Williamson
Innovators in Noncontact Temperature Measurement

1λ Single-Wavelength Industrial Infrared Thermometers

GOLD2010

Easy to Install, Operate, and Maintain

The Gold Series sensors feature a variety of input, output, and alarm options to enable advanced process monitoring and control capabilities. Each sensor can be configured to operate as a stand-alone sensor or with a remote Interface Module using the sensor's six conductor interconnecting cable.

Communications Interface		
	Stand Alone Sensor	**Sensor with Interface Module**
Analog Output(s)	One	Two
Relay Alarm(s)	One	Two
Analog Input	One	One
Digital Interface	RS485	RS485 & RS232
Input Power	24Vdc	90-260Vac

The sensor can be set to an analog (A) configuration for operation with a digital meter, PID Controller, or PLC. In addition to providing an analog output, the sensor may be configured for an alarm relay output (default), or a remote analog input for adjustment of the sensor's alarm set-point or emissivity.
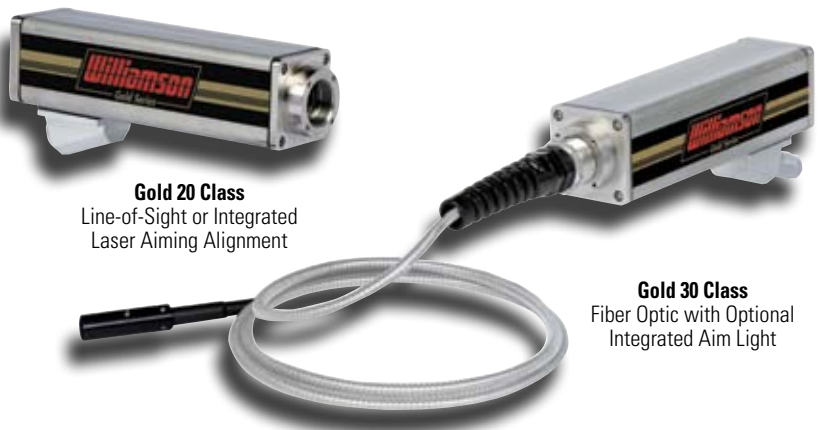

The sensor can be set to a digital (D) configuration (RS485) for operation with the optional Interface Module or a serial connection with a PC or PLC. The 1/4 DIN Interface Module (shown below) includes 33 quick release connections for more advanced capabilities as well as an RS232 connector for interface with the ProView PC Software.

High Performance Gold 20 and 30 Class Sensors

The Gold Series is a complete family of single-wavelength infrared thermometers featuring state-of-the-art technology to provide accurate and reliable measurements for a wide range of industrial applications.

Gold 20 Class
Line-of-Sight or Integrated
Laser Aiming Alignment

Gold 30 Class
Fiber Optic with Optional
Integrated Aim Light

Gold Specifications	
Temperature Limits	-50 to 4500°F / -45 to 2500°C (actual sensor ranges vary by model)
Spectral Response	Gold 20: Complete Range of Short, Long, and Specialty Wavelengths Gold 30: Short Wavelengths
Optical Resolution	Range of Optics with Nominal Spot Size based on 90% of Energy
Accuracy	Models 21, 22, 31, 32: 0.25% of Reading or 2°C whichever is greater All other Models: 0.5% of Reading or 2°C whichever is greater
Repeatability	Better than 1°C
Emissivity	0.010 to 1.500
Response and Update Time	Models 21,22,31,32: 5ms (95% of Response) with 5ms Update Time All other Models: 75ms (95% of Response) with 5ms Update Time Interface Module: 100ms Update Time
Analog Outputs	4-20mA or 0-20mA output (max impedance 1000 ohms)
Alarms	Sensor: SPST relay rated 2A@24V Interface Module: Two SPDT relays rated 2A@110Vac
Analog Input	Sensor: 4-20mA or 0-20mA input (impedance 250 ohms) Interface Module: 4-20mA or 0-20mA input (impedance 237.5 ohms)
Digital Interface	Bi-Directional RS485 and RS232 communications
Human Interface	Built-in Menu System with Access to Averaging, Peak/Valley Hold (Time or Temp Reset), Programmable Outputs and Alarms
Measured Parameters	Filtered and Unfiltered Temperature, Ambient Temp. & Rate of Change
Input Power	Sensor: 24Vdc (300mA); Interface Module: 90-260Vac 50-60 Hz
Ambient Temperature Limits	Sensor: 0 to 140°F / -17 to 60°C, with Water Cooling limit is 350°F / 175°C (varies with water rate and temp) Fiber Optic Cable & Lens Barrel: 400°F / 200°C Interface Module: 0 to120°F / -17 to 50°C
Enclosure Rating	Sensor: Stainless Steel Enclosure with NEMA 4X (IP65) Rating. Optional NEMA 7 and ATEX enclosures are available Interface Module: NEMA12 Front Panel w/ Anodized Aluminum Enclosure
Weight	Sensor: 2.8lbs (1.3kg); Interface Module: 2.2lbs (1kg)
Dimensions	Sensor: 7.75in x 2.0in x 3.1in / 197mm x 51 mm x 79 mm Interface Module: 7.0in x 3.78in x 3.78in / 178mm x 96 mm x 96 mm
CE Certification	EMI/ RFI for heavy industry; LVD (Low Voltage Directive)
Warranty	2 year

