

# Photoelectric sensors

30.03.2021 / Version 2.1  
11209433

## O200 Xpert Mode



EN  
DE  
FR  
IT  
ES  
CN

## Models with IO-Link

IO-Link Process Data Input									
Integer T(16)	Integer T(8)	8 bit							
Measurement Data Channel (MDC)	Scale	Baumer specific							
		7	6	5	4	3	2	1	0
		SSC4				Alarm	Quality		SSC1

SSC1/4: Switching Signal Channels  
MDC: Excess Gain, Intensity or Switch Counter (selectable)  
Quality: The quality bit signals a weak signal  
Alarm: The alarm bit signals a problem with the configuration or the functionality of the sensor  
Scale: Factor by power of ten, applicable to the value of the Measurement Data Channel (MDC)

**Available Commands:**  
Teach-In commands, light emission on/off, Find Me (locating sensor) and more

**Available Parameters:**  
Switching point, output function, time filters, operation modes, qTeach lock time, teach-mode, LED status indicators, Teach-In method and more

**Available Additional Data:**  
Switch counter, temperature

www.baumer.com

qTarget®  
qTeach®

**Baumer**

Baumer Electric AG - CH-8501 Frauenfeld  
Phone +41 (0)52 728 1122 - Fax +41 (0)63 739 1144

# Alignment Aid

O200 Lichtschranken (O200.R, O200.S, O200.E) verfügen über eine Ausrichthilfe. Diese ist im Teach Level 1 integriert und zeigt die Stärke des empfangenen Signals an.

O200 light barriers (O200.R, O200.S, O200.E) are equipped with an alignment aid, which is integrated in Teach Level 1. The alignment aid indicates the strength of the received signal.

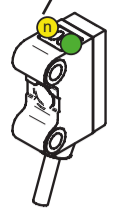
Les barrières lumineuses O200 (O200.R, O200.S, O200.E) sont équipées d'un outil d'aide à l'alignement, qui est intégré au niveau 1 de la procédure de teach.  
L'aide à l'alignement indique la force du signal reçu.

Le barriere fotoelettrica O200 (O200.R, O200.S, O200.E) sono dotate di indicazione di corretto allineamento. Questa funzione è integrata nel livello 1 di Teach-In e viene indicata l'intensità del segnale ricevuto.

Las barreras de luz O200 (O200.R, O200.S, O200.E) están equipadas con una ayuda de alineado integrada en el Nivel 1 de Teach.  
La ayuda de alineado indica la potencia de señal recibida.

O200 轻障 (O200.R, O200.S, O200.E) 配备了对准辅助功能, 集成在设定级别1中。  
对准辅助表明了接收信号的强度。

Faster flashing  
→ stronger signal



Sensor ausrichten, schnelles Blinken, besserer Empfang

Align sensor, faster flashing, better reception

Aligner le capteur, clignotement plus rapide, meilleure est la réception

Allineamento del sensore: più è veloce il lampeggiamento tanto più è forte il segnale

Sensor alineado, parpadeo más rápido, mejor recepción

对准传感器 · 闪烁越快 · 接收得更好

# Related Models

## O200 Models with Xpert Teach:

- O200.G\* (Background suppression sensors)
- O200.Z (Diffuse sensors with intensity difference)
- O200.R (Retro-reflective sensors)
- O200.S\* (SmartReflect light barriers)
- O200.T/E (Through beam sensors (E: Receiver)(T: Emitter))

\*Equipped with

**ALINE®**

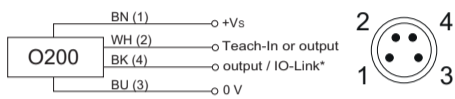
The innovative, high performance CMOS Opto-ASIC for fast and temperature-stable sensors with high ambient light immunity

More Information related to these products can be found on our website (CAD, Beamcharts, CoC, Drawings, IODDS ...)



www.baumer.com

# Connection Diagrams



	Push-Pull & Teach-In / IO-Link*	PNP Complementary	NPN Complementary	O200.T, Emitter
1 - Brown BN		+Vs		
2 - White WH	Teach-In*	PNP Inverted	NPN Inverted	Test
3 - Blue BU		0 V		
4 - Black BK	Push-Pull / IO-Link*	PNP	NPN	n.c.

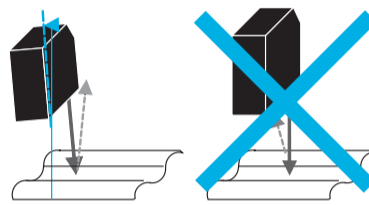
\*Only for models with IO-Link or ext. Teach-In  
Test: Connect Test to +Vs to deactivate the light emission (O200.T)  
n.c.: Not connected

See packaging label for the specific wiring of your product

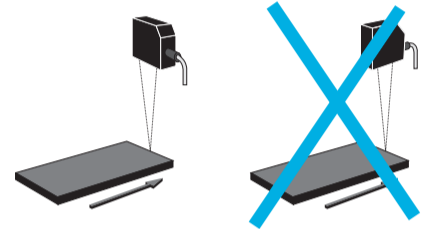
- Disconnect power before connecting the sensor.  
- Voltage supply according UL 1310, Class 2  
or device shall be protected by an external R/C or listed fuse, rated max. 30 VAC/3A or 24 VDC/4A

# Mounting Instructions

Background suppression sensors (O200.G) & SmartReflect light barriers (O200.S)



The direct reflection from glossy or reflective objects must not impinge on the receiver. This can be avoided by slightly tilting the sensor.



