



## Industrial Automation: *Interfacing CWS Weather Stations to SCADA, DCS, and PLC systems*

Columbia Weather Systems has developed interfaces for our weather stations to be used directly with common industrial automation systems such as SCADA, DCS, and PLC systems. These systems are used in industrial manufacturing, as well as government facility and infrastructure operations and maintenance.

**SCADA** (supervisory control and data acquisition) is a type of computer-controlled system that monitors and controls industrial processes, typically large-scale processes that can include multiple sites, and large distances.<sup>1</sup>



A **DCS** (distributed control system) refers to a control system usually of a manufacturing system, process or any kind of dynamic system, in which the controller elements are not central in location (like the brain) but are distributed throughout the system with each component sub-system controlled by one or more controllers. The system of controllers is connected by networks for communication and monitoring.<sup>2</sup>

A **PLC** (programmable logic controller) is a digital computer used for automation of electromechanical processes, such as control of machinery on factory assembly lines. Unlike general-purpose computers, the PLC is designed for multiple inputs and output arrangements, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact.<sup>3</sup>

**To interface with these systems, CWS has two main options:**

### 1) Weather MicroServer

The Weather MicroServer offers Modbus interface for all CWS stations with both 32- and 16-bit registers. (The point list is available at <http://www.columbiaweather.com/media/Microserver/OrionModbusData.pdf>.)

The MicroServer can be configured for either Modbus TCP/IP (Ethernet) or Modbus RTU (RS-485 Serial) communication. Please refer to System Diagrams on page 3. The Weather MicroServer offers additional features including additional sensors and monitoring options such as the Weather Display.

