OPTIONS FOR ABB DRIVES

FSO-12/-21 firmware update with Drive composer pro

User instruction

FSO-12/-21 firmware update with Drive composer pro

User instruction

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3. Updating the FSO-12/-21 safety functions module

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1

Introduction

This document describes the requirements and the procedure for updating the firmware of safety functions modules FSO-12 and FSO-21 using Drive composer pro software. The update process will update FSO module firmware version to revision H, v4.3.0.0. Revision H fixes a safety critical bug with Safely-limited speed (SLS) function and PROFIsafe modulation status bit that exists on earlier FSO-12/-21 firmware revisions A to G. The update procedure is identical for both FSO-12 and FSO-21 safety modules and takes approx. 25 minutes per one FSO module.

Note: You can update only one FSO module at a time.

Note: This instruction does not cover updating FSO-11 safety option modules.

Related manuals

You can find more detailed information about the new FSO firmware in the following user manuals:

Document	Code
Option manuals	
FSO-12 safety functions module user's manual	3AXD50000015612
FSO-21 safety functions module user's manual	3AXD50000015614
Drive PC tool manual	
Drive composer Start-up and maintenance PC tool user's manual	3AUA0000094606

You can find manuals and other product documents in PDF format on the Internet. See www.abb.com/drives/documents. For manuals not available in the Document library, contact your local ABB representative.

For additional ABB safety information and solutions visit http://www.abb.com/safety.

2

Requirements

Before starting the update process, download Drive composer pro 2.4.1 software using the link below. The Drive composer pro 2.4.1 will work with your existing Drive composer pro (DCPT-01) license key. If you do not have Drive composer pro license, the software can be run in trial mode for 30 days.

Link to download Drive composer pro 2.4.1:
https://new.abb.com/drives/software-tools/drive-composer

In addition to Drive composer pro 2.4.1, you will need the following equipment:

- USB A to USB Mini-B cable
- IBM Compatible PC with Microsoft Windows 7 or Windows 10 (32-bit or 64-bit) operating system and a free USB A slot. Preferably a laptop computer that can easily be taken near the drive cabinets.

If the drive where the FSO module to be updated is installed in does not have an ACS880 assistant control panel, you will also need the following:

- ACS880 assistant control panel (any version)
- Standard ethernet cable (RJ45-RJ45).

ACS880 drive control unit (ZCU or BCU) and FSO-12/-21 module shall be powered up with 24 V auxiliary voltage all time during the update process. Drive main supply shall be disconnected, or in the case of ACS880-104 inverter modules, the supply unit shall be shut down before opening drive cabinet doors.

Note: The drive must not be running during the update process.

3

Updating the FSO-12/-21 safety functions module

Setting up the connections

Follow the procedure below to make the connections necessary for the update:

1. Make sure that a laptop computer is fully charged and will not go to scheduled sleep mode or restart. It is recommended to have the computer connected to an AC supply.
2. If the drive with the FSO to be updated does not have an ACS880 assistant control panel, connect a control panel to the drive control unit (BCU or ZCU) connector X13.
3. Connect the USB cable between the control panel and the PC. Wait for Windows to detect the new device (ABB assistant control panel).

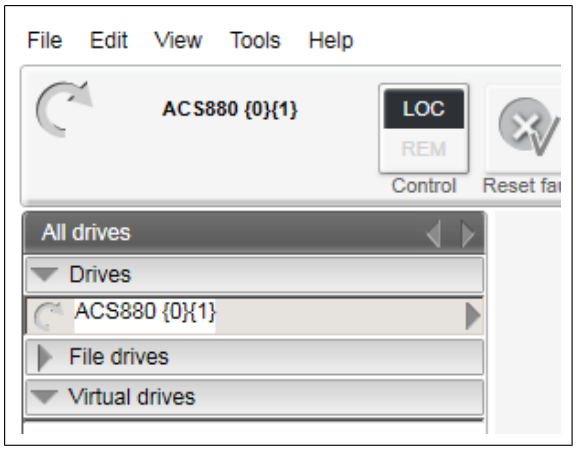
Note: FSO module update process can only be performed with a direct connection to the drive control panel's USB port - one drive at a time. Updating the module is not possible, for example, over a panel bus chain implemented with FDPI-02 adapters where several drives are connected to one control panel, nor over an Ethernet tool network.

