

## CURRICULUM DESCRIPTION

# Drive Expert

### Tuition Fee

Tuition is free (\$0) for authorized distributor Channel Partners.

### Description

This program is specifically designed to provide students with the technical expertise to support and promote sales of ABB LV Drives. The Drive Expert level of training focuses on industrial drive applications, with an emphasis on performance products. Products covered in this class are the ACS880, ACS800, DCS880, DCS800, AC500 e-Co PLC and CP600 HMI. The Drive Specialist program is a prerequisite to the Drive Expert program.

### Student Profile

Students must be an employee of an ABB authorized distributor and have responsibility for pre-sales support or technical sales of LV drives products.

Students must have:

- Experience working with power electrical equipment and voltage levels up to 600Vac
- The ability and knowledge for use of test equipment such as multi-meters and basic computer skills
- A personal computer (e.g., laptop or tablet)
- A strong understanding of LV AC Drives
- A strong understanding of motor control methods

### Expectations of a Drive Expert

- Sales Support (Business Growth)  
The Drive Expert shall support the outside sales efforts. Their primary role is the technical expert in selection, use, and application of automation equipment.
- After Sales Support (Customer Assistance)  
The Drive Expert shall support the customer in the installation, commissioning, and application of automation products in industrial applications.
- Training (Sales, Customer)  
The Drive Expert shall provide “lunch-n-learn” training classes for customers, technical sales training for sales teams, and product overview and technical training for inside support staff.

### Training Type and Duration

The class portion of the program is 4.5 days of instructor-led training, including lab exercises, to achieve program objectives. The Drive Expert program also includes prerequisite e-Learning courses that must be completed before class begins.

**Please Note:** Student presentation projects, which require a moderate amount of time (est. 2 to 6 hrs.) outside class hours, will be assigned. These must be completed and delivered to finish this course. Please plan accordingly to ensure you can manage these projects, in addition to your daily responsibilities.

### Goal

The goal of this program is to educate students in applications, product capability, selection, and programming solutions of performance applications.

### Learning Objectives

Upon successful completion of this program, students will have the required knowledge to:

- Support sales team members in account penetration and customer support
- Understand the electrical and mechanical principles related to successful sizing and application of motors and drives
- Understand safe installation requirements and best practices for application of a LV AC Drive
- Program and utilize standard software features of the drives covered in this training
- Understand how to set up a drive to communicate with an HMI and PLC
- Perform basic fault diagnostics and quickly correct installation issues on-site
- Understand the application benefits of DTC, load-sharing, and lead-follower control
- Understand the need for and use of Adaptive Programming or custom firmware in challenging AC and DC applications

**Student Materials**

Upon completion each student will receive:

- 1 Student Manual with all training materials, including practice labs

**Prerequisites**

- ACS880 Authorized Startup
- Drive Specialist
- DCS880 Authorized Startup (currently optional, but will be required in the future)

**(e-Learning)**

- Harmonic Concepts – Answers (What, Why, How Much is a Problem)
- Safety Options – Specific Drive Examples
- Common Mode Voltage & Current
- Grounding, Power Cabling & Control Wiring (Recommendations)
- High Frequency Motor Bearing Currents (What They Are, How to Prevent)
- Line Supply GFCI with AC Drives

**Suggested Supplemental Modules**

- Machine Safety Standards – Basic Pieces & How They Fit Together
- Mechanics 101
- Harmonic Solutions – Reactors, Filters, Solid-State Techniques
- Truth About Cable Lengths (Voltage Reflection, Filters & Solutions)

**Program Post-requisite (e-Learning)**

- Knowledge assessment exam

**Course Agenda – Classroom Hours**

Day 1	Day 2	Day 3	Day 4	Day 5
<p><b>8:00 AM – 5:00 PM</b></p> <ul style="list-style-type: none"> <li>- Course Intro</li> <li>- Student Presentation Info</li> <li>- Duty Cycles &amp; Overload Apps</li> <li>- AC Motor Above Base Speed Apps</li> <li>- ACS800/ACS880U nique &amp; Protective Features</li> <li>- Regenerative Drives - Applying Them</li> <li>- PM Motors for ABB Drives</li> <li>- Break</li> <li>- Harmonics</li> <li>- Dynamic Braking Resistor Sizing</li> </ul>	<p><b>8:00 AM – 5:00 PM</b></p> <ul style="list-style-type: none"> <li>· Common DC Bus Apps</li> <li>· ULH-Regen ACS880’s</li> <li>· ULH-Regen Values</li> <li>· Regen / Dyne Demos</li> <li>· Intro to IEC 61131-3 Programing Language</li> <li>· Load Sharing Applications</li> <li>· Lead / Follower Apps Connectivity</li> <li>· Ethernet Communications</li> <li>· ABB Add-On Instructions</li> </ul>	<p><b>8:00 AM – 4:50 PM</b></p> <ul style="list-style-type: none"> <li>· Tour thru Application Land</li> <li>· ACS880-07 Cabinets</li> <li>· DC vs AC – When to Sell</li> <li>· DCS880 Lead/Follower - Lab</li> <li>· Drive Safety FSO / STO</li> <li>· Drive Integration with HMI and PLC – Lab</li> <li>· Class Presentations</li> <li>· Projects – Q&amp;A Session</li> </ul>	<p><b>7:45 AM – 5:00 PM</b></p> <p><u>Hands-on labs:</u></p> <ul style="list-style-type: none"> <li>· Dyne Tuning/Unique Features – Lab</li> <li>· Adaptive Programing on ACS880 – Lab</li> <li>· ACS880 Lead-Follower (Speed) – Lab</li> <li>· ACS880 Load Sharing / Lead-Follower (Torque) – Lab</li> <li>· Harmonics - Demonstration</li> </ul>	<p><b>8:00 AM – 11:40 AM</b></p> <ul style="list-style-type: none"> <li>· AC Applications &amp; Sizing Projects – Student presentations</li> <li>· ACS880 Special Application FW</li> <li>· DCS880 Special Application FW</li> <li>· Course Review</li> <li>· Course Survey</li> <li>· Course Dismissal</li> </ul>