Control unit
Series X32
BE X32

Translation of original

Operating manual

Store for future reference

PLARAD® Torque & Tension Systems

Contents

1. Manufacturer

Maschinenfabrik Wagner GmbH & Co. KG
53804 Much, Deutschland
+49 (02245) 62-0

2. Documented Operation

(possible only in conjunction with control unit)

Documented hydraulic torque wrench/tensioner operation requires the use of a control unit (optional accessory). When creating your bolting applications using the PC software application "BE32.exe", make sure to create these bolting applications in the desired mode (torque, torque-angle, bolting or tensioner mode). You may not be able to use your power pack in all modes depending on the power pack you purchased!

2.1. Connecting the control unit

1. Connect the control unit tot he power pack using the „ Adapter cable – power pack“.

2. Connect the red port with the control unit.

3. Plug the blue connector into the corresponding port on the control enclosure of the power pack.
4. Connect the power pack to the mains supply.

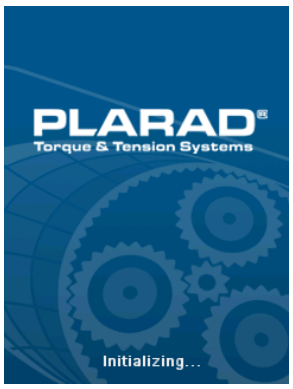
The control unit will be supplied with power for as long as it remains connected to the power pack. Its battery, however, will not be charged. Use the included docking station to recharge the battery pack. The docking station must be connected to the power supply unit for this purpose.

On a fully charged battery, the control unit can run for approx. 2 hours without a connection to an external power supply.

2.2. Putting the control unit into service

1. Press the OK button to turn the unit on:

The control unit initialises. The following screen will appear after a few seconds:



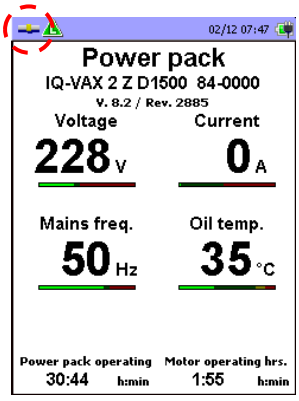
If the control unit has never been synchronised with a PC, the following message will be displayed:

2. In this case, you will have to synchronise the control unit with a PC first to set its clock. Repeat the start-up process afterwards.

3. If this message pops up for a control unit that has already been synchronised, the battery of the internal clock is defective and should be replaced by Maschinenfabrik Wagner or one of its authorised service partners.

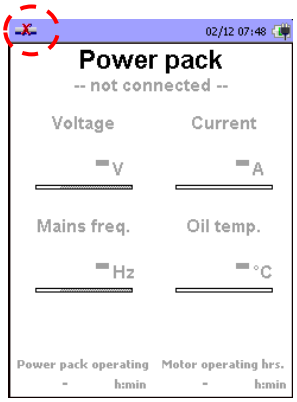
4. Once the data link between control unit and power pack has been established, the "Power pack" menu will appear, showing such information as the type and the serial number of the power pack that is connected to the control unit.

   A proper connection between power pack and control unit is indicated by the following icon:



   The top right corner of the header holds the charging status of the control unit battery. When the control unit is connected to the docking station or the power pack, an additional connector icon will indicate this connection (supply by an external power supply).

   A faulty connection between power pack and control is indicated as follows:



5. Check the connection between power pack and control unit and correct it if necessary.

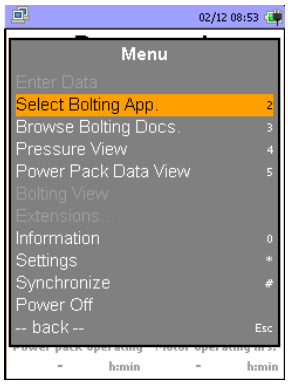
2.3. Using the control unit to control tensioning (D1500 dual power packs only)

Preparation

For information on how to create and transfer bolting applications to the control unit.
The control unit will not be ready for tensioning unless the bolting applications have been previously transferred from the PC.

1. Press the button ○ on the control unit to call up the main menu of the control unit.

2. Use the buttons ▲ / ▼ to select the child menu "Bolting Application Definitions" and confirm your selection by pressing OK.



An overview with lists of available bolting applications appears.

3. Use the buttons ▲ / ▼ to select the desired list and press OK to confirm your selection.

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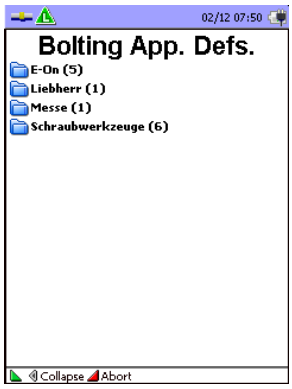
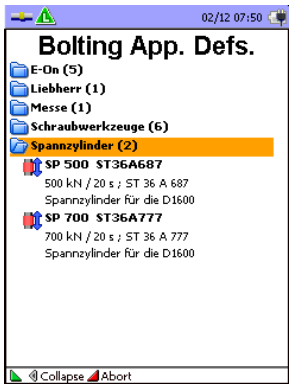
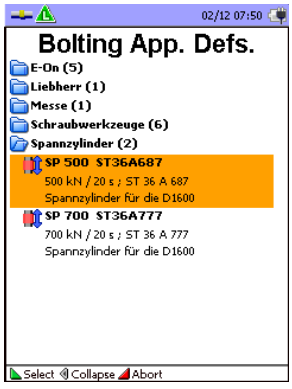


The list you selected appears.



4. Use the buttons ▲ / ▼ to select the desired bolting application and press OK to confirm your selection.

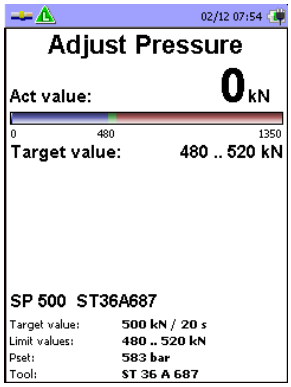


5. You can only select bolting applications which have previously been transferred from the PC to the control unit and stored in the lists of bolting applications. Make sure to select a bolting application on the control unit that has been created in tensioner mode. Corresponding bolting applications are marked with the following icon:

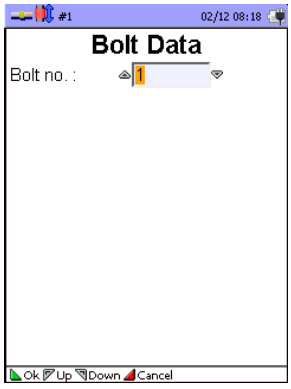
Once the bolting application has been selected, the associated parameters will be transmitted to the power pack.

6. Use the pressure relief valve to adjust the pressure in order to set the value for the pretensioning force in kN that is displayed on the control unit.

   You will not be able to adjust the pressure using the control unit unless you enabled pressure adjustment mode by pressing the button "automatic" and the red button at the same time. When finished adjusting the pressure, press this button combination again to exit pressure adjustment mode and send a message to the control unit that the required pressure has been set.