Updating the module with Drive composer

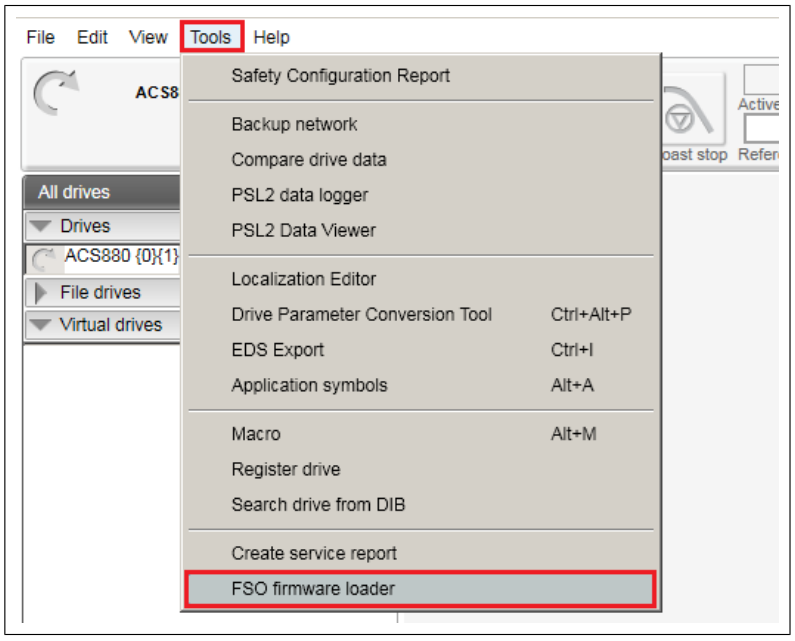
After the computer has detected the connected drive control panel successfully, start the Drive composer pro 2.4.1 software.

1. On the Drive composer pro “Welcome” screen, select “USB/COM enabled”, then click “Connect”.

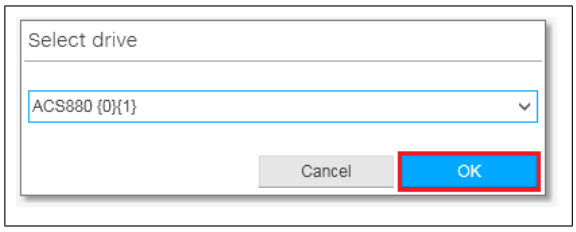
2. After Drive composer pro has connected to the drive, you will see one connected drive in the left pane.



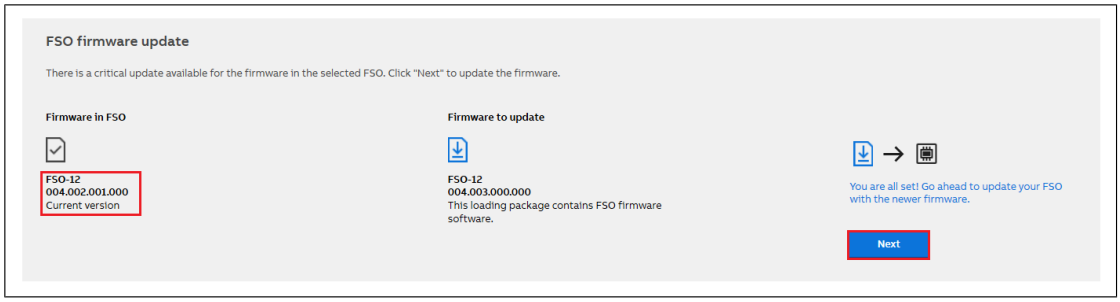
3. From “Tools” menu, select “FSO firmware loader”.



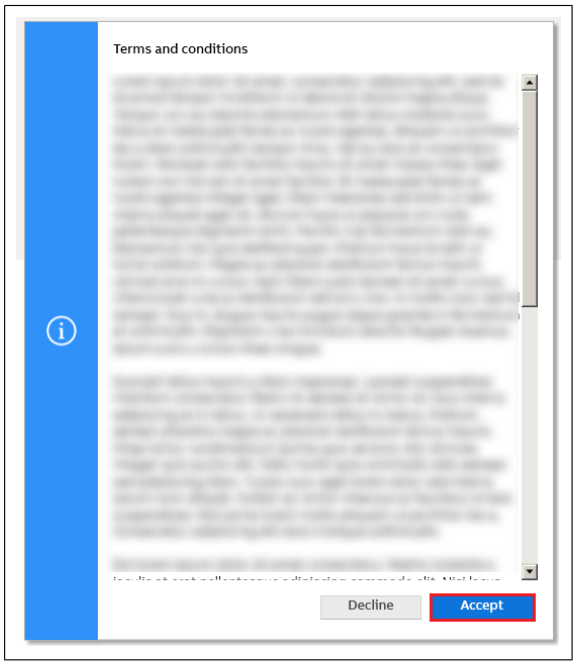
4. A dropdown menu opens. Select the drive that you want to update and click “OK”.



