

**ATTENTION**

# New Apogee Wiring Colors



Some of the wire colors for connecting our bare-lead sensors to data loggers changed in March, 2018. Please check your sensor serial number and/or if it has one of our new in-line, cable connectors 30 cm from the sensor head, and then review the serial number ranges below to ensure proper sensor connection. If your sensor is not listed, please check the owner's manual at [apogeeinstruments.com](http://apogeeinstruments.com) or contact tech support at [techsupport@apogeeinstruments.com](mailto:techsupport@apogeeinstruments.com).

## PYRANOMETERS

Model	Serial Number Range	Black	Red	White	Green	Yellow	Blue	Clear
SP-110	Serial # 0-60050	Negative (signal from sensor)	Positive (signal from sensor)					Shield/Ground
	Serial # 60051 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)				Shield/Ground
SP-212	Serial # 0-9897			Input Power	Positive (signal from sensor)			Ground (from sensor signal and output power)
	Serial # 9898 and above or if sensor has a connector	Ground	Input Power (3.3-24 V DC)	Amplified signal output				Shield/Ground
SP-214	Serial # 0-9897	Input ground	Input power	4-20 mA signal output	Signal ground			Shield/Ground
	Serial # 9898 and above or if sensor has a connector	Ground	Input power (7-24 V DC)	4-20 mA signal output				Shield/Ground
SP-215	Serial # 0-9897			Input power	Positive (signal from sensor)			Ground (from sensor signal and input power)
	Serial # 9898 and above or if sensor has a connector	Ground	Input power (5.5-24 V DC)	Amplified signal output				Shield/Ground
SP-230	Serial # 0-9897	Low side of differential channel (negative lead for sensor)	High side of differential channel (positive lead for sensor)	12 V DC (positive lead for heater)	Ground (negative lead for heater)			Analog ground (shield wire)
	Serial # 9898 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)		12 V DC (positive lead for heater)	Ground (negative lead for heater)	Shield/Ground
SP-421	Serial # 0-1173	SDI-12 Data Line	Input Power (4.5-24 V DC)					Ground (shield wire)
	Serial # 1174 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	SDI-12 Data Line				Shield/Ground
SP-510	Serial # 0-1269	Negative (signal from sensor)	Positive (signal from sensor)	12 V DC (positive lead for heater)	Ground (negative lead for heater)			Shield/Ground
	Serial # 1270 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)		12 V DC (positive lead for heater)	Ground (negative lead for heater)	Shield/Ground
SP-610	Serial # 0-1093	Negative (signal from sensor)	Positive (signal from sensor)	12 V DC (positive lead for heater)	Ground (negative lead for heater)			Shield/Ground
	Serial # 1094 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)		12 V DC (positive lead for heater)	Ground (negative lead for heater)	Shield/Ground
SP-422	Serial # 0-1173							
	Serial # 1174 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	RS232 Tx or RS485 +	Select – RS485/RS232		RS232 Rx or RS485-	Shield/Ground



