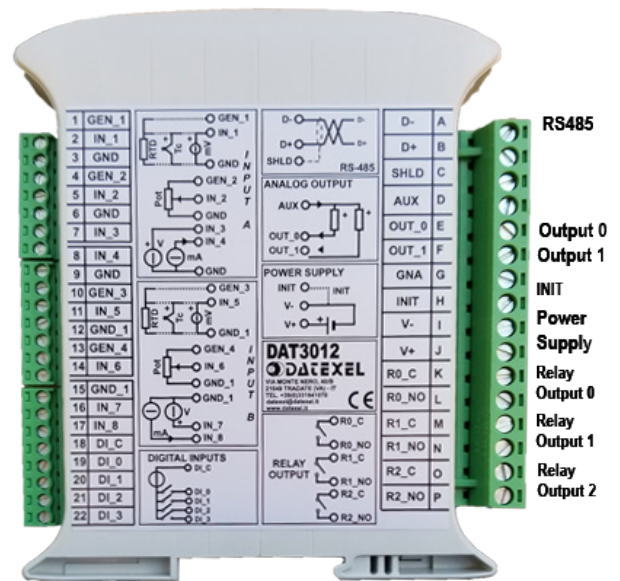


## Modbus RTU Analog and Digital IO DAT3012.

### Set Up the DAT3012.

1. Connect 24 Vdc to I and J.
2. Connect RS485 to A and B.
3. Connect an Input to the Analog A. For this application note we have chosen the default setting of an RTD.
4. To check the Digital Input Connect 24Vdc across DI\_C and DI\_1.
5. Connect a Multimeter between terminal D and E to read the 4-20mA output.
6. Connect a Multimeter to measure the output of the relay on Terminal K and L, which is Relay Output 0
7. If the communication parameters are unknown, short out the INIT connections H and I.
8. Power up the DAT3012 Modbus RTU Slave.

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Analog Input A  
Analog Input B  
Digital Inputs



It is advisable to use the DAT3580 to connect the DAT3012 to the PC. The advantage of using the DAT3580 is that it will isolate your PC from the DAT3012. The DAT3580 options are USB, Ethernet and RS232. If the DAT3580USB version is used, install the USB drivers. If the DAT3580MBTCP or the DAT3580GW are used, make sure the Ethernet parameters are compatible with the net, and transmission of data over port 502 is allowed.

### Set Up the PC.

1. Download the 3000-10000 Software from [www.datexel.com](http://www.datexel.com) download page.
2. Close all other software.
3. UnZIP the Modbus\_3000\_10000\_setup software.
4. Run the 3000-10000 software.
5. To start the software click the English version.

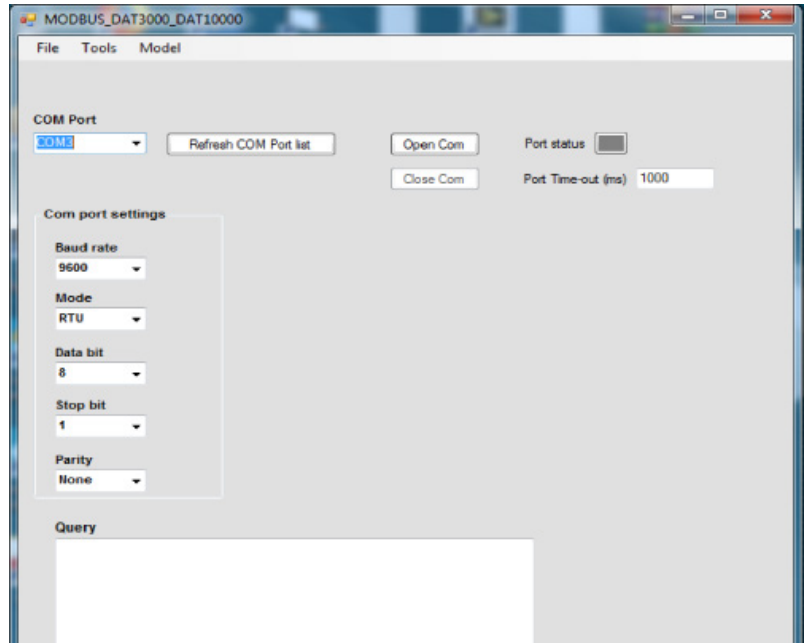
[www.datexel.com](http://www.datexel.com)

Call 561 779 5660 for technical support.



