

PRO 100 and 200 Series

VISUAL AND FIBER OPTIC MULTI-WAVELENGTH NONCONTACT TEMPERATURE SYSTEMS

SENSOR SELECTION GUIDELINES

Multi-wavelength sensors utilize programmable ESP algorithms to provide 'aim and read' capabilities for applications that are not accurately measured by single- and dual- wavelength sensors. These sensors are recommended for applications involving:

- Non-greybody materials such as aluminum, brass, chrome, copper, stainless steel, titanium, tungsten, and zinc
- Intervening media such as dirty optics, scale, steam, or dust
- A partially filled field of view caused by a mechanical obstruction or a small or wandering target

While ESP's can be developed for new applications, the list of applications where ESP's have already been developed includes:

- Aluminum Extrusion Applications: Press Exit, Cut Face of Billet, Sheared Billets, Side of Billets, and Quench
- Aluminum Rod and Bar Mills: Cast and Rolled Surfaces
- Galvanneal and Galvanized Steel Measurements
- Glass Mold Measurements
- Molten Aluminum Stream Measurements
- Stainless Steel (Low and High Ni content)

TEMPERATURE RANGE AND FIELD OF VIEW SPECIFICATIONS

PRO 100 SERIES – Visual Aiming, Multi-Wavelength (Mλ) Sensors							
PRO Model	Nominal Spectral Response (microns)	TEMPERATURE RANGE		FIELD OF VIEW		SIGNAL DILUTION	
		Fahrenheit	Celsius	Standard or Large Resolution Optics	High Resolution Optics	Temperature Where Exceeds 20:1	Top End
120-5	2 μm	300 - 600 °F	150 - 315 °C	D/17	n/a	375°F / 190°C	300:1
120-20	2 μm	400 - 1100 °F	200 - 600 °C	D/17	n/a	525°F / 275°C	900:1
120-25	2 μm	500 - 1100 °F	260 - 600 °C	D/25 or D/17	D/50	525°F / 275°C	1200:1
120-40	2 μm	900 - 2700 °F	475 - 1475 °C	D/75	D/100	1025°F / 550°C	900:1
110-10	1.5 μm	700 - 2100 °F	375 - 1150 °C	D/75 or D/17	n/a	925°F / 500°C	6000:1
110-15	1.5 μm	750 - 2500 °F	400 - 1375 °C	D/75 or D/17	n/a	1000°F / 540°C	6000:1
110-20	1.5 μm	900 - 3200 °F	475 - 1750 °C	D/100 or D/17	D/120	1225°F / 660°C	6000:1
110-30	1.5 μm	1000 - 4000 °F	550 - 2200 °C	D/100 or D/17	D/120	1325°F / 720°C	6000:1
110-40	1 μm	1100 - 2000 °F	600 - 1100 °C	D/30 or D/17	n/a	1325°F / 720°C	1800:1
110-50	1 μm	1300 - 2500 °F	700 - 1375 °C	D/75 or D/17	n/a	1575°F / 860°C	1800:1
110-65	1 μm	1600 - 3200 °F	875 - 1750 °C	D/100 or D/25	D/150	1900°F / 1040°C	1800:1
110-70	1 μm	1700 - 4500 F	925 - 2475 °C	D/100 or D/25	D/150	2375°F / 1300°C	1800:1

PRO 200 SERIES – Fiber Optic, Multi-Wavelength (Mλ) Sensors										
PRO Model	Nominal Spectral Response (microns)	TEMPERATURE RANGE		FIELD OF VIEW			FIBER CABLE		SIGNAL DILUTION	
		Fahrenheit	Celsius	Standard Resolution Optics (2)	High Res. I Optics	High Res. II Optics	Max. Length	Type of Cable	Temperature Where Exceeds 20:1	Top End
220-20	2 μm	400 - 1100 °F	200 - 600 °C	D/2 or D/12	n/a	D/50	3ft / 91cm	Quartz	460°F / 240°C	1200:1
220-25	2 μm	500 - 1100 °F	260 - 600 °C	D/2 or D/12	n/a	D/50	3ft / 91cm	Quartz	525°F / 275°C	1200:1
220-40	2 μm	900 - 2700 °F	475 - 1475 °C	D/2 or D/16	D/50	D/75	6ft / 1.8m	Quartz	1025°F / 550°C	900:1
210-10	1.5 μm	700 - 2100 °F	375 - 1150 °C	D/2 or D/12	D/35	D/50	30ft / 9.1m	Quartz	925°F / 500°C	6000:1
210-15	1.5 μm	750 - 2500 °F	400 - 1375 °C	D/.75 or D/12	D/35	D/50	30ft / 9.1m	Glass	1000°F / 540°C	6000:1
210-20	1.5 μm	900 - 3200 °F	475 - 1750 °C	D/.75 or D/12	D/50	D/75	30ft / 9.1m	Glass	1225°F / 660°C	6000:1
210-30	1.5 μm	1000 - 4000 °F	550 - 2200 °C	D/.75 or D/12	D/50	D/75	30ft / 9.1m	Glass	1325°F / 720°C	6000:1
210-40	1 μm	1100 - 2000 °F	600 - 1100 °C	D/.75 or D/12	n/a	D/50	20ft / 6m	Glass	1325°F / 720°C	1800:1
210-50	1 μm	1300 - 2500 °F	700 - 1375 °C	D/.75 or D/12	D/35	D/50	25ft / 7.6m	Glass	1575°F / 860°C	1800:1
210-65	1 μm	1600 - 3200 °F	875 - 1750 °C	D/.75 or D/16	D/50	D/75	30ft / 9.1m	Glass	1900°F / 1040°C	1800:1
210-70	1 μm	1700 - 4500 F	925 - 2475 °C	D/.75 or D/16	D/50	D/75	30ft / 9.1m	Glass	2375°F / 1300°C	1800:1

