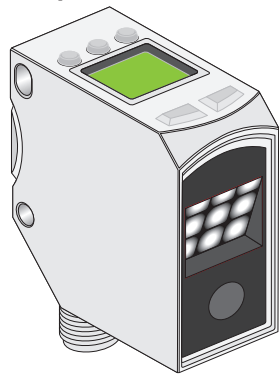


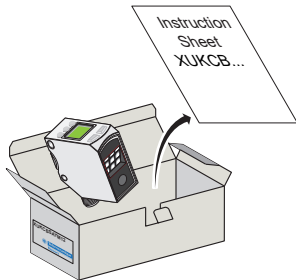
Compact color sensor



XUKCBSAYM12 : Short sensing distance
XUKCBLAYM12 : Long sensing distance



Package Content
(Example)



<http://qr.tesensors.com/XU0020>

Scan the code to access this Instruction Sheet in different languages and all the product information or you can visit our website at:
www.telemecaniquesensors.com

We welcome your comments about this document. You can reach us through the customer support page on your local website.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before servicing equipment.
- Do not connect this device to AC power.
- The power voltage must not exceed the rated range.

Failure to follow these instructions will result in death or serious injury.

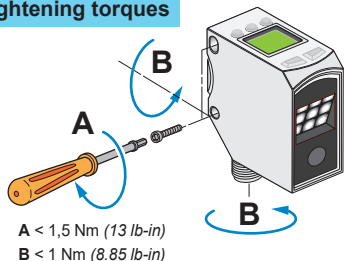
WARNING

IMPROPER SETUP OR INSTALLATION

- This equipment must only be installed and serviced by qualified personnel.
- Read, understand, and follow the compliance below, before installing the XU Photo-electric sensor.
- Do not tamper with or make alterations on the unit.
- Comply with the wiring and mounting instructions.
- Check the connections and fastening during maintenance operations.
- The proper functioning of the XU Photo-electric sensor and its operating line must be checked regularly and according to the application (for example number of operations, level of environmental pollution, etc.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Mounting and tightening torques



A < 1,5 Nm (13 lb-in)
B < 1 Nm (8.85 lb-in)

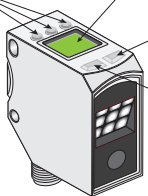
CAUTION

DEGREE OF PROTECTION DETERIORATION
Do not apply excessive torque on the sensor during the installation process.
Failure to follow these instructions can result in injury or equipment damage.

LEDs and Setting

Push buttons

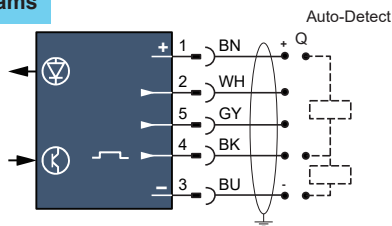
Display



LED:
- Yellow: Output LED Q
- Red: status indicator

LED:
- Green: Power ON / status indicator
- Yellow: status indicator

Wiring diagrams



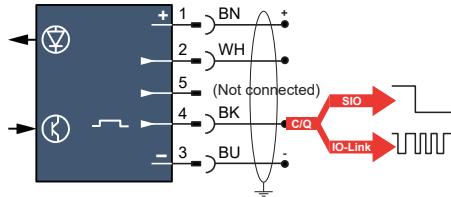
- 1: + UB (BN)
- 2: Q2 / IN Trigger, to activate the detection (no other function in this input) (WH)
- 3: - UB (BU)
- 4: Q1/IO-Link (BK)
- 5: Q3 / IN Key lock, to block the sensor settings (no other function in this input) (GY)

BN: Brown
WH: White
BU: Blue
BK: Black
GY: Grey

CAUTION

REDUCTION OF SERVICE LIFE
Use with shielded cables
Failure to follow these instructions can result in injury or equipment damage.

