Tech Note 5   How to setup Modbus IO transfers in RAM6000 or RAM9000

red lion®

Abstract:

This document provides a step by step procedure for configuring Modbus I/O transfers between a Red Lion Controls RAM 9731 and a Red Lion panel meter model PAX2A (Modbus Device).

Product:

Red Lion RAM 9731 & Red Lion PAX2A with PAXCDC10 RS-485 communications card.

Use Case / Problem Solved:

This procedure uses a Red Lion panel meter as the Modbus slave device and will configure Modbus I/O transfers in the RAM (master) to read/write values to the PAX2A. Instructions are provided to configure 2 different I/O transfers:

1. Write to PAX2A analog output (setpoint 1).
2. Read from PAX2A analog input (process variable).

RAM Firmware:

4.20 or later.

Procedure:

1. Log into the SN/RAM Web Browser
   a. Type the device's LAN/WAN IP, port 10000 into a web browser
   b. **User Name**: *admin*
   c. **Password**: Last six digits of the device's serial number
2. Go to **Services → Automation → Modbus → Local Station**.
3. Setup **Station Name**, **Station Number**, and **Modbus Local Port** number for the RAM.
   a. **Station Name**: *Local* (your preference)
   b. **Station Number**: *1*
   c. **Modbus Local Port**: *502*

   Note: Standard TCP Port number for Modbus is 502)

4. Click **Save**.
   Go to **Services → Automation → Modbus → Remote Station**
   Where you will add a remote station for Internal I/O transfer.
5. Click **Add**
6. Enter details of the Remote station. Here you will enter details of the Modbus device (IPM)
   a. **Station Name**: *PAX2A*
   b. **Station Number**: *2*
   c. **Connection Type**: *Serial*
   d. **Message Timeout**: *5000*
   e. **Message Retries**: *3*
   f. **Station Online Address**: *40001*

7. Remote station appears in the table. Click **Save**.
8. Go to **I/O Transfers** on the bottom of the page. Or you can navigate to:
    Services → Automation → Modbus → I/O Transfer
9. Modbus I/O transfer page appears.
10. Click **Add** to add the Modbus I/O transfers
11. Add I/O transfer to Write to PAX2A setpoint in the **IO Transfer Settings** window.

    a. **Station Name**: *PAX2A*

    b. **Protocol**: *Modbus*

    c. **Send Mode**: *Wait for Reply*

    d. **Port**: *ttyS5 (RS-485)*

e. **Command Type**: *WRITE*

f. **Local**: *SP_HI* (Tag Name if specified)

g. *Analog Output*

h. *4009*

i. *Analog Output*

j. **Remote** address: *40009*

k. **Number of Registers**: *2*

12. Click **Finish** and the I/O transfer will appear in the table.

Add a new I/O transfer to READ from PAX2A input

1. Click **Add**

2. Click **Save**.
3. Modbus I/O transfer setup is complete for RAM.
4. Click **Apply**.

   Note: At this point the RAM I/O Transfer setup is complete. The following has been included as a method to test the transfer with the Red Lion panel meter. However, RAM will interface with any Modbus device.

Testing Modbus I/O Transfer

Use the RAM Test I/O to test the newly-configured I/O transfers.

1. Go to **Test I/O**
2. Enter in a value (*3604* is used in this example).

The PAX2A displays the setpoint as follows:

3. The Modbus I/O transfer is successfully working between the RAM and PAX2A.

Note that the green totalizer value and units

Disclaimer:

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For questions contact Red Lion Inc. Support at 877-432-9908 or email to support@redlion.net