

FAQ: Using a SMDXXE2 Absolute Encoder

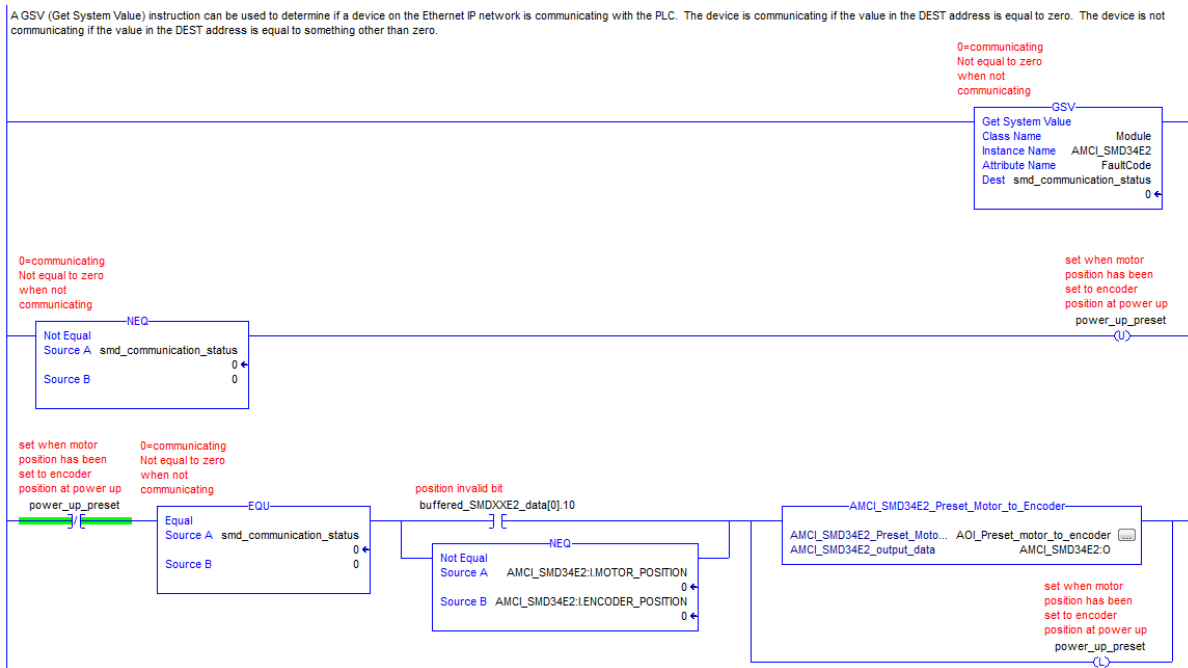
AMCI SMDXXE2 integrated motors and drivers can be ordered with an optional absolute encoder. This encoder has a fixed 2048 counts per turn and can measure 2^{21} (2,097,152) turns before rolling over to zero.

This FAQ shows where and how to use the absolute encoder position data.

Power UP

AMCI SMDXXE2 motion products will always power up with the Position Invalid status bit set and with the Current Motor Position equal to zero.

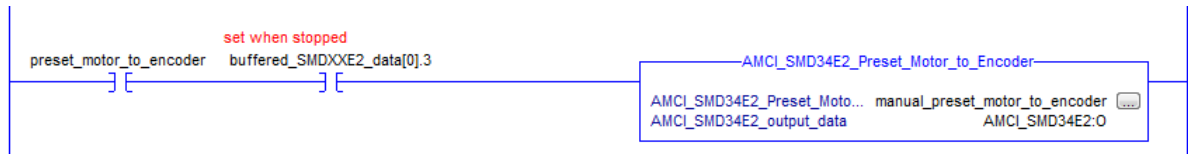
The following three rungs monitor the network communication status of the AMCI SMDXXE2 device and use the Preset Motor to Encoder command to set the motor position to the absolute encoder position when either the position invalid status bit is set or if the current motor position is not equal to the current encoder position.



Manually setting the Motor Position to the Absolute Encoder Position

It is also possible to manually send the command to preset the motor position to the absolute encoder position.

In this example, the **preset_motor_to_encoder** bit is an internal bit that must be set by your ladder logic program to make this operation occur.



