr> <tr> <td>Date / Time:</td> <td>2022/03/31 09:39:15</td> </tr> </table>								Station:	STATION 1	Sequence:	Schrauber in Folge	Phase:	1 / 3	Operation:	EC-Schrauber	Operation description:	EC Programm 5	Tool:	TRPECO-120W	VIN2:		Operator code:		Date / Time:	2022/03/31 09:39:15
Station:	STATION 1																								
Sequence:	Schrauber in Folge																								
Phase:	1 / 3																								
Operation:	EC-Schrauber																								
Operation description:	EC Programm 5																								
Tool:	TRPECO-120W																								
VIN2:																									
Operator code:																									
Date / Time:	2022/03/31 09:39:15																								

The  icon shows the trace:

Identifier	Description	VIN	VIN2	Stat.	Tool	Station	Sequence	Torque Res.	Angle resolt	Date / Time	Status
<input checked="" type="checkbox"/>	EC-Schrauber	2.5Nm	2022061091701	2 / 2	TBPEC-120WB	1-STATION 1	1-Schrauben 2.5Nm	2.5 Nm	5450°	01/06/2022 09:17:	OK
<input checked="" type="checkbox"/>	EC-Schrauber	2.5Nm	2022061091701	1 / 2	TBPEC-120WB	1-STATION 1	1-Schrauben 2.5Nm	2.52 Nm	4550°	01/06/2022 09:17:	OK
<input checked="" type="checkbox"/>	EC-Schrauber	2.5Nm	2022061091682	2 / 2	TBPEC-120WB	1-STATION 1	1-Schrauben 2.5Nm	2.51 Nm	4765°	01/06/2022 09:16:	OK
<input type="checkbox"/>	EC-Schrauber	2.5Nm	2022061091682	1 / 2	TBPEC-120WB	1-STATION 1	1-Schrauben 2.5Nm	2.5 Nm	3845°	01/06/2022 09:16:	OK
<input type="checkbox"/>	EC-Schrauber	2.5Nm	2022061091683	2 / 2	TBPEC-120WB	1-STATION 1	1-Schrauben 2.5Nm	2.51 Nm	4715°	01/06/2022 09:16:	OK

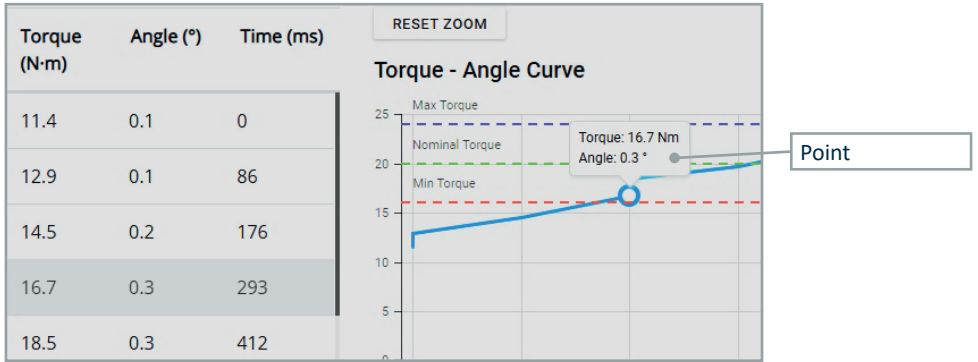
Click on **Switch to Torque - Time Trace** or **Switch to Torque – Angle Trace** to change the chart type.

Click on the **Exporting / Printing** menu to export the trace in PNG, JPEG, PDF or SVG file:



In the trace, it is possible to zoom selecting the area with the mouse. Click on **Reset Zoom** to restore whole trace.

Click on a point to view it on the trace:



Traces can be compared (maximum 10 at a time) selecting more results and clicking on the **Compare traces** icon:

Only Vin's last results

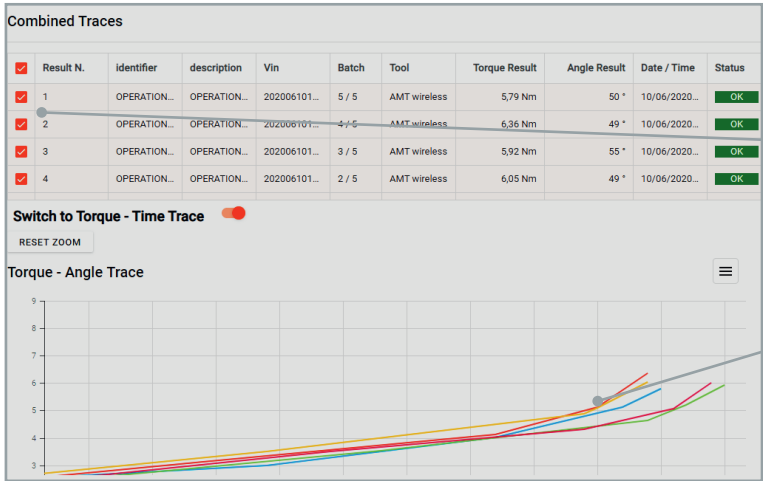
Drag a column header here to group by that column

<input type="checkbox"/>	identi...	descr...	Vin	Bat...	Tool	Torque Res...	Angle Result	Date / ...	Status
<input checked="" type="checkbox"/>	OPERATI...	OPERATI...	2020061...	5 / 5	AMT wire...	5,79 Nm	50 °	10/06/20...	OK
<input checked="" type="checkbox"/>	OPERATI...	OPERATI...	2020061...	4 / 5	AMT wire...	6,36 Nm	49 °	10/06/20...	OK
<input checked="" type="checkbox"/>	OPERATI...	OPERATI...	2020061...	3 / 5	AMT wire...	5,92 Nm	55 °	10/06/20...	OK
<input checked="" type="checkbox"/>	OPERATI...	OPERATI...	2020061...	2 / 5	AMT wire...	5,05 Nm	49 °	10/06/20...	OK
<input checked="" type="checkbox"/>	OPERATI...	OPERATI...	2020061...	1 / 5	AMT wire...	6,02 Nm	54 °	10/06/20...	OK
<input type="checkbox"/>	OPERATI...	OPERATI...	2020061...	5 / 5	SC01-IP	20,81 Nm	8 °	10/06/20...	OK
<input type="checkbox"/>	OPERATI...	OPERATI...	2020061...	4 / 5	SC01-IP	20,76 Nm	7 °	10/06/20...	OK

Compare traces

Select

The following window is shown:



Select/Deselect

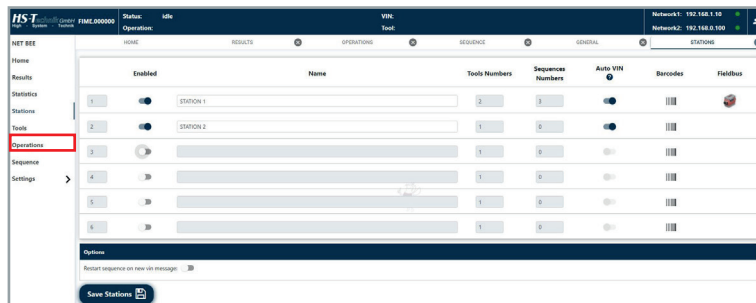
Superimposed traces

4.3.4 Stations

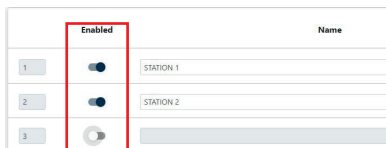
In this menu it is possible to add up to 6 stations:



Attention: 6 stations only with NetBee-UH.



Active



For each station, enable this flag to activate it. If enabled, it is shown in the home page.

Name

Enter the station name

Tools Numbers

This shows how many tools are associated to the station. See the Tools chapter for more information.

Sequences numbers

This shows how many sequences are defined for the station. See the Sequence chapter for more information.

Auto VIN

It is possible to auto generate a VIN (with the time stamp, in the format YYYY-MM-DD-hh.mm.ss), useful in case the production system of the customer would not provide it.