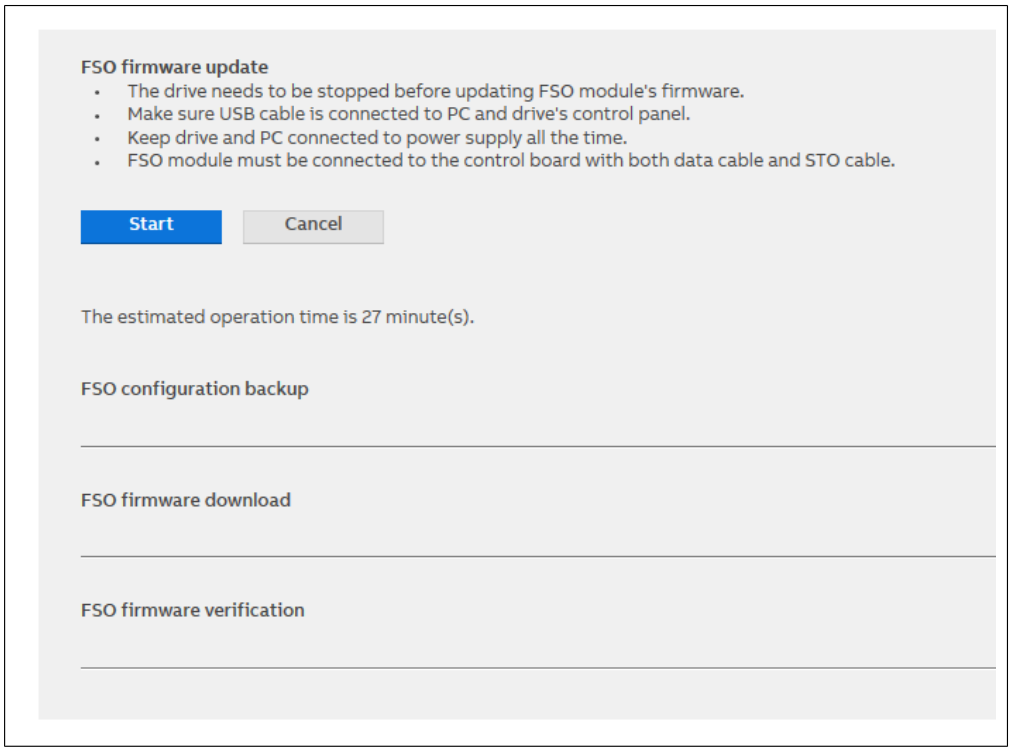
5. FSO firmware update screen appears. Firmware update is possible, if the current firmware version of the FSO module is older than 004.003.000.000. Click “Next” to continue.



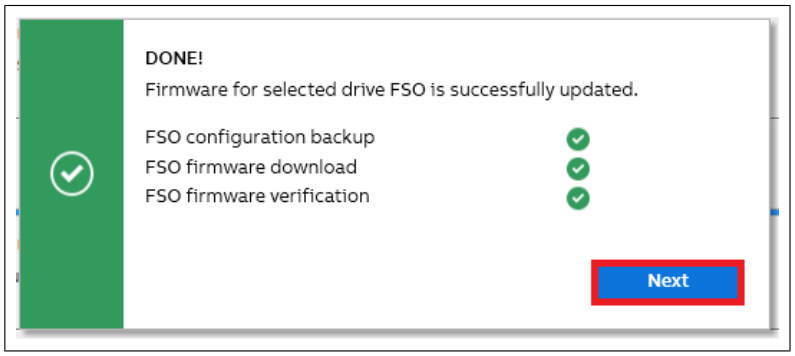
6. Accept terms and conditions to continue.



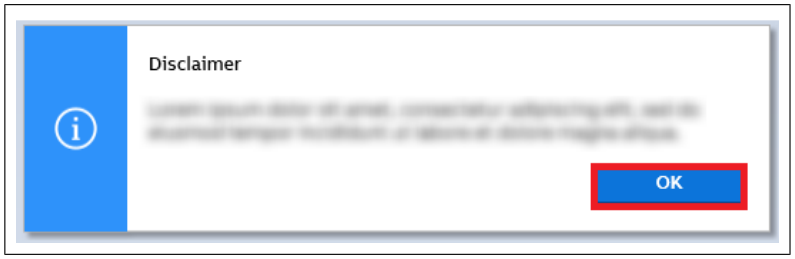
7. FSO firmware update screen appears. Click “Start” to start firmware update. It is recommended not to do other tasks on the computer at the same time.