This quick configuration guide includes the most commonly used Williamson models, options, and accessories. Simply select the part numbers from the tables to configure a sensor for your application. For additional models and accessories contact Williamson.

Sample Part Numbers						
A - Sensor Model	**Temp Scale**	**B - Field of View**	**C - Sensor Output**	**D - Options**	**E - Accessories**	**F - Cable**
GOLD 21-50-	F- or C-	-FOV5FT/100-	A- or D-	LA-	IM-WCAP-SB-	CF040
GOLD 31-50-	F- or C-	-FOV6IN/35-	A- or D-	10G-SSB-AL-	IM-STSB-	CF040

Gold 20 Class Sensors - Camera Style				
A - Sensor Model			**B - Field of View (1)**	
Model Number	**Nominal Wavelength**	**Temperature Range** Fahrenheit Celsius	**Optical Resolution**	**Typical Application**
Short-Wavelength Sensors – Best for Tolerating Emissivity Variation and Optical Obstruction				
21-50	0.9 µm	1000-2500°F 540-1375°C	D/100	Metals, Refractory, and Other High Temperature Applications; Silicon Processing; View through Water
21-60	0.9 µm	1200-3200°F 650-1750°C	D/100	
21-70	0.9 µm	1400-4500°F 760-2475°C	D/100	
21-20	1.6 µm	500-2100°F 260-1150°C	D/100	Metals and General Purpose Applications; Flame-Fired Processes; Bulk Glass Temperatures; View through Steam, Water Vapor, Flames, & Combustion Gasses
21-25	1.6 µm	600-2500°F 315-1375°C	D/100	
21-30	1.6 µm	700-3200°F 375-1750°C	D/100	
21-35	1.6 µm	900-4000°F 500-2200°C	D/100	
22-37	2.2 µm	300-2000°F 150-1100°C	D/50	General Purpose Applications; Low-Temperature, Low-Emissivity Metals; Flame-Fired Processes; View through Steam, Water Vapor, Flames, Combustion Gasses, Plasma, Thin Plastics & Oil
22-40	2.2 µm	400-2500°F 200-1375°C	D/100	
Specialty-Wavelength Sensors –				
25-10	5 µm	200-1000°F 95-540°C	D/20	
25-15	5 µm	400-1500°F 200-800°C	D/20	
28-13	7.9 µm	85-600°F 30-315°C	D/20	
28-36	7.9 µm	200-1100°F 100-600°C	D/20	
28-41	7.9 µm	500-2500°F 260-1375°C	D/40	
Long-Wavelength Sensors – Best to Measure Non-Reflective or Near-Ambient Targets				
29-20	8-12 µm	0-1000°F 0-550°C	D/40	General Purpose Applications, preferably below 500°F / 250° C with Non-Reflective, High Emissivity Materials
29-23	8-12 µm	0-500°F 0-260°C	D/40	