The control unit displays the data input window:



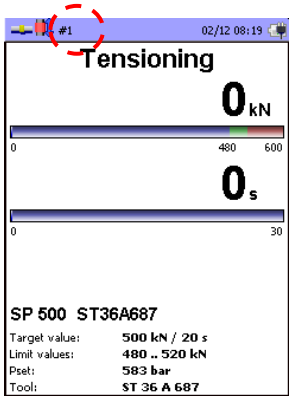
You can use the child menu "Bolt Data" to enter data about the bolting in six free text fields (e. g. operator's name, operator's ID, work piece designation, etc.).

You can use the button #↑ to toggle between lower and upper case letters resp. numbers.

The illustration below shows that the user created only one field named "Bolt no."

Use the included PC software application to define the number and designation of the fields. The control unit does not allow you to make any changes. All you can do is enter data in the fields provided you selected a bolting application beforehand.

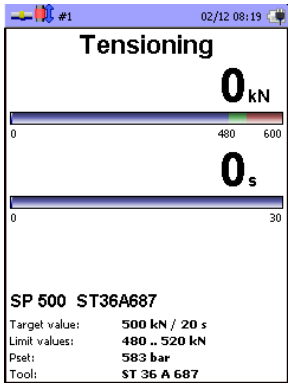
Press the button OK to confirm your entries and have the control unit display the selected bolting application. You will find the number of the next bolting (see mark) at the top of the display:



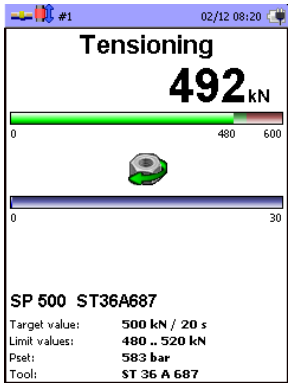
When the tensioner has been connected to the hydraulic hose, the system is ready for the documented operation of the tensioner.

Tensioning process

1. Press and hold the "automatic" button on the remote control to start the documented tensioning process. The pressure build-up is displayed on the control unit:



Keep the button depressed until the green and the red indicator light on the remote control light up permanently at the same time. The generated tensioning force is within the tolerance limit, which is indicated by the control unit as follows:



The remote control display will show the following screen:

2. Tighten the fastener.

3. If you use the control unit, the power pack will also repump in each case if the generated pressure drops again as a result of, for instance, setting losses.

4. Relieve pressure from the tensioner after tightening the fastener:

- Press the green button on the remote control.

Documentation of the tensioning process

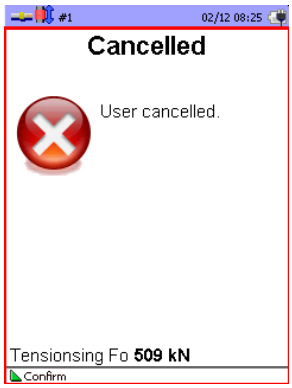
The control documents the pressure measured immediately prior to the depressurisation as a result of the bolting process.

If the tensioning process was completed successfully, the control unit will display the following message:

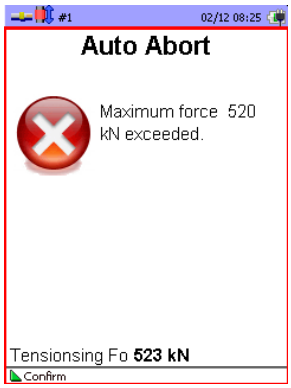
You will not have to press the OK button to acknowledge the completion message if the tensioning process was completed successfully. You can proceed immediately with the next tensioning process. The number of the bolting is counted up automatically.

Faulty tensioning process

If you cancel the bolting process by pressing the red button on the remote control, the control unit will display the following message:



Other error messages, which will be displayed if, for instance, the maximum permissible tensioning force was exceeded by an inadvertent adjustment of the pressure adjusting valve, will also be shown as clear text messages:

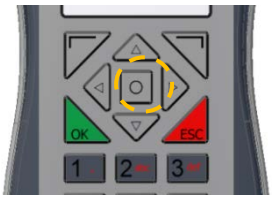


If an error message has occurred, the number of the bolting will not be counted up automatically.

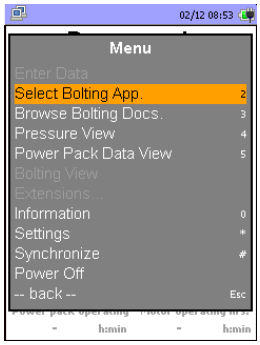
2.4. Using the control unit to control the bolting process

This type of use requires that you select a bolting application in the menu "Bolting Application Definitions" that has been created in torque mode or torque-angle bolting mode. Please note that torque-angle bolting applications cannot be completed unless you are using a power pack that is suitable for this purpose! The control unit will detect whether the connected power pack is capable of performing torque-angle bolting applications. If the power pack is not designed for such applications, any torque-angle bolting applications stored on the control unit may be greyed out.

1. Press the button on the control unit to call up the main menu of the control unit.

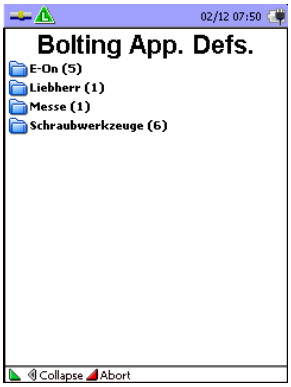


2. Use the buttons / to select the sub menu "Bolting Application Definitions" and confirm your selection by pressing OK.



3. An overview with lists of available bolting applications appears.

4. Use the buttons / to select the desired list and press OK to confirm your selection.



5. The list you selected appears.

6. Use the buttons / to select the desired bolting application and press OK to confirm your selection.

You can only select bolting applications which have previously been transferred from the PC to the control unit and stored in the lists of bolting applications.

Once the bolting application has been selected, the associated parameters will be transmitted to the power pack.

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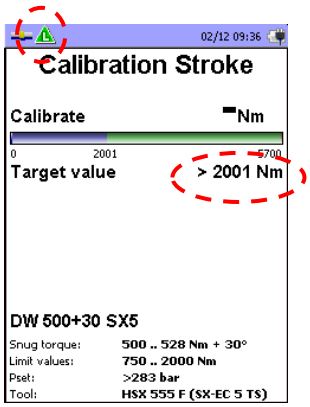
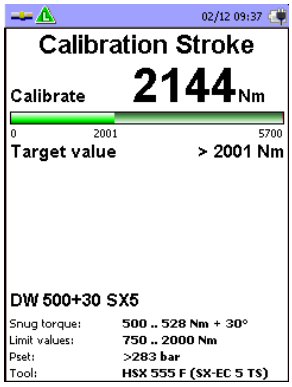
7. When you have selected a bolting application, the screen "Calibration Stroke" will appear.

f the calibration pressure matches a bolting pressure that may have been calibrated previously and you are using the same hydraulic tool, the screen "Calibration Stroke" will not be displayed as no calibration is necessary, and you will be able to start bolting right away. If the power pack needs calibrating, the marked icon in the status bar will indicate that calibration is required.