Barcodes



Red icon: Barcode data present



Black icon: Barcode data empty

A barcode string can be scanned by:

- A barcode scanner connected to NetBee via serial port
- A tool having barcode scanner (for example TorqBee, WrenchBee, ...) connected to the NetBee

Here the barcode strings to be scanned are specified. Using the sequence name and number fields, it is possible to start automatically a sequence scanning a certain barcode string:

Type	Length	Portion / Last values	Characters to remove	Only digits	Mask
VIN	4	4			
VIN2	5	2 To 3			
Sequence number	9	7 To 9			

- **Barcode redirect:** This allows to associate the barcode to a port COM of the NetBee
- **Barcode timeout:** Timeout to read all the barcodes (maximum 4)
- **Type:** Select between **VIN**, **VIN2**, **Sequence name**, **Sequence number** or **Operator** depending from which information is contained in the barcode

Selecting **Sequence name** or **Sequence number**, the sequence is activated when the barcode containing the sequence name or number is scanned

For example, if the sequence name is PR02, it will be activated in cases like:

Type	Length	Portion / Last values	Character
Sequence name	4	1 To 4	

Barcode scanned: PR02

Type	Length	Portion / Last values	Character
Sequence name	8	5 To 8	

Barcode scanned: XXXXPR02

If the sequence number is 3, it might be activated with:

Type	Length	Portion / Last values	Character
Sequence number	8	1 To 1	

Barcode scanned: 3XXXXXXX

- **Length:** barcode length
- **Only digit:** Enable if the barcode is composed only by digits
- **Portion From To:** Extract one section of the barcode
- **Mask:** Mask the selected portion of the string, with the following rules:
 - ? all characters
 - # only digits
 - ! only letters
 - * any string with any length

Note: If Only digit is enabled, it is possible to use only # or *

- **Characters to remove:** Remove one or more characters from the selected portion of the string. Example: 1,3 → A9B99 will turn into 999

Click on **ADD BARCODE** and **Save Barcode** to add a barcode and save the configuration.

Fieldbus

Activate Fieldbus interface for the station. It can be enabled only in the first station.

- **Active:** activate the fieldbus
- **Gateway type:** Select the mode (TCP or Serial)
- **Protocol type:** Select one of the protocol available
- **IP and Port:** Parameters for TCP
- **Connector and Baud Rate:** Parameters for Serial

Restart sequence on new VIN message

If enabled, the sequence is restarted if a new VIN is received

Save Stations

Click to save the stations

Apply configuration changes

After saving, this command restarts the NetBee application to make the changes effective.

4.3.5 Tools

In this menu it is possible to define up to 12 tools:

Results	N°	Serial Number	Name	Supplier	Range	Type	Station
Statistics	1	17340002	TBPEC-12WB		1.00 to 14.00 N/m	HST TorqBeE ECO	STATION1
Stations	2	+Add Tool					
Tools	3	+Add Tool					
Operations	4	+Add Tool					
Sequence	5	+Add Tool					
Settings	6	+Add Tool					
	7	+Add Tool					
	8	+Add Tool					
	9	+Add Tool					
	10	+Add Tool					
	11	+Add Tool					
	12	+Add Tool					

Click on **Add tool** (or **Edit icon**) to define a tool. The following window is shown. The parameters shown depends from the tool type:

Station: 1 - STATION 1 | Type: HST TorqBeE ECO | Back to Grid

Tool data

Tools N°: 1 | Serial N°: 17340002

Barcode: | Name: TBPEC-12WB

Range: 1,00 | 14,00 | N/m | Supplier: |

IP address: 192,168,0,110 | Port: 8040

Save Tool

Station	Associate the tool to the station. See the Stations chapter for more information
Type	Select the tool type from the list
Tools N°	Tool number, progressive (1 to 12) and not modifiable
Serial Number	Tool serial number
Barcode	Tool ID
Name	Tool description

Range

Torque range and measurement unit.

For customized HS-Technik tools, it is possible to define a customized range:

The screenshot shows a 'Tool data' form with the following fields:

- Tools N°: 1
- Barcode: (empty)
- Range: 0,75 - 15 (dropdown menu is open, showing options: 0,75 - 15, 1,5 - 30, 3,5 - 70, 5 - 50, 5 - 100, 10 - 200, 15 - 300, 20 - 400, 30 - 600, 40 - 800, 50 - 1000, 60 - 1200, and custom. The 'custom' option is highlighted with a red box and a mouse cursor is pointing at it.)
- Wrench ID: (empty)
- Unit: N.m (dropdown menu)
- Save button (blue)

Manufacturer

Tool manufacturer

Other parameters

The other parameters depend on the tool type. Refer to the tool user manual for more information about how those parameters are used.

NOTE: For HST tools, the IP address must be entered even if not necessary (the important parameter is the port). The communication protocol allows to select a Program/Sequence and collect data.

Save Tool

Save the tool data

Apply configuration changes

After saving, this command restarts the NetBee application to make the changes effective.

4.3.6 Operations

In this menu it is possible to define all the tightening operations, that will be used then to define the sequences:

Operations defined

Add operation

Edit / delete / clone operation

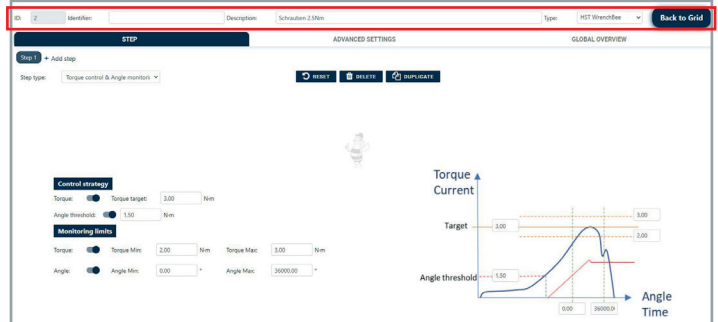
In the figure above, for each operation its most important data are shown.

Click on **Add operation** (or **Edit** or **Clone** icon) to define a operation. The following window is shown. The parameters shown depends from the tool type:

Identifier	Operation identifier
Description	Operation description
Type	<p>Every operation must be assigned to a tool type, since each tool can perform its own operations with the relevant parameters.</p> <p>The parameters shown in the figure above depends on the type selected here.</p>

Tightening parameters All the parameters shown in the figure above are strictly related to the tool type.

For WrenchBee, data are grouped in different tabs:



For more information about how they are used by the specific tool, please refer to the tool user manual (for example, HS-Technik manuals for NetBee).

Save operation Save the operation data

Apply configuration changes After saving, this command restarts the NetBee application to make the changes effective



NOTE

The Minimum torque value must be \geq the minimum torque range of the tool. For example: Tool range is 5 to 50 N·m \times Minimum torque value must be \geq to 5 N·m.


4.3.7 Sequence


In this menu it is possible to define the sequences (assembly procedures). Each sequence is composed by phases, that are the operations defined in the Operations menu.

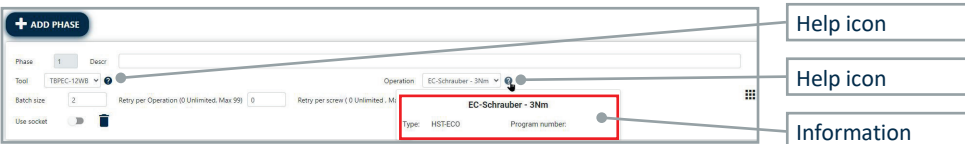
In the figure above, for each sequence its most important data are shown. Click on **Add sequence** (or **Edit** or **Clone** icon) to define a sequence. The following window is shown:

Click and drag on the icon on the right  to move the phases in different position.

Sequence name	Name of the sequence. It can be used to start it with the barcode reader.
Station	Assign the sequence to the relevant station
Sequence execution	- Sequential: The phases must be executed in the specified order. - Parallel: The phases can be executed in parallel at the same time (the order is not important)
Add phase	Add the operations to the sequence. At least one operation must be added to have a sequence.
Phase	Progressive number automatically created
Descr	Phase description

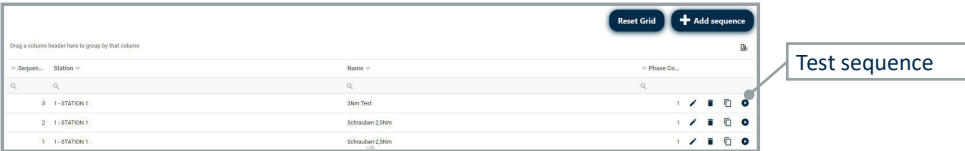
Tool	Tool used to execute the tightening. See the Tools chapter to define tools.
Operation	Select the operation to execute in this point of the sequence. See the Operations chapter to define operation.
Batch size	Number or times that the operation must be repeated (number or screws).
Use Socket	If enabled, it specifies the socket number to use (for application with the NetBee Socket Tray by HS-Technik). Sockets available depend from the Socket Tray configuration. See the Socket Tray settings chapter for more information.
	Remove phase from the sequence
Save Sequence	Save the sequence
Apply configuration changes	After saving, this command restarts the NetBee application to make the changes effective.

Positioning the mouse on the help icon  for tools or operations, a pop-up window shows the relevant information:



The screenshot shows a configuration window for a phase. The 'Operation' dropdown is set to 'EC-Schrauber - 3Nm'. A red box highlights this operation, with a callout pointing to an 'Information' box that displays 'Type: HSTECO' and 'Program number:'. Two other callouts point to help icons (question marks) located near the 'Tool' and 'Operation' dropdowns.

