

C105

Quality Control Systems - Machine Direction Transition Control



Learn to set-up, tune, and verify headbox control and machine direction transition controls in the ABB Quality Control System.

Course type and methods

This is an instructor led workshop with short presentations and demonstrations, extended exercises, and hands-on sessions and discussion.

Student Profile

This course is targeted to process control engineers.

Prerequisites

Students should have completed the C103 training and field modules or be able to demonstrate equivalent skills.

Course objectives

This course covers set-up, tuning, and validating headbox control, coordinated speed change, speed optimization (minimum steam range and dryer limited), and auto grade change. Laboratory exercises utilize a process simulator to provide hands-on practice of set-up, tuning, and verification steps.

The class will be taught from a System 800xA platform, but the fundamental machine direction control knowledge gained in this course can be applied to an ABB QCS with MP280, AC450, or System 800xA hardware. User interface and program differences will be related back to the other platforms.

Upon completion of this course the participants will be able to:

- Set-up, tune, and validate headbox control
- Test for a relationship between headbox pressure and moisture
- Set-up, tune, and validate transition machine direction controls:
 - Coordinated speed change
 - Speed optimization (minimum steam range and dryer limited)
 - Automatic grade change control

Duration

The duration is 5 days

Course Outline

Day 1	Day 2	Day 3	Day 4	Day 5
<ul style="list-style-type: none">• Kick off and Introductions• Review field module 1 best practices• Headbox types<ul style="list-style-type: none">- Airpad versus pneumatic• Headbox control<ul style="list-style-type: none">- Theory of operation- Target entry options- J/W control options- Dryline- Liquid level control- Total head control- Block diagram- Total head algorithm- Moisture with respect to total head- Inferred flow calculation- Jet velocity equation options• Lab<ul style="list-style-type: none">- Configure- Tune jet/wire control- Set-up dryline control- Tune feedforward jet/wire from slice	<ul style="list-style-type: none">• Review: questions and answers• Speed change options<ul style="list-style-type: none">- Manual versus automatic• Coordinated Speed Change control<ul style="list-style-type: none">- Headbox control considerations (Internal or external to ABB QCS)- Operator Interface- Feedforward bump test procedure- Set-up, tuning, and testing procedures- Necessary feedforwards to enable• Lab<ul style="list-style-type: none">- Tune speed level 1- Perform speed bumps to determine feedforward model- Tune coordinated Speed change- Compare the results of the following speed changes: full manual, fast automatic, coordinated	<ul style="list-style-type: none">• Review: questions and answers• Auto grade change<ul style="list-style-type: none">- Objectives- Coordinated- Uncoordinated- Operator Interface- Abort/suspend conditions- Tuning procedures- Fast grade change option- Setting Independent tuning options for feedback versus auto grade change- Ash compensation options• Lab<ul style="list-style-type: none">- Set-up and tune auto grade change- Test a manual grade change- Test auto grade change without any scan level controls required- Test auto grade change with scan level controls required	<ul style="list-style-type: none">• Review: questions and answers• Speed optimization: minimum steam range<ul style="list-style-type: none">- Theory of operation- Maximum feasible speed- Set-up, tuning, and testing procedures• Speed optimization: dryer limited<ul style="list-style-type: none">- Theory of operation- Set-up, tuning, and testing procedures• Lab<ul style="list-style-type: none">- Set-up and tune speed optimization: minimum steam range- Set-up, tune, and test alternate speed optimization: dryer limited	<ul style="list-style-type: none">• Review: questions and answers• Troubleshooting<ul style="list-style-type: none">- Auto grade change- Auto grade change static gain verification worksheet- Grade change- Speed optimization• Data collection options• Grade change performance monitoring• Case studies• Review field module 2 requirements

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