8. Use the hydraulic hose to connect the hydraulic torque wrench to the power pack. Proceed by adjusting the pressure: **When performing torque bolting applications, you must use the pressure relief valve on the power pack to set precisely the same pressure ("target value") that corresponds to the torque displayed.** If torque/angle bolting applications have been selected, the torque displayed by the control unit is a minimum value. You need to set the power pack to a pressure of your choice provided it corresponds to a torque that exceeds the minimum value.

9. While adjusting the pressure, watch the increase of the resulting torque on the control unit:



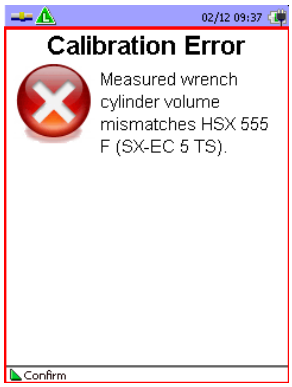
Example Torque-Angle Bolting Application – Value of the set pressure corresponds to a torque of 2,144 Nm, thereby exceeding the target value of 2,001 Nm => result is OK.

If the necessary pressure has been set properly, the bar display indicating the torque is green.

Attention!

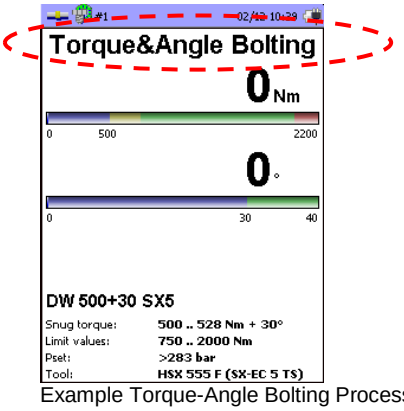
Never set the power pack to a pressure that exceeds the maximum permissible operating pressure of the connected hydraulic torque wrench!

10. Proceed by completing the calibration process.
11. Any error occurring during calibration will be indicated by an alternating blinking of the indicator lights on the remote control as well as a clear text message on the control unit (see chapter4) .



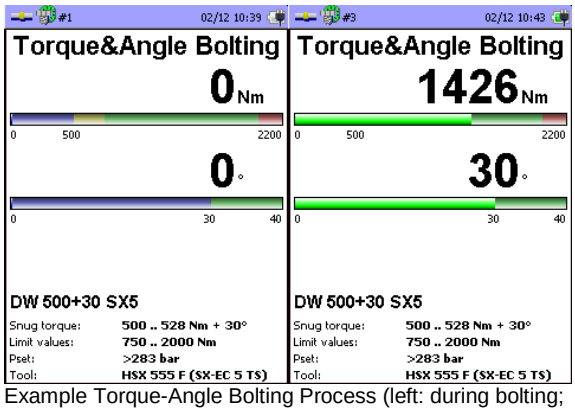
12. Calibration must be repeated once the cause of the error has been eliminated. A properly progressing calibration process is indicated by the switching of the green indicator light on the remote control from blinking to permanent light.

13. After successfully undergoing calibration, the power pack is prepared for automatic bolting processes and their documentation on the control unit. Also, following successful calibration, the control unit will display the corresponding bolting screen which indicates the bolting process associated with the bolting application (torque or torque-angle bolting):



Example Torque-Angle Bolting Process

The bolting process is completed as described. While bolting is undergoing, the control unit will indicate the progress of the bolting process. The control unit indicates the increase in torque during torque bolting, while only initially indicating the increase in torque for torque-angle bolting processes. The control unit will indicate the increase of the tightening angle once the torque angle bolting process has reached the snug torque:

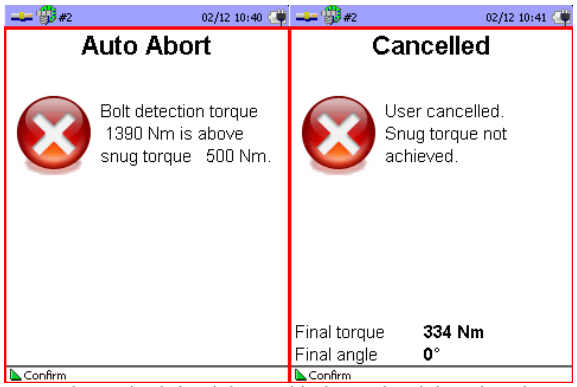


Example Torque-Angle Bolting Process (left: during bolting; right: when the bolted connection has been completed)

When a bolting process has been completed successfully (torque bolting: torque has been reached within the allotted time frame; torque-angle bolting: tightening angle has been reached, and the torque corresponding to the tightening angle is within the tolerance limit stored in the bolting application definition), the following message will be displayed including the parameters that have been reached (here: the generated torque):

Before shifting the position of the hydraulic torque wrench, you should switch off the power pack by pressing the red switch on the side. You can place the hydraulic torque wrench onto the next bolting and bolt it down without the need to acknowledge the information on the control unit that has been reported to the control unit by the power pack. The active bolting counter is increased by one (the control unit keeps "counting" automatically). The evaluation of whether the bolting operation was completed properly is performed automatically by the system. The bolt data (operator's name, etc.) are also stored automatically for the next bolting unless they were changed (e. g. during a shift change).

If the system discovered an error during the bolting process, it will issue a corresponding error message.

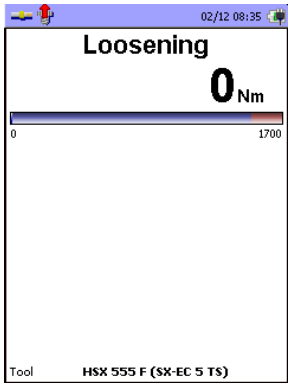


Example on the left: Tightened bolt; on the right: Abort by user

This may happen, for instance, if the user tries to retighten an already tightened bolt or inadvertently let go off the "automatic" button during the automatic bolting process. Such an error message must always be acknowledged on the control unit, the bolting number is not increased by one automatically, and the bolting process can be repeated.

2.4.1. Loosening

To loosen bolts with the control unit connected, proceed in the same way as without the control unit connected. The control unit will display the following screen:

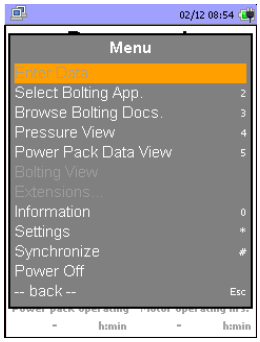


2.5. Additional features of the control unit

2.5.1. User data input

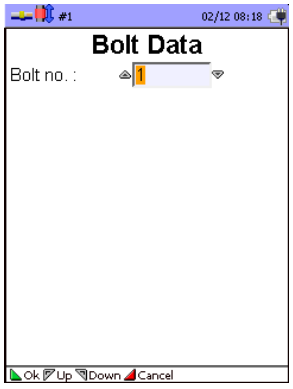
1. To modify the data that was entered after the pressure adjustment (e. g. operator's name during a shift change), you can open the menu "Enter Data" manually as well. The control unit must be connected with the power pack for this purpose! The power pack must be connected to the mains supply! Press the button on the control unit to call up the main menu of the control unit.