When a sequence is defined, it is possible to execute it, in order to test the sequence. Click on the test sequence icon on the right:



The screenshot shows a table with sequence information. The table has columns for 'Seq...', 'Station', 'Name', and 'Phase Co.'. The first row is highlighted and contains '1 - STATION 1', 'Screw Test', and '1'. A callout labeled 'Test sequence' points to a play button icon in the rightmost column of this row.

Seq...	Station	Name	Phase Co.
1	1 - STATION 1	Screw Test	1
2	1 - STATION 1	Schrauben 2,9Nm	1
1	1 - STATION 1	Schrauben 2,9Nm	1

4.3.8 Statistics

In this menu it is possible to open statistics on the operations executed.

The screenshot shows the HST software interface with the 'Statistics' menu open. Callouts point to various features: 'Filter' (a search icon), 'Compare operations' (a button labeled 'Compare Operations (1)'), 'Expand operation' (a plus icon next to a row), 'View charts' (a bar chart icon), and 'Operations' (a list icon).

Operation	Results	% OK	% NOT OK	Torque min/Avg/Max	Angle min/Avg/Max	Torque Cm	Torque Cmk	Angle Cm	Angle Cmk	
03 Schreiber	0	100	0	17.2	0 / 11.01 / 2.04	0.12	0.09	0 / 224.1 / 1026	0.0	0.25
03 Instuctor	1	0	100	0	14.12 / 14.78 / 14.27	6.87	0.61	7 / 7.2 / 8	0	-4.1
03 1090-1018	3	33	0	75	0 / 2.20 / 3.95	0.12	0.06	0 / 282.7 / 1087	19.86	0.33

In this windows, all operations with results are shown. For each operation, the following information are shown:

Screw nr: Screw number

Results: number of results present

% OK: Percentage of OK results on the total number of results

% NOT OK: Percentage of NOT OK results on the total number of results

Torque min/Avg/Max and Torque min/Avg/Max: Torque statistics (minimum, average and maximum values)

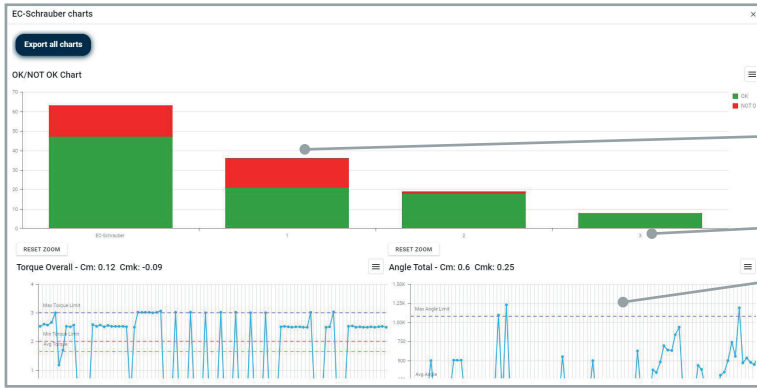
Torque Cm, Torque Cmk, Angle Cm, Angele Cmk: Machine capability indexes calculated on torque results and angle results

In the upper area of this window, filters are available to search for specific results:

The filter section includes a date range selector from '03/01/2022' to '01/06/2022', a 'Filter Q' button, a toggle for 'Only Vin's last results', and a dropdown for 'OK/NOT OK: Select...'.

Click on the left to expand and view results for each operation.

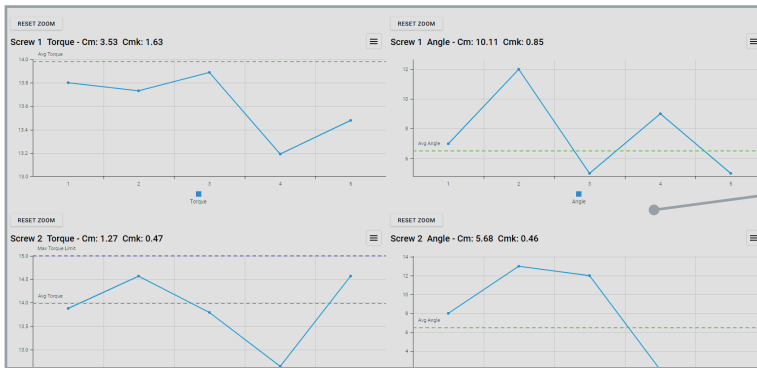
Click on the chart icon on the right to open the following chart:



OK / NOK statistics per each screw

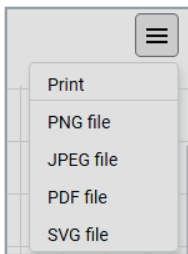
Screw number

Overall statistics



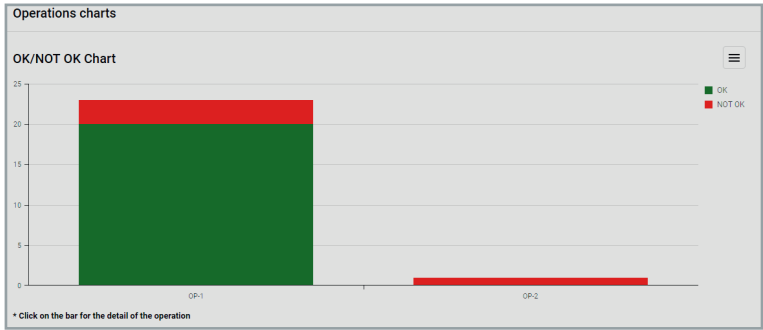
Statistics per each screw

Click on the icon on the right to export the chart in PNG, JPEG, PDF or SVG file

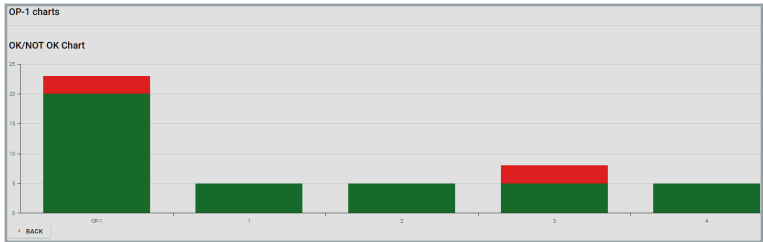


Click on **Export all charts** on the top-left to export all the charts.

Select more operation and click on **Compare Operations** to view the following chart comparing the operations statistics about OK and NOT OK percentages:




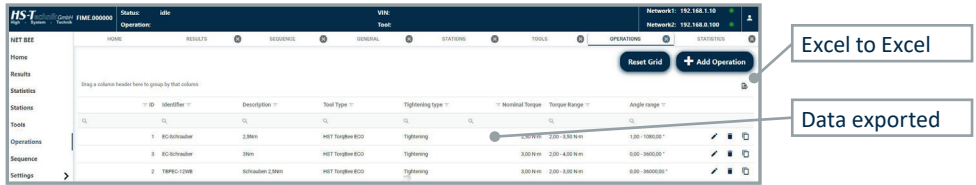
Click on a single operation to open its detailed statistics:



4.3.9 Common functions

4.3.9.1 Export data

In several screens of the software, the  icon exports the data shown in the current window to an Excel file:



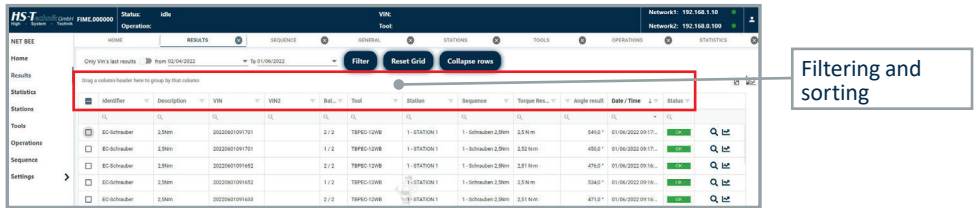
Excel to Excel

Data exported

Data are exported as they are shown in the window. For example, if rows are hidden with the filters above, they are not exported.

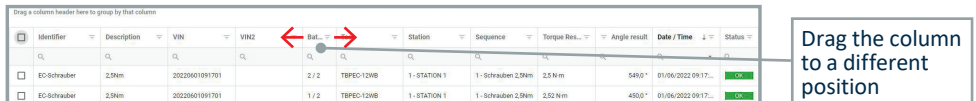
4.3.9.2 Filtering and sorting tables

In several screens of the software, it is possible to filter and sort the data.



