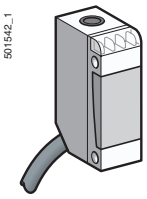
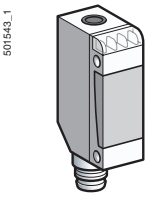
# OSICONCEPT™ Photoelectric Sensors
## XUM Miniature Rectangular
## Multi-Mode, DC




**XUM OA••L2**




**XUM OA••M8**

### Features:

- Ability to select sensing mode (Diffuse, Diffuse with Background Suppression, Polarized Retroreflective ■, or Thru-Beam ★)
- Simple push-button teach for sensor to learn application
- Ability to reduce stock with one multi-mode sensor
- Housing: Plastic
- N.C. / N.O. selectable

| Output Mode | Circuit Type | Voltage Range | Connection Type □ | Load Current Maximum | Operating Frequency Maximum | Catalog Number |
|---|---|---|---|---|---|---|
| N.C. / N.O. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 250 Hz | **XUM0APSAL2** |
| N.C. / N.O. | PNP | 12-24 Vdc | M8 Nano conn. | 100 mA | 250 Hz | **XUM0APSAM8** |
| N.C. / N.O. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 250 Hz | **XUM0ANSAL2** |
| N.C. / N.O. | NPN | 12-24 Vdc | M8 Nano conn. | 100 mA | 250 Hz | **XUM0ANSAM8** |

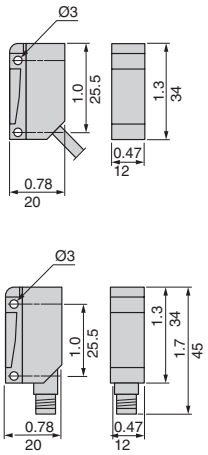
### Accessories

| Description | Connection Type | Catalog Number |
|---|---|---|
| Reflector | – | **XUZC50** |
| Transmitter | 2 m (6.6') cable | **XUM0AKSAL2T** |
| | M8 Nano connector | **XUM0AKSAM8T** |

★ Transmitter required for multi-mode receiver to operate in Thru-beam mode
■ Reflector required for multi-mode receiver to operate in Polarized Retroreflective mode
□ 5 m cable length available with L5 suffix / 10 m cable length available with L10 suffix.

### Dimensions

**XUM**

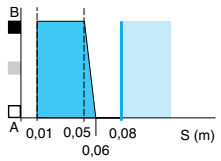



Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

### Variation of Usable Sensing Distance

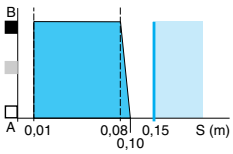
Diffuse System with Adjustable Background Suppression

Learning at Minimum




A-B: Object Reflection Coefficient
Black 6%
Gray 18%
White 90%
Sensing Range
Non-sensing Zone (matt surfaces)

Learning at Maximum




### Excess Gain

An excess gain of 2 has been achieved at the nominal sensing distance (Sn) of all sensing modes.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## Wiring

Connector

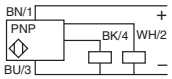



3 (-)
1 (+)
4 Output
2 Alarm or Test

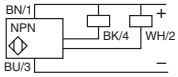
Cable

| | |
|---|---|
| (-) | Blue |
| (+) | Brown |
| (Output) | Black |
| Alarm | White |
| Beam Break Test | Violet |