IO-Link



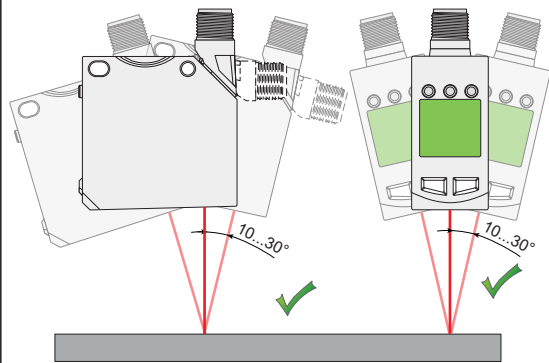
Pin	Signal	Definition
1	+	+ 24 Vdc
2		IN/OUT defined in IO-Link software
5		Not connected
3	-	0 Vdc
4	Q	Switching signal (SIO)
	C	Communication IO-Link

CAUTION

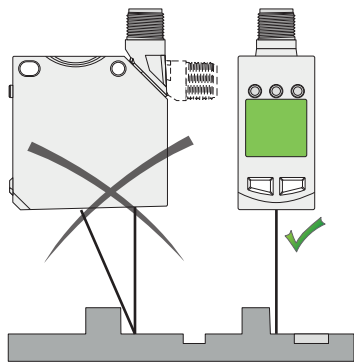
INOPERABLE EQUIPMENT DUE TO CYBER ATTACK ON IO-LINK
• Apply external cybersecurity protection on IO-Link Master device.
• Download IO-Link Description files only from these web servers:
<https://tesensors.com/global/en/support/iolink> or
<https://ioddfinder.io-link.com/#/>
Failure to follow these instructions can result in injury or equipment damage.

IO-Link data tables and IODD files are online:
Scan the 2D code, above

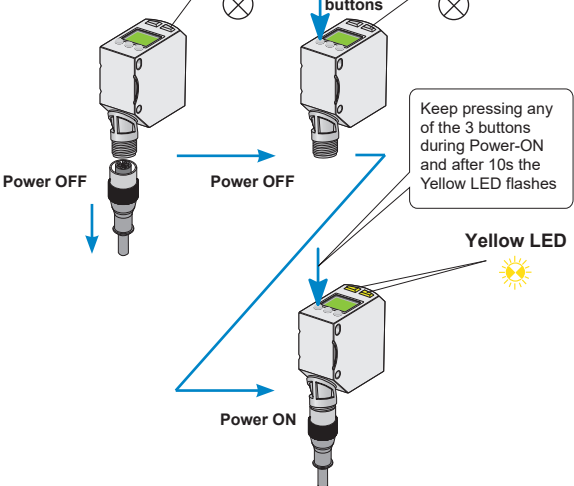
Adjustment



Detection direction



Factory Setting



Ambient light effect and correction

Ambient light: High-frequency light radiating on the receiver can impede a reliable detection. If this is the case, change the mounting position.
As an alternative reduce the switching frequency or install a protective screen.

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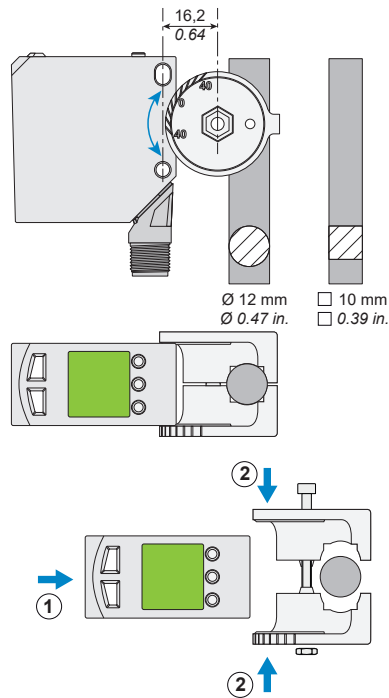
Output:
Output function:
Switching output:
Yellow LED configuration:
Speed:

Switching outputs deactivated
N.O.
PNP, auto-detect
Q all
30 Hz

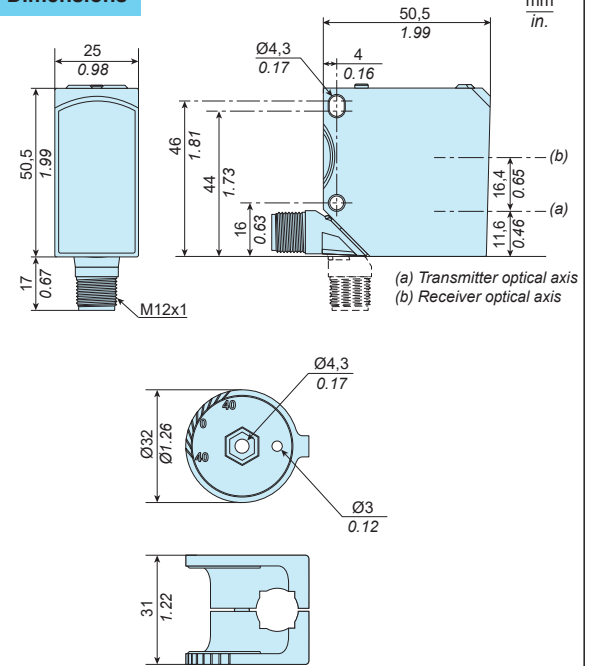
Accessories

XUZARK

Dovetail clamp mounting for flexible adjustment
(to order separately)

