


## KTA-249 UV, Solar and Anemometer Modbus Interface

	<ul style="list-style-type: none"> <li>• Accepts Davis Instruments 6490 UV Radiation Sensor</li> <li>• Accepts Davis Instruments 6450 Solar Radiation Sensor</li> <li>• Accepts Davis Instruments 7911 Anemometer</li> <li>• Accepts Maxim / Dallas DS18S20 Digital Temperature Sensor</li> <li>• Accepts various 0-20mA / 4-20mA Sensors</li> <li>• Accepts 0-30V (Adjustable) Analog Signals</li> <li>• All readings stored in Modbus Holding Registers</li> <li>• RS232 and RS485 Modbus ports</li> <li>• 8-30VDC Input Power</li> <li>• Optional 8x2 LCD</li> </ul>
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The KTA-249 is an interface for a range of weather monitoring including UV, Solar, Wind and Temperature sensors, whose readings are stored in Modbus Holding Registers and made available for SCADA, PLC or PC monitoring. UV Radiation, Solar Radiation and Wind sensors designed for the Davis Instruments Vantage Pro2 Weather Station can be used with the KTA-249 without the need of an entire weather station unit. Additionally, extra inputs for monitoring 0-20mA signals or Battery Voltages up to 30V are included.

As well as having this information available to the monitoring system the optional LCD can be used to display the data locally.

### Connections:

+V	8-24Vdc Power in Positive	S1	Up/Left Button
COM	Common (Power in Negative)	S2	Enter Button
AN1	Analog Input 1 (0-30V)	S3	Down/Right Button
AN2	Analog Input 2 (0-20mA or 0-3V Jumper Selectable)	Anemom	Anemometer Input
COM	Common	UV	UV Sensor Input
D+	RS485 Data+	Solar	Solar Radiation Sensor Input
D-	RS485 Data-		
D9 Female	RS232		

### Supported Sensors and Data:

Sensor	Measures	Units	Notes
Davis Instruments 6490 UV Radiation Sensor	Ultra Violet Radiation	UV Index	Plugs directly into UV Connection
Davis Instruments 6450 Solar Radiation Sensor	Solar Radiation	W/m <sup>2</sup>	Plugs directly into SOLAR Connection
Davis Instruments 7911 Anemometer	Wind Speed and Direction	Speed: Knots, km/h, mph, m/s Direction: Degrees	Plugs directly into ANEMOM Connection
Maxim / Dallas DS18S20 Digital Temperature Sensor	Temperature	Degrees Celsius	Requires breakout board
Various 0-20mA / 4-20mA Sensors	Current Signals	No Unit (Scaled 0-1023 for 0-20mA)	AN2 input J1 jumper installed
0-3V Analog Signal	Voltage Signals	No Unit (Scaled 0-1023 for 0-3V)	AN2 input J1 jumper out
0-30V Analog Signal	Voltage Signals	No Unit (Scaled 0-1023 dependent on max input voltage)	R3 adjusted for max input voltage range

## Temperature Sensor:

A dedicated connection is not included for using the DS18S20 temperature sensor from Maxim / Dallas Semiconductor. The sensor can connect into any of the 3 6P6C connections for the Davis sensors, Custom cabling can be made or an additional breakout board can be supplied by Ocean Controls. If custom cabling is to be made the connections required are Pin 1 = One Wire Data, Pin 4 = Common, Pin 6 = +5V these connections can be used at the same time as the Davis sensor.

## Analog Input 1:

Analog Input 1 is a voltage input with included voltage dividing trimpot R3. To calibrate the input decide on the voltage that should be the maximum input that will scale to 1023. Set either the LCD or Modbus Master to display the AN1 input and then input the maximum voltage. Wind the R3 trimpot until 1022 is shown then finely adjust the trimpot until 1023 is just shown. I.e., if an input of 0-24V is required feed 24V into AN1 and then wind the R3 trimpot until a value below 1023 is shown. Once this happens wind R3 in the opposite direction slowly until the display changes from 1022 to 1023. This will set the range. Check by reducing the input voltage to 12V, the display should now show approximately 512.

## Analog Input 2:

Analog Input 2 can be used as either a 0-20mA input or a 0-3V input, with jumper J1 inserted the input will be set to 0-20mA current signals, with J1 out the input will be set to 0-3V voltage signals.