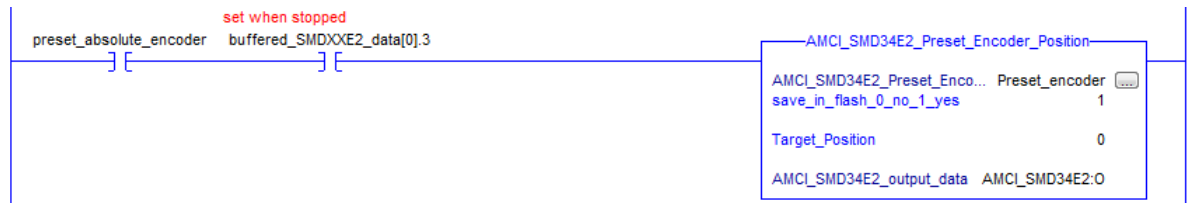
Presetting the Absolute Encoder Position

The absolute encoder position will probably not match the machine position. Instead of turning the motor's shaft until it does, the SMDXXE2 allows you to set the absolute encoder's position to a desired value within the range of +/- 8,388,607.

The Preset Encoder command has a Save In Flash option. The results of this command will be lost the next time the SMDXXE2's power is cycled if there is a "0" in the Save_In_Flash field when issuing this command.

Because the SMDXXE2's flash memory has a life of 10,000 write cycles, the Preset Encoder and Save in Flash command must only be used during setup and calibration operations.

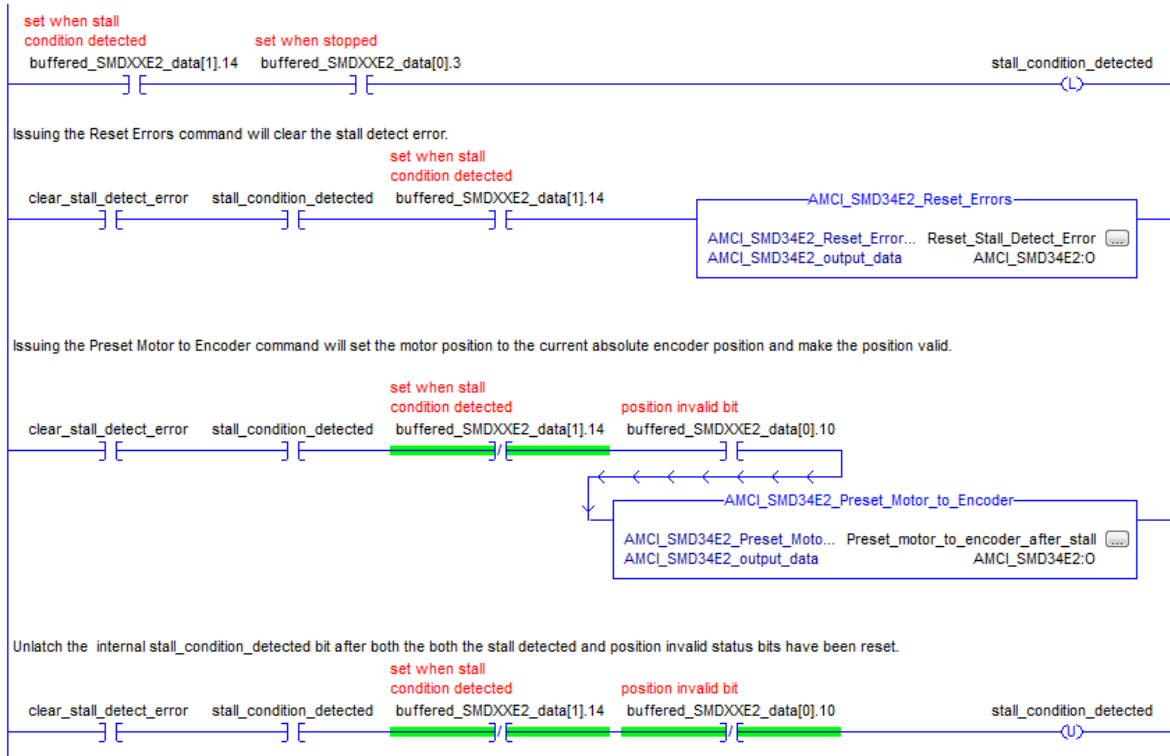
In this example, the **preset_absolute_encoder** bit is an internal bit that must be set by your ladder logic program to make this operation occur.



Recovering from a Stall Detected Condition

Any SMDXXE2 unit with either an Absolute or Incremental encoder can be configured to detect when the motor's shaft has stalled. Specifically, the SMDXXE2 will stop the move if the motor position and the encoder position are out of alignment by more than 45 degrees.

