Application Note

FESTO

YHBP - Servo-pneumatic Balancer Kit Software Update and backup

This Application Note explain the update process of the application software of the CECC-D-BA Balancer controller.

And the backup and restore function of the configuration-files.
Reading of log-data.

YHBP-...

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1 Components/Software used

Type/Name	Software/firmware version	Date of manufacture
Servo-pneumatic balancer kit	General	--
Application software YHBP (GSAY-A8-F0-Z4-1.0)	0.62.0	--
Firmware controller (CECC-D-BA)	1.4.0	--
Festo Field Device Tool	V2.9.6.56066	--

Table 1.1: 1 Components/Software used

2 Description of the application

This application note explains the software update of the CECC-D-BA and the backup and restore of existing configuration files on the controller.

2.1 Additional application notes

Apart from this application note, other application notes on commissioning and safety functions are also available:

Name	Contents
YHBP - Servopneumatic Balancerkit - Operation	Explanation of the operating modes of the servo-pneumatic balancer: - Normal operation - User-specific special functions: - Monitoring functions (not safety-oriented) - Sample applications
YHBP - Servo-pneumatic Balancer Kit - Commissioning	Explanation of the commissioning steps for the servo-pneumatic balancer kit.
YHBP-Servo pneumatic Balancer Kit - SLS-SSC-PLb-CatB	Application note for the servo-pneumatic kit for implementation of Safely Limited Speed (SLS) and Safely Stop and Close (SSC) with PL b, Category B
YHBP - Servo pneumatic Balancer Kit - SLS-SSC-PLd-Cat3	Application note for the servo-pneumatic kit for implementation of Safely Limited Speed (SLS) and Safely Stop and Close (SSC) with PL d, Category 3

Table 2.1: Additional application notes

3 Basic information

3.1 Required software-tools

To perform a successful update of the application software, the Festo Field Device Tool is required.

This can be downloaded from the Festo Support Portal (www.festo.com/sp).

For the automatic installation script (.bat-file) attached to the application software to work correctly, the Field Device Tool must be installed to the default path (C:\Program Files (x86)\Festo\FFT).

3.2 Access to web visualisation

Web visualisation is accessed with any web browser (Internet Explorer is recommended) via the IP address of the device in the following format: http://‹IP-Adresse›:8080/webvisu.htm.

The default address is http://192.168.2.20:8080/webvisu.htm, but it can be changed with the Festo Field Device Tool if access to multiple balancers in one network is required.

The computer used for access must have a fixed IP address (e.g. 192.168.2.1).

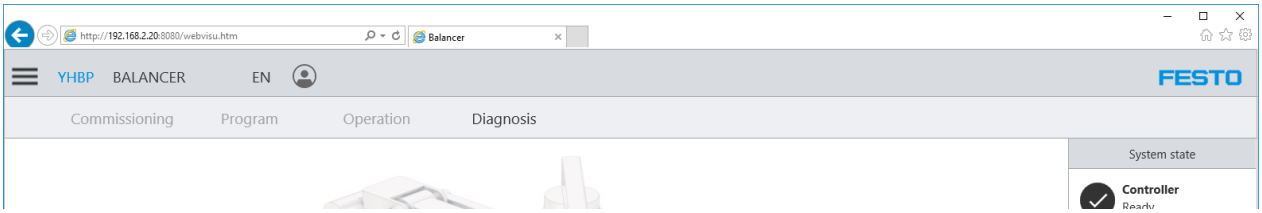


Figure 3.1: Access to web visualisation

After input of the IP address, the start screen opens with some basic information.

Information on diagnostics and the current status of the system can be viewed without having to log in.

Access to other data requires users to log in by clicking on the following symbol:  .

The log-in data for a service technician is:

- User name: Service
- Password: Service (default)

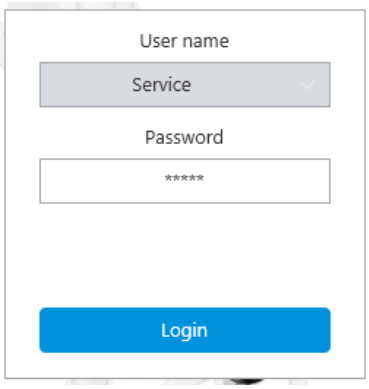


Figure 3.2: Login dialogue

4 Update of the application software

There are two ways to do the update:

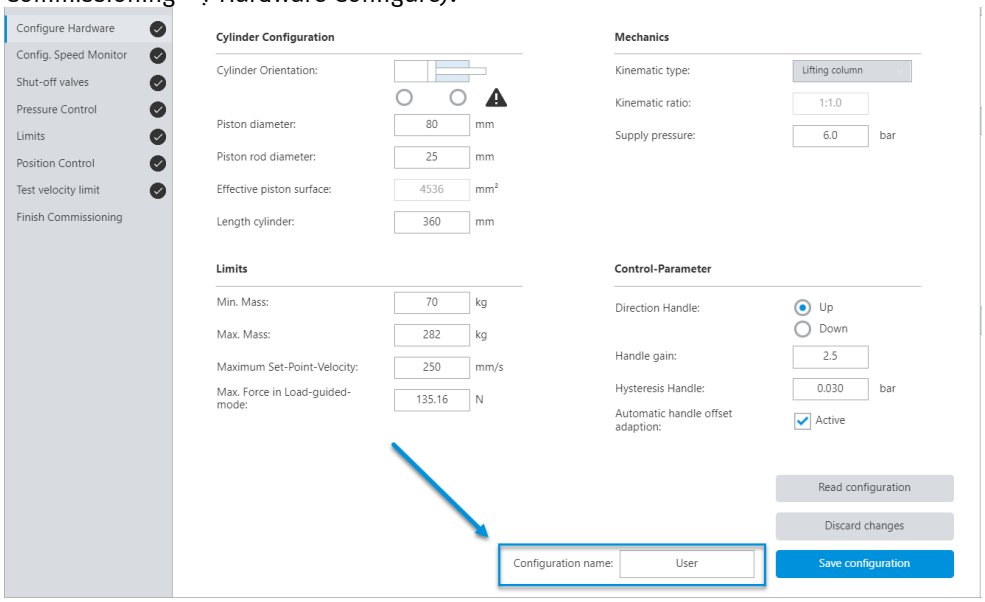
1. Automatic update with the automatic script file
2. Manual update via the Festo Field Device Tool

If possible the first way should be used to do the update.

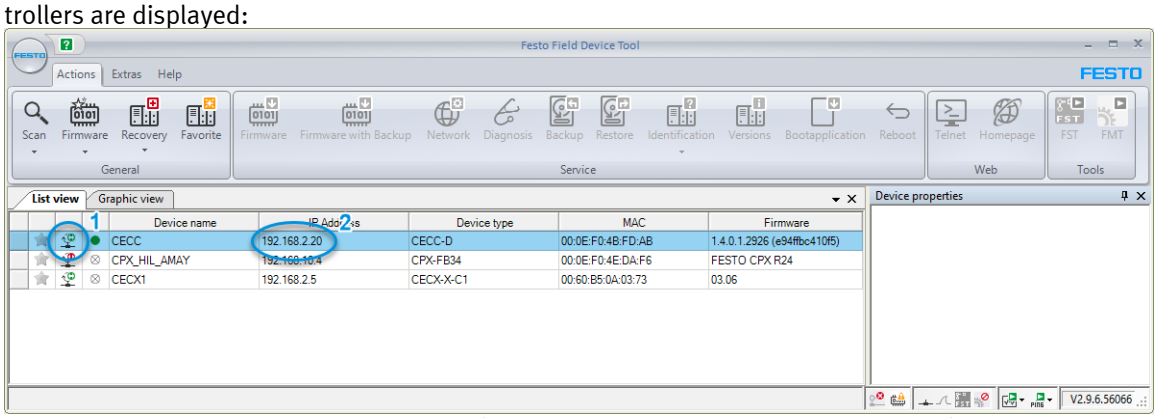
In order to establish a connection to the controller, a static IP address (e.g. 192.168.2.100, Sub-Net-Mask: “255.255.255.0”) must be set. This is done via the LAN adapter settings of the PC.