## OXYGEN SENSORS

Model	Serial Number Range	Black	Red	White	Green	Yellow	Blue	Clear
<b>SO-110</b>	Serial # 0-4606	Low side of differential channel (negative lead for O <sub>2</sub> sensor)	High side of differential channel (positive lead for O <sub>2</sub> sensor)	Excitation channel (excitation for thermistor)	Single-ended channel (positive lead for thermistor)	12 V port (positive lead for heater)	Ground (negative lead for thermistor and heater)	Analog ground (shield wire)
	Serial # 4607 and above or if sensor has a connector	Low side of differential channel (negative lead for O <sub>2</sub> sensor)	Excitation channel (excitation for thermistor)	High side of differential channel (positive lead for O <sub>2</sub> sensor)	Single-ended channel (positive lead for thermistor)	12 V DC (positive lead for heater)	Ground (negative lead for thermistor and heater)	Shield/Ground
<b>SO-120</b> For separate thermocouple wiring see manual	Serial # 0-4606	Low side of differential channel (negative lead for O <sub>2</sub> sensor)	High side of differential channel (positive lead for O <sub>2</sub> sensor)	12 V DC (positive lead for heater)	Ground (negative lead for heater)			Analog ground (shield wire)
	Serial # 4607 and above or if sensor has a connector	Low side of differential channel (negative lead for O <sub>2</sub> sensor)		High side of differential channel (positive lead for O <sub>2</sub> sensor)		12 V DC (positive lead for heater)	Ground (negative lead for heater)	Shield/Ground
<b>SO-210</b>	Serial # 0-4606	Low side of differential channel (negative lead for O <sub>2</sub> sensor)	High side of differential channel (positive lead for O <sub>2</sub> sensor)	Excitation channel (excitation for thermistor)	Single-ended channel (positive lead for thermistor)	12 V port (positive lead for heater)	Ground (negative lead for thermistor and heater)	Analog ground (shield wire)
	Serial # 4607 and above or if sensor has a connector	Low side of differential channel (negative lead for O <sub>2</sub> sensor)	Excitation channel (excitation for thermistor)	High side of differential channel (positive lead for O <sub>2</sub> sensor)	Single-ended channel (positive lead for thermistor)	12 V DC (positive lead for heater)	Ground (negative lead for thermistor and heater)	Shield/Ground
<b>SO-220</b> For separate thermocouple wiring see manual	Serial # 0-4606	Low side of differential channel (negative lead for O <sub>2</sub> sensor)	High side of differential channel (positive lead for O <sub>2</sub> sensor)	12 V port (positive lead for heater)	Ground (negative lead for heater)			Analog ground (shield wire)
	Serial # 4607 and above or if sensor has a connector	Low side of differential channel (negative lead for O <sub>2</sub> sensor)		High side of differential channel (positive lead for O <sub>2</sub> sensor)		12 V DC (positive lead for heater)	Ground (negative lead for heater)	Shield/Ground
<b>SO-411</b>	Serial # 0-1144	SDI-12 Data Line	Input Power (4.5-24 V DC)	Positive Heater Power	Negative Heater Power			Ground (shield wire)
	Serial # 1145 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	SDI-12 Data Line		12 V DC (positive lead for heater)	Ground (negative lead for heater)	Shield/Ground
<b>SO-421</b>	Serial # 0-1144	SDI-12 Data Line	Input Power (4.5-24 V DC)	Positive Heater Power	Negative Heater Power			Ground (shield wire)
	Serial # 1145 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	SDI-12 Data Line		12 V DC (positive lead for heater)	Ground (negative lead for heater)	Shield/Ground

## QUANTUM SENSORS

Model	Serial Number Range	Black	Red	White	Green	Blue	Clear
<b>SQ-110</b>	Serial # 0-25369	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 25370 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-120</b>	Serial # 0-25369	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 25370 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-212</b>	Serial #0-7597			Input power	Positive (signal from sensor)		Ground (for sensor signal and input power)
	Serial # 7598 and above or if sensor has a connector	Ground	Input power (3.3-24 V DC)	Amplified signal output			Shield/Ground