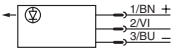
PNP

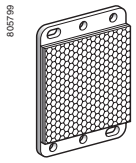



NPN

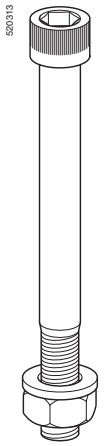


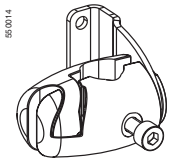

Emitter



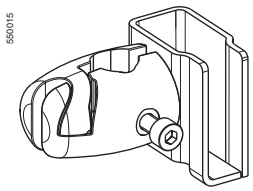

**XUZC50**




**XUZM2003**

**XUZ2001**




**XUZM2004**

## Specifications

| | | |
|---|---|---|
| **Mechanical** | | |
| For usable sensing range, see detection curves | | |
| Sensing Distance (Sn) (excess gain = 2) | Diffuse Background Supp. | 10 cm |
| | Diffuse Standard | 40 cm |
| | Pol. Retroreflective | 3 m |
| | Thru-Beam | 10 m |
| Temperature Range | Operating | -13 ° to +131 ° F (-25 ° to +55 ° C) |
| | Storage | -40 ° to +158 ° F (-40 ° to +70 ° C) |
| Enclosure Rating | NEMA Type | 1, 3, 4, 6, 6P (cable version only), 12, 13 |
| | IEC Type | IP67 |
| Enclosure Material | Case | PBT |
| | Lens | PMMA |
| | Cable | PVR |
| Vibration Resistance | (IEC 60068-2-6) | 7 g, amplitude +/- 1.5 mm (f=10 Hz to 55 Hz) |
| Shock Resistance | (IEC 60068-2-27) | 30 g, duration 11 ms |
| LED indicator | Output | Yellow |
| | Power & Teach | Green |
| | Signal Instability | Red |
| Connection | Cable | 4.2 mm O.D. 4 conductor |
| | Connector | 4 pin Nano conn. M8 |
| **Electrical** | | |
| Voltage Range | | 12 – 24 Vdc |
| Voltage Limit (including ripple) | | 10 – 30 Vdc |
| Voltage Drop (across switch) closed state maximum | | 1.5 V |
| Current Consumption (no load) maximum | | 35 mA (20 mA – XUM0…T) |
| Load Current maximum | | 100 mA |
| Maximum Operating Frequency | | 250 Hz |
| On Delay Maximum | | 2 ms |
| Off Delay Maximum | | 2 ms |
| Power up Delay Maximum | | 100 ms |
| Alarm Output | | 50 mA |
| Wavelength | Polarized - red | 660 nm |
| | Short Range Proximity | 660 nm |
| | All others | 880 nm |
| Protective Circuitry | Reverse Polarity Protection | Yes |
| | Overload Protection | Yes |
| | Short Circuit Protection-SCP | Yes |
| Agency Listings | | |

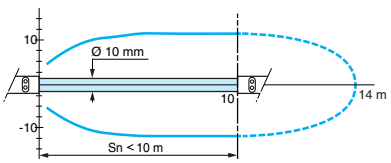
## Accessories

| Description | Catalog Number |
|---|---|
| Reflector 50x50 mm | **XUZC50** |
| 3-D mounting bracket (stem not included) | **XUZM2003** |
| 3-D Protective mounting bracket (stem not included) | **XUZM2004** |
| M12 Stem (75 mm usable length) | **XUZ2001** |
| 3-D mounting base | **XUZ2003** |
| Metal Mounting Nuts | **XSZE108** |

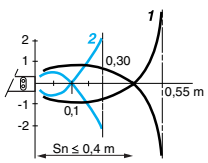
See page 159 for complete 3-D assembly.

## Detection Curves

Thru-beam with Thru-beam Accessory

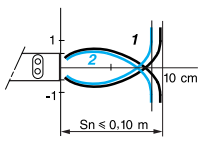



Diffuse without Accessory

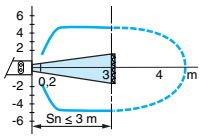



Object: 3.9 x 3.9" (10 x 10 cm)
1: White 90%, 2: Grey 18%

Diffuse without Accessory with Background Suppression




Polarized Retroreflective with Reflector Accessory




With Reflector XUZC50

### Connector Cables (M8 or S suffix)

| | |
|---|---|
| XSZCS141 | Nano conn., 4 pin, 2m, straight |
| XSZCS151 | Nano conn., 4 pin, 2m 90 ° |

For additional cable options and lengths see p. 518



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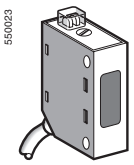
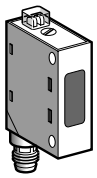
# Photoelectric Sensors
## XUM Miniature Rectangular DC




XUM •A••L2



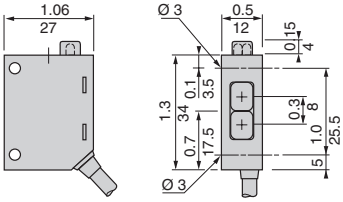
Optimum miniature rectangular photoelectric sensors designed for OEMs & industrial applications.