2. Use / to select the child menu "Enter Data" and press to confirm your selection.



3. You can use the submenu "Enter Data" to enter data about the bolting in six free text fields (e. g. operator's name, operator's ID, workpiece designation, etc.) that complement the field "Bolt no.", which will always remain in place, or overwrite existing entries.

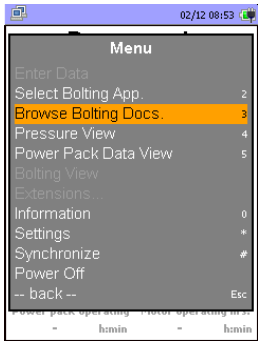
   The illustration below shows that the user did not create another field apart from the field "Bolt no."



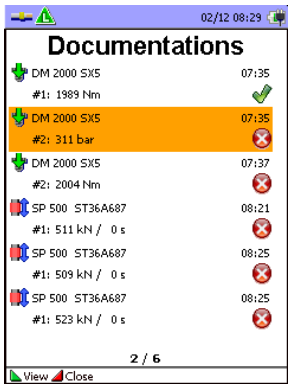
   Use the included PC software application to define the number and designation of the fields. The control unit does not allow you to make any changes to the field names. All you can do is enter data in the fields provided you selected a bolting application beforehand.

2.5.2. Viewing documentation and data

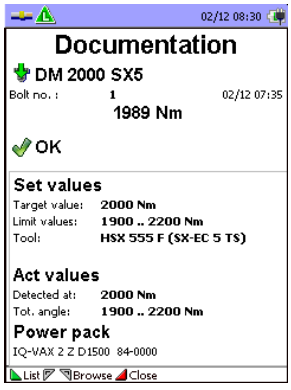
The submenu "Browse Bolting Docs." provides a list of the completed bolting operations. To open this menu, select the submenu "Browse Bolting Docs." in the main menu.



To view a documentation, browse through the submenu "Browse Bolting Docs." using the buttons / and select the highlighted record by pressing OK.

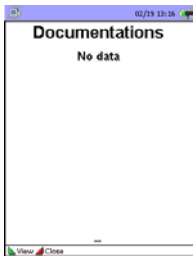


The record contains all data relating to this bolting operation including date, recorded pretensioning force / recorded torque or snug torque and tightening angle, tensioner / hydraulic torque wrench used, bolting designation, etc.



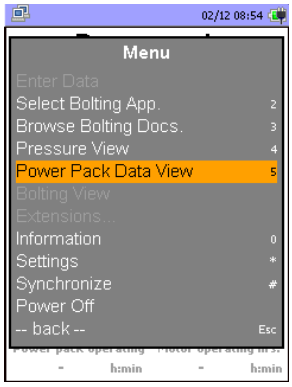
Use the buttons / to navigate to the next or the previous record in the detailed view.

If no data are available, the following message will appear:

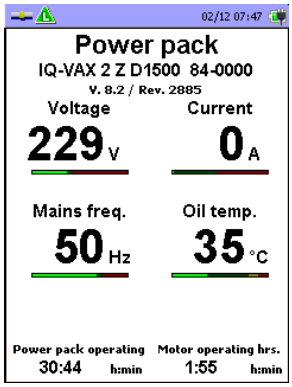


2.5.3. Viewing power pack data

The submenu "Power Pack Data View" allows you to view the data of the power pack that is connected to the control unit. To open this menu, select the submenu "Power Pack Data View" in the main menu.

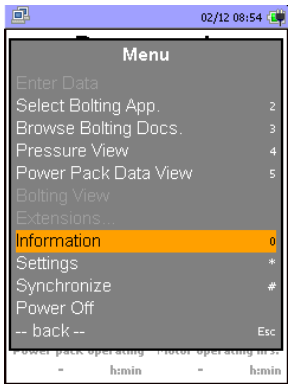


The control unit shows the current data of the power pack:

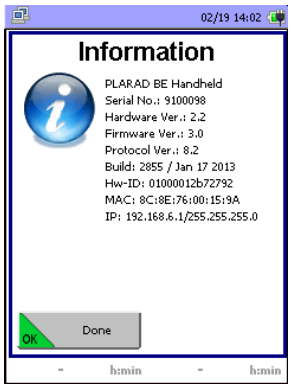


2.5.4. Viewing data about the control unit

To open this menu, select the submenu "Information" in the main menu.



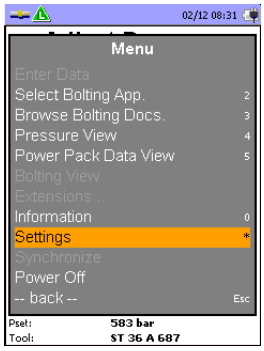
The submenu "Information" lets you view all data relating to the control unit.



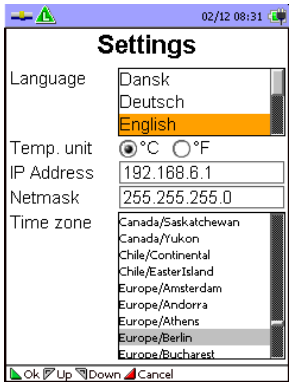
Exit the menu by pressing OK.

2.5.5. Modifying settings

You can open the submenu "Settings" by pressing OK in the main menu.



You can alter the following settings in the submenu "Settings": Language, temperature unit (degree Centigrade / Fahrenheit), and time zone; if using the control unit on a network, you can also adjust the IP address and the netmask.



1. Press either of the two buttons / on the control unit to toggle between language, temperature unit and the netmask and IP address input fields.

2. Change language and temperature unit using and / and .

3. Change the IP address and the netmask using the numeric keys on the control unit:

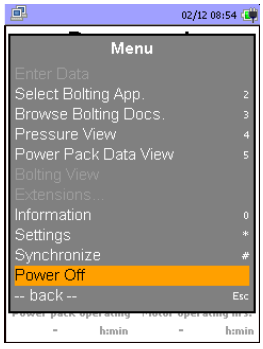
   - Select "IP Address" / "Netmask" using / . The status bar of the display will show the icon 123. The buttons on the control unit have now been switched to numeric mode.
   - Enter IP address / netmask.

4. Press OK to confirm your entries.

5. Press ESC to cancel the process.

2.6. Powering down the control unit

To power down the control unit, select the submenu "Power Off".



2.7. Data exchange between PC and control unit

You will not be able to use the control unit with the power pack unless you have previously transferred bolting application data from the PC to the control unit.
Only the included PC software application allows you to create or modify bolting applications. This ensures that the operator will not be able to manipulate the parameters of the bolting application later on.
Connect the docking station to your PC either directly using a network cable or with the included network adapter.

Both cases require that an administrator set up a network connection. You will find the associated documentation on the CD in the folder "Docu."

When using the included network adapter (see included installation CD), you can connect the control unit to an available USB port on your PC.

