



General Purpose Sensor with Data Port



XPC – Extremely Versatile Photoelectric Communication Sensor

The **SMARTEYE® X-PRO XPC** is a versatile general purpose sensor with built in data port. Its patented communication technology allows for fast access and operational status to and from the sensor. This unique photoelectric sensor is designed to be used in any application where physical contact of the sensor is either restricted, undesirable, or adds too much time to production line throughput. Its the kind of sensor innovation expected from TRI-TRONICS®. We've been pushing the envelope for half a century and continue to offer customers superior performance sensors for their unique application requirements.



Features

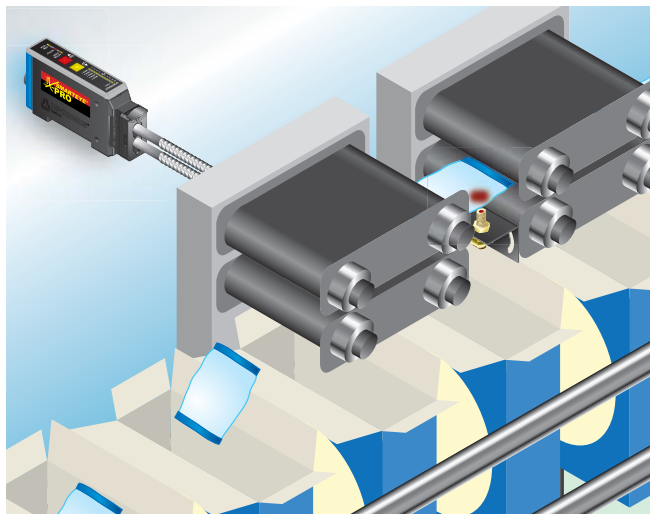
- Downloadable recipes
- Half-Duplex communication
 - RS-485 (multi-drop) or RS-232 (single drop)
 - MODBUS ASCII or RTU
- Five onboard memory locations
- Button lockout
- Configurable response time: 60µs, 125µs, or 450µs
- 8-Pin male, M12 connector
- Available in white, red, or infrared LED
- Patent No.'s 5,621,205 and 6,950,778
- 10-LED dual-function bargraph
- EyewareXPC Software Includes:
 - Two 4-Segment digital displays (Signal level & threshold)
 - Digital sensor scope
 - Full featured command set

Note: EyewareXPC is free demonstration software. Command Set also available for custom interface software.

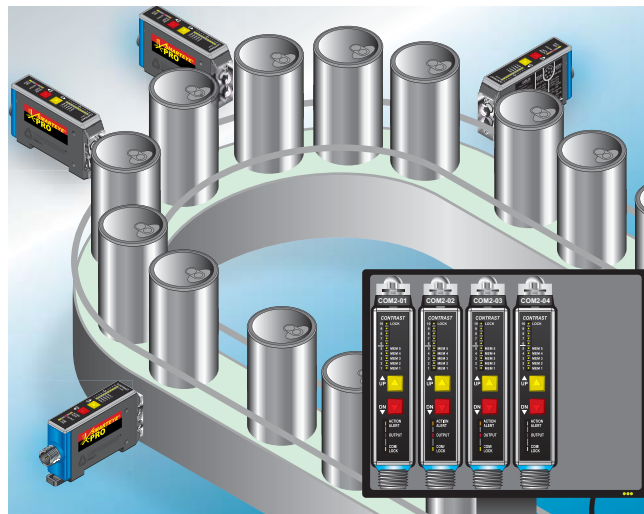
Benefits

- P.A.T. Compliant Process Analytical Technology
- No-touch setup
- Quick digital changeover
- Tamperproof
- Capture and save setups
- Log sensor performance
- Digital process validation
- Performance calibration
- Universal application flexibility
- Quality verification