Filtering and sorting

The columns position can be changed simply dragging the columns in the preferred position:



Drag the column to a different position

Click on the row header to sort the items (click twice to reverse the order):

Identifer	Description	VIN	VIN2	Mat...	Tool	Station	Sequence	Torque R...	Anzahl result	Date / Time	Status	
<input type="checkbox"/>	TBPEC-12WB	Schrauben 2,5Nm	20220501060382		1 / 5	TBPEC-12WB	1 - STATION 1	2 - Schrauber 2,5Nm	324 N m	310	31.05.2022 09:24...	OK
<input type="checkbox"/>	EC-Schrauber	3Nm	20220524114929		1 / 3	TBPEC-12WB	1 - STATION 1	3 - 3Nm Test	324 N m	550	24.05.2022 11:49...	OK
<input type="checkbox"/>	EC-Schrauber	3Nm	20220501060250		1 / 3	TBPEC-12WB	1 - STATION 1	3 - 3Nm Test	324 N m	1070	31.05.2022 09:23...	OK
<input type="checkbox"/>	TBPEC-12WB	Schrauben 2,5Nm	20220501060257		1 / 5	TBPEC-12WB	1 - STATION 1	2 - Schrauber 2,5Nm	322 N m	440	31.05.2022 09:20...	OK

Sorting by column

Items sorted

Click on  to filter the items:

Identifer	Description
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm
<input type="checkbox"/>	3Nm

Filter icon

Options

Select **Contains**, **Does not contain**, **Starts with**, **Ends with**, **Equals** or **Does not equal** and enter the criteria, then press enter to apply:

Vin

Drag the columns to group the items:

NET BEE
 Home
 Results
 Statistics
 Stations
 Tools
 Operations
 Sequence
 Settings

Operation: **VIN** tool

Only VIN's last results from 04/27/2022 to 02/09/2022

Filter Reset Grid Collapse rows

Identifier	Description	VIN2	Bat...	Tool	Station	Sequence	Torque Res...	Angle result	Date / Time	Status	
VIN: 20220902092420											
<input type="checkbox"/>	EC-Schrauber	3Nm		3 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	507 Nm	256.9°	02/09/2022 09:25:21	OK
<input type="checkbox"/>	EC-Schrauber	3Nm		3 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	400 Nm	153.9°	02/09/2022 09:25:16	OK
<input type="checkbox"/>	EC-Schrauber	3Nm		2 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	507 Nm	116.0°	02/09/2022 09:24:33	OK
<input type="checkbox"/>	EC-Schrauber	3Nm		2 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	107 Nm	60.7°	02/09/2022 09:24:34	OK
<input type="checkbox"/>	EC-Schrauber	3Nm		1 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	50 Nm	148.0°	02/09/2022 09:24:23	OK
VIN: 20220902092039											
<input type="checkbox"/>	EC-Schrauber	3Nm		2 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	506 Nm	91.0°	02/09/2022 09:22:52	OK
<input type="checkbox"/>	EC-Schrauber	3Nm		3 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	107 Nm	69.7°	02/09/2022 09:22:43	OK
<input type="checkbox"/>	EC-Schrauber	3Nm		2 / 3	TSPEC-12WB	1-STATION 1	1-TSPEC-12WB	507 Nm	48.8°	02/09/2022 09:22:42	OK

Drag the column

Items grouped

Click on the icon to reverse the order:

VIN ↓

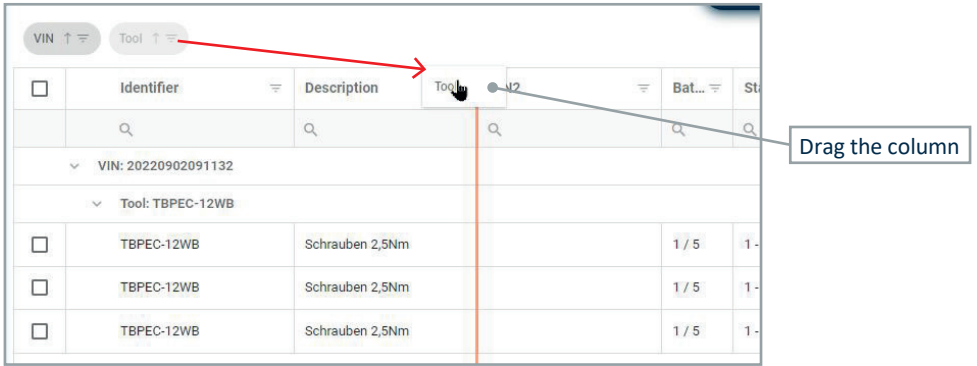
<input type="checkbox"/>	Identifier	Description	VIN2	Bat...
VIN: 20220902092420				
<input type="checkbox"/>	EC-Schrauber	3Nm		3 / 3
<input type="checkbox"/>	EC-Schrauber	3Nm		3 / 3
<input type="checkbox"/>	EC-Schrauber	3Nm		2 / 3

Click to reverse order

VIN ↑ Tool 2/3

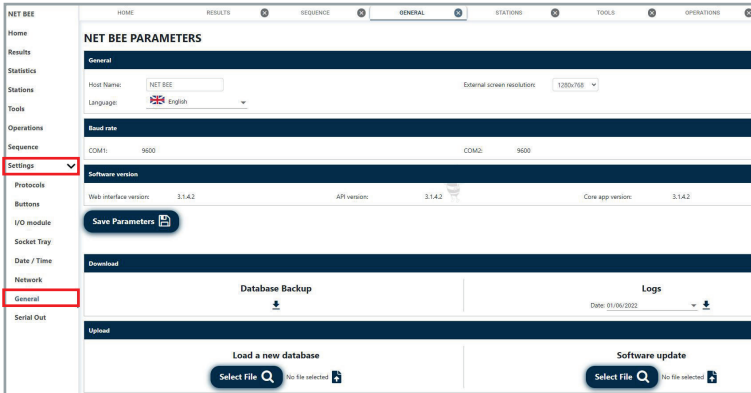
<input type="checkbox"/>	Identifier	Description	VIN2	Bat...	Station	Sequence	Torque Res...	Angle result	Date / Time	Status	
VIN: 20220909091132											
Tool: TSPEC-12WB											
<input type="checkbox"/>	TSPEC-12WB	Schrauber 2,5Nm		1 / 3	1-STATION 1	2-Schrauber 2,5Nm	302 Nm	432.0°	02/09/2022 09:11:30	OK	
<input type="checkbox"/>	TSPEC-12WB	Schrauber 2,5Nm		1 / 5	1-STATION 1	2-Schrauber 2,5Nm	302 Nm	192.0°	02/09/2022 09:11:42	OK	
<input type="checkbox"/>	TSPEC-12WB	Schrauber 2,5Nm		1 / 5	1-STATION 1	2-Schrauber 2,5Nm	304 Nm	46.8°	02/09/2022 09:11:36	OK	
VIN: 20220902092007											
Tool: TSPEC-12WB											
<input type="checkbox"/>	EC-Schrauber	3Nm		3 / 3	1-STATION 1	1-TSPEC-12WB	307 Nm	36.0°	02/09/2022 09:20:21	OK	
<input type="checkbox"/>	EC-Schrauber	3Nm		2 / 3	1-STATION 1	1-TSPEC-12WB	50 Nm	37.5°	02/09/2022 09:20:16	OK	
<input type="checkbox"/>	EC-Schrauber	3Nm		1 / 3	1-STATION 1	1-TSPEC-12WB	305 Nm	58.0°	02/09/2022 09:20:12	OK	

Drag the column to the table header to remove it:



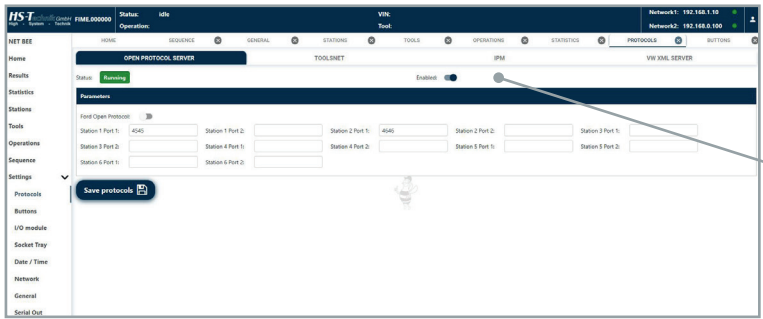
4.3.10 Settings

4.3.10.1 General



Host name	Host name of the NetBee
External screen resolution	If a monitor is connected to the NetBee (for instance to have a duplicate of the NetBee display connecting a monitor to the VGA port), here the resolution is set.
Language	Select the language of this software
Software version	Current software version of: - Web interface: this software - API: module for communication with external devices - Core app: software running on the NetBee
Programming mode	Standalone: NetBee working alone
Download	Database backup: Save all the NetBee data. It is possible to save a certain configuration to be restored then at a later time. Also, it is possible to copy the database (sqlite) from one NetBee to another one (software version must be the same). Logs: save the log file. Useful for troubleshooting activities.
Upload	Load a new database: Restore a database (sqlite) previously saved
Software update	Select a file to update the software version (web interface, API, Core App).

