

**SIMPLWINDOWS
NAME:**

Modbus Analog Holding Register Poll and Control

CATEGORY:

HVAC

VERSION:

1.0

SUMMARY:

Polls and controls a single Modbus analog holding register

GENERAL NOTES:

Modbus is a generic communications protocol. It allows a group of addressable "points" to be accessed by the Crestron system. There are digital points, which have two states - on and off. There are also analog points, which allow 16 bit numbers to be accessed. Some points are read only, while others are read/write.

Modbus supports two different command formats - RTU and ASCII. This module uses the RTU format. You must be sure that the Modbus device is also set for RTU mode.

Modbus does not specify a communications medium or format, so for information on baud rate, parity, etc., as well as cabling information, you must consult the documentation that comes with the Modbus system. The Modbus device that was tested at Crestron was an Automated Logic Portal, and all connection information below is for that device only.

Each device on a Modbus system is uniquely addressed using it's slave address, and it's point number. This module has a single parameter field for the slave address (SLAVE-ADDRESS-HEX). This parameter needs to be entered as a 2 digit hex number with no suffix. So for slave 1, enter 01. This module has two parameter fields which specify the point number. By using two bytes (high byte and low byte) it allows a larger addressing range. These parameters also need to be entered as 2 digit hex numbers with no suffix. The point numbers are also offset by one. So if you want to access point number 2, you would enter 00 for the POINT-NUMBER-HIGH-HEX and enter 01 for the POINT-NUMBER-LOW-HEX parameters.

The Modbus system does not do real time updating. Therefore we must poll each point for the current setting. This module has a POLL input for this purpose. The polling sequence should be constructed by using an Oscillator with a high time of .1s and a low time of .9s driving the clock input of a Ring counter. Each output of the ring counter should drive separate POLL inputs on the Crestron Modbus modules. So if there are ten Modbus points that are being monitored, there would be ten Crestron Modbus modules in the program, and the Ring Counter would have ten outputs, so that each point could be polled in turn. See the demo program on the Crestron FTP site for an example of this implementation.

This module must be used in conjunction with the Modbus Processor module. The serial output of this module will be sent to the Modbus processor module for formatting. Also, the serial input to this module must come from the Modbus Processor module.

This module will provide the status and control of a single analog point. It allows you to increment the setting of the point up or down to limits which are set using the UPPER-LIMIT+1 and LOWER-LIMIT parameters. Three seconds after neither up nor down inputs are pressed, the new setting will be sent to the Modbus system. Since this module was designed for

room set points in HVAC type systems, there is no provision for negative numbers. Also, the numerical range is 0-255 only.

This module uses Modbus function code 03, which is designated for reading the contents of Output Registers, or Holding Registers. It also uses function code 06 for presetting a Holding Register.

**CRESTRON
HARDWARE
REQUIRED:** CNMSX,
CNXCOM,
ST-COM

**SETUP OF CRESTRON
HARDWARE:** The port should be set as follows:

Baud Rate - 9600
Parity - None
Data Bits - 8
Stop Bits - 1

VENDOR FIRMWARE: None

VENDOR SETUP: The Automated logic system must be in RTU mode. Use the Diagnostic Port connector for communications.

CABLE DIAGRAM: CNSP-124

CONTROL:

ADJUST-UP	D	Pulse to increment the value of the point up
ADJUST-DOWN	D	Pulse to increment the value of the point down
POLL	D	Pulse this input to poll the desired point
FROM-MODBUS-PROCESSOR\$	S	Serial signal routed from the Crestron Modbus Processor module
SLAVE-ADDRESS-HEX	P	Two digit hex representation of the slave address. For slave 1, enter 01
POINT-NUMBER-HIGH-HEX	P	Two digit hex representation of the most significant byte of the 16 bit point address
POINT-NUMBER-LOW-HEX	P	Two digit hex representation of the least significant byte of the 16 bit point address

FEEDBACK:

VALUE-*-AN	A	Analog value indicating the current value of the desired point. Should be routed to a digital panel meter on a touchpanel
TO-MODBUS-PROCESOR\$	S	Serial signal routed to the Crestron Modbus Processor module

OPS USED FOR TESTING: 5.12.01x

COMPILER USED FOR TESTING: SimplWindows Version 1.51.08

SAMPLE PROGRAM: Modbus Demo Program

REVISION HISTORY: None