UVS – Analog/Digital Luminescence Sensor

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STEALTH-UV

UVS – Analog/Digital Luminescence Sensor

The SMARTEYE® *Stealth-UV* Analog/Digital Sensor is a special-purpose sensor designed to detect the presence of invisible UV fluorescent materials contained in special chalk, ink, paint, grease, glue, and optical brighteners found in labels, paper, tape, string, etc. The sensor contains an ultraviolet (UV) solid-state light source that is used to excite the luminescent materials to fluoresce in the visible range.

The **Analog Output** is 4-20mA as the standard factory default configuration. The sensor can also be ordered with a 0-5 or a 0-10 VDC output. This provides flexibility when interfacing to different machine input requirements.

Four AUTOSET Modes allow for custom control of the sensor's unique AUTOSET routines. **Light State** AUTOSET is the default setting and should be used when performing a setup with the luminescent material in view. **Dark State** AUTOSET should be used when setting up on the background. This setting provides for maximum range and highest gain when the background is clear of all luminescent material. **Mid-Point** AUTOSET should be used when determining the exact amount of luminescent material that is optimal. Then the sensor will respond to any amount of luminescent material that is too much or too little compared to the optimal amount. **Two-Point** AUTOSET should be used when there are two luminescent materials that require contrast deviation. For instance, the background may be a white envelope with luminescent material and the target is the luminescent glue on the envelope.

These two features make the SMARTEYE® *Stealth-UV* Analog/Digital Sensor the most flexible and versatile luminescent sensor on the market.

Features

- The widest selection of UV sensors in the world
- Analog and Digital outputs in one sensor:
  - Digital: NPN and PNP
  - Analog: 4-20 mA, 0-5 VDC, or 0-10 VDC
- Four easy AUTOSET modes
  - Light State
  - Dark State
  - Mid-Point
  - Two-Point
- The only standard fiber optic Luminescence sensor available in the industry
- Longest range, up to 24 inches
- Immune to most ambient light, including direct sunlight
- Contrast Indicator for "at-a-glance" performance data

Benefits

- One sensor fits all – both analog and digital outputs
- Three standard output configurations for multiple machine interfaces
- Four AUTOSET modes for maximum sensing flexibility and sensitivity
- Minimize inventory requirements
- Easy to use

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Applications

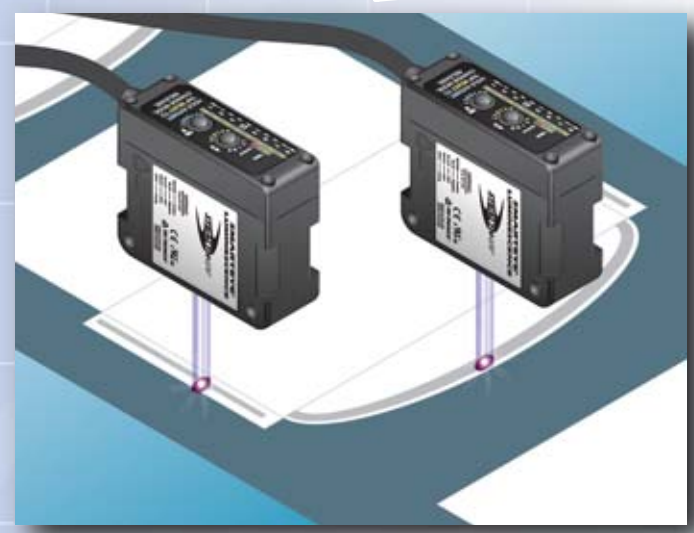
STEALTH-UV

When you need to see the . . .