8. The update procedure has three steps: configuration backup, actual firmware download to FSO, and verification of the updated firmware. After all steps are done, drive control unit and the FSO module are rebooted automatically, and the following screen appears. Click “Next”.



9. The update tool shows disclaimers about the validation of the safety functions. Click “OK”.



10. USB cable can now be disconnected from the drive, if there is another Drive composer pro connection available for the drive, eg, a tool network over Ethernet to configure FSO safety parameters. Close the Drive composer pro software.
11. If no other Drive composer pro connection is available for the drive, keep the USB cable connected and continue to FSO parameter settings in the next section.
12. You can verify that the new firmware is loaded to FSO module by checking FSO safety settings. If parameters SLSx.05 SLS ramp modoff reaction and SLSx.06 SLS ramp modoff delay time [ms] are listed, then firmware of the FSO has been successfully updated to revision H. See the next section for reference on how to check FSO parameter settings.

Setting the FSO parameters

The revision H of the FSO-12 and FSO-21 safety functions modules includes two new safety-critical parameters when compared to revisions A to G.

The functionality of the SLS function has been improved related to the following case where:

1. SLS function is activated from a higher speed than the SLS limit speed.
2. FSO forces the drive to decelerate to SLS limit speed.
3. The drive trips during the deceleration ramp forced by FSO.
4. IMPROVED FUNCTIONALITY: FSO will detect that the drive stops modulation during the deceleration ramp and activates STO with appropriate indications.

This improvement is realized by adding two new parameters into the SLS parameter group:

SLSx.05: SLS ramp modoff reaction

- A) Modoff delay time
- B) Monitoring active
- C) Monitoring active and modoff delay time
- D) Monitoring and modoff delay time are disabled

SLSx.06: SLS ramp modoff delay time [ms]

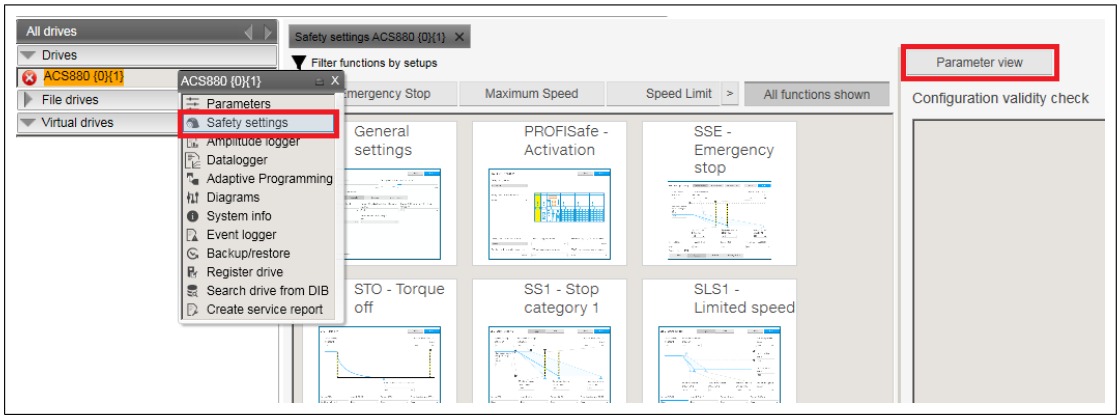
- Delay for the modoff reaction for SLSx.05 selection A) and C)

As a default setting, the value of SLSx.05 is set to A) *Modoff delay time* and the value of SLSx.06 is set to *0 ms*, which means that the FSO will activate STO immediately when modulation is lost during a deceleration ramp forced by the SLS function.

