



## SM02 to Cordex Controller Replacement

Prepared by: Technical Support Department

### Summary

This is a general procedure on how to replace the SM02 supervisory controller with a Cordex controller

### Tools, Reference Documents Required

- Various hand tools, including insulated tools
- Mounting screws
- Insulating canvas and non-conductive clamps
- Bridging cable (size appropriately with 3/8" or 1/4" mounting hardware)
- Tie wraps
- Digital multimeter
- Electrical insulating tape
- Laptop and cross-over Ethernet cable or null modem cable
- Personal safety equipment
- Reference schematic diagrams, Cordex Controller Manuals and a copy of the system configuration file

### Procedure

**NOTE: Before proceeding, all metal jewelries including rings and watches must be removed**

1. Review the power system schematic in the power system manual
2. If the power system is equipped with a Low Voltage Disconnect, inhibit LVD control switch, turn the switch to IN position. Assemble bridging cable to bypass the contactor. The bridging cable should be sized to carry the maximum load of the system

**WARNING: This bridging cable will maintain power system integrity. If this is not done and when the CXC controller is removed, the contactor will disengage and drop the load**

3. Insulate all grounded metal work around the contactor while installing the bridging cable. (Canvass cloth is recommended). Use the non-conductive clamps to hold it in place
4. Install bridging cable across LVD Contactor effectively bypassing the contactor. Cable must be bolted in place



5. Insulate with canvas cloth the metal work between the controller modules
6. Identify and tag all wires terminating to the controller to ensure wires are reinstalled in the correct positions. Prepare or cut strips of electrical insulating tape.
7. Cut the tie wraps to release the wire bundle
8. De-energized SM02 by removing the input fuses
9. Disconnect wire terminations and insulate exposed leads as you remove them. Disconnect RS485 communication cable as well
10. Remove mounting screws and dismount SM02
11. Mount the Cordex controller in position. Reconnect the wire terminations in the reverse order from which they were removed. Plug the communication cable into its proper RJ12 socket (if you will continue to use Pathfinder series rectifiers use the RS485 socket otherwise connect using the CAN socket). Review and verify all wire terminations. Secure the wire bundle with tie wraps. Power up Cordex controller by installing the power leads (pins 67/68 and pins 69/70)

**NOTE: Temperature sensors are polarized. Digital inputs are bipolar**

12. Login to the controller via its web interface (default IP is 10.10.10.201) and review all the settings

**NOTE: Refer to the CXC controller software manual (or MOP) for setting up the local connection between the controller and computer. You may also use the CXC connection wizard**

13. Check Cordex controller functionality and verify all settings with the power system configuration:
  - Check for correct system voltage under System -> Configure System
  - Under Rectifiers -> Configure Rectifiers, confirm voltage settings are within the correct range
  - Enable power save if required
  - If system has a 3 phase input, map the rectifier phasing under Rectifiers -> Rectifier Phase Mapping

14. Check and calibrate (if necessary) Voltage and Current Inputs.

For Current reading:

- Confirm physical shunt rating stamped on shunt if possible or use system wiring schematic
- Confirm that the static calibration match the shunt's physical rating under Signals -> Configure Signals -> Analog Inputs -> I1/I2/I3/I4
- Confirm the Load and Battery current equations under signals/configure signals
- Perform single high point calibration if current going to just the load is known

Voltage Verification:

- Check the voltage of the battery string using a calibrated multimeter



- Verify that the actual output voltage shown on the top of the web interface (Battery Voltage) match the voltage read by the meter
  - If there is a discrepancy, calibrate V2 's high point under Signals -> Configure Signals -> Analog Inputs -> V2
15. Verify remaining peripherals and parameters and operation of the system:
- Check on temperature reading by going to Signals -> view live status -> analog inputs -> T1 (GP1), T2 (GP2)
  - Check on the AC input voltage under Signals -> View live status -> Controller -> AC Mains. If there is a discrepancy of more than 10 volts, perform an AC calibration by going to Signals -> Configure signals -> Controller -> AC Mains
  - Check if all temperature compensation cables are enabled correctly under Signals -> Configure Signals -> Battery Temperature and select the sources that are connected/available
  - Test the digital alarms by turning the battery breakers or the load breaker into its trip position
- NOTE: Mid trip breakers must be in the over-current state (middle position). You can manually set it to that position by hitting it on its short side to trip and then insert in back to the distribution panel**
- Battery properties for battery optimization needs be entered using battery specification (battery data sheet) under Batteries -> Configure Batteries
16. Backup up your configuration by going to Logs and Files -> Manage Configuration click 'Save Full Site Configuration'
17. Remove insulating canvasses and reinstall distribution bay rear cover panels
18. Remove LVD bypass cables and insulating canvas
19. **Optional:** Reset the controller by going to Controller -> Reset on the webpage to perform a safe shutdown and reboot to verify settings are preserved

**You have now successfully upgraded the CXC controller and thank you for choosing Alpha Technologies**