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What is the Conversion Factor on the NI-9505 When Setting and Measuring Current?

Hardware: Motion Control>>Power Drives>>cRIO-9500**Problem:**

The NI-9505 is a Servo Drive module that can be used for current loop control applications. These applications require the user to specify the Current Setpoint and Current Limit (Amps) as floating point [DBL] numbers. What is the conversion factor and why is this used?

Solution:

A conversion factor is used because the FPGA on the NI-9505 can not currently interpret double precision numbers so all floating point numbers must be converted to integers. To convert from integer values on the FPGA to current readings the conversion is 0.0062.

Although it is recommended not to exceed +/- 12 amps when specifying the current set point for a current loop control algorithm on the Real-Time controller, the actual current range of the module is +/- 12.7 amps.

The ADC on the 9505 has 12 bits of resolution, thus the values range between -2048 and 2047 which needs to map to a current range of +/- 12.7 amps (See Table 1).

Current Limit (Amps)	I16 Representation
-12.7	-2048
12.7	2047

Table 1: Mapping

Therefore the conversion factor is calculated with the following equation, units being amps/integer value:

$$\frac{12.7}{2048} = 0.0062 \text{ Amps / Count}$$

This explains why most of the examples in the LabVIEW Example Finder use 6.2 mA/integer value as the conversion factor between floating point numbers on the Real-Time controller and integers on the FPGA.

Related Links:[Product Manuals: NI-9505 Operating Instructions and Specifications](#)**Attachments:**

- Mapping.JPG



- Equation.JPG

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