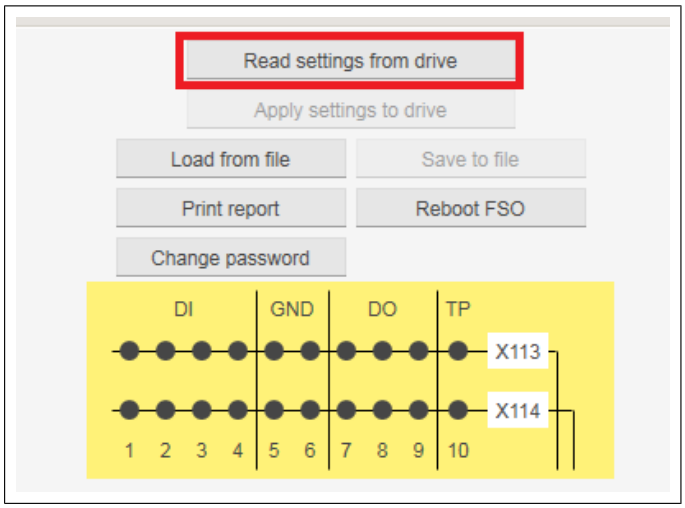
If you prefer to keep the basic setting found in the older firmware versions of the FSO module (revisions A to G), you must set the value of parameter SLSx.05 to D) *Monitoring and modoff delay time disabled*. In this case, FSO will not activate STO if modulation is lost during deceleration.

To set FSO parameters using the Drive composer pro PC tool, do the following:

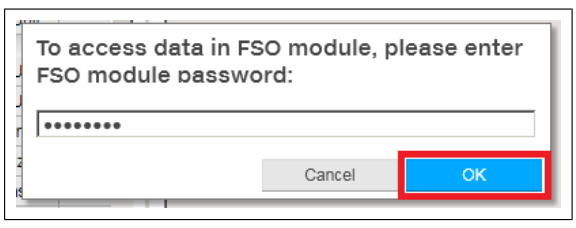
1. Click drive name in drive list and from the menu, select “Safety settings”. When Safety settings screen opens, click “Parameter view” button.



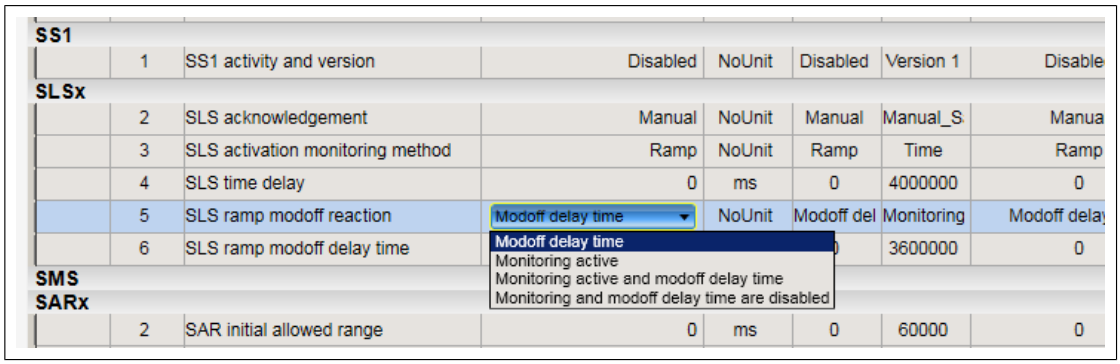
2. Click “Read settings from the drive”.



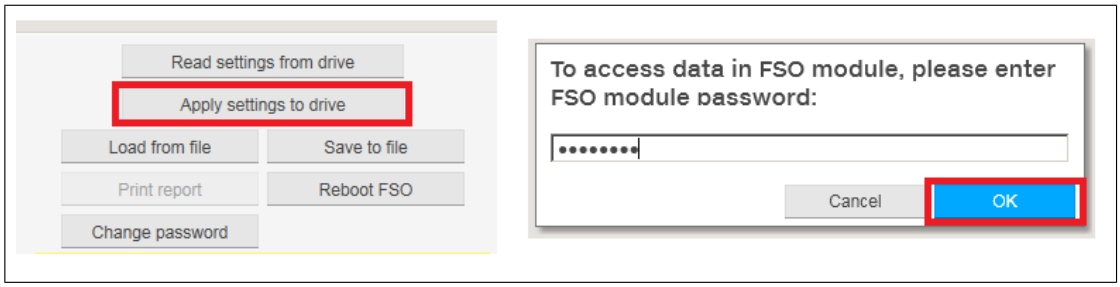
3. Enter FSO password (default is “12345678”) and click “OK”. Wait until safety settings are loaded from the FSO.



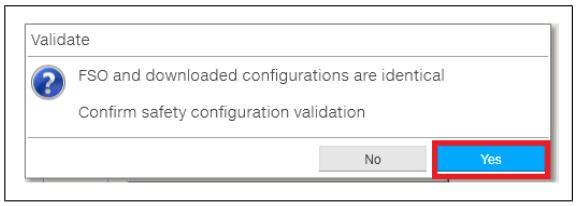
4. Scroll parameter list down to “SLSx” section. Set the new parameters SLSx.05 and SLSx.06 to desired values.