4.1 Update with the automatic script file

1. Note the name of the current configuration-file on the CECC-D-BA. It can be found in the Webvisu under Commissioning ⇢ Hardware Configure):



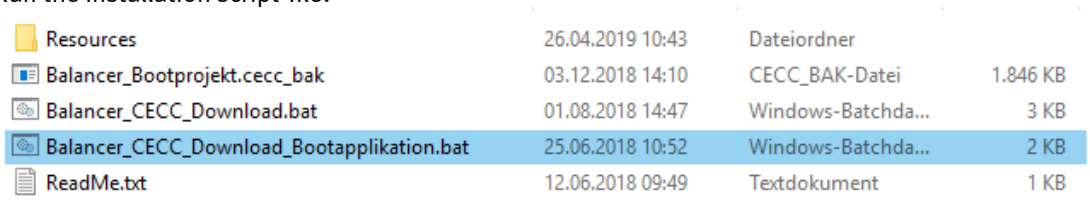
2. Determine the IP address of the controller. After opening the Festo Field Device Tool, all available controllers are displayed:



1: Connection to the controller is possible (IP address of the computer is set correctly)
2: IP address of the controller

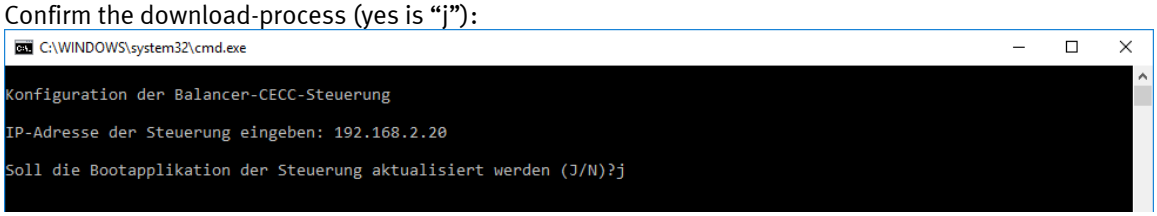
3. Close the Festo Field Device Tools.

4. Run the installation script-file:

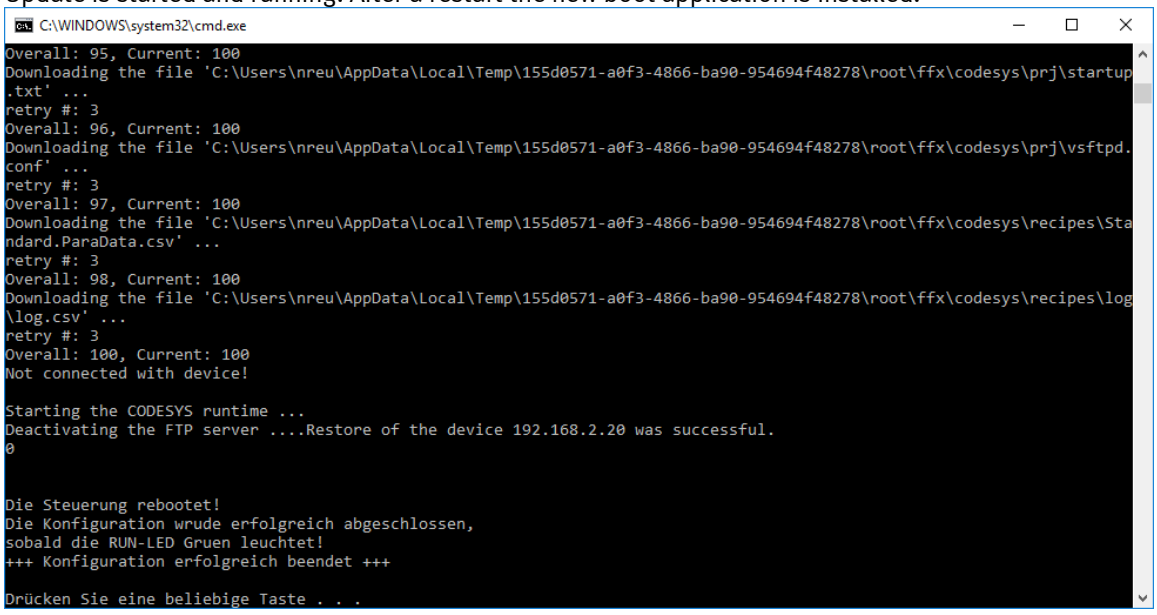


5. Input the IP-address of the Controllers:

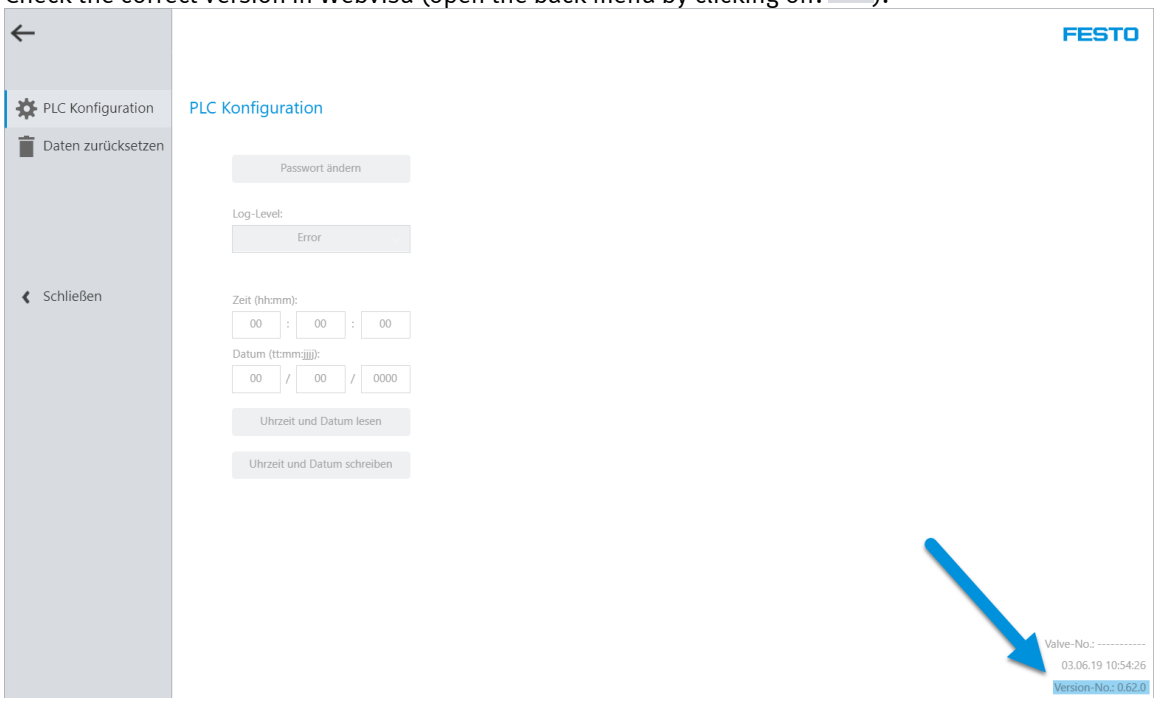
6. Confirm the download-process (yes is “j”):



