PowerMACS 4000 and Scalable Quality Solution 3 Integration

Pocket Guide

1   Revision history

Revision	Date	Author	Description
1.0	December 20, 2019	Hendrik Fischer	Initial version

Contents

2   Purpose of this document

This document describes the configuration steps that are required to integrate a PowerMACS 4000 (PMACS) and the Scalable Quality Solution 3 (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 PMACS and SQS3:

- A PMACS with at least one drive and tightening spindle. Please note that SQS3 does not support presses as of the time this document is written.
- A PMACS firmware revision supported by SQS3. See the SQS3 Fact Sheet on the Marketing & Support portal for details:
  http://toosseas0004/portal/content.php/3343-Single-Qualition-Solution-tool-connectivity-corner
- A ToolsTalk PowerMACS version that is compatible with the FW revision of the PMACS
- Scalable Quality Solution 3.3.0 or newer

4 PowerMACS 4000 configuration

4.1 ToolsTalk PowerMACS configuration user interface

Make sure your PMACS is connected and available on the network. Use ToolsTalk PowerMACS to connect to the PMACS and to make the configuration changes.

4.2 Enable Open Protocol

In the *Hardware* branch of the *System map*, find the TC that contains an *Ethernet* device. Select this device and check the *Ethernet type* in the *Details* view. (If Details are not visible, enable the view from the tool bar of the *System Map*.) Switch *Ethernet Type* to *Open Protocol* and set the *Port No.* to '4545'(default) or another port you prefer.
If there is no Ethernet device yet, add it to the System TC. The System TC usually is TC 01 and the first character of its name is an asterisk '*'.

4.3 Time server

SQS3 will update date and time on the controller every time it selects a mode. This is to ensure that all tasks (tightening and non-tightening) of an SQS3 assembly process are in the correct chronological order. The PMACS must allow SQS3 to set date and time.
Open *Set Up* from the menu bar and select *Options*... Switch the drop-down list labeled *Time Server* to *Open Protocol.*

4.4 Add bolt, programs and modes

Add bolts, programs and modes to your PMACS configuration according to the needs of the tightening application.

5 Scalable Quality Solution 3 configuration

5.1 Add a PowerMACS tool

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

1. In the *Station Tree*, add a new *Tool* to the *Hardware* of your station.
   Choose "PowerMACS System" as the *Device class*.
2. Enter a *Tool/channel name* for the controller. Also enter the *IP Address* of the PMACS and set the *Port* to the number of the Open Protocol port you assigned to the controller.
3. Set the *Number of spindles* attached to the PowerMACS System. It is important that this field correctly represents the number of spindles as the value will be used to validate plausibility of the SQS3 configuration later on.
4. On the *Options* tab make sure the parameter *Set time of controller* is checked

5.2 Assign the PowerMACS and modes to bolt cases

Assign the PowerMACS System to the bolt cases linked to your station and select the modes you want to use as tightening programs. The SQS3 will enable the tool for these bolt cases and select the modes when you run the SQS3 operator guidance.

5.3 Assign spindle or channel numbers to bolt locations

After linking the PowerMACS System to a bolt case, the numbers of the channels or spindles must be mapped to every bolt location of this bolt case so SQS3 will know how to associate the result data coming from the PMACS with the individual bolt locations. Simply select every bolt location of the bolt case, enter the corresponding *Channel number* and *Apply* the changes.

The following rules apply when assigning channel numbers to bolt locations:

- Channel numbers do not have to be assigned to bolt locations in sequential order or a continuous manner. The numbers can be in any order and increments can be greater than 1.
- The number of distinct channels assigned to bolt locations can never be greater than the *Number of spindles* configured for the PowerMACS System (see chapter 5.1). This rule is enforced across all bolt cases of a station and will result in configuration errors if violated.
- The number of bolt locations in a bolt case does not have to match the number of spindles of a PowerMACS System. If there are more bolt locations in a bolt case than spindles, it will simply take multiple tightenings to complete the bolt case (stitching). If there are more spindles than bolt locations, SQS3 can fasten two or more bolt cases simultaneously if the channel numbers have been assigned accordingly.

6 Troubleshooting

6.1 No connection from SQS3 operator guidance to PMACS

The status light that represents the PMACS in the SQS3 operator guidance remains red. This means that the SQS3 is unable to establish a network connection to the controller.

Cause	Solution
The network settings of the PMACS do not meet the settings of the network it is in. The controller is completely unavailable on the network.	Connect to ToolsTalk PMACS to the controller or use the user interface directly on the PMACS. 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 PMACS 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 *PowerMACS System* you configured for the the PMACS. Check the IP address and the Open Protocol port and correct them if needed.
Network IP address conflict	Check the PMACS for error messages about IP address conflicts. If there is one, configure a different, unique IP address on the PMACS and adjust the configuration of the *PowerMACS System* of SQS3 accordingly.

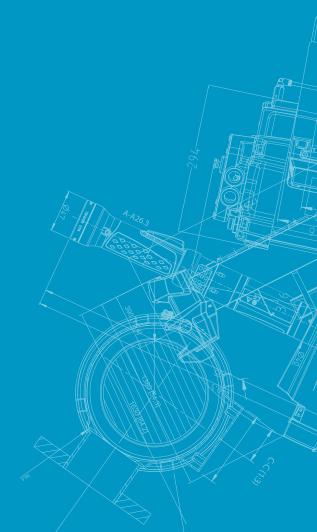## 6.2 No connection from SQS3 Configurator to PMACS

The *Synchronize* button of the *Bolt Case Link* on the station does not populate the field *Mode number* with the list of mode numbers of the PMACS. 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 PMACS.	This can be normal in environments where production networks are isolated from other networks. Simply enter the mode number manually into the *Mode number* field.
There are no modes configured on the PMACS.	Configure at least one mode on the PMACS.

6.3 Tool not enabled/PSet not selected

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

Cause	Solution
There are no modes configured on the PMACS.	Configure at least one mode on the PMACS.
The PowerMACS does not allow SQS3 to update date and time prior to enabling the spindles.	Make sure the PMACS allows updates of date and time via Open Protocol as described in chapter 4.3.