Installation procedure for ABB ACS880 demo encoder kit with ABB (blue) motor (Kit PN 3AUA0000234593)
Revision B (8/19/2021)

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Purpose
The purpose of this document is to identify how to install an encoder option kit to the ABB ACS880 demo drive. This kit is specifically designed to fit the newer U.S. ACS880 demo drives that utilize an ABB (blue) motor. A different kit and installation document exists for the U.S. ACS880 demo units that utilize the Baldor (grey) motor. Neither of these kits work on ACS880 demos built outside the U.S. This encoder kit can be used to accurately close the speed loop of the demo drive. The hardware can also be used to demonstrate the N5700 positioning software. The N5700 software is not included with this kit. Please contact your ABB representative to obtain a copy of this software.

Additional references
For more information on the ACS880-01 drive used in the ACS880-01 demo refer to:

- ACS880-01 hardware manual 3AUA0000078093
- ACS880-01 firmware manual 3AUA0000085967
- FEN-01 manual 3AFE68784603
- FETA-01 installation instructions 3AXD50000206063

Warning
This drive has hazardous voltages present that could cause injury or even death. If you are not a qualified electrical professional do not perform this work. Only those qualified and competent on working with higher voltages should install this option kit. Refer to the ACS880-01 hardware manual (3AUA0000078093) for further information and warnings.

Tools Required
The following tools are required to add the encoder kit to your ACS880 demo:
- Standard #2 Phillips screwdriver
- T10 Torx driver
- T20 Torx driver
- ABB flat screwdriver (3.5mm)
- 2mm Allen Wrench (provided with encoder)
- 11/32” wrench (open end)

Unpacking
This encoder kit is designed to be used on ABB ACS880 demo drives that use an ABB (blue) motor. This hardware will not fit the demos that use a Baldor (grey) motor. If your demo uses an older Baldor (grey) motor use kit 3AUA0000234592.

Along with a paper that includes a link to these installation instructions, this kit contains:

- 260-N-T-09-S-1024-R-HV-1-S/2-SF-1-N-SPEC885 encoder mounted to a bracket with Allen wrench with flywheel with applied degree wheel label.
- 3-Flywheel cover washers
- 1-cable grommet
- FEN-01 encoder module
- FETA-01 termination board for FEN-01
Below is a photo of the components in the encoder kit. (Grommet not shown)

Installation Process

Remove power to the demo unit
Unplug power to the back of the demo and remove any other remote power source that may be connected to the demo.

There are dangerous voltages inside the demo and at the drive terminals. Unplug the unit and wait 10 minutes for capacitances to bleed down before you start installing the encoder kit. Tip: It might be
easier to install the kit with the demo unit on its back. The power cord on the back of the unit will limit you from doing this.

Remove the drive cover
Using the T20 Torx driver (and following the ACS880-01 hardware manual (3AUA0000078093) if needed), remove the drive cover by loosening the two captive screws and tilting the cover upward.

Remove the flywheel cover
Using the 11/32” wrench, remove the four nuts holding the flywheel cover onto the motor. The cover and hardware will be reused.

Remove the flywheel
This flywheel is a press fit and should not have any screws securing it to the motor. With the flywheel cover removed, grasp the flywheel securely and pull straight off the motor shaft. The flywheel will not be reused.
Mount the encoder

**Warning**
The encoder is robust, as is the spring bracket mounted to its back, however, use caution not to bend or over-stress the spring bracket or cable connection at the encoder or damage could occur. Do not put excessive stress on the encoder bearings or damage to the encoder will occur.

**Confirm proper alignment with bracket**
This step should be preset from the factory. Note the rotational orientation between the encoder and its bracket in the photo below. The rotational orientation must be approximately as shown for the flywheel cover cable slot to properly align with the encoder cable. If this orientation is not correct, loosen the encoder mounting screws with the 2mm Allen wrench and rotate the encoder so that it is centered as shown in the photo. Carefully retighten the encoder bracket screws without stripping the bracket. Turn the encoder over and ensure that there will be clearance between the motor shaft and encoder bracket when the encoder is placed on the motor shaft.

**Slip-fit encoder to motor**
With the supplied Allen wrench, confirm that the screw for the encoder mounting collar is not tight. Carefully grasp the encoder, flywheel, and bracket combination and ensure there is a slip fit between the encoder and motor shaft. If there is not a slip fit polish the motor shaft with emery cloth or for large nicks, a fine file or stone, to obtain a slip fit while ensuring no debris/metal filings go into the motor or demo case. Tip: You may want to set the demo case vertically when you polish the motor shaft to help prevent debris from entering the motor bearing or panel. Do not put excessive stress on the encoder bearings or damage to the encoder will occur.
Slip the encoder onto the motor shaft

Once you have a slip fit between the encoder and motor shaft, and the orientation between the encoder and encoder bracket is correct, slide the encoder and bracket onto the motor shaft until the bracket bottoms out against the motor. Do not put excessive pressure on the encoder housing while finding this fit as encoder bearing damage could occur. The encoder must easily slide on the shaft while moving the mounting bracket. Align the encoder cable to approximately the 5:00 position while facing the motor. Grasp the encoder bracket and not the encoder housing and hold it securely to the motor face while tightening the encoder Allen screw. This assures you have a proper fit without stressing the encoder bearings.

