HCT Windows app v2

Manual

Content

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1 Identification data

Product:	HCT Windows app version 2.144 or later
Version:	00067 Original user manual
Date of creation:	1111/20245

2 Safety instructions

Please read and observe these notes to avoid hazards.

2.1 Target group

All activities described in these operating instructions may only be carried out by trained personnel authorized by the plant operator.

2.2 Operating instructions

Please read this user manual carefully before use to prevent errors in the handling of the software or the HCT dongle. This ensures safe handling. The user manual must be stored carefully and be always at hand.

2.3 Proper use

The HCT dongle must only be connected to a suitable, free USB port on a PC with a Windows operating system. After use, unplug the HCT dongle to avoid unattended power.
The HCT dongle must only be used in dry rooms and must be protected from heat, cold and moisture.
The HCT dongle is not suitable for children. The HCT dongle must never be operated and left unattended.
The HCT dongle should only be used for the purposes described in the user manual.

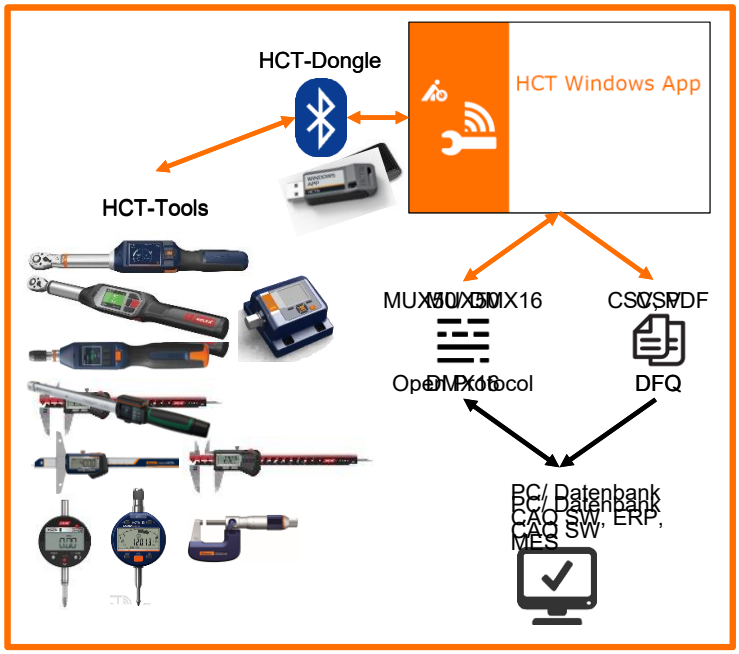
2.4 Accessories

To operate the HCT Windows app, the HCT dongle, item no. 498999, required. This provides Bluetooth wireless technology.

3 The HCT Windows app - An overview

- The HCT Windows app allows you to connect your HCT tools to a computer system via Bluetooth. A bi-directional connection is established, with which data can be sent from the HCT Windows app to the HCT tools and the generated measured values are transferred back to the computer.
- You can connect up to 16 HCT tools to the HCT Windows app.
- The measured values are displayed on the screen and saved in measurement logs in CSV file format.
- You can create measurement cases and save and manage them in the HCT Windows app and assign them to a suitable HCT tool at any time if necessary.
- The HCT tools can be divided into different stations.
- Even if you add or replace an HCT tool, the measurement cases already created are available for the new HCT tool.
- Work plans can be created and processed in the sense of a factory tour.
- In addition, a workpiece identification can be linked to the sequence diagram.
- Your staff can support you through the sequences by integrating images, drawings, etc. for each work step. This prevents errors and ensures complete documentation.
- The HCT Windows app can transmit the measurement data directly to other systems such as CAQ systems or pass it on via files. The established and widely used data transfer protocols MUX50, ~~and~~ DMX16 and Open Protocol are available for this purpose. The HCT Windows app uses CSV and DFQ formats (also known as AQDEF) to transfer data via files.

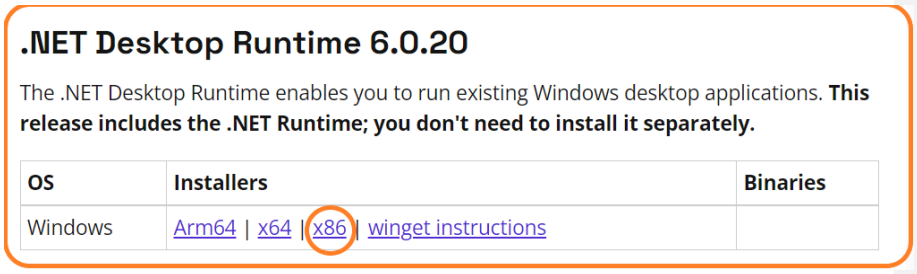
3.1 System overview



3.2 System requirements

The computer system on which you want to install the HCT Windows app must have the following system requirements:

- PC with Windows 10 or later operating system installed and .NET **Desktop** Runtime 6.0.20 for **x86** installed:



.NET Desktop Runtime 6.0.20

The .NET Desktop Runtime enables you to run existing Windows desktop applications. **This release includes the .NET Runtime; you don't need to install it separately.**

OS	Installers	Binaries
Windows	Arm64 | x64 | x86 | winget instructions	

You can find this at the following link:
https://ho7.eu/win-app-hct or

- Download .NET 6.0 Desktop Runtime (v6.0.20) - Windows x86 Installer (microsoft.com)
  A free USB slot for the HCT dongle. Since the HCT dongle includes Bluetooth wireless technology, make sure that the HCT dongle is not shielded by sheet metal parts, cabinet walls, etc.
- To install the HCT Windows app, you must have local administrator privileges. These are no longer required to operate the HCT Windows app.

Feldfunktion geändert

Feldfunktion geändert

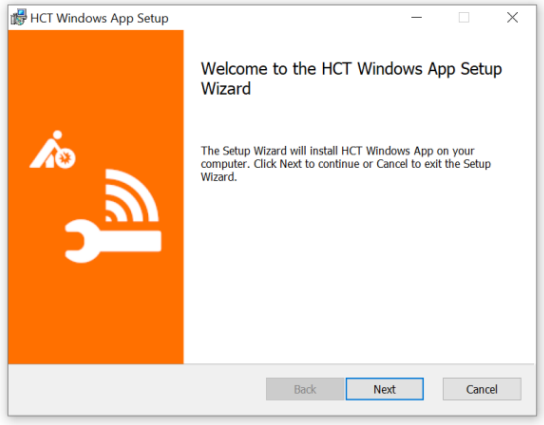
HCT Windows App

The HCT tools must meet the following requirements:

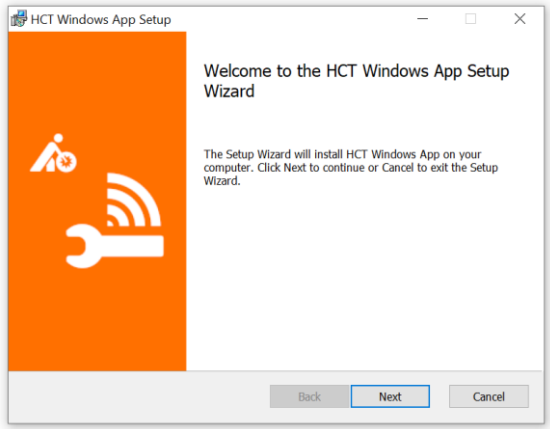
HCT measuring equipment	Item number	BT Version	Min. FW Version	
			FW Version	BLE Version
Garant DTW	655010	5	v3.42	v0.96
Holex HCT-TW	655025	5	v1.1.15	v1.3.8
Garant HCT-TS	659021	5	V1.0.20	V1.4.0
Garant HCT-TT	654410	5	v1.0.10	v1.3.8
Stahlwille HCT-TM	655010/ 655015	5	v1.39	v0.0.16
Holex HCT-DC	412790	5	v1.2.5	v1.3.8
	412792			
	418743			
Holex HCT-DI	434008	5	v1.2.5	v1.3.8
Garant HCT-DC	412781	5	r5.02	v1.03.1046
	412783			
	418685			
Garant HCT-DI	434336	5	r5.02	v1.03.1046
	434342			
Garant HCT-MM	421575	5	r5.02	v1.03.1046

4 Installation

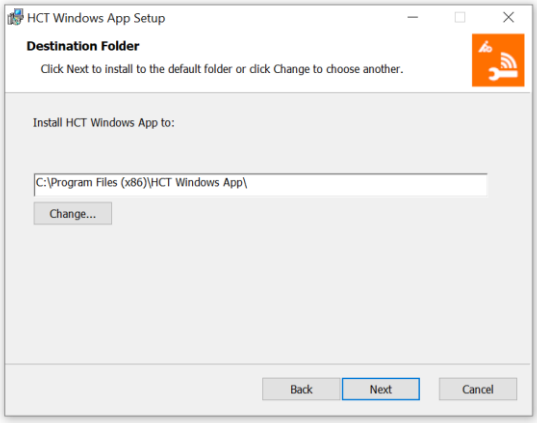
To install the HCT Windows app, you must have local administrator privileges. If you do not have it, please contact your system administrator.
Before installing the HCT Windows app, please ensure that the .NET desktop runtime 6.0.20 for x86 is installed. The links to this can be found in chapter "3.2 System requirements~~System requirements~~~~System requirements~~".
Download the installation package to your computer on which you want to install the HCT Windows app.
Unzip the installation package into a suitable folder (for example, in "Downloads\HCT Windows App\").
Install the HCT Windows app by double-clicking the installation file "HCT Windows app setup vx.x.x.msi" (x.x.x stands for the version number of the HCT Windows app) in the folder above. The installation wizard starts and guides you through the installation. You can cancel the installation at any time with "Cancel". To continue, click Next.



In the next step, select the language in which you want to read the Terms of Use. You can print the Terms of Use by clicking "Print" and following the instructions. To proceed with the installation, you must accept the terms of use and tick "I accept the terms in the License Agreement". Then click on "Next".

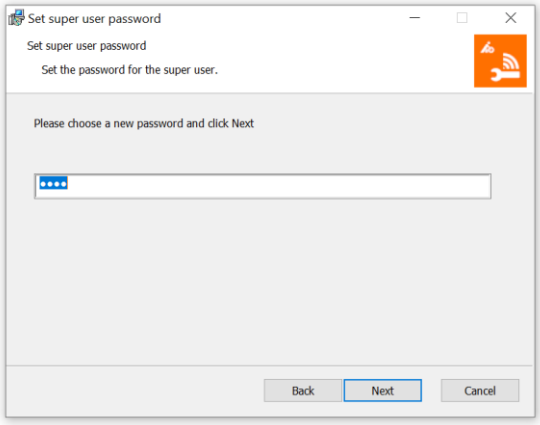


You will now be asked in which folder you want to install the HCT Windows app. If you want to use a folder other than the suggested one, make sure that the installation wizard has write permissions for it. Then click on "Next".

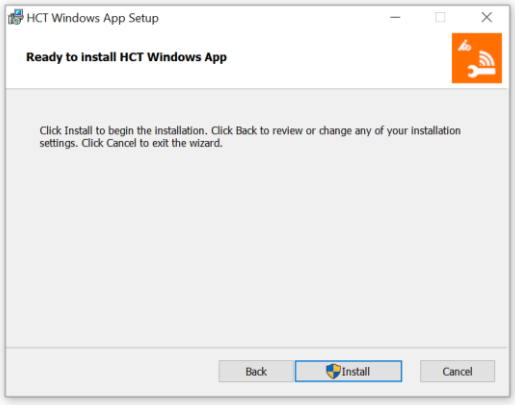


Set the Super User password

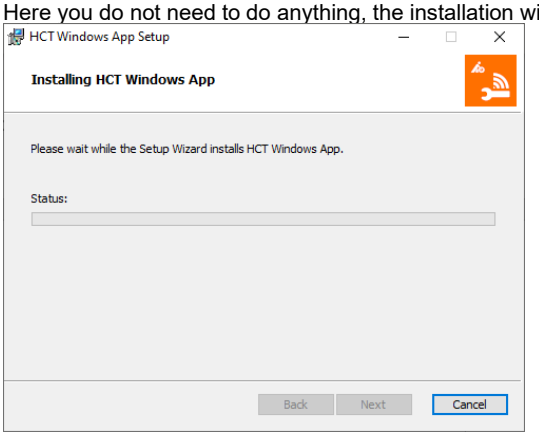
In this step, set a password for the Super User. In order to be able to make far-reaching changes in the settings of the HCT Windows app later, you must log in as a super user and use the password to be set here. It is valid for this purpose only and is not relevant to the operating system or other applications. Then click on "Next".



You have now made all the settings and the installation wizard is ready. Click "Install" to complete the installation of the HCT Windows app.

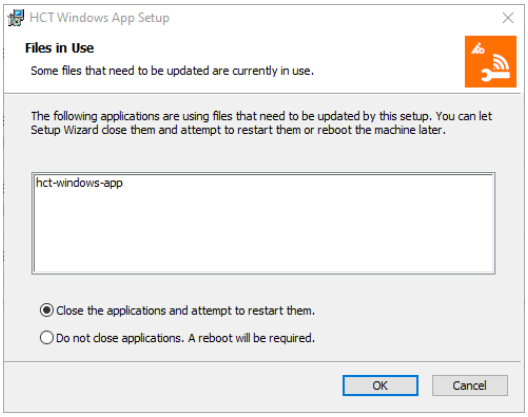


Here you do not need to do anything, the installation wizard will show you the progress:



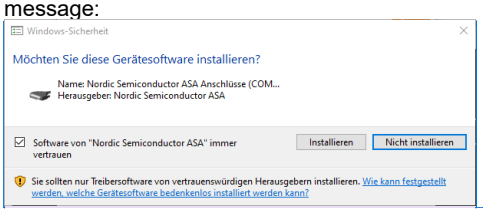
If you install a new version on the PC on which an installation already exists and the HCT Windows app is already running, you will receive the following message:

HCT Windows App



We recommend that you exit the installation wizard from the running HCT Windows app and continue the installation. Leave the selection to "Close the applications and attempt to restart them." If you are unable to exit the already running HCT Windows app, select "Do not close applications. A reboot will be required." However, remember that in this case, a reboot of the machine is required after installation.
Click OK.

When you install the HCT Windows app on your PC for the first time, the device software (driver) for the HCT dongle is usually missing. The installation wizard checks the system for the presence of the device software, and if it is not already installed, it displays the following message:



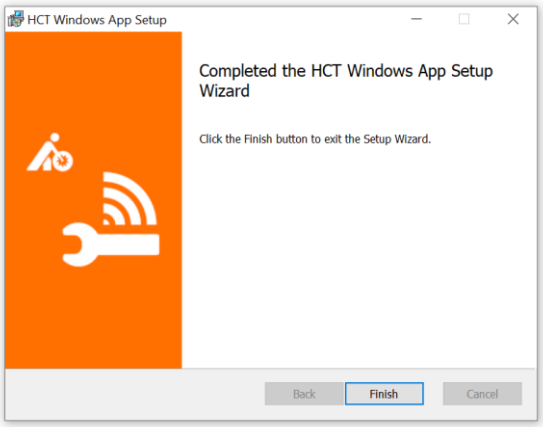
Since the HCT dongle will not work without this device software, check "Always trust Nordic Semiconductor ASA software" and then click "Install".
To finalize the installation, click on "Finish":

Kommentiert [AB1]: In Englisch?

Kommentiert [MK2R1]: Wenn wir Zeit haben, dann ja

Kommentiert [MK3R1]: Wenn möglich

HCT Windows App



Insert the HCT dongle into an available USB slot on your computer. Note that the HCT dongle includes Bluetooth wireless technology. Therefore, make sure that the dongle is not shielded by sheet metal parts, switch cabinet walls or the like, otherwise you will not be able to establish connections or the range of the radio connections will be severely restricted.

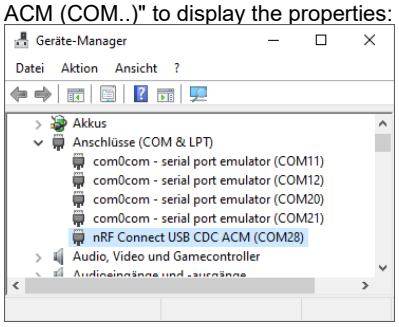
4.1 Silent Installation

The MSI can be used for silent installation. In this case, a default super user password must be provided on the command line. The MSI property to set the password from the command line is `ADMIN_PASSWORD`
Example given:

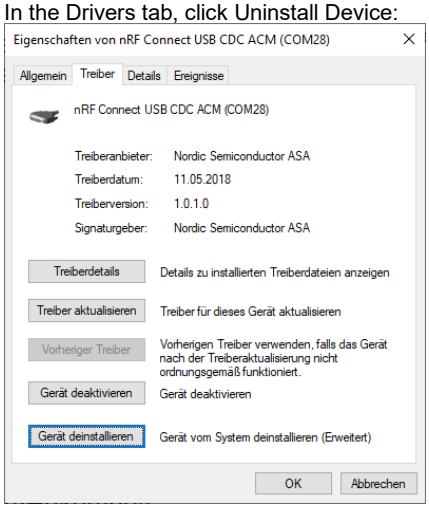
```
& '.\HCT Windows App Setup vX.X.msi' ADMIN_PASSWORD=Test123 /q /log install.log
```

4.2 Uninstalling the device software

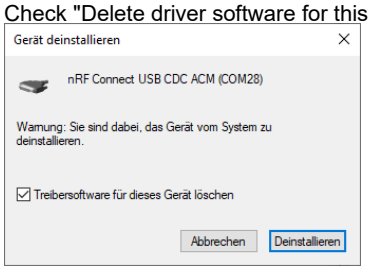
The device software remains on the PC and will not be removed when the HCT Windows app is uninstalled. If you want to uninstall the device software, you must do so from the Windows Device Manager. To do this, insert the HCT dongle into a USB slot and start the device manager. Open the Ports (COM & LPT) folder. Double-click "NRF Connect USB CDC ACM (COM..)" to display the properties:



In the Drivers tab, click Uninstall Device:



Check "Delete driver software for this device" and click "Uninstall":

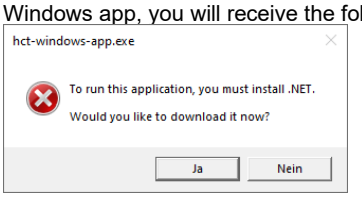


The device software will now be uninstalled and the HCT dongle can be unplugged.

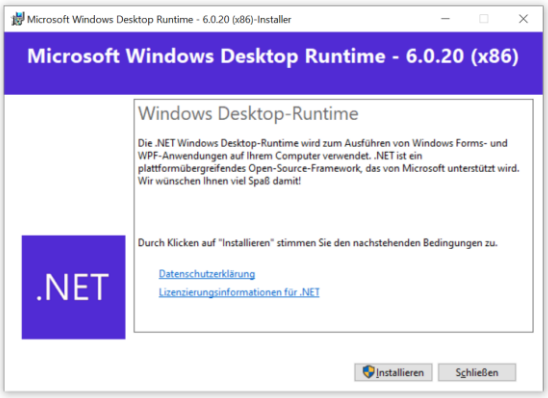
5 First launch of the HCT Windows app

5.1 Check for installation of the .NET Desktop Runtime

If the .NET desktop runtime 6.0.20 for x86 was not installed prior to installing the HCT Windows app, you will receive the following error message:

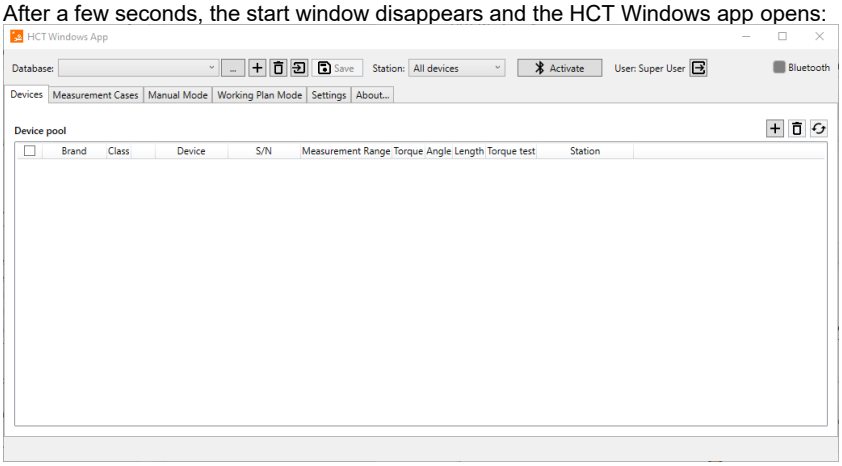


Click "Yes" here, you will be redirected to the .NET website and the download of the .NET 6.0 Desktop Runtime (v6.0.20) - Windows x86 Installer will start.
After downloading, open the file you just downloaded:



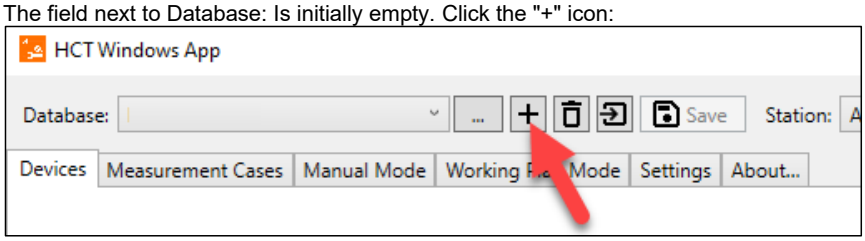
Install the .NET Desktop Runtime 6.0.20 for x86 by clicking Install and following the instructions in the installation wizard.
Now restart the HCT Windows app.
During the startup process of the HCT Windows app, you will see the startup window:

After a few seconds, the start window disappears and the HCT Windows app opens:



5.2 Create a database

The HCT Windows app stores all settings, working plans, etc. in a database. After the first installation, you must create such a database. You must be logged in as the "Super User" user to create, change or remove databases.
The field next to Database: Is initially empty. Click the "+" icon:

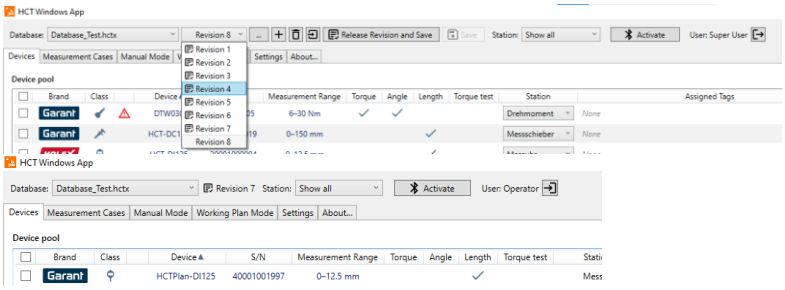


In the dialog that opens, assign a folder for the database.
The default file name is Database.hctx. If necessary, you can change the name and location accordingly. Thus, the HCT Windows app allows you to create multiple databases and switch between them, for example one database for setup and testing purposes and another for the production process.

Make sure that the HCT Windows app has full access to this folder. The default is C:\Users\Public\Documents\hct-windows-app\Customer Files. This folder provides full read and write access on standard Windows systems.
Finally, click Save.
To change the database and use an existing database, click "…" to the right of the database name field. Select and open the appropriate location and database to use.

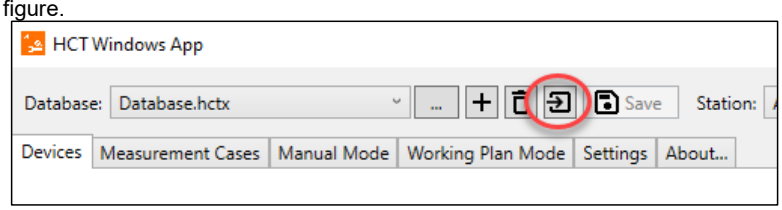
5.3 Database revisions

As a Super User, you have the option of saving changes made to databases as a revision and releasing them for the operator. Only after the Super User has released the revision can the operator access it. As a Super User, you can also specify which revision is to be used in the following. In Super-User-mode, you can still revert to previous versions or revisions if, for example, changes you have made have become obsolete. To do this, select the desired revision from the list.

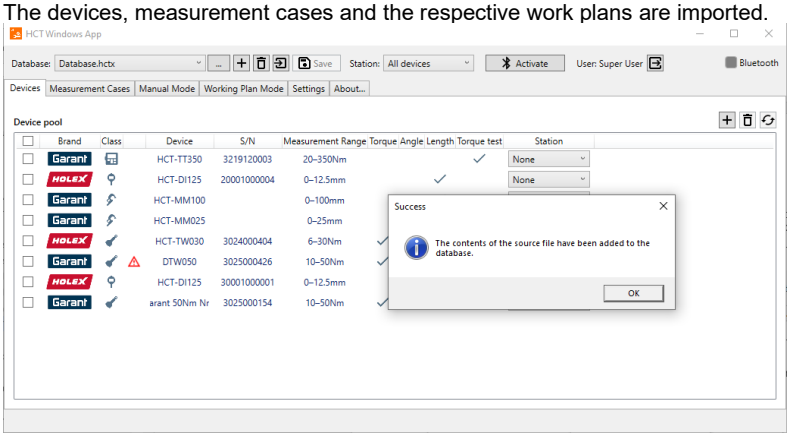


5.4 Import version 1.x databases

The database format has changed with version 2 of the HCT Windows app.
You can now import version 1 databases. Therefore, click on the import icon shown in the figure.



Select the relevant database file that you want to import.
The devices, measurement cases and the respective work plans are imported.



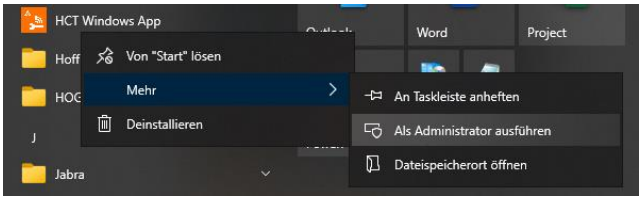
Please note that the current calibration status and the FW version of the devices are still described as unknown in the device view. As soon as the respective devices are connected via Bluetooth, the status is synchronized.

5.5 Manage users

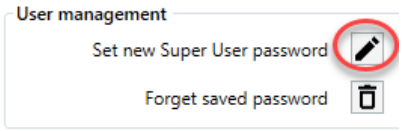
The HCT Windows app allows you to use two types of users. As the "Super User" user, you have full access rights and can make all settings. This type of user is intended for setting up the HCT Windows app. Note that the user "super user" in the HCT Windows app is **not** the Windows administrator!
The Operator user is intended for later use of the HCT Windows app in production. This user type restricts the changes to settings so that no tool-relevant parameters or working plans can be changed.

5.5.1 Set the Super User password again

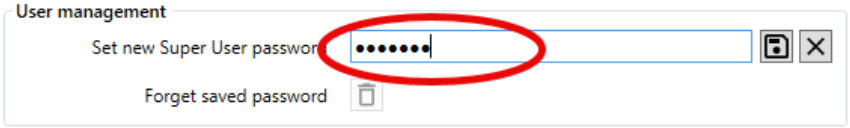
Run the HCT Windows app as an administrator. To do this, right-click on the entry "HCT Windows App" in the Windows Start menu under H. Select "More" and "Run as Administrator":



After starting the HCT Windows app, go to the "Settings" tab and click on (New super user password) under "User management" to the right of "Set new super user password":



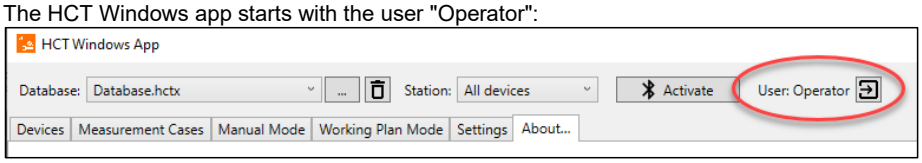
Enter your password in the text field that appears and save it by clicking “Save”. Use “Cancel” to cancel the operation:



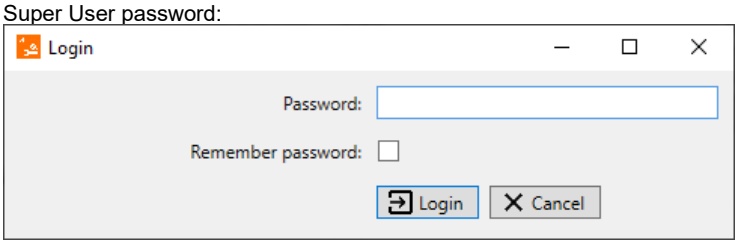
Please note that your settings are saved separately when the HCT Windows app is operated as a **Windows administrator**. If you start the HCT Windows app on your PC without Windows administrator rights, the settings are not applied, but are saved separately. However, the password you have set as described above will remain valid.