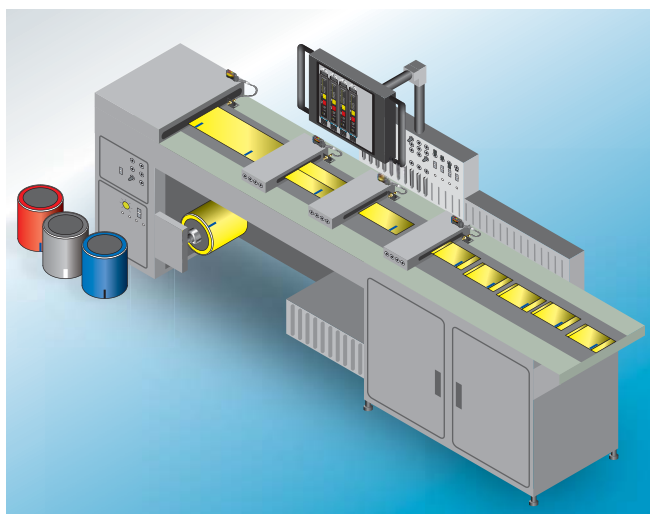
Applications



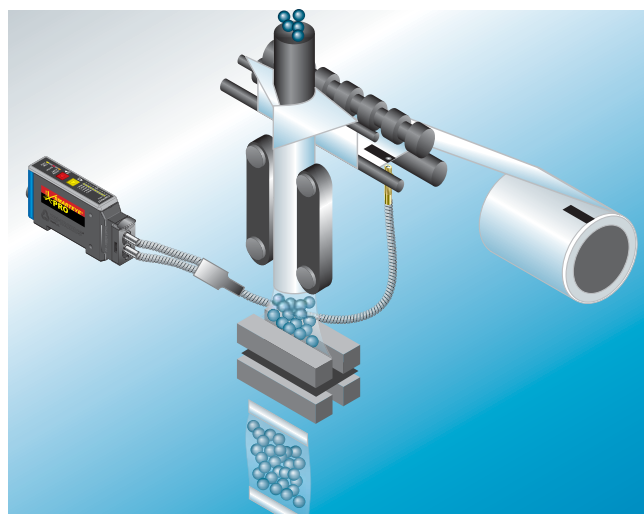
Coupon Dispensing - use downloadable recipes for quick digital changeover.



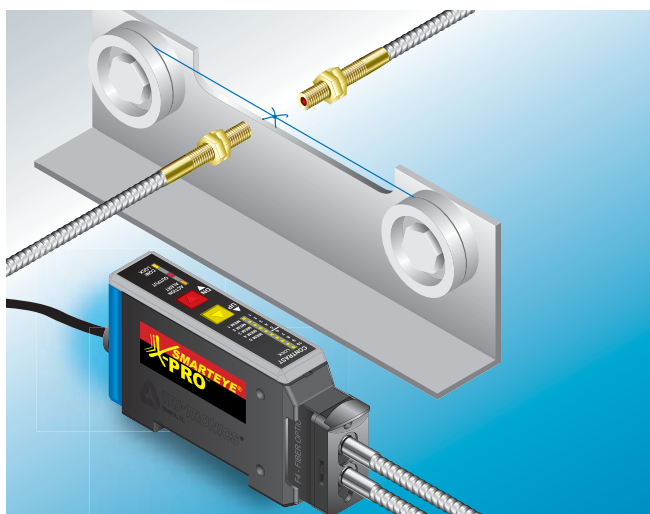
Access all sensors from one location for process validation and monitoring.



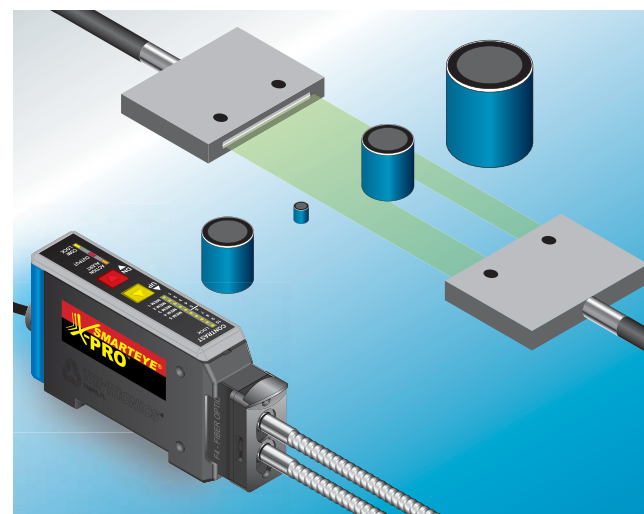
Conversion machine with multiple sensors - use downloadable recipes for quick digital changeover.



