

# ANIMATICS

## Application Note: Setup Brushed Motor with RTC4000 For RTC4000

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The RTC4000 can drive both a brush and brushless DC motor. The Application note shows how to wire the RTC4000 to a brush DC motor. For this set up, only phase A and C are used to drive the motor. Since this is a brush DC motor, hall sensor signals are not applied. In this case, hall 2 needs to be jumper to signal GND. It is recommended to use twisted pair shield cable for RS485 communication and add Bias/Terminating resistors. Please see Figure 1 below.

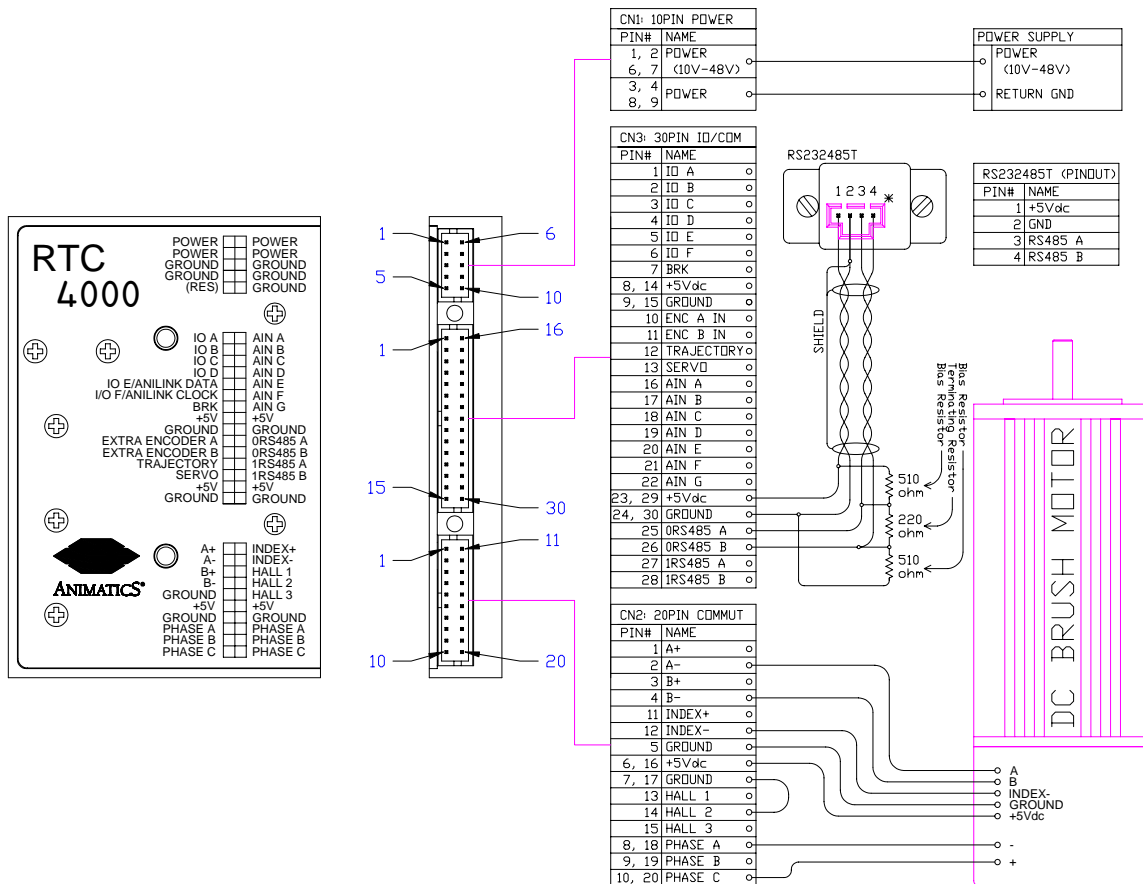


Figure 1: Wiring between RTC4000 and DC Brush Motor, using Single Ended Encoder Signal.