5.5.2 Set up the HCT Windows app as a "super user" user

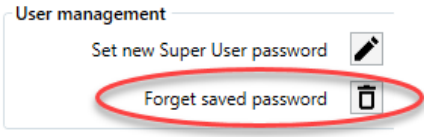
The HCT Windows app starts with the user "Operator":



To set up the HCT Windows app and make extensive settings, you must switch to the user "Super User". Click “Login” to the right of Operator. You will now be prompted to enter your Super User password:



To switch back and forth between "Super User" and "Operator" during setup without entering the password, check "Remember Password"
Click on "Sign in".
You can remove the saved password again so that the user "Operator" cannot change anything. Go to the Settings tab. In "User management” click on (Forget saved password) to the right of "Forget saved password":

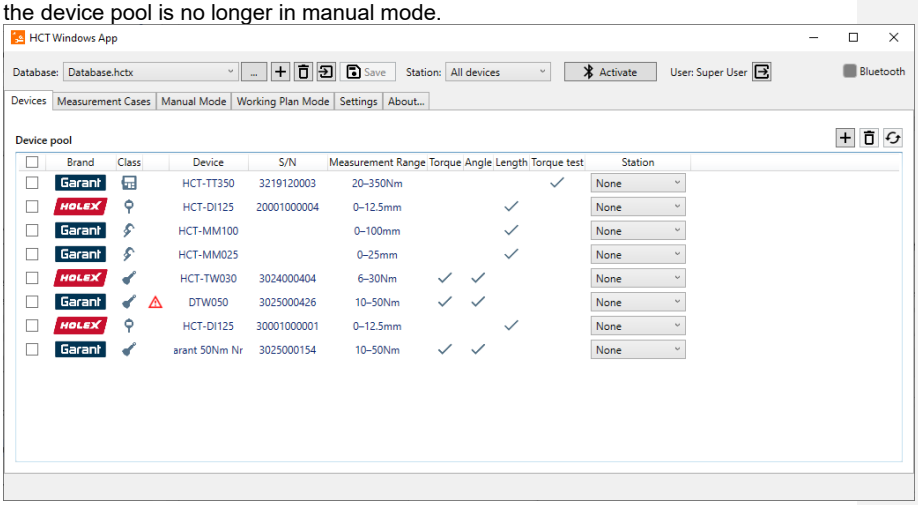


To log in again as a "Super User" with the already assigned password, proceed as described in this chapter.
You can assign a new password as described in section "5.5.1 Set the Super User password again".

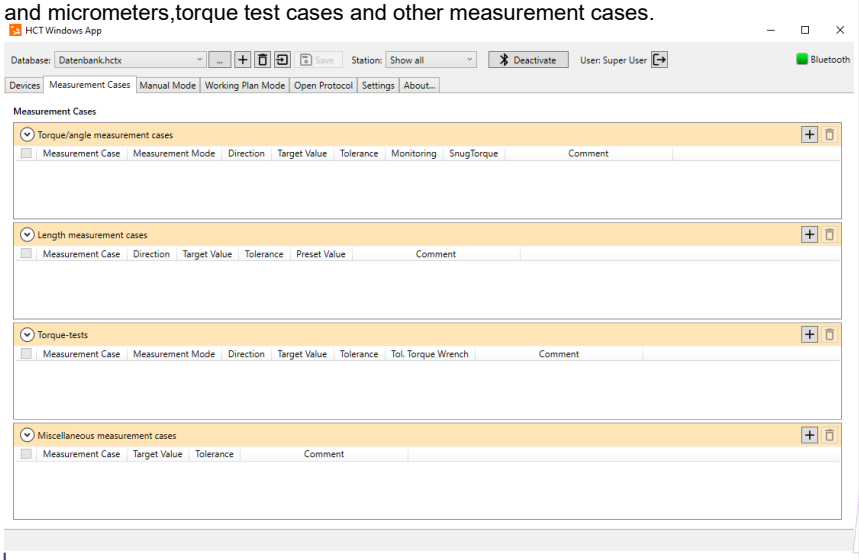
5.6 General structure of the HCT Windows app and its tabs

Due to the extension of the HCT Windows app for the HCT measurement tools, the basic structure of the app has been revised. The individual tabs will be briefly introduced below

- **Devices**
  In the device view, all devices are managed in the so-called device pool. You can add new devices, assign stations, and delete devices from the pool. Unlike version 1.x, the device pool is no longer in manual mode.



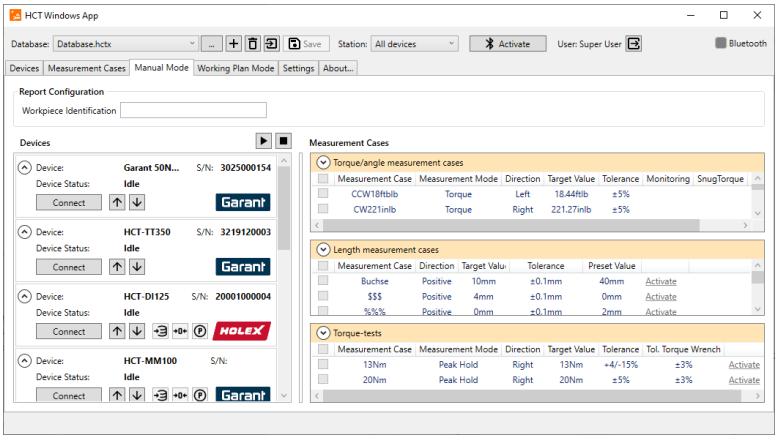
- **Measurement cases**
  In the Measurement Cases tab, the measurement cases for the devices supported by version 2 are managed. A distinction is made between torque test cases (screw cases) for the torque wrenches, length measurement cases for calipers, dial gauges and micrometers,torque test cases and other measurement cases.



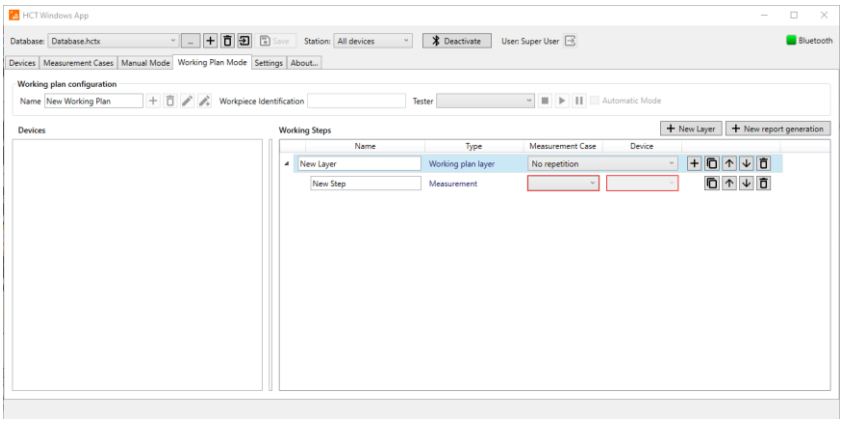
Kommentiert [AB4]: Neuer Screenshot

Kommentiert [AB5R4]: Erstellt

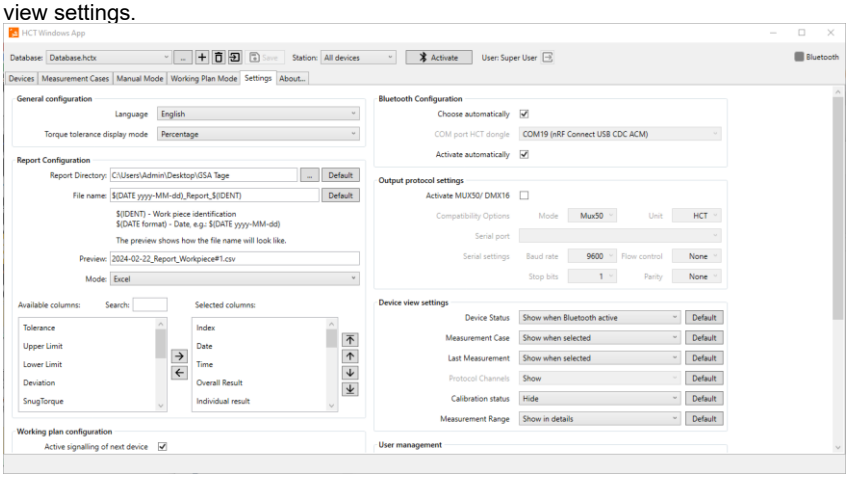
- **Manual mode**
  In this view, measurement cases can be manually assigned, activated and executed to the devices.



- **Working Plan Mode**
  In Working plan mode, layers with working steps can be planned and processed. The work steps can include measurements in which measurement cases can be linked to devices, as well as attributive characteristics that are queried. In addition, a report can be created directly in work plan mode to document the measurements. You can find more detailed information in chapter “6.5 Working plan mode”.



- **Settings**
  In this view, the Super User rights can be used to make general settings, Bluetooth settings, report settings, working plan settings,output protocol settings, and device view settings.

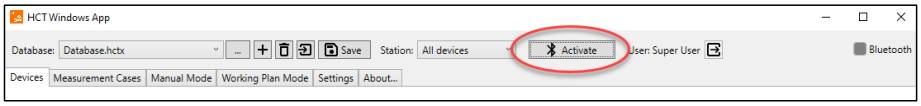


6 Application

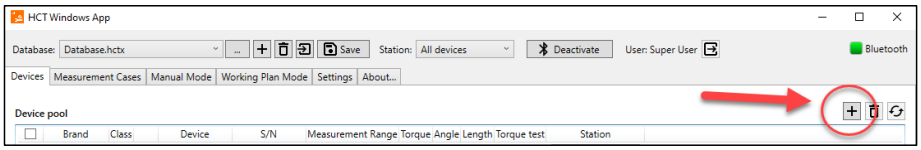
6.1 Create and manage HCT tools

You must be logged in as a "Super User" to connect HCT tools.
In the input field next to "Database:", check whether you have selected a database. If not, select a database with the "…" symbol to the right of the input field or create a new database with "+" as described in the " section 5.2 Create a database~~Create a database~~~~Create a database~~".
Bluetooth cannot be activated without a database.

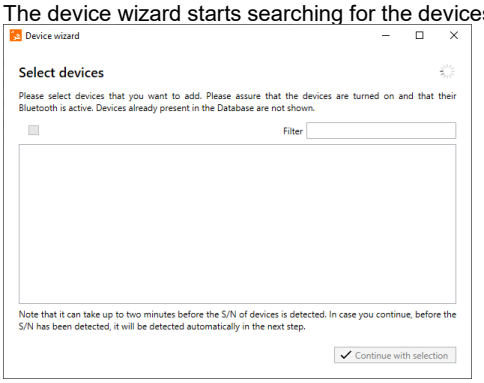
Make sure that the HCT dongle is plugged in and click "Enable Bluetooth":



Once Bluetooth is enabled, you can start searching for devices by clicking the "+" Add icon.



The device wizard starts searching for the devices.



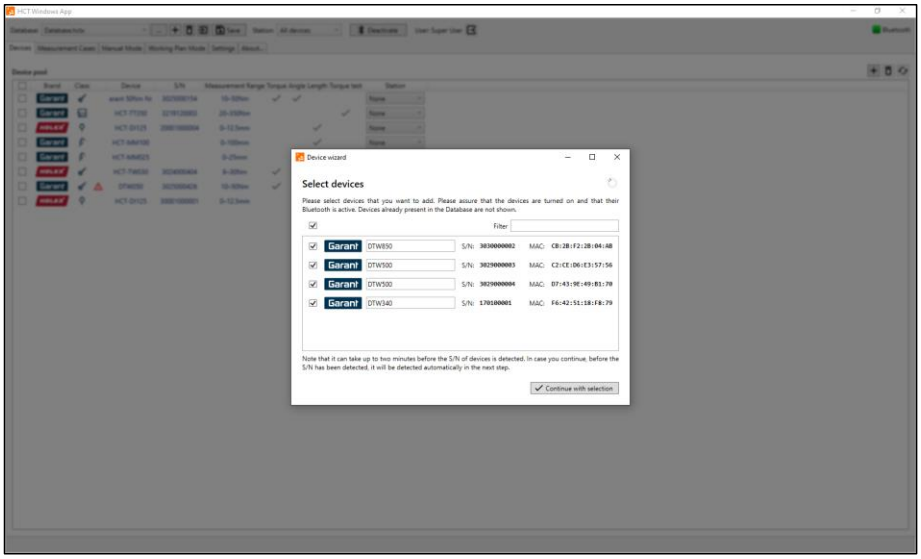
To do this, turn on your HCT tools and make sure their Bluetooth wireless technology is turned on and that they are ready to connect. You can see this on the flashing Bluetooth icons, or on the displays of the HCT tools. If necessary, switch on the radio modules according to the operating instructions in chapter 9 “Transfer measurements to other systems”. The HCT tools distinguish between APP and HID connection, make sure that APP connection is enabled.

Kommentiert [AB6]: Verweis einfügen

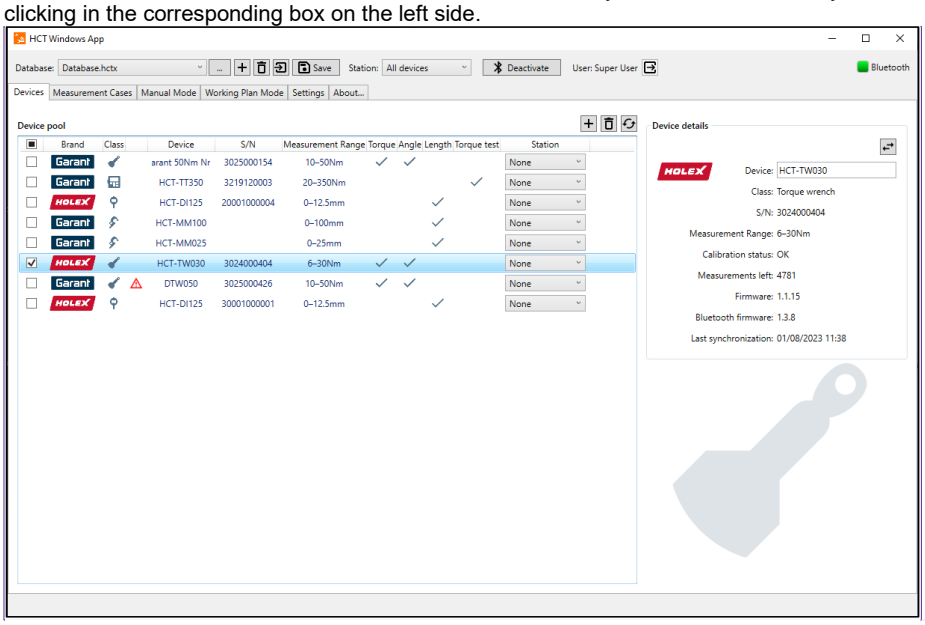
Kommentiert [AB7R6]: Erledigt

The devices that are found can now be selected and transferred to the database. If you now click "Continue with selection", the marked devices are briefly automatically connected and the HCT-Windows app reads device-specific information such as firmware versions, measuring range and calibration status.

HCT Windows App



This information can then be viewed in the device overview if you select the device by clicking in the corresponding box on the left side.



Kommentiert [AB8]: Screenshot Kalibrierintervall

In addition, you can change the devices name and calibration interval in the device overview. Just write the desired name in the field provided and then click on “save”. It should be noted that the calibration interval may only be changed if the user carries out a test equipment monitoring procedure.

When creating a working plan (see “6.6 Work plan mode”), you can either assign a device to each step yourself or use the Smart Selection, which means that the Windows App selects a

device suitable for that step. In the device details you can choose whether the device is added to the device pool from which the smart selection chooses. To do this, click **“Smart selection allowed”.**

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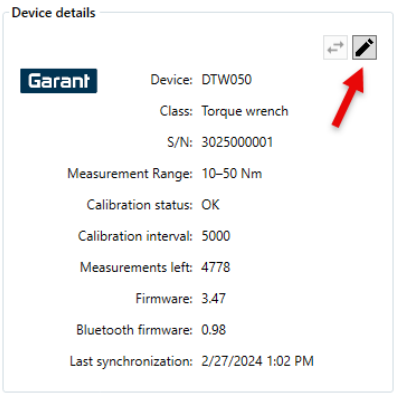
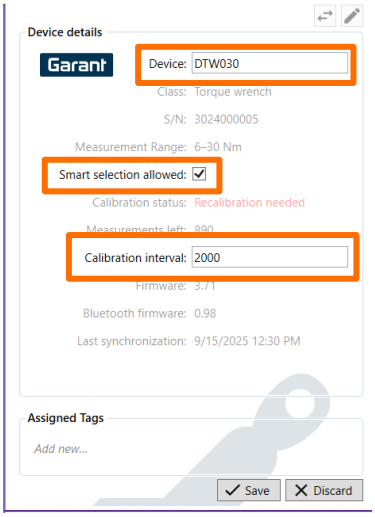
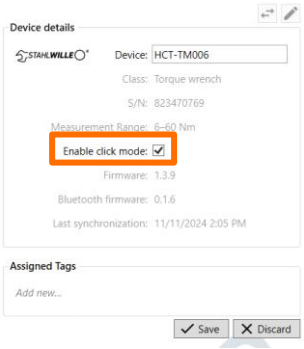
Kommentiert [AB9]: Neues Bild => Smart Selection allowed



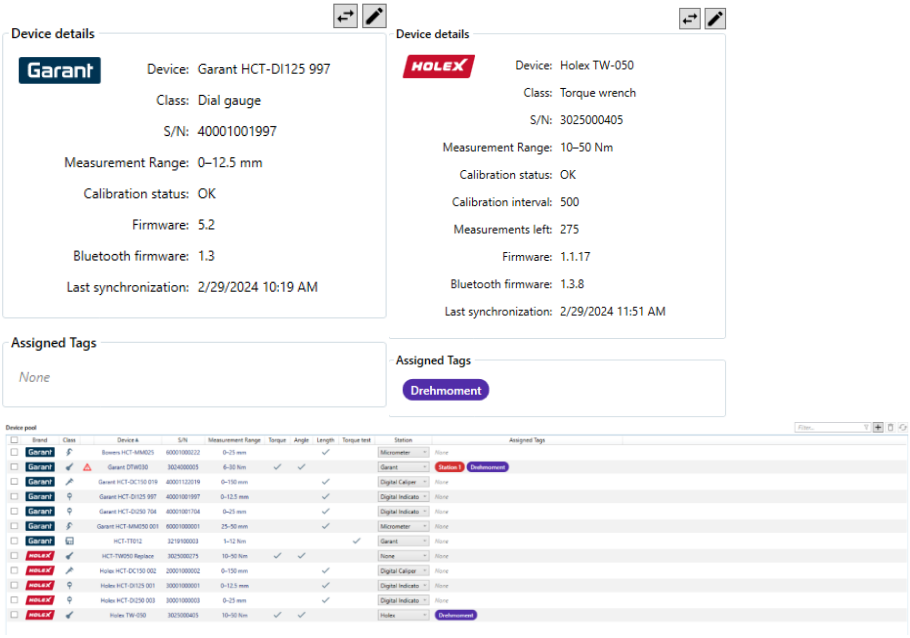


“Enable click mode” for Stahlwille 766
With the Stahlwille torque wrenches, you can change the devices name in device details. In addition, you can set whether the click mode should be used. To do this, check the box next to “Enable click mode”.

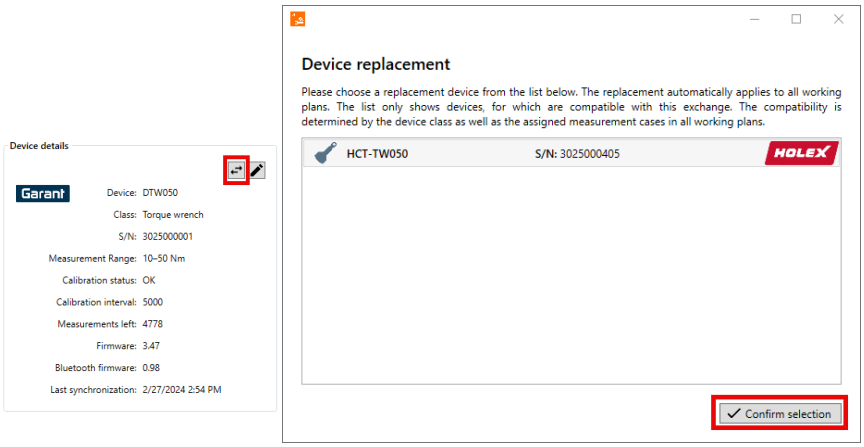


Assigned Tags
You can use tags to divide devices into different categories or describe them in more detail. This is helpful when using the smart function (see “6.6.4 Configure the measurement”) to narrow down the device pool from which the app selects a suitable device for the measurement to be carried out. To do this, enter the desired day in the field provided and confirm with ENTER. Then click on “Save”.

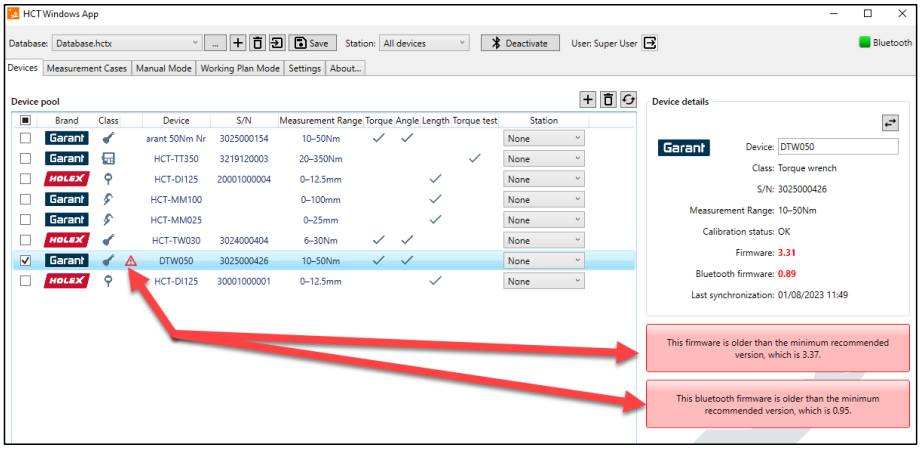
HCT Windows App



Replacing devices
It is also possible to replace the device with a spare device. This means that the device is automatically replaced in all work schedules and does not have to be changed manually.



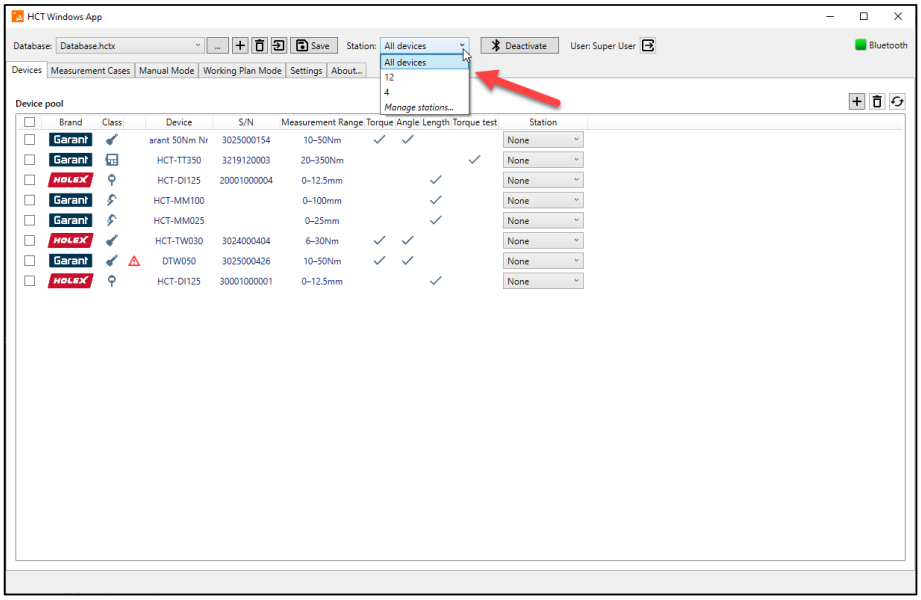
For devices with the red warning sign, please check whether the FW version corresponds to the minimum version for the HCT Windows app V2, see chapter 3.2, Or whether the calibration status is correct.



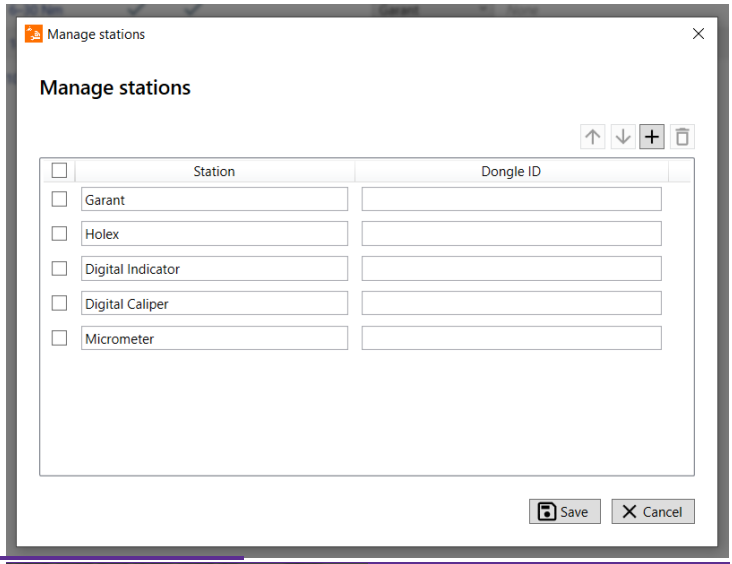
The HCT Windows app and the used Bluetooth wireless technology allow you to connect a maximum of 16 HCT tools. Note, however, that this many HCT tools can delay connection and data transfer. We therefore recommend not to connect more than 10 HCT tools to the HCT Windows app. If you use more HCT tools, distribute them to multiple workstations and thus to multiple PCs using the HCT Windows app and HCT dongles.

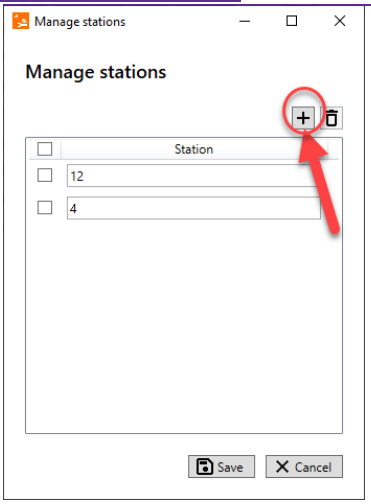
6.2 Station assignment

If you want to equip several stations with HCT tools in your production, you can create and manage them in the device view as "Super User" and assign the devices from the device pool to the stations in which they are required. To do this, go into the station field and expand it, "Manage stations" appears. Click Manage Stations.



The context menu appears in which you can create a new station and assign a name by clicking on the + symbol.