Form, Fill, & Seal - registration mark sensing with downloadable recipes.



Suture knot detection - use threshold adjustment with digital sensor scope to optimize performance.



Sort parts by size - use digital display of sensor signal level for part profiling.

Features

10 LED DUAL-FUNCTION BARGRAPH

Contrast Indicator –
Provides at-a-glance performance data.

Lock –
Tamperproof when enabled. *Note:* The remote AUTOSET and programming are not affected by the Lock option.

MEM 1 through MEM 5 –
LED indicates MEM location selected.
NOTE: Any changes to the sensor will automatically be saved to current MEM # location.

EDR® (Patent No. 5,621,205)
EDR® (Enhanced Dynamic Range) circuit prevents dark state saturation and expands the operating range without reducing amplifier gain.

ACT
ACT (Automatic Contrast Tracking) automatically adjusts the sensor for diminishing conditions. Example: dirty environment, scratched lenses, thermal drift, or LED light power.

AGS
AGS (Automatic Gain Select) provides automatic digital selection of amplifier gain based upon sensing requirements.

AUTOSET
The AUTOSET adjustment routine only requires the push of one button, one time. Oftentimes, in dynamic operating conditions, all you have to do is push the button for a perfect setting. This is dependent upon at least a 4:1 duty cycle ratio.
Note: The buttons on the sensor are inactive when in communication mode, if COM/LOCK LED is on or blinking.

COMMUNICATIONS
RS-485 or RS-232 in either MODBUS ASCII or MODBUS RTU protocol. Up to 128 sensors per node, more-or-less, depending on cable length. Baud rate and addresses are user selected and defined when utilizing the EyewareXPC software, or proper commands as defined by the Command Set. When using EyewareXPC software, simply tap the Communications button located on Screen 2 in order to access the Baud Rate or Address widows.

RESPONSE TIME SELECTION
60µs, 125µs, and 450µs available.

AUX IO
AUX IO line can be configured as:
• Remote AUTOSET
Remotely AUTOSET the sensor by applying a momentary contact closure from the Remote AUTOSET input wire to negative as shown in the wiring diagram. The Remote AUTOSET command will duplicate the last manual AUTOSET.
• Remote Input
• Action Alert Output
• Output Mode: On
• Output Mode: Off

Note: Configure AUX IO by using complimentary EyewareXPC software or Full Featured Command Set.

CONNECTIONS
Built-in 8-pin M12 Connector

MOUNTING OPTIONS
Built-in DIN rail snap-on design, through hole, or bracket mount.



DUAL FUNCTION BARGRAPH

Primary function: Contrast Indicator Secondary function: Option Status Indicator of 6 selectable options.

#10 LOCK

Tamper proof Operation

#5 – #1 MEMORY (MEM)

Illuminates to indicate active memory and/or selecting new memory.

ACTION ALERT INDICATOR

Illuminates when action alert occurs.

OUTPUT STATUS INDICATOR

Illuminates when Output is ON.

COM/LOCK MODE INDICATOR

Illuminates during communication activity and/or when Lock feature is enabled.

LARGE HIGH VISIBILITY OUTPUT INDICATOR

Illuminates when Output is ON.
Flashes when LOCATE button activated on EyewareXPC Screen 2.