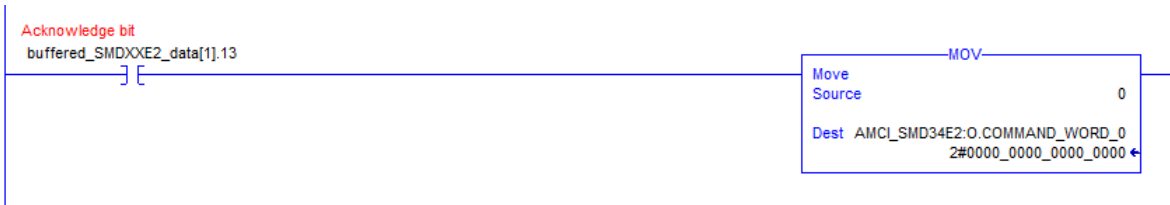
In this example, the **clear_stall_detect_error** bit is an internal bit that must be set by your ladder logic program to make this operation occur.



Resetting the Acknowledge Bit

The SMDXXE2 units set an Acknowledge Bit as a response to a Reset Error or any of the Preset commands. The following rung resets the command word to zero to allow the next Reset Error or Preset command to be immediately accepted.

Resetting the command word to zero will cause the SMDXXE2 to reset the Acknowledge bit.

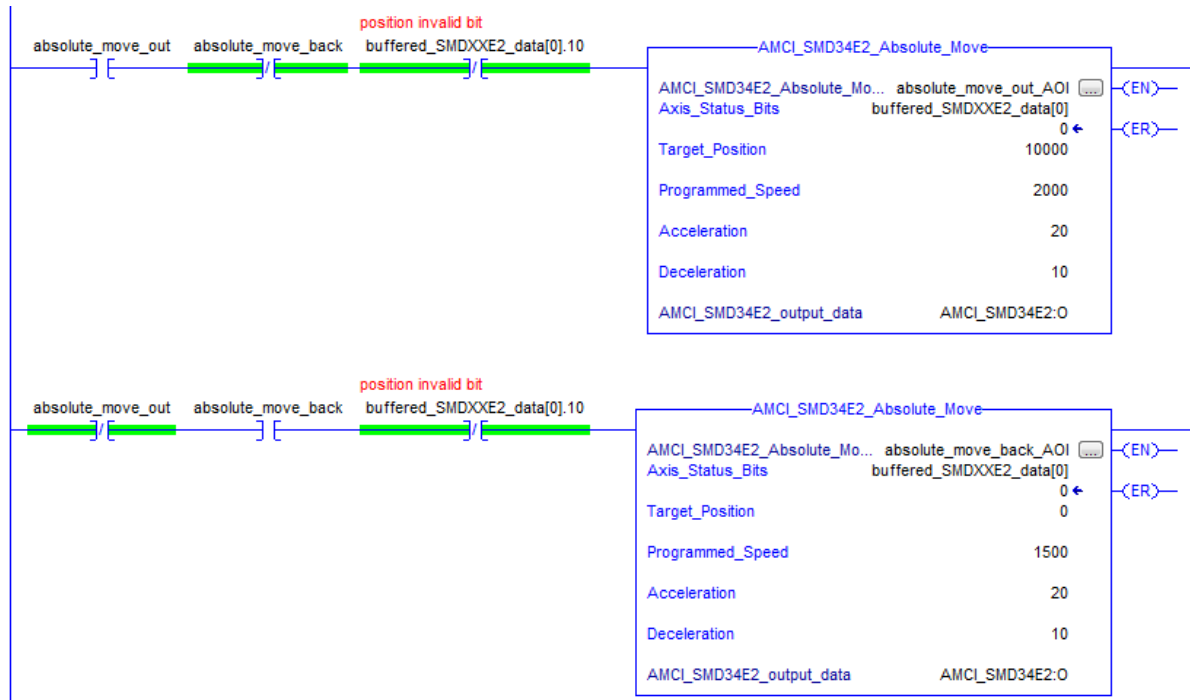


Out and Back Absolute Moves

The following two rungs perform out and back Absolute Moves.

The Position Invalid Status bit must be reset before any Absolute Moves can be performed.

In this example, the **absolute_move_out** and **absolute_move_back** bits are internal bits that must be set by your ladder logic program to make either of these absolute moves occur.