You can then save the created stations. You can also assign different dongle IDs to the stations if you use several dongles. You can find the dongle IDs in the settings (see 7.3 License settings)

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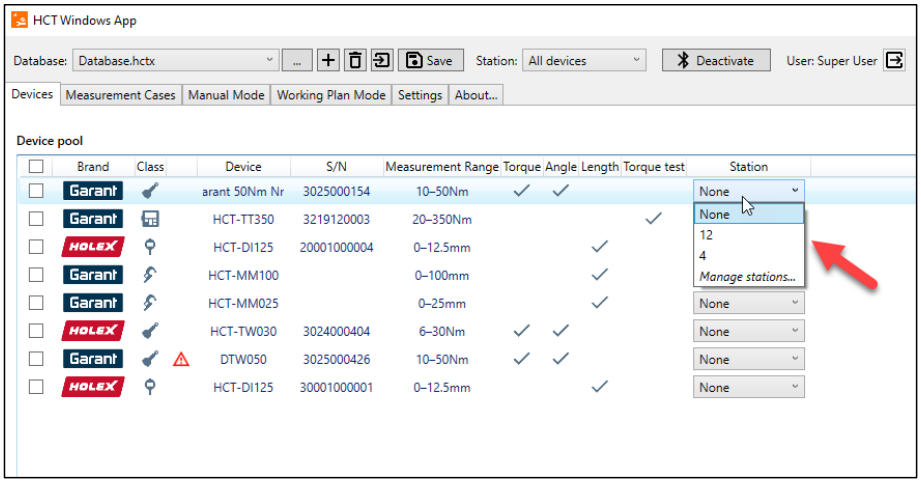
Now you can assign the individual devices to the stations.



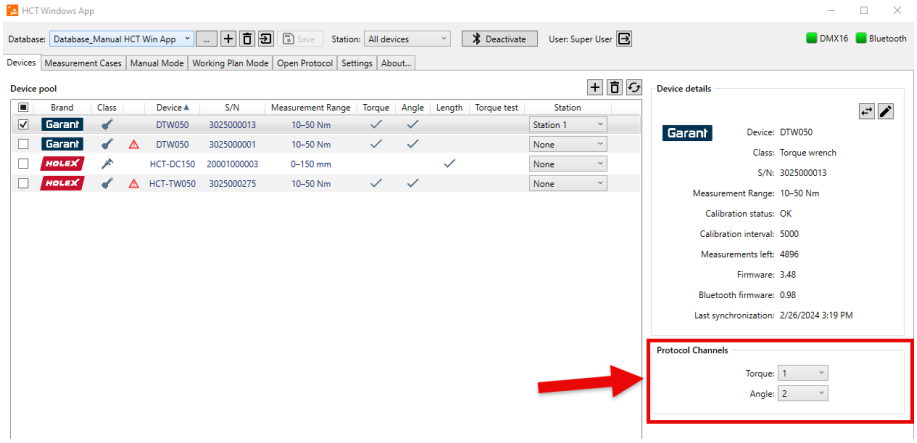
If you have already made a station assignment and have activated a station in the header under Station, you will see all devices assigned to this station and those that have not yet been assigned to a station. If "all devices" is selected in the Station header, you will see all devices that have been read in so far.
At the respective stations, only the devices assigned to the station are visible by the "operator" and can be connected via Bluetooth.

From version 2.11.3, if stations are created, a station must be selected before starting a work plan. To do this, assign all devices that you need to carry out the work plan to a station and select it from the drop-down list in the header under “Station:”.

6.3 Channel assignment for MUX50/ DMX16 data transfer

In order for the measured values of the HCT measuring equipment to be transmitted to a CAQ application via the HCT Windows app, channels for data transmission must be assigned to the individual measuring equipment. First activate data transmission via MUX50 or DMX16 as described in chapter "7.5.1 Using MUX50/DMX16".
Then switch back to the "Devices" tab and select a device to which you want to assign a transmission channel. The "Device information" dialog is now displayed on the right. Below this is the "Protocol channels" dialog. Please note that this is only displayed if "Use MUX50/DMX16" is activated in the output protocol settings.
You can now specify a channel for the measuring device. Please note that two channels must be assigned for torque wrenches with an angle measurement function. One is used to transmit the angle measurement value and one is used to transmit the torque measurement value.
The channel numbers assigned here are used in the data transfer between the HCT Windows app and another application such as CAQ software. When you configure your additional application, use these channel numbers to define the input channels.

HCT Windows App

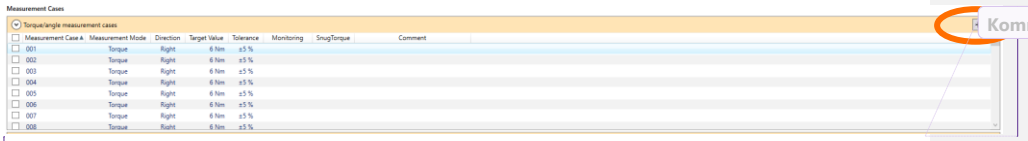


6.4 Create the measurement cases

A separate tab has also been provided for creating and managing the measurement cases. After creating the measurement cases, they are displayed in a list sorted according to the type of measurement case. A distinction is made between torque cases/screw cases, torque test cases, length measurement cases and miscellaneous measurement cases. If you select a measurement case from this list by clicking on it, it will be displayed on the right-hand side of the screen. The treatment of the measurement cases is station-independent, so station selection and filtering are not relevant to create and manage the test cases.
The following explains how you can create the different types of measurement cases.

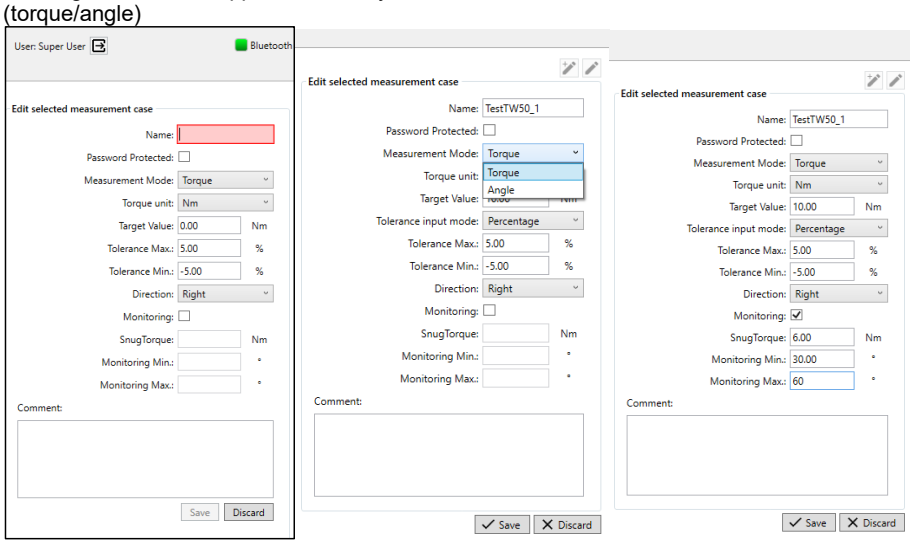
6.4.1 Create the torque (screw) cases

To create a torque or rotation angle measurement case click on the button 



Kommentiert [AB10]: Neuer Screenshot

A dialog box will then appear in which you can enter the name of the screw case, mode (torque/angle)



Name:
Specify the name of the measurement case. Note that the name cannot exceed 60 characters. This name is displayed in the "Measurement cases" and "Measurement case storage" tables in the "Measurement case" column. In addition, the name is entered in the "Name" column of the CSV file and is only entered in the K field K2003/x of the DFQ file in the work plan mode.

Password protected:

Check the box if you want to protect the measurement case against accidental or intentional changes using a password. However, password protection only applies to the torque wrench to which the measurement case is transferred and only if a master password has been assigned on the wrench.

Measurement mode:
Select the appropriate measurement mode here. Note, however, that you cannot load a measurement case with measuring mode "Angle" into a HOLEX torque wrench without angle measurement. Always select "Torque" for these torque wrenches.

Torque unit:
Set the desired torque unit. Note that this unit is used for the target value, the joining moment, and in the Angle measurement mode for monitoring Min. And Max. is valid.

Target value:
Enter the desired setpoint here depending on the measurement mode. If you have selected torque, enter the setpoint with the unit selected above, if you have selected angle, enter the setpoint in "°". Note that the target value must always be greater than or equal to 0 and must not be greater than 999.9° in the Angle measurement mode. If you want to make measurements anticlockwise, set the direction of rotation to the left, see below.

Tolerance input mode

You have various options for specifying the tolerance range of your measurement. If you select “Percentage”, enter the values as a percentage of the target value. For “Relative”, the value entered for Tolerance min/max is subtracted from/added to the target value and for “Absolute”, enter the minimum/maximum value for Tolerance min/max.

Tolerance Min. And Tolerance Max:
In the torque measuring mode, set the upper and lower tolerance limits of the target value here. Depending on how you set the toleranceinput mode , enter the values as a percentage of the target value or as a value in the unit of torque. Note that the lower tolerance must not fall below -10.00% of the target value and the upper tolerance must not exceed 10.00% of the target value.
In the Angle measurement mode, enter the tolerance limits in "°". Note that the lower tolerance must not fall below -99.90° and the upper tolerance must not exceed 99.90°.

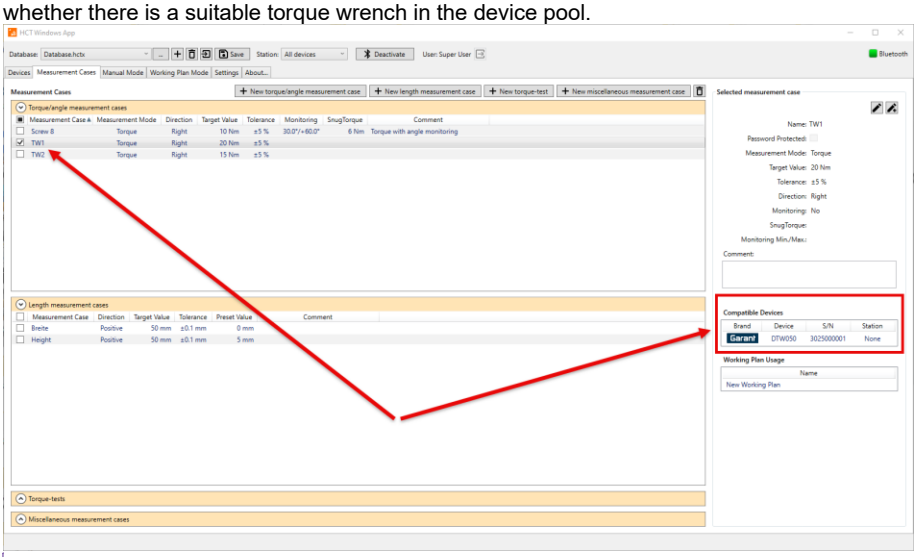
Direction of rotation:
Select the direction of rotation for measuring the measurement case. In this case, "Right" means that you turn the torque wrench clockwise around its square drive, "Left" means counterclockwise. For the GARANT torque wrenches, note that you can insert the tool chuck so that the square drive points upwards, for example, to tighten a screw pointing downwards and still be able to look at the display. In such a case, you would tighten a left-threaded screw by turning it clockwise (clockwise). The direction of rotation always refers to the torque wrench when looking at the display.

Monitoring:
This function only makes sense for GARANT torque wrenches, as only these have it, HOLEX torque wrenches, even with rotation angle measurement, do not support the function. If you create a measurement case for a GARANT torque wrench, you can activate the function by placing a check mark.

Joining moment:
Enter the value for the joining moment here. This is the torque measured value from which the monitoring or rotation angle measurement starts.

Monitoring Min. And monitoring Max.:
In the torque measuring mode, enter the lower and upper limits of the angle of rotation within which the target value is to be achieved. The rotation angle monitoring starts when the joining moment is reached.

In the Angle measurement mode, enter the lower and upper limits of the torque within which the torque may move until the target angle of rotation is reached. Torque monitoring starts when the joining moment is reached.
When you have made all the settings for the measurement case, click "Save" to save the data and place the measurement case in the measurement case storage or
If you click on Save, the values are accepted and the screw case is shown in the list. Please note that no validations are carried out when entering the target values, the measuring mode and the tolerances, as at the time the measurement case is created, it is not yet checked whether there is a suitable torque wrench in the device pool.



Kommentiert [AB11]: Neuer Screenshot

If you then mark the screw case, you can see under "Compatible devices" whether there is a suitable wrench in the device pool and which station this is assigned.

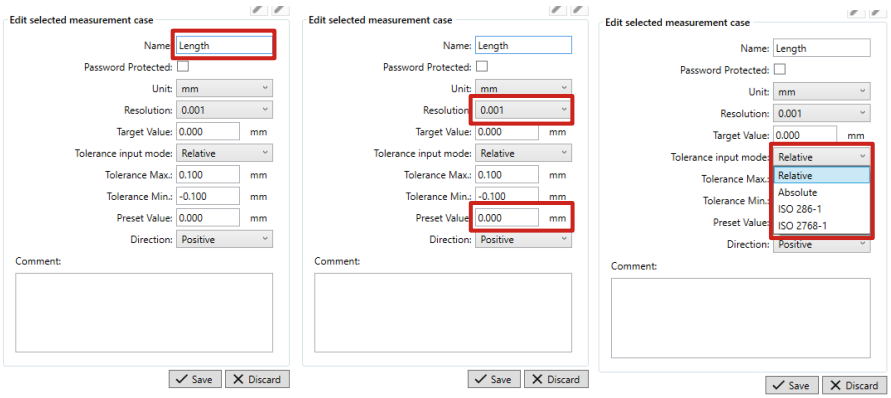
6.4.2 Create new length measurement cases

Click on 

Kommentiert [AB12]: Neuer Screenshot

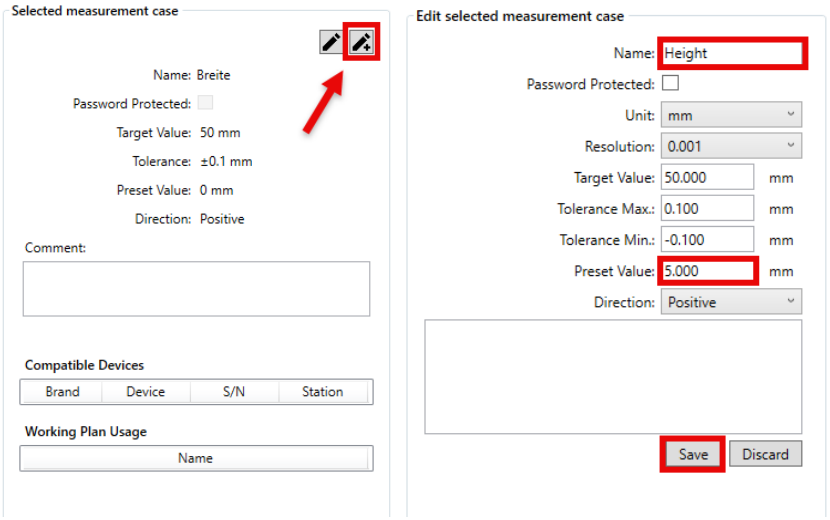
The name, the unit (mm/inch) must be entered in the editing menu, followed by the necessary resolution, which can be explicitly specified by the decimal places. You can then specify the target value, tolerance, and preset value with the given precision. For the measurement mode you can choose between “Standard”, “Minimum”, “Maximum” and “Delta”. For “Standard”, enter the exact measured value to be achieved below. With “Minimum”/ “Maximum”, only the minimum/maximum value is measured and with “Delta” the maximum difference is measured. The “Maximum”, “Minimum” and “Delta” modes can only be used with Garant dial gauges. You also have various options for specifying the tolerance range of your measurement. If you select “Relative”, the value entered under Tolerance min/max is subtracted from/added to the target value; if you select “Absolute”, enter the

lower/upper limit under Tolerance min/max or select ISO 286-1 or ISO 2768-1 to specify the tolerance in accordance with the standard.



Kommentiert [AB13]: Neuer Screenshot

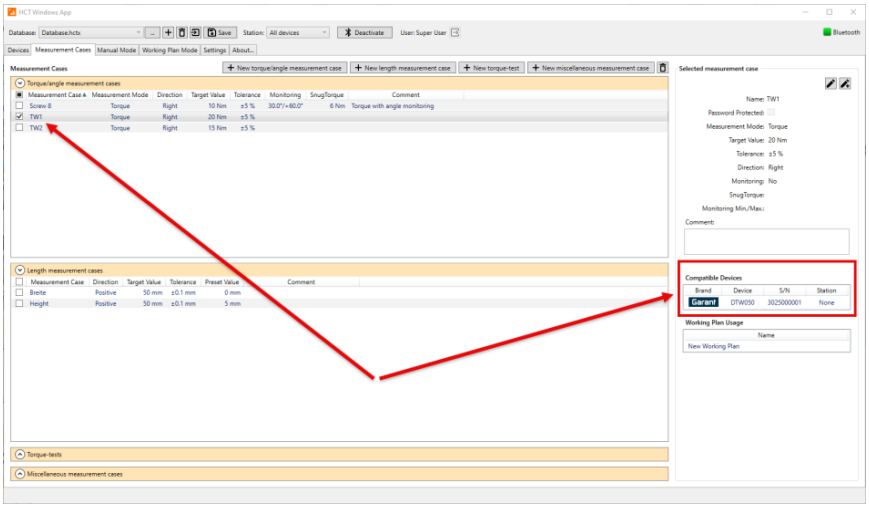
By clicking on , a measurement case can be easily copied and modified.



Once you have saved the measurement cases, you can check which device is compatible by marking the respective measurement case. Please note, however, that only a check of the possible measuring range of the devices is made here, but not of the topological conditions of the measurement.

Kommentiert [AB14]: Neuer Screenshot

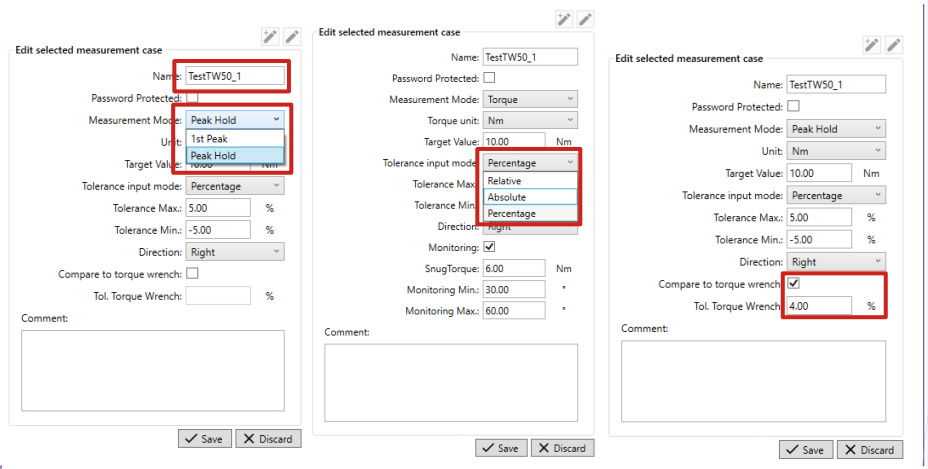
HCT Windows App



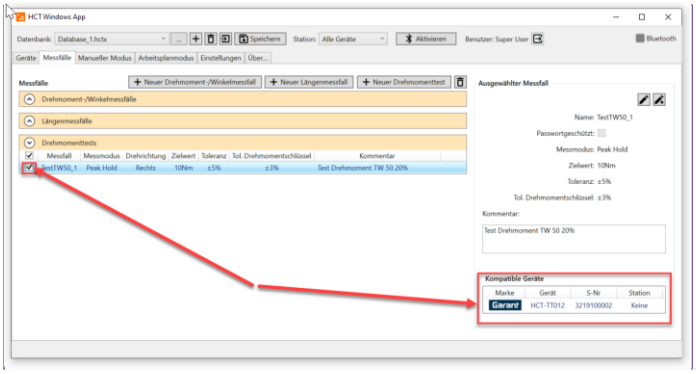
6.4.3 Create torque test cases

The integration of the torque tester makes it possible to check the accuracy of torque tools. To do this, click on +

You can choose between 1st peak for mechanical click wrenches or peak hold for electronic wrenches in the measurement modes. If you want to test the HCT electronic wrenches, you can also use the option "With torque lock. Compare" and specify the permissible tolerance between the torque wrench and the torque tester. As with the torque/angle measurement cases, you can also set the tolerance input mode here.



As with the other measurement cases, you can identify whether you have a compatible device in your device pool by marking the test case.

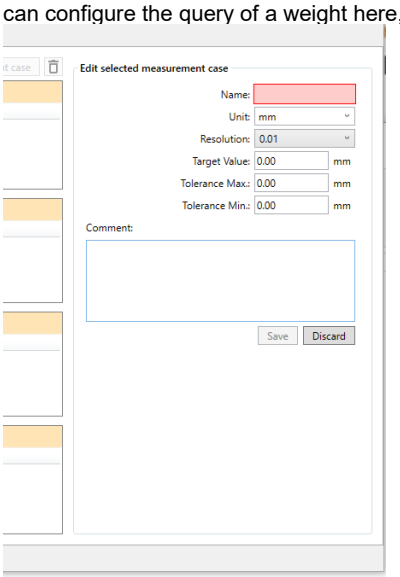


Kommentiert [AB15]: Neuer Screenshot

Kommentiert [AB16]: Neuer Screenshot

6.4.4 Create new miscellaneous measurement cases

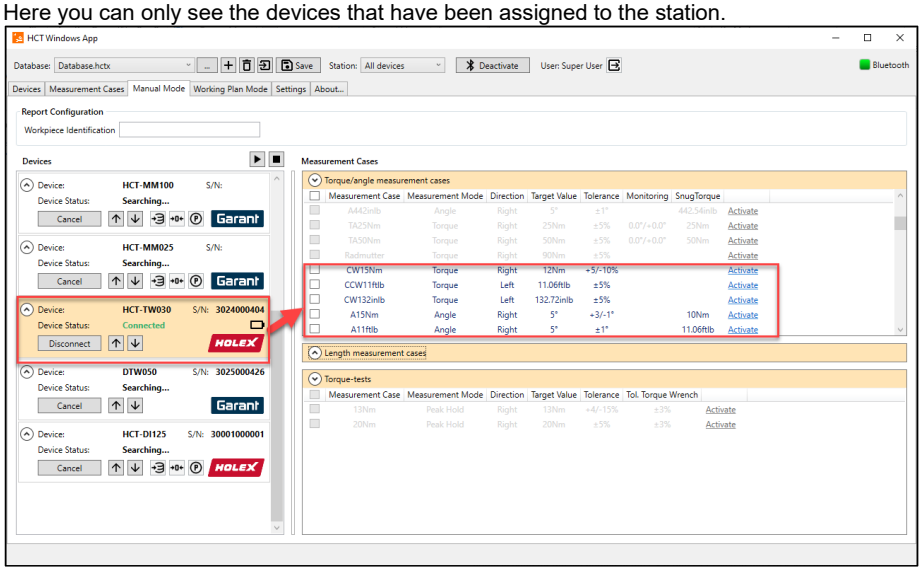
"New miscellaneous measurement cases" offers you the option of recording measured values in units that cannot be recorded by the HCT measuring devices. For example, you can configure the query of a weight here, which you record using a scale.



As with the other measurement cases, the "Edit selected measurement case" view opens on the right-hand side of the window. Here you can assign a name for the measurement case and then enter the desired unit manually in the input field next to "Unit:". Tolerances and the resolution, i.e. the decimal places queried later, can also be specified. Please note that no compatible devices for this type of measurement case are displayed after the measurement case has been created, as the subsequent value query takes place via an input field and your keyboard when the measurement case is executed.

6.5 Manual Mode

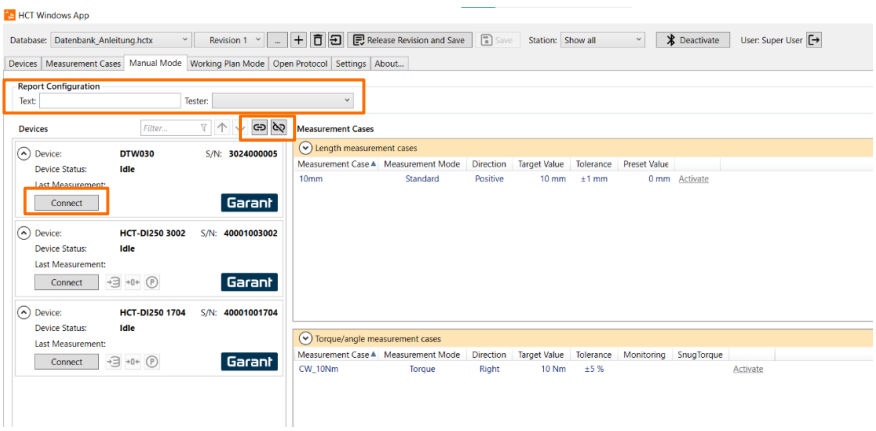
Select the Manual Mode tab to use it.
In manual mode, station assignment is used for the first time. Dedicated assignment of devices to stations allows them to activate individual stations.
Here you can only see the devices that have been assigned to the station.



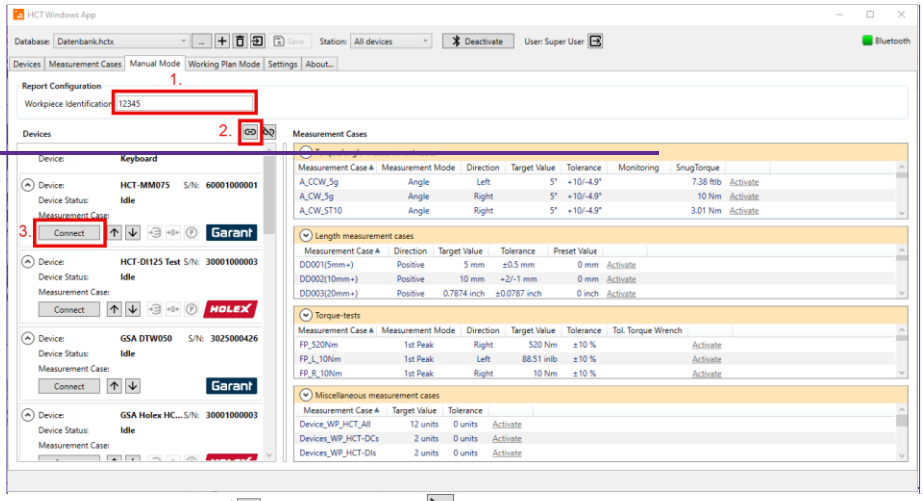
If you select a device on the left, the measurement cases covered by the device are highlighted, and those that are not compatible are grayed out.

Under “Report configuration”, you can see the master data fields that you can configure in the settings (see “7.7 Master data configuration”). The values entered will be included in the global report when you perform a measurement case as described later.

~~In the "Workpiece identification" field, specify which workpiece you want to process (1.). This name is used for the file names of the CSV and DFQ files in the $(IDENT) wildcard, see chapter "7.7.27.2.2 File namesFile names".~~



HCT Windows App



Kommentiert [AB17]: Neues Bild

You can now connect ( ) or disconnect ( ) all devices assigned to the station at the same time by clicking on the corresponding icon. Use the arrow keys to change the order of the devices displayed. If you want to connect the devices individually use the connect icon Connect , which is displayed in the box of the respective device in the device view. ~~You can now connect all devices that have been assigned to the station by clicking on the "Play" button (2.) or devices individually (3.) when you click on Connect.~~ If Bluetooth has not yet been activated on the station's computer, you will be asked if you want to continue, make sure that the HCT dongle on the station's computer is ready for use.