4.3.10.2 Applications



Select and enable the application

Open protocol server Interface with customer system via Open Protocol Server. See the Working with Open Protocol chapter for more information.

Toolsnet Interface with Toolsnet. See the Working with Toolsnet chapter for more information.

IPM Interface with IPM.
IP address and **Port** must be entered here.

VW XML server Interface with VW XML Server.
Enter the parameters, depending on your XML server configuration, in the following window:



Status Indicates if the application is **Running** or **Not Running**

Active Enable the application

Apply configuration changes After saving, this command restarts the NetBee service.
Restart then the NetBee to make the saved configuration effective (for example, press the button on the NetBee with the Reboot option assigned. Otherwise, if the reboot option is not active, switch off and then switch on the NetBee).

4.3.10.3 I/O Module

In this menu you can define the actions for the NetBee inputs and outputs (number of inputs and output depending from the NetBee hardware configuration):

The screenshot shows the NetBee configuration interface. The 'Settings' menu item is highlighted in red. The 'I/O module' section is expanded, showing a list of settings for 'INPUT' and 'OUTPUT'. The 'OUTPUT' tab is selected, and the 'INPUT' tab is also visible. Callout boxes labeled 'Outputs' and 'Inputs' point to the respective tabs.

OUTPUTS

Event	INPUT							OUTPUT								
	Out 1	Out 2	Out 3	Out 4	Out 5	Out 6	Out 7	Out 8	Out 9	Out 10	Out 11	Out 12	Out 13	Out 14	Out 15	Out 16
NET BEE ON																
General Error																
Sequence Started																
Sequence Finish OK																
Sequence Finish NOK																
Tightening OK																
Tightening NOK																
NOK Low Torque																
NOK High Torque																
NOK Low Angle																
NOK High Angle																
Already tightened																
Tool selected																



Output OFF



Output ON



Output BLINK

Empty

No action

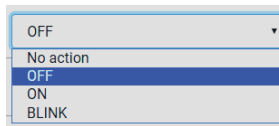
Click on each event shown on the left to define which output to activated:

Output	Station	Action	Time (ms)
1	1-STATION1	ON	0
2	1-STATION1	ON	200
3	1-STATION1	BLINK	200
4	1-STATION1	No action	0
5	1-STATION1	BLINK	0
6	1-STATION1	No action	0

Station

Select on which station you want to monitor the event

Action



- **OFF:** Turn off output (useful to turn on an output which was turned ON before)
- **ON:** Turn on output
- **BLINK:** Blink the output (ON/OFF)

Time

Specify for how long the output is ON or BLINK.

If set to zero, the output remains active until another event is set to turn it off.



NOTE

When an event activates an output without a timer, the output will remain active for an undefined time. It is important to check that the outputs are enabled and disabled properly for the assembly cycle.

Example: The event Sequence Started is set to turn on output number 1 (with no timer). In this case would be recommended to set the Sequence Finish OK and Sequence Finish NOK with to turn off the output number 1, so that output number 1 will not remain active all the time.

Events

The events available are:

NetBee ON: NetBee switched on

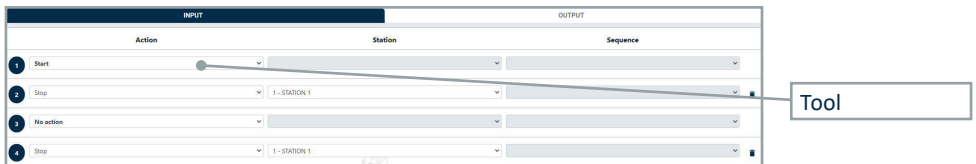
General Error: Error. The specific error message will be shown on the NetBee display

Sequence Started: Sequence started

Sequence Finish OK: Sequence completed with OK result

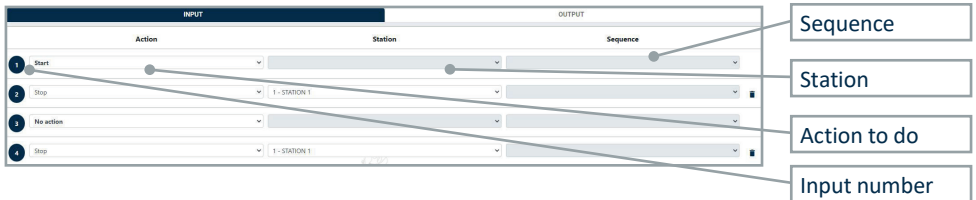
Events

- Sequence Finish NOK:** Sequence completed with Not OK result
- Tightening OK:** Last tightening operation completed with OK result
- Tightening NOK:** Last tightening operation completed with OK result
- NOK-Low Torque:** Last tightening operation completed with low torque
- NOK-High Torque:** Last tightening operation completed with high torque
- NOK-Low Angle:** Last tightening operation completed with low angle
- NOK-High Angle:** Last tightening operation completed with high angle
- Already tightened:** Last tightening operation executed and detected as “screw already tightened”
- Tool selected:** Here you can activate an output when a specific tool is selected (for example, to activate a light on the tool to be used by the operator)

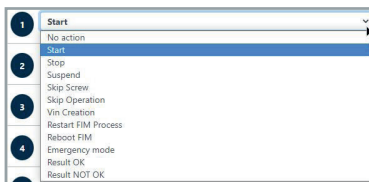


INPUTS

In this window you can set the action to be taken when an input is activated:



Action



Action

No action: Input disabled

Start: Start a specific sequence on a specific station

Stop: Stop the ongoing sequence on a specific station

Suspend: Suspend (pause) a station. To resume, the „start“ event must be generated again

Skip Screw: Skip a single tightening operation

Skip Operation: Skip the whole batch for an operation in the sequence

Vin creation: Create a VIN to be associated to the sequence (Time stamp in the format date and time as following: YYYY-MM-DD-hh.mm.ss)

Reboot NetBee: Restart the NetBee

Emergency mode: In this mode, select a station and a sequence. The specified sequence will be always activated again when it is completed

STATION

Some of the actions defined for the inputs (Start, Stop, Suspend, Skip Screw, Skip Operation, VIN Creation), are applicable for a specific station. Here you can define to which station the action is taken.

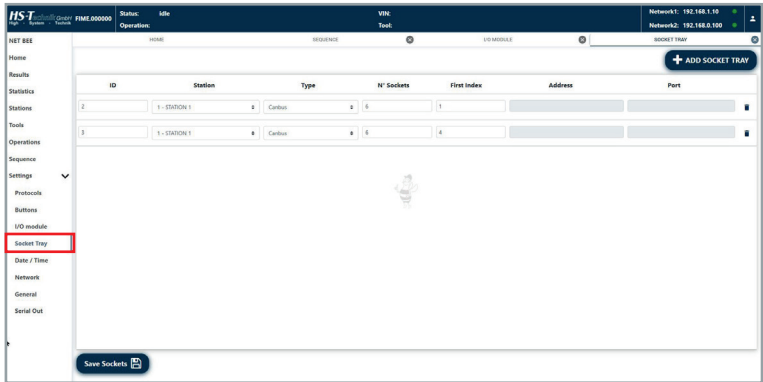
SEQUENCE

The Start action is applicable for a specific sequence. Here you can define to which sequence to start.

4.3.10.4 Socket Tray

In this menu you can configure the NetBee Socket Tray (by HS-Technik).

Refer to the NetBee Socket Tray user manual for more information about the product.



ID Identification number. It must be different for each socket tray, and it does not have effect in the operations.

Station Select the station on which the NetBee Socket Tray is working.

Type Select the type according to your NetBee Socket Tray type:
 - **Canbus**
 - **WiFi**

Sockets Number of sockets of the NetBee Socket Tray.

