

## C107

# Quality Control Systems - Cross Direction Control



Learn the skills necessary to setup, tune, and verify CD control as applied to controlling weight, moisture, and caliper profiles, as these control applications present the majority of CD control challenges.

### 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 MD2 training and field modules, and their corresponding prerequisites, or be able to demonstrate equivalent skills.

### Course objectives

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

- Setup, tune, and verify CD controls for:
  - Weight
  - Moisture
  - Caliper
- Utilize manual bump test methods to commission CD control
- Setup and utilize the CD automatic bump test feature to determine mapping and spatial response model

### Platform

The fundamental cross direction control knowledge gained in this course can be applied to ABB Quality Control Systems with any of the following hardware: MP280, AC450, or 800xA. The class will be taught from an 800xA platform. User Interface and program differences will be related back to the other platforms.

### Duration

The duration is 5 days

## Course Outline

Day 1	Day 2	Day 3	Day 4	Day 5
<ul style="list-style-type: none"><li>• Course Introduction</li><li>• CD control system and software architecture<ul style="list-style-type: none"><li>- Platform differences</li><li>- Functional block diagram</li></ul></li><li>• CD control applications<ul style="list-style-type: none"><li>- Headbox slice</li><li>- Dilution headbox</li><li>- Calendar stack</li><li>- Steambox</li><li>- Re-wet</li></ul></li><li>• Time-based measurement processing</li><li>• CD user Interface<ul style="list-style-type: none"><li>- Operator</li><li>- Tuning</li></ul></li><li>• Data collection options</li><li>• Laboratory exercise<ul style="list-style-type: none"><li>- Getting familiar with CD control pages</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Review Q/A</li><li>• Actuator to profile mapping<ul style="list-style-type: none"><li>- Parameters needed for a map</li><li>- Mapping options (fixed, automatic, linear, non-linear)</li></ul></li><li>• Actuator to profile response<ul style="list-style-type: none"><li>- Spatial response (CD coupling)</li><li>- Temporal response</li></ul></li><li>• Definition of a CD bump test<ul style="list-style-type: none"><li>- Related to mapping</li><li>- Related to response model</li></ul></li><li>• Laboratory exercise<ul style="list-style-type: none"><li>- Gathering and measuring mapping information</li><li>- Entering mapping information</li><li>- Verify mapping from manual bump test</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Review Q/A</li><li>• Signal processing for CD control<ul style="list-style-type: none"><li>- CD actuator parameters</li></ul></li><li>• CD control algorithm: constraint optimization</li><li>• Time-domain control algorithm: I-only vs. PI</li><li>• Setpoint post processing (center, minimize, maximize)</li><li>• Laboratory exercise<ul style="list-style-type: none"><li>- Tune CD caliper control</li><li>- Estimating temporal and spatial response from manual bump test</li><li>- Explore various setpoint post-processing option</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Review Q/A</li><li>• Automatic bump test<ul style="list-style-type: none"><li>- Setup display</li><li>- Analysis display</li><li>- Platform differences</li></ul></li><li>• Edge handling options<ul style="list-style-type: none"><li>- Error profile definition on the edges</li><li>- Edge setpoint options</li></ul></li><li>• Grade dependent tuning</li><li>• Laboratory exercise<ul style="list-style-type: none"><li>- Tune CD weight control</li><li>- Estimating temporal and spatial response from manual bump test</li><li>- Perform automatic bump tests to determine mapping and process model</li><li>- Explore various edge handling options</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Review Q/A</li><li>• Troubleshoot CD control problems<ul style="list-style-type: none"><li>- Interacting CD loops</li><li>- Wide response</li></ul></li><li>• Laboratory exercise<ul style="list-style-type: none"><li>- Correct CD control problems</li><li>- Final lab discussion</li></ul></li></ul>

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