Power Focus 6000 and Scalable Quality Solution 3 Integration

Pocket Guide

1 Revision history

Revision	Date	Author	Description
1.0	January 3, 2018	Hendrik Fischer	Initial version
1.1	January 9, 2020	Hendrik Fischer	Update of PF6000 configuration and SQS3 product name change
1.2	July 7, 2020	Hendrik Fischer	Added description for download of traces

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2 Purpose of this document

This document describes the configuration steps that are required to integrate a Power Focus 6000 (PF6000) and the Scalable Quality Solution (SQS3).
The document only details the tasks that are specific to the basic integration of the two products. The reader of the document needs to possess good knowledge of the configuration and operation of all components involved as a prerequisite.

3 Prerequisites

These components are required for a successful integration of the PF6000 and the SQS3:

- A Power Focus 6000 with an IAM installed that provides Open Protocol connectivity (e.g. IAM Process Control), at least one virtual station configured and a tool connected to the virtual station
- Power Focus 6000 FW revision supported by SQS3 according to the SQS3 Fact Sheet: http://toosseas0004/portal/content.php/3343-Single-Qualition-Solution-tool-connectivity-corner
- Scalable Quality Solution 3.3.0 or newer

4 Power Focus 6000 configuration

4.1 Power Focus configuration user interface

The following instructions have been written for the touch screen of the PF6000 or a web browser connected to the configuration user interface of the controller. Alternatively, you can also use ToolsTalk 2 to adjust the settings but the navigation of the system will differ of course.

