7551 to 7561 Manual Addendum

AMCI has become aware that some newer generations of Digital Output LDT sensors will not work with AMCI 7551 LDT interface modules for the SLC 500 PLC platform.

At the time of the writing of this document, the AMCI 7551 will not work with the following Balluff LDT sensors, where "x" can be any characters.

BTL-x-Mx-xxxx-x-xxxx-xx
BTL-x-Px-xxxx-x-xxxx-xx

If you find yourself in a situation where you need to replace either an AMCI 7551 module or a LDT sensor, please consider replacing the 7551 module with a 7561 SSI interface module, and the LDT sensor with a SSI sensor.

SSI sensors have several advantages over LDT sensors.

1. Greater resolution.
2. SSI sensors are more universal and will work with almost all SSI interface modules.
3. They are available in the same mechanical housings as your existing LDT sensors.

Switching from 7551 to 7561

Switching from an AMCI 7551 module to an AMCI 7561 module will require you to make changes to your SLC 500 program.

1. You will need to change the ID code used to add the module to the I/O from 3515 to 3535. Both of these ID codes create eight input words and eight output words in the PLC's input and output image tables.
2. The position data for both modules is located in input words 1 and 2. However, different logic will be required to combine these two position words into one Floating Point or Long data type register.

   The 7551's position can be combined into one register by multiplying input word 1 by 1000 and adding input word 2 to it.

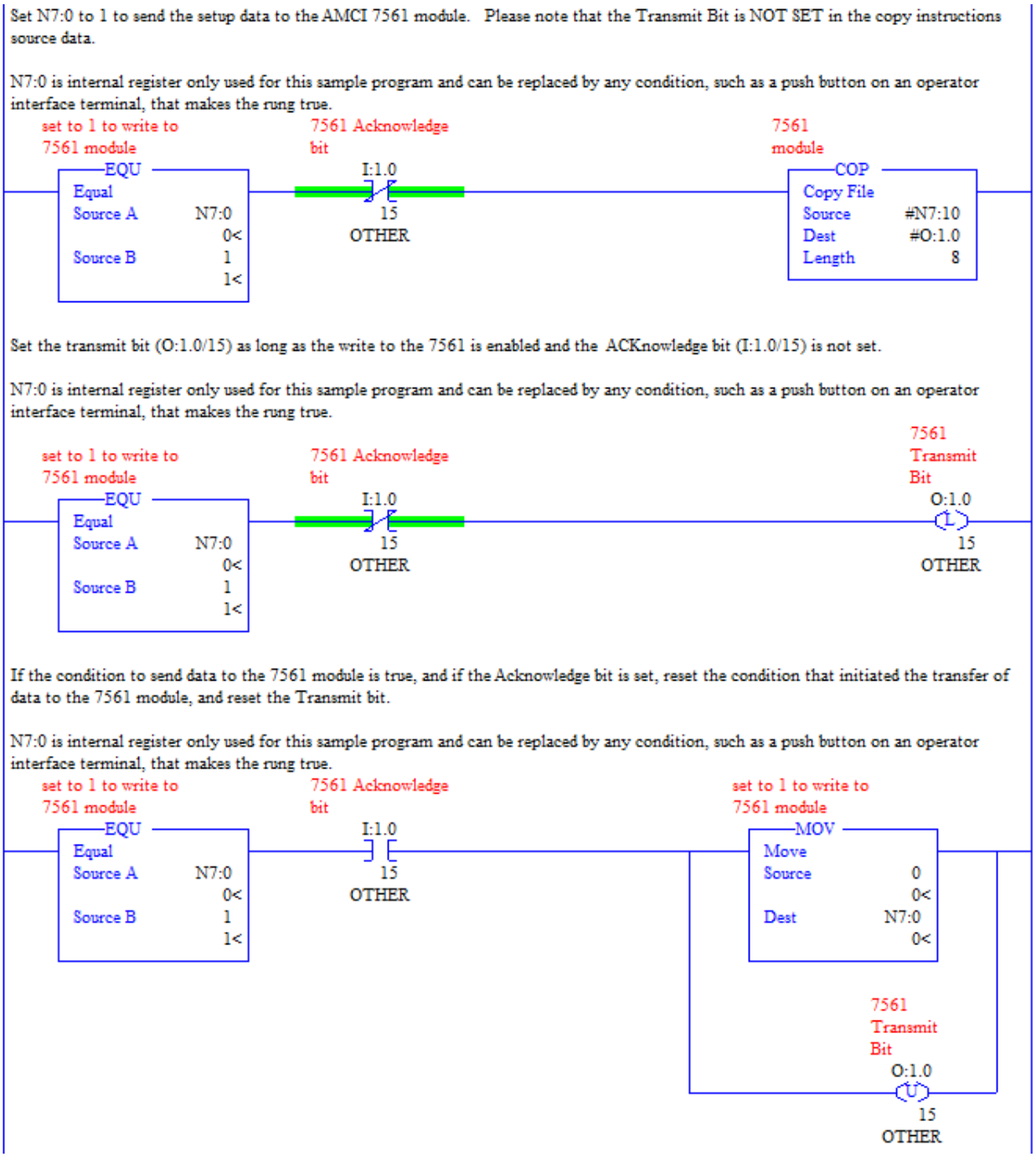
   The 7561's position can be combined into one register by multiplying input word 1 by 10,000 and adding input word 2 to it.