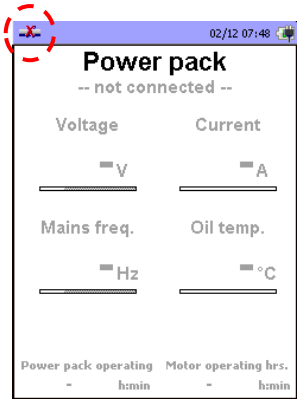
If you want to connect the control unit via a network, connect the control unit directly to the network you want to use using a network cable.

In each case, you must assign a valid IP address to the control unit or the network interface. Consult your network administrator if necessary.

Performing data exchange

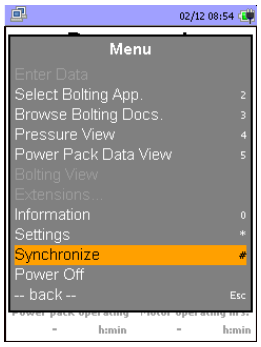
1. Insert the control unit into the docking station.

   If the control unit is connected properly to the PC via the docking station, the icon marked in the illustration below will confirm the correct connection.

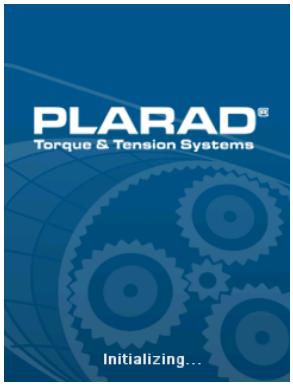


3. You can now synchronise the control unit with the PC. During this process, the bolting documentations (data of the completed bolting operations) will be trans-mitted to the database on the PC; at the same time, the selected bolting application definitions will be transferred from the PC to the control unit.

   To start the process, select the submenu "Synchronize" and press OK.



The following message will be displayed during synchronisation:



The following message will appear if the control unit is not properly connected to the PC or the synchronisation application is currently not running on the PC.

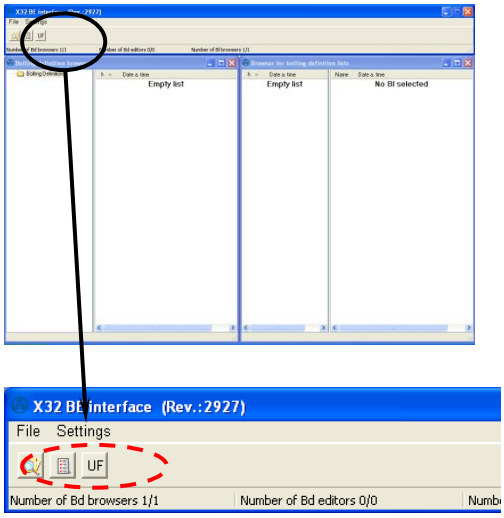
If this happens, you need to establish the connection or launch the synchronisation application "BE32Sync.exe" on your PC.

3. Creating / managing bolting applications

You create and manage bolting applications by using the PC software application "BE32.exe."

1. Install software and driver as described in the user's guide. You will find the user's guide and the software application on the software CD that is included with your control unit.
2. Launch the application "BE32.exe" (Start/Run).

The main window "X32 BE Interface", which is comprised of the "Bolting definition browser" and the "Browser for bolting definition lists", appears:



Buttons to open additional browsers and editors

3. If necessary, open additional bolting definition browsers, browsers for bolting definition lists or the "Editor for standard user fields." Click the correspond-ding icon to do so.

   The status bar indicates the current number of open browsers/editors.

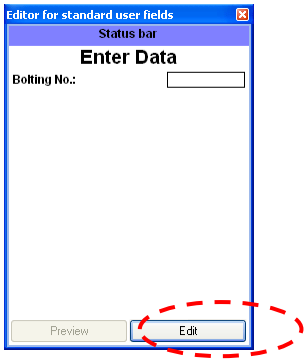
4. To control the browsers and editors, move the cursor into the workspace of the browser or editor.

5. Right-click to open the "context menu."

3.1. Creating user fields

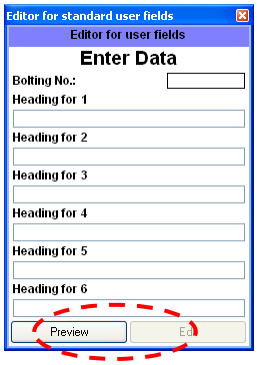
You can use the editor for standard user fields to define up to six free text user fields of your choice for your control unit. While using the unit for bolting, the operator can enter additional information into the fields that have been created with the help of this editor.

1. Open the editor for standard user fields by clicking on the icon "UF."



2. If necessary, switch to editor view by pressing the button "Edit."

3. Enter headings for the fields:



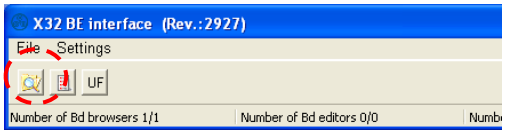
4. Switch to preview mode by pressing the "Preview" button and verify your entries. This allows you to check how the text you entered will be displayed on the control unit.
5. You can later store the template you created in a bolting application.

The user fields created in the example shown here are "Bolting", "Operator", "Flange number" and "Tower number." These specifications are stored during bolting along with the bolt data.

3.2. Creating/editing bolting applications

The bolting definition browser lets you create and manage bolting applications. You can also create a directory structure which allows you to store your individual bolting applications (e. g. sorted by machine types).

1. If necessary, open the bolting definition browser with a click on the "Browser with magnifier" icon:



The editor opens:

2. Right-click to open the context menu.

3. „Select "Create bolting application" and enter a name.

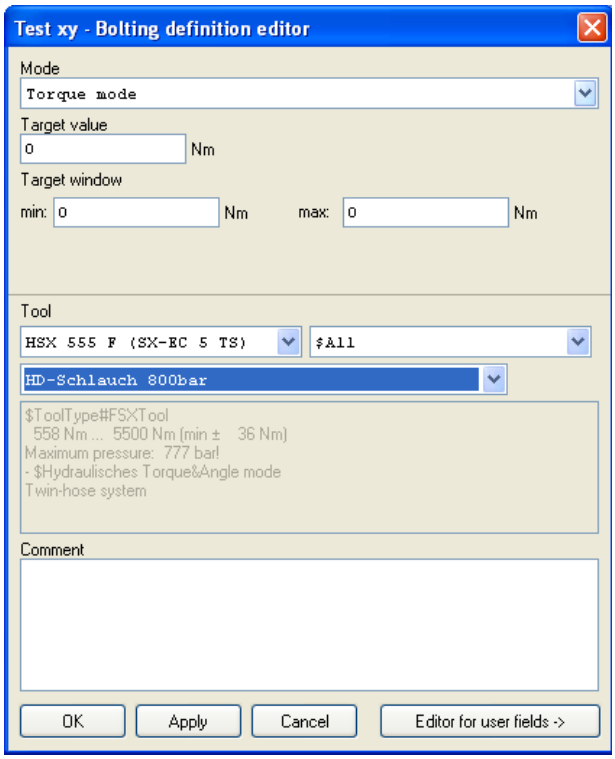
   The bolting application shows up on the list.