10 INTERCHANGEABLE OPTICAL BLOCKS

1. O4 (Wide Beam Proximity)
2. O5 (Long Range Proximity)
3. R4 (Retroreflective)
4. R5 (Polarized Retroreflective)
5. V4 (Convergent, 1in Axis)
6. V4A (Convergent, 1in Axis, Apertured)
7. V6 (Convergent, 1.5in Axis)
8. V8 (Convergent, 0.5in Axis)
9. F4 (Glass Fiber Optic Light Guides)
10. F5 (Plastic Fiber Optic Light Guides)

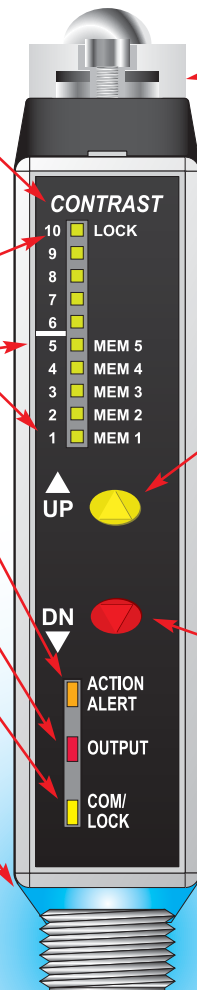
YELLOW PUSH-BUTTON – Four Functions

1. Manual UP Adjustment
2. Options Select & AUTOSET Programming
3. Toggle selected option to opposite state and return to normal operation.
4. When holding red AUTOSET button, tap to alter AUTOSET mode: Light State/Dark State.

RED PUSH-BUTTON – Four Functions

1. Manual DOWN adjustment
2. Options Select & AUTOSET Programming
3. When in Option Status Mode, tap to desired function to be altered
4. When holding yellow AUTOSET button, tap to alter AUTOSET mode... Light State/Dark State

Note: Press and hold both red and yellow buttons simultaneously for 3 seconds to enter Options mode.



Special Features

EyewareXPC Software - Complimentary

EyewareXPC is a free diagnostic tool to aid the user in setting up, testing, and debugging applications.

Write your own custom controls using the available full featured Command Set.

Note: EyewareXPC Software works only with modbus ASCII versions of XPC.

ADDRESSABLE

RS-485 Multidrop. Distinct, customer defined addresses. Up to 128 sensors on one Network.

ON-SCREEN ADJUSTMENT

Buttons are active on screen. Manually adjust the sensor UP or DOWN for precise sensor setup.

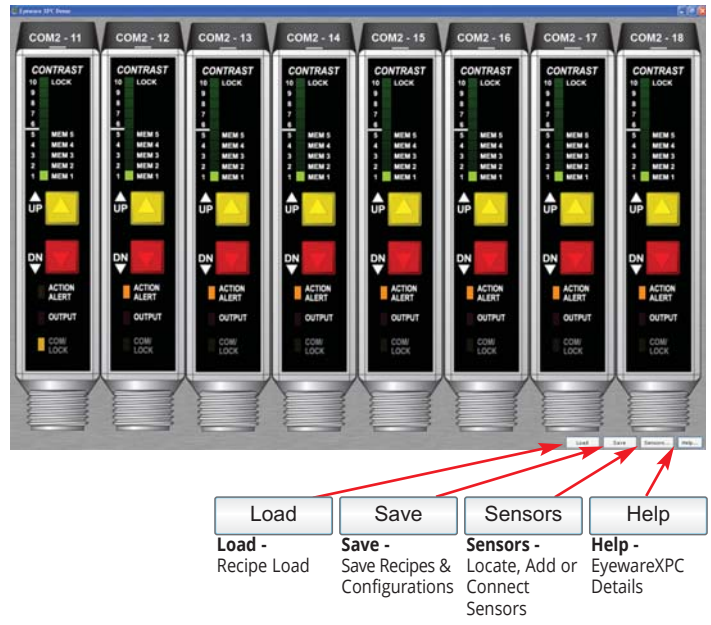
OUTPUT LED

The blue and red LED Output Indicators are active on the screen and turn on when the output is activated.

CONTRAST INDICATOR

These ten LEDs are active on the screen and respond up and down to each sensor's received light level.