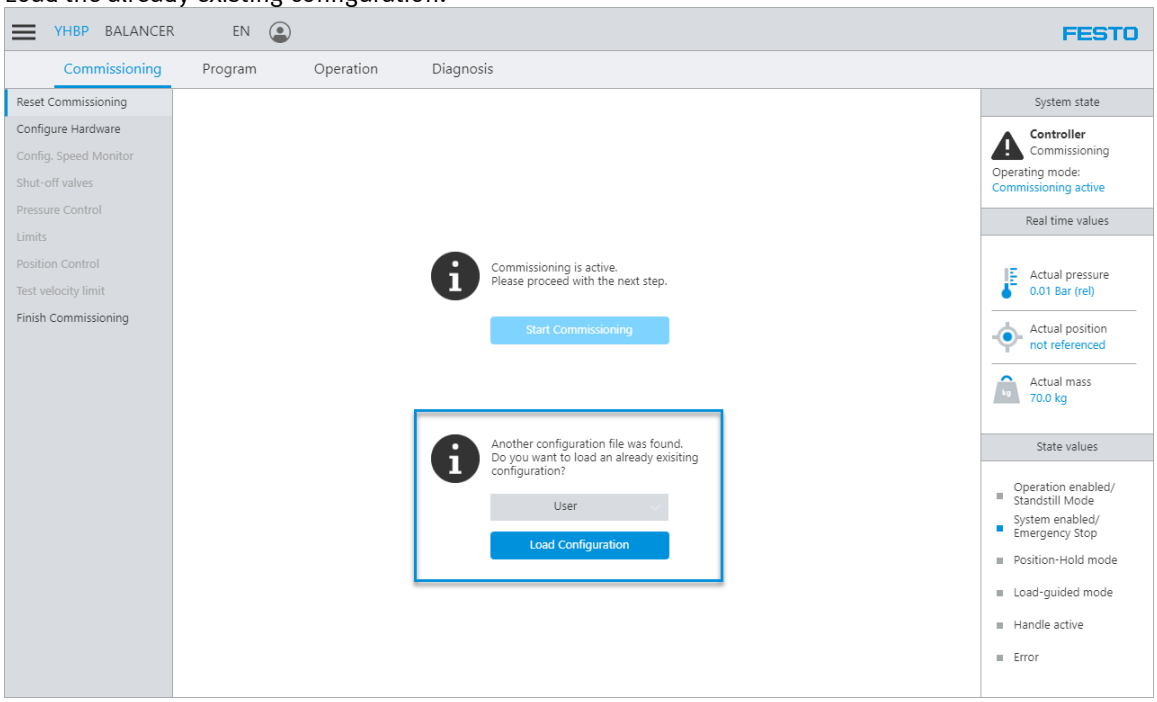
7. Update is started and running. After a restart the new boot application is installed.



8. Check the correct version in Webvisu (open the back menu by clicking on: ☰).



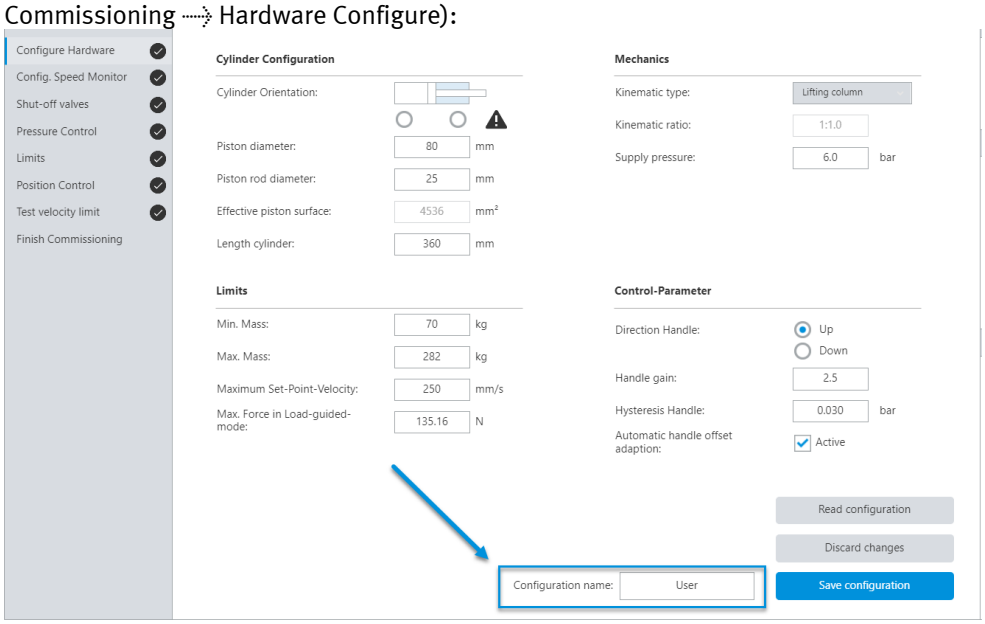
9. Load the already existing configuration:



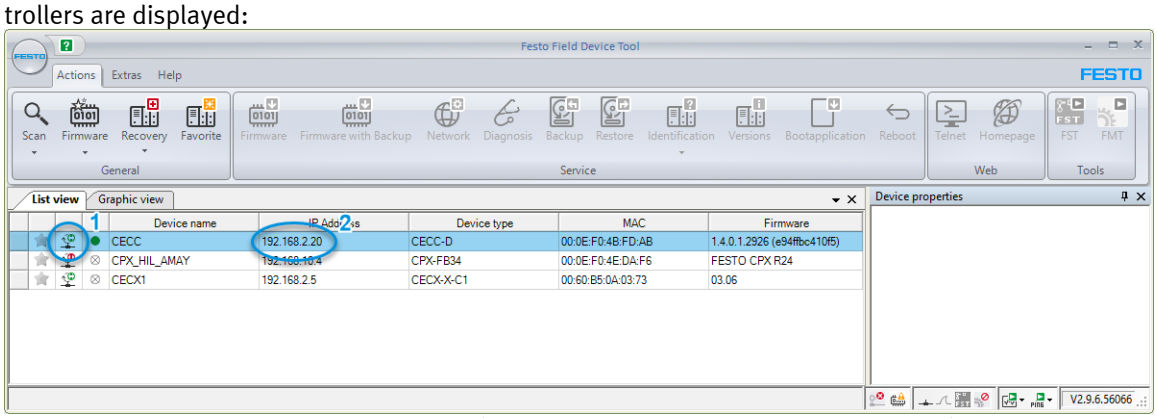
10. Finish the commissioning.

4.2 Update with the Festo Field Device Tool

1. Note the name of the current configuration-file on the CECC-D-BA. It can be found in the Webvisu under Commissioning ⇢ Hardware Configure):

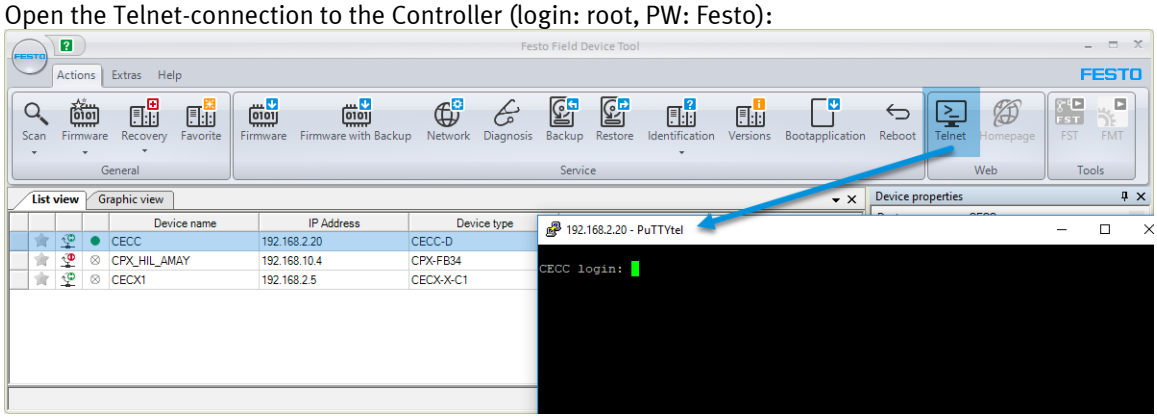


2. Determine the IP address of the controller. After opening the Festo Field Device Tool, all available controllers are displayed:

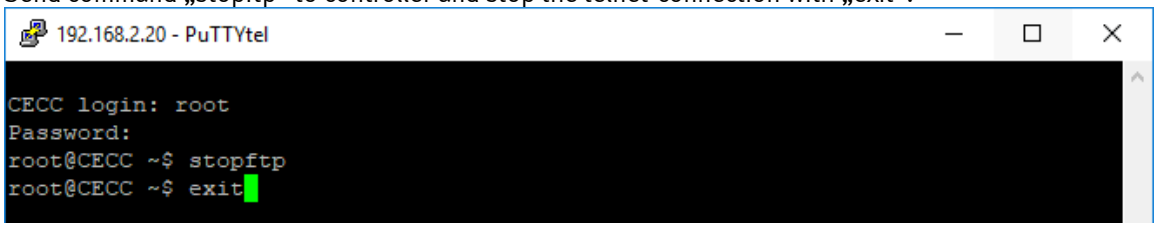


1: Connection to the controller is possible (IP address of the computer is set correctly)
2: IP address of the controller

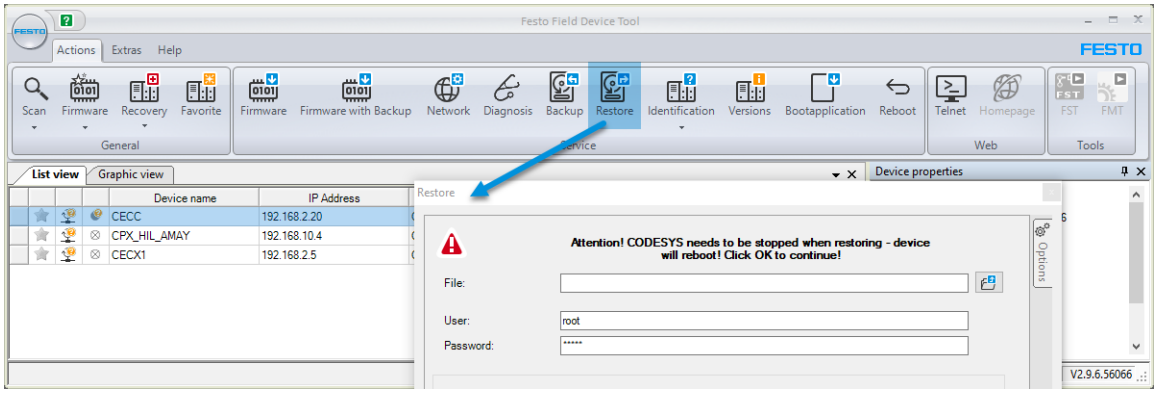
3. Open the Telnet-connection to the Controller (login: root, PW: Festo):



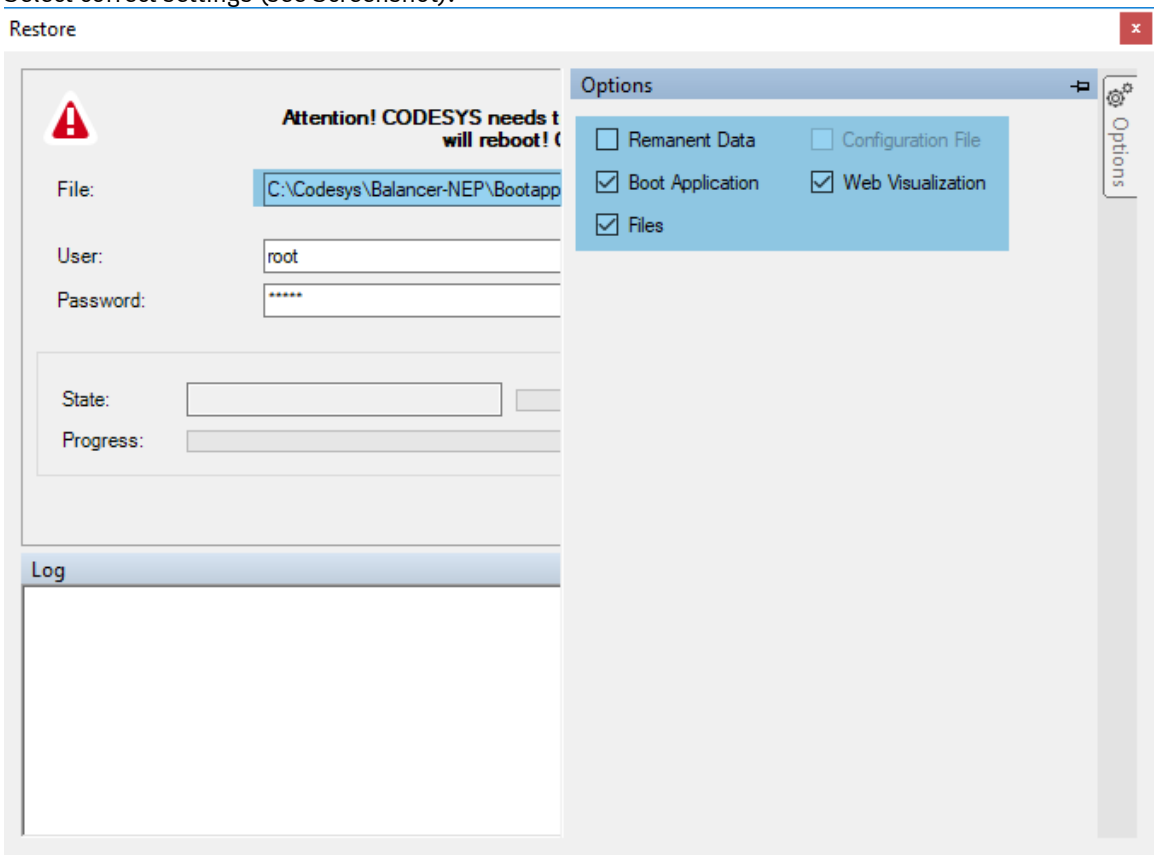
4. Send command „stopftp“ to controller and stop the telnet-connection with „exit“:



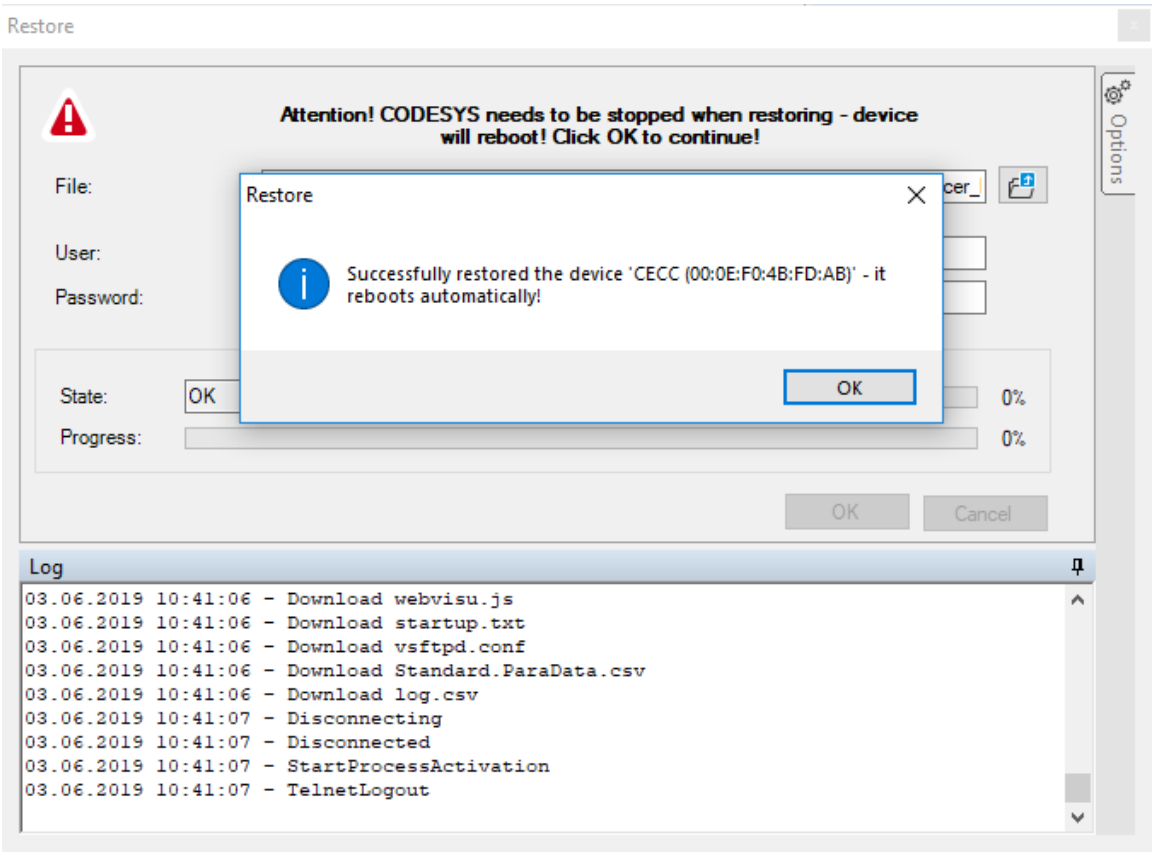
5. Select the Restore-function:



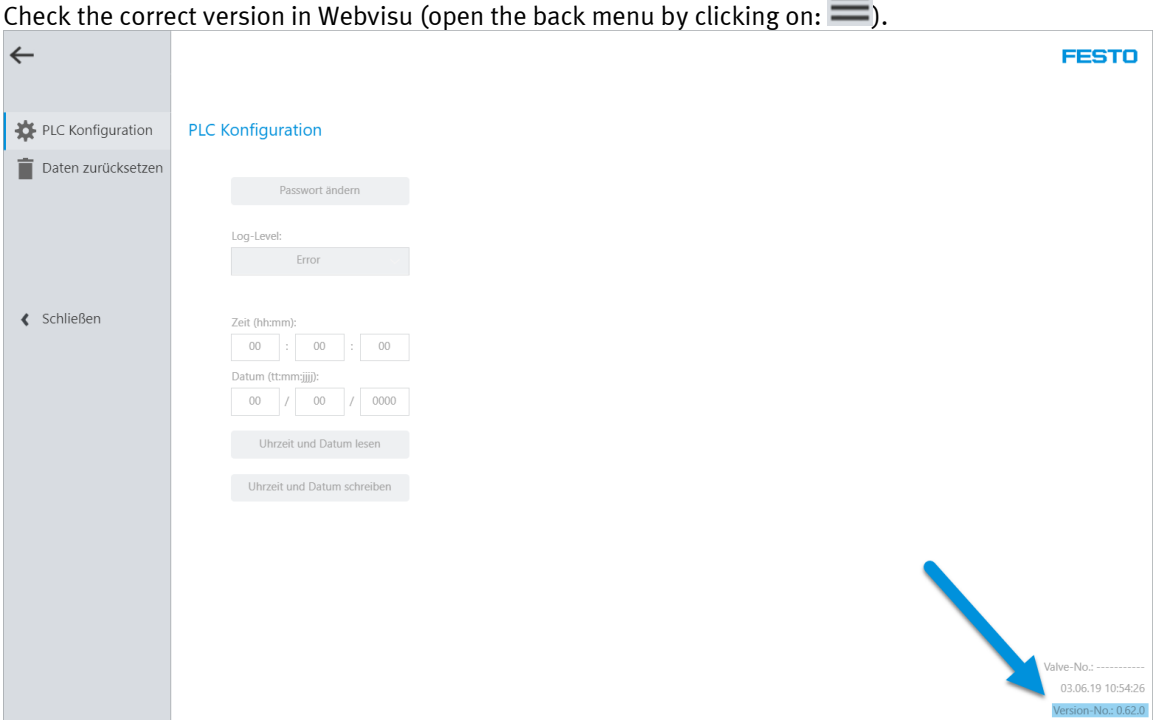
6. Select correct settings (see Screenshot):



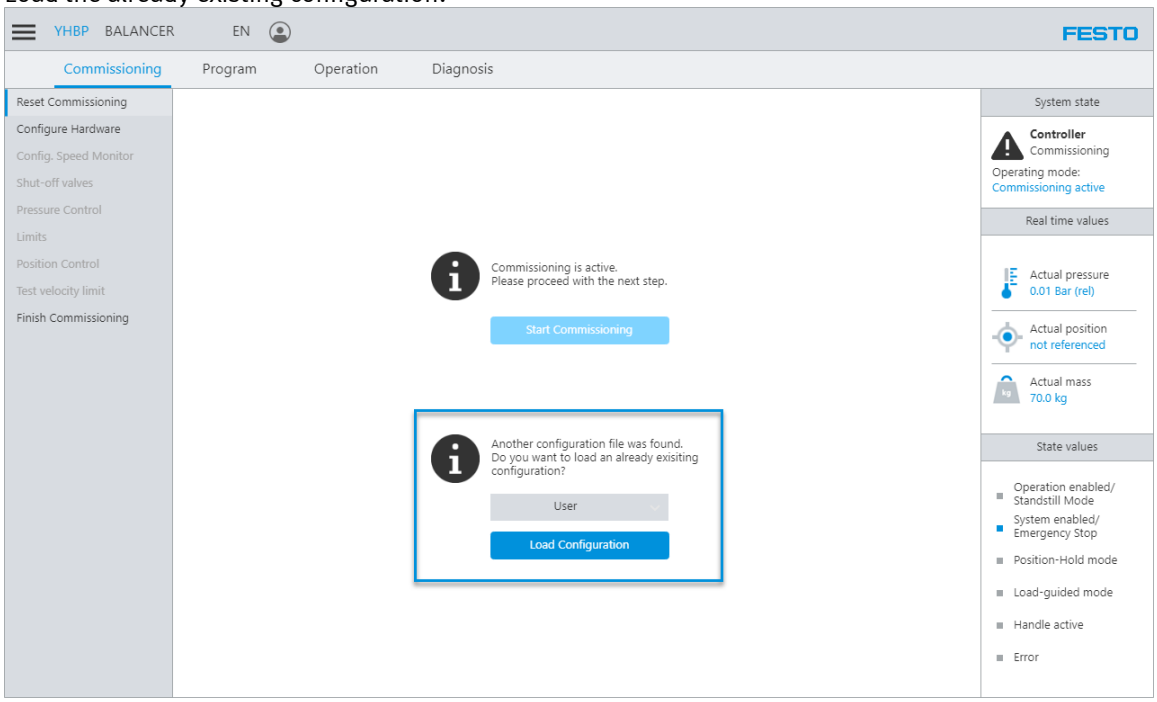
7. Start Download and wait for the restart of the controller:



8. Check the correct version in Webvisu (open the back menu by clicking on: ☰).



9. Load the already existing configuration:



10. Finish the commissioning.

5 Configuration files

5.1 Saving a configuration file

To save a configuration file, the web visualization has to be switched to the diagnostics view.
After clicking on Log → "Download configuration" a new window opens. Any pop-up blocker should be disabled.

Figure 5.1: Saving a configuration file

Now with a right-click → "Save Target As" the corresponding configuration file can be saved. If no other name was specified during the configuration, this is "User.ParaData.csv".

The FTP server on the CECC-D-BA remains active only 5 minutes after a click. Afterwards the procedure must be done again.

When using Internet Explorer, it should also be noted that caching occurs when accessing an FTP server. This means that each time a new configuration is saved an update of the browser window should take place.

If access using the Internet Explorer or a comparable Internet browser is not possible, another FTP client can also be used, for example FileZilla.

The login credentials for accessing the FTP client are:

Login: root

Password: Festo

5.2 Loading a configuration file

To save a configuration file, the web visualization has to be switched to the diagnostics view and the ftp-connection has to be enabled. To do this, go to Log →"Download configuration" as done for saving a configuration file. A new window will open. Any pop-up blocker should be disabled again.

