

Application Note

Configuring a Sentinel Modbus with an Ultima X MSA Gas Detector

OVERVIEW

The Ultima X is a series of MSA gas detectors widely used in industry for safety in hydrocarbon mining applications. The detector can communicate over Modbus RS-485, and as such is often used with the Sentinel Modbus. The Ultima X, however, uses default settings that differ from the norm, and as such can be difficult to set up without careful reading of the manual. Follow the settings below to get started with the Ultima X MSA gas detector.

PROCEDURE

To communicate with the Ultima X series, change the baud rate to **19,200 bits/sec**, and an even parity bit (**8E1**). Keep in mind that the Sentinel Modbus's settings are entirely independent of the Gateway's Modbus settings. While the Sentinel needs to be configured to match the Ultima X, the Gateway does not need to do this and should match the settings of whatever PLC/RTU/Master is trying to read it (default 9,600 8N1).

After this, addressing can be unusual. The Ultima X has a "base address" for its registers to use as a reference point. By default, this number is 40,000. When choosing a register to read from the manual, take the register number it gives, and add 40,000. For example, the register that holds the device's Slave ID is 101, plus the base address, making the actual register 40,101. Typically, the Sentinel Modbus would read this register by pointing to address 101, as it truncates the 40,000 offset. However, the Ultima needs the full register number, so to read this with the Sentinel Modbus, add a program step that reads 1 register at address 40,101 with function code 03.

The value of the base address is stored in register 1,000, and it is possible to change the base address by writing a new value to register 1,000. SignalFire recommends keeping the base address of 40,000.

The screenshot shows the 'Current Program Steps' configuration window. The 'Baud Rate' is set to 19200 and 'UART Mode' is set to 8E1. The 'SlaveID' is set to 1. Below this is a table of program steps:

#	Func	Address	Count	Status
1	03	40101	1	Unknown
2				

A 'Run Modbus Program Steps' button is visible on the right side of the interface.