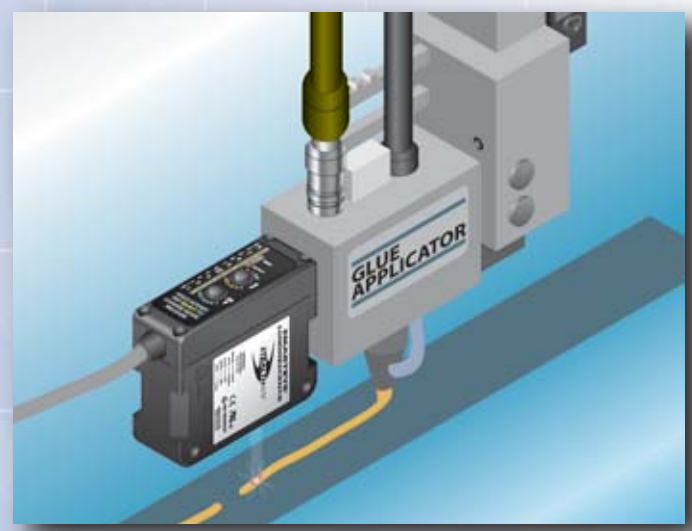
INVISIBLE
INVISIBLE
INVISIBLE

TYPICAL SMARTEYE® *Stealth-UV Analog/Digital* Sensor Applications

- Product inspection & verification
- Amount of glue/adhesives on paper, plastics, envelopes and transparent materials
- Detection and verification of invisible registration marks for printing, cutting, positioning
- Continuous web splice detection
- Detecting and measuring marks (chalk) for grading or sorting such as lumber/wood, and tile products
- Verifying the presence/amount of lubricants such as oil, grease or identifying oil leaks
- Seeing UV threads in carpets for cutting or positioning
- Triggering on inkjet printed marks for product identification or inserting
- Detection of cellophane tape on cardboard cartons or boxes
- Detection & verification of cap liners for quality assurance & control



Glue Detection and Bead Size



Glue Measurement for Feedback Loop

UV Ink Amount Verification

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Features

CONTRAST INDICATOR

Provides “at-a-glance” performance data, both statically and dynamically.

All 8 LEDs will flash three times if contrast insufficient or too low in Two-Point AUTOSET mode.

AUTOMATIC GAIN SELECT

This unique feature provides automatic digital selection of amplifier gain based upon your sensing requirements.

AUTOSET ADJUSTMENT

Four AUTOSET Modes:

Light State, Dark State, Mid-Point, and Two-Point

The default AUTOSET mode is Light State as described in the Special Features Section.

MANUAL ADJUSTMENT

The AUTOSET (DWN) and SELECT (UP) button also provide tweaking capability for fine tuning. Simply tap the (DWN) button or (UP) button for small, incremental changes.

TIMER

When the “OFF” delay pulse stretcher is enabled, the output duration is extended by 15 milliseconds. Enabling the Timer allows ample time for the controller to respond to short duration input events.

HIGH SPEED

- 200 us for UVS-1A thru 4A
- 750 µs for UVS-5A
- 300 µs for UVS-6A

Note: Custom models available; consult factory for details

CONNECTIONS

Built in 6" pigtail cable with 5-Pin Male, M12 Mini Micro connector

MOUNTING OPTIONS

Through-hole or bracket mount.

Note: Custom brackets available; consult factory for details

LT/DK OUTPUT SELECT

Push and hold this button for two seconds to toggle "Light On" or "Dark On" operation

CONTRAST INDICATOR BAR 8
Remains illuminated when Light State signal strength is 8 or above

CONTRAST INDICATOR BAR 4
Switching Threshold - sensor digital outputs toggle state when signal passes through Bar 4...above or below

CONTRAST INDICATOR LEDs (X8)
Green - provides visible, “at-a-glance” performance data

All 8 LEDs will flash three times if contrast insufficient or too low in Two-Point AUTOSET mode

TIMER INDICATOR
Green - illuminates when 15 ms pulse stretcher timer is enabled
Hold both buttons for two seconds to enable/disable timer

OUTPUT INDICATOR
Red - illuminates when output transistors are on
Flashes when output transistor is over current limit

LIGHT/DARK AND MANUAL UP ADJUST
1. Push for two seconds to select “Light On” or “Dark On” operation
2. Tap UP to “Tweak” setting if needed
3. When holding AUTOSET button tap to select next AUTOSET mode

AUTOSET/MANUAL DOWN ADJUST
1. Push and hold to view current AUTOSET mode; release for AUTOSET
2. Tap DWN to “Tweak” setting if needed

Responds to invisible luminescent materials

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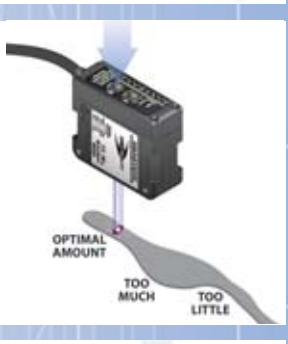
Special Features

A. Light State AUTOSET Mode – With luminescent target in view, the sensor samples the signal level from the target and sets the switching threshold just below that signal level. The sensor is sensitive to less luminescent materials in this mode. This is the default mode and is useful in solving most common applications. The analog output can be used to provide feedback of target brightness level for control applications.