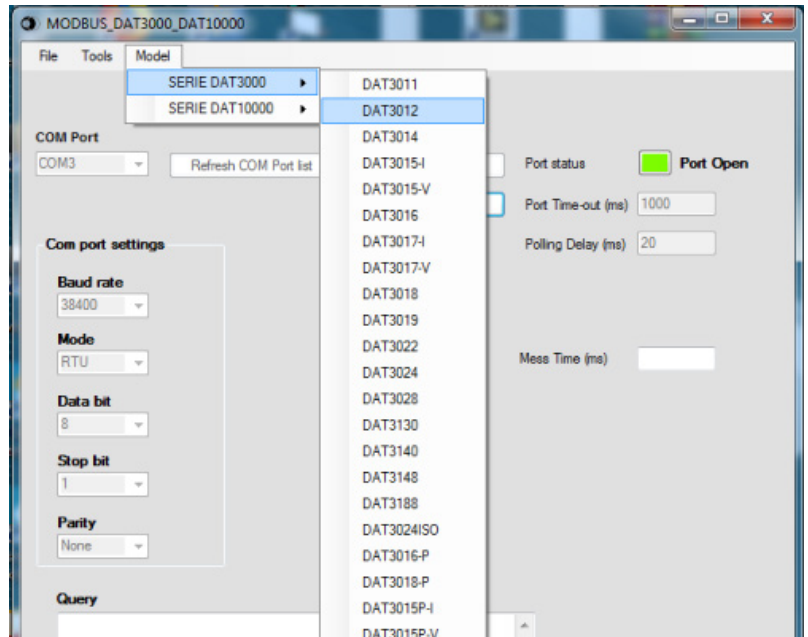
## Set Up Communication.

1. The software should automatically select the correct comms port. It is possible to override the comms port or refresh if you change the physical port.
2. Choose the correct Com port settings.
3. Click Open Com. The Port Status will change to green.
4. The default Baud rate is either written on the Label or 38400bps. If the INIT is shorted, the Baud rate will be 9600bps, RTU, Data Bit 8, Stop Bit 1, Parity None.