Screen One



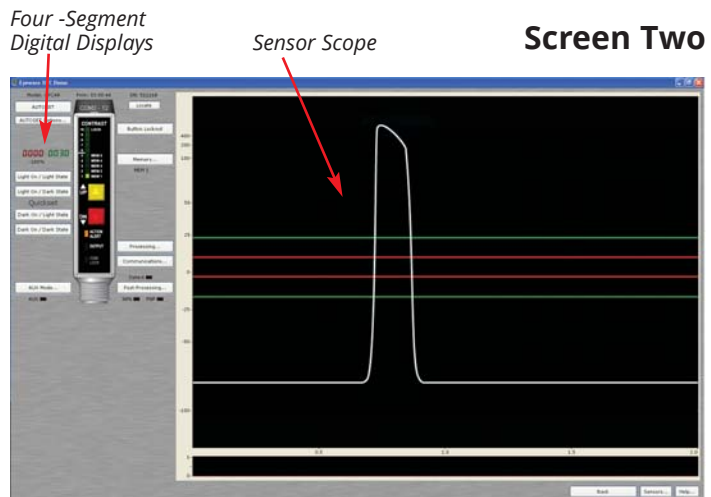
Detailed Features

Click or Touch an area of the sensor on the screen, other than the red/yellow buttons, and you will advance to the screen below, Screen Two. To return to the multi-sensor screen view, or Screen One, click on the Back button in the lower right corner.

This area is feature rich with many buttons available to customize any sensing solution.

- AUTOSET** Performs previous AUTOSET function.
- AUTOSET Options...** Change hysteresis multiplier, and set point percentage.
- Four AUTOSET Buttons -**
 - Light On / Light State Dark On / Light State
 - Light On / Dark State Dark On / Dark State
- AUX Mode...** Change auxiliary line to Remote AUTOSET, Remote Input, Action Alert, or Input/Output.
- Locate** Blinks the blue output LED on the back of the sensor.
- Button Lockout** Locks the buttons on the sensor to make it tamperproof.
- Memory...** Selection of MEM 1 through 5.
- Processing...** Change response time, Light On/Dark On, and activate Automatic Contrast Tracking (ACT).
- Communications...** Select Baud rate and device address.
- Post-Processing...** Select and alter time delays, and output invert

Screen Two



Sensor Scope - Analyze received light levels, threshold settings, and hysteresis ON/OFF points.

All of these features are detailed in the Help button.

Optical Block Selection



Convergent V-Axis Blocks

Narrow beam optics useful for proximity sensing to minimize response to reflected light from background objects.



V4
Convergent 1in V-Axis

Useable range of 1in to 5in.



V6
Convergent 1.5in V-Axis

Useable range of 1.5in to 8in.



V8
Convergent .5in V-Axis

Useable range of .25in to 5in

Proximity Blocks



O4
Proximity

Wide beam optics useful for short-range sensing of a variety of objects.



O5
Proximity

Narrow beam optics useful in long-range sensing of medium to large size objects.

Retroreflective Blocks



R4
Retroreflective

Narrow beam optics designed to sense reflectors or reflective materials at long range.



R5
Polarized Anti-Glare Retroreflective

Polarized to reduce response to hot-spot glare from shiny surfaces. Use with visible light source.

Fiber Optic Blocks



F4
Glass Fiber Optics

Adapter for use glass fiber optic light guides.



F5
Plastic Fiber Optics

Adapter for use plastic fiber optic light guides.