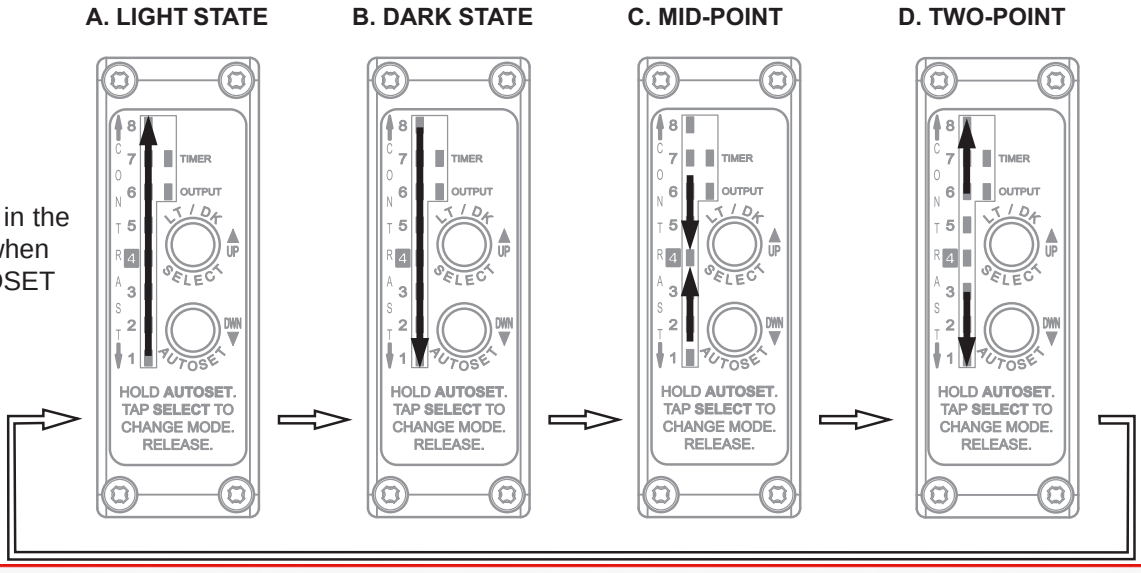
B. Dark State AUTOSET Mode – With background in view, the sensor samples the signal level from the background and sets the switching threshold just above that signal level. The sensor is sensitive to more luminescent materials in this mode. This mode is useful in solving many common applications. The analog output can be used to provide feedback of target brightness level for control applications in this mode as well.



C. Mid-Point AUTOSET Mode – This mode is recommended for use in analog output applications only. With the luminescent material in view, the sensor samples the signal level from the target and sets the sensor at the switching threshold. The sensor's analog output then reflects the level of fluorescence as compared to the target…either higher or lower than the sampled signal level. This can be used as part of a feedback loop to maintain or control the flow of materials at an optimum level.

D. Two-Point AUTOSET Mode – Use this mode to establish upper and lower limits. When monitoring the target luminescence using the analog output, this mode will set your upper and lower control limits at specific points on the analog output scale. This is the most sensitive mode for detection of low contrast differences in two UV luminescent materials. An example would be glue on a white paper envelope, where both the glue and the paper have optical brighteners present.

NOTE: LEDs move in the direction of arrows when performing an AUTOSET



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How to Specify

Model/Range Guidelines

Optimal range is dependent upon fluorescent concentration, size, and surface reflectivity.

***Note:** Sensor selection should not be determined solely by range. It may be advisable to test multiple sensors or fiberoptic light guide tip configurations to ensure optimum performance.

Example:

UVS X A X X

- UVS — *STEALTH-UV*
- X — MODEL SELECTION UVS-1 THRU 6*
- A — ANALOG OUTPUT
- X — BLANK = 4-20 mA; 5 = 0-5 VDC; 10 = 0-10 VDC
- X — WINDOW: BLANK = ACRYLIC; G = GLASS

Note:
For chemical resistant glass window, add "**G**" to model numbers.
Example: **UVS-1AG**