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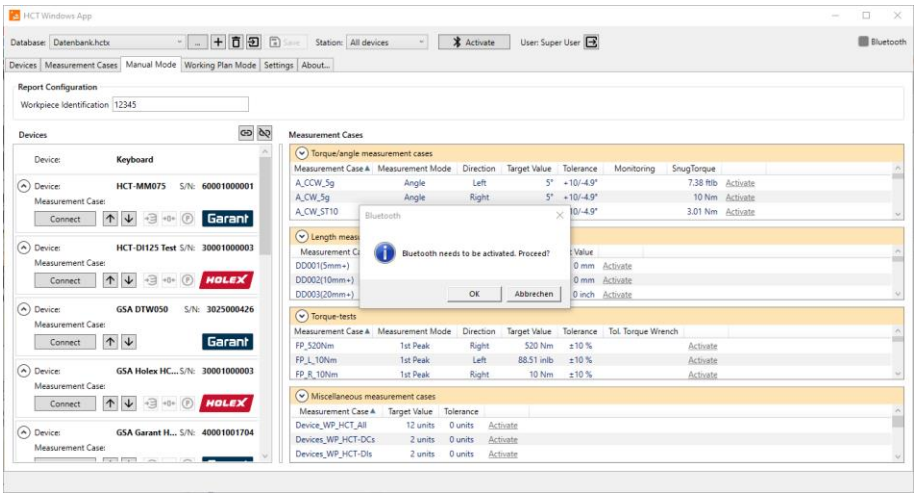
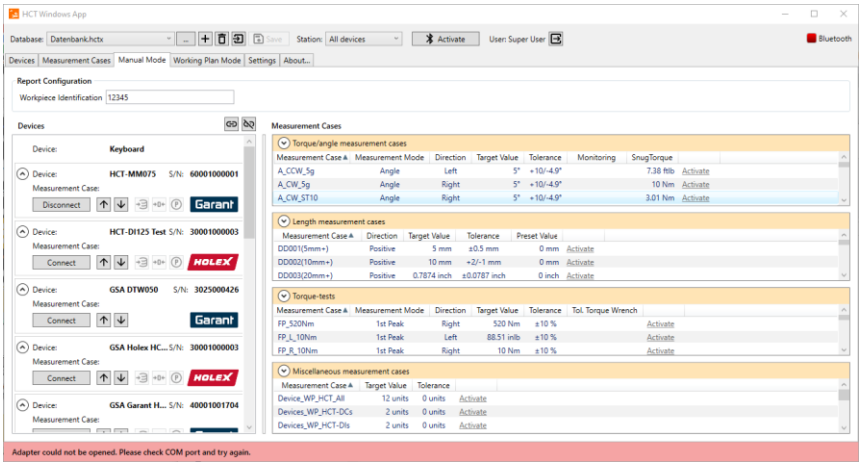
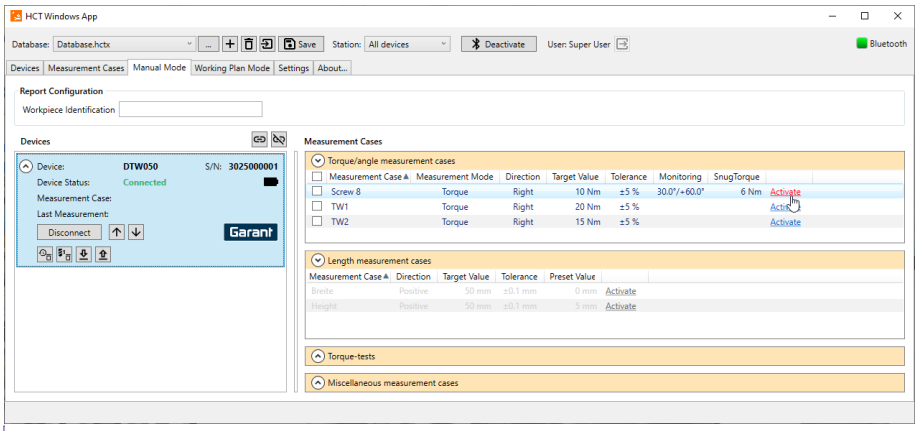


If this is not the case, they receive an error message in the status line and the Bluetooth connection field turns red.

HCT Windows App

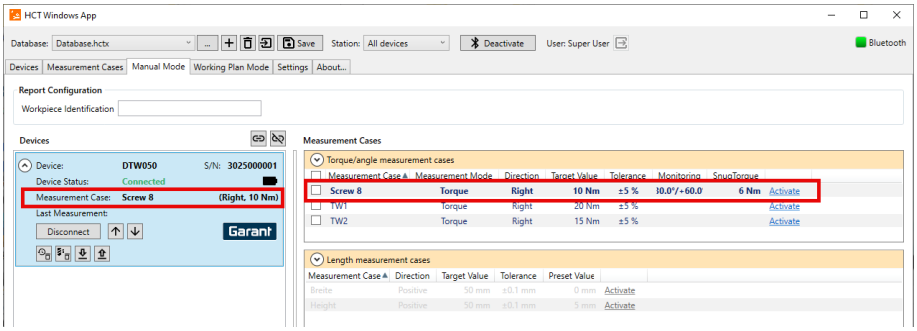


Once they have successfully connected the required devices, they can only manually activate individual test cases. Select the respective device and click on "Activate" of the respective measurement case, as shown in the example on a screw case.

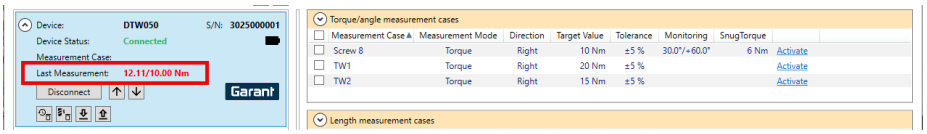


Kommentiert [AB19]: Neuer Screenshot

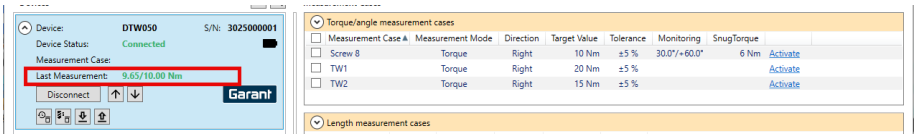
The screw case is then transferred to the wrench; they recognize this by displaying the measurement case name in the left-hand device view and by marking the measurement case in bold, in this example screw 1



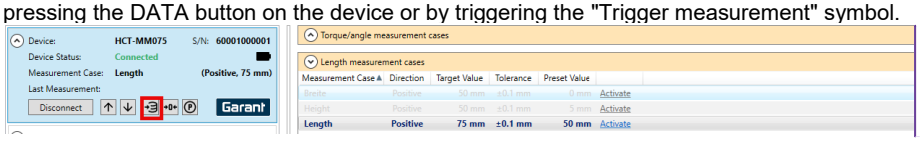
If you now perform a measurement, the result of the measurement and thus of the measurement case evaluation is displayed, in the example a n.i.O, because the measured value is > than the target value + tolerance.



If the measurement was successful, the last result is shown in green for OK.



In the case of a handheld measuring device, you can measure the measurement either by pressing the DATA button on the device or by triggering the "Trigger measurement" symbol.



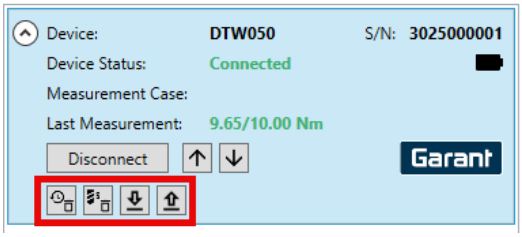
Kommentiert [AB20]: Neuer Screenshot

6.5.1 Additional functions of the measuring equipment in manual mode.

6.5.1.1 GARANT torque wrench:

The wrench has additional functions that are displayed when the wrench is connected:

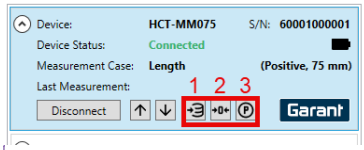
Kommentiert [AB21]: Neuer Screenshot



1. **Delete history on the device:**
   This deletes the history of the measurements taken so far
2. **Delete all measurement cases on the device**
   All previously transferred and saved measurement cases to the device are deleted.
3. **Import:**
   All screw cases stored on the device are loaded into the measurement case pool
4. **Load to Device:**
   The marked compatible screw cases can be loaded onto the device.

6.5.1.2 Hand-held measuring equipment:

For handheld measuring devices such as calipers, dial gauges and micrometers, additional functions can be triggered via the following buttons:



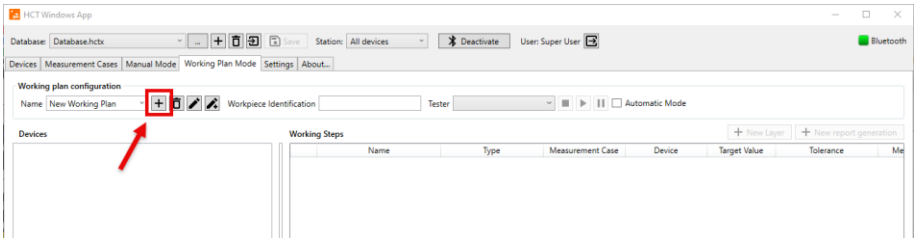
Kommentiert [AB22]: Neuer Screenshot

1. **Initiate measurement:**
   This allows a measurement to be triggered manually without pressing the DATA button on the instrument.
2. **Set to zero**
   The current value of the device is set to zero.
3. **Set to preset**
   The current measurement value of the device is set to the preset value that was loaded when the respective measurement case was activated. Note that the measured value is also set to the preset value when loading and activating a measurement case that had a different preset than the one previously activated.

6.6 Work plan mode

For a work plan, first create all measurement cases in the Measurement Cases tab. After that change to the Work plan mode tab and click on the "+" icon to create a new work plan.

6.6.1 Create a new working plan

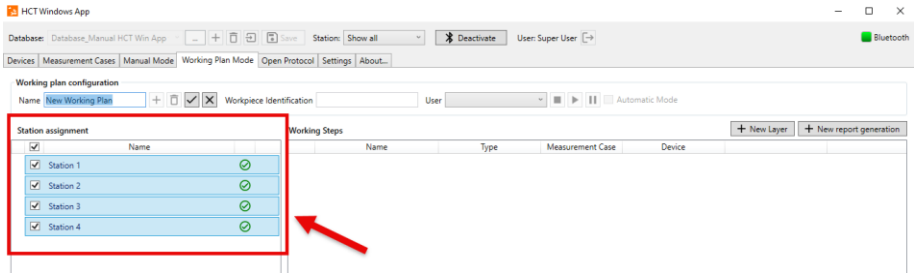


Now you can give the new work plan a name.

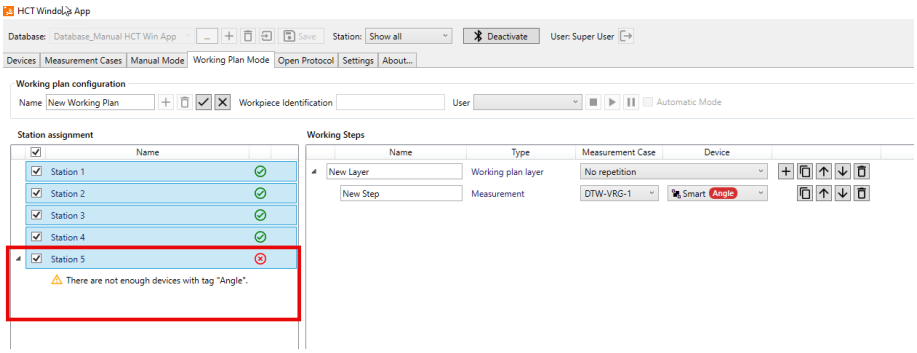
6.6.2 Station assignments

A working plan can be assigned to several stations:

HCT Windows App

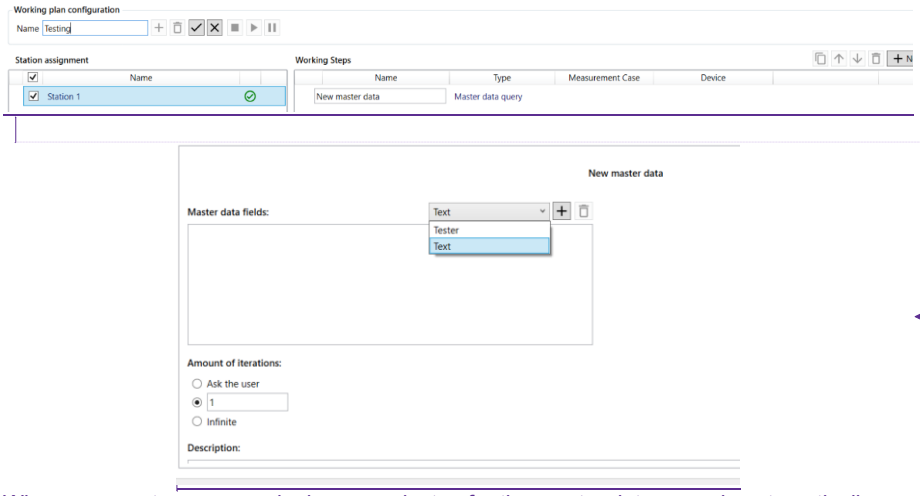


In case a measurement case can´t be linked to a device on the chosen station, a warning sign will be indicated:

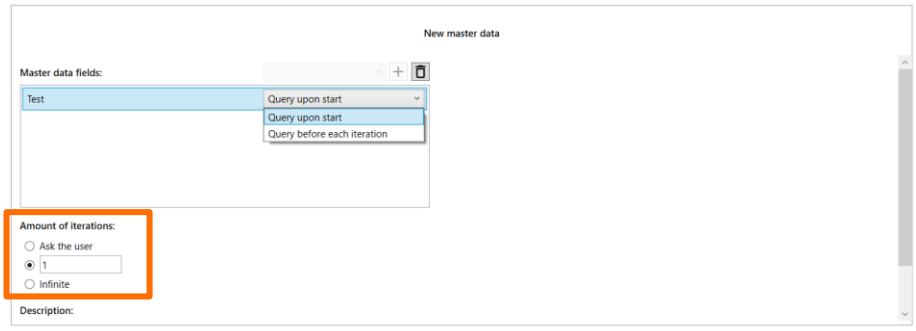


6.6.3 Master data query

If you don't want to use the master data query, go directly to "6.6.4 New operation".



When you create a new work plan, a work step for the master data query is automatically included. You can configure the master data in the settings ("7.7 master data configuration"). Select the master data to be queried from the drop-down menu next to "Master data fields" and press +. If you want to delete a previously added master data field, select it from the list and click 🗑.



You can set when each master data field should be queried by selecting the desired option from the drop-down menu. You can choose between:

- **Query upon start:** The master data is only queried once when the work plan is initially started.
- **Query before every iteration:** The master data is queried at the start of every iteration of the work plan.

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Kommentiert [AB23]: Neues Bild mit mehr Wahlmöglichkeiten?

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hat formatiert: Englisch (Vereinigte Staaten)

hat formatiert: Englisch (Vereinigte Staaten)

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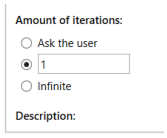
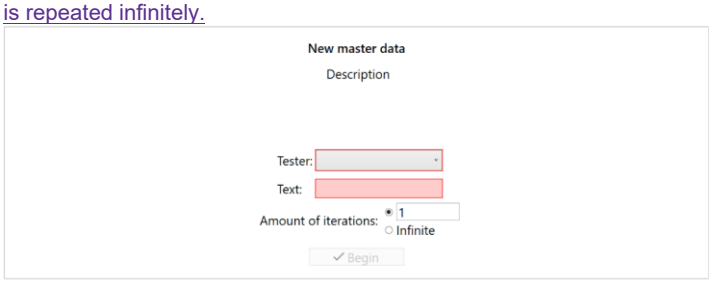
hat formatiert: Schriftart: Nicht Fett



You can also set the amount of iterations, i.e. how often the work plan is repeated back to back. You have the following options:

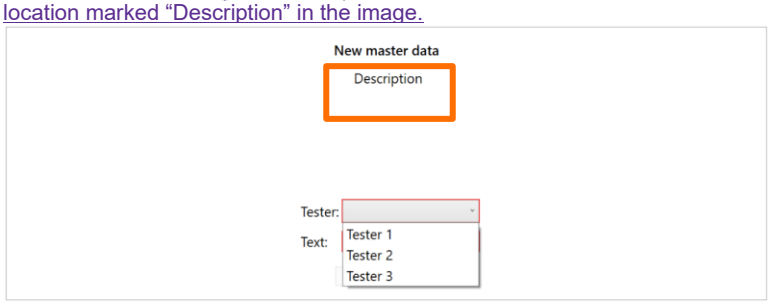
- **Ask the user**: When querying the master data, the user can decide whether the work plan has a defined number of iterations, which he/she can choose or if the work plan is repeated infinitely.



- **Define a number**: Enter the desired number of iterations in the field provided.
- **Infinite**: The work plan is repeated until it is stopped manually.

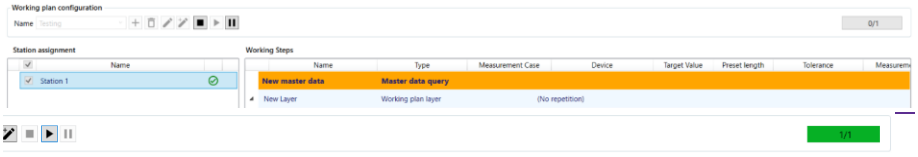
Note on report generation: Depending on whether you have configured report generation, a separate report is generated for each run of the work plan.

Finally, you can add a **description**. This will appear when the master data is queried at the location marked “Description” in the image.



Progress bar

While executing the work plan, a progress bar will show you how many repetitions are still pending. Once you have completed the set number of iterations, the progress bar will turn green.



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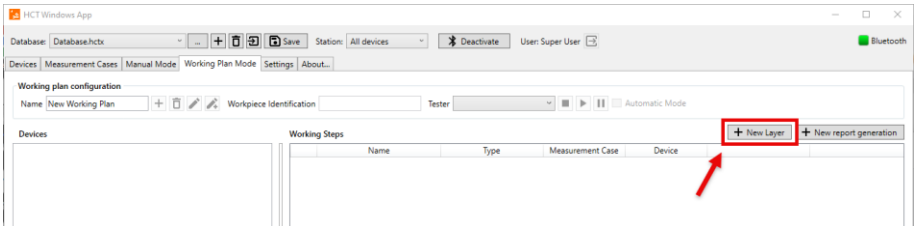
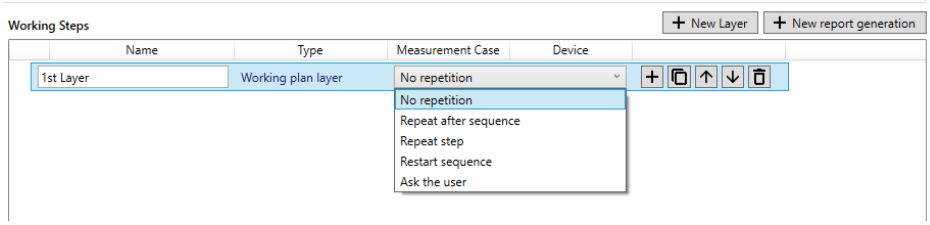
~~6.6.3~~6.6.4 New operation

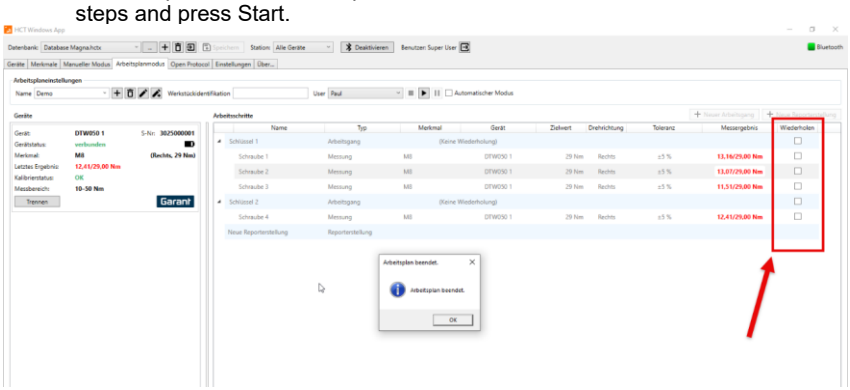
Once the name of the working plan is entered, you can fill the working plan with content by creating a new operation. To do this, please click on the highlighted button.



You can now give the operation a name and select how to proceed in this operation if a measurement was not OK.
Here it has different choices:



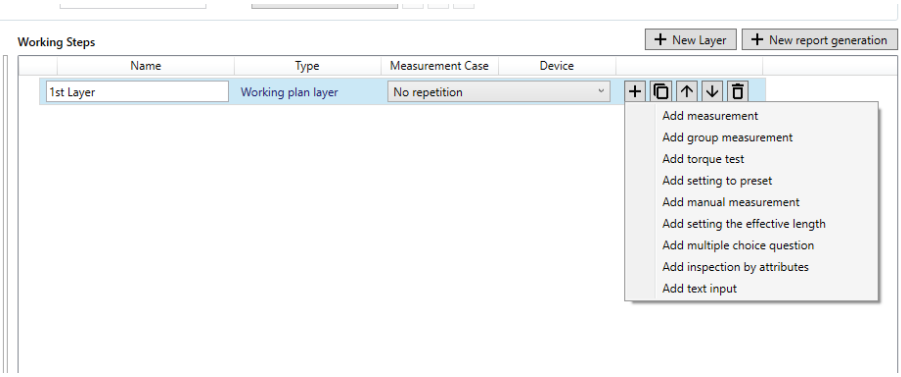
- **No repetition**: Despite a failed measurement, the next work step is carried out. Even if you select “No repetition”, you have the option of repeating individual steps once the work plan has been completed. To do this, select the boxes behind the desired steps and press Start.



- **Repetition by sequence**: After the operation has been completed, the measurements, which were not OK, are repeated.
- **Repeat step**: Not OK Measurements must be repeated directly.
- **Cancel the sequence and repeat**: The process is stopped immediately after a failed measurement and restarted from the beginning.
- **Ask the user**: If a measurement is not OK, the user will be asked how to proceed. The user can choose between

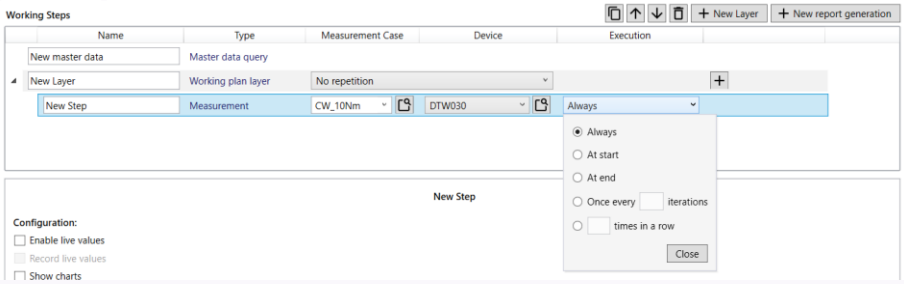
- Accept with comment: The measurement, that was not OK, is accepted without repetition after the user has added a comment. The comment is also noted in the report.
- Repeat step
- Abort work plan

~~6.6.4~~6.6.5 Create a work step



- **Measurement**: Torque/angle of rotation or length measurements can be created as a work step.
- **Group measurement**: For length measurements, several measurements can be combined into a group and created as a work step.
- **Torque test**:A torque test can be created as a work step.
- **Set to Preset**: A work step can be created in which a specific measuring device is set to a specific preset value.
- **Manual Measurement:** Manual work steps can be added, which include an attributive query. The result is then entered using the keyboard (or HID). **Effective Length**: An effective length can be set and send to a HCT torque wrench.
- **Multiple choice question**: Manual work steps can be added, which include a configurable query.
- **Inspection by attributes**: An attributive query (standard OK and NOK) can be inserted into the work plan.
- **Text input**: A keyboard entry can be inserted as a work step.

Execution



For each work step you can specify whether and how often it is to be executed per pass of the working plan. You can choose between:

- Always: The work step is performed once during each pass of the working plan.

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- At start: The work step is only performed during the first pass of the working plan.
- At end: The work step is only performed during the last pass of the working plan.
- Once every X iterations: The work step is performed once every X passes of the working plan.
- X times in a row: The work step is performed X times in succession for each pass of the working plan. Enter the desired number in the field provided.
-

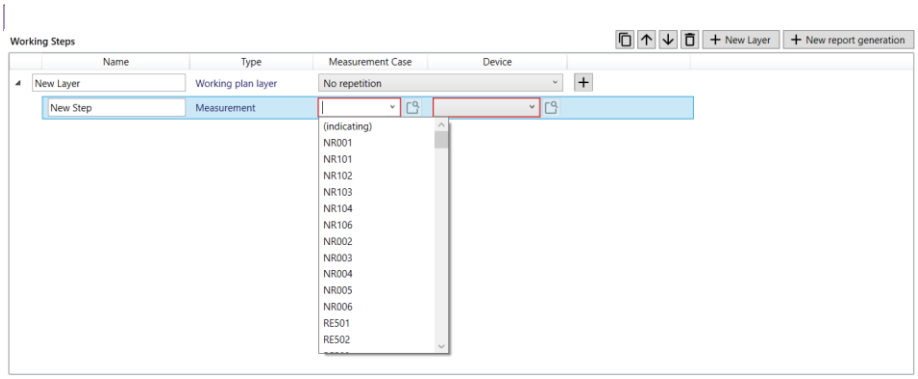
Formatiert: Listenabsatz, Aufgezählt + Ebene: 1 + Ausgerichtet an: 0,63 cm + Einzug bei: 1,27 cm

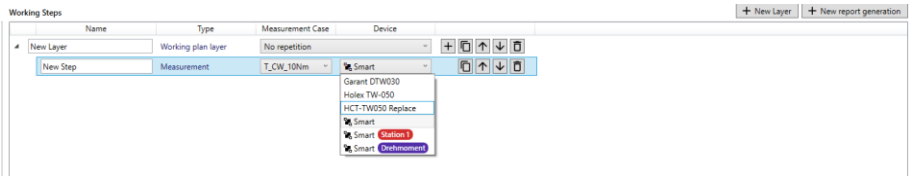
hat formatiert: Englisch (Vereinigte Staaten)

Formatiert: Listenabsatz, Aufgezählt + Ebene: 1 + Ausgerichtet an: 0,63 cm + Einzug bei: 1,27 cm

Kommentiert [AB27]: Neuer Screenshot

~~6.6.5~~6.6.6 Configure the measurement



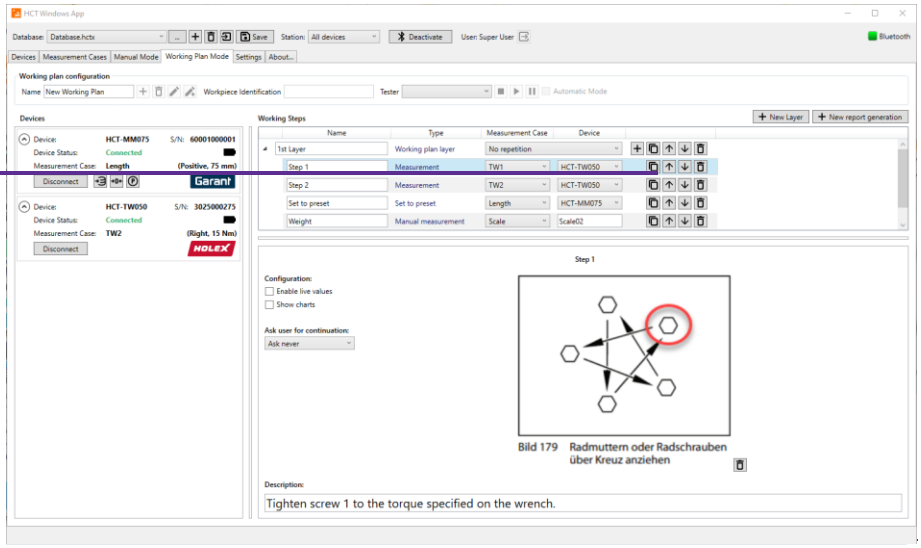


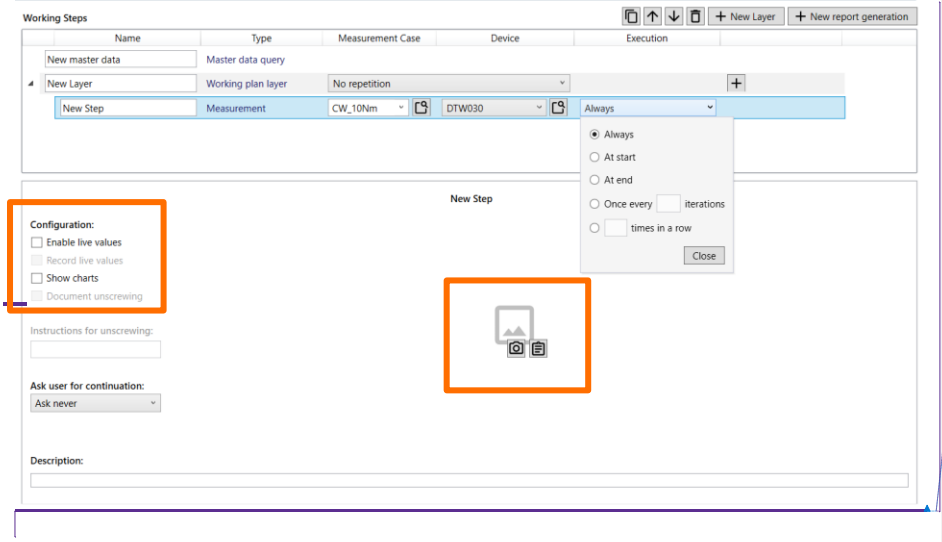
The name of the measurement, the measurement case and the device can be configured for a measurement. You can only add a measurement case that has already been created to a work plan (see “6.4 Create the measurement cases”). Either select the desired measurement case from the drop-down list or write the name yourself in the field provided. When you start entering the name in the field, you will automatically start a search through the list of created measurement cases. For the device you can either select a specific device from the device pool or use the smart function.

