

## Application Note: Converting a 16-Bit Unsigned Integer to a Floating Point Number

App Note SLC Integer Convert  
1.1.doc

Programmable Controllers

**Product(s):** SLC500 (1747)  
**Catalog #:** 1747L531; 1747L532; 1747L541; 1747L542; 1747L542P; 1747L543; 1747L551E; 1747L552E;  
1747L553E  
**Series / Revision:**  
**Subject (Key phrases):** Application  
**Summary of Tech note Information:**

### PURPOSE

The purpose of this document is to provide RSLogix programming code for SLC-500 PLC's to purposefully understand analogue input from a remote radio linked to a WI-GTWAY-9-MD1 (DF1) then to serial connection to SLC-500 using the DF1 protocol.

*All references in this document to the WI-GTWY-9 also apply to the licensed and unlicensed gateways.*

### BACKGROUND

Since the SLC-500 logic platform only stores integers in the 2's complement binary data type, the highest order bit in the data word is reserved to determine the sign of the integer, limiting the maximum read number to 32,767.

If data values greater than 32767 are desired a floating point format must be used. Any number with a value between 32768 and 65535 are negative numbers. When they are converted to floating point format they convert as negative numbers. The following rung of logic will convert a 16 Bit value between 32768 and 65535 to a float.

NOTE: This logic is not supported in the SLC-5/02 or below.

This application note is applicable to Gateway Firmware versions 1.70 and below. Firmware version can be found in the serial number of the module located at numbers 5 – 7. e.g. 0505**170**1234 indicates firmware version 1.70.

For all later versions of Firmware the W-Series configuration utility will cater for scaling the I/O registers to a signed register without the need of any further logic.

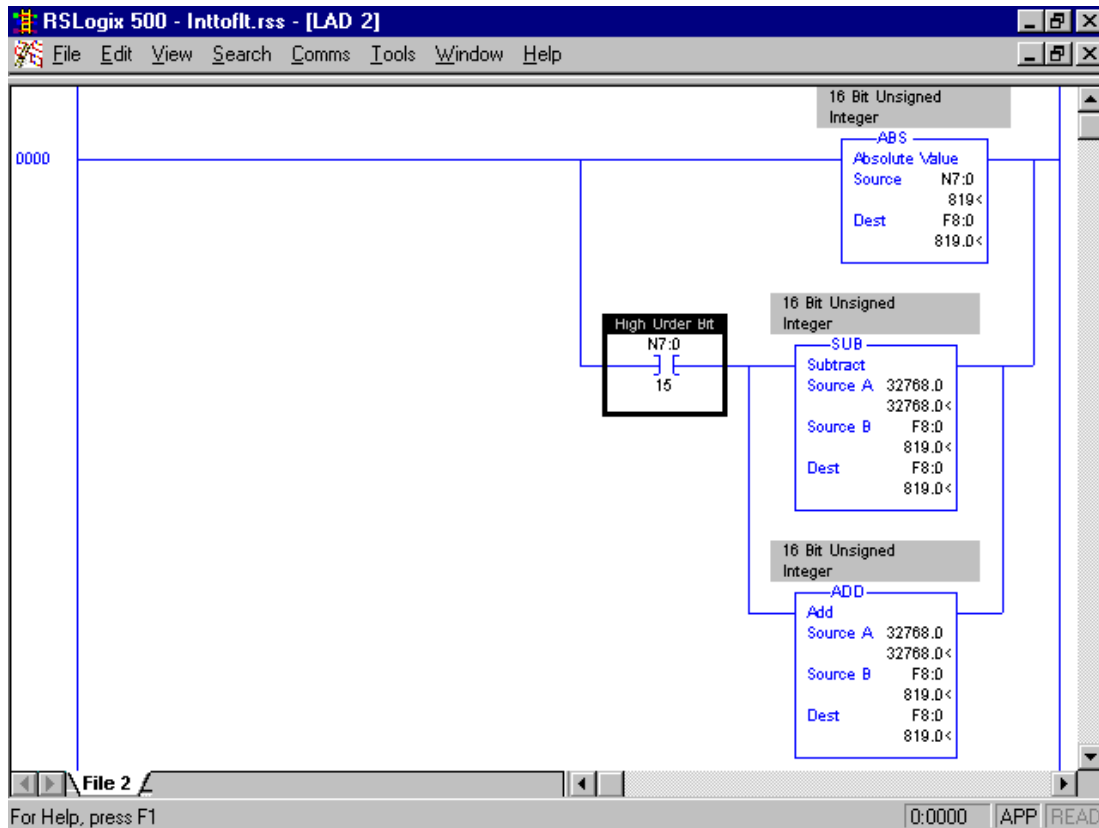
### APPLICATION

This application note should be read in conjunction with both the user manual and DF1 Example final application note. These documents provide reference to the implementation of the MSG command if the SLC500 provides is an initiator.

Unlike a Micrologix, the SLC-500 PLC will not support Long integer data files. The SLC500 integer registers are 16 bit signed (32767 to -32768), The WI-GTWY-9-MD1 (DF1) I/O registers are 16 bit unsigned (0-65535).

As the analogue scale for 4 – 20mA is 13384 – 49152 (4000h to C000h) and for 0 - 20mA is 8192 – 49152 (2000h to C000h), PLC programming conversion from an unsigned integers to a Floating point number is required within the SLC-500 for the data to be purposeful.

The following piece of logic can be used to perform this task.



**Rockwell Automation Knowledgebase Article #A18226: Converting a 16-Bit Unsigned Integer to a Floating Point Number**

<http://support.rockwellautomation.com/knowledgebase>