Remove the demo panel

Using the Phillips screwdriver, remove the 8 screws holding the demo panel to the frame. Carefully lift the panel so that the encoder cable can be routed under the panel and into the drive.
Route the encoder cable

On some of the earliest demo units there is a grommet that is located below and to the right of the motor that was filled with RTV with the intention that the RTV could easily be removed and cable inserted. This is not the case. If your demo case has the grommet filled with RTV, from the back side of the mounting plate cut the grommet off with a knife and replace with the new grommet. If your kit didn’t contain a grommet please contact Technical Support at drivessupportline@us.abb.com or call 1-800-752-0696 option 1, option 1. Provide the demo serial number, confirm you are dealing with a demo that has a blue ABB motor, and an appropriate grommet will be shipped to you. If the grommet is filled with RTV, you will likely need a different flywheel cover discussed in section “Mount the flywheel cover to the motor” below. If your demo case has a plug and not a grommet, remove the plug and discard. Install the grommet.

Route the cable through the grommet as shown in the photo below and bring it back through the opening in the bottom of the drive. Feed enough cable though the drive so that it can be connected to a FEN-01 module in slot 2.
Secure the demo panel
Carefully locate the panel in its original position and secure with 8 screws. Use care when tightening the screws so that you don’t strip the threads in the aluminum frame.

Mount the flywheel cover to the motor
On some of the earliest demo units with the ABB (blue) motor, the flywheel cover did not have a deep enough slot to adequately accommodate the encoder cable. The slot depth shown is adequate.

If the cover that came with the demo has a slot that is 9/16” deep or less, contact Technical Support at drivessupportline@us.abb.com or call 1-800-752-0696 option 1, option 1. Provide the demo serial number, confirm you are dealing with a demo that has a blue ABB motor, and an appropriate cover will be shipped to you. If the cover is not correct you likely have already discovered that you also need a new grommet as described above.
Place the three washers over the three motor screws as shown (not over the encoder bracket screw) and place the flywheel cover over the screws while locating the encoder cable through the slot in the flywheel cover. The washers make up the difference in height for the encoder bracket arm.

Place the four nuts over the screws and tighten with the 11/32” wrench while ensuring the encoder cable fits loose in the flywheel cover. Below is a finished view.
Mount the FEN-01 module
If you need to, refer to the FEN-01 manual (3AFE68784603) for additional instructions. Mount the FEN module in slot 2 or any other desired slot (parameter list below reflects slot 2 mounting). Secure the module with the push tab and the T10 Torx grounding screw.

Mount the FETA-01 adapter
Using the installation instructions (3AXD50000206063), secure the FETA-01 adapter card to the FEN-01 module.

Wire the encoder to the FETA-01 module
The encoder module wiring is defined in the table below. Connect the color codes correctly to the FETA-01 using the 3.5mm flat screwdriver. Encoder leads are tinned for your convenience.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Wire Color</th>
<th>A</th>
<th>A'</th>
<th>B</th>
<th>B'</th>
<th>Z</th>
<th>Z'</th>
<th>+V</th>
<th>Com</th>
<th>Shield</th>
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<tbody>
<tr>
<td>FETA-01</td>
<td>Brown</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>Blk term block</td>
</tr>
<tr>
<td>X41Terminal</td>
<td>Yellow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Red</td>
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<td></td>
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<tr>
<td></td>
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<td></td>
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<tr>
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<td>White</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Terminal numbers on the FETA-01 are difficult to see. Note that X41 is the terminal wired in the photo and terminal 1 is on the left (brown wire).
Install the drive cover
Wiring is complete and you can install the cover on the drive and secure with two T-20 Torx screws.

Power the drive
Plug the power cable into the back of the demo and turn on power.

Program the FEN-01 module
The following parameters are used to program the FEN-01 module in Slot 2 for the supplied encoder. Set these using the control panel or through Drive Composer.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>91.11</th>
<th>91.12</th>
<th>92.1</th>
<th>92.10</th>
<th>92.12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Module 1 Type</td>
<td>Module 1 Location</td>
<td>Encoder 1 Type</td>
<td>Pulses per Revolution</td>
<td>Speed Calculation Mode</td>
</tr>
<tr>
<td>Value</td>
<td>FEN-01</td>
<td>Slot 2</td>
<td>TTL</td>
<td>1024</td>
<td>A&amp;B all</td>
</tr>
</tbody>
</table>

Refresh the drive parameters using parameter 91.10 Encoder Parameter Refresh or cycle power.

Make sure the motor and encoder electrically are in the same direction
- Run the drive in the positive direction. This should be clockwise as you face the drive shaft end. If turning the opposite, reverse two motor leads. Be careful to pull the power on the drive demo and wait 10 minutes for the bus to discharge before removing the drive cover.
- Observe Parameter 1.04 Encoder 1 speed filtered to see if the encoder speed is positive. If not reverse A and B channels on the encoder.
- Restart the drive and confirm the motor and encoder are both in the same direction.

Close the speed loop on the drive
If at this time you want to close the drive speed loop, set parameter 90.41 to Encoder 1.

Backup drive parameters
Backup the parameters and the installation is complete.