Index This can be used if, for example, there is a NetBee Socket Tray with 6 sockets but only 3 are used. In that case, the index starts to 1, and the next NetBee Socket Tray will start from 4:

ID	Station	Type	N° Sockets	First Index
2	1 - STATION 1	Canbus	3	1
3	1 - STATION 1	Canbus	6	4

If the NetBee Socket Tray (6 sockets) is used with all sockets, index will be 1 and the second from 7:

ID	Station	Type	N° Sockets	First Index
2	1 - STATION 1	Canbus	6	1
3	1 - STATION 1	Canbus	6	7

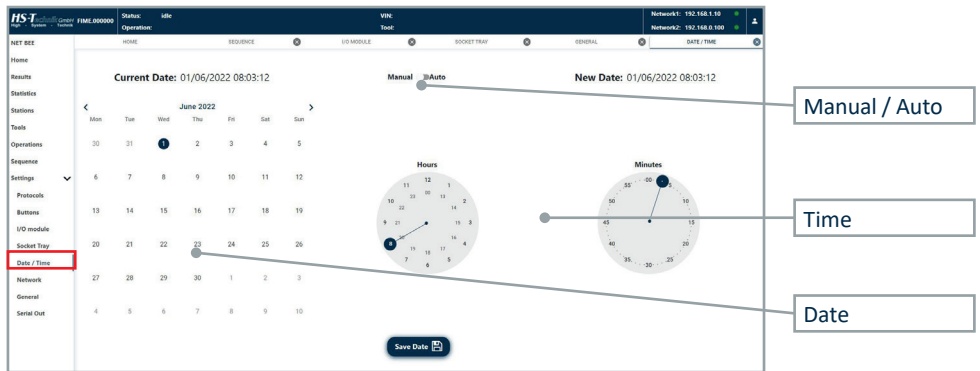
Address Port Network parameters, for the WiFi type only

Add socket tray Add a new socket tray

Save sockets Save the configuration

4.3.10.5 Date/Time

In this window you can set the NetBee date and time:



Manual: Manual setting of the date / time

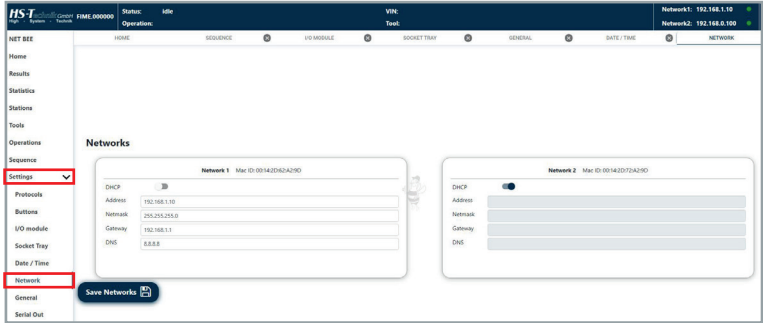
Auto: NetBee will take the date and time automatically from the network. This option is recommended.

If the NetBee is connected to a internet network, the date and time are always automatically taken from the network.

Save Date: Save the settings

4.3.10.6 Network

In this window you can set the NetBee network parameters:

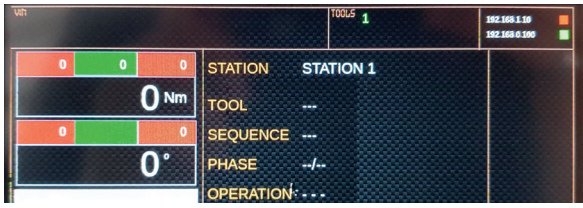


DHCP: Enable / disable the DHCP mode

Other parameters: Set according to your network

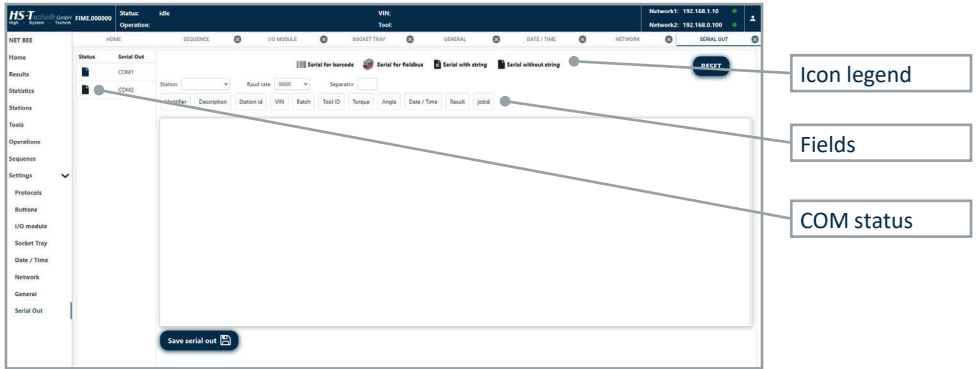
NOTE

After changing the default settings, make sure to take note of the new settings, in order to be able to connect to the NetBee with this programming software. IP address is shown anyway on the NetBee display:



4.3.10.7 Serial Out

In this window you can set the format of the results, which will be sent after each tightening operation:



The status of the COM ports is shown as following:



COM used for barcode (not available for Serial Out)



COM used for fielfbus (not available for Serial Out)



COM already defined for Serial Out



COM not used

Station: Select the station associated to Serial Out

Baud Rate: Baud rate of the serial port

Separator: Separator for the fields

Select the fields (click to enable/disable each field) to use and arrange them in the desired order:

The screenshot shows a configuration interface with a header row containing the following fields: Identifier, Description, Station Id, VIN, Batch, Tool ID, Torque, Angle, Date / Time, Result, and JobId. Below this, each field is listed with a 'Padding' input field set to '0' and a three-dot menu icon to its right. A callout box labeled 'Select the fields' points to the three-dot menu for the 'JobId' field. Another callout box labeled 'Drag and drop to arrange in the desired order' points to the three-dot menu for the 'Torque' field. At the bottom left, there is a 'Save serial out' button with a document icon.

Padding: This can be used to have a fixed number of characters for the field. Padding is the minimum length of the field.

For example, with padding = 10 and comma as separator

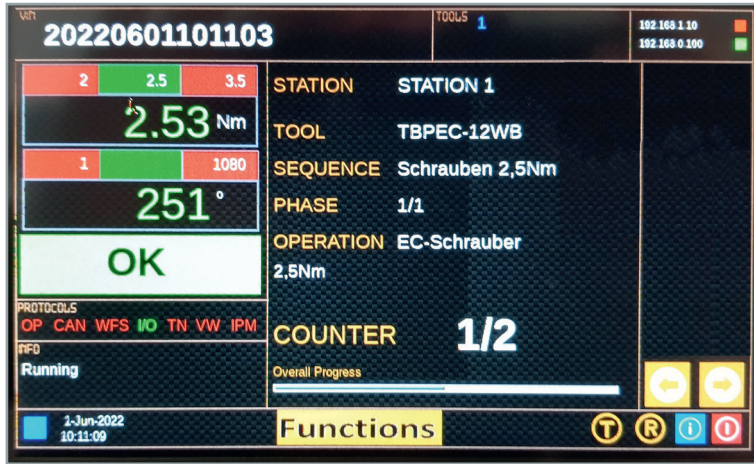
Fields = 12 → 8 blank characters will be added
 tightening1 → no blank characters will be added
 2 → 9 blank characters will be added
 15.26 → 5 blank characters will be added

Formatted string = 12,tightening1, 2, 15.26

Blank characters added to reach the specified padding

4.4 Operations/Sequences Execution

When the NetBee is programmed and running, the display shows the data:



VIN	VIN number associated with the current operation
Tools	Tools numbers. Colors are as following: Blue: Active Red: Offline Green: Online
IP addresses	IP addresses of the two ethernet ports. The icon on the right is green or red if the network port is connected or not.

Torque / angle results

Torque and angle data, with limits shown above the measurement.



The result OK or NOK is shown in green or red color.



Operation data

STATION: Station name

TOOL: Tool connected

SEQ: Sequence name

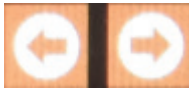
PHASE: Phase number / number of phases

OPERATION: Operation description

COUNTER: Batch counter

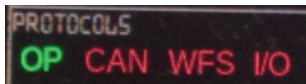
OVERALL PROGRESS: Progress of the complete sequence

The arrows change the station, when more stations are defined on the NetBee:



Protocols

Interfaces with other devices are shown here:



Each item is green in these cases:

OP: Open Protocol communication active

CAN: NetBee Socket Tray, canbus version, connected

WFS: NetBee Socket Tray, WiFi version, connected

I/O: 16 I/O module installed in the NetBee

Info

Status if the NetBee:

Running: NetBee operating (Blue)

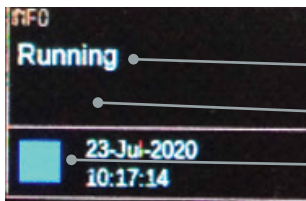
Idle: Idle mode (Green)

Waiting VIN: Waiting for VIN to start (Yellow)

Waiting Job: Waiting for Job to start (Yellow)

Suspended: NetBee in suspend mode (Yellow)

Alarm: Error (Red)



Status

Alarm message

Status color

In the second row, alarm messages might be displayed in certain conditions, for example “Tool <number> not active” or “Socket interrupt” (in case the NetBee Socket Tray is not connected or socket not in proper position).