If you click on the icon  next to the measurement case/device, you will be taken directly to the measurement cases/devices tab, where the measurement case/device you have selected is highlighted and displayed on the right-hand side of the screen. Here you can also edit the measurement case or device information again by clicking on the icon  .

Smartfunc~~k~~tion

With the smart function, the app connects to the first device from the device pool that is suitable for carrying out the selected measurement case. You can use tags, which can be assigned to the individual devices (see “6.1 Create and manage HCT tools”), to further restrict the device pool. If you select “Smart low” for a length measurement, for example, the app will only attempt to connect to length measuring devices with the tag “low”.





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During a measurement, a picture of the measurement case can be stored, which makes it easier for the operator/inspector to navigate when carrying out the work plan. ~~For that click on in the bottom half of the screen.~~ To do this, click on in the lower half of the screen to select the image file or click on if you have already copied the image to the clipboard. When you click on the camera icon, your computer's webcam is activated and you can take a picture.

Kommentiert [AB29]: Bild

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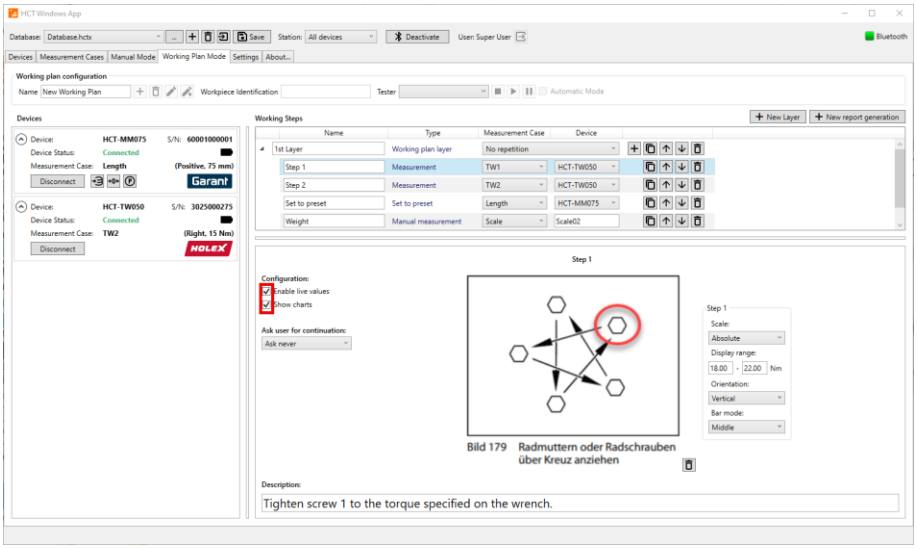
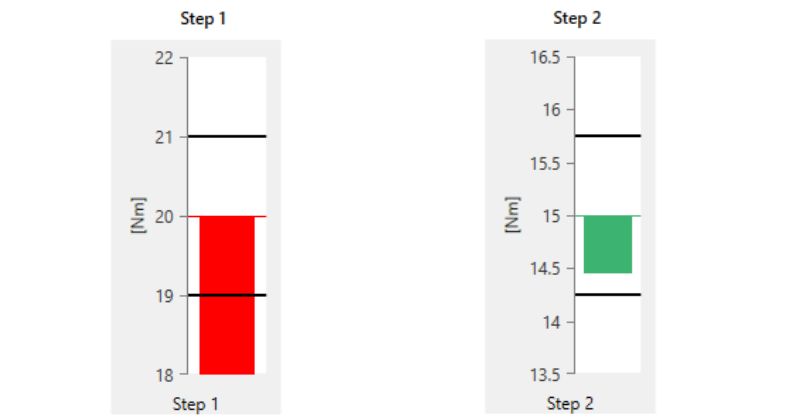
In addition to the image, you also have the option of adding a description.

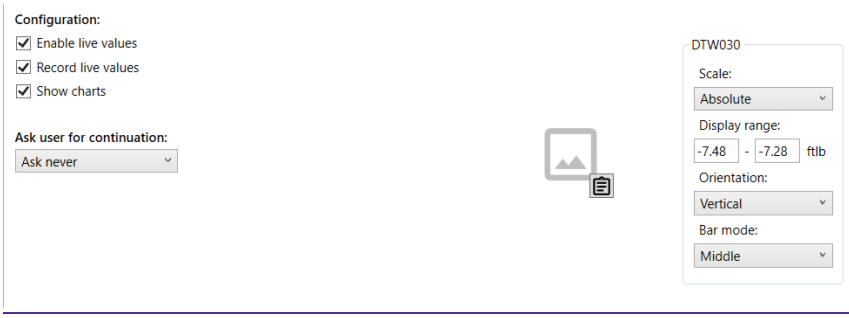
In the "Configuration" menu at the bottom left, you can also select whether the live measured values should be displayed in real time during the measurement. To do this, check the

"Enable live values" box. If you would like to illustrate these live measured values with a bar chart, also select "Show charts".
The bar chart can be configured using the menu that appears on the right if you have selected "Show charts". You can adjust the scale, the displayed value range, the orientation and the bar mode.



This depicts how the values will be visualized once you start the working plan:





Record live values

If you have activated live values, you can save the history of these values, which means you will receive a .csv file with the live values after completing the working plan, which you can use to create diagrams, for example:

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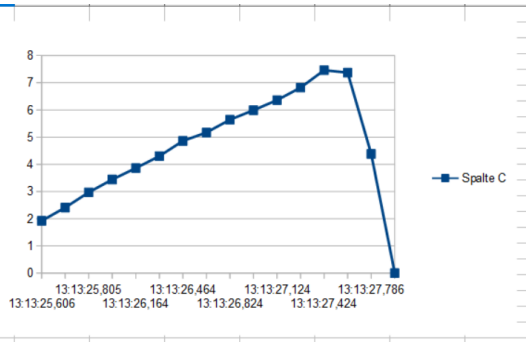
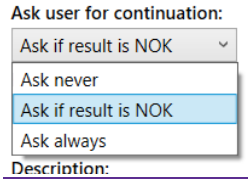
Datum	Zeit (Präzise)	Istwert	Einheit
2025-06-11	13:13:25,606	1,92	LbfFt
2025-06-11	13:13:25,684	2,41	LbfFt
2025-06-11	13:13:25,805	2,97	LbfFt
2025-06-11	13:13:25,985	3,44	LbfFt
2025-06-11	13:13:26,164	3,86	LbfFt
2025-06-11	13:13:26,284	4,3	LbfFt
2025-06-11	13:13:26,464	4,86	LbfFt
2025-06-11	13:13:26,584	5,17	LbfFt
2025-06-11	13:13:26,824	5,64	LbfFt
2025-06-11	13:13:26,944	5,99	LbfFt
2025-06-11	13:13:27,124	6,36	LbfFt
2025-06-11	13:13:27,244	6,82	LbfFt
2025-06-11	13:13:27,424	7,46	LbfFt
2025-06-11	13:13:27,604	7,37	LbfFt
2025-06-11	13:13:27,786	4,38	LbfFt
2025-06-11	13:13:27,965	0	LbfFt



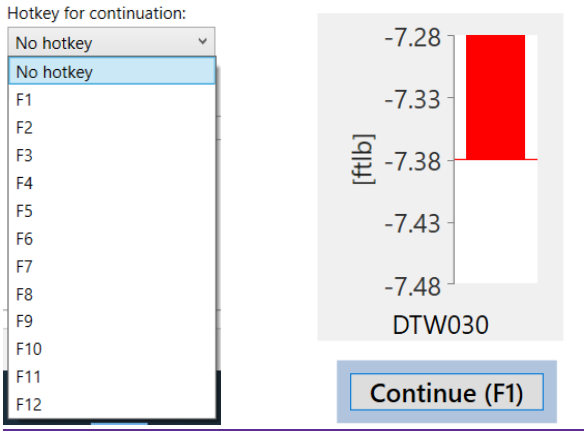
Ask user before continuation



After executing one step of the working plan, you can choose whether you want to be asked before continuing with the next step. You have the following setting options:

- Ask never: After each executed step, the system moves directly to the next one without asking the user.
- Ask if result is NOK: If the result of the working step performed is NOK (not OK), the user is asked before moving to the next step of the working plan.
- Ask always: Regardless of the result, the user is always asked before the next step of the working plan is executed.

You can select a hotkey with which you can confirm that you wish to proceed to the next step.



Document unscrewing (Only for Torque/Angle measurement cases)

If you have not tightened a screw connection correctly, you have the option of adding a step to loosen the screw. To do this, select “Repeat step” as the repetition mode (see “6.6.4 Create a work step”). Then select “Document unscrewing” under Configuration and, if desired, add instructions for loosening the screw in the text field below.

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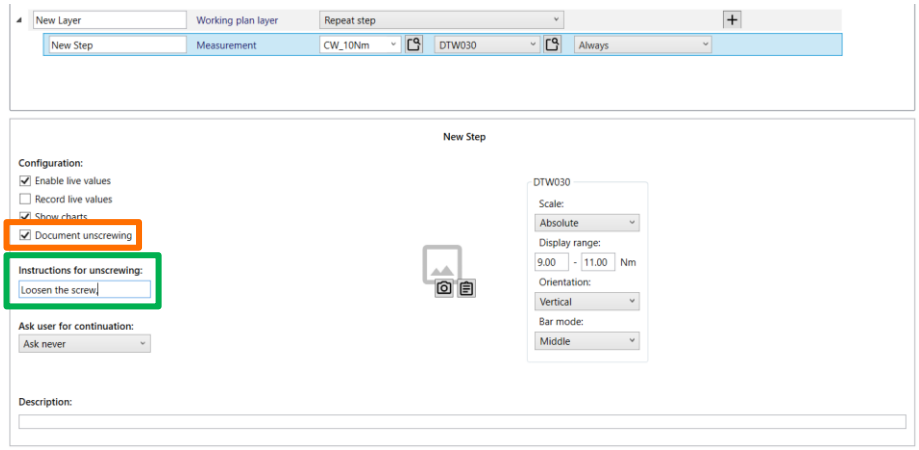
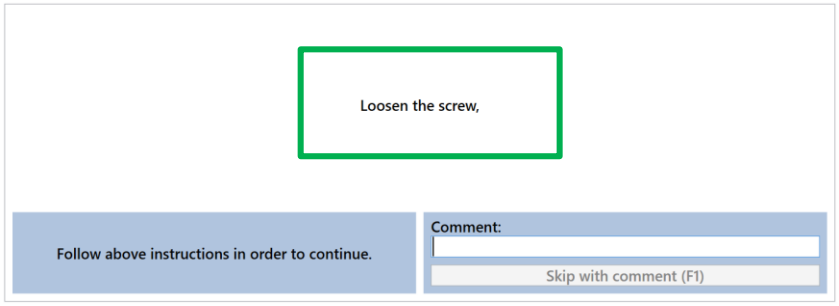
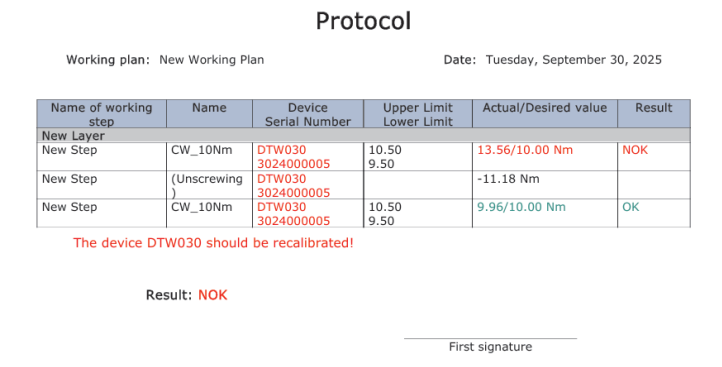


If you have not performed the torque/angle measurement correctly while running through the work plan, you will be prompted to loosen the screw. Confirm that you have loosened the screw by pressing the send button on your torque wrench/screwdriver, after which you can perform the measurement again. You can also skip this step by adding a comment.



The (PDF) report documents the loosening of the screw as follows:



Protocol

Working plan: New Working Plan Date: Tuesday, September 30, 2025

Name of working step	Name	Device Serial Number	Upper Limit Lower Limit	Actual/Desired value	Result
New Layer					
New Step	CW_10Nm	DTW030 3024000005	10.50 9.50	13.56/10.00 Nm	NOK
New Step	(Unscrewing)	DTW030 3024000005		-11.18 Nm	
New Step	CW_10Nm	DTW030 3024000005	10.50 9.50	9.96/10.00 Nm	OK

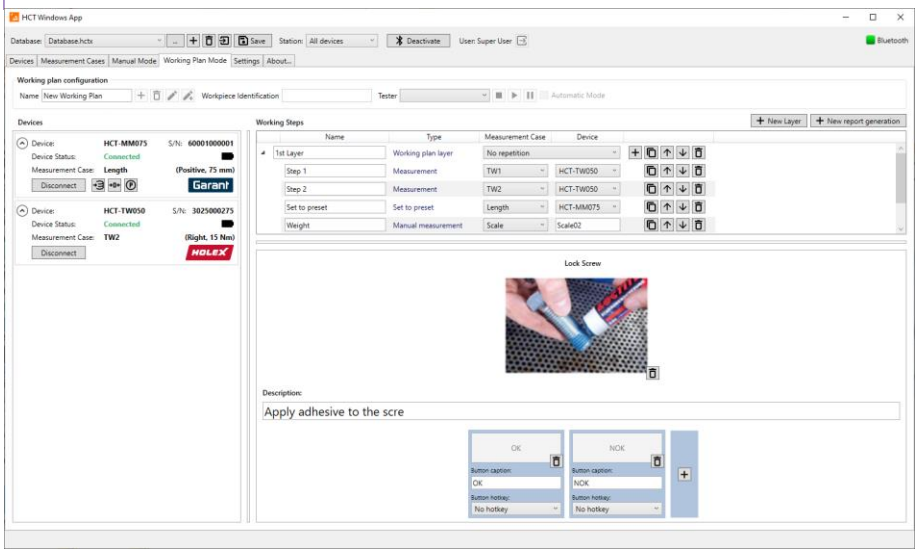
The device DTW030 should be recalibrated!

Result: NOK

First signature

~~6.6.6~~6.6.7 Configure the multiple choice question

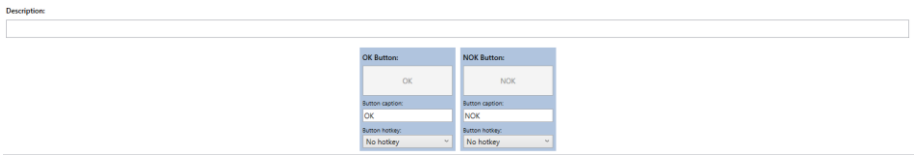
Kommentiert [AB31]: Neuer Screenshot



An image and description can be added to a query.
Furthermore, a button is displayed in the lower half of the screen after a query has been added to the operation.
You can now add any number of additional buttons via (Add) on the right-hand side.
You can also use the drop-down lists at the bottom to define hotkeys for selecting the buttons.

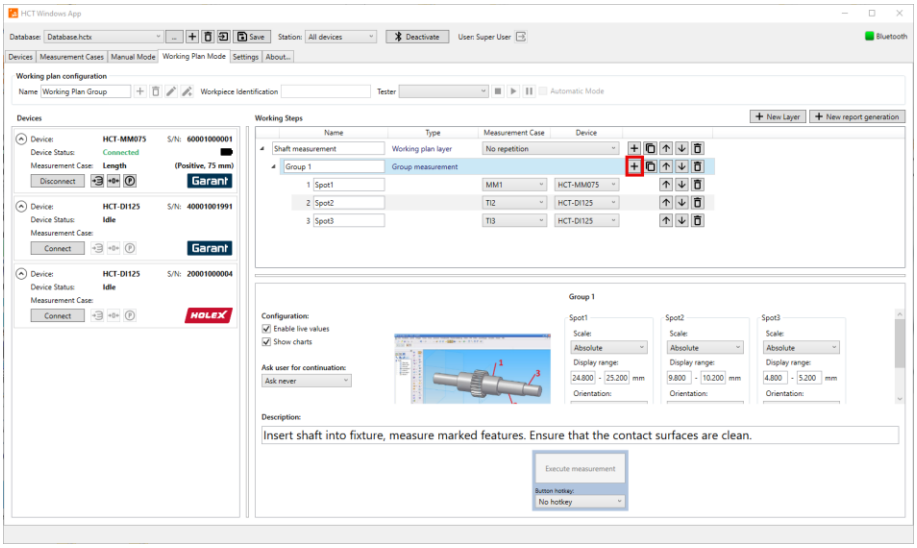
CAUTION: You must enter a label for each of the buttons created using the text field under "Button label:", otherwise the work step will be highlighted in red in the work plan and the work plan cannot be saved.

~~6.6.7~~6.6.8 Configure Inspection by attributes



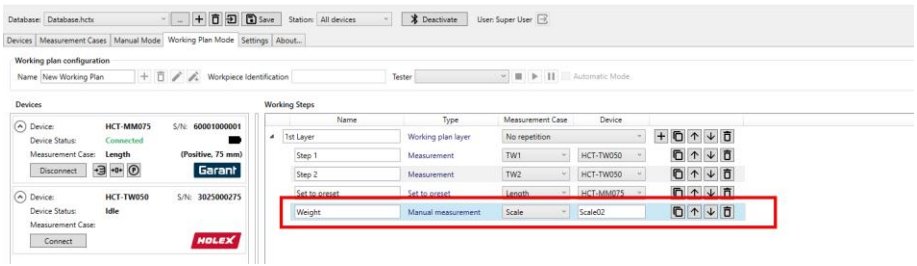
The attributive query can be used to formulate a yes/no question. The attributive query offers you the same options for inserting images and descriptions as the "multiple choice question". The difference lies in the button configuration: the attributive query has two buttons as standard, "OK" and "NOK". You can rename these, but not delete them or add further buttons.
If the attributive query is answered in the workflow, the results are evaluated. In comparison to the normal "multiple choce question", an "OK" / "NOK" is always stored in the report files in addition to your selected button label. Therefore, always make sure that the button labeled "OK. Button:" for good findings and always use the button labeled "NOK." for negative findings.

~~6.6.8~~6.6.9 Configure group measurements



A group measurement is used to simultaneously record the values of different length measuring devices. This function may be required if you want to insert a component into a test setup with several dial gauges and record several values simultaneously. The measuring equipment can be combined into groups for this purpose. Click on ⊞ (Add) and add the desired number of locations, up to a maximum of ten. You then assign the measuring equipment and measurement cases to these added locations. To do this, click on the previously added drop-down lists in the "Measurement case" column and select one measurement case per place. Then select the respective length measuring equipment from the right-hand drop-down list that you want to use for the selected measurement case.
By selecting "Enable live values", the measured values of the devices are displayed in real time during the execution of the group measurement and also visualized by a diagram if you also check the "Show charts" box.
When executing the work plan, you can transfer all measured values of the group to the HCT Windows app by pressing the "Execute measurement" button in the lower half of the screen. You also have the option of defining a hotkey to trigger the measurement (similar to the query). You can also transfer the measured value of the device by pressing the DATA button on the respective measuring device. Please note, however, that only the measured value of the measuring device whose DATA button was pressed is transferred in this way.

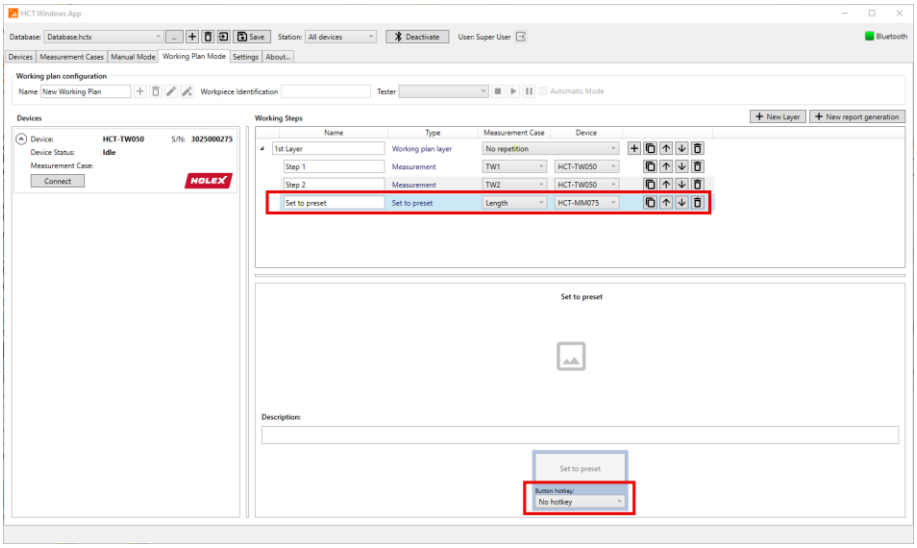
~~6.6.9~~6.6.10 Configure manual mode



You can use "Manual mode" to integrate measurement cases in the "Miscellaneous measurement cases" category into your work plan. To do this, select one of the other measurement cases from the drop-down list on the left. You can then manually define a measuring device to be used for recording the value. To do this, use the input field in the "Device" column. An image for visualization and a description can be entered in the lower half of the screen, as with the other measurement cases.

If you carry out a work step that involves manual input, an input window is displayed at the bottom of the screen. The worker/inspector can now enter the measured value here and confirm by clicking on OK. The value is transferred to the documentation including the result evaluation (OK / NOK).

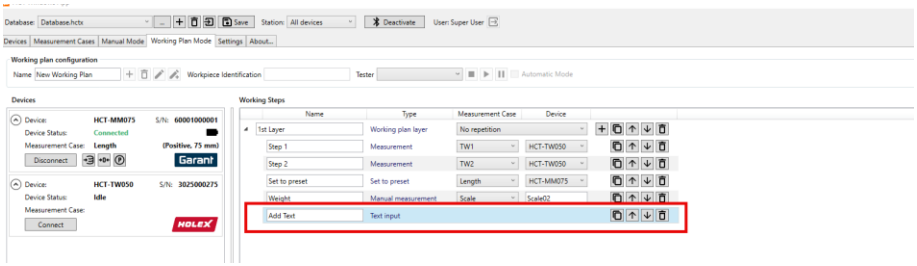
~~6.6.10~~6.6.11 Configure Set to preset



The "Set to preset" function is used as a work step for inserting a standard measurement to calibrate the length measuring device used to the desired preset value. In the drop-down list on the left, select the measurement case that you want to carry out in the further course of the work plan. Select the measuring equipment to be used in the right-hand drop-down list. Please note that in the "Set to preset" step, the same measurement case and the same measuring equipment must be used that will be used for the measurement to be carried out in the further course of the work plan. When configuring the work step, you have the option of defining a hotkey for accepting the preset value in the lower half of the window. During the execution of the work plan, the preset value is adopted as soon as you press the configured

hotkey or the "Set to preset" button displayed. The next work step (the measurement to be carried out) is then started.

~~6.6.11~~6.6.12 Configure Text input



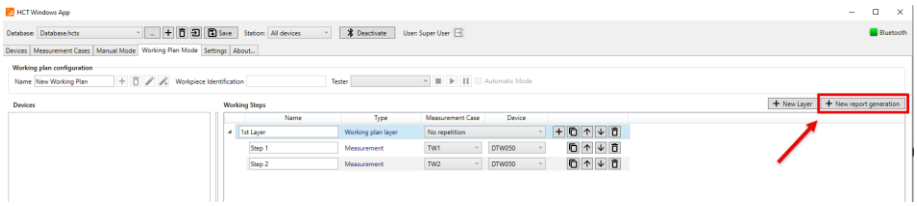
You can use the "Add text input" function to add information to the work plan in the form of text during execution.

Kommentiert [AB32]: Bilder

You have the option of specifying the input length, i.e., how many characters the text input must have in order to be accepted. If you want to use this function, select the “Specify input length” field and enter the desired number of characters in the field provided.

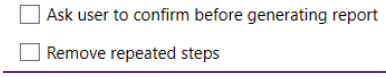
If you carry out a work step that involves text input, an input window is displayed at the bottom of the screen. The worker/inspector can now enter the desired text here and confirm by clicking on “Submit value”. The value is transferred to the documentation.

6.7 New report generation



If a report with the measurement results is to be generated after the work plan has been carried out, click on "New report generation". You can choose between a CSV, PDF and

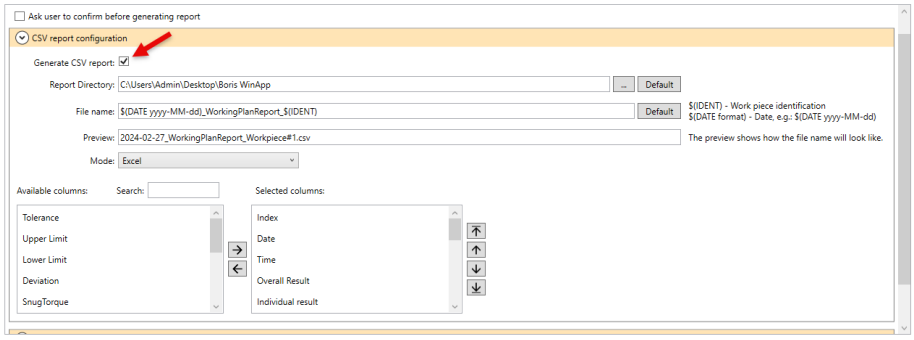
DFQ report. Depending on your selection, the report is saved either in a CSV, PDF or DFQ file. To do this, tick the desired format in the respective drop-down menu.



After finishing the working plan, you can choose whether you want to be asked again before creating the report. Check the box “Ask user to confirm before generating report” if you want to be asked.