   A bolting application remains invalid until all data fields have been completed correctly and in full. In the mean- time, the following icon will remain in front of the name of the bolting application:

   ⚠

   When the bolting application has been created properly and in full, the name of the bolting application will be preceded by the associated bolting mode.

4. A double click on the bolting application (or selecting it using the context menu) will open the "Bolting definition editor."



5. Enter the bolting application parameters in the editor window including the required pretensioning force, the tool used, etc.

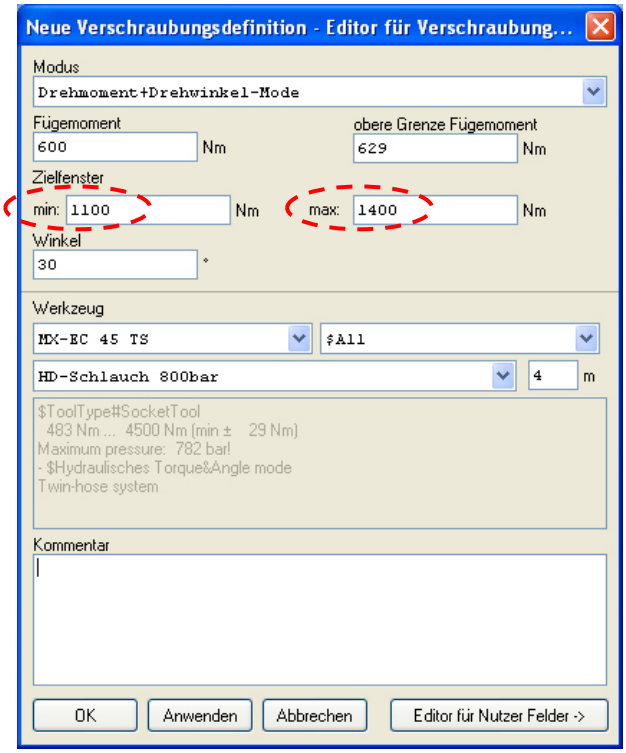
Note on the definition of the target window and the later setting the working pressure on the power pack:

a) Torque-controlled bolting:
The torque-controlled bolting method requires that you set the **exact pressure** on the unit. This ensures that the bolt will not be overtightened as the applied torque will correspond to the torque generated by the torque wrench in accordance with the torque table. The unit will already check during calibration whether the correct pressure expected by the BE32 is set to a value within the range of the corresponding tolerance window. Unless the pressure is set correctly, the unit will refuse calibration.

b) Torque-angle bolting:
This method requires that you set a pressure on the unit that is sufficient to provide for both the snug torque and the subsequent tightening angle. The pressure that needs to be set on the unit **must be greater than the pressure necessary to reach the user-defined maximum torque** of the target window (resulting from the application of the tightening angle). The bolt is prevented from being overtightened by means of two mechanisms.

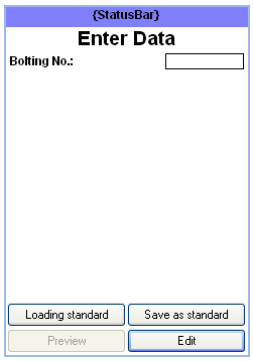
a. The unit will detect if the bolt was already tightened at the beginning of the bolting process. It is possible that the unit will fail to detect if the bolt is already tight on account of external influences (e.g. skipping a tooth on the ratchet system of the wrench when used on worn bolts, abrupt slippage of the reaction arm during pressure build-up when the arm is not applied correctly, etc.). This is due to the fact that the pressure curve will dip briefly in such cases. This phenomenon is associated with the external factors mentioned above, i.e. it cannot be attributed to a malfunction of the unit.

b. The second safeguard against overtightening is provided by a torque window (upper and lower target torque after the snug torque and the tightening angle have been applied) for which you can set reasonable values.



This means that, if mechanism a. – as described above – fails to take effect, the unit will constantly check the current system pressure and compare it with the pressure that corresponds to the upper, expected overall torque. The unit will terminate the bolting process upon reaching this pressure and indicate a corresponding error message. If the upper torque target / its corresponding pressure is defined based on reasonable values, the bolt is protected against overtightening.

6. If needed, bring up the "Editor for user fields" by clicking the associated button. (For more information.

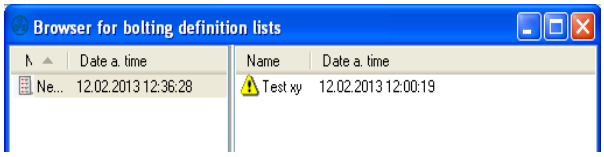


7. If you wish to store the user field definition as default (as a template for other bolting applications), click on the button "Save as standard."
8. If standard user field definitions have already been created, click on "Loading standard" to load the standard definition..

3.3. Creating bolting definition lists

You can use the browser for bolting definition lists to compile application-specific lists that are based on the bolting applications you created.

1. Open the browser for bolting definition lists by clicking on the "List" icon.
2. Right-click to open the context menu.
3. Select "Create bolting definition list" and enter a name.
4. Drag and drop the desired bolting applications from the browser for bolting definition lists to the selected list.



If you apply the default setting, all available bolting definition lists will be transmitted to the connected control unit during synchronisation. Note, however, that any invalid bolting applications that may be contained in these bolting definition lists will not be included in the transfer!

3.4. Managing documentation data

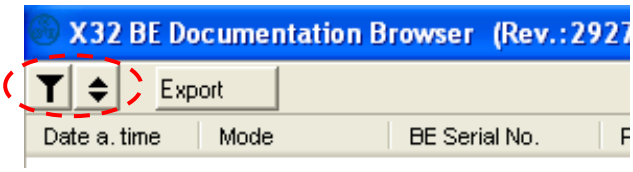
The bolting documentations stored in the control unit will be saved to the PC database every time you sync control unit and PC.

The bolting documentations will be erased from the control unit after each successful transmission.

Use the application "DrExplorer.exe" to view and manage the bolting documentations that are stored on the PC. This application displays the bolting documentations in a table and allows you to filter, sort and export them.

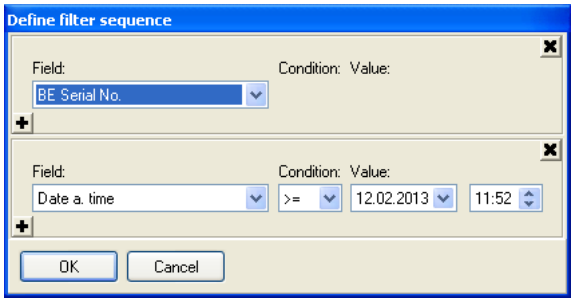
1. Lunch the application "DrExplorer.exe" (Start/Run).