**Features:**

- Small dimensions, designed to fit in those tight applications
- Quick connect versions
- Available in either N.C. or N.O. operation

### Dimensions

**XUM**




Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

| Output Mode | Circuit Type | Voltage Range | Connection Type ★ | Load Current Maximum | Operating Frequency Maximum | Catalog Number |
|---|---|---|---|---|---|---|
| **Thru-Beam (receiver) - 8 m (26') Nominal Sensing Distance (emitter sold separately)** | | | | | | |
| N.O. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 400 Hz | **XUM2APANL2R** |
| N.C. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 400 Hz | **XUM2APBNL2R** |
| N.O. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 400 Hz | **XUM2ANANL2R** |
| N.C. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 400 Hz | **XUM2ANBNL2R** |
| N.O. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 400 Hz | **XUM2APANM8R** |
| N.C. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 400 Hz | **XUM2APBNM8R** |
| N.O. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 400 Hz | **XUM2ANANM8R** |
| N.C. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 400 Hz | **XUM2ANBNM8R** |
| **Thru-Beam (emitter)** | | | | | | |
| – | – | 12-24 Vdc | 2 m (6.6') cable | – | – | **XUM2AKSNL2T** |
| – | – | 12-24 Vdc | M 8 Nano conn. | – | – | **XUM2AKSNM8T** |
| **Retroreflective - 4 m (13') Nominal Sensing Distance (reflector sold separately)** | | | | | | |
| N.O. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM1APANL2** |
| N.C. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM1APBNL2** |
| N.O. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM1ANANL2** |
| N.C. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM1ANBNL2** |
| N.O. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM1APANM8** |
| N.C. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM1APBNM8** |
| N.O. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM1ANANM8** |
| N.C. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM1ANBNM8** |
| **Polarized Retroreflective - 2 m (6.6') Nominal Sensing Distance (reflector sold separately)** | | | | | | |
| N.O. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM9APANL2** |
| N.C. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM9APBNL2** |
| N.O. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM9ANANL2** |
| N.C. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM9ANBNL2** |
| N.O. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM9APANM8** |
| N.C. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM9APBNM8** |
| N.O. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM9ANANM8** |
| N.C. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM9ANBNM8** |
| **Adjustable Short Range Proximity Diffuse – 10 cm (4') Nominal Sensing Distance** | | | | | | |
| N.O. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM6APANL2** |
| N.C. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM6APBNL2** |
| N.O. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM6ANANL2** |
| N.C. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM6ANBNL2** |
| N.O. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM6APANM8** |
| N.C. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM6APBNM8** |
| N.O. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM6ANANM8** |
| N.C. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM6ANBNM8** |
| **Adjustable Long Range Proximity Diffuse – 40 cm (16') Nominal Sensing Distance** | | | | | | |
| N.O. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM5APANL2** |
| N.C. | PNP | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM5APBNL2** |
| N.O. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM5ANANL2** |
| N.C. | NPN | 12-24 Vdc | 2 m (6.6') cable | 100 mA | 500 Hz | **XUM5ANBNL2** |
| N.O. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM5APANM8** |
| N.C. | PNP | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM5APBNM8** |
| N.O. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM5ANANM8** |
| N.C. | NPN | 12-24 Vdc | M 8 Nano conn. | 100 mA | 500 Hz | **XUM5ANBNM8** |

★ 5 m cable length available with L5 suffix.