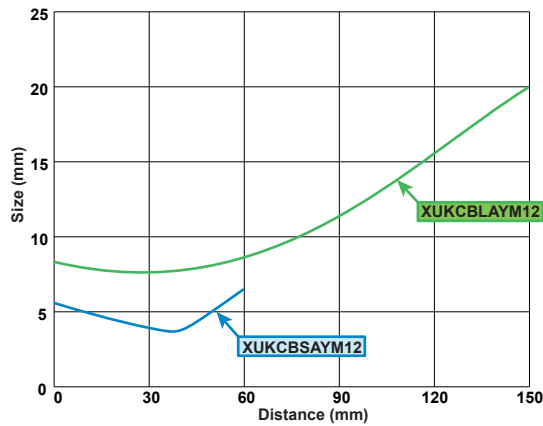


Dimensions



Detection curves

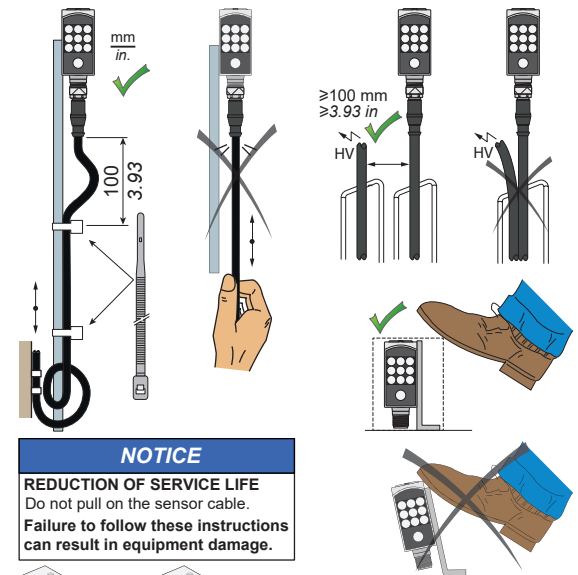
width / height



Characteristics

Certification	CE - UKCA - cULus
Sensing distance (Reference material)	XUKCBSAYM12: 18...60 mm / 0.71...2.36 in. XUKCBLAYM12: 20...150 mm / 0.79...5.91 in.
Setting	Buttons or IO-Link
Color of detection light beam	White (EN 62471)
Maximum of memorized colors (for Binary out mode)	7 (6 colors + 1 background color)
Spot size of the light beam	XUKCBSAYM12: 3,5 x 3,5 mm at 40mm / 0.14 x 0.14 in. at 1.57 in. XUKCBLAYM12: 8 x 8 mm at 60mm / 0.31 x 0.31 in. at 2.36 in.
Switching output Q	PNP / NPN / Q ₁ auto-detect / IO-Link
Switching outputs (Q)	3
Current consumption	≤ 60 mA
Switching capacity	≤ 100 mA
Switching frequency	3 - 3000 Hz
Power on delay	< 150 ms
Response time	≤ 180 μs (at ≥ 1500 Hz)
Warm-up time	300 s
Ambient Temperature	Operating: - 20...+55 °C (-4...+131 °F) Storage: - 20...+80 °C (-4...+176 °F)
Power Voltage	Rated operational voltage: 24 Vdc Operating range: 18...30 Vdc (including ripple p-p 10% maximum)
Product protection	Power supply: Reverse polarity protection Output: Short circuit protection
Protection against electric shocks	Protection class III
Degree of protection	IP67 conforming to IEC 60529, IP69K conforming to DIN 40050-9
Vibration resistance	Conforming to EN 60947-5-2
Shock resistance	Conforming to EN 60947-5-2
Material	Housing: Zinc die-cast, matt chrome - Front screen, display: PMMA

Mounting, wiring and maintenance precautions



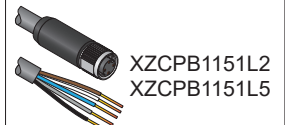
Pre-wired connectors (examples)

