

# PmodRF1™ Weather Station Demo

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215 E Main Suite D | Pullman, WA 99163  
(509) 334 6306 Voice and Fax

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## Required Hardware

- two Cerebot Nanos
- two PmodRF1s
- two PmodTMPs
- two PmodCLSs

## Functionality

This demo shows how to utilize two PmodRF1 Wireless Radio Transceivers to communicate data. The project is divided into two components, a base station and a remote station. Each station is controlled by a Cerebot Nano microcontroller board, which receives temperature data from a PmodTMP thermometer.

The temperature data from the monitoring station is transmitted wirelessly to the base station using the two PmodRF1s. Once the base station receives the remote temperature data, it shows both the base and remote temperature on the PmodCLS display. The remote station then sleeps for 30 seconds to conserve battery power. After 30 seconds, the remote station takes and transmits another temperature reading and the process repeats.

## Station Setup

### Base Station

First, connect one PmodRF1 to JA on the base station Cerebot Nano. Then connect J1 on the PmodTMP to pins 7 through 12 of JB on the Cerebot Nano. Finally, connect J1 on the PmodCLS display to J1 on the Cerebot Nano.

### Remote Station

Connect the second PmodRF1 and PmodTMP to the second Cerebot Nano in the same manner as was done for the base station. There is no display to attach to the monitoring station.

## Board Programming

The Cerebot Nano boards are programmed using a JTAG-USB cable and the Digilent AVR Programmer software. Before programming, a Cerebot Nano must be receiving power from an external source, and the jumper JP1 must be in the RST position. Please note that for the base station, you must disconnect the PmodCLS from J1 before programming.

Once the base station programming is complete, remove power from the board, set JP1 to the SS (Slave Select) position, and reconnect the PmodCLS. Then reconnect power to the Cerebot Nano.

Because the remote station has no display, its JP1 jumper can be left in the RST position for both programming and operation. There is no need to power-cycle the remote station after programming, it should begin transmitting data immediately.

More information on programming the Cerebot Nano can be found in its reference manual, available from the Digilent website.

## **Station Operation**

Once programmed and power-cycled, the base station will display a welcome message until it receives a temperature reading from the remote station, at which point it will display the temperature information. The display will update for each new temperature reading received from the remote station.