

Modbus

Alternate Numeric Representations

April 13, 2017

Overview

Modbus reports numeric data in 16-bit registers. Typically, each register contains one signed 16-bit integer value. Some devices use two consecutive registers to report a 32-bit integer or a floating point value. This document describes how to configure the ASE2000 to accommodate these alternate numeric representations.

Note, while the ASE2000 can be configured to process Modbus numeric points as either:

- 16-bit signed integers,
- 32-bit signed integers, or
- 32-bit floating point numbers

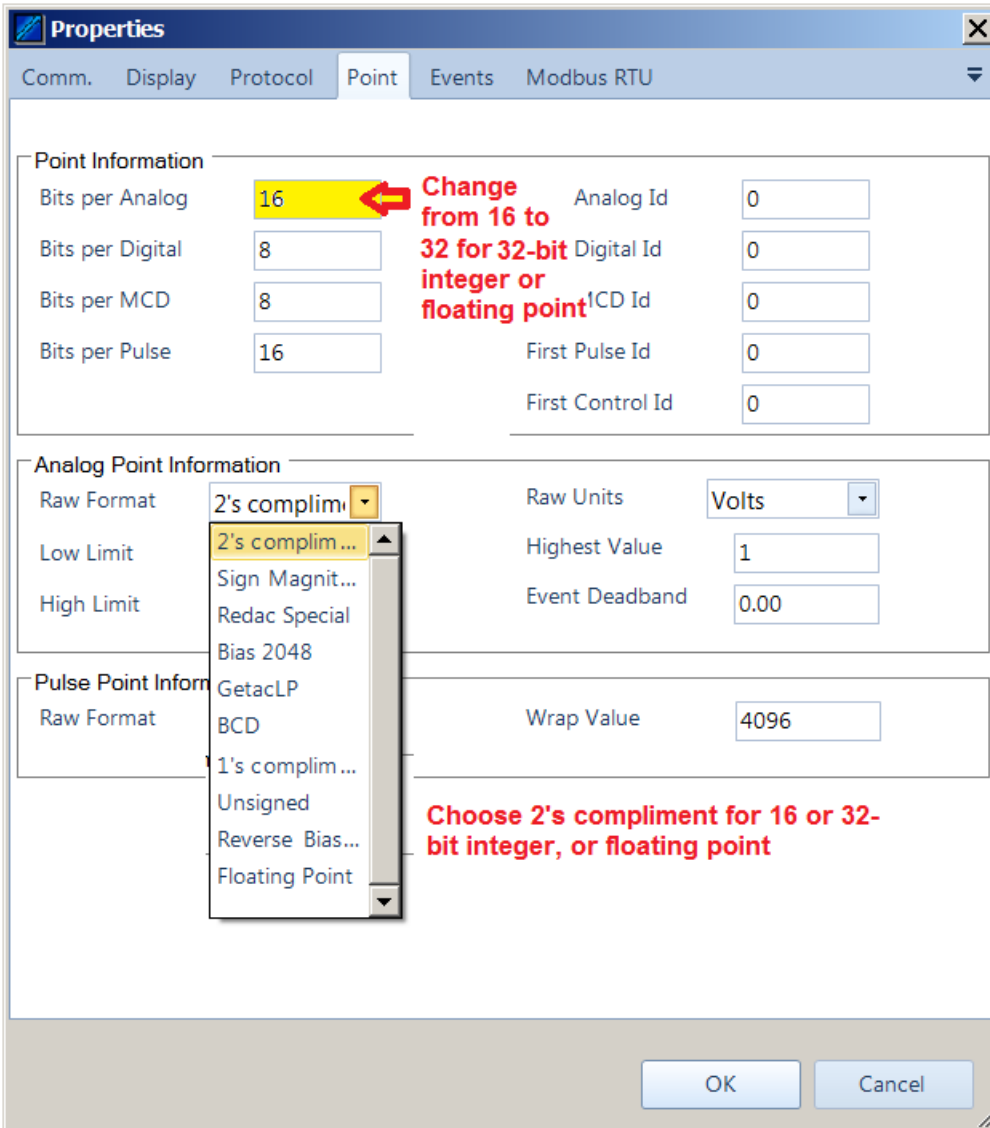
It can only be configured for one type at a time. If, for example, the ASE2000 is set up to process numeric points as 32-bit integers, then all numeric points are 32-bit integers. You cannot mix 16-bit integers, 32-bit integers, and floating point values at the same time.

Setup

The following procedure is the same for all Modbus variations: Modbus RTU, Modbus ASCII, and Modbus TCP.

Initial Setup

Set the numeric representation and point size from Tools, Properties, and the Point tab.



This may be all you need to do. If the values still do not appear correctly, read the next section.

Ordering

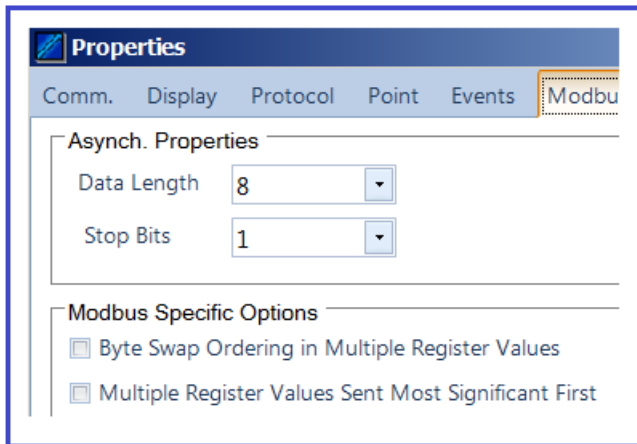
The problem with 32-bit (integer or floating point) numbers in Modbus is that they are not defined in the protocol. The protocol only defines 16-bit registers. 32-bit values are reported in two consecutive 16-bit registers. The least significant 16 bits of a 32-bit value can be in the first

or second of these registers. And (particularly for floating point) the least significant 8 bits of each word can be in the first or second byte. Since there is no standard, one company may adopt a convention different from that of a second company. We accommodate them all.

The default Modbus convention adopted by the ASE2000 is to transmit the most significant byte first within each word, but the least significant word first. This is shown below.



The above ordering can be changed from Tools, properties, and the Modbus tab.



- The “Byte Swap ...” option exchanges the left and right bytes in each word
- The “Multiple Register ...” option swaps the two 16-bit words

One of the four combinations:

- Swap none
- Swap bytes only
- Swap words only
- Swap both

Should work for a given device.