

# RM Young 2D sonic anemometer

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## System description

The 2D anemometer is mounted just below the Licor on the bow mast. It's only purpose is to run the sector control system for the gas sampling inlets. **If the anemometer head or Wind Tracker display fails for any reason, it's possible to bypass the sector control and force the sampling inlets to run by unplugging the Wind Tracker alarm cable from the SSR box on the upper left front side of the APIMS rack and plugging in the 24V test plug. This will hold the sampling pumps and inlets in a permanently ON state.**

The 2D sonic system consists of the heated anemometer head on the mast and the Wind Tracker display on the APIMS rack in the lab van. The 24 volt DC power supply in the flux box below the tower provides all power for heat and electronics. Communication is via RS 485 serial, and the serial feed is converted to TCP/IP at the flux box and then back to RS 485 in the lab van using MOXA serial device servers. In the lab van the serial feed is split into two cables, one to the Wind Tracker display and another to the DAS100 computer for logging. The data rate is 1 Hz.

This system worked well during leg 1. The only problem we encountered occurred after a period of freezing fog, with warmer temperatures and high humidities. Ice formed on the anemometer head and the heater was not able to keep the sonic transducers ice-free. If this occurs again you may need to lower the tower and warm the transducers manually to clear the ice once the freezing fog conditions have ended. Be very careful to avoid damage to the transducers. It's probably not a good idea to use alcohol or other solvents to clean the head because we don't know if the head is compatible with solvents. Try warming the transducers with your fingers to remove ice. In most cases, the built-in heater should keep the head clear of frost and ice.

We have a spare RM Young anemometer head in the large aluminum Zarges box in the warm storage container (the large box that doesn't have tubing). We replaced the head during leg 1, so this is actually the original. We thought the heater might not be functioning but it was probably just severe icing. Checked it in the lab and the wind data looked OK. It's configured and ready to install if needed.

## System cabling

The anemometer head is connected to the flux box with a single cable for power and serial communications. See Ludo's write-up for a description of the wiring details. The cable is hard-wired into the anemometer head, which is a bit difficult to do with cold fingers. Be sure to disconnect the DC power leads in the flux box before working on the wiring at the head.

The 5150A MOXA in the flux box at the tower is configured as shown on the following screen shots. For the 4-port MOXA in the lab van, the serial tab will be the same as below (4800,8,N,1) and the operating mode panel will be set to Pair Connect Master mode with port 4010. Remember to check the Modify box if you want to actually change any of the settings.

The Configuration window displays the following information:

- Information:**
  - Model Name: NPort P5150A
  - MAC Address: 00:90:E8:79:21:FF
  - Serial Number: 6656
  - Firmware Version: Ver 1.5
  - System Uptime: 8 days, 21h:21m:57s
- Account Management** | **Configuration Pre-shared Key** | **System Log Settings** | **Auto Warning**
- Basic** | **Network** | **IP Address Report** | **Serial** | **Operating Mode** | **Accessible IPs**
- Network Setting** | **SNMP Setting**
- Modify**
  - IP Address: 192.168.127.10
  - Netmask: 255.255.255.0
  - IP Configuration: Static
  - Gateway: [Empty]
- Modify**
  - DNS Server 1: [Empty]
  - DNS Server 2: [Empty]
- Modify**
  - Enable LLDP
  - Message Transmit Interval: 30 (5~32768sec)