Sensing Range Guidelines

*Catalog Listing	Digital Output	Analog Output	Supply Voltage	Min. Load Voltage Out	Max. Impedance Out	Scanning Distance	Usable Range	Spot Size
UVS-1A	NPN/PNP	4-20 mA	10 to 30 VDC	N/A	500 Ohms @ 12 VDC In	0.5 Inches (12.7 mm)	5 Inches (127 mm)	.067 Inches (1.7 mm)
UVS-1A5		0 to 5 VDC	10 to 30 VDC	1k Ohm	N/A			
UVS-1A10		0 to 10 VDC	15 to 30 VDC					
UVS-2A	NPN/PNP	4-20 mA	10 to 30 VDC	N/A	500 Ohms @ 12 VDC In	1.0 Inch (25.4 mm)	7.5 Inches (190.5 mm)	.086 Inches (2.2 mm)
UVS-2A5		0 to 5 VDC	10 to 30 VDC	1k Ohm	N/A			
UVS-2A10		0 to 10 VDC	15 to 30 VDC					
UVS-3A	NPN/PNP	4-20 mA	10 to 30 VDC	N/A	500 Ohms @ 12 VDC In	2.0 Inches (50.8 mm)	10 Inches (254 mm)	.128 Inches (3.25 mm)
UVS-3A5		0 to 5 VDC	10 to 30 VDC	1k Ohm	N/A			
UVS-3A10		0 to 10 VDC	15 to 30 VDC					
UVS-4A	NPN/PNP	4-20 mA	10 to 30 VDC	N/A	500 Ohms @ 12 VDC In	4.0 Inches (101.6 mm)	13 Inches (330 mm)	.16 Inches (4.1 mm)
UVS-4A5		0 to 5 VDC	10 to 30 VDC	1k Ohm	N/A			
UVS-4A10		0 to 10 VDC	15 to 30 VDC					
UVS-5A	NPN/PNP	4-20 mA	10 to 30 VDC	N/A	500 Ohms @ 12 VDC In	8.0 Inches (203 mm)	2 Inches To 2 Feet (50.8 - 609.6 mm)	1.0 Inch (25.4 mm)
UVS-5A5		0 to 5 VDC	10 to 30 VDC	1k Ohm	N/A			
UVS-5A10		0 to 10 VDC	15 to 30 VDC					
UVS-6A	NPN/PNP	4-20 mA	10 to 30 VDC	N/A	500 Ohms @ 12 VDC In	Dependent upon fiber optic selection	Up To 2.5 Inches (63.5 mm)	Dependent upon fiber optic selection
UVS-6A5		0 to 5 VDC	10 to 30 VDC	1k Ohm	N/A			
UVS-6A10		0 to 10 VDC	15 to 30 VDC					

Hardware & Accessories

Micro Cable Selection Guide, 5-wire, M12

GSEC-6
6' (1.8 m) Shielded cable

GSEC-15
15' (4.6 m) Shielded cable

GSEC-25
25' (7.62 m) Shielded cable

GSEC-2MU
6.5' (2.0 m) Unshielded

GSEC-5MU
16.4' (5.0 m) Unshielded

GRSEC-6
6' (1.8 m) Right angle shielded cable

GRSEC-15
15' (4.6 m) Right angle shielded cable

GRSEC-25
25' (7.62 m) Right angle shielded cable

GX-25
25' (7.62 m) Extension cable

Suggested fiber optic light guides for Stealth UV:

BF-U-36TUV
BF-A-36T
BF-C-36

FMB-1 (8.4 mm diam.)
Standard Fiberoptic Mounting Bracket

SEB-4
Stainless Stealth Mounting Bracket

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Specifications

SUPPLY VOLTAGE
- 10 to 30 VDC on 4-20 mA and 0-5 VDC models
- 15 to 30 VDC for 0-10 VDC models
- Polarity Protected

CURRENT REQUIREMENTS
- UVS-1A through 4A; 50 mA max
- UVS-5A & 6A; 65 mA max (exclusive of load)

DIGITAL OUTPUT
- (1) NPN and (1) PNP output transistor:
  NPN: Sink up to 150 mA
  PNP: Source up to 150 mA
- Continuous short circuit protected
- Outputs protected from pulsing during power up

ANALOG OUTPUT
- 4-20 mA; 0-5 VDC; or 0-10 VDC

RESPONSE TIME
- 200 us for UVS-1A through 4A
- 750 µs for UVS-5A
- 300 µs for UVS-6A

AMBIENT TEMPERATURE
- -15° C to +70° C (5° F to 158° F)

LIGHT IMMUNITY
- Responds to sensor's pulse modulated light source, resulting in high immunity to most ambient light, including indirect sunlight

CONNECTION TYPE
- Built in 6" pigtail cable with 5-Pin Male, M12 Mini Micro connector

PUSHBUTTON CONTROL
- AUTOSET pushbutton setup
- Tweak adjustments with "UP" or "DWN" buttons
- Selection of Light/Dark operation
- Enable/Disable pulse stretcher
- "Select" button scrolls thru four AUTOSET modes

DIAGNOSTIC INDICATORS
- Contrast Indicator – Display scaled reading of sensor's response to contrasting UV light levels (light vs. dark) on an 8 bar LED display
  Note: All 8 LEDs will flash three times if contrast insufficient or too low in Two-Point AUTOSET mode
- Red LED Output Indicator – Illuminates when the sensor's output transistors are "ON"
  NOTE: If Output LED flashes, a short circuit condition exists
- Green LED Timer Indicator – Illuminates when the 15 ms pulse stretcher timer is enabled

LIGHT SOURCE
- UV LED, 375 nm Wavelength

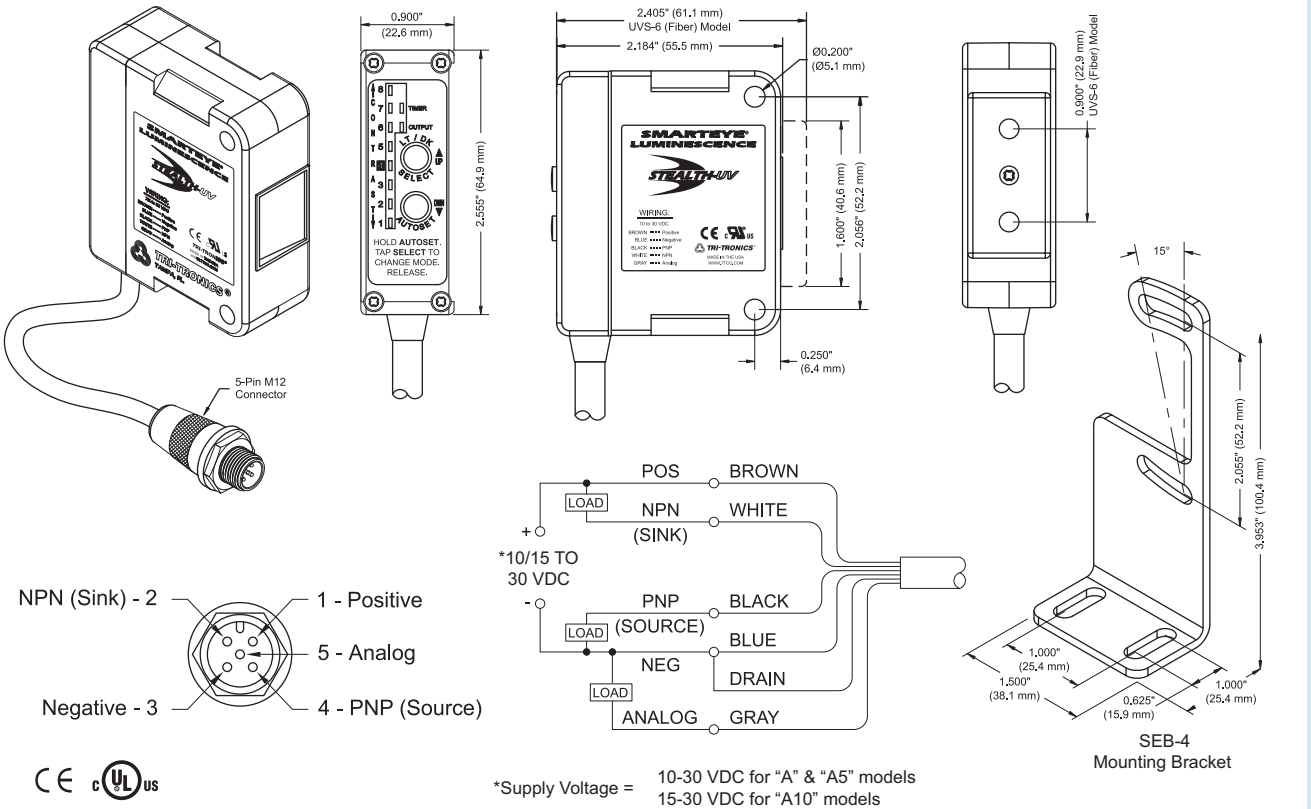
RUGGED CONSTRUCTION
- Chemical resistant high impact polycarbonate housing, acrylic or glass lens cover
- Industry Ratings: NEMA 4, IP67

CERTIFICATIONS
- UL, CE, RoHS

RoHS Compliant
Product subject to change without notice.

Connections and Dimensions

SMARTEYE® *STEALTH-UV* Analog/Digital



*Supply Voltage = 10-30 VDC for "A" & "A5" models
15-30 VDC for "A10" models

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