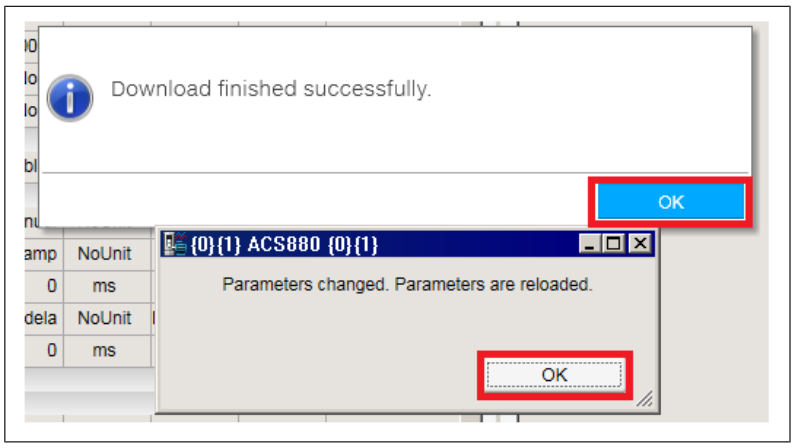
5. Apply new settings to FSO module by clicking “Apply settings to drive” and again, enter FSO password and click “OK” to continue.



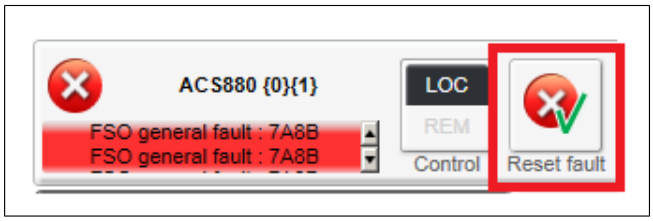
6. Drive composer pro shows a warning about safety configuration validation. Click “Yes”.



7. Two information messages appear. Click “OK” for both.



8. After the new safety settings have been uploaded to the FSO, the drive is still faulted for “FSO general fault” until the fault is reset. Reset the fault by clicking “Reset fault” button.

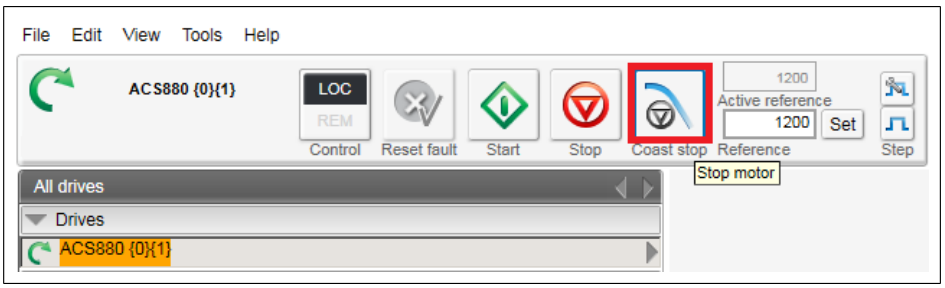


9. FSO parameters are now set and the drive can be started.
10. If you used point-to-point USB connection to set FSO parameters, you can now close the Drive composer pro software and disconnect USB cable from the drive control panel.

Validating the safety functions

Once the FSO module has been updated and safety settings have been changed, the user must perform safety functions validation for the safety system, that is, all safety functions must be tested to verify that they work as intended. Especially, it is important to test the new SLS failure reaction behavior in a situation when drive modulation is lost.

You can easily test modulation loss behavior by clicking “Coast stop” button in Drive composer. This causes modulation to stop immediately and the motor will coast to a stop instead of a controlled ramp. Make sure that it is safe to perform a coast stop for your machine.



Safety functions validation shall be performed by a competent person, who has expertise and knowledge of the safety function(s) in use. Safety functions validation shall follow the acceptance test procedure described in FSO-12 and FSO-21 safety functions module user manuals. Basically, validation or acceptance test shall include at least the following steps:

- having an acceptance test plan
- testing all commissioned functions for proper operation
- testing all used inputs for proper operation
- testing all used outputs for proper operation
- documenting all acceptance tests performed
- test responsible person signing and archiving the acceptance test report for further reference.

Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

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