Date / time

Date and time



Click to view the software versions: NetBee software, WEB interface, API



Restart the NetBee

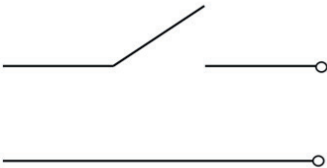
4.4.1 Starting a sequence

A sequence on NetBee can be started as following:

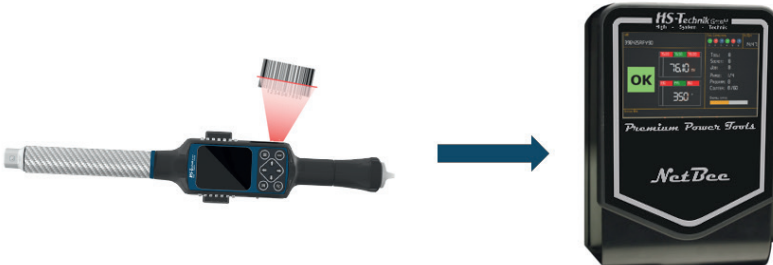
- Pressing the button „Functions“ on the touchdisplay of the NetBee.



- Receiving an input from an external device (PLC, switch or others). See the Inputs chapter for more information.



- Scanning a specific barcode string. See the Stations chapter for more information.



- Receiving a command via Open Protocol. See the Working with Open Protocol chapter for more information.



In all cases, the VIN number must always be scanned. It is possible to select the “Auto VIN” option to create automatically a VIN if it is not scanned by barcode (See the Stations chapter for more information).

4.5 Working with Open Protocol

Open Protocol can be used to:

- Interface the NetBee with customer system (Open Protocol Server)
- Interface the NetBee with open protocol power tools

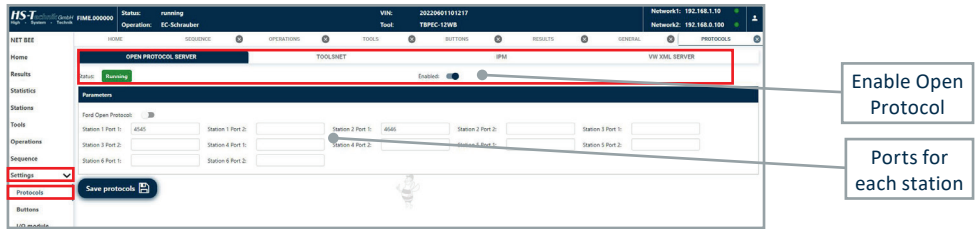
4.5.1 Open Protocol server

When NetBee is used to communicate with a remote system via Open Protocol (server), it must be properly configured. Communication is via Ethernet.



When NetBee is used with Open Protocol, the following configuration in the NetBee is needed (See the NetBee Programming with Web Interface chapter for more information about the programming interface):

Applications in the settings → General must be set to Open Protocol:



For each station, the communication port must be specified (default value 4545).

MID supported by open protocol server:

MID_JOB_ID_UPLOAD_REQUEST	0030
MID_JOB_ID_UPLOAD_REPLY	0031
MID_JOB_INFO_SUBSCRIBE	0034
MID_JOB_INFO	0035
MID_SELECT_JOB	0038
MID_RESTART_JOB	0039
MID_DISABLE_TOOL	0042
MID_SEND_VIN_STD	0050
OP_MID_VIN_SCANNED_SUBSCRIBE	0051
OP_MID_VIN_NUMBER_SCANNED	0052
MID_RESULT_UPLOAD_SUBSCRIBE	0060
MID_RESULT_UPLOAD	0061 rev1 to rev6 (rev 3-6 are filled with default values)
MID_ABORT_JOB	0127

4.5.2 Open Protocol power server

Tools with Open Protocol can be interfaced with NetBee.



MID supported:

MID_COMMUNICATION_START	0001
MID_COMMUNICATION_START_ACKNOWLEDGE	0002 (rev 1-4)
MID_COMMUNICATION_STOP	0003
MID_PSET_ID_UPLOAD_REQUEST	0010
MID_PSET_ID_UPLOAD_REPLY	0011

MID_PSET_ID_PSET_PARMS_REQUEST	0012
MID_PSET_ID_PSET_PARMS_REPLY	0013
OP_MID_PSET_SELECTED_SUBSCRIBE	0014
MID_PSET_SELECTED	0015
MID_PSET_SELECTED_ACKNOWLEDGE	0016
OP_MID_PSET_SELECTED_UNSUBSCRIBE	0017
MID_SELECT_PSET	0018
MID_SET_BATCH_SIZE	0019
MID_RESET_BATCH_SIZE	0020
MID_JOB_ID_UPLOAD_REQUEST	0030
MID_JOB_ID_UPLOAD_REPLY	0031
MID_JOB_INFO_SUBSCRIBE	0034
MID_JOB_INFO	0035
MID_JOB_INFO_ACKNOWLEDGE	0036
MID_JOB_INFO_UNSUBSCRIBE	0037
MID_SELECT_JOB	0038
MID_RESTART_JOB	0039
MID_TOOL_DATA_UPLOAD_REQUEST	0040
MID_TOOL_DATA_UPLOAD_REPLY	0041
MID_DISABLE_TOOL	0042
MID_ENABLE_TOOL	0043
MID_SEND_VIN_STD	0050
OP_MID_VIN_SCANNED_SUBSCRIBE	0051
OP_MID_VIN_NUMBER_SCANNED	0052

OP_MID_VIN_SCANNED_UNSUBSCRIBE	0054
MID_SEND_VIN_EX	0150
MID_RESULT_UPLOAD_SUBSCRIBE	0060
MID_RESULT_UPLOAD	0061 rev1 to rev6 (rev 3-6 are filled with default values)
OP_MID_RESULT_UPLOAD_ACKNOWLEDGE	0062
OP_MID_RESULTS_UNSUBSCRIBE	0063
MID_GET_OLD_RESULT	0064
MID_OLD_RESULT_UPLOAD_REPLY	0065
MID_ALARMS_SUBSCRIBE	0070
MID_ALARM_EVENT	0071 (HST wrenches reply with OK but without alarm) currently implemented)
MID_ALARM_ACK	0072
MID_ALARMS_UNSUBSCRIBE	0073
MID_READ_TIME_UPLOAD_REQUEST	0080
MID_READ_TIME_UPLOAD_REPLY	0081
MID_SET_TIME	0082
MID_TXT_USER_GRAPH	0111 //Text to show to user
MID_ABORT_JOB	0127
MID LIMITS FOR GRAPH	0901
MID_KEEPAIVE	9999

The open protocol power tools must be defined in the Tools menu of the NetBee programming interface (See the NetBee Programming with Web Interface and Tools chapter for more information):

NET BEE FIME.000000 Status: idle VIN: Network1: 192.168.1.10
 Operation: Operation: Tool: Network2: 192.168.0.100

HOME SERIAL OUT GENERAL I/O MODULE TOOLS

Station: 1 - STATION 1 Type: HST TongBee ECD Back to Grid

Tool data

Tools N°:	1	Serial N°:	17340202
Barcode:		Name:	TBPEC-12WB
Range:	1.00 64.00 N/A	Supplier:	
IP address:	192.168.0.110	Port:	8040

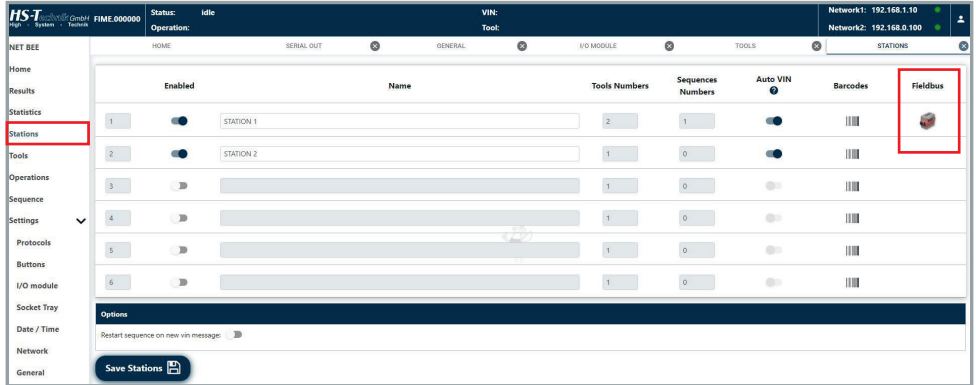
Save Tool

For open protocol communication, **IP address** and **Port** must be specified, together with the other tools parameters in the window above.

4.6 Working with Fieldbus

Fieldbus can be used to connect the NetBee with a customer system. Communication is performed via Ethernet or serial (COM 2 port of NetBee).

Fieldbus communication is enabled (on the first station), with proper parameters, via the webserver programming interface:



INPUT CARD

Byte size	Description	Notes
2	Job Number to Start	
60	VIN Number	
2	Stop Job	Stop if <> 0

OUTPUT CARD

Standard NetBee job



NOTE

Sent at Job End (only Job number is written when the cycle is started for inform the master that is running the cycle).

