Q.uick Start Guide: Interfacing a Modbus Slave Device with a Q.gate Controller using the Modbus Read & Write Functions

Purpose: This guide will explain how to connect a Modbus slave device to a Q.gate Test Controller. Using the Modbus Read and Modbus Write functions inside the Q.gate, it will be possible to read and/or write Modbus registers.

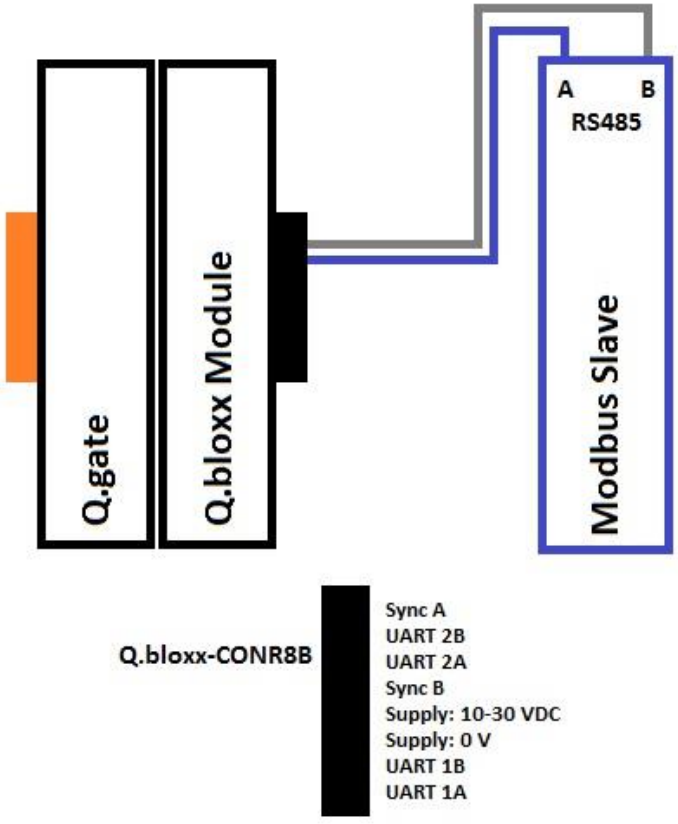
Need to know (Slave Device):

- Character format (i.e. 9600, 8, None, 1)
- Modbus address
- Modbus registers to read and/or write to/from
- Modbus variable format

Equipment Required:
1 x Q.gate with available 2nd UART
1 x test.commander on a PC
1 x Q.bloxx-CONR8B

Procedure:

1. Using the Q.bloxx-CONR8B connector, connect the Modbus slave device to UART 2 of the Q.gate.



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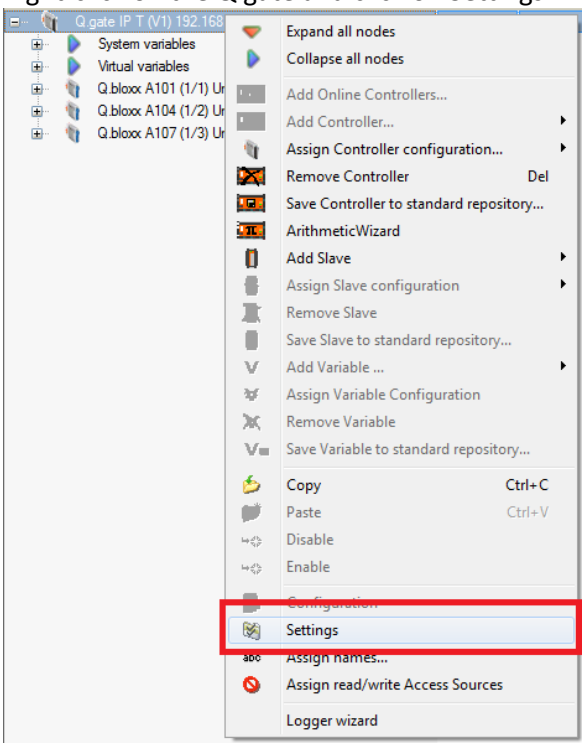
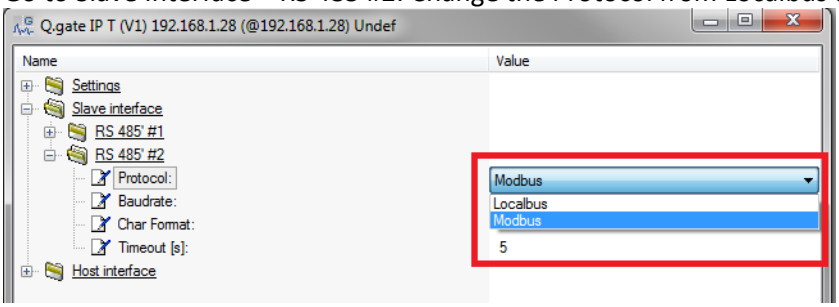
2. Open the project in test.commander that includes the Q.gate we are going to configure.