- **FOV Selection:** $d=D/F$, where d =Measured Target Diameter, D =Working Distance, F =Optical Resolution Factor
- **Fiber Cables** are available in the following lengths: 3ft (91cm), 6ft (1.8m), 10ft (3m), 20ft (6m), 25ft (7.6m), 30ft (9.1m)
- Consult with Williamson for **custom temperature ranges, wavelengths, and optics.**

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Williamson
Innovators In Noncontact Temperature Measurement

PRO 100 AND 200 SPECIFICATIONS			
ACCURACY	0.25% to 0.5% of Reading or 2°C (varies by model)		
REPEATABILITY	Better than 1°C		
RESPONSE TIME	Constant Target: 100ms (update time) Intermittent Target: 400ms (98% of Reading - 4τ)		
CE CERTIFICATION	EMI / RFI for heavy industry; LVD (Low Voltage Directive)		
AMBIENT TEMPERATURE LIMITS	Sensor Head: All Models: 0 to 140°F (-17 to 60°C) Except 120-5: 32 to 120°F (-17 to 50°C) Interface Module: 0 to 120°F (50°C) Sensor w/ Water Cooling: 200-350°F (95-175°C) (this varies with water rate and temperature) Fiber Optic Assembly: 400°F (200°C)		
INPUT POWER	Stand-alone Sensor: 24Vdc (300mA); With Interface Module: 90-260Vac, 50/60Hz		
INPUT AND OUTPUT SIGNALS	Stand-Alone Configuration: An internal jumper is used to select the analog or digital mode.		
	<table border="0"> <tr> <td style="vertical-align: top;"> Analog Mode <ul style="list-style-type: none"> • 4-20 mA or 0-20 mA (1000ohm max. impedance. Shunt resistors produce voltage outputs.) • TTL Alarm with 2mA at 5Vdc rating • External Peak Hold Reset • Select parameter, scale, & range of output & alarm </td> <td style="vertical-align: top;"> Digital Mode <ul style="list-style-type: none"> • Bi-directional RS485 communications • RS232 with a converter • Used to connect to the Interface Module </td> </tr> </table>	Analog Mode <ul style="list-style-type: none"> • 4-20 mA or 0-20 mA (1000ohm max. impedance. Shunt resistors produce voltage outputs.) • TTL Alarm with 2mA at 5Vdc rating • External Peak Hold Reset • Select parameter, scale, & range of output & alarm 	Digital Mode <ul style="list-style-type: none"> • Bi-directional RS485 communications • RS232 with a converter • Used to connect to the Interface Module
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System Configuration with Interface Module <table border="0"> <tr> <td style="vertical-align: top;"> 2 Programmable Analog Outputs <ul style="list-style-type: none"> • 4-20 mA or 0-20 mA (1000ohm max. impedance. Shunt resistors produce voltage outputs.) • Select parameter, scale, and range 3 Analog Inputs <ul style="list-style-type: none"> • Sample and Hold • External Peak Hold Reset • Analog input for remote parameter adjustments </td> <td style="vertical-align: top;"> Bi-directional Serial Communications <ul style="list-style-type: none"> • RS232 and RS485 simultaneously 2 Programmable Relay Alarms <ul style="list-style-type: none"> • Form C (4A at 250Vac or 2.5A at 30Vdc) • Select alarm parameter and set point 1 Programmable TTL Alarm <ul style="list-style-type: none"> • TTL rating is 2 ma at 5Vdc • Select alarm parameter and set point </td> </tr> </table>	2 Programmable Analog Outputs <ul style="list-style-type: none"> • 4-20 mA or 0-20 mA (1000ohm max. impedance. Shunt resistors produce voltage outputs.) • Select parameter, scale, and range 3 Analog Inputs <ul style="list-style-type: none"> • Sample and Hold • External Peak Hold Reset • Analog input for remote parameter adjustments 	Bi-directional Serial Communications <ul style="list-style-type: none"> • RS232 and RS485 simultaneously 2 Programmable Relay Alarms <ul style="list-style-type: none"> • Form C (4A at 250Vac or 2.5A at 30Vdc) • Select alarm parameter and set point 1 Programmable TTL Alarm <ul style="list-style-type: none"> • TTL rating is 2 ma at 5Vdc • Select alarm parameter and set point 	
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PRO SERIES MENU SYSTEM	
PROGRAMMABLE OUTPUT & ALARM PARAMETERS	Filtered Temperature, Unfiltered Temperature, Ambient Temperature, Signal Dilution, and Signal Strength / Emissivity
SIGNAL CONDITIONING	Average Time, Peak Hold Delay, Temperature Scale (°F/C) Adjustment, Slope Adjustment
ESP'S	ESP Filters for Signal Strength & Signal Dilution ESP Algorithms for specific applications
DIAGNOSTICS	System Test, Analog Output Tests, Alarm Tests, Menu Access/Security
STATUS MESSAGES	Out of Range, Ambient Warning, Communications

PRO SERIES OPTIONS AND ACCESSORIES	
23	Programmable Interface Module (see above)
25 /25S /25RS	PID Controllers w/ power supply, & 4-20mA Output
PS	Power Supply 24Vdc (700mA) to 90-260Vac (50/60Hz)
AP	Air Purge
WCAP	Water Cooling Air Purge
SB	Swivel Bracket
LA	Laser Aiming (visual and fiber optic sensors)
AL	Aim Light (For PRO 50 Series only)
Cable Sheathings	PRO 200's-Armor Guard (AG), Stainless Steel Braid (SSB)