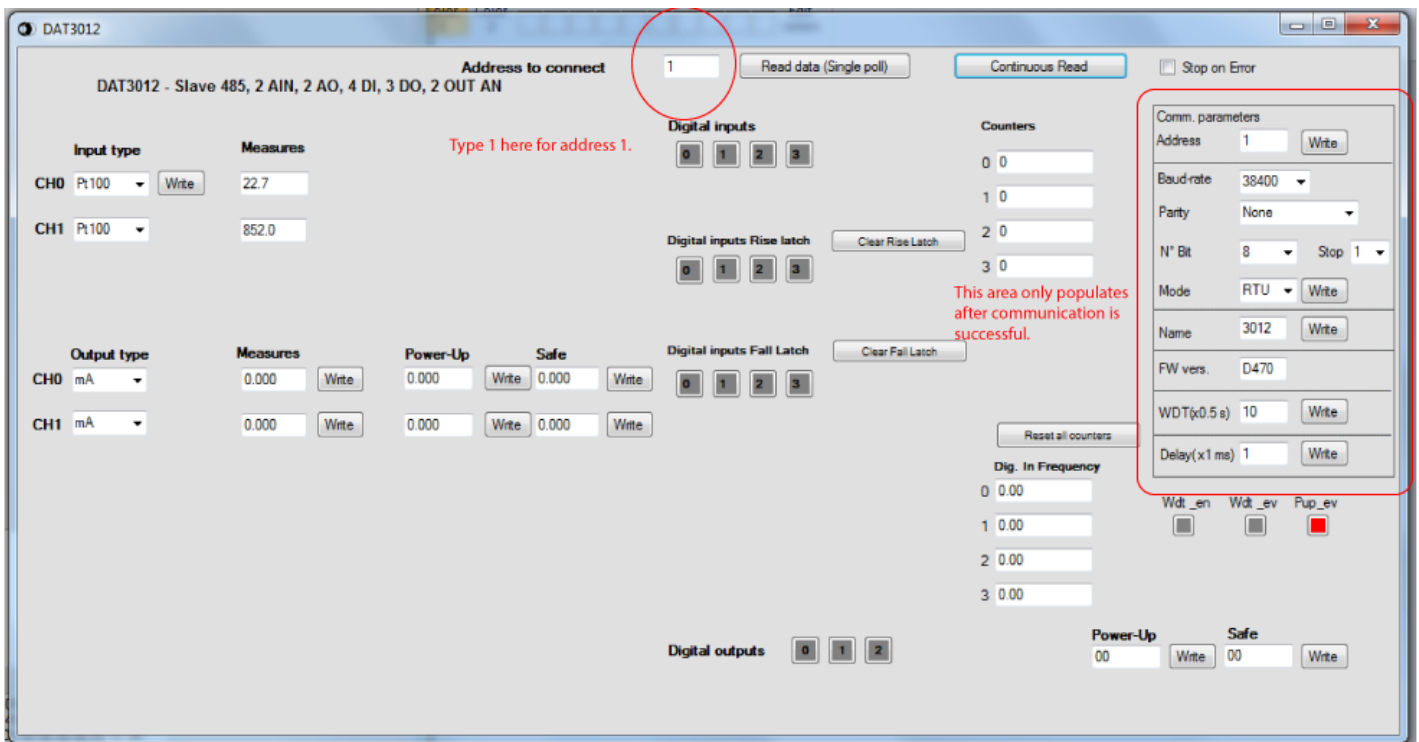
## Selecting the Modbus RTU IO Module DAT3012.

1. The green light only indicates the port is open. Even if the settings are incorrect the light will turn green.
2. Select Model and the drop down navigation will appear.
3. Select DAT3012.



