Reading External Devices with ScriptBasic

Overview

This ScriptBasic example reads three registers from an external Modbus temperature/humidity probe connected to the master RS-485 port (pins M+/M-). The external Modbus device is defined as ID 8 in this ScriptBasic program.

See the ScriptBasic manual for more information on the individual functions.

Accessing Modbus Registers Using ScriptBasic

The ScriptBasic functions used to read Modbus data are MULTIGET and GETREG. This example program only uses the MULTIGET function.

MULTIGET

Reads multiple registers into an array.

Use the MBREGIN function to read the data in the array.

GETREG

Reads one register.

The ScriptBasic functions used to write to registers are MULTISET and SETREG.

MULTISET

Writes data defined in an array.

Use the MBREGOUT function to write the data to the array.

SETREG

Writes to a single Modbus register.

The Example ScriptBasic Program

The main loop begins with the `WHILE (1)` statement and ends with the `WEND` statement. Everything between these two statements is executed forever.

The first statement in the `WHILE` loop is the read of the external sensor:

```
RdErr = MULTIGET(External_regs, 3, External_ID,HoldingReg)
```

This function read three Modbus registers starting at the `External_regs` address. The external Modbus ID is defined by the constant *External_ID*. The last variable in the function call is the type of Modbus register it is, which in this case is a Holding register.

The next three statements assign the data from the Modbus read command, `MULTIGET`. The function `MBREGIN` is used to read the input array. Location 0 is the first element of the array, which is assigned to the variable *Humidity*. The next array element is assigned to *Temp_C* and the last array element is assigned to *Temp_F*.

```
Humidity = MBREGIN(0)
Temp_C = MBREGIN(1)
Temp_F = MBREGIN(2)
```

The `PRINT` command prints the variables to the console output. The console output can be viewed using the DXM Configuration Tool, using the **Device** > **View Serial Activity** menu. The device must be connected via USB. Alternatively, a simple terminal program, like PUTTY, can be used to view the output.

```
PRINT" Humidity: ", Humidity, " TempC: ", Temp_C, " TempF: ", Temp_F,"\n"
```

The read data from the external device is in program variables within ScriptBasic. The next four lines of code write the data to the processors Local Registers. This displays the data on the LCD screen of the DXM Controller.

First load the output array using the `MBREGOUT` function; humidity is the first value in the array, Temp_C the second value, and Temp_F is next. The `MBREGOUT` function only defines the array; the `MULTISET` function writes the data to the Local Registers.

```
WrErr = MBREGOUT(0, Humidity)
WrErr = MBREGOUT(1, Temp_C)
WrErr = MBREGOUT(2, Temp_F)
WrErr = MULTISET(SaveData_reg, 3, LocalReg, HoldingReg)
```

Finally, the `SLEEP(1)` program line executes, which causes the program to pause for one second before continuing.

```
SLEEP(1)
```

The `WEND` keyword defines the end of the `WHILE` statement.

Set up a Configuration File for ScriptBasic

Use the DXM Configuration Tool to create a configuration (XML) file.

This example defines the first three registers that will be written from the ScriptBasic program.

1. On the **Local Registers** > **Local Register Configuration** screen, define these Local Register names and parameters to display the values on the DXM's LCD.

Local Register	Name	Units	Sign Type	Scaling	Scale Value	LCD Permissions
1	Humidity	RH	Unsigned	Divide	100	Read
2	TempC	C	Signed	Divide	20	Read
3	TempF	F	Signed	Divide	20	Read

   The names and values are listed on the DXM LCD under the **Registers** menu.
2. Verify the DXM Controller is connected to the computer via USB (**Device** > **Connection Settings** menu).
3. On the DXM Configuration Tool, go to the **Settings** > **Scripting** screen.
4. Click **Upload script**.
5. Click on the uploaded file name in the directory window, then click **Add Selected to Startup**.
   The selected ScriptBasic file runs every time the device reboots.
6. Save the XML configuration file by going to the **File** > **Save** menu.
7. Send the XML file to the DXM Controller by going to the **Device** > **Send Configuration to Device** menu.
8. To view the console output, go to the **Device** > **View Serial Activity** menu.

   The DXM Controller must be connected to the computer via USB to view the console output.