Gold 30 Class Sensors - Fiber Optic Style					
A - Sensor Model			**B - Field of View (1) (select one)**		**D - Fiber Cable Option (4)**
Model Number	**Nominal Wavelength**	**Temperature Range** Fahrenheit Celsius	**Wide Angle Optics (2)**	**Standard Resolution Optics**	**Type of Fiber Cable** / **Max Fiber Cable Length**
Short-Wavelength Sensors – Best for Tolerating Emissivity Variation and Optical Obstruction					
31-50	0.9 µm	1000-2500°F 540-1375°C	D/.75	D/15	Glass / 20ft / 6m
31-60	0.9 µm	1200-3200°F 650-1750°C	N/A	D/35	Glass / 20ft / 6m
31-70	0.9 µm	1400-4500°F 760-2475°C	N/A	D/50	Glass / 30ft / 9.1m
31-20	1.6 µm	500-2100°F 260-1150°C	D/2	D/35	Quartz / 10ft / 3m
31-30	1.6 µm	700-3200°F 375-1750°C	N/A	D/50	Glass / 20ft / 6m
32-37	2.2 µm	300-2000°F 150-1100°C	D/2	D/15	Quartz / 30ft / 9.1m
32-18	2.2 µm	400-3000°F 200-1650°C	N/A	D/60	Quartz / 30ft / 9.1m

Note: For typical Gold 30 applications, refer to Gold 20 models with comparable wavelengths.

| C - Configuration (Select One)	
Part No.	**Description (see note 3)**
A	Sensor set to Analog Output/Input with linear mA output
D	Sensor set to Digital Communications for operation with Interface Module

D – Options	
Part No.	**Description (see note 4)**
Gold 20 Class	
LA	Laser Aiming
Gold 30 Class	
Gn (5)	Glass Fiber Cable with sealed Teflon Jacket (n=length in feet)
Qn (5)	Quartz Fiber Cable with sealed Teflon Jacket (n=length in feet)
Mn (5)	Monofilament Fiber Cable with Teflon sheathing and Teflon outer jacket (does not include lens and offers D/2 optics)
SSB	Stainless Steel Braided Conduit includes flexible, lightweight conduit, air purge and a stainless steel sight tube
AL	Built in Aim Light
3QT	Nonconductive Ceramic Quartz Tip, 3.25in/83mm Long, threads onto end of fiber cable
N7 or ATEX	NEMA7 or ATEX Enclosures (varies by sensor)

| E - Accessories	
Part No.	**Description**
Gold 20 Class	
AP	Air Purge Assembly
WCAP	Water Cooling Air Purge
SB	Swivel Bracket (includes MP)
FMxx (6)	A Selection of Flange Mounts
Gold 30 Class	
FOAP	Fiber Optic Air Purge Assembly (formerly APR)
WC	Water Cooling for Fiber Optic Sensors
FOSB	Fiber Optic Swivel Mounting Bracket (includes FOAP)
STSB	Sight Tube Swivel Bracket (use with SSB)
RAM	Right Angle Mirror for Fiber Optic Systems
FOFMxx (6)	A Selection of Fiber Optic Flange Mounts
STFMxx (6)	A Selection of Sight Tube Flange Mounts (used with SSB)
Gold 20 and 30 Class	
IM	Interface Module with Display, Output, and Power Supply
PACS	Purge Air Control/Filter System
VCS	Vortex Cooling System (requires WC)
MP	Gold Mounting Plate
PD603	Panel Meter, 1/8DIN, excitation voltage, 85-265VAC power input
PD765	Panel Meter, 1/8DIN, excitation voltage and Alarm Relays, 85-265VAC power input
PSD	Sensor Power Supply with DIN Rail Mount (90-260Vac)
25/25S /25RS	PID Controllers w/ Power Supply includes 4-20mA Output and a choice of update times and PID Functions
PV	ProView Software for Windows XP with USB to RS232 Cable
NIST	NIST Calibration Certificate

F - Sensor Electrical Cable	
Part No.	**Description (see note 7)**
CO	Sensor Connector Kit (no Cable)
CFn	Sensor Electrical Cable. Lengths (n) ordered in increments of 10 feet
CMn	Sensor Electrical Cable. Lengths (n) ordered in increments of 3 meters
R (8)	Reverse Orientation of Connector 180°
nPT	Sensor Interconnect Cable is Pigtail/Hardwired. Lengths (n) ordered in increments of 10 ft./3m, 20 ft./6m, 50 ft./15m

Sample Sensor Field of View

These single-wavelength sensors may be used at any distance as long as the measured target fills the sensor's viewing area (i.e a full FOV). The diameter (d) of the viewing area is calculated as $d=D/F$ where D is the focal distance of the sensor from the target and F is the optical resolution factor of the sensor.