The RTC4000 has two RS485 communication ports. They are labeled as channel 0 and channel 1. Channel 0 is the only one enabled as shipped from the factory. Since RS485 is a parallel bus, the RTC4000's must be pre-addressed prior to placing in service. To do so, use the following to establish communication and set an address in the RTC4000.

1. Establish communication with the RCT4000. Please do the following:

== Set SMI2 to RS485 communication.

[Be sure you have Channle 0 electrically connected as shown in the diagram.]

- a. Open SMI2 softeware and go to the Configuration window on the left.
- b. Right click on the Comm port that is connected to the RTC4000.
- c. Choose Properties (Port Properties window will open)
- d. In the Port Properties window, select RS485 for Comm Type, 9600 baud for Baud, and Channel 0 for Motor Channel.
- e. Then click OK

== Set RTC4000 to communicate RS485 on channel 0.

- a. Issue a "0RP" and look for a Report Position response. If you get a response, you're talking to the RTC4000.
- b. Issue a "0SADDR1" to set the controller as address number 1. Then issue a "1RP" and look for a response. If you get a response, then you have successfully set a temporary motor address to "1".
- c. Now go back to the Configuration window, right click on the comm port that is connected to the RTC4000, and choose "Detect Motors on RS485-Bus." SMI2 will attempt to find any RS485 device is connected to it. Once it finds the RTC4000, an icon of the motor will be displayed under the comm port icon in the Configuration window. As long as there is no Software reset or power reset, SMI2 will be connected to the RTC4000 as address "1."

2. Create and transmit a program to the RTC4000 to open comm. channel and give it a permanent address on power-up:

To Create a program:

- Go to FILE and choose NEW
- a new editor window opens with name SMI1

```
SADDR1
OCHN(RS4,0,N,9600,1,8,C)      'open ch 0 for RS485 comm
END
```

-- Save program

To Transmit

- Right click on the program (editor window)
- choose Compile & Transmit SMX file F5
- The "Select Motor" window open, you should see your motor listed (ex. Motor1-Com1)
- choose your motor and click OK.

If the motor is not listed, that means you have not Detect the motor and SMI2 does not know what motor is connected. Please repeat step number 1 again to detect the motor.

After transmitting the program to the motor, you can reset with a Z command or run the program with the RUN command. As long as the open channel and the set address command is in your RTC4000, SMI2 will always detect the motor when you click on Detect. So the next time a program is transmitted to the

motor, include the OCHN(.....) and the SADDR# commands at the beginning. This will allow SMI2 to detect the motor after a reset. The firmware of the RTC4000 is similar to the PLS firmware that we offer to the SmartMotor.

The OCHN(...) is to open the comm channel on the RTC4000. The setting in the OCHN(RS4,0,N,9600,1,8,C) is as follows:

OCHN -> open channel to the setting in ( )  
RS4 -> RS485 communication  
0 -> for channel 0 (there is also channel 1 on the connector)  
N -> for NON-PARITY  
9600 -> set baudrate  
1 -> for 1 stop bit  
8 -> for 8 data bits  
C -> for COMMAND MODE

Alternatively, the motor can use channel 1 instead of 0 of both. This can be set up by adding another open channel command for channel 1. It will look like the following in the program.

```
SADDR1  
OCHN(RS4,0,N,9600,1,8,C)      'open ch 0 for RS485 comm  
OCHN(RS4,1,N,9600,1,8,C)     'open ch 1 for RS485 comm  
END
```

SADDR# is to set the motor's address. Since all motors will be sharing the same RS485 bus, it is important that each motor has its address value. The address number can be any value from 1 to 100. In this setup, 1 is used. Please keep in mind that SMI2 will only look for motors from address 1 to 10 in the default setting. If you set your motor with the address above 10, you'll have to go back to the Configuration window, right click on the comm port that you're using, and choose Properties. Here change the Max Motor Address to the number that you have set in your controller. SMI2 will go through all the This means that the smaller the address, the smaller the Max Motor Adress setting you can have which will make SMI2 Detect your motor faster.