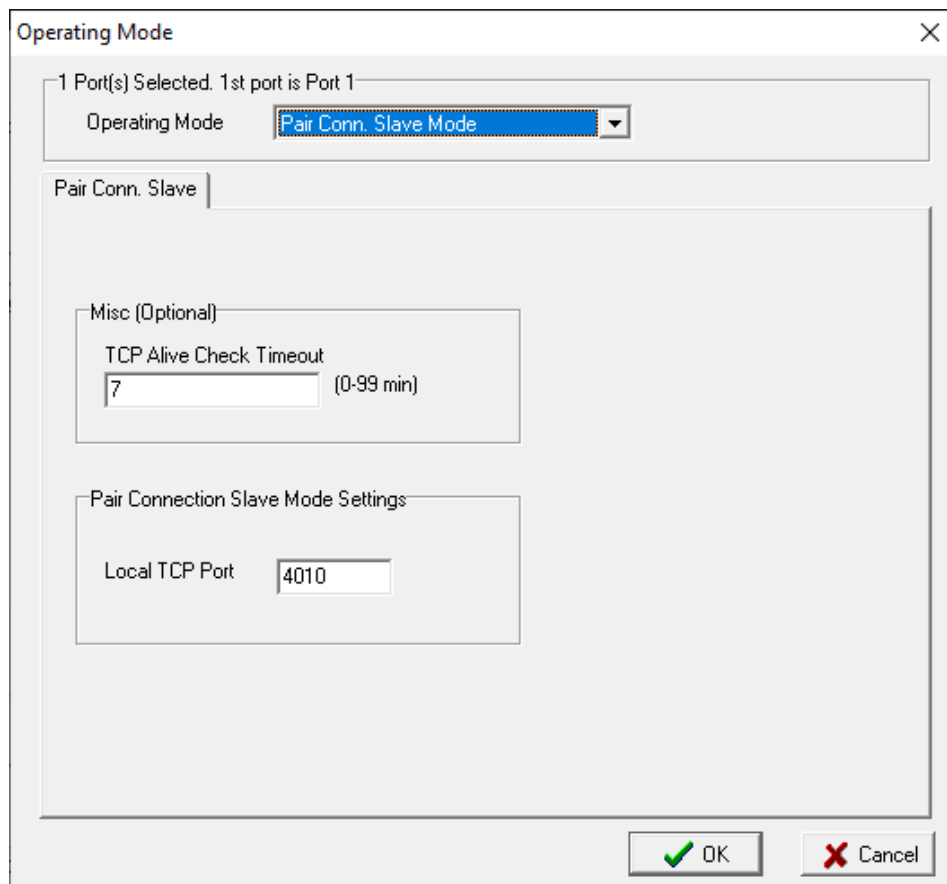
Click the "Modify" check box to modify configuration

OK Cancel

The Serial Settings window displays the following information:

- 1 Port(s) Selected. 1st port is Port 1
- Apply port alias to all selected ports.**
- Port Alias: RMYoung
- Baud Rate: 4800
- Parity: None
- Data Bits: 8
- Stop Bits: 1
- Flow Control: None
- FIFO: Enable
- Interface: RS-485, 4 wire

OK Cancel



The DAS100 serial port (COM11) is set to RS-485 mode using the [Port Manager](#) app.

## RM Young setup utility

The [86Setup](#) app on DAS100 can be used to connect to the anemometer remotely, view the serial output feed, and configure settings. Shut down NOAA services data logging for the RM Young before running the 86Setup app. You should not need to configure anything, but if you do, be careful to leave the RS-232 mode enabled. This is required to enable remote control mode. If RS-232 is disabled you won't be able to connect remotely. You will need to remove the anemometer from the tower and bring it to the lab, install RS-232 cabling, connect to an RS-232 port on DAS100, and then follow instructions in the 86Setup app for making a connection during the first 20 sec after power-up. For MOSAiC, the RS-485 mode in full duplex should also be enabled, and for proper operation with the Wind Tracker display the baud rate must be set to 4800 on the sonic and both MOXAs, and the NMEA output mode must be selected.

## Wind Tracker display and sector control

Wind Tracker display settings are adjusted with the two buttons on the display unit. Beware, entering set up mode will instantly clear the alarm state and shut down the inlet system. Enter

setup mode when the inlet system is already in backflush condition. See the Wind Tracker manual for details on the various settings. For leg 1, a 10 sec average display update rate and a 1 minute alarm delay gave sufficient sensitivity without triggering unnecessary shutdowns. A +/- 130° wind direction alarm sector seems fine for avoiding ship emissions. The wind speed alarm is set at 1 m/s, which also seems fine.

## **Data files and submission to MCS archive**

All 1 Hz data is saved on DAS100 by the NOAA Data Acquisition service. See data archiving instructions for details.