# Setting the address of the DAT3012 Modbus Slave.

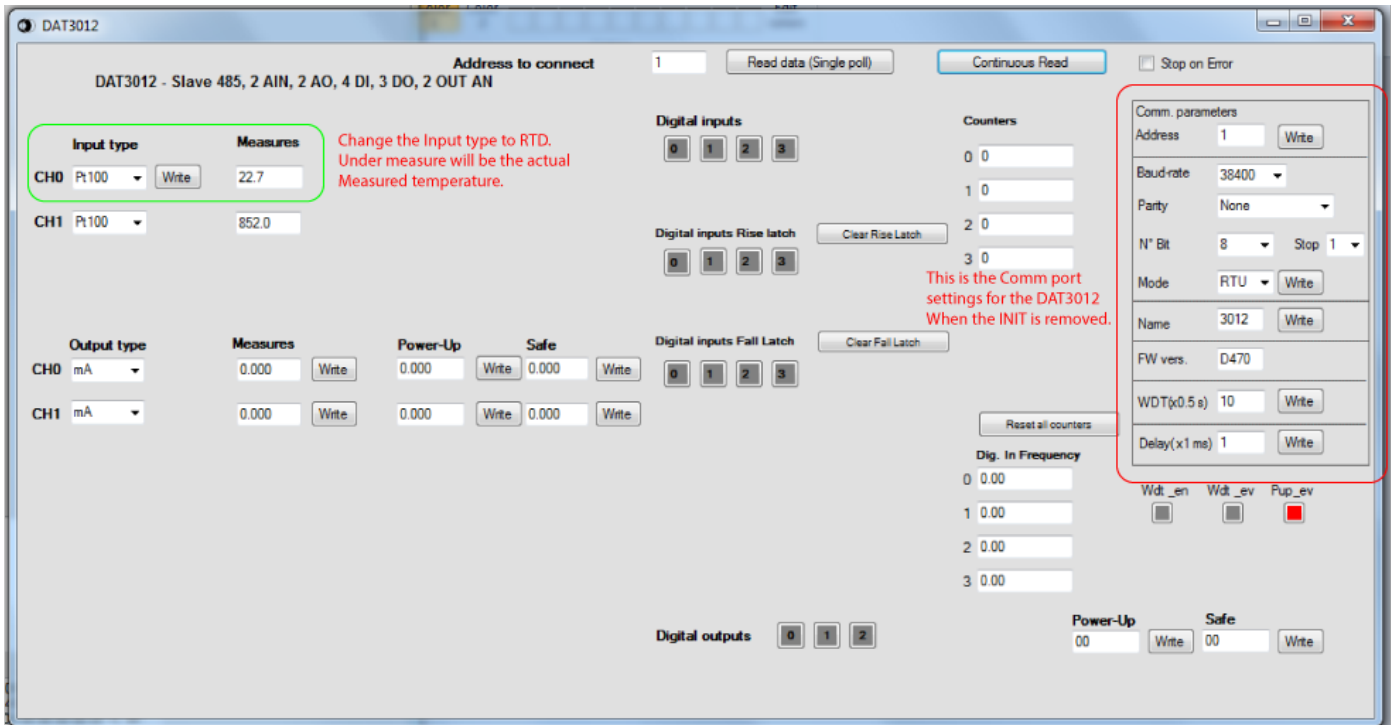
1. Change the Address to connect to 1 or what is written on the label.
2. Click "Read data" (Single poll).
3. The screen should now display the below screen.
4. If there is a function error, no CRC match, check Baud rate, RS485 connection or Modbus Slave Address.
5. This needs to be fixed before further progress. If you have not used the INIT on terminals H and I, it is highly recommended that you do now. Then return to Communication set up and set the settings to 9600bps, RTU, Data Bit 8, Stop Bit1, Parity None.
6. This will always be the correct setting unless it differs on the label.



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# Reading the analog input on the DAT3012.