You can also choose not to include repeated steps in the report. To do this, click “Remove repeated steps”.

6.7.1 CSV report configuration



- **Report Directory**

Assign a folder as the report folder. Click on ... (Select report folder) to open the dialog for selecting a folder.
Make sure that the HCT Windows app requires full access rights to this folder. The default setting is "C:\Users\Public\Documents\hct-windows-app\Customer Files". This folder provides full access for reading and writing on standard Windows systems.

- **File name**

You can configure the file names of the measurement reports here. Use the placeholder "$(DATE format)" to include a date in the file name of the CSV file. To do this, enter the desired date format for "format" in the example above. Where dd stands for the day, MM for the month and yy for the year
Examples:

yyyy-MM-dd results in 2022-06-30
yy-MM-dd results in 22-06-30
dd.MM.yy results in 30.06.22
dd.MM.yyyy results in 30.06.2022
etc.

~~You can use the placeholder $(IDENT) to embed the workpiece identification in the file name. You can find more information on this topic in chapter 8.1.~~
~~You can also add any text. However, make sure that you only use special characters that are permitted for file names and that the file names are not too long. A standard Windows~~

~~system limits the character length for file paths to 256 characters. With longer file names, the creation of the CSV or DFQ file is restricted.~~
The preview in the line below shows you an example of how your compilation will affect the file name. If you want to return to the file name suggested by us, click on "Standard" next to the input field for the file name.

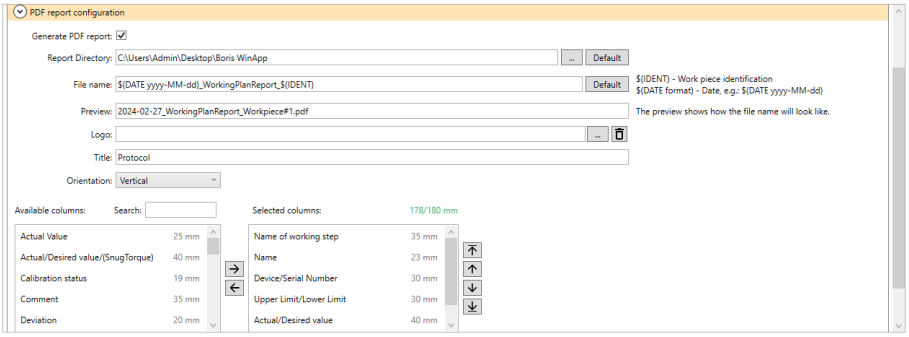
- **Mode**

In mode, you can set how the data is recorded and processed. You can choose between Excel and automatic processing.

- **Design**

The report consists of a table in which the data is entered.
You can choose how many and which categories should be included in the report and in which order they should appear in the table. You can see the available categories in the two columns below. Use the arrows between the columns to move the categories from the left ("Available columns") to the right ("Selected columns") or vice versa. You can edit the order using the arrows to the right of the columns.

6.7.2 PDF report configuration



- **Report Directory**

Assign a folder as the report folder. Click on ... (Select report folder) to open the dialog for selecting a folder.
Make sure that the HCT Windows app requires full access rights to this folder. The default setting is "C:\Users\Public\Documents\hct-windows-app\Customer Files". This folder provides full access for reading and writing on standard Windows systems.

- **File name**

You can configure the file names of the measurement reports here. Use the placeholder "$(DATE format)" to include a date in the file name of the CSV file. To do this, enter the desired date format for "format" in the example above. Where dd stands for the day, MM for the month and yy for the year
Examples:

yyyy-MM-dd results in 2022-06-30
yy-MM-dd results in 22-06-30
dd.MM.yy results in 30.06.22
dd.MM.yyyy results in 30.06.2022
etc.

~~You can use the placeholder $(IDENT) to embed the workpiece identification in the file name. You can find more information on this topic in chapter 8.3.~~
~~You can also add any text. However, make sure that you only use special characters that are permitted for file names and that the file names are not too long. A standard Windows system limits the character length for file paths to 256 characters. With longer file names, the creation of the CSV or DFQ file is restricted.~~
The preview in the line below shows you an example of how your compilation will affect the file name. If you want to return to the file name suggested by us, click on "Standard" next to the input field for the file name.

- **Logo**

Click on ... (Select logo) to specify the file path of the folder containing the logo you want to insert into the report. The logo is displayed in the top right-hand corner of the PDF report. If you want to delete the selected logo or insert a new one, click on .

- **Title**

You have the option of giving your report a title, to do so write the desired title in the line provided.

- **Orientation**

You can select the desired sheet format from the drop-down menu. You can choose between “vertical" and "horizontal".

- First signature text

Here you can enter the text that is shown in the report below the signature line.

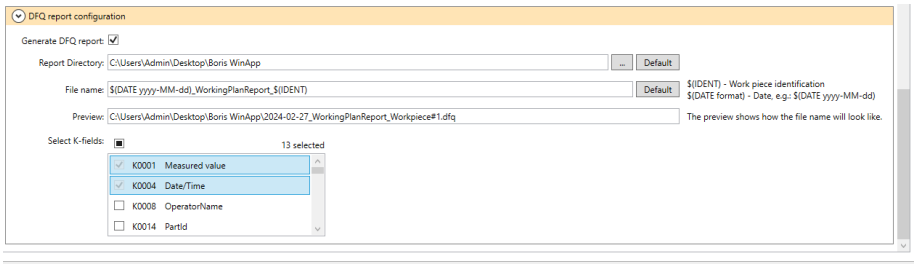
- Second signature text

If you need two fields for signatures, click in the box next to “Second signature text”. You then have the option of setting the text that appears under the line intended for the signature yourself.

- **Design**

The report consists of a table in which the data is entered.
You can choose how many and which categories should be included in the report and in which order they should appear in the table. You can see the available categories in the two columns below. Use the arrows between the columns to move the categories from the left ("Available columns") to the right ("Selected columns") or vice versa. You can edit the order using the arrows to the right of the columns. Please note that it is not possible to select all categories at the same time, as only a certain width is available due to the sheet size. You can see how much of this width you have already used from the numbers in the top right-hand corner above the columns. For more space, you can create the report in landscape format. (see **Orientation**)

6.7.3 DFQ report configuration



- **Report Directory**

Assign a folder as the report folder. Click on ... (Select report folder) to open the dialog for selecting a folder.
Make sure that the HCT Windows app requires full access rights to this folder. The default setting is "C:\Users\Public\Documents\hct-windows-app\Customer Files". This folder provides full access for reading and writing on standard Windows systems.

- **File name**

You can configure the file names of the measurement reports here. Use the placeholder "$(DATE format)" to include a date in the file name of the CSV file. To do this, enter the desired date format for "format" in the example above. Where dd stands for the day, MM for the month and yy for the year
Examples:

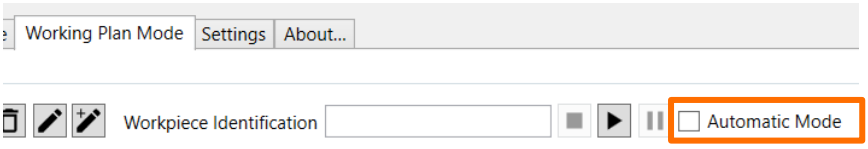
yyyy-MM-dd results in 2022-06-30
yy-MM-dd results in 22-06-30
dd.MM.yy results in 30.06.22
dd.MM.yyyy results in 30.06.2022
etc.

~~You can use the placeholder $(IDENT) to embed the workpiece identification in the file name. You can find more information on this topic in chapter 8.2.~~
~~You can also add any text. However, make sure that you only use special characters that are permitted for file names and that the file names are not too long. A standard Windows system limits the character length for file paths to 256 characters. With longer file names, the creation of the CSV or DFQ file is restricted.~~
The preview in the line below shows you an example of how your compilation will affect the file name. If you want to return to the file name suggested by us, click on "Standard" next to the input field for the file name.

- **Select K-fields**

You can choose how many and which categories should be included in the report. Use the column below to select the desired categories.

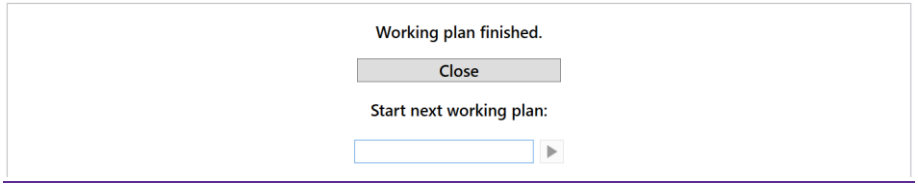
~~Automatic mode~~



~~If you activate automatic mode, you do not have to press ▶ each time to start the working plan but simply fill in the "Workpiece identification" field and any additional fields and confirm this with Enter. The working plan is then executed automatically.~~

6.8 Completing the working plan

Once you have completed a working plan, you have the option of executing the next work plan directly. To do so, enter the exact name (with the correct upper and lower case letters) in the field provided and then click on ▶ (Start). Otherwise, click on "Close" if you do not want to start another one directly.



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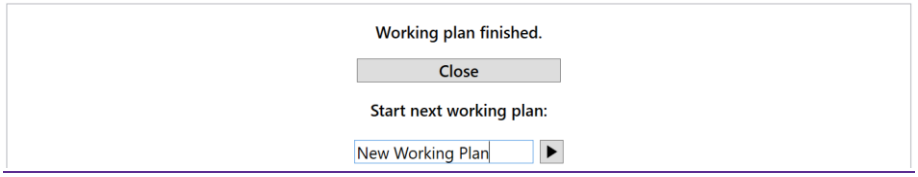
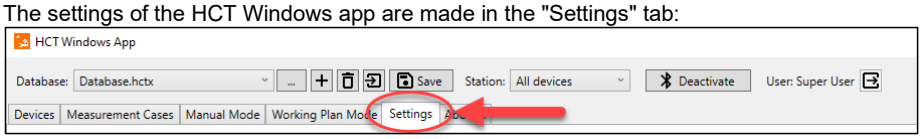
Formatiert: Überschrift 2
Formatiert: Überschrift 2

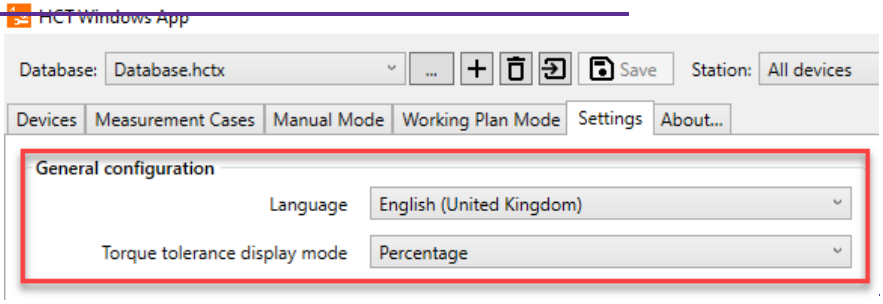

Working plan finished.
Close
Start next working plan:
New Working Plan

7 Settings

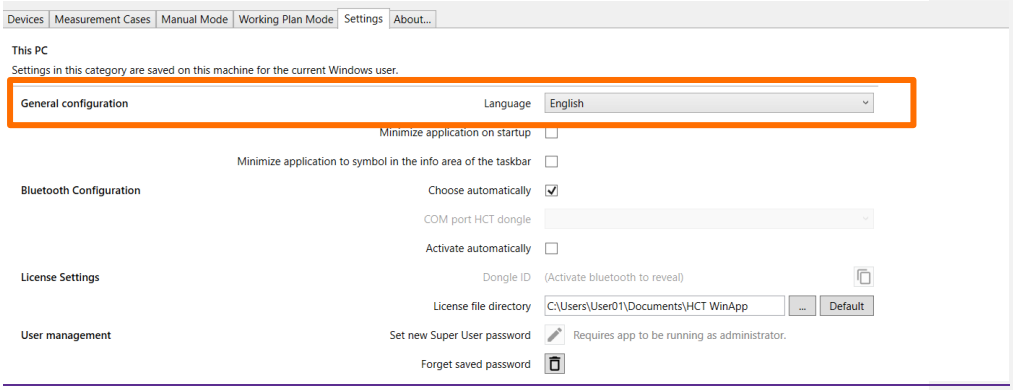
The settings of the HCT Windows app are made in the "Settings" tab:



7.1 General settings

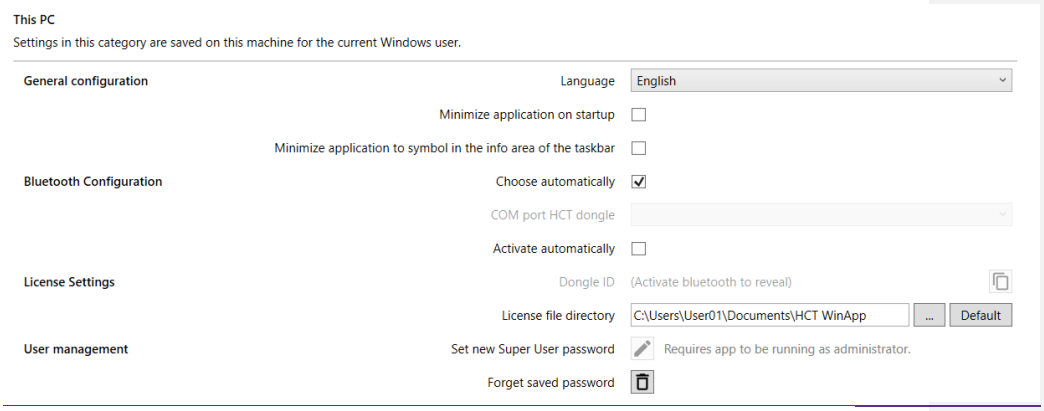


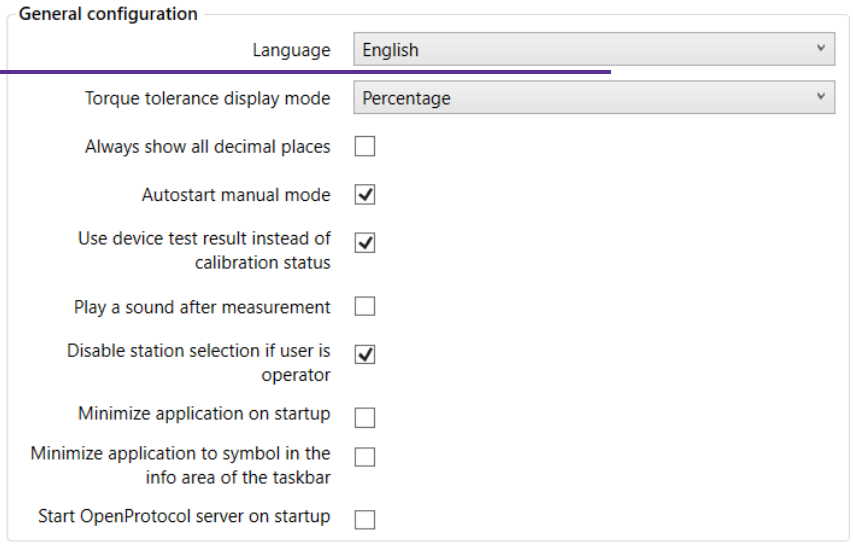
7.1.1 Language



Under Language, select the language in which you want to work with the HCT Windows app. Note that if you change the language, you will need to exit and restart the HCT Windows app:

Click on "OK" in this window, exit the HCT Windows app and start again, your desired language will now be used.





7.1.2 Minimize application on startup

If this field is selected, the Windows app is not opened in full screen mode, but in minimized mode.

7.1.3 Minimize application to symbol in the info area of the taskbar:

If you select this field, the Windows App is displayed as a small icon in the “System tray”.

7.2 Bluetooth settings

7.2.1 Select automatically

Check this to automatically find the HCT dongle. The HCT Windows app searches for the HCT dongle after starting and connects to it via a virtual COM port.

Formatiert: Überschrift 3

Formatiert: Überschrift 3

Formatiert: Standard, Keine Aufzählungen oder Nummerierungen

Formatiert: Überschrift 2

7.2.2 COM port HCT dongle

Here, you specify via which virtual COM port the HCT dongle communicates with the HCT Windows app. You only need to make this setting if the automatic detection of the HCT dongle does not work. You can use the Windows Device Manager to determine the COM port. Pull the HCT dongle out of the USB port and launch the Device Manager. Insert the HCT dongle back into the USB port and check in the Device Manager under "Connections (COM & LPT)" which COM port has been added. The COM port is called "NRF Connect USB CDC ACM (COM..) is displayed. You then enter this COM port.

7.2.3 Automatically activate

Check this box if you want the HCT Windows app to activate the Bluetooth wireless technology of the HCT dongle directly at startup. This makes sense in the operation of the HCT Windows app for users "operator", because then the HCT Windows app connects the set up HCT tools immediately after the start and is ready to receive the measured values. To set up the HCT Windows app, it is advantageous to turn off automatic activation, because many settings can only be made with Bluetooth wireless technology disabled.

7.3 License settings

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7.3.1 Dongle ID

Formatiert: Überschrift 3

Here you will find the ID of your dongle, which you need to obtain licenses or to assign them to stations.

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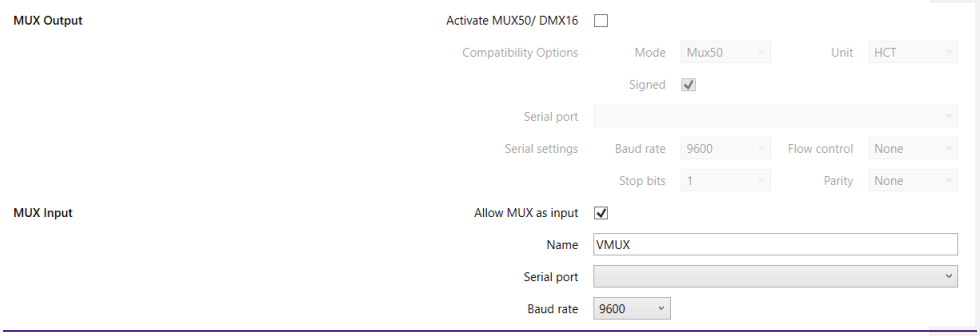
7.3.2 License file directory

hat formatiert: Nicht Hervorheben

Please note that the license files must be saved in this folder in order to be able to use the additional functions provided by the licenses.

Formatiert: Standard



7.4 MUX Output

You must be logged in as a Super User to change the output protocol settings.
These settings allow you to activate and adapt the measurement transmission to other systems. A detailed explanation of this can be found in the chapter "9 Transfer measurements to other systems~~Transfer measurements to other systemsTransfer measurements to other systems~~".

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7.4.1 Activate MUX50/DMX16

Place a check mark here to enable the protocol in principle.

7.4.2 Compatibility options

With "Mode" you decide which protocol is used: MUX50 or DMX16.
Use "Unit" to select whether and which unit is appended to the measured values in the protocol: HCT, no units or always millimeters "mm".
For more details, see chapter "9 Transfer measurements to other systems~~Transfer measurements to other systemsTransfer measurements to other systems~~".

7.4.3 Serial port

Here you set the COM port via which the measured values are output.
For more details, see chapter "9 Transfer measurements to other systems~~Transfer measurements to other systemsTransfer measurements to other systems~~".

7.4.4 Serial settings

These settings set the baud rate, flow control, number of stop bits, and parity parameters.
For more details, see chapter "9 Transfer measurements to other systems~~Transfer measurements to other systemsTransfer measurements to other systems~~".

7.5 MUX Input

If you want to connect an external device, i.e. a device that does not belong to the HCT family, to the Windows app, you can do this via the MUX protocol. To do this, select “Allow MUX as input” Under “Serial port”, set the COM port via which the measured values are entered. You can also assign a name and set the baud rate.

7.6 Database – Settings

From version ~~X~~2.13~~X~~, you can save settings in the database used so that they are transferred if you work with this database on another computer.

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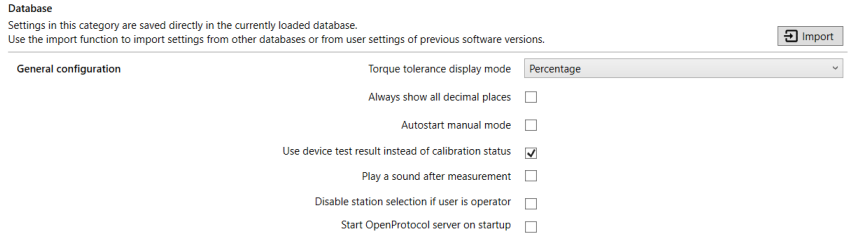
Formatiert: Standard

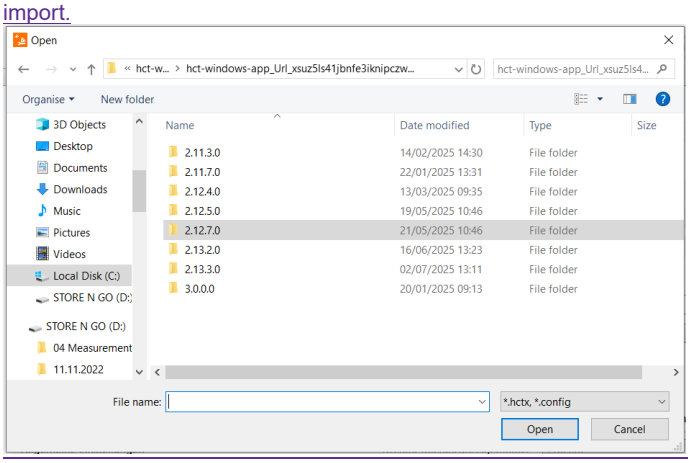


7.6.1 Import

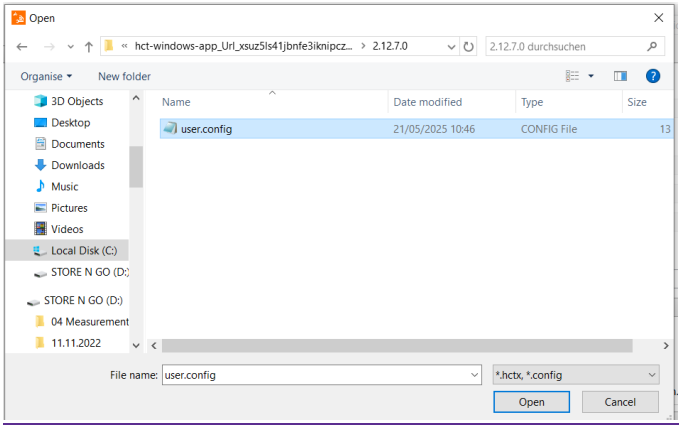
If you want to import settings from an older version of the Windows app, proceed as follows:

Click on Import.

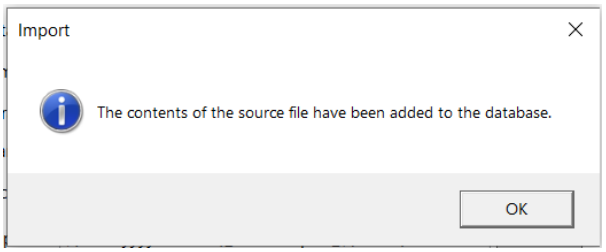
This opens the file explorer. Go to %LOCALAPPDATA% >> hct-windows-app >> hct-windows-app_Url_….. >> and open the folder of the version whose settings you want to import.



Here you will find the user.config file in which all settings are saved. Select it and click on “Open”.



You will then receive a message that the content has been added to the database.



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~~7.1.2 Tolerance display mode~~

~~Here, you can set whether the torque tolerances of the measurement cases should be displayed as a percentage or in the unit of the torque.~~
~~The angular tolerances remain unaffected by this in the unit "°" (degree, deg).~~
~~The tolerances for length measurements remain unaffected by this in the unit "mm" or "inch".~~

~~7.1.3~~7.6.2 ~~Other settings~~General configuration

- **Torque tolerance display mode**: Here you can set whether the torque tolerances of the measurement cases should be displayed as a percentage or in the unit of the torque. The angular tolerances remain unaffected by this in the unit “°” (degree, deg). The tolerances for length measurements remain unaffected by this in the unit “mm” or “inch”.
- **Always show all decimal places**: If you select this field, you will always be shown the same number of decimal places as you set under “Resolution” when creating the measurement case. If you do not select this field, the Windows app terminates at the point where only zeros would follow.
- **Autostart manual mode**: If you select this field, you will be directly in the “Manual mode” tab after opening the HCT Windows app.
- **Use device test result instead of calibration status**: If a recalibration is required for a torque wrench used, the measurements performed with it are displayed “NOK” in the working plan report. If you select this field, you can carry out a torque test with the torque tester and use that result instead of the calibration status.
- **Play a sound after measurement**: If this field is selected, the computer emits a signal tone after transmitting a measurement result.
- **Disable station selection if user is operator**: If this field is selected, the operator has no access to the station selection, i.e. you must be logged in as a super user to change the station.
- ~~**Minimize application on startup**: If this field is selected, the Windows app is not opened in full screen mode, but in minimized mode.~~
- ~~**Minimize application to symbol in the info area of the taskbar**: If you select this field, the Windows App is displayed as a small icon in the “System tray”.~~
- ~~**Start OpenProtocol server on startup**: If this field is selected~~, the Open Protocol server is started directly when the Windows App is opened.

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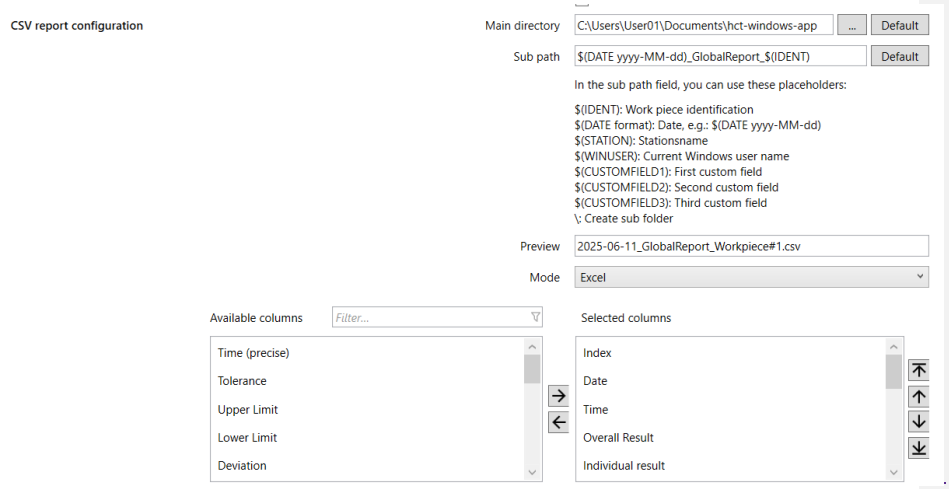
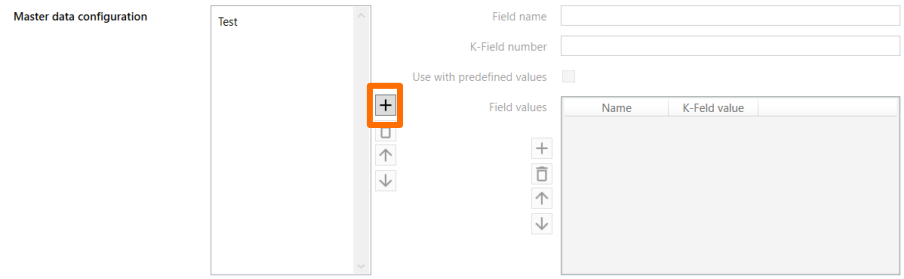


7.7 Master data configuration



Here you can configure the master data, i.e., the data that is queried when executing a work plan. The master data can be used, for example, to add the name of the inspector, who monitors the execution of the work plan or to identify the workpiece used.
To create a master data field, proceed as follows:
Click on + (Add new) and enter the desired name of your master data field under “Field name”. If you select “Use with predefined values”, you can create a list of field values. Those field values appear when the master data is queried in the form of a drop-down list, from which the target value can be selected.
To create a field value, click on + (Add new) and name it. You can use the arrows to change the order of the values. This is the order in which the values will be displayed in the drop-down menu. If you want to delete a value that has already been created, select it by clicking on it and then click on (Delete).