Sensing Range Guidelines

Convert to Inches
25.4mm = 1in

Speed Setting Sensing Mode		60µs Reflective			125µs Reflective			450µs Reflective		
Fiber	Block	IR	Red	White	IR	Red	White	IR	Red	White
Glass Fibers	F4	89mm	63mm	76mm	178mm	115mm	102mm	229mm	127mm	115mm
	F4 w/UAC-15	178mm	152mm	203mm	330mm	330mm	330mm	356mm	357mm	356mm
Plastic Fibers	F5	N/A	38mm	95mm	N/A	44mm	115mm	N/A	59mm	127mm
	F5 w/HLA-2	N/A	102mm	57mm	N/A	140mm	76mm	N/A	152mm	83mm
Speed Setting Sensing Mode		60µs Opposed			125µs Opposed			450µs Opposed		
Fiber	Block	IR	Red	White	IR	Red	White	IR	Red	White
Glass Fibers	F4	254mm	203mm	356mm	406mm	305mm	457mm	610mm	357mm	559mm
	F4 w/UAC-15	4.6m	3.7m	6+m	6+m	5.5m	6+m	6+m	6+m	6+m
Plastic Fibers	F5	N/A	127mm	115mm	N/A	203mm	152mm	N/A	241mm	165mm
	F5 w/GLA-2	N/A	1.2m	1.1m	N/A	2.1m	9.5m	N/A	2.5m	1.5m
Lens Blocks		60µs			125µs			450µs		
		IR	Red	White	IR	Red	White	IR	Red	White
	O4 SR Proximity	178mm	127mm	203mm	279mm	203mm	254mm	406mm	229mm	305mm
	O5 LR Proximity	1.1m	813mm	610mm	254mm	1.3m	9.1m	2.4m	1.5m	965mm
	R4 Retro	4.6m	5.5m	3m	7.6m	8.2m	4.3m	9.1m	8.5m	4.6m
	R4 Retro wo/prox	1.5m	2.8m	1.1m	2.4m	2.7m	762mm	1.5m	2.7m	1.1m
	R5 Polarized Retro	N/A	2.1m	N/A	N/A	2.1m	N/A	N/A	2.1m	N/A

Note: Proximity tests utilized a 90% reflective white target. Retroreflective tests utilized a 3in (76.2mm) diameter round reflector, Model AR3.

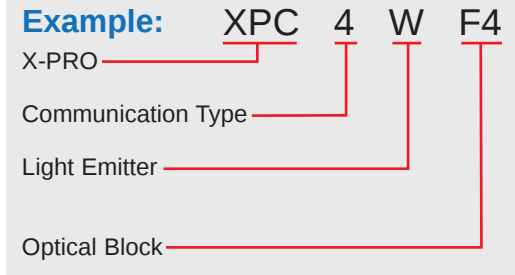
Note: R4 retroreflective tests utilized a Kraft paper target, with no proxing.

Note: Glass fiber tests utilized a .125in (3.175mm) diameter fiber bundle. Plastic fiber tests utilized a duplex, .040in (1.016mm) diameter fiber bundle.

How to Specify



1. Select XPC sensor
2. Select communication type required:
2 = RS-232 MODBUS ASCII
3 = RS-232 MODBUS RTU
4 = RS-485 MODBUS ASCII
5 = RS-485 MODBUS RTU
3. Select sensor light source required:
I = Infrared
R = Red
W = White
4. Select optical block based on Sensing Range Guidelines.



Hardware & Accessories

T-Junction Cable



- TJC-3**
8-pin F, 5-pin M, DB9 for RS-232
- TJC-5**
8-pin F, 5-pin M, DB9 for RS-485

8-Wire MicroCable, M12



- DCS8-2M**
2 meter 8-pin cable
- DCS8-5M**
5 meter 8-pin cable



- RDSC8-5M**
5 meter 8-pin cable, right angle

Development Kits



- XPC4-DEV** for RS-485 Models
Includes: Software, USB Adapter, and TJC-5 Cable
- XPC2-DEV** for RS-232 Models
Includes: Software, USB Adapter, and TJC-3 Cable

Mounting Brackets



FMB-1 (8.4 mm diam.)
Standard Fiber Optic



SEB-3
Stainless L Bracket



FMB-2 (5.1 mm diam.)
Mini Glass Fiber Optic



FMB-3 (3.1 mm diam.)
Mini Plastic Fiber Optic

Specifications



SUPPLY VOLTAGE

- 10 to 30VDC
- Polarity protected
- Intended for use in class 2 circuits

CURRENT REQUIREMENTS

- 45mA (exclusive of load)

OUTPUT TRANSISTORS

- (1) NPN and (1) PNP sensor output transistors
- Outputs sink or source up to 150mA (current limit)
- All outputs are continuously short circuit protected

REMOTE AUTOSET INPUT/AUX I/O

- Opto-isolated momentary sinking input (10mA)
- Can be configured as INPUT or OUTPUT (PNP Sourcing up to 150mA).