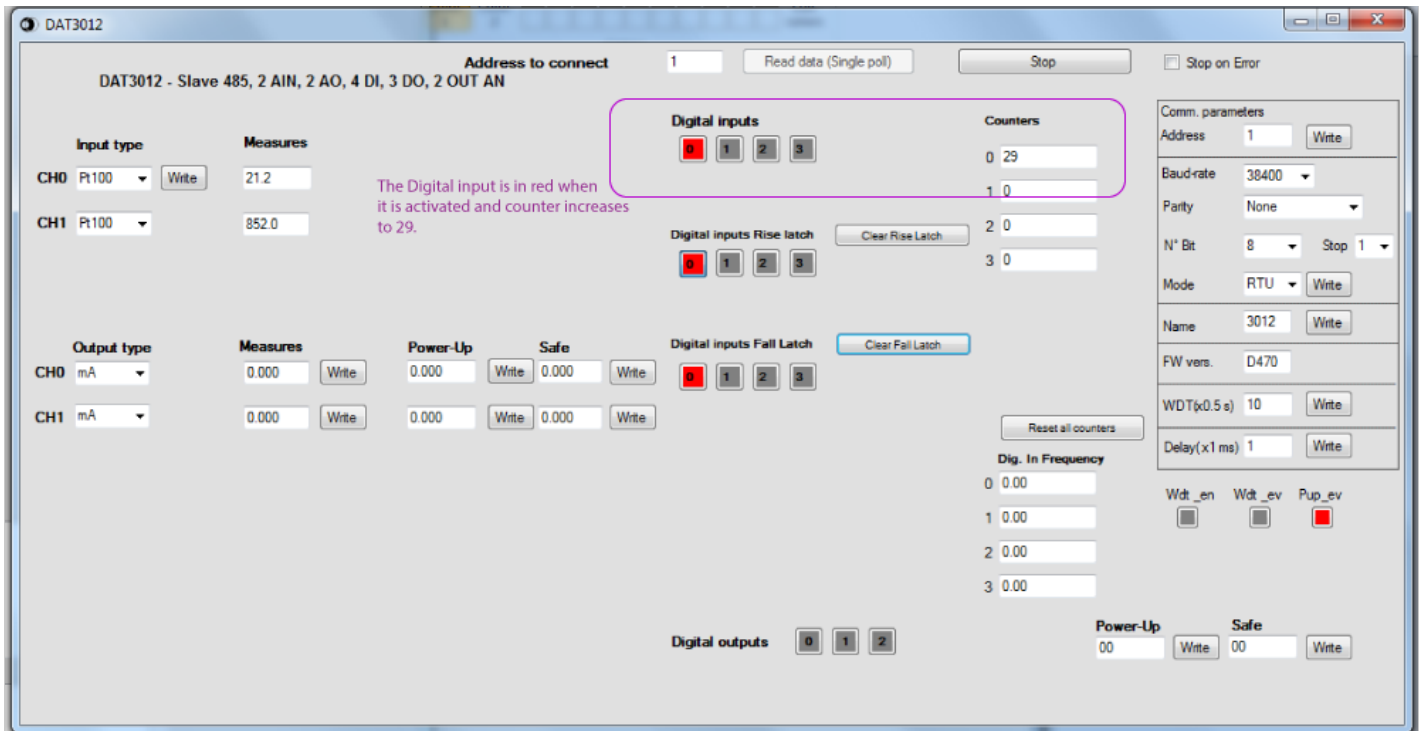
1. Connect a sensor to the input terminals for chosen sensor, We have selected an RTD for this application note.
2. Select the correct sensor from the drop down option under Input Type.
3. Click the Write button.
4. Click the Read data button.
5. The correct sensor reading should be under the Measure label.



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# Digital input and Counter DAT3012 Modbus Slave.