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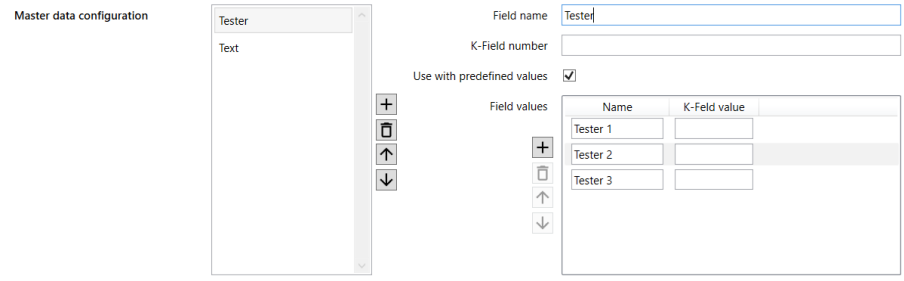

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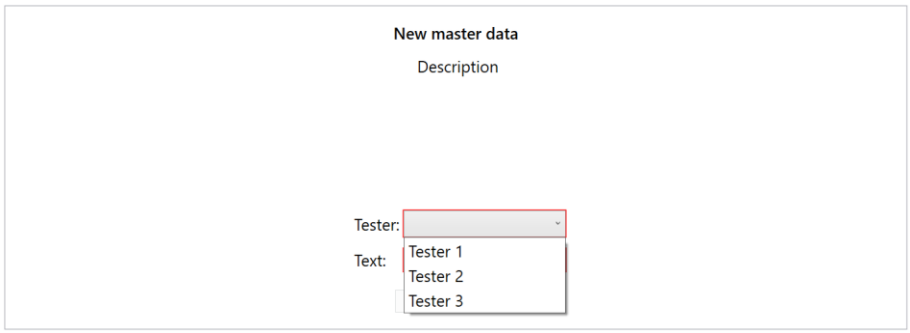


Master data query during work plan execution

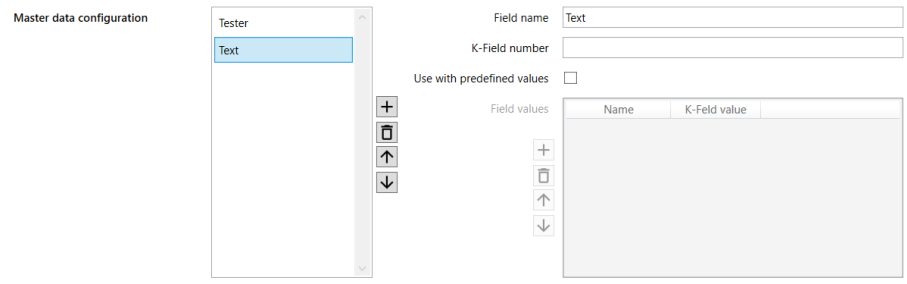
hat formiert: Schriftart: 9 Pt., Kursiv, Schriftfarbe: Text 2

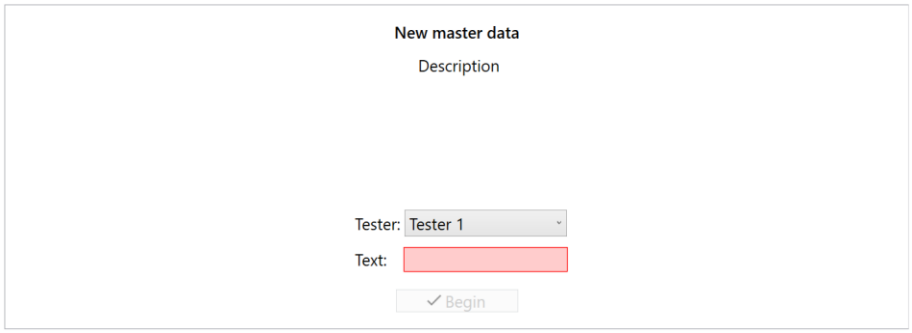
If you don’t want to use predefined values, a text field will appear instead of a drop-down list when the master data is queried, allowing you to enter the desired value freely.

hat formiert: Englisch (Vereinigte Staaten)

hat formiert: Schriftart: 9 Pt., Kursiv, Schriftfarbe: Text 2

You can use the arrows to change the order of the master data fields, i.e., the order in which the master data items are queried. If you want to delete a master data field, select it by clicking on it and then click on (Delete).





Master data query during work plan execution

If you want to create a report in DFQ format after running through the work plan, use the “K-Field number” and “K-field value” fields.

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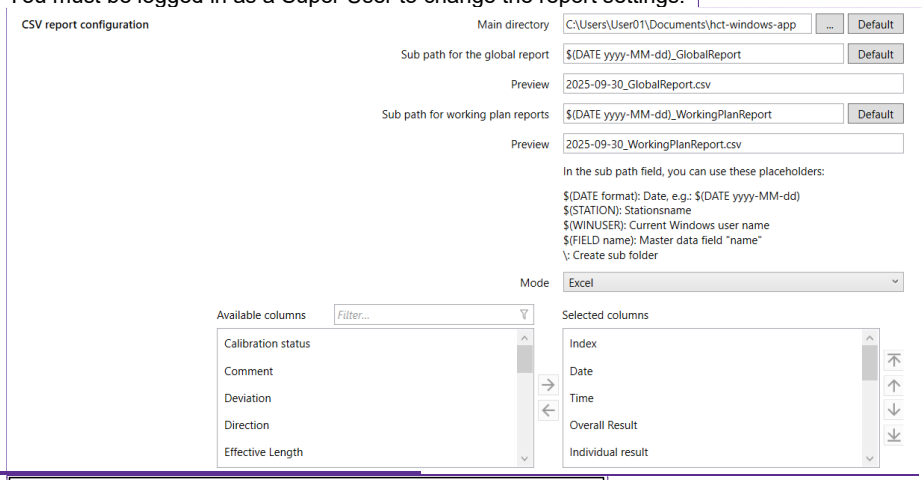
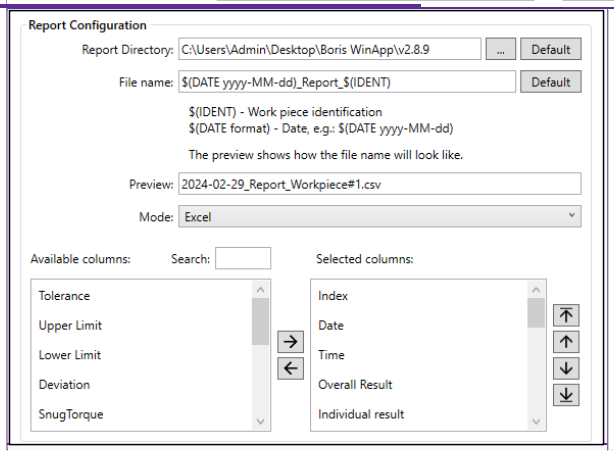
~~7.2~~7.8 CSV Report ~~settings~~configuration

You must be logged in as a Super User to change the report settings.





~~7.2.1~~7.8.1 ~~Report folders~~Main directory

Assign a folder as a report folder. Click on "..." to open the dialog for selecting a folder. This folder stores the measurement reports of the HCT Windows app in CSV format. Make sure that the HCT Windows app has full access to this folder. The default is C:\Users\Public\Documents\hct-windows-app\Customer Files. This folder provides full read and write access on standard Windows systems.

~~7.2.2~~7.8.2 ~~File names~~Sub path for global report

~~You can configure the file names of the measurement reports here.~~Here you can configure the file names for the global report. Use the placeholder $(DATE format) to include a date in the file name of the CSV file. Here, dd stands for the day, MM for the month, and yy for the year.

~~You can use the $(DATE format) placeholder for the date by specifying how the date should be entered for format. Where dd is the day, MM is the month, and yy is the year~~

Examples:

Kommentiert [AB34]: Neues Bild ohne IDENT

Kommentiert [AB35]: Neuer Screenshot

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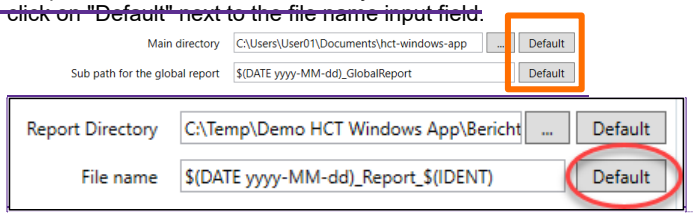
hat formatiert: Englisch (Vereinigte Staaten)

hat formatiert: Englisch (Vereinigte Staaten)

Yyyy-MM-dd results in 2022-06-30
YY-MM-dd results in 22-06-30
DD.MM.yy results in 30.06.22
DD.MM.yyyy results in 30.06.2022
etc.
~~You can use the $(IDENT) placeholder to embed the workpiece identification in the file name~~
In addition, you can add any text. However, make sure that you use only special characters allowed for file names and that the file names do not become too long. Depending on the location and the associated path, access can be denied if the string is too long.
The preview in the bottom line of the report settings shows you an example of how your composition affects the file name. If you want to return to the file name we have suggested, ~~click on "Default" next to the file name input field.~~



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7.8.3 Sub path for working plan reports

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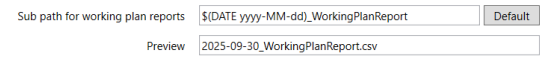
hat formatiert: Englisch (Vereinigte Staaten)
Formatiert: Überschrift 3

Here you can configure the file names for the working plan reports. Use the placeholder $(DATE format) to include a date in the file name of the CSV file. Here, dd stands for the day, MM for the month, and yy for the year.
Examples:
Yyyy-MM-dd results in 2022-06-30
YY-MM-dd results in 22-06-30
DD.MM.yy results in 30.06.22
DD.MM.yyyy results in 30.06.2022
etc.



In addition, you can add any text. However, make sure that you use only special characters allowed for file names and that the file names do not become too long. Depending on the location and the associated path, access can be denied if the string is too long.
The preview in the bottom line of the report settings shows you an example of how your composition affects the file name. If you want to return to the file name we have suggested, click on "Default" next to the file name input field.
You can also use the placeholders listed below the preview to automatically include the name of a master data field in the title, for example. To do this, proceed as you would with the date.

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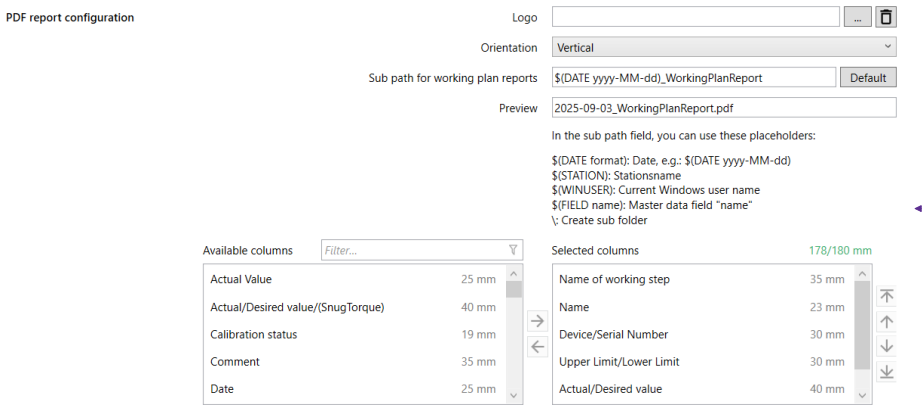
~~7.2.3~~7.8.4 Mode

In the mode, you can set how the data is recorded and processed. You can choose between Excel and automatic processing.

~~7.2.4~~7.8.5 Design

You can choose how many and which categories should be included in the report and in which order they should appear in the table contained in the report. To do this, use the two columns shown below, from which you can select the desired categories.
In work plan mode, you can also generate PDF or DFQ reports that show the measurement results of the completed work plan. See "6.7 New report generation"

7.9 PDF report configuration



7.9.1 Logo

Here you can enter a logo which will then be inserted in your PDF report. Click on ... to select the file in which the logo is saved. You can delete it again with .

7.9.2 Orientation

You can select the desired sheet format from the drop-down menu. You can choose between portrait (“Vertical”) and landscape (“Horizontal”) formats.

7.9.3 Sub path for working plan reports

Here you can configure the file names for the working plan reports. Use the placeholder $(DATE format) to include a date in the file name of the PDF file. Here, dd stands for the day, MM for the month, and yy for the year.
Examples:
Yyyy-MM-dd results in 2022-06-30
YY-MM-dd results in 22-06-30
DD.MM.yy results in 30.06.22
DD.MM.yyyy results in 30.06.2022
etc.
In addition, you can add any text. However, make sure that you use only special characters allowed for file names and that the file names do not become too long. Depending on the location and the associated path, access can be denied if the string is too long.
The preview in the bottom line of the report settings shows you an example of how your composition affects the file name. If you want to return to the file name we have suggested, click on "Default" next to the file name input field.
You can also use the placeholders listed below the preview to automatically include the name of a master data field in the title, for example. To do this, proceed as you would with the date.

7.9.4 Design

You can choose how many and which categories should be included in the report and in which order they should appear in the table contained in the report. To do this, use the two columns shown below, from which you can select the desired categories.

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Formatiert: Überschrift 3

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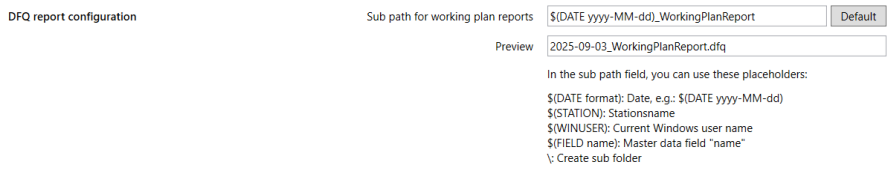
Formatiert: Standard

Formatiert: Standard

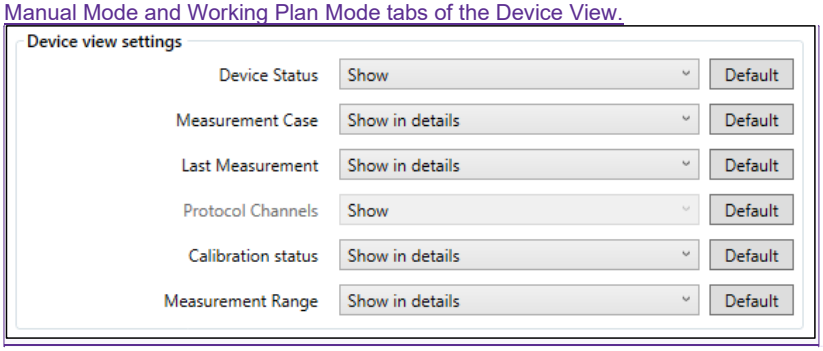
7.10 DFQ report configuration



Here you can configure the file names for the working plan reports. Use the placeholder $(DATE format) to include a date in the file name of the DFQ file. Here, dd stands for the day, MM for the month, and yy for the year.
Examples:
Yyyy-MM-dd results in 2022-06-30
YY-MM-dd results in 22-06-30
DD.MM.yy results in 30.06.22
DD.MM.yyyy results in 30.06.2022
etc.
In addition, you can add any text. However, make sure that you use only special characters allowed for file names and that the file names do not become too long. Depending on the location and the associated path, access can be denied if the string is too long.
The preview in the bottom line of the report settings shows you an example of how your composition affects the file name. If you want to return to the file name we have suggested, click on "Default" next to the file name input field.

7.11 Device view settings

The individual fields allow you to set the information that displays your HCT tools in the Manual Mode and Working Plan Mode tabs of the Device View.



For each information listed here, you can select the following setting:

- **Hide**: The information is not displayed at all.
- **Display**: The information is always displayed.

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Formatiert: Listenabsatz, Aufgezählt + Ebene: 1 + Ausgerichtet an: 0,63 cm + Einzug bei: 1,27 cm

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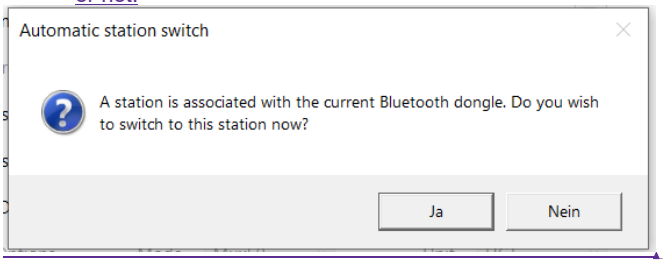
- **Show under details**: The information is only visible when you click on the small circle with the arrow in the device view.
- **Show when Bluetooth is active**: The information is only displayed if you have enabled Bluetooth in the HCT Windows app.
- **Show when selected**: The information is only displayed if you have selected the HCT tool in the device view by clicking on it.

You cannot hide the device name and serial number; this information is essential and always displayed. Use "Default" to the right of the selection fields to reset the settings back to our recommendation.
We recommend that you display only the most important information for you permanently in the case of several HCT tools, as otherwise the device view no longer provides an overview. Display the information that will help you work directly with the HCT tool in question with "Display when selected" and click on the HCT tool before you want to use it.

7.12 Dialog configuration

If you have assigned your dongle to a station, you can set here whether the Windows app should automatically switch to the station that is linked to the dongle when the dongle is activated if you have just selected a different station. You have the following setting options:

- Yes: The Windows app automatically switches to the station linked to the dongle.
- No: Activating the dongle does not change your station selection.
- Show Dialog: A dialog box appears and you can decide whether you want to switch or not.



~~7.3~~7.13 Working Plan Configuration

You must be logged in as the Super User user to change the Working Plan configurations.
~~The only exception in this area is the setting **"Fehler! Verweisquelle konnte nicht gefunden werden."**, which can also be changed by the "Operator" user.~~
The settings in this area refer to the working plan mode.

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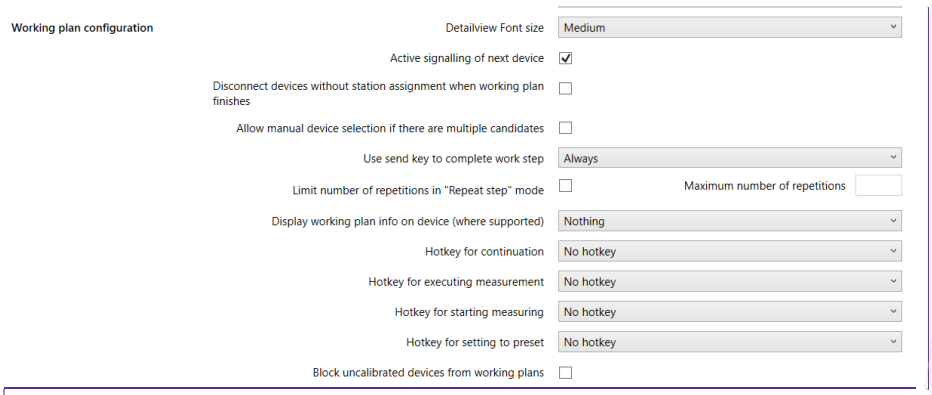
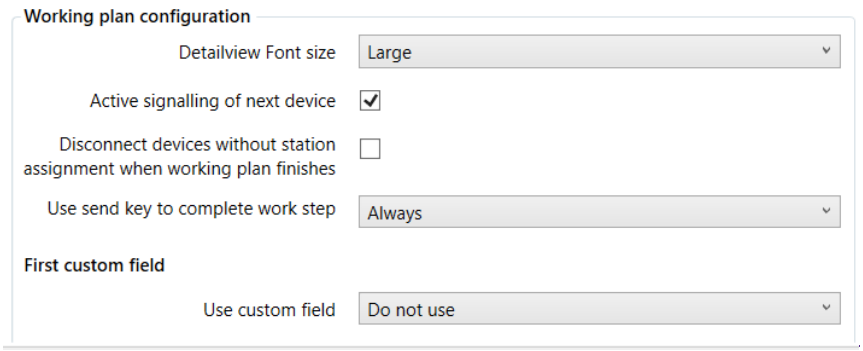
hat formatiert: Englisch (Vereinigte Staaten)



Kommentiert [AB38]: Neues Bild



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~~7.3.1~~7.13.1 Detailview Font size

The detailview is the view that is displayed in the lower half of the screen when you run through a working plan and contains, for example, the text input or the bar chart that visualizes the live measured values. Here you can set how large the font size of this detailview should be.

~~7.3.2~~7.13.2 Active signalling of next device

Check this box if you want the HCT tool to signal that it should be applied in the active work step. The GARANT HCT torque wrenches signal this by flashing green on their light ring and vibrating when the vibration in the torque wrench is switched on. The HOLEX HCT torque wrenches only vibrate because they do not have a light ring, but again the vibration in the wrench must be switched on.
Remove the check mark in this setting if you do not want active signaling.

~~7.3.3~~7.13.3 Disconnect devices without station assignment when working plan finishes

Once a working plan has been completed, the connection to all devices that are not assigned to the station of the working plan is disconnected.

7.13.4 Allow manual device selection if there are multiple candidates

If you use Smart Mode for device selection in your working plan, you can set here that if several devices are suitable for the work plan step, you can select one yourself from this list of possible devices.

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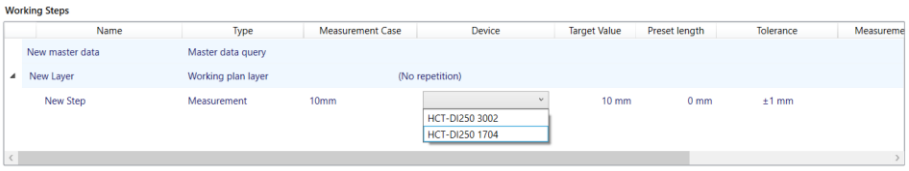

If you do not select this function, the first compatible device for the step is automatically selected. Manual selection is then not possible.

~~7.3.4~~7.13.5 Use send key to complete work step

Here you can select whether it is necessary to press the send button on your measuring device after a measurement in order to proceed to the next step in the working plan. You can choose between:

- Always: After every measurement, the send button on the measuring device must be pressed to move on to the next step of the working plan.
- On failure: The send button only needs to be pressed if the measurement is NOK.
- No selection: No selection is equivalent to “Never”, i.e. the send button does not need to be pressed after a measurement, the system automatically moves on to the next step.

7.13.6 Limit number of repetitions in “Repeat step” mode

In working plan mode, you can set how you want to proceed in the event of a scrap measurement. If you have selected “Repeat step”, you can limit the maximum number of times the step can be repeated. Check this box and enter the desired number in the field provided.

7.13.7 Display working plan info on device (when supported)

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When you run through a working plan, you can display various information on the device. You have the choice between:

- Nothing
- Name of working plan
- Name of working layer
- Name of working step

Select the desired information from the drop-down menu. Please note that it is not possible to display this information on all devices.

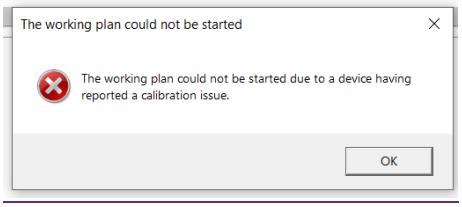
Hotkeys
You can choose different hotkeys, i.e., keys that you can press instead of the app button to perform an action. You can assign the following actions to the F1-F12 keys:

- Hotkey for continuation
- Hotkey for executing measurement
- Hotkey for starting measuring
- Hotkey for setting to preset

7.13.8 Block uncalibrated devices from working plans

Formatiert: Überschrift 3

If you select this field, it is not possible to start the work plan if one of the devices used needs to be recalibrated.



Formatiert: Überschrift 3

~~7.3.5 Use the extra field~~

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~~You can add up to three custom columns to the CSV files generated by the HCT Windows app by placing a check mark here. Only then will the Extra Field Name and Extra Field Values fields be enabled.~~

~~7.3.6 Extra field name~~

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~~If you want to use the extra field, enter a name for it here. In the CSV files created later, the additional column in the header is given this name.~~

~~7.3.7 Extra field values~~

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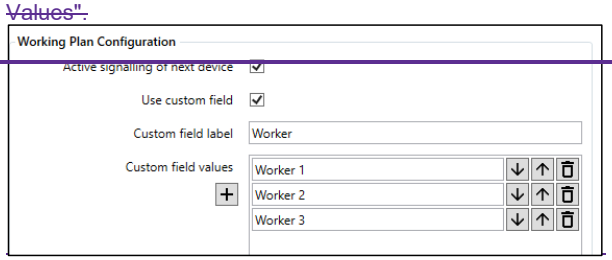
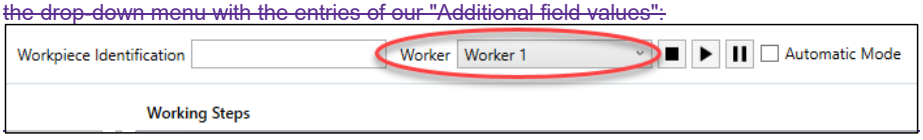
~~Use the extra field values to create a working plan mode selection from which you can select the entries in the additional column. Click (Add) under Extra Field Values to add entries. Use the arrows (down/up) to change the order of entries in the list. Use (Delete) to delete entries.~~

~~Example of using the extra field:~~
~~In this example, we want to use the additional field to have the operator entered in the CSV files.~~
~~To do this, we activate "Use additional field" by checking.~~
~~To explain this to the reviewers, we enter a meaningful name in the "Extra Field Name", in our example "Reviewers".~~
~~Our colleagues who later work with the work plan are entered one by one in "Extra Field Values".~~



~~If we now switch to the "Work plan mode" tab, we see our additional field with the name "Examiner" assigned by us next to "Workpiece identification" and the option to select from the drop-down menu with the entries of our "Additional field values":~~



~~7.3.8 K-field number~~

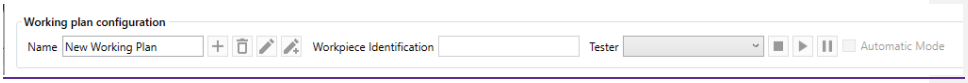
~~To each custom field a specific K-field number can be addressed for dfq documentation.~~

7.13.9 Automatic field selection

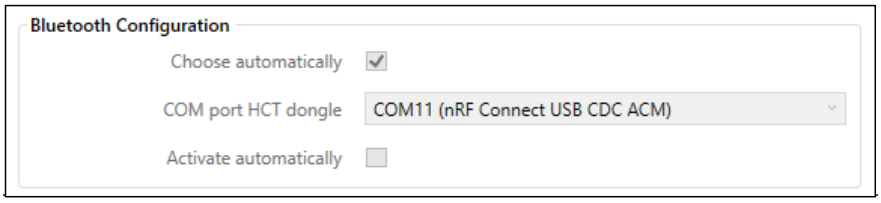
Here you can choose where the cursor jumps to in the Windows app after the work plan has been completed:

- Working Plan (Name)
- Workpiece identification
- Tester (custom field)

Formatiert: Listenabsatz, Aufgezählt + Ebene: 1 + Ausgerichtet an: 0,63 cm + Einzug bei: 1,27 cm



~~7.4 Bluetooth settings~~



~~7.4.1 Select automatically~~

~~Check this to automatically find the HCT dongle. The HCT Windows app searches for the HCT dongle after starting and connects to it via a virtual COM port.~~

~~7.4.2 COM port HCT dongle~~

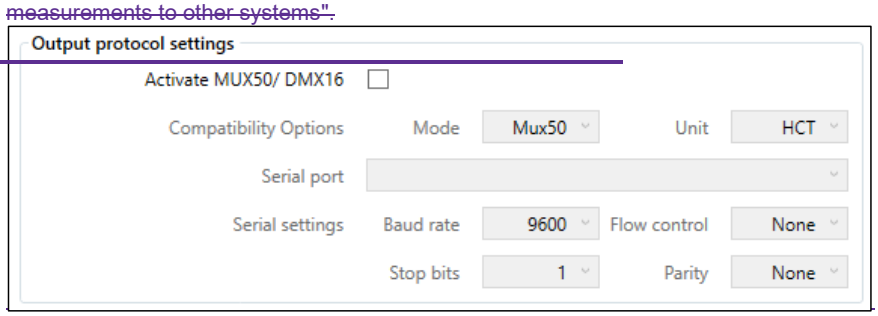
~~Here, you specify via which virtual COM port the HCT dongle communicates with the HCT Windows app. You only need to make this setting if the automatic detection of the HCT dongle does not work. You can use the Windows Device Manager to determine the COM port. Pull the HCT dongle out of the USB port and launch the Device Manager. Insert the HCT dongle back into the USB port and check in the Device Manager under "Connections (COM & LPT)" which COM port has been added. The COM port is called "NRF Connect USB CDC ACM (COM..) is displayed. You then enter this COM port.~~

~~7.4.3 Automatically activate~~

~~Check this box if you want the HCT Windows app to activate the Bluetooth wireless technology of the HCT dongle directly at startup. This makes sense in the operation of the HCT Windows app for users "operator", because then the HCT Windows app connects the set up HCT tools immediately after the start and is ready to receive the measured values. To set up the HCT Windows app, it is advantageous to turn off automatic activation, because many settings can only be made with Bluetooth wireless technology disabled.~~

7.5 Output protocol settings

You must be logged in as a Super User to change the output protocol settings.
These settings allow you to activate and adapt the measurement transmission to other systems. A detailed explanation of this can be found in the chapter "9 Transfer measurements to other systems".