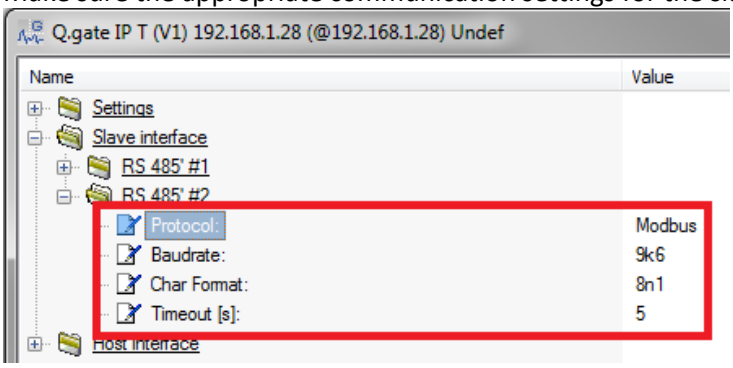
3. Right-click on the Q.gate and click on Settings:



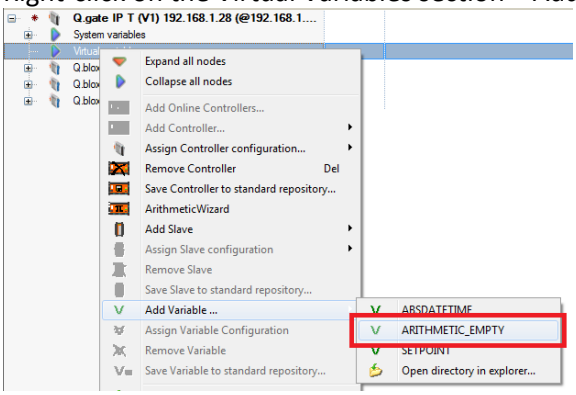
4. Go to Slave Interface > RS 485 #2. Change the Protocol from Localbus to Modbus.



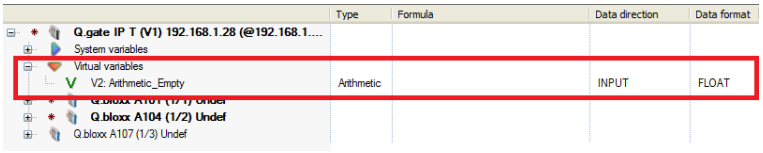
5. Make sure the appropriate communication settings for the slave device are set. Click OK.