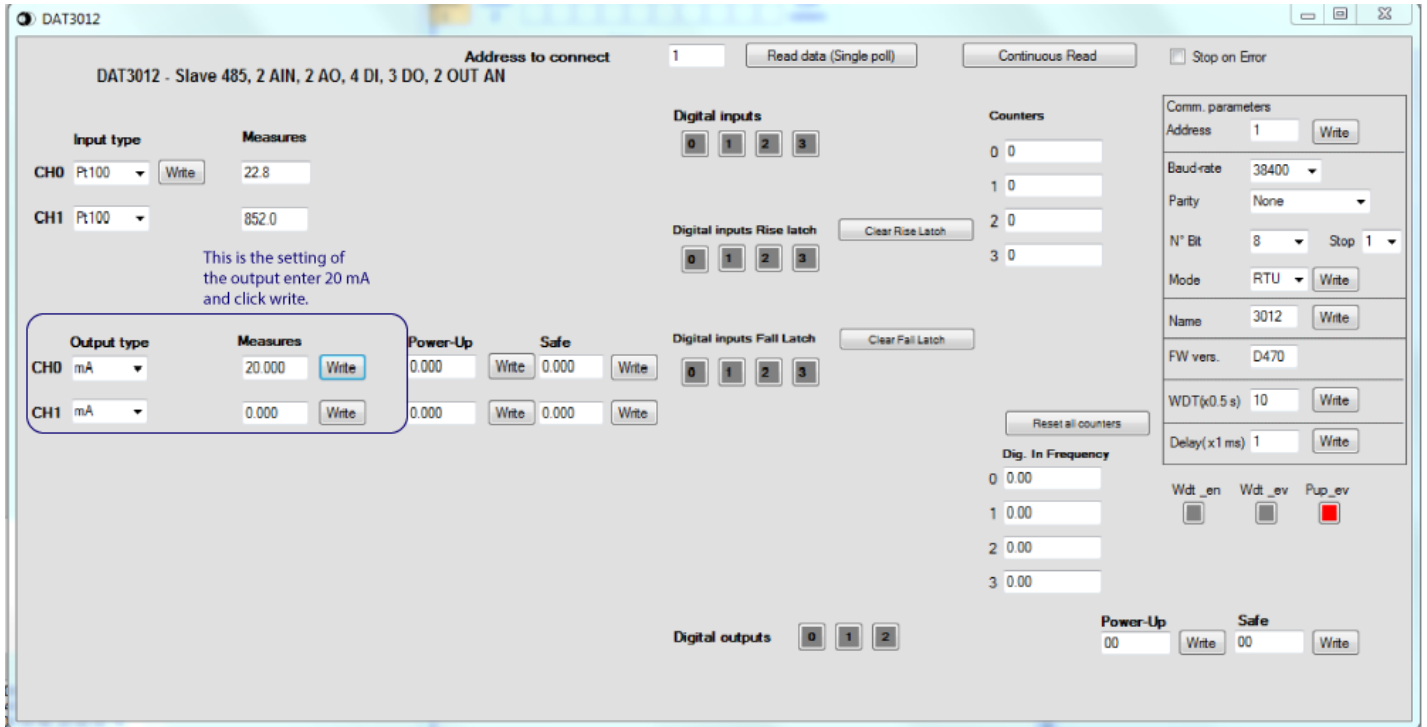
1. Connect 24Vdc to the Input terminals 18 and 19
2. Click Continue read
3. The channel 0 box under the Digital Input should change state to red.
4. Remove the 24 Vdc and the box should return to gray.
5. The counter increases by 1 each time the connection is made.
6. The counter can be reset when the reset all counters is clicked.
7. Should a function generator be connected and set to a particular frequency this can be seen under the frequency box.



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# Providing a 4-20 mA output from the DAT3012 Modbus IO Module.