7.5.1 Use the MUX50/DMX16

Place a check mark here to enable the protocol in principle.

7.5.2 Compatibility options

With "Mode" you decide which protocol is used: MUX50 or DMX16.
Use "Unit" to select whether and which unit is appended to the measured values in the protocol: HCT, no units or always millimeters "mm".
For more details, see chapter "9 Transfer measurements to other systems".

7.5.3 Serial port

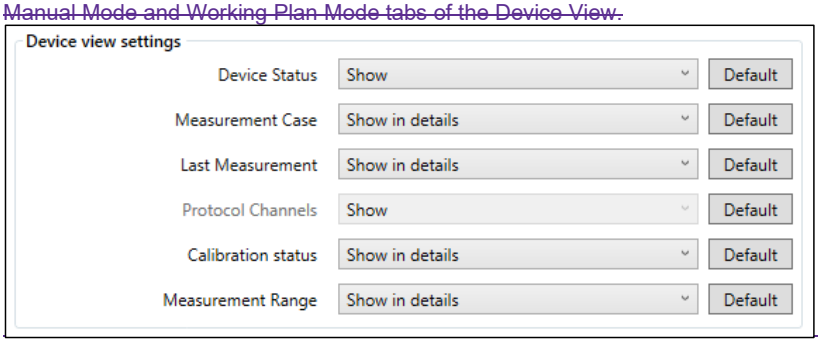
Here you set the COM port via which the measured values are output.
For more details, see chapter "9 Transfer measurements to other systems".

7.5.4 Serial settings

These settings set the baud rate, flow control, number of stop bits, and parity parameters.
For more details, see chapter "9 Transfer measurements to other systems".

7.6 Device representation

The individual fields allow you to set the information that displays your HCT tools in the Manual Mode and Working Plan Mode tabs of the Device View.



For each information listed here, you can select the following setting:
"Hide": The information is not displayed at all.
"Display": The information is always displayed.

~~"Show under details": The information is only visible when you click on the small circle with the arrow in the device view.~~
~~"Show when Bluetooth is active": The information is only displayed if you have enabled Bluetooth in the HCT Windows app.~~
~~"Show when selected": The information is only displayed if you have selected the HCT tool in the device view by clicking on it.~~
~~You cannot hide the device name and serial number; this information is essential and always displayed. Use "Default" to the right of the selection fields to reset the settings back to our recommendation.~~
~~We recommend that you display only the most important information for you permanently in the case of several HCT tools, as otherwise the device view no longer provides an overview. Display the information that will help you work directly with the HCT tool in question with "Display when selected" and click on the HCT tool before you want to use it.~~

8 Data output to files

8.1 CSV files

The HCT Windows app generates reports in the form of CSV files from the measurement cases carried out or enters the results there if the file name has not changed. The composition of the file name can be set as in section "7.8.27.8.27.2.2 ~~File names~~".
If the file name does not contain variables such as date or workpiece identification, the HCT Windows app always appends all results to the same file. In some cases, this may make sense, but the file may become very large if you forget to set a new file name. We therefore advise against this.
It is better to use a variable in the file name. If the value of this variable changes, the HCT Windows app creates a new CSV file and enters the results there until the value of the variable changes again.
Example variable date "$(DATE yyyy-MM-dd)":
As soon as the date changes, a new CSV file with the current date is generated, i.e. after 24 hours at the latest.
Example of variable workpiece identification "$(IDENT)":
A new CSV file with the workpiece identification is generated with each new workpiece identification. Especially in work plan mode, you have one log file per workpiece, but with the disadvantage that a large number of files may be generated.
Our standard "$(DATE yyyy-MM-dd)_REPORT_$(IDENT)" generates a new file with each new workpiece identification, but at the latest when the date is changed. This ensures that no file of any size is created even if no new workpiece identification is entered.

Feldfunktion geändert

8.1.1 Data in the CSV file

In addition to the measured values determined by the HCT tools, additional data is written to the CSV file for each measurement case.
In "Manual Mode", these include:
Date and timestamp
Tolerance limits
Name of the measurement case
Serial number of the HCT tool used
Name of the device
Workpiece identification
The following data is also entered in "Work plan mode":
Name of the work plan
Name of the Working Plan level
Name of the Working Plan step
Extra field value if "Use Extra Field" has been enabled in the settings
Get an overview by using our examples or your own measurement cases to create CSV files and open them with a suitable program.

8.2 DFQ files

DFQ files are structured in accordance with the AQDEF format. Most CAQ systems can read and process such files.
DFQ files only make sense in conjunction with a work plan, because it is only in this way that it is defined beforehand what is to be measured with and within which limits. The HCT Windows app therefore only generates such files in the work plan mode and only if you have activated the generation. In chapter 6.7.3 you can see how to turn the generation on or off.
The settings for the file name are as valid as for the CSV files, so in the work plan mode you will receive two files of the same name, which can only be changed by their extensions (.CSV or .DFQ). The DFQ file can be read with a simple editor without conversion, but it does not contain explanatory comments, only the K-fields and the associated values.

8.3 PDF Report

It is possible to save the executed work plans as a PDF report. Go to “6.7.2 PDF report configuration” for more information.

The PDF report contains less information than the DFQ and CSV files, but offers the option of documenting a work plan clearly in PDF format and printing, signing and passing it on or filing it in paper form later if required.
The PDF report is stored in the same directory as the .csv or .dfq file.

Kommentiert [AB40]: Neuer Screenshot

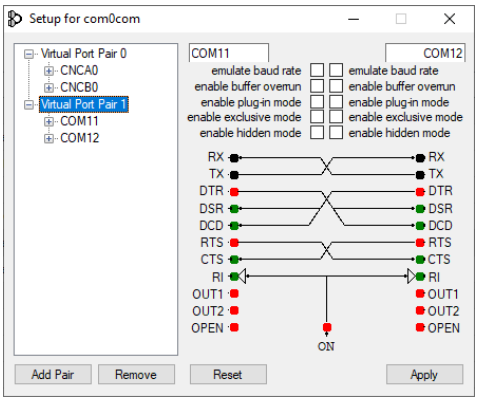
9 Transfer measurements to other systems

9.1 COM port

The HCT Windows app can send the measurements generated by the measurement tools to other systems such as CAQ software systems. The data is transmitted via COM ports in MUX50 or DMX16 format. The prerequisite is that the COM ports are provided by a virtual COM port driver with null modem functionality. We recommend using the com0com null modem emulator, whose link you can find on our HCT website. After the emulator is installed, it provides pairs of COM ports that function as null modems. Note that the emulator designates the COM ports as CNCA0 and CNCB0 by default, and the HCT Windows app does not recognize them. Using the null modem emulator setup program, create a new virtual COM port pair ("Add Pair") and change labels to the usual names, such as "COM11" and "COM12". Make sure that these COM ports are not yet in use.
Click on "Apply". Please note that your computer should be restarted after creating new COM ports to ensure error-free operation.

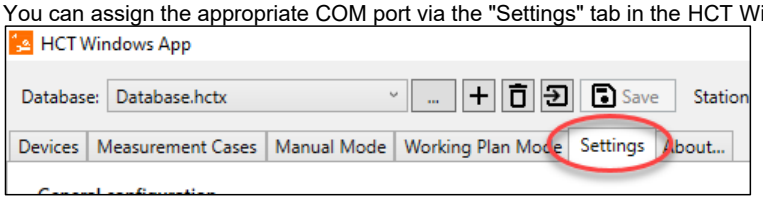
Link to our HCT-website:
HCT Windows app | Hoffmann Group (hoffmann-group.com)

Feldfunktion geändert

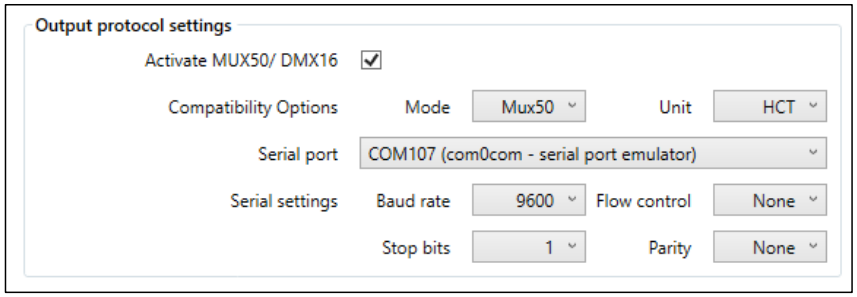


9.1.1 Assign the COM port to output the data

You can assign the appropriate COM port via the "Settings" tab in the HCT Windows app.



In the "Protocol settings" area, check "Use MUX50/DMX16":



Then make additional settings according to your requirements.

Mode: Select the appropriate protocol, MUX50 or DMX16. Note that the MUX50 protocol can only transmit channels with numbers 1 through 9. If you want to use channels above 9 to a maximum of 99, use the DMX16 protocol. Make sure that your target system can process this log.

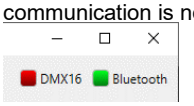
Unit: Here you select the unit with which the measured values are to be assigned.
"HCT": The measured values are given the units provided in the measuring tools
"No units": The measured values are transmitted without units. Use this setting if your target system cannot handle the units and generates error messages due to incorrect formats.
"MM": The measured values are always marked with the unit "MM". Some target systems expect all measurements with this unit, other formats are simply ignored or generate error messages. Note, however, that for example, angle measurements or measurements in inches are also marked with the unit "mm" in the protocol.

Serial port: Set the COM port on which the HCT Windows app should output the data. This is NOT the COM port on which your target system receives the data; for this purpose, set the paired COM port there. In the above case, COM11 includes the COM12 to be used for the target system. Make sure that you DO NOT set the same COM port as for the HCT dongle (in the Bluetooth settings, chapter "1.1.107.4.2 ~~COM port HCT dongle~~").

Feldfunktion geändert

Serial Settings: These are the transmission parameters for the serial port, i.e. for the COM port. Set the parameters exactly as you set them in your target system.

The HCT Windows app shows with a green light in the upper right corner whether the data transfer is always working and whether the target system is present. If the light is red, communication is not working:



Then check the settings again and whether the target system exists and is running. If necessary, you can check the communication with the help of terminal software, see also the following chapter.

9.2 Description of the MUX50 and DMX16 protocols

The MUX50 and DMX16 protocols are used to transmit the measurements collected by the HCT Windows app to other applications such as CAQ software or other devices via a COM port. The protocol is NOT used to communicate with the tools and measuring equipment connected to the HCT Windows app, this is done by the HCT protocol.

9.2.1 Details of the MUX50 and DMX16 protocol

The logs are ASCII characters and can be read by most CAQ software systems. They also provide some control commands so that the connected application, called the host, can control the HCT Windows app.

9.2.2 Send and receive measured values

A measured value is always output with 24 in the MUX50 protocol and always with 25 ASCII characters in the DMX16 protocol and is terminated with the characters "carriage return", shown here as "<CR>", and "line feed", shown here as "<LF>". The difference between the MUX50 and DMX16 is that the former can only work with single-digit channel numbers from 1 to 9, while the latter can work with two-digit channel numbers up to 99. On the DMX16, a word space (spaces) is prefixed to single-digit channel numbers. The word spaces, the "spaces", are represented here with the underscore "_".
Examples:
MUX50: `3_MW_+12345.67_Nm___<CR> <LF>`
DMX16: Single-digit channel numbers: `_3_MW_+12345.67_Nm___<CR> <LF>`
DMX16: Two-digit channel numbers: `26_MW_+12345.67_Nm___<CR> <LF>`

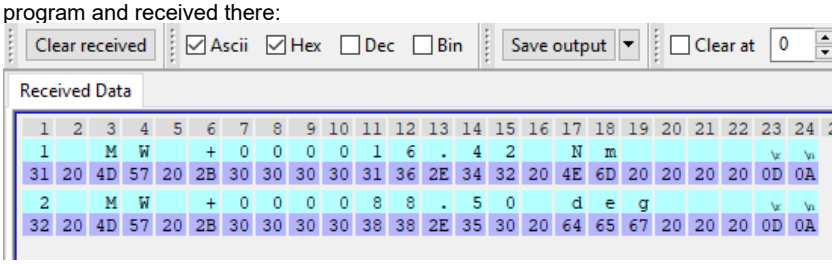
9.2.3 Explanation MUX50:

1. Characters	Channel number	This is the channel on which the measured value is transmitted or received. The channel numbers can be 1 to 9.
2. Characters	Spaces	Word interspace
3. - 4. Characters	Value type	This is the type of reading. The HCT Windows app always uses the characters MW for the measured value.
5. Characters	Spaces	Word interspace
6. Characters	Sign	+ or -
7. - 15. Characters	Measured value	The decimal place in the measured value is variable, leading zeros are not suppressed.
16. Characters	Spaces	Word interspace
17. - 22. Characters	Unit of the measured value	The unit depends on the protocol settings, see section "9.1.1 Assign the COM port to output the data". The remaining characters are filled with word spaces (spaces).
23. Characters	<CR>	Carriage return
24. Characters	<LF>	Line feed

9.2.4 Explanation DMX16:

1st and 2nd characters	Channel number	This is the channel on which the measured value is transmitted or received. The channel numbers can be 1 to 99. For single-digit channel numbers, the first character is a word space (spaces).
3. Characters	Spaces	Word interspace
4. - 5. Characters	Value type	This is the type of reading. The HCT Windows app always uses the characters MW for the measured value.
6. Characters	Spaces	Word interspace
7. Characters	Sign	+ or -
8. - 16. Characters	Measured value	The decimal place in the measured value is variable, leading zeros are not suppressed.
17. Characters	Spaces	Word interspace
18. - 23. Characters	Unit of the measured value	The unit depends on the protocol settings, see section "9.1.1 Assign the COM port to output the data". The remaining characters are filled with word spaces (spaces).
24. Characters	<CR>	Carriage return
25. Characters	<LF>	Line feed

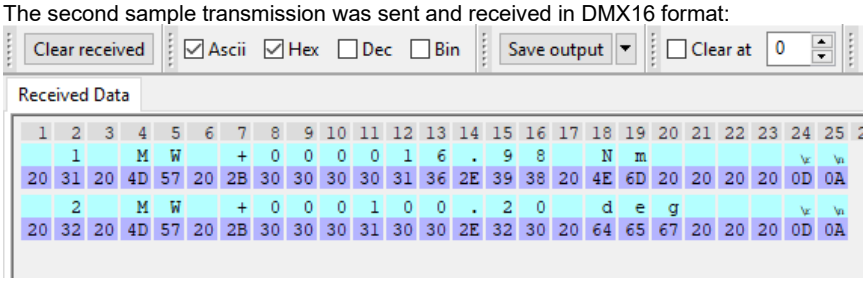
The following example transmission of the executed measurement case with a GARANT HCT torque wrench was sent from the HCT Windows app in MUX50 format to a terminal program and received there:



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		M	W		+	0	0	0	0	1	6	.	4	2		N	m					\r	\n
31	20	4D	57	20	2B	30	30	30	30	31	36	2E	34	32	20	4E	6D	20	20	20	20	0D	0A
2		M	W		+	0	0	0	0	8	8	.	5	0		d	e	g				\r	\n
32	20	4D	57	20	2B	30	30	30	30	38	38	2E	35	30	20	64	65	67	20	20	20	0D	0A

The first line highlighted in green shows the torque measured value with the unit "Nm", the second line highlighted in green shows the rotation angle measured value with the unit "deg". The two rows with a purple background represent the characters as hexadecimal values (according to ASCII).

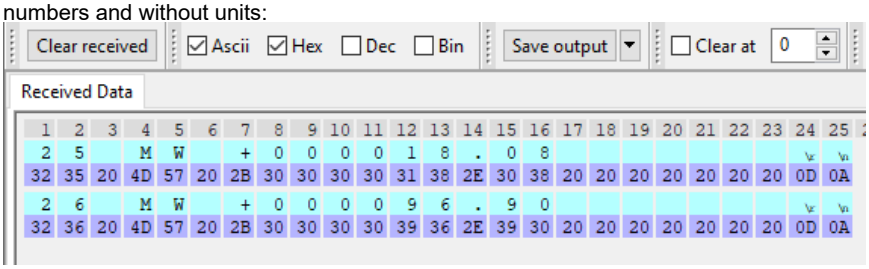
The second sample transmission was sent and received in DMX16 format:



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	1		M	W		+	0	0	0	0	1	6	.	9	8		N	m					\r	\n	
20	31	20	4D	57	20	2B	30	30	30	30	31	36	2E	39	38	20	4E	6D	20	20	20	20	0D	0A
	2		M	W		+	0	0	0	1	0	0	.	2	0		d	e	g				\r	\n	
20	32	20	4D	57	20	2B	30	30	30	31	30	30	2E	32	30	20	64	65	67	20	20	20	0D	0A

In this case, you will see the spaces in front of the channel number in column 1.

The third sample transmission was sent and received in DMX16 format with two-digit channel numbers and without units:



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
2	5		M	W		+	0	0	0	0	1	8	.	0	8								\r	\n	
32	35	20	4D	57	20	2B	30	30	30	30	31	38	2E	30	38	20	20	20	20	20	20	20	0D	0A
2	6		M	W		+	0	0	0	0	9	6	.	9	0								\r	\n	
32	36	20	4D	57	20	2B	30	30	30	30	39	36	2E	39	30	20	20	20	20	20	20	20	0D	0A

You will see the two-digit channel numbers at the front , with no spaces leading, and the spaces instead of the units in columns 18 to 20.

9.2.5 Query the HCT Windows app via MUX50 and DMX16 protocols

The target system or host can send certain commands to the HCT Windows app, which responds accordingly:
Query identification:
Host: `I.<CR>` or `I.<CR> <LF>`
Hexadecimal: `49 0D` or `49 0D 0A.`
HCT Windows app: `Hct-windows-app_1.3.2<CR> <LF>`
Hexadecimal:
`68 63 74 2D 77 69 6E 64 6F 77 73 2D 61 70 70 20 31 2E 33 2E 32 0D 0A.`

Host: `D0<CR>` or `D0<CR> <LF>` or `D00<CR>` or `D00<CR> <LF>`
Hexadecimal: `44 30 0D` or `44 30 0D 0A` or `44 30 30 0D` or `44 30 30 0D 0A.`
With one of these commands, the HCT Windows app disables all channels and therefore does not send measurements.

Host: `E0<CR>` or `E0<CR> <LF>` or `E00<CR>` or `E00<CR> <LF>`
Hexadecimal: `45 30 0D` or `45 30 0D 0A` or `45 30 30 0D` or `45 30 30 0D 0A.`
With one of these commands, the HCT Windows app activates all channels and sends measured values as soon as a measurement case has been carried out.

The HCT Windows app does not currently allow the host to query a channel, the HCT Windows app ignores these requests.

9.2.6 Tips

Many CAQ systems only offer the MUX50 protocol, but can still handle the DMX16 format and understand the two-digit channel numbers. First, set the DMX16 protocol in the HCT Windows app, assign two-digit channels to an HCT tool in the device view , and test whether your target application receives and processes the readings correctly.
Some CAQ systems interpret channel numbers above 89 as a transmitter error, in this case, they remain below the channel numbers.

9.2.7 Error messages

The HCT Windows app displays data transfer errors that occur on the right in the bottom line of the window.

10 Additional features

The additional options listed below can be purchased via one-off licenses. Please contact HCT@hoffmann-group.com for more information.

10.1 Open protocol ~~Mode~~ Server

The HCT Windows App provides a feature to share torque wrenches connected to the App via TCP for any integrator that supports Open Protocol.

10.2 Open Protocol Client

This feature enables the possibility to connect any device via Open protocol.

~~10.2~~10.3 Minimum torque test

The minimum torque repetition feature enables a new repetition type in working plan mode. This repetition mode is special because it does not only reflect the overall result of the measurement but also inspects the torque and the angle result separately. The goal of this is to filter out working plan step executions, in which the torque was too low. Please note that this feature only makes sense for torque measurement cases of type "torque triggering with angle supervision". An overview about the behavior is given in below table:

Case ID	Torque	Angle	MUX Message	Is Repetition
1	OK	OK	Yes	N/A
2	Too Low	OK	No	Yes
3	Too High	OK	Yes	No
4	Too High	Not OK	Yes	No
5	OK	Not OK	Yes	No
6	Too Low	Not OK	Yes	No

A 'no' for MUX message means that the MUX message is suppressed.

~~10.3~~10.4 ~~Connect~~ MUX50/DMX16 ~~devices~~Client

This feature enables the possibility to connect any device via MUX50 or DMX16 protocol.

~~10.4~~10.5 Label printing

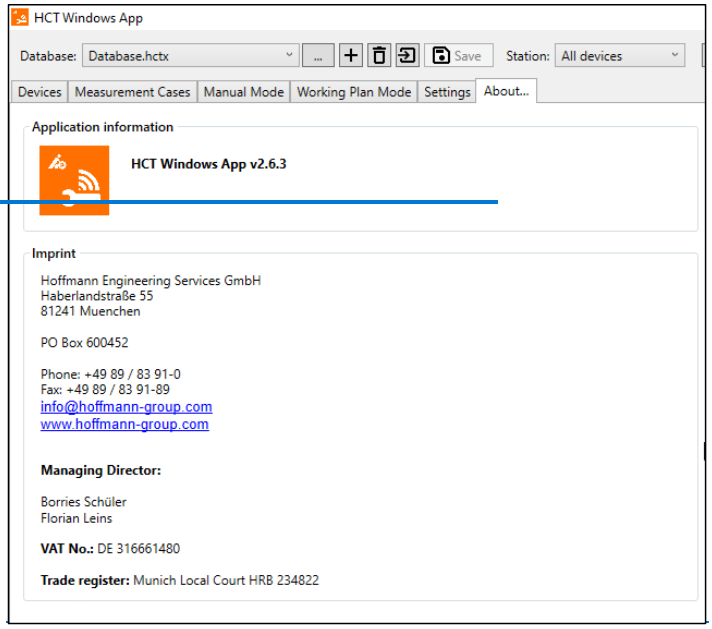
This feature enables the possibility to output the report as a print file. The format can be configured.

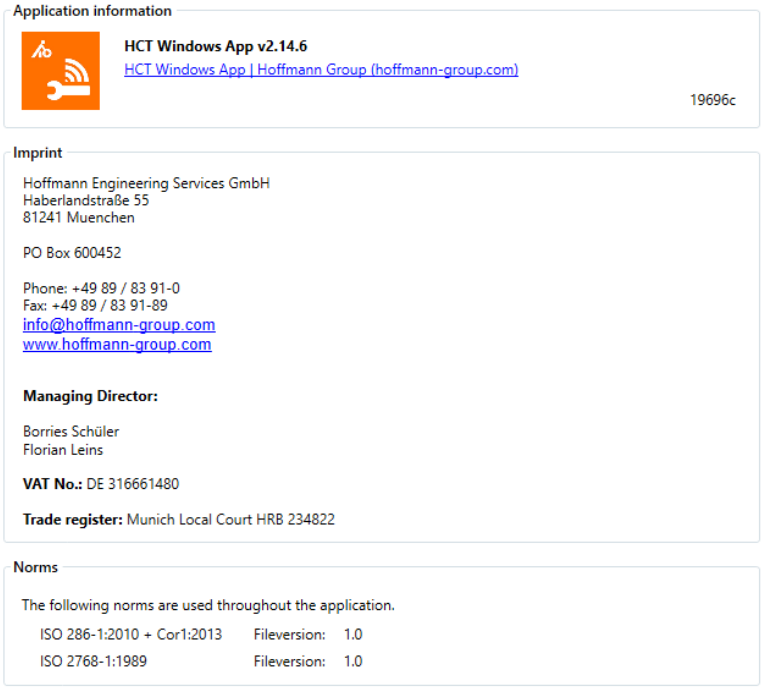
11 Advice and help with problems

11.1 Version of the HCT Windows app and imprint

The version of your installed HCT Windows app and the imprint can be found in the tab "About…":

HCT Windows App





When contacting our customer service, please always indicate the version of the HCT Windows app.

11.2 HCT Windows app is displayed too large on the screen

Please check the screen scaling setting if the HCT Windows app window is too large on the screen and there are no buttons on the edge, the status bar, or the menu bar. To call this up, minimize the HCT Windows app and right-click on the desktop of your Windows computer. Then select "Display settings". Here you will find the option you are looking for to change the scaling under "Scaling and arrangement".

11.3 Bluetooth wireless technology cannot be enabled

The Bluetooth wireless technology is built into the HCT dongle and can only be activated if you have created a database, the HCT dongle has been detected by the system and is connected to the HCT Windows app. Therefore, check the following:
Do you have a database as described in chapter "5.2 Create a database~~Create a database~~~~Create a database~~"?
The settings have been made correctly as described in section "1.1~~0~~7.4 ~~Bluetooth settings~~"?
In some cases, the HCT dongle is not automatically recognized by the system. Determine the COM port for the HCT dongle to be set manually using the device manager and set the Bluetooth settings accordingly, see chapter "1.1~~0~~7.4 ~~Bluetooth settings~~".

Feldfunktion geändert

Feldfunktion geändert

11.4 The Super User password is no longer known

If you are no longer able to log in as a Super User because you no longer know the password, you can assign a new password. To do this, proceed as described in the chapter "5.5.1 Set the Super User password again".

11.5 Null modem emulator and Windows 10 Pro

On some Windows 10 and 11 systems, especially Windows 10 Pro, the current version 3.0.0.0 of the com0com null modem emulator does not work properly. We have been successful with version 2.2.2.0 in this case. Observe the information in section "9.1 COM port~~COM port~~~~COM port~~". If you are unable to select the COM ports, exit the HCT Windows app and, if necessary, restart your CAQ software so that the newly available COM ports are recognized by the software. If you are not successful with the null modem emulator, please contact our customer service. The link to this can be found on our HCT website under this link https://ho7.eu/win-app-hct in the lower part of the page under "Would you like to get advice on HCT?".

Feldfunktion geändert

11.6 The COM port for data transfer is not found

Verify that you have installed a null modem emulator on your system and that it is working correctly. If you installed the null modem emulator or made changes to its settings while the HCT Windows app or target application was already running, exit it and restart it. This will re-read the port information and apply changes. Observe the information in section "9.1 COM port".

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