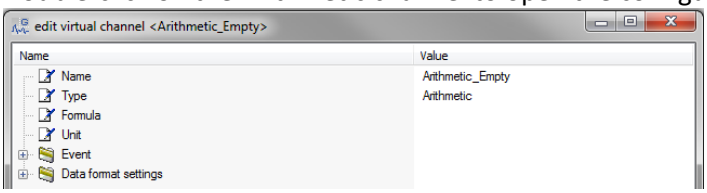
6. Right-click on the Virtual Variables section > Add Variable > Arithmetic Empty



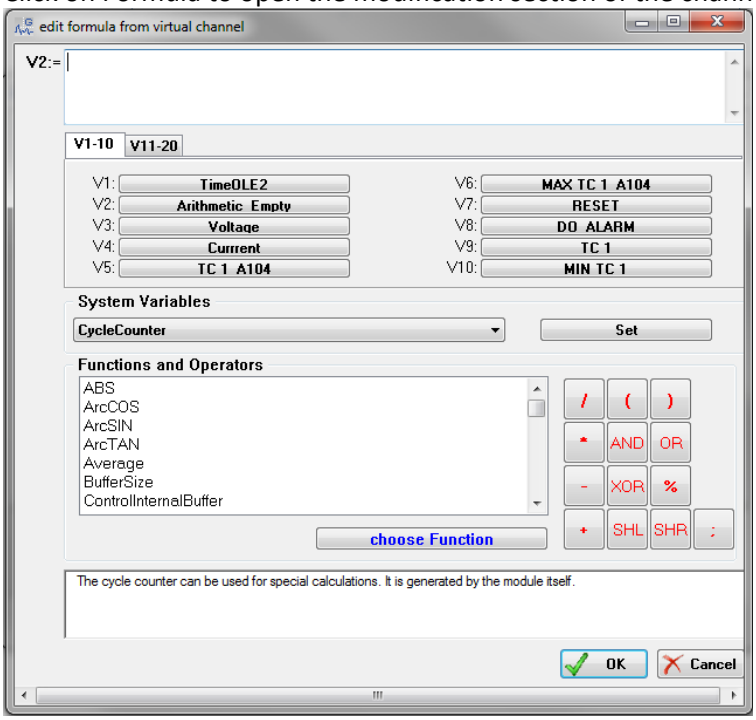
7. A new blank Arithmetic channel will be added:



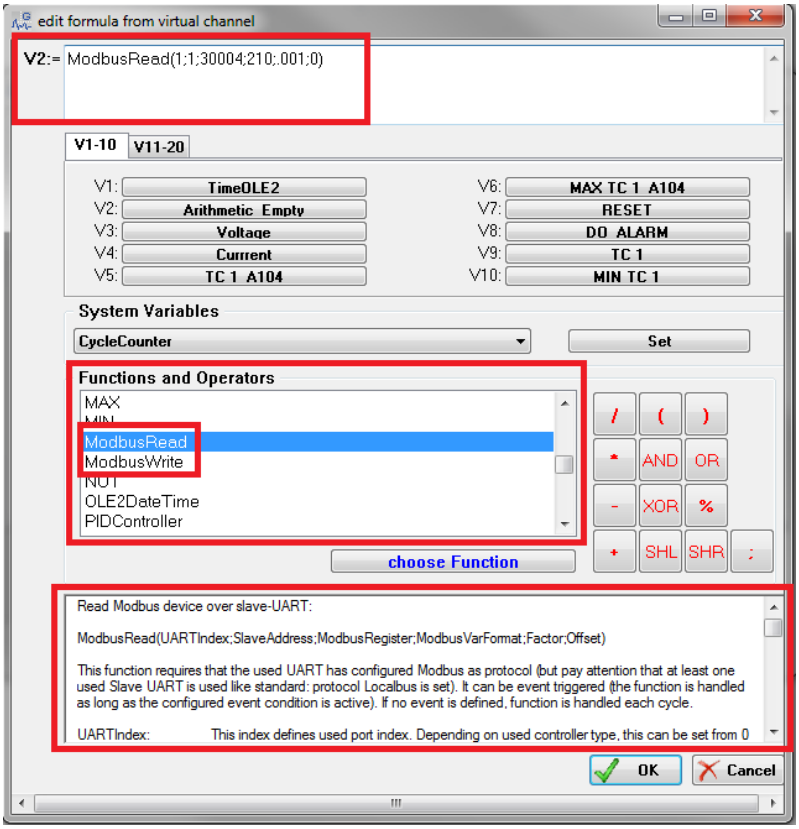
8. Double-click on the Arithmetic channel to open the configuration window:



9. Click on Formula to open the modification section of the channel:



10. In the Functions and Operators section, scroll down till the ModbusRead and ModbusWrite functions are visible. Double-click on the desired function to add the function I the formula section.
    For the selected function, a help section is accessible at the bottom of the page that provides useful information on the format of the formula and how to build it.