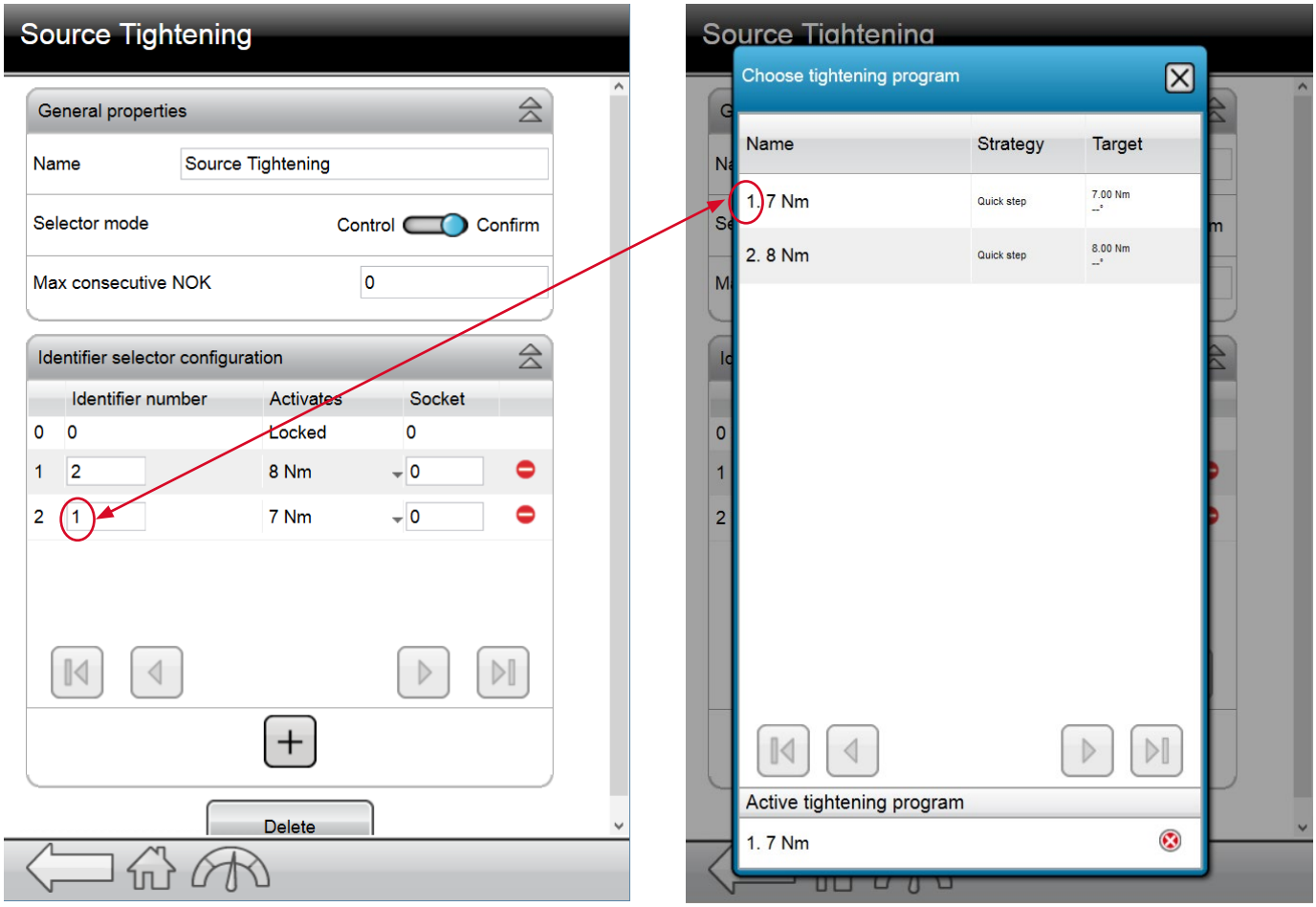
4.2 Configure tightening programs

If there are no PSets configured on the PF6000, configure them now. Use the settings required for the tightenings you intend to do.

4.3 Configure Source Tightening

A *Source Tightening* is required so the SQS3 can query the controller for available tightening programs and to select a tightening program for a tightening operation.

1. Open the menu *Sources* from the Home screen of the PF6000
2. Select *Tightening* and click on *Source Tightening*
3. Switch the *Selector Mode* to *Confirm*
4. For every tightening program you want to use with the SQS3, add an entry to the table *Identifier selector configuration* like this:
   a. In the column *Activates*, select the tightening program
   b. In the column *Identifier number*, enter the number of this tightening program. The tightening program number is the ordinal number of the tightening program as found in the *Tightening program library*. It is imperative that every *Identifier number* matches the ordinal number of its associated tightening programs as shown below.



4.4 Configure the virtual station

SQS3 will communicate to the virtual station of the PF6000 via Open Protocol. It must be enabled properly. If you want to connect the SQS3 to multiple virtual stations of the PF6000, repeat these steps.

1. Open the menu *Virtual station* and select a virtual station
2. Make sure *Task* is set to *Source Tightening*. If not, use *Change task* and select a task of type *Source Tightening*
3. Click on *Open Protocol.*
4. Toggle the switch to the *On* position
5. Set the *Server port* to "4545"
6. Set the *Disconnect setting* to "Lock tool"
7. Repeat the steps above for other virtual stations. Be sure to increment the *Server port* in step 5. The port numbers must be unique.

4.5 Configure time server settings

SQS3 will update date and time on the controller every time it selects a tightening program. This is to ensure that all tasks (tightening and non-tightening) of an SQS3 assembly process are in the correct chronological order. The PF6000 must allow SQS3 to set date and time.

1. Open the menu *Settings* and switch to *Preferences*.
2. In the *Date and Time* stanza at the top of the configuration panel, make sure the field *Source* is set to *Manual*.

4.6 Enable download of traces (optional)

If you wish to download tightening traces from the PF6000 to SQS3, acquire and install a license for the PF6000 virtual station feature "Open Protocol Extension". The download of traces will not work without a license for this feature. If you want to download traces from several virtual stations, every virtual station will require its own license for "Open Protocol Extension".
The download of traces from a PF6000 is only supported with PF6000 firmware revision 3.1.x or higher. Please check the SQS3 Fact Sheet for further information on supported FW revisions.

5 Scalable Quality Solution 3 configuration

5.1 Add the virtual stations

The Open Protocol connection to the virtual stations of the PF6000 need to be configured:

1. In the *Station Tree*, add a new *Tool* to the *Hardware* of your station. Choose "Open Protocol Tool" as the *Device class*.
2. Enter a *Tool/channel name* for the controller. Also enter the *IP Address* of the PF6000 and set the *Port* to the number of the Open Protocol port you assigned to the virtual station.
3. On the *Options* tab make sure the parameter *Set time of controller* is checked
4. If you wish to download traces from the PF6000, select "Open Protocol" for the parameter Trace protocol. Also check whether you want to download OK traces, NOK traces or both. Be sure the feature "Open Protocol Extension" is licensed and available for the virtual station of the PF6000.
5. Repeat these steps for all other virtual stations of the PF6000 that you want to use with the SQS3.

5.2 Assign the virtual stations to bolt cases

Assign the new *Open Protocol Tools* to the bolt cases linked to your station and select the tightening programs you want to use as tightening programs. SQS3 will enable the tool for these bolt cases and select the tightening programs when you run the SQS3 operator guidance.