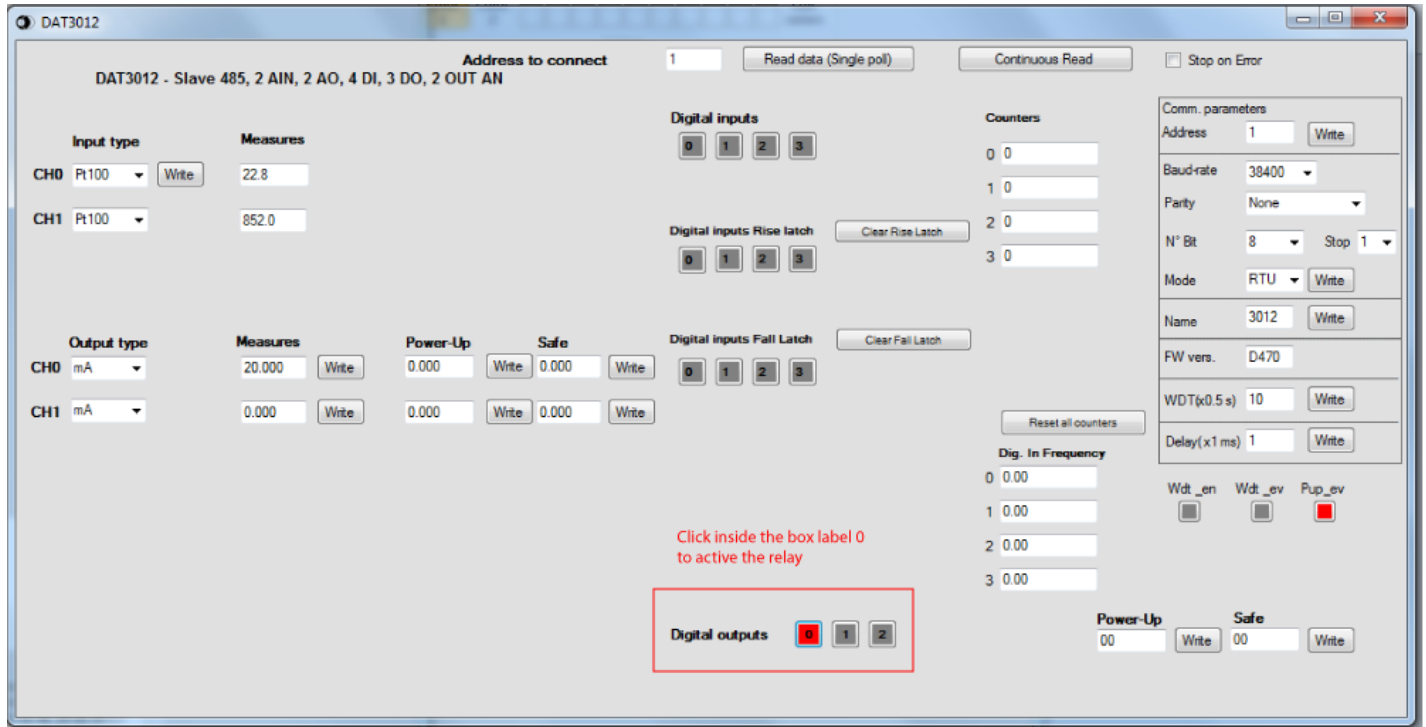
1. Under the measure label type 20 for 20 mA output.
2. Click write.
3. On Terminal D and E you should be able to read 20 mA with a multimeter.
4. On terminal G and E you will be able to measure 20mA if you connect in series a 24 Vdc power supply.
5. Type 4mA to measure 4 mA on the output.
6. Type in any other number between 0 and 20mA and to check the entire mA output range.



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# Checking the relay output operation of the DAT3012 Modbus RTU Analog and Digital IO Slave module.

1. Measure the resistance across relay output terminals K and L. It should be open circuit.
2. Click the 0 tab inside the box next to the Digital Output label.
3. You should be able to hear the relay operation and measure the low resistance across the Modbus relay output Slave terminals K and L, relay out 0.



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# Explanation of Communication parameters for Modbus Slave DAT3024.

## Address

The actual address of the DAT3012 connected.

## Baud rate

The actual baud rate of the DAT3012 connected.

## Parity

The actual parity mode of the DAT3012 connected.

## N°Bit

The actual number of bit selection of the DAT3012 connected.

## Mode

The actual Modbus modality (RTU or ASCII) set for the DAT3012 connected.

## Name

The string read from the DAT3012 of 4 ASCII characters used to name it example DAT3012.

## FW Vers

The firmware version read from the DAT3012.

## WTD (x0.5)

The watchdog time read from the DAT3012 is in steps of 0.5 seconds.

## Delay (x1 ms)

The delay time between the reception of a query and transmission of the response. Expressed in steps of 1 millisecond.

## Button Wdt\_en

Indicates if the bit to enable the watchdog time of the device has been set: red indicates the bit is set, grey indicates the bit is not set.

## Button Wdt\_ev

Indicates if the watchdog timer event has occurred: red if the event occurs, grey if the event has not occurred. This condition is also signaled by the blinking of the led "PWR" of the device and the safe state of the digital outputs.

## Button Pup\_ev

Indicates if the Power up event has occurred: red if the event has occurred, grey if the event has not occurred. This condition is also signaled by the power-up state of the digital outputs.

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