Figure 5.2: Loading a configuration file

Now the ftp server can be accessed using a FTP-Client (eg Filezilla) via the address "ftp://<IP-Adresse/" (default: ftp://192.168.2.20/). The login credentials are:

Login: root

Password: Festo

Alternatively, the address can also be entered in the Windows Explorer:

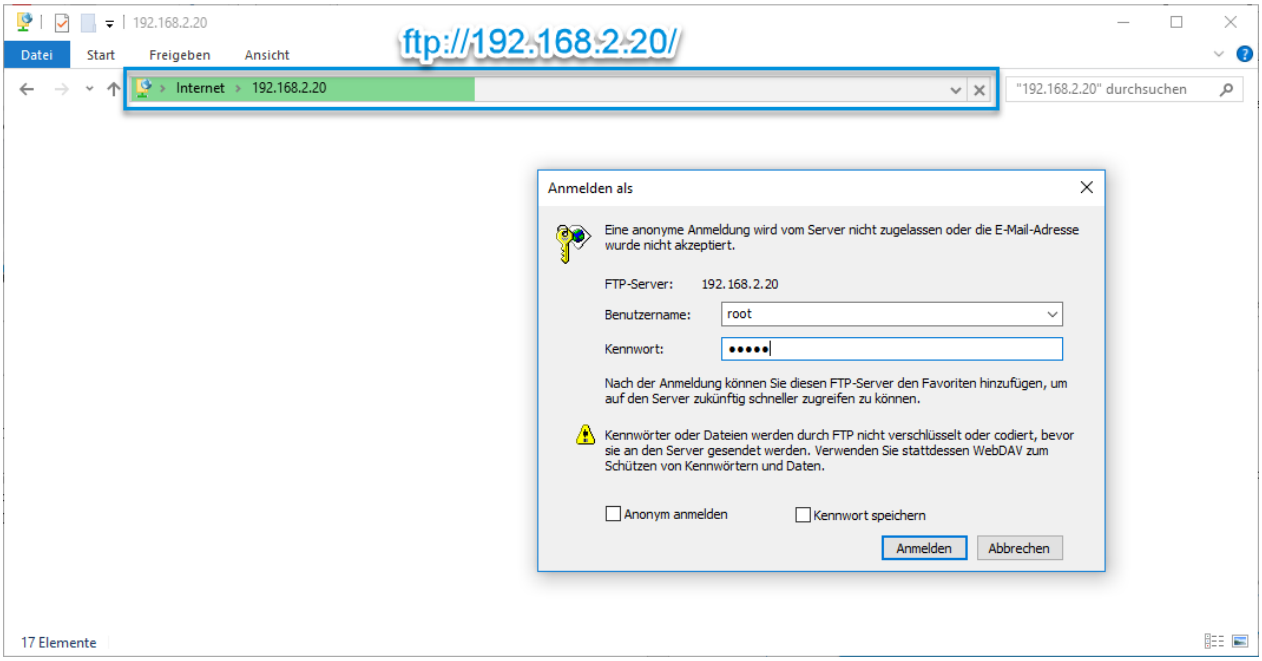


Figure 5-1: Access via Windows-Explorer

Now the existing data will be displayed on the CECC-D-BA. An existing configuration file must now be transferred to the server and any existing files overwritten.

The FTP server on the CECC-D-BA remains active for 5 minutes after being accessed. Afterwards the procedure must be carried out again.

After the configuration has been transferred, it has to be loaded in the Webvisu.

For this the following steps have to be carried out:

1. Click on "Commissioning".
2. Change to commissioning mode by clicking on "Start commissioning".
3. If a configuration already exists, a selection dialog will be displayed.
   Select the appropriate configuration here and load with.
4. After loading complete commissioning by clicking on "End commissioning".

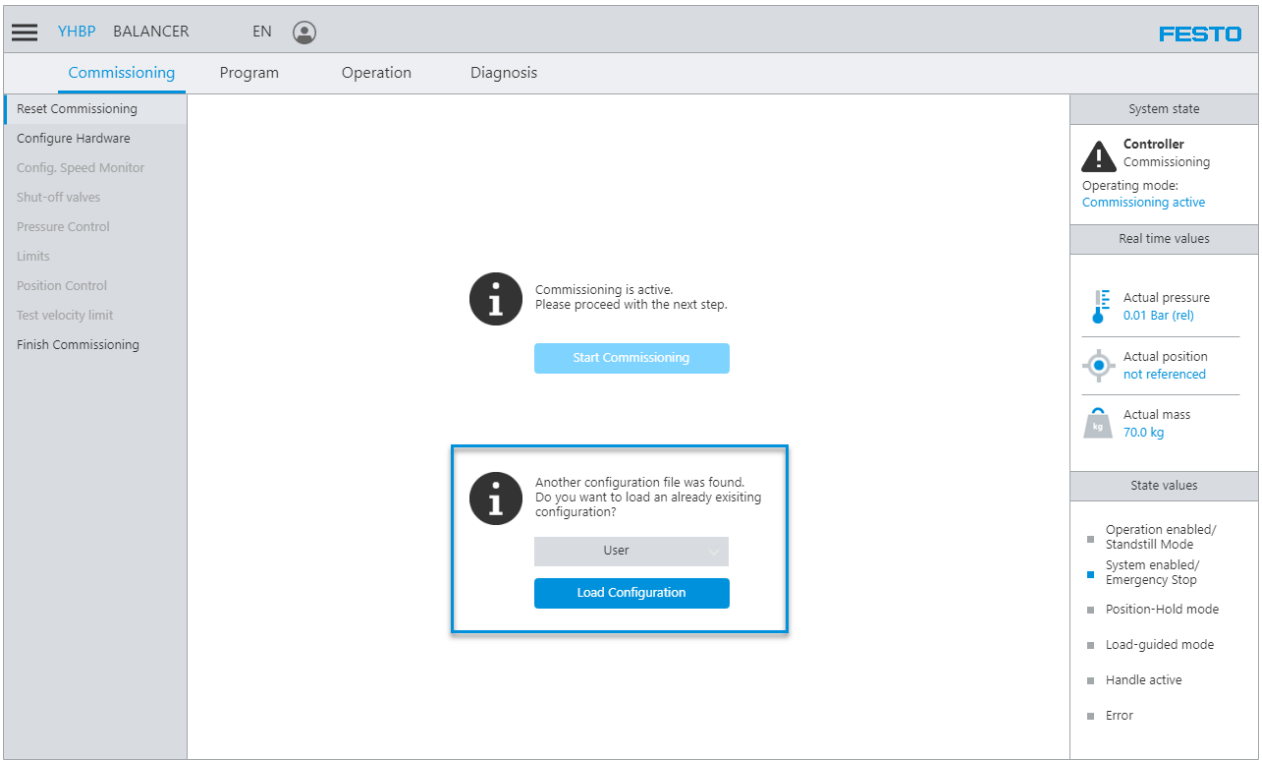


Figure 5.3: Loading the configuration in the Webvisualisation

6 Log-files

The system can store up to 20 log-messages. When the maximum number of log-messages is saved, the current log.csv file is copied as log1.csv and a new log.csv is started. Therefore it is made sure that at least the last 20 messages are saved at all times.

A log-file is text based csv-file where every message consists of the following information:

Name	Description
Timestamp	Timestamp of the Error
Msg-ID (dec)	Message ID of the Error, see description in the appendix.
Description	Short description of the error, for more information see description in the appendix.
Current State	State in which the error appeared.
Pressure	Pressure at time of the error (Format X.XX bar)
Pressure Set-Point	Pressure set point at time of the error (Format X.XX bar)
Position	Position at time of the error (Format X.XX mm)
Position Set-Point	Position Set-Point at time of the error (Format X.XX mm)
Velocity	Velocity at time of the error (Format X.XX mm/s)
Velocity Set-Point	Velocity Set-Point at time of the error (Format X.XX mm/s)
Mass	Mass at time of the error (Format X.XX kg)
Mass-Deviation	Mass-Deviation at time of the error (Format X.XX kg)
Cat.	Category of the error (Error, Warning, Info)
Device	Device at which the error appeared.
SubSys	Subsystem of the device.
Add01, Add02, Table, Device (dec), SubSys (dec), Current State (dec)	Additional data.