## LCD Version:

The LCD version of the KTA-249 can have all the parameters adjusted using the buttons and menu system. Push S2 (the middle button) to enter the menu, S3 navigates down the menu, S1 navigates up the menu, when a menu option is selected using the S2 button its parameters can be changed using the S1 and S3 buttons. A tick will show which parameter value is currently selected. Pressing the S2 button will select a parameter and quit the menu.

Menu Item	Parameters	Description
Solar	ON, OFF	Turns Solar Radiation Sensor ON and OFF
UV	ON, OFF	Turns UV Radiation Sensor ON and OFF
Anemom	ON, OFF	Turns Wind Sensor ON and OFF
Temp	ON, OFF	Turns Temperature Sensor ON and OFF
A1	ON, OFF	Turns Analog Input 1 ON and OFF
A2	ON, OFF	Turns Analog Input 2 ON and OFF
Baud	1200, 2400, 4800, 9600, 19200, 38400	Selects Baud Rate
Parity	None, Odd, Even	Selects Parity
MBAAddr	1 – 247	Selects Modbus Address
BL Time	0 – 255	Back Light "On Time", 0 = Always On
Cycle	0 – 255	Parameter Cycle Time, 0 = Never Cycle
WindUnit	Knots, km/h, mph, m/s	Selects Wind Speed Units
Exit		Exits menu system

When not in the menu the display will show the readings from sensors that are turned ON. If more than one sensor is ON then the next reading can be shown by pressing the S1 or S3 buttons to cycle through the readings. If the cycle time parameter is set to anything other than 0 the KTA-249 will automatically cycle to the next parameter after the current parameter has been shown for the number of seconds set by the cycle time.

The back light can be made to turn off to conserve power for solar powered installations. The back light will stay lit always if the "BL Time" parameter is set to 0, or turn off after the set number of seconds if set greater than 0. Each time a button is pressed the back light will come on and then wait the time again.

## Defaults:

If the Baud, Parity or Modbus address have been set to unknown values then the default values of 9600 Baud, No Parity and Modbus address 1 can be set by holding down button S2 (the centre button) while the unit is being powered up.

## Modbus Holding Registers:

All parameters and readings are available in the Modbus holding registers as listed below.

Reg	Data	Range	Unit
1	Solar Radiation Reading	0 – 1800	W/m <sup>2</sup>
2	Ultra Violet Radiation Index	0.0 – 16.0	UV Index x 10 <sup>[1]</sup>
3	Wind Direction	0 – 360	Degrees
4	Wind Speed	130 Knots, 241 km/h, 150 mph, 67m/s	Knots, km/h, mph, m/s Selected by Reg 10
5	Temperature	-55.0 – +125.0	Degrees Celsius x 10 <sup>[2]</sup>
6	Analog Input 1	0 – 1023	None
7	Analog Input 2	0 – 1023	None
8	Back Light Time	0 – 255	Seconds
9	Cycle Time	0 – 255	Seconds
10	Wind Speed Units 0=Knots, 1=km/h, 2=mph, 3=m/s	0 – 3	Dimensionless
11	Enable Solar Sensor 0=Disabled, 1=Enabled	0 – 1	Dimensionless
12	Enable UV Sensor 0=Disabled, 1=Enabled	0 – 1	Dimensionless
13	Enable Anemometer 0=Disabled, 1=Enabled	0 – 1	Dimensionless
14	Enable Temperature Sensor 0=Disabled, 1=Enabled	0 – 1	Dimensionless
15	Enable Analog Input 1 0=Disabled, 1=Enabled	0 – 1	Dimensionless
16	Enable Analog Input 2 0=Disabled, 1=Enabled	0 – 1	Dimensionless
17	Unused		
18	Modbus Address	0 – 247	Dimensionless
19	Baud Rate 0=1200, 1=2400, 2=4800, 3=9600, 4=19200, 5=38400	0 – 7	Dimensionless
20	Parity 0=No Parity, 1=Odd Parity, 2=Even Parity	0 – 2	Dimensionless

<sup>[1]</sup>UV Index is stored as 10 times the actual value. Eg. a value of 45 in the register will equate to a UV index of 4.5

<sup>[2]</sup>Numbers are stored as 16-bit signed values and 10 times the value. Eg. 257 in the register will equate to 25.7°C and 65279 will equate to -25.7°C

## Selection Guide:

# KTA-249

→ A: Standard Version  
L: LCD Version