Sample Part Number: FOV40in/100 = 0.4in diameter @ 40in distance
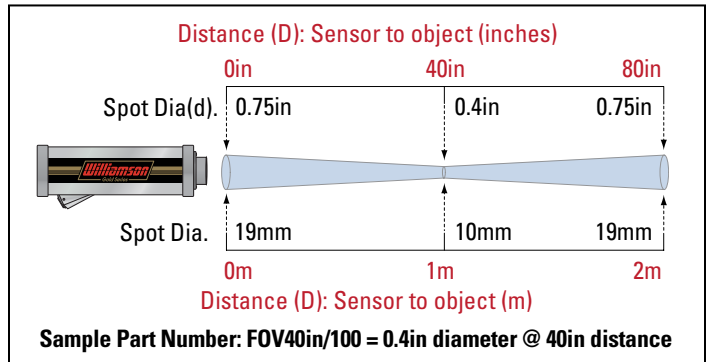
Gold Sensor Dimensions
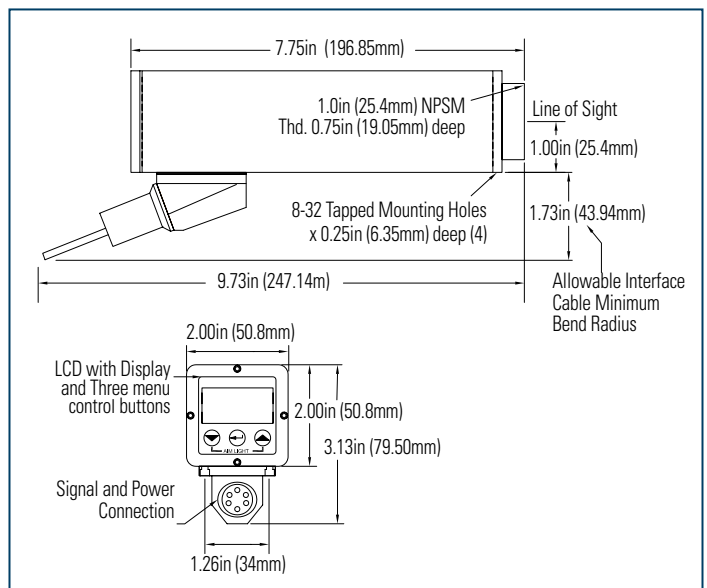
Gold Series Notes

1. The minimum focal distances are listed below. Contact Williamson for custom options.
   - Gold 20 Models is 10in / 25cm (with laser aiming, minimum is 24in / 60cm)
   - Gold 30 Models with Standard Resolution Optics is 2in / 5.1cm
   - Gold 30 Models with Wide Angle Optics is 0in / 0cm

2. The wide angle optics do not include a lens assembly. The fields-of-view for the D/.75 and D/2 optics are 68° and 30° cones respectively.

3. The sensor configuration is specified at the time of the order and can be easily modified in the field using the sensor menu.

4. Options must be specified at the time of order and can not be modified in the field.

5. The standard fiber optic cable lengths (n) are 3ft/0.9m, 6ft/1.8m, 10ft/3m, 15ft/4.6m, 20ft/6.1m, 25ft/7.6m, and 30ft/9.1m. Consult with Williamson for custom lengths, and cables with vacuum bushings and right angle bends.

6. Contact Williamson for accessory details.

7. All Williamson sensors use Belden Cable #83606, or equivalent. This cable has six 20 AWG conductors with an overall braided shield and a Teflon jacket.

8. Sensor drawing shows the standard orientation of the sensor connector.

Gold 20 Mounting and Protective Accessories

To simplify installation and provide added sensor protection, Williamson offers Swivel Bracket (SB) and Water Cooling Air Purge (WCAP) accessories. The recommended air flow is 1-3 cfm (1.5-5 m³ph) and water flow is 0.5-3 gpm (2-12 lpm).
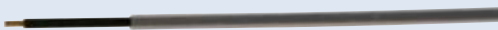
AP