6.1 Saving a log-file

To save a configuration file, the web visualization has to be switched to the diagnostics view.
After clicking on Log → "Download Log-File" a new window opens. Any pop-up blocker should be disabled.

Figure 6.1: Saving a log-file

Now with a right-click → "Save target as" the corresponding log file can be saved. "Log.csv" is the newer file, "log1.csv" is the older one.

The FTP server on the CECC-D-BA remains active only 5 minutes after being accessed. Afterwards the procedure must be carried out again.

When using Internet Explorer, it should also be noted that caching occurs when accessing an FTP server. This means that before each save an update of the browser window should take place.

If access using Internet Explorer or a comparable Internet browser is not possible, another FTP client can also be used, for example FileZilla.

The login data for accessing the FTP client are:

Login: root

Password: Festo

A Technical appendix

A.1 Error messages

A.1.1 CAN connection

Error ID	Error message	Error description	Possible causes
192, 200, 201, 202, 203, 204, 205, 206, 207, 208	Different. E.g.: Error in receiving CAN-Process-Data. Check CAN-Connection and restart! / Timeout of the VPCB-Valve. Check CAN-Connection and restart!	Error in the CAN connection between VPCB proportional rule valve and CECC-D-BA.	-VPCB valve is not supplied with voltage (emergency press, false wiring) → Check status LEDs from the VPCB -CAN connection erroneous → Closing resistance at CECC-D-BA not activated, false wiring, screen not properly laid out -VPCB and control are not grounded → to connect grounding connections -ensure EMC-appropriate wiring

Table 6.1: Error table CAN connection

A.1.2 Initialization routine

Error ID	Error message	Error description	Possible causes
213, 214	Error in sending CI-Parameter during Initialization. / Error in receiving CI-Parameter during Initialization.	Errors in parameter transfer to the valve during Initialization.	-Short-term error in communication between valve and controller → Please restart -Incorrect parameter values → commissioning again. -If the error occurs permanently, e.g. after a restart: Possibly incorrect valve software → exchange
215	Timeout in the reset of the VPCB-Valve.	Timeout in the reset of the VPCB-Valve.	-Error in the valve. Are there more error messages? → Please restart -If the error occurs permanently, e.g. after a restart: Possibly incorrect valve software → exchange

Table 6.2: Error table Initialization routine

A.1.3 Balancer state machine

Error ID	Error message	Error description	Possible causes
224	Timeout in the state change of the VPCB-Valve (Balancer-State-Machine).	Timeout in the state change of the VPCB-Valve (Balancer-State-Machine).	-Error in the valve. Are there more error messages? ⇢ Please restart -If the error occurs permanently, e.g. after a restart: Possibly incorrect valve software ⇢ exchange
512	Emergency Break (No System Enable).	Emergency stop is active. There is no voltage at input X3.1 (system enable).	-Emergency stop is pressed -System enable is not connected -No load power supply → terminal X5 with voltage

Table 6.3: Error table Balancer state machine

A.1.4 Closing valves

Error ID	Error message	Error description	Possible causes
240	Safety-Valve 1 Test failed.	Safety valve 1 test failed. During the test, a short pressure pulse is given to the closed valve. There must be no change in the output of the pressure/position.	-During the test, the balancer was moved. -No supply pressure. -Too high leakage on the working cylinder. Does the cylinder or pressure slowly drop when the closing valves are locked? ⇢ Check interconnectors and bolts -If the test fails repeatedly, there may be a defect in the lock valve. → Exchange.
241	Safety-Valve 2 Test failed.	Safety valve 2 test failed. During the test, a short pressure pulse is given to the closed valve. There must be no change in the output of the pressure/position.	see error ID 240
242	Safety-Valve-Test failed. No Supply pressure or valves not opening.	Safety valve test failed. At the beginning, it is tested for existing supply pressure.	- No supply pressure. - Closing valves do not open → check wiring

Table 6.4: Error table closing valves

A.1.5 Monitoring functions

Error ID	Error message	Error description	Possible causes
272	Maximum Velocity-Deviation exceeded (Balancer-Controller).	Maximum speed deviation between setpoint velocity and actual velocity exceeded. Monitoring by CECC-D-BA.	
273	Maximum critical velocity exceeded (Balancer-Controller).	Parametric critical speed limit was exceeded. Monitoring by CECC-D-BA.	- Jerky movement by the operator. - In load-guided mode, the workpiece was pulled too hard. - Load was detached abruptly. - In position-hold mode the load has gotten stuck at a pinch-point and has detached abruptly. - Other error.
274	Maximum position-deviation exceeded (Balancer-Controller).	In position hold mode the load was deflected too much from its set position.	-Load was loaded or unloaded and the control could not adjust quickly enough -Limit value is too narrow → Select higher limit under program → monitoring configuration → position deviation -Supply pressure failure
275	Maximum mass exceeded (Balancer-Controller).	The maximum mass parameterized in the web-visualization has been exceeded. The mass is determined internally on the base of the movement behaviour of the balancer.	- It was attempted to lift too much weight - Too much load has been added - A disturbance contour is present, and the balancer was moved against the disturbance contour with the maximum force - A maximum mass limit that is too low has been configured

Error ID	Error message	Error description	Possible causes
276	Maximum pressure deviation error (Balancer-Controller).	Maximum pressure deviation between set-point pressure and actual pressure in the working cylinder exceeded.	- Supply pressure failure - Can sometimes occur with rapid changes of direction - Control error in the proportional valve
277	Maximum mass deviation exceeded (Balancer-Controller).	The deviation between the real mass and the currently set mass has exceeded the limits that are parameterized in the webvisualization. The monitoring is only active in load guided mode or during positioning.	- Jerky movement by the operator. - In load-guided mode, the workpiece was pulled too hard. - Load was detached abruptly. - In load guided mode, an attempt was made to set a wrong mass via a special function - While positioning, the mass has changed → If desired, choose higher limit below "Program → Monitoring configuration → Mass deviation" - Limits are parameterized too narrow and are triggered, for example, by excessive friction
278, 279	Upper position limit exceeded (Balancer-Controller). or Lower position limit exceeded (Balancer-Controller).	Upper/Lower parametric software end position have been run over.	- The buffer zone before the end positions was set too low. This makes it possible to pass over the end positions at high speeds - Limits can be in run over in load-guided mode by hand - Other error
280	Maximum pressure deviation in load-guided mode error (Balancer-Controller).	In load-guided mode, the actual pressure has left the pressure range that can be adjusted via the handle. (Parameters for setting the pressure range: "Max force in Last-guided mode")	- Error in the proportional valve - Supply pressure failure - Range is configured too narrow - Other control error
281	Position-Value equals zero. Position sensor is referenced to the wrong value. Check homing position.	Position value is zero. Displacement sensor is referenced to the wrong position. Check reference position and teach the new position.	- Cylinder switch for the reference position is in the wrong position → teach the position again in commissioning - Wrong value for final position entered in step pressure control-commissioning → do commissioning again

Table 6.5: Error table monitoring functions

A.1.6 Commissioning

Error ID	Error message	Error description	Possible causes
288, 289, 290	Timeout in Parameter transmission to VCPB during Commissioning. / Error in sending CI-Parameter during Commissioning. / Wrong CI-Answer from the VPCB-Valve during Commissioning.	Errors in the parameter transfer to the valve during Commissioning.	- Short-term disturbance in the communication between the valve and the controller. Redo the commissioning step. In the event of repeated occurrence of the error: - Check the parameter values ⇢ Possibly wrong parameters, try resetting factory condition and restart commissioning - Exchange the valve

Error ID	Error message	Error description	Possible causes
291	Error in the recipe management.	Error in storing the variables in the internal memory of CECC-D-BA.	- Special characters included in the configuration name - Invalid configuration has been loaded or memory of the control is full → reset to factory settings and try again - Other error
292	Timeout in the state change of the VPCB-Valve (Commissioning-State-Machine).	Timeout in the state change of the VPCB-Valve (Commissioning-State-Machine).	- Error in the valve. Are there other error messages? - Error keeps coming repeatedly. Software errors in the valve. Exchange the valve.