It is recommended that the object to be detected approaches the active area of the sensor from the side, which avoids malfunctions caused by deflection of the light beam at edges.  
Exception: Sensors with line beam



qTarget®

The Baumer design aligns the sensor's light beam to the fixing holes (qTarget®). This allows a fast and easy installation without fine-tuning as well as fast exchange.

# LED Indication



# Legend

- LED on
- LED flashing 1 Hz
- LED flashing 2 Hz
- LED flashing 8 Hz

# Operating Mode

EN

LED Indicators	Green	Yellow
Power on	LED on	
Short circuit	LED flashing 1 Hz	
Output 1 active		LED flashing 2 Hz
Output 1 signal close to threshold		LED flashing 8 Hz
Teach-in mode	see Teach-in Instruction	

# LED Anzeige



# Legende

- LED leuchtet
- LED blinkt 1 Hz
- LED blinkt 2 Hz
- LED blinkt 8 Hz

# Betriebsmodus

DE

LED Indikatoren	Grün	Gelb
Betriebsanzeige	LED on	
Kurzschluss	LED flashing 1 Hz	
Ausgang 1 aktiv		LED flashing 2 Hz
Ausgang 1 Signal nahe der Schwelle		LED flashing 8 Hz
Teach-In Modus	siehe Teach-In Anleitung	

# Teach-In Description Level 1 & 2

	O200.G, Background suppression sensors	O200.R, O200.Z, O200.T/E	O200.S, SmartReflect light barriers	Optional Teach-In methods*
<b>Level 1</b>	<b>1-Point Teach</b> Sets the switchpoint at the position of the object +TPO* (teach point offset) TPO: See packaging (typ. 0% or 10%) 	<b>1-Point Teach</b> Sets the threshold as close to the measured value as possible Threshold = Signal * TPO TPO: See packaging (typ. 33%) 	<b>1-Point Teach</b> Teaches the position of the reference (distance) Tolerance: See packaging (typ. 12%) 	Configurable via IO-Link <b>Window mode</b> (only O200.G) Level 1 / 1-Point Teach: Sets a window of +/- 10%* around the position of the object Level 2 / 2-Point Teach: Sets a window within the object is being detected
<b>Level 2</b>	<b>2-Point Teach</b> Sets the switchpoint in the middle of position A & B 	<b>2-Point Teach</b> Sets the switching point in the middle of the teach points SP = sqrt(TP1 * TP2) 	<b>Not active</b> For SmartReflect Light barriers, the teach level 2 is not active If level 2 is entered, the sensor leaves the level immediately without any changes	<b>Dynamic Teach-In</b> (O200.G, O200.R, O200.Z, O200.E) Available also for window mode. Enter teach level 1 to start the data acquisition and TAP to stop the data acquisition. (Duration 2 ... 15 sec) The switchpoint or window is defined by the detected min & max value.

\*This value is adjustable by IO-Link. Please check the IO-Link manual available on www.baumer.com

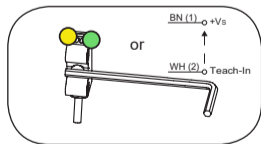
# Teach-In Beschreibung Level 1 & 2

	O200.G, Hintergrundausblendung	O200.R, O200.Z, O200.E	O200.S, SmartReflect Lichtschranken	Optionale Teach-In Modi*
<b>Level 1</b>	<b>1-Punkt Teach</b> Setzt den Schwellenwert an der Position des Objektes +TPO* (Teach point offset, typ. 0% oder 10%) TPO: Siehe Verpackung (typ. 33%) 	<b>1-Punkt Teach</b> Setzt die Schwellenwert so nah ans eingelernte Signal wie möglich Threshold = Signal * TPO TPO: Siehe Verpackung (typ. 33%) 	<b>1-Punkt Teach</b> Lernt die Position der Referenz ein (Distanz) Tolerance: Siehe Verpackung (typ. +/- 12%) 	Einstellbar per IO-Link <b>Fenster-Modus</b> (O200.G) Level 1 / 1-Punkt Teach: Definiert ein Fenster à +/- 10% um die Position des Objektes Level 2 / 2-Punkt Teach: Definiert ein Schwellenwert, innerhalb welchem ein Objekt erkannt werden soll
<b>Level 2</b>	<b