WC

SB

FMxx
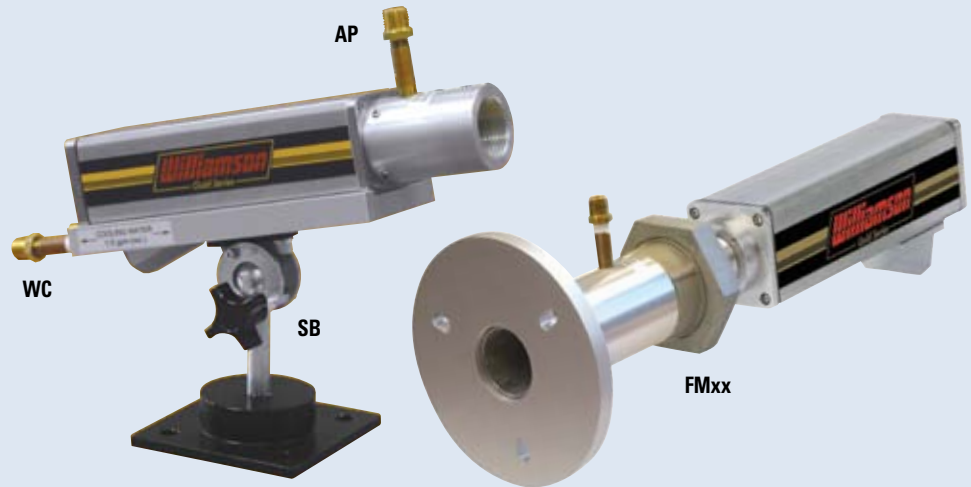
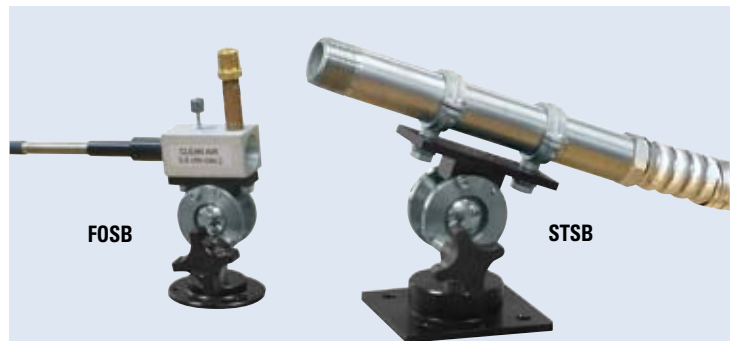Standard Fiber Optic Cable (Gn and Qn)

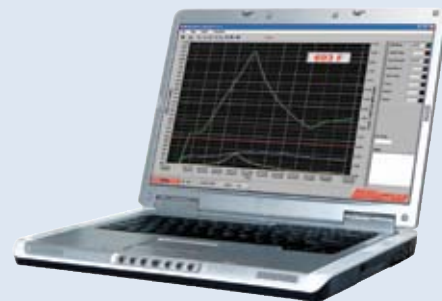Cable with Stainless Steel Braid (SSB)

Monofilament Cable (Mn)

FOSB

STSB

Fiber Cable Mounting Brackets

To simplify the installation and alignment of the Gold 30 sensors, Williamson offers a Fiber Optic Swivel Bracket (FOSB) and a Sight Tube Swivel Bracket (STSB). For applications with more hostile conditions there is also a FOSBAP with a more robust air purge assembly.

Fiber Optic Cable Options

Williamson's Gold 30 sensors offer greater durability and flexibility for sensor installations involving confined spaces, high ambient temperatures or electromagnetic interference. The standard fiber optic cables are sealed with a Teflon jacket over a stainless steel sheath and are available in lengths of 3-30 feet (1-9 meters). The cable diameter is 0.25in/6.5mm with a lens assembly that is 3.05in long by 0.56in diameter (77mm x 14mm dia). For added protection, the flexible, lightweight Stainless Steel Braid is available with a built in air purge and stainless steel sight tube with a 1 inch pipe thread. For applications with very confined access and a high potential for electromagnetic interference, the monofilament fiber cables with a Teflon sheathing and Teflon outer jacket offer a smaller diameter of 0.05in/1.3mm and non-conductive packaging.

ProView PC Software

Williamson's ProView (PV) PC Software can be used to adjust sensor settings as well as log and analyze data from the sensor. ProView requires a Windows XP based PC, an Interface Module, and a USB to RS232 converter with a DB9 male connector.