<b>SQ-214</b>	Serial #0-7602	Input ground	Input power	4-20 mA signal output	Signal ground		Shield/Ground
	Serial # 7603 and above or if sensor has a connector	Ground	Input power (7-24 V DC)	4-20 mA signal output			Shield/Ground
<b>SQ-224</b>	Serial #0-7602	Input ground	Input power	4-20 mA signal output	Signal ground		Shield/Ground
	Serial # 7603 and above or if sensor has a connector	Ground	Input power (7-24 V DC)	4-20 mA signal output			Shield/Ground
<b>SQ-215</b>	Serial #0-7597			Input power	Positive (signal from sensor)		Ground (for sensor signal and input power)
	Serial # 7598 and above or if sensor has a connector	Ground	Input power (5.5-24 V DC)	Amplified signal output			Shield/Ground
<b>SQ-222</b>	Serial #0-7597			Input power	Positive (signal from sensor)		Ground (for sensor signal and input power)
	Serial # 7598 and above or if sensor has a connector	Ground	Input power (3.3-24 V DC)	Amplified signal output			Shield/Ground
<b>SQ-225</b>	Serial #0-7597			Input power	Positive (signal from sensor)		Ground (for sensor signal and input power)
	Serial # 7598 and above or if sensor has a connector	Ground	Input power (5.5-24 V DC)	Amplified signal output			Shield/Ground
<b>SQ-421</b>	Serial # 0-2052	SDI-12 Data Line	Input Power (4.5-24 V DC)				Ground (shield wire)
	Serial # 2053 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	SDI-12 Data Line			Shield/Ground
<b>SQ-313</b>	Serial # 0-3204	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 3205 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-323</b>	Serial # 0-3204	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 3205 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-316</b>	Serial # 0-3204	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 3205 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-326</b>	Serial # 0-3204	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 3205 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-311</b>	Serial # 0-3204	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 3205 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-321</b>	Serial # 0-3204	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 3205 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-500</b>	Serial # 0-1558	Negative (signal from sensor)	Positive (signal from sensor)				Shield/Ground
	Serial # 1559 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)			Shield/Ground
<b>SQ-512</b>	Serial # 0-1689	Ground	Power	Output			
	Serial # 1690 and above or if sensor has a connector	Ground	Input power (3.3-24 V DC)	Amplified signal output			Shield/Ground
<b>SQ-515</b>	Serial # 0-1689	Ground	Power	Output			
	Serial # 1690 and above or if sensor has a connector	Ground	Input power (5-24 V DC)	Amplified signal output			Shield/Ground

<b>SQ-521</b>	Serial # 0-1689	SDI-12 Data Line	Input Power (4.5-24 V DC)				Ground (shield wire)
	Serial # 1690 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	SDI-12 Data Line			Shield/Ground
<b>SQ-422</b>	Serial # 0-2052						
	Serial # 2053 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	RS232 Tx or RS485 +	Select – RS485/RS232	RS232 Rx or RS485-	Shield/Ground
<b>SQ-522</b>	Serial # 0-1689						
	Serial # 1690 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	RS232 Tx or RS485 +	Select – RS485/RS232	RS232 Rx or RS485-	Shield/Ground

## ALL OTHER APOGEE SENSORS

Model	Serial Number Range	Black	Red	White	Green	Yellow	Blue	Clear	Orange
<b>SN-500</b>	Serial # 1085 and less	SDI-12 Data Line	Input Power (4.5-24 V DC)					Ground (shield wire)	
	Serial # 1086 and greater	Ground	Input Power (5.5-15 V DC)	SDI-12 Data Line				Shield/Ground	
<b>TS-100 Fan</b>	Serial # 0-1541	Ground (negative fan lead)	Input power (positive fan lead)	Pulse Counter or Control Port (tachometer output)	Control Port (PWM control)		Input Power (for tachometer)	Shield/Ground	
	Serial # 1542 and above or if sensor has a connector	Ground (negative fan lead)	Input power (positive fan lead)	Pulse Counter or Control Port (tachometer output)	Control Port (PWM control)		Input Power (for tachometer)	Shield/Ground	
<b>SL-510</b>	Serial # 0-1073	Low side of differential channel (negative thermopile lead)	High side of differential channel (positive thermopile lead)	12 V DC (positive lead for heater)	Ground (negative lead for heater)	Single-ended channel (positive thermistor lead)	Excitation channel (excitation for thermistor)	Analog ground (negative thermistor lead)	
	Serial # 1074 and above or if sensor has a connector	Negative (signal from sensor)	Excitation channel (excitation for thermistor)	Positive (signal from sensor)	Single-ended channel (positive thermistor lead)	12 V DC (positive lead for heater)	Ground (negative lead for thermistor and heater)	Shield/Ground	
<b>SL-610</b>	Serial # 0-1033	Low side of differential channel (negative thermopile lead)	High side of differential channel (positive thermopile lead)	12 V DC (positive lead for heater)	Ground (negative lead for heater)	Single-ended channel (positive thermistor lead)	Excitation channel (excitation for thermistor)	Analog ground (negative thermistor lead)	
	Serial # 1034 and above or if sensor has a connector	Negative (signal from sensor)	Excitation channel (excitation for thermistor)	Positive (signal from sensor)	Single-ended channel (positive thermistor lead)	12 V DC (positive lead for heater)	Ground (negative lead for thermistor and heater)	Shield/Ground	
<b>ST-100</b>	Serial # 0-2724	Single-ended channel (positive thermistor lead)	Excitation channel (excitation for thermistor)				Analog Ground (negative thermistor lead)	Ground (shield wire)	
	Serial # 2725 and above or if sensor has a connector	Ground (negative thermistor lead)	Excitation channel (excitation for thermistor)	Single-ended channel (positive thermistor lead)				Shield/Ground	
<b>ST-110</b>	Serial # 0-2724	Single-ended channel (positive thermistor lead)	Excitation channel (excitation for thermistor)				Analog Ground (negative thermistor lead)	Ground (shield wire)	
	Serial # 2725 and above or if sensor has a connector	Ground (negative thermistor lead)	Excitation channel (excitation for thermistor)	Single-ended channel (positive thermistor lead)				Shield/Ground	