PVC cable for general use
PUR cable for severe industrial environments

Jumper
M12 - 5 pins plug
M12 - 5 pins socket



M12 - 5 pins socket
5 wires



Cable also available in angled version:

XZCPB1251L2
XZCPB1251L5

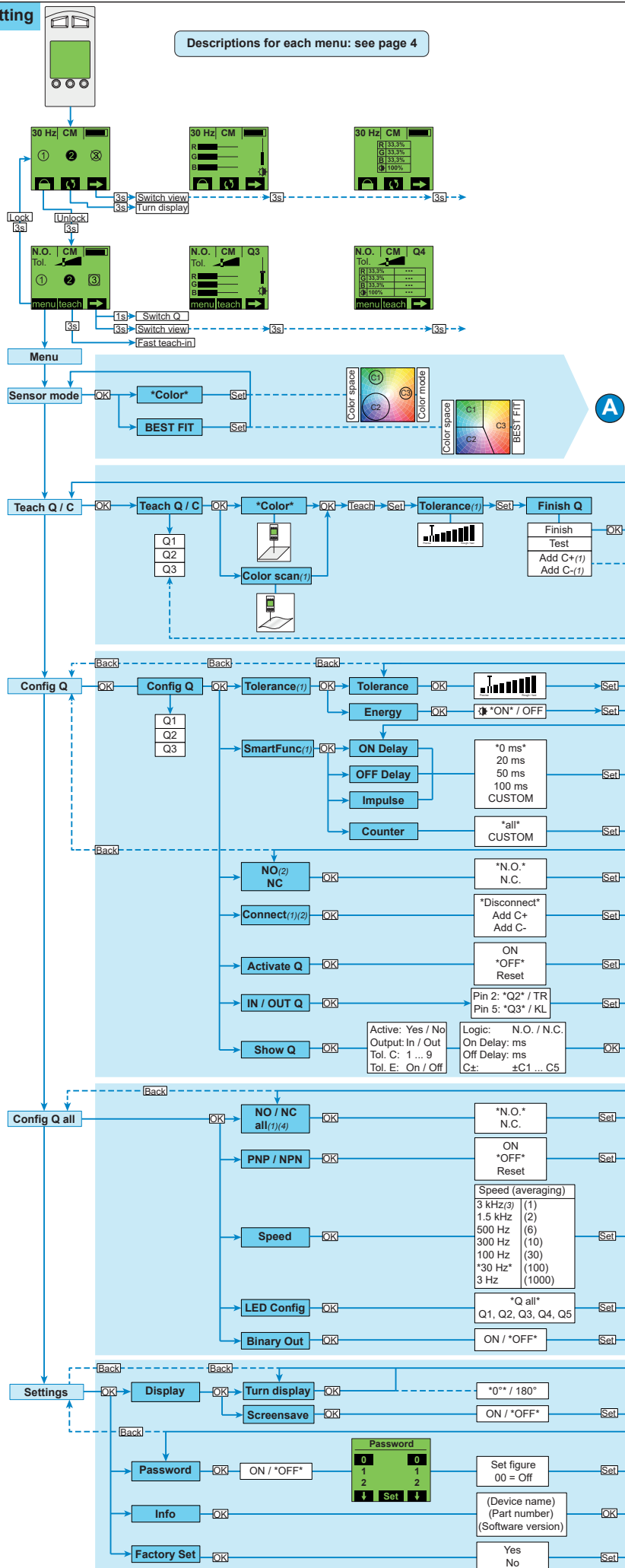


Manufacturer :
TMSS France
Tour Egho - 2 avenue Gambetta
92400 Courbevoie
France



UK Representative :
Yageo TMSS UK Limited
2 North Park Road
Harrogate, HG1 5PA
United Kingdom

Setting



Typical application

Color sorting	Color validation
BEST FIT	COLOR
When "false" colors are KNOWN	When "false" colors are NOT KNOWN
Output activated for each object detected (whatever the color). Teaching the background is highly recommended.	Output activated ONLY if the taught color is detected.
Minimum : 2 colors need to be taught, that is 1 color + background	Minimum: 1 color
Maximum: 7 colors (6 colors + 1 background color)	Up to 7 colors in Binary Out mode
Automatic tolerance 6 colors + 1 background	Manual tolerance
	Smart functions available: timer, counter
	Enabling 2 colors combination by output
Applications: - Sorting of known colors	Applications: - Color precise evaluation - Color detection