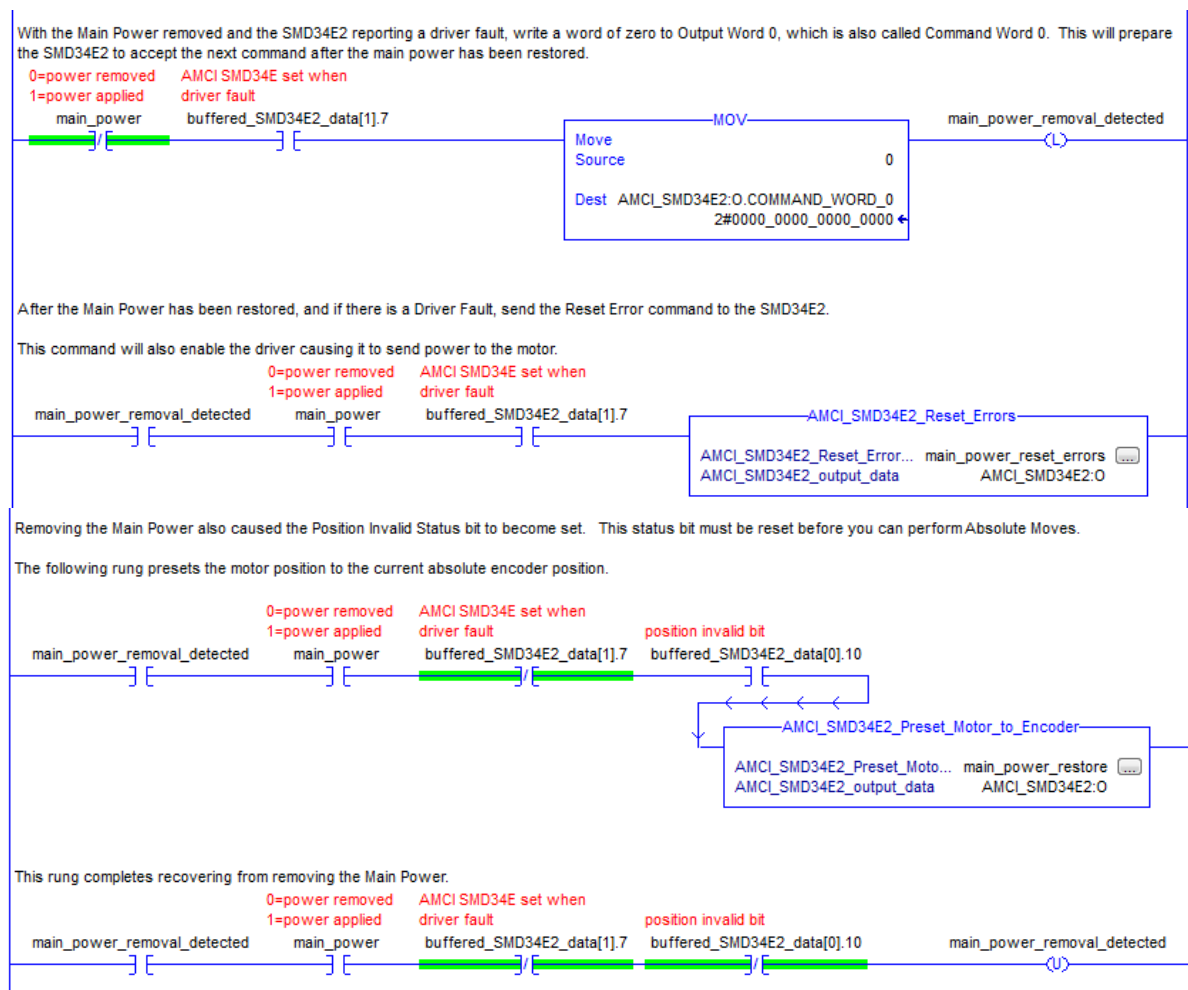


SMD34E2 Resetting Driver Faults

The AMCI SMD34E2 is different from AMCI's other SMDXXE2 products is that it will set a Driver Fault bit when the Main Power is removed while the Auxiliary Power is maintained.

The following logic shows how to recover from a SMD34E2 Driver Fault.

NOTE: For this logic to work correctly, the PLC must be aware of whether or not the main power is applied to the SMD34E2. (The SMD34E2 does not report this information to the network.) In the following example, the state of the main power is represented by the **main_power** bit, "0" if the main power is removed or "1" if the main power is applied.



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