<b>ST-200</b>	Serial # 0-1351	Single-ended channel (positive thermistor lead)	Excitation channel (excitation for thermistor)				Analog Ground (negative thermistor lead)	Ground (shield wire)	
	Serial # 1352 and above or if sensor has a connector	Ground (negative thermistor lead)	Excitation channel (excitation for thermistor)	Single-ended channel (positive thermistor lead)				Shield/Ground	
<b>ST-300</b>	Serial # 0-1075	Low Side of Differential Channel 2	High Side of Differential Channel 2	Analog Ground	Low Side of Differential Channel 1		High Side of Differential Channel 1	Ground (shield wire)	PRT Excitation Channel
	Serial # 1076 and above or if sensor has a connector	Low Side of Differential Channel 1	Excitation channel (excitation for PRT)	High Side of Differential Channel 1	High Side of Differential Channel 2	Analog Ground	Low Side of Differential Channel 2	Shield/Ground	
<b>ST-150</b>	Serial # 0-2724	Low Side of Differential Channel 2	High Side of Differential Channel 2	Analog Ground	Low Side of Diff. Channel 1			Ground (shield wire)	
	Serial # 2725 and above or if sensor has a connector	Low Side of Differential Channel 1		High Side of Differential Channel 1	High Side of Differential Channel 2		Low Side of Differential Channel 2	Shield/Ground	
<b>SF-110</b>	Serial # 0-1137	Single-ended channel (positive leaf thermistor lead)	Excitation channel (excitation for leaf thermistor)	Excitation channel (excitation for bud thermistor)	Single-ended channel (positive bud thermistor lead)		Analog ground (negative leaf thermistor lead)	Analog ground (shield wire)	Analog ground (negative bud therm. lead)
	Serial # 1138 and above or if sensor has a connector	Therm 1 (negative leaf thermistor lead)	Excitation channel (excitation for leaf and bud thermistor)	Therm 1 (positive leaf thermistor lead)	Therm 2 (positive bud thermistor lead)		Therm 2 (negative bud thermistor lead)	Shield/Ground	
<b>SF-421</b>	Serial # 0-1013	SDI-12 Data Line	Input Power (4.5-24 V DC)					Ground (shield wire)	
	Serial # 1014 and above or if sensor has a connector	Ground	Input Power (5.5-24 V DC)	SDI-12 Data Line				Shield/Ground	
<b>SU-100</b>	Serial # 0-2481	Negative (signal from sensor)	Positive (signal from sensor)					Shield/Ground	
	Serial # 2482 and above or if sensor has a connector	Negative (signal from sensor)		Positive (signal from sensor)				Shield/Ground	
<b>SB-100</b>	Serial # 0-2404	Signal output; connect to single-ended channel	Input Power; connect to 5 V		Ground for signal output; connect to analog ground				
	Serial # 2405 and above or if sensor has a connector	Ground for signal output; connect to analog ground	Input Power (5 V)	Signal output (connect to single-ended channel)				Shield/Ground	