(1) Only available for Color mode

Factory settings: Reset to all default values between stars *xxx*

(1) Only available for Color mode

(2) Not available when Binary Out is active

Factory settings: Reset to all default values between stars *xxx*

(1) Only available for Color mode

(3) At 3 kHz, only Q1 & Q2 are available

(4) Not available when Binary Out is active

Factory settings: Reset to all default values between stars *xxx*

Factory settings: Reset to all default values between stars *xxx*

Views		
N.O. / N.C. (per Q)	CM = Color Mode BF = Best Fit Mode	Tol. Tolerance (1...9)
	1 ... 5 switching output Q ☐ OFF ☒ ON ☐ Selected ☒ Deactivated 	N.O. CM Q3 Tol. RGB = red / green / blue = energy / brightness (normalized values) Qi: selected switching output N.O. CM Q4 Tol. Taught-in color values Live color values

Fast teach-in	
Teach-in	
Tolerance (1)	
By pressing Teach or Tol. for 1 s the sensor switches between the two. With targeted color, by pressing Teach for 3 s the selected channel is taught.	

(1) Only available for Color mode

A Sensor mode	
Color	Validates the taught color. Required colors ≥ 1 . Application = color detection / color evaluation. Is used when the false colors are not known .
Best Fit	Switches the output corresponding to the closest taught color. Required colors ≥ 2 . → One channel of the sensor always switches. → To prevent unwanted switching, teaching of the background is recommended. Application = Sorting of known objects. Is used when it should be distinguished between known colors . → Additional colors on same output (C+/-; see below) is not possible in BF mode. → N.O. / N.C. settings & Smart functions are deactivated in BF mode. When returning to color mode they are restored. → *N.O.* / N.C. settings can only be adjusted for all Q at once via Config Q all in BF mode.

B Teach over menu (Teach Q / C)	
Teach Q / C	Teaching of a color (C) on a switching output (Q).
Color	Teaching of a color point.
Color Scan	Teaching of a color space (i.e. teaches colors until stop is pressed). → Scanning can be paused.
Tolerance	Setting of the tolerance in 9 levels: the more tolerant, the more approximative colors will be detected.
Finish Q	Finish: Save and close. Test: Checks whether a detection will be repeatable: 2x green LED = OK, 2x red LED = not OK C+: add an additional color (C) to the switching output (Q) that will be detected as well. C-: add an additional color (C) to the switching output (Q) that must not be detected.

C Config Q	
Tolerance / Energy	Only available in Color mode (Color): Tolerance adjustable in 9 levels. Energy evaluation can be turned off. This may be helpful in applications with object distances larger 65 mm. From here on the energy decreases with increasing object distance. The color values remain the same.
Smart functions (SmartFunc)	
ON Delay	adjustable in 1 ms steps
OFF Delay	adjustable in 1 ms steps
Impulse	adjustable in 1 ms steps
Counter	
Connect C+ / C-	The sensor can store more colors than it has outputs. Thus colors C and switching outputs Q are distinguished. It is preset which colors can be connected.
Activate Q	Activate / Deactivate → The stored colors C remain in the sensor. Reset → Resets the switching output to factory settings. Stored colors on this Q will be deleted.
IN / OUT Q	Some switching outputs can be set as input or output. → TR = Trigger (high = lamp on, low = lamp off) → KL = Keylock (high = keys are locked, low = keys are unlocked) → Low signal ≤ 0.8 V, high signal ≥ 3 V

D Config Q all	
PNP / NPN	Setting for all Q. Autodetect (Auto Q1) is set based on switching output Q1.
Speed	Speed (Averaging) Less speed results with more precise color recognition. Additional averaging also helps if ambient light disturbs the measurement.
Binary Out	Logically combines the switching outputs in order to be able to detect up to 7 colors. The combination is shown in the figures below. Thereby: → Connected colors will be disconnected. → Always only one color switches. The priority is C1 > C2 > C3... → Smart functions are not available in this mode. → All switching outputs will be set to N.O.

E Settings	
Display	Turn display Display is turned 180°. Screensave ON = Display turns off after 3 minutes. OFF = Display stays on.
Password	Definition of unlock password. This has to be entered each time when unlocking the sensors. If password is forgotten, a master password can be obtained at the Customer Care Center support.
Factory Set	Deletes all modifications that are done since set up of the sensor, all settings are reset to original factory settings.