Table 6.6: Error table commissioning

A.1.7 Proportional control valve

Error ID	Error message	Error description	Possible causes
336	General Error in the VPCB-Valve.	General Error in the VPCB-Valve.	Different, see the following errors
337	Low voltage at the VPCB-Valve ‹ 21,6 Volt.	Low voltage at the VPCB-Valve ‹ 21,6 Volt.	- Supply voltage is too low. Increase voltage levels or reduce line length.
338	Control deviation of the piston position control of the VPCB-Valve is too high.	Control deviation of the piston position control of the VPCB-Valve is too high.	- Valve may be stuck - Check friction of the valve - Use filtered compressed air
339	High voltage at the VPCB-Valve › 28 Volt.	High voltage at the VPCB-Valve › 28 Volt.	- Supply voltage is too high → reduce voltage levels.
340	Control deviation of the pressure control of the VPCB-Valve is too high.	Control deviation of the pressure control of the VPCB-Valve is too high.	- Locking valves are closed while the pressure control is active → Check wiring - Filter parameters are incorrectly set → Check commissioning step "Pressure Control" again. - The balancer is often charged alternately in succession
341	Temperature of the piston actuator coil of the VPCB-Valve › 100°C.	Temperature of the piston actuator coil of the VPCB-Valve › 100°C.	- Too high temperature at the coil. Valve is stuck or is operated at too high temperatures.
342	Error in the CAN-Communication of the VPCB-Valve.	Error in the CAN-Communication of the VPCB-Valve.	- CAN connection erroneous → Termination resistance at CECC-D-BA not activated, false wiring, shield not connected properly - VPCB and control are not grounded → connect grounding connections - Ensure EMC-appropriate wiring
343	Error in the supply pressure of the VPCB-Valve.	Error in the supply pressure of the VPCB-Valve.	- No supply pressure. - Locking valves are closed while the pressure control is active → Check wiring

Error ID	Error message	Error description	Possible causes
344	Timeout of the Balancer-Controller (Watchdog of the VPCB-Valve).	Watchdog of the VPCB valve has struck. The time gap between two CAN messages was too great.	- Check CAN connection. - Overload of the balance controller
345	Error in the E2PROM of the VPCB-Valve.	Error in the E2PROM of the VPCB-Valve.	- Internal error of the VPCB valve. Restart. - If the error persists → Exchange
346	Control-Interrupt-Structure of the VPCB-Valve could not be activated.	Control-Interrupt-Structure of the VPCB-Valve could not be activated.	- Internal error of the VPCB valve. Restart. - If the error persists → Exchange
363	Hardware-circuitry of the actuator of the VPCB-Valve is defective.	Hardware-circuitry of the actuator of the VPCB-Valve is defective.	- Internal error of the VPCB valve. Restart. - If the error persists → Exchange
364	Error in the external displacement encoder connected to the VPCB-Valve.	Error in the external displacement encoder connected to the VPCB-Valve.	- Check the connection between the displacement sensor and the VPCB valve
366	Maximum Velocity exceeded (VPCB-Valve).	Parameterized critical speed limit was exceeded. Monitoring by the VPCB valve.	- Jerky movement by the operator. - In load-guided mode, the workpiece was pulled too hard. - Load was detached abruptly. - In position-hold mode the load has gotten stuck at a pinch-point and has detached abruptly. - Other error.

Table 6.7: Error table proportional control valve

A.1.8 Safety relay

Error ID	Error message	Error description	Possible causes
368	Maximum velocity exceeded (Safety Speed-Monitor).	Parameterized critical speed limit was exceeded. Monitoring by the safety relay.	- Jerky movement by the operator. - In load-guided mode, the workpiece was pulled too hard. - Load was detached abruptly. - In position-hold mode the load has gotten stuck at a pinch-point and has detached abruptly. - Other error.
369	Other Error: Encoder error, Reset Error (Safety Speed-Monitor).	Other error at the safety relay.	- Check the error display on the safety relay. - Possible error causes: - Operation enable switch in middle position, no signal on the inputs Y31-34 - Position measuring system connected incorrectly Further information: see Application Note - SSC / SLS PLd.

Error ID	Error message	Error description	Possible causes
370	Wrong maximum velocity parameterized (Safety Speed-Monitor).	Wrong maximum velocity parameterized (Safety Speed-Monitor).	- Safety relay reports error, although the speed is still within the parameterized control range → Check parameterized limits: either change setpoint speed under "Hardware configuration" or check the speed limit of the safety relay.

Table 6.8: Error table safety relay

A.1.9 Controller

Error ID	Error message	Error description	Possible causes
378	Error on one of the outputs (possible short circuit/cross circuit).	Error on one of the outputs (possible short circuit/cross circuit).	- Short circuit / cross-circuit at one of the outputs - Overload of the outputs
379	Low voltage at the power supply (clamp X1) of the CECC.	Low voltage at the power supply (clamp X1) of the CECC.	- Power supply set too low - Power supply designed too small - Too many consumers on a power supply - Cable cross-section too small, cables too long
380	Missing load voltage supply (clamp X5) at the CECC.	Missing load voltage supply (clamp X5) at the CECC.	- Missing load voltage supply - Emergency stop pressed

Table 6.9: Error table controller

A.1.10 Handle

Error ID	Error message	Error description	Possible causes
385	Handle is under pressure, while resting in middle position. Maybe leakage is appearing.	If the operation enable or the handle active input are not set, it is checked if there is no pressure on the handle. If there is pressure this could indicate leakage.	- Handle was deflected from the middle position while the operation was not enabled. - There is leakage between the handle and the valve. Check the connections and seals. - Hysteresis of the handle parameterized too small.

Table 6.10: Error table handle

A.1.11 Info messages (only if PLC-log level Info)

Info ID	Info message	Info description
768	Info: CAN Initialisation done.	Info message is generated after the CAN is successfully initialized after power-on.
769	Info: Configuration file has been loaded.	Info message is generated after the configuration is loaded.
770	Info: Initialisation successfully finished. System is ready.	Info message is generated after initialization is complete.

Table 6.11: Info messages initialisation

Info ID	Info message	Info description
771	Info: Test of the safety valve successfully finished during first start.	Info message is generated when the closing valves are successfully tested after the first startup.
772	Info: Homing successfully finished during first start.	Info message is generated when the homing has been successfully performed after first startup.
773	Info: Switched to load-guided mode.	Info message is generated each time the system is switched to load-guided mode.
774	Info: Switched to position-hold mode.	Info message is generated each time the system is switched to position hold mode.
775	Info: Exhaust function activated.	Info message is generated each time the exhaust function is used.

Table 6.12: Info messages state machine

Info ID	Info message	Info description
784	Info: Hardware configuration is done (Commissioning).	Info message is generated when the hardware configuration has been completed during commissioning.
785	Info: Safety monitor configuration is done (Commissioning).	Info message is generated when the safety switching device has been configured during commissioning.
786	Info: Pressure control configuration is done (Commissioning).	Info message is generated when the pressure control has been configured during commissioning.
787	Info: Position control configuration is done (Commissioning).	Info message is generated when the position control has been configured during commissioning.
788	Info: Limits configuration is done (Commissioning).	Info message is generated when the software limits have been configured during commissioning.
789	Info: Safety valve test is done (Commissioning).	Info message is generated when the closing valves have been tested during commissioning.

Table 6.13: Info messages commissioning