   The application window opens:

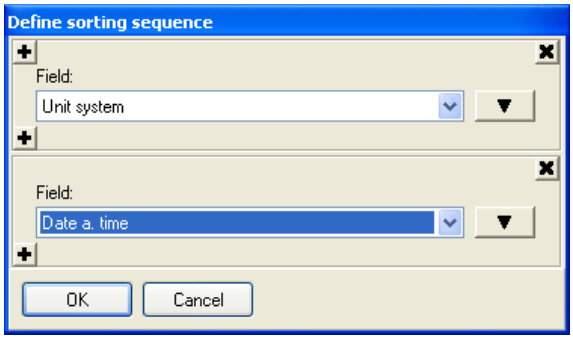


2. Click on the icons shown above to select the functions Filter or Sort.
3. Right-click to open the context menu.

The dialog box that lets you define a filter or a sort sequence opens. You can enter a maximum of five filter and sorting criteria.

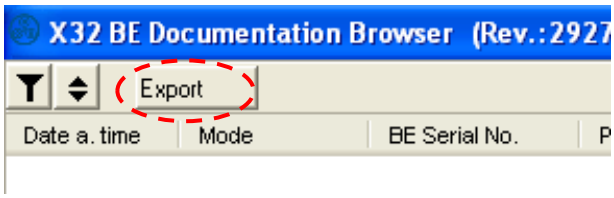


The filter in this example sorts results by the serial number of the control unit and date/time

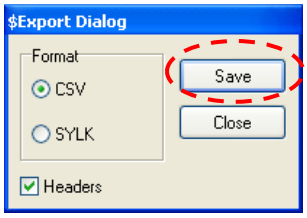


In this example, the results are sorted first by bolting mode (descending) and then by date/time (ascending)

To export data, click on the Export icon:



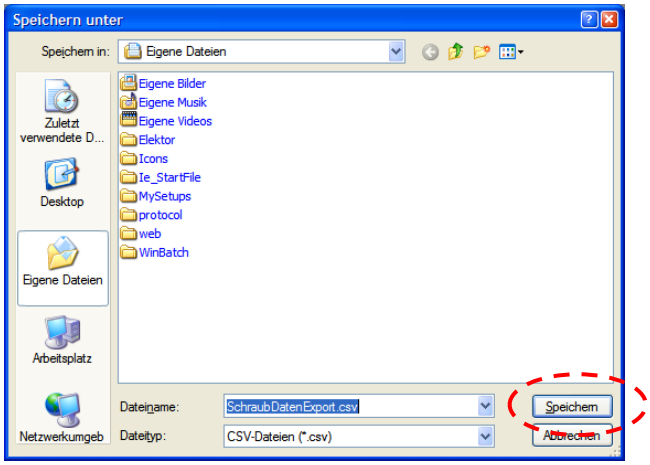
In the following dialog box,



you can define the file format.

After selecting the file format, click on the Save button marked in the illustration above.

The following dialog box appears:



Use this dialog box to specify the file name and the path under which you wish to save the file and finish saving by clicking on the Save button that is marked in the illustration above.

Only the data previously selected by the filter will be exported. The data is transferred in the order that you specified by applying your sorting criteria.

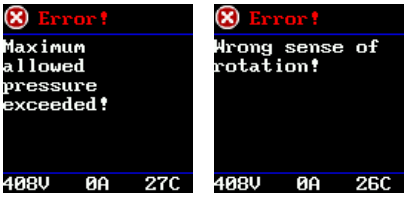
4. Error messages

Internal errors

Example of an internal error message

Once connected via the power plug, the power pack will perform a self-test. The self-test starts by displaying internal error messages which will disappear once the test has been completed successfully.
While the self-test is in progress, the remote control may show error messages for a brief period of time. If these error messages are still indicated when the self-test is completed, the power pack needs to be turned in for service.

Clear text error messages
Errors that can be corrected by the user are displayed as clear text messages:



Examples of user errors

5. Remote control display

The status bar may display the following icons. The green LED will be on at the same time

 Menu

 Tensioner mode without automatic repumping

 Tensioner mode with automatic repumping

 Error

 Pressure adjustment mode enabled (1,500 bar tensioner mode) or calibration required (800 bar bolting mode)

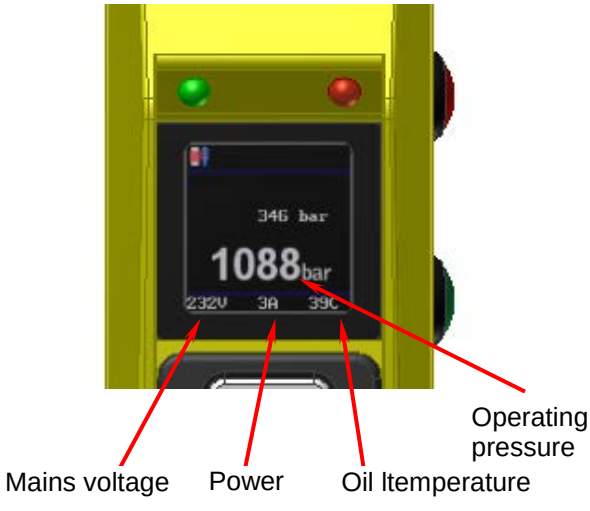
 Torque mode

 Loosening mode

 Torque-angle bolting mode

The following icon may be displayed along with the red LED.

 Connected to PC or control unit



6. Indicator lights on the remote control

Blinking frequency	Function of IQ VAX D1500 with control unit in tensioner mode up to 1,500 bar	Function of IQ VAX D1500 without control unit in tensioner mode up to 1,500 bar
Green indicator light is lit permanently	Power pack is set to tensioning mode. **Function 1:** Power pack is ready for tensioning (you may still have to set the pressure that matches the bolting application!) **Function 2:** The tensioning process was completed correctly, i. e. the documented pressure stayed within the tolerance limit that was specified by the control unit.	Power pack is set to tensioning mode. **Function 1:** Power pack is ready for tensioning (you may still have to set the pressure that matches the bolting application!) **Function 2 (only with Automatic Repump Mode disabled):** The tensioning process was completed correctly, i. e. the set pressure was delivered by the power pack.
Green indicator light is blinking slowly	Power pack is set to pressure adjustment mode.	Power pack is set to pressure adjustment mode.
Green indicator light is blinking rapidly	Power pack is set to tensioning mode. Rapid blinking is always an indication of an ongoing process, e. g. the power pack is starting up or pressure is being built up during the tensioning process.	Power pack is set to tensioning mode. Rapid blinking is always an indication of an ongoing process, e. g. the power pack is starting up or pressure is being built up during the tensioning process.
Red indicator light is blinking	Tensioner is being relieved.	Tensioner is being relieved.
Red and green indicator light are blinking alternatingly	An error has occurred.	An error has occurred.
Red and green indicator light come on permanently at the same time	Tensioning is enabled. Target pressure was reached. Bolt can be added. Automatic repumping may occur in the meantime!	**In Automatic Repump Mode only:** Tensioning is enabled. Target pressure was reached. Bolt can be added. Automatic repumping may occur in the meantime!