2-WIRE COMMUNICATION

- RS-485 or RS-232 models available

RESPONSE TIME

- 60µs (High Speed Mode)
- 125µs (Standard Mode)
- 450µs (Long Range/High Rez Mode)

REPEATABILITY

- 20µs (High Speed Mode)
- 25µs (Standard Mode)
- 50µs (Long Range/High Resolution Mode)

LED LIGHT SOURCE

- Infrared = 880nm, Red = 660nm, White = Broadband Color Spectrum

PUSH-BUTTON CONTROL

- AUTOSET
 - Manual Adjustments
 - Set status of options: 10) Lock, 5-1) Five Memory Locations
- NOTE: Any changes to the sensor will automatically be saved to current MEM # location.*

HYSTERESIS

- Software Configured by User; Factory Default Setting = 1.
- (See EyewareXPC Help for details)

LIGHT IMMUNITY

- Responds to sensor's pulsed modulated light source – immune to most ambient light including indirect sunlight

AMBIENT TEMPERATURE

- 0°C to 70°C (32°F to 158°F)

DIAGNOSTIC INDICATORS

- 10-LED dual-function bargraph operates in one of two modes:
 1. Contrast indicator – displays scaled reading of sensor's response to contrasting light levels (light to dark).
 2. Status indicator – displays status of selectable options.
- Red LED output indicator – illuminates when the sensor's output transistors are ON.

NOTE: If output LED flashes, a short circuit condition exists.
- Amber LED – illuminates when Action Alert occurs.
- Yellow LED – illuminates during com activity and/or when Lock feature is enabled.
- Blue LED output indicator – illuminates when output is ON. Flashes when LOCATE button activated on EyewareXPC screen 2.

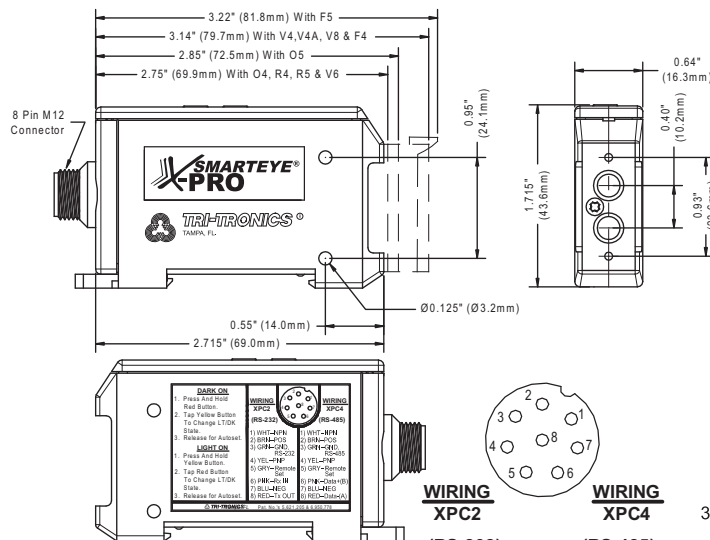
RUGGED CONSTRUCTION

- Chemical resistant, high impact polycarbonate housing
- Waterproof ratings: NEMA 4X, 6P and IP67
- Conforms to heavy industry grade CE requirements

Patents No. 5,621,205 and No. 6,250,778

RoHS Compliant
Product subject to change without notice

Connections and Dimensions



WIRING XPC2 (RS-232)

- 1) WHT--NPN
- 2) BRN--POS
- 3) GRN--GND, RS-232
- 4) YEL--PNP
- 5) GRY--Remote Set
- 6) PNK--Rx IN
- 7) BLU--NEG
- 8) RED--Tx OUT

WIRING XPC4 (RS-485)

- 1) WHT--NPN
- 2) BRN--POS
- 3) GRN--GND, RS-485
- 4) YEL--PNP
- 5) GRY--Remote Set
- 6) PNK--Data+(B)
- 7) BLU--NEG
- 8) RED--Data-(A)