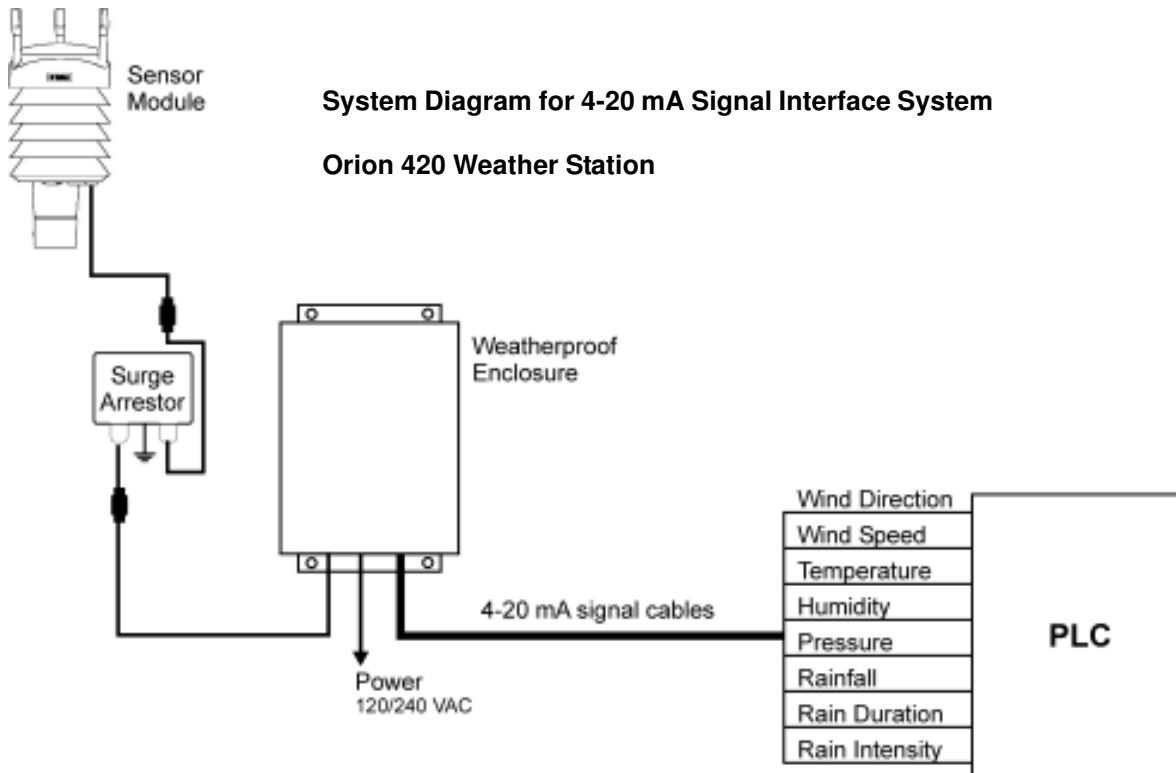


## 2) 4-20 mA Signal Interface

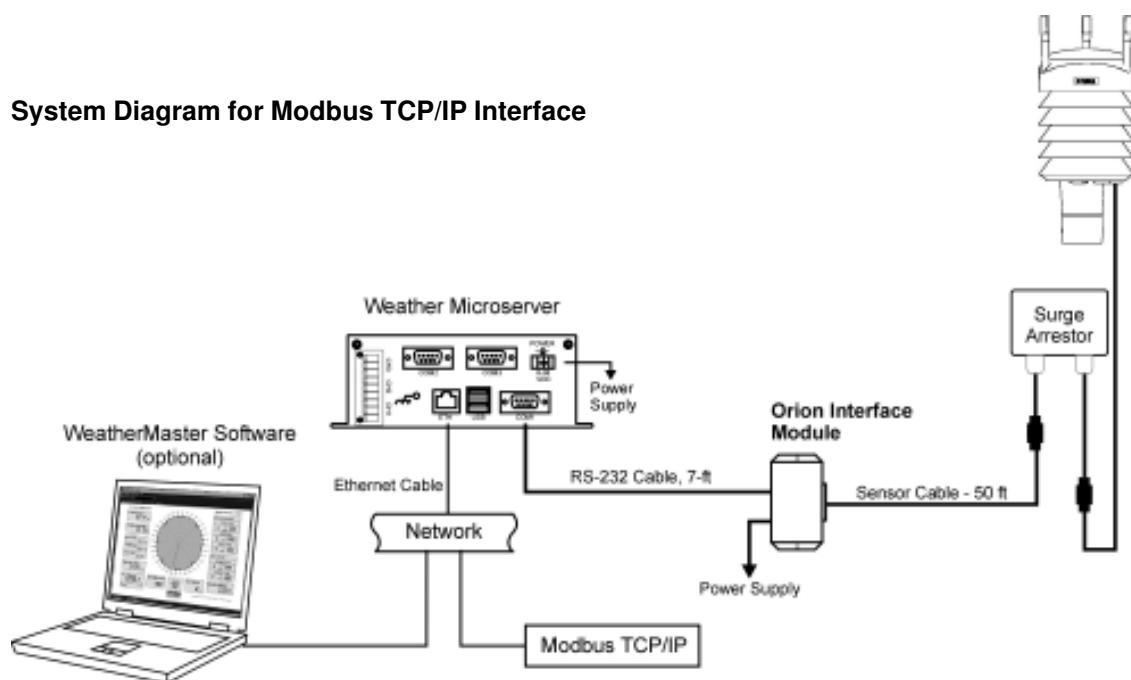
PLC systems often require 4-20 mA Signal Interface which is available with the Orion 420, Magellan 420, and Vela 420 Weather Stations. The weather sensor module connects to a weatherproof enclosure containing converter modules. Customer supplied 4-20 mA signal cables connect the weatherproof enclosure (screw terminal blocks) to the PLC device. Please note System Diagram below. Users monitor weather data on their PLC plant software such as Wonderware®. Additional monitoring options such as Weather Display, MicroServer, and WeatherMaster Software can be used via an optional RS-232 cable to the weatherproof enclosure.



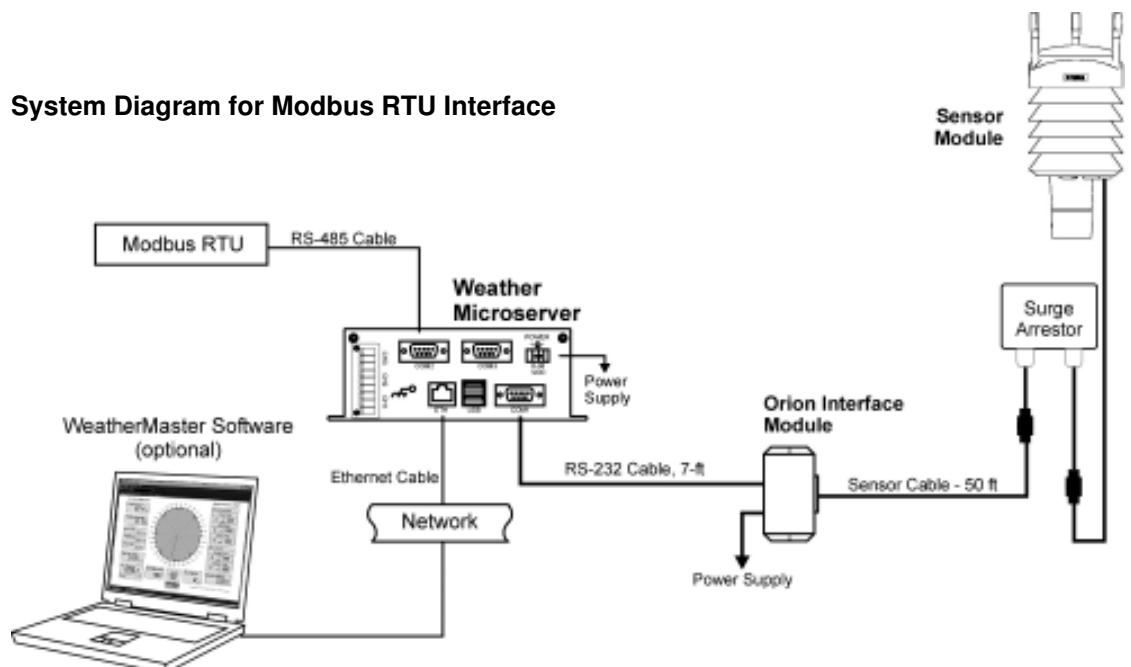
**For more information:** Visit <http://www.columbiaweather.com/products/weather-stations/industrial/> or contact Columbia Weather Systems (503) 629-0887 or email info@columbiaweather.com.



### System Diagram for Modbus TCP/IP Interface



### System Diagram for Modbus RTU Interface



### References:

<sup>1</sup>Boys, Walt (18 August 2009). "Back to Basics: SCADA." *Automation TV: Control Global - Control Design*.

<sup>2</sup>"Distributed control system." *Wikipedia: The Free Encyclopedia*. Wikipedia Foundation, Inc., Date last updated (13 January 2014). Web. Date accessed (16 January 2014)."

<sup>3</sup>"Programmable logic controller." *Wikipedia: The Free Encyclopedia*. Wikipedia Foundation, Inc., Date last updated (16 January 2014). Web. Date accessed (16 January 2014).