6 Troubleshooting

6.1 No connection from SQS3 operator guidance to PF6000

A status light that represents a virtual station of the PF6000 in the SQS3 operator guidance remains red. This means that the SQS3 is unable to establish a network connection to this virtual station.

Cause	Solution
The network settings of the PF6000 do not meet the settings of the network it is in. The controller is completely unavailable on the network.	Connect to the configuration interface of the PF6000. Verify the network settings of the controller with a network administrator and correct them if needed.
The network settings of the PC that hosts the SQS3 do not meet the requirements of the network it is in. No other network device can be reached from the PC.	Use the *ping* command to reach other devices on the network. If there's no connection to other network devices, verify the network settings of the PC with a network administrator and correct them if needed.
The IP address of the PF6000 and/or the Open Protocol port of the virtual station are incorrectly configured in the SQS3.	In the SQS3 Configurator, open the Network tab of the *Open Protocol Tool* you configured for the virtual station of the PF6000. Check the IP address and the Open Protocol port and correct them if needed.
Network IP address conflict	Check the display of the PF6000 for error messages about IP address conflicts. If there is one, configure a different, unique IP address on the PF6000 and adjust the configuration of the *Open Protocol Tool* of the SQS3 accordingly.

6.2 No connection from SQS3 Configurator to virtual station

The button *Read programs from tools* of the *Bolt Case Link* on the station does not populate the field *Tightening program* with the list of *Identifer numbers* of the PF6000. Instead, you receive the message "Not able to synchronize; please check your settings".

Cause	Solution
There's no network connection available from the PC that runs the SQS3 Configurator to the PF6000.	This can be normal in environments where production networks are isolated from other networks. Simply enter the tightening programs manually into the *Tightening program* field.
There are no tightening programs configured on the PF6000.	Configure at least one tightening program on the PF6000.

Cause	Solution
Source Tightening was not properly configured.	Make sure that a source of type *Source Tightening* has been configured as described in chapter 4.3.
The *Source Tightening* was not set as the *Task* of the virtual station.	Make sure that the *Source Tightening* has been assigned to the virtual station as a *Task* as described in chapter 4.4.

6.3 Tool not enabled/tightening program not selected

The status light that represents the virtual station in the SQS3 operator guidance is green but the SQS3 cannot properly enable the tool and select a tightening program when a tightening is to be done.

Cause	Solution
There's no network connection available from the PC that runs the SQS3 Configurator to the PF6000.	Make sure the PF6000 allows manual updates of date and time as described in chapter 4.5.
There are no tightening programs configured on the PF6000.	Configure at least one tightening program on the PF6000.
Source Tightening was not properly configured.	Make sure that a source of type Source Tightening has been configured as described in chapter 4.3.
The *Source Tightening* was not set as the *Task* of the virtual station.	Make sure that the *Source Tightening* has been assigned to the virtual station as a *Task* as described in chapter 4.4.
The *Program* configured in the SQS3 for the bolt location is not available in the *Source Tightening* assigned to the virtual station.	Check the *Identifier numbers* available in the *Source Tightening* on the PF6000 and select one that is available. If the SQS3 Configurator can establish a network connection to the PF6000, use the *Synchronize* button of the *Bolt Case Link* so it will only show the numbers that are truly available.

6.4 No result data available/bolt location remains blue

After a bolt has been torqued and the PF6000 displays the result of the tightening, the bolt location on the SQS3 operator guidance remains blue and the workflow does not move on to the next tightening or other task. Also, the tool remains enabled.

Cause	Solution
The *Identifier number* in *Source Tightening* does not match the ordinalnumber of the tightening program in the *Tightening program library*.	Check all *Identifier numbers* of the *Source Tightening* and make sure each matches the ordinal number of the tightening program associated with it as described in chapter 4.3.

6.5 SQS3 does not download traces from the PF6000

After a bolt has been torqued, the SQS3 operator guidance updates the status of the bolt location to OK or NOK but the tightening trace is not available from the trace display element or from the context menu of the bolt location.

Cause	Solution
The download of traces is incorrectly configured or not enabled at all.	Enable the download of OK and/or NOK traces as described in chapter 5.1.
The PF6000 firmware is too old.	Update the firmware of the PF6000 to a revision 3.1.x or higher. Check the SQS3 Fact Sheet for PF6000 FW revisions supported by SQS3.
The download of traces is not licensed for the virtual station of the PF6000.	Acquire and install the virtual station license “Open Protocol Extension” as described in chapter 4.6.

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