Byte size	Description	Notes
2	Job Number	Written when the cycle is started
4	Screw Bitmap	Map of maximum 32 screw results, where the bitmap is 0 for NOK and 1 for OK
1	Job Completed	Completed if <>0
1	Job Result	1 OK - 0 NOK
2	NetBee Ready	NetBee in not in error if <>0
2	Result Number	Result number in the next field
128	Results	Block of 4 bytes for every result, 2 byte for the torque and 2 for the angle (Max 32 results) values are multiplied X 10

Standard NetBee base

Byte size	Bits	Type	Description	Notes
	1	Bit	NetBee connected	1 when the NetBee is connected on Ethernet
	2	Bit	Ready	0 Not Ready / 1 Ready if the tool is connected to the controller and ready
	3	Bit	Sequence in progress	0 No sequence start / 1 sequence started
	4	Bit	Not used	
	5	Bit	Tightening status	0 NOT OK / 1 OK
	6	Bit	Operation status	0 NOT OK / 1 OK
	7	Bit	Sequence status	0 NOT OK / 1 OK
1	8	Bit	Not used	
2		Unsigned16	Echo sequence number	
4		Unsigned16	Torque result	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal"
2		Unsigned16	Angle result	1 word (2 Byte) for Angle Integer

2	Unsigned16	Batch count
2	Unsigned16	Rundown year
2	Unsigned16	Rundown month
2	Unsigned16	Rundown day
2	Unsigned16	Rundown hour
2	Unsigned16	Rundown minute
2	Unsigned16	Rundown second
1	BitField	Keep alive

Standard NetBee full

Byte size	Bits	Type	Description	Notes
	1	Bit	NetBee connected	1 when the NetBee is connected on Ethernet
	2	Bit	Ready	0 Not Ready / 1 Ready if the tool is connected to the controller and ready
	3	Bit	Sequence in progress	0 No sequence start / 1 sequence started
	4	Bit	Not used	
	5	Bit	Tightening status	0 NOT OK / 1 OK
	6	Bit	Operation status	0 NOT OK / 1 OK
	7	Bit	Sequence status	0 NOT OK / 1 OK
1	8	Bit	Not used	
2		Unsigned16	Echo sequence number	
4		Unsigned16	Torque result	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
2		Unsigned16	Angle result	1 word (2 Byte) for Angle Integer
2		Unsigned16	Batch count	

2	Unsigned16	Rundown year	
2	Unsigned16	Rundown month	
2	Unsigned16	Rundown day	
2	Unsigned16	Rundown hour	
2	Unsigned16	Rundown minute	
2	Unsigned16	Rundown second	
1	BitField	Keep alive	
1	Character	Angle status	L = Low Angle / H = High Angle
1	Character	Torque status	L = Low Torque / H = High Torque
4	Fixed Point Number	Prevailing torque result	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Rate torque result	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Low torque setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Max torque setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Target torque setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
2	Unsigned16	Low angle setup	1 word (2 Byte) for Angle Integer
2	Unsigned16	High angle setup	1 word (2 Byte) for Angle Integer
2	Unsigned16	Target angle setup	1 word (2 Byte) for Angle Integer
4	Fixed Point Number	Low prevailing torque setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Max prevailing torque setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Low rate torque setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal

4	Fixed Point Number	Max rate torque setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Torque threshold setup	1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal 1 word (2 Byte) for Torque Integer 1 word (2 Byte) for Torque decimal
4	Fixed Point Number	Angle threshold setup	
60	Character	Rundown VIN 1	
60	Character	Rundown VIN 2	
20	Character	Rundown operator	
10	Character	Rundown tool name	
22	Character	Rundown serial tool nr	
2	Unsigned16	Rundown operation nr	

4.6.1 Fieldbus settings

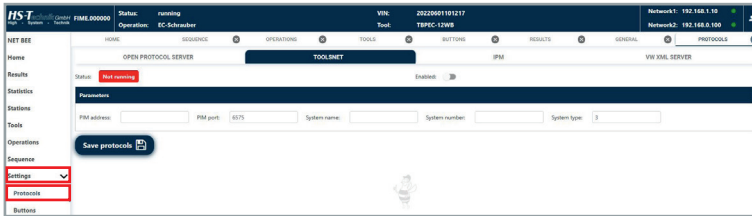
Fieldbus nodes must be configured via Sycon software by Hilscher. Refer to the hilscher.com website for more information.

4.7 Working with Toolsnet

NetBee can be connected to Toolsnet to send each result. Communication is performed via Ethernet.

Toolsnet communication must be enabled, with proper parameters, via the web programming interface.

Select **Settings** → **Application**:



Active	Enable the communication with Toolsnet
Status	Connection status
PIM address	Parameters of Toolsnet, that must be set according the specific Toolsnet installation
PIM port	
System name	
System number	
Save Application	Save the parameters

See the NetBee Programming with Web Interface chapter for more information of the webserver application.

5 Storage

Observe the following information when storing the NetBee:

- Store the device in a dry environment protected against splashing water.
- Store the device in a well ventilated space and protected against exposure to dust.
- Ensure that the storage environment is free of aggressive chemicals and vapours.

6 Technical data

Description	NetBee
Power supply	100 - 240 VAC, 50/60 Hz
AC input power	100 W
AC Fuse	T3.15A L250V
Overvoltage category	II
Tools managed	max. 12
Supported tools	<ul style="list-style-type: none"> - TorqBee - NutBee - RivBee - WrenchBee
Results memory	100 000
Traces memory	100 000
Printer support	USB / serial for printing, a custom application must be provided by HS-Technik
Socket tray	Compatible with HS-Technik NetBee Socket Tray
Barcode management	Yes (2 on serial port and 1 on USB port)
Communication protocols	<p>Open Protocol, Toolsnet, IPM, XML, PFCS, XML VW</p> <p>Fieldbus (optional): Profibus DP master, Profibus DP slave, DeviceNet master, DeviceNet slave, CC-Link slave, CANopen master, CANopen slave, Profinet IO device, Profinet IO controller, EtherNet/IP scanner, EtherNet/IP adapter, Open Modbus/TCP</p>
Input / Output	<p>4 outputs</p> <p>16 inputs / outputs optional</p>
Sequences / Operations managed	Unlimited
Display	7" touchscreen, resolution 800 × 480 pixel
Ethernet	2 ports, one for connection to plant network, and 1 available to connect to a controller

Description

NetBee

USB

USB ports are used to:

- Connect external keyboard and mouse
- Connect a barcode reader
- Connect a USB-Stick to export reports from the NetBee
- Software communication

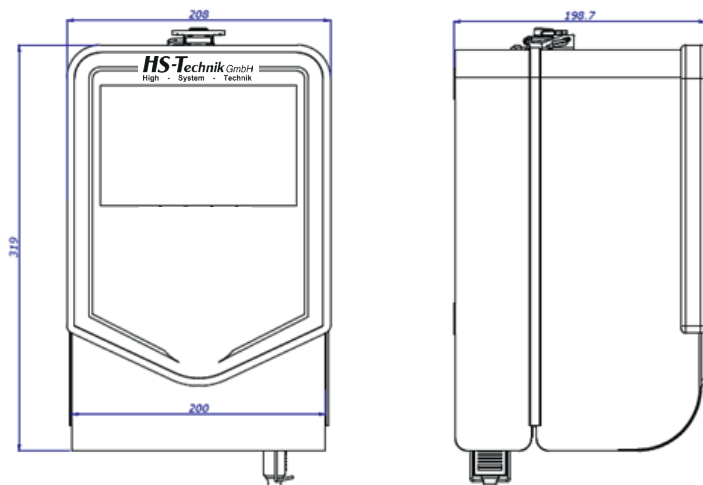
NOTE: Radio adapter 868 / 915 MHz for CL – CLS wrenches must be connected to USB 1

RS 232 Serial Port

2 ports, one for printer and one for barcode reader. Results can be also exported via serial interface (Serial Out function)

CAN BUS port

Interface for NetBee Socket Tray by HS-Technik (CAN BUS version).



Specifications in mm
Not shown to scale

CE Declaration of conformity

We, the manufacturer, hereby declare that the named device complies with the essential protection requirements of the listed EU directives regarding design and construction type.

The prerequisite for this is the intended use of the device as well as compliance with the installation and commissioning instructions.

If the product or its accessories are modified without our permission, this declaration becomes invalid.

Device description: Industrial Universal Controller for tightening tools

Type designation: NetBee

Manufacturer: HS-Technik GmbH
Im Martelacker 12
D-79588 Efringen-Kirchen

Directives: 2014/35/EU
2014/30/EU
2011/65/EU

Applied standards: EN 61010-1:2010+A1:2019
EN 61326-1:2013
EN 50581:2012

HS-Technik GmbH
Im Martelacker 12, D-79588 Efringen-Kirchen

January 2023



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CEO

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