Blinking frequency	Function of IQ VAX with control unit in standard mode up to 800 bar	Function of IQ VAX without control unit in standard mode up to 800 bar
Green indicator light is lit permanently	Bolting system is set to tightening mode. **Function 1** following calibration if calibration was OK **Function 2** following the bolting process if bolting process was OK and the documented pressure stayed within the tolerance limit that was specified by the control unit.	Bolting system is set to tightening mode. **Function 1** following calibration if calibration was OK **Function 2** following the bolting process if bolting process was OK
Green indicator light is blinking slowly	Bolting system is set to tightening mode. While bolting system is starting up. Calibration has not yet been performed.	Bolting system is set to tightening mode. While bolting system is starting up. Calibration has not yet been performed
Green indicator light is blinking rapidly	Bolting system is set to tightening mode. Rapid blinking is always an indication of an ongoing process inside the bolting system, e. g. the power pack is starting up or the bolting process is in progress.	Bolting system is set to tightening mode. Rapid blinking is always an indication of an ongoing process inside the bolting system, e. g. the power pack is starting up or the bolting process is in progress.
Red indicator light is blinking slowly	Bolting system is set to loosening mode. Calibration has not yet been performed.	Bolting system is set to loosening mode. Calibration has not yet been performed.
Red indicator light is blinking rapidly	Bolting system is set to loosening mode. Rapid blinking is always an indication of an ongoing process inside the bolting system, e. g. the power pack is starting up or the loosening process is in progress.	Bolting system is set to loosening mode. Rapid blinking is always an indication of an ongoing process inside the bolting system, e. g. the power pack is starting up or the loosening process is in progress.
Red indicator light is lit permanently	Bolting system is in loosening mode after calibration is complete and calibration is OK	Bolting system is in loosening mode after calibration is complete and calibration is OK
Red and green indicator light are blinking alternatingly	An error has occurred	An error has occurred

7. Membrane keyboard of the control unit

8. Display of the control unit

The connection status can be indicated by the following icons:

Control unit not connected to the power pack

Control unit connected to the power pack

Control unit has data link to PC

The power pack status can be indicated by the following icons:

Tensioner mode

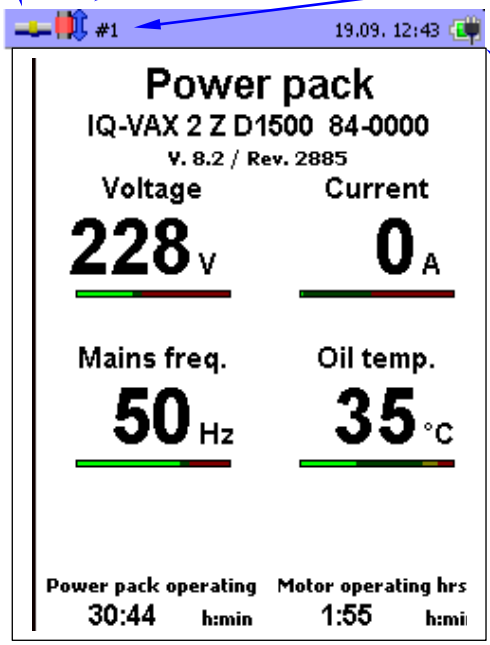
No bolting application transmitted

Torque mode

Loosening mode

Torque/angle bolting mode

Calibration required



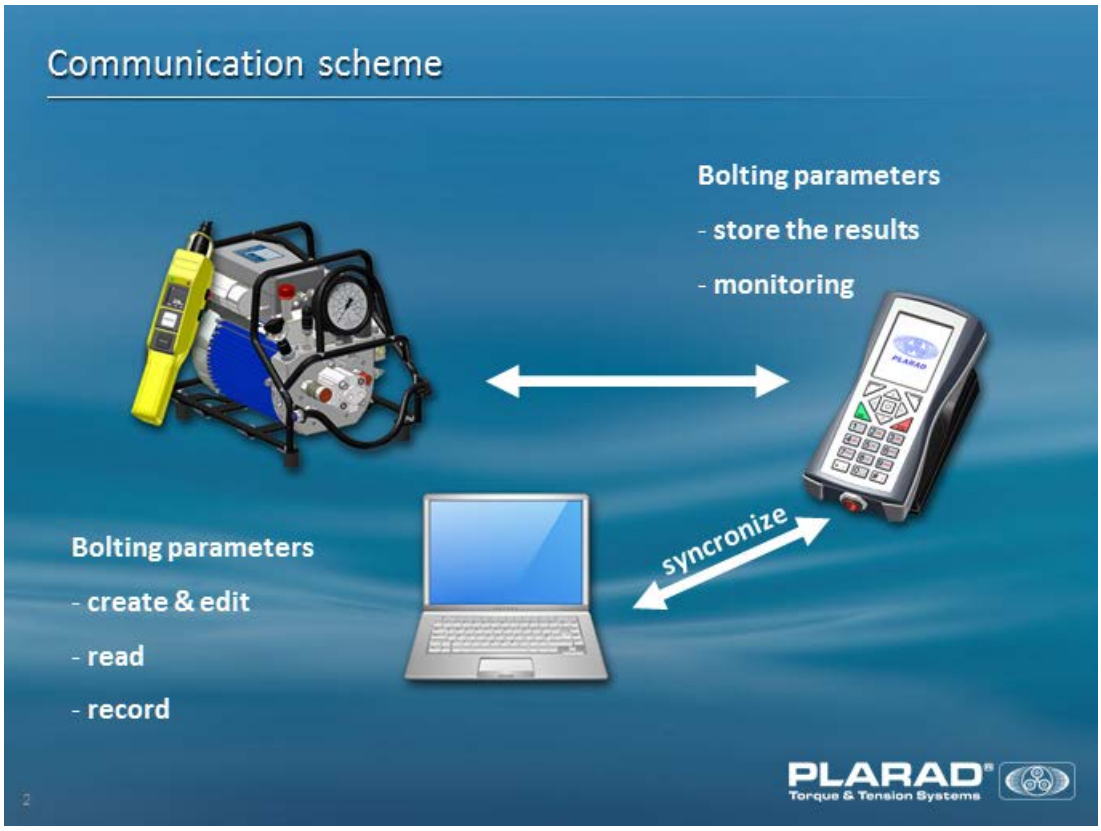
Indication of the current bolting number

Battery charging status / mains supply

Footer


Status line of handheld
The status line
01.09. 16:05
Connected
Non connected
Battery full
Battery empty
Bolting case loaded, teaching
Manual mode
Torque mode
Torque-/ angle mode
Untighten
Tensioner 1600 bar
Drücke
PLARAD
Torque & Tension Systems

8.1 Communication scheme



8.2 Connecting the Hardware

9. Instructions on disposal

Dispose of the control unit as required by local regulations.

Attention!

This symbol points out that the product must not be disposed of with regular household waste as specified in the WEEE directive (Waste Electrical and Electronic Equipment Directive, 2002/96/EC) and national laws.

- **Dispose of this product at an authorised waste collection facility. Return the product if, for instance, purchasing a similar product or take it to a waste collection facility that is authorised to recycle waste electrical and electronic equipment.**
- **Turn to your local administration office, your public waste disposal authority, a facility that is authorised to dispose of waste electrical and electronic equipment or your waste management company.**

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