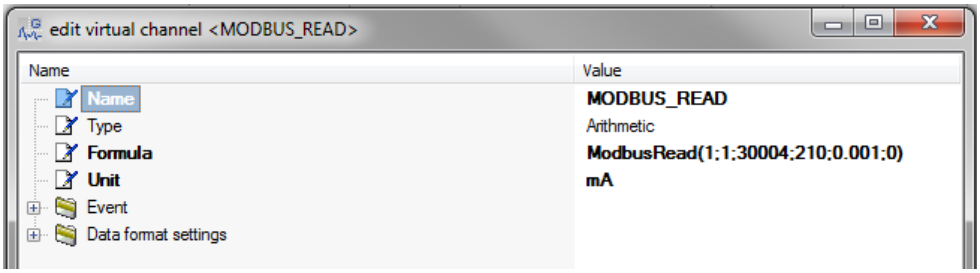
11. For this example, we will use the ModbusRead function. The function has the following components:

    ModbusRead(UARTIndex;SlaveAddress;ModbusRegister;ModbusVarFormat;Factor;Offset)

    UARTIndex: This index defines the port. Depending on the type of controller, this can be set from 0 (corresponding to Slave UART 1) up to available maximum port index.
    SlaveAddress: Address of slave to be read (1 to 247).
    ModbusRegister: Defines start register to be read.
    Input registers: 30001 to 40000
    Holding registers: 40001 to 50000
    ModbusVarFormat: With this parameter the format of variable to be read can be defined. According to this parameter, automatically 1 or more registers are read.
    Factor/Offset: These both values are directly calculated into the read value:
    ResultValue = ReadValue x Factor + Offset

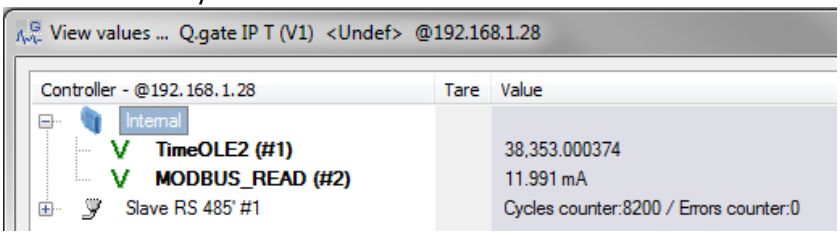
12. For this example, our function looks like: ModbusRead(1;1;30004;210;0.001;0)
    Click OK.

13. Give the channel a Name and Units (i.e. MODBUS_READ and mA).
    Click OK.

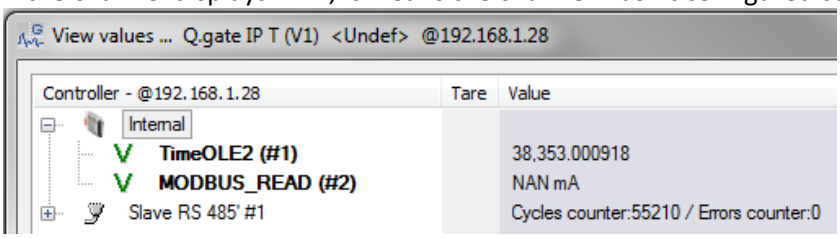


14. Update the project to the controller.

15. After the project has updated we can view the online values to check if we configured the channel correctly:



16. If the channel displays NAN, it means the channel wasn't configured correctly:



17. Repeat the same process for another Modbus register. Make sure to choose the ModbusWrite as the function if the variable needs to be written.

Contact us today if you have any further questions!

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