3. The data value sign status bits are located in different locations.

   For the 7551it is input word 1 bit 15.

   For the 7561 it is input word 0 bit 8.

4. The ladder logic that was used to program the 7551 module can be reused to program the 7561 module. That is, the Transmit Bit / Acknowledge Bit programming sequence is exactly the same for both modules.



5. The setup data that you send to each of the modules is very different. The following table shows the function of each of the programming data words. Please see the module's user's manual for a more detailed description of each of these parameters.

Output Word	7561 Function	7551 Function
0	Command Bits	Command Bits
1	Format Word	Upper 1 or 2 Digits Gradient
2	Scalar Multiplier	Lower 3 Digits Gradient
3	Scalar Divisor	Full Scale Length
4	Upper 4 Digits Preset Value	Upper 3 Digits Full Scale Count
5	Lower 4 Digits Preset Value	Lower 3 Digits Full Scale Counts
6	Velocity Update Time	Upper 3 Digits Preset Value
7	Must be 0	Lower 3 Digits Preset Value

6. SSI sensors typically have greater resolution than LDT sensors. The maximum resolution of a LDT sensor when used with the 7551 module is 1000 counts per inch. A typical resolution for a SSI sensor is 5µm or 5080 counts per inch.

   The 7561 module has two parameters, Scalar Multiplier and Scalar Divisor, which can be used to scale the SSI sensors data to the resolution used by your 7551 module. The following procedure shows how to calculate these Scalar Multiplier and Divisor values.

   Conversion Factor: $\frac{\text{Desired Resolution (counts/inch)}}{\text{SSI sensor Resolution (counts/inch)}}$

   Step 1: Convert your SSI sensor resolution from µm to inches. For example, you are using a SSI sensor with 5µm resolution in your application.

   $$5\ \mu m * \frac{1\ mm}{1000\ \mu m} * \frac{1\ inch}{25.4\ mm} = 0.00019685\ inches/count = 5080\ counts/inch$$

   Step 2: Determine the number of counts per inch for the desired resolution. For example, 0.001".

   0.001 inch/count = 1000 counts/inch

   Step 3: Determine the Scalar Multiplier and Divisor values.

   $$\frac{\text{Desired Resolution (counts/inch)}}{\text{LDT Resolution (counts/inch)}} = \frac{1000\ counts/inch}{5080\ counts/inch} = \frac{100}{508} = \frac{50}{254} = \frac{25}{127}$$

   Therefore, to use a sensor with 5µm resolution and get 0.001 inches per count resolution, use a Scalar Multiplier of 25 and a Scalar Divisor of 127.

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