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## Wiring

Connector

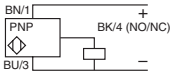



3 (-)
1 (+)
4 Output
2 Test

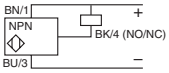
Cable

(-) Blue
(+) Brown
(Output) Black
Beam Break Test Violet

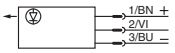
PNP




NPN




Emitter



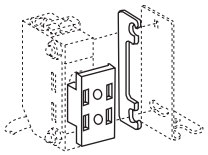

## Specifications

| Mechanical | | |
|---|---|---|
| For usable sensing range, see detection curves | | |
| Temperature Range | Operating | -13 ° to +131 ° F (-25 ° to +55 ° C) |
| | Storage | -40 ° to +158 ° F (-40 ° to +70 ° C) |
| Enclosure Rating | NEMA Type | 1, 3, 4, 4X (indoor), 6, 6P (cable version only), 12, 13 |
| | IEC Type | IP67 |
| Enclosure Material | Case | PBT |
| | Lens | PMMA |
| | Cable | PVR |
| Vibration Resistance | (IEC 60068-2-6) | 7 g, amplitude +/- 1.5 mm (f=10 Hz to 55 Hz) |
| Shock Resistance | (IEC 60067-2-27) | 30 g duration 11 ms |
| LED indicator | Output | Yellow |
| | Power | Green (XUM2…T) |
| Connection | Cable | 4.2 mm O.D. 3 conductor |
| | Connector | 4 pin Nano style DC (M8) |

| Electrical | | |
|---|---|---|
| Voltage Range | | 12 – 24 Vdc |
| Voltage Limit (including ripple) | | 10 – 30 Vdc |
| Voltage Drop (across switch) closed state maximum | | 1.5 V |
| Current Consumption (no load) maximum | | 35 mA |
| Load Current maximum | | 100 mA |
| Maximum Operating Frequency | | 500 Hz (400 Hz Thru-Beam) |
| On Delay Maximum | | 1 ms |
| Off Delay Maximum | | 1 ms |
| Power up Delay Maximum | | 30 ms |
| Wavelength | Polarized - red | 660 nm |
| | Short Range Proximity | 660 nm |
| | All others | 880 nm |
| Protective Circuitry | Overload Protection | Yes |
| | Short Circuit Protection | Yes |
| Agency Listings | | |

## Accessories

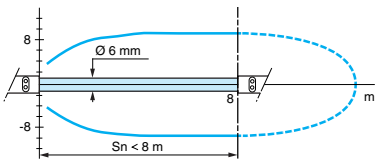
| Description | | Sensing Distance | Catalog Number |
|---|---|---|---|
| 90 ° mounting bracket (cable version) | | – | **XUZA47** |
| 90 ° mounting bracket (connector version) | | – | **XUZA46** |
| Thru-beam aperture | 0.5 mm diameter | 4.5 cm (1.78") | **XUMZ01** |
| | 1.0 mm diameter | 4.5 cm (1.78") | **XUMZ02** |
| | 2.0 mm diameter | 4.5 cm (1.78") | **XUMZ03** |



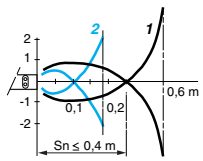
**XUMZ0●**
**Thru-Beam Aperture**

## Detection Curves

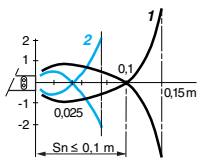
Thru-Beam System




Diffuse
Long Range

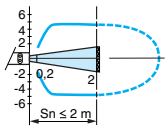



Diffuse
Short Range



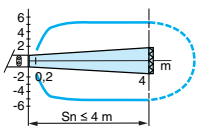

Object : 3.9 x 3.9" (10 x 10 cm), 1 : White 90 %, 2 : Gray 18 %

Polarized Retroreflective




With Reflector XUZ C50

Retroreflective




With Reflector XUZ C50

## Excess Gain

An excess gain of 2 has been achieved at the nominal sensing distance (Sn) of all sensing modes.

| Connector Cables (M8 or S suffix) | |
|---|---|
| XSZCS141 | Nano conn., 4 pin, 2m, straight |
| XSZCS151 | Nano conn., 4 pin, 2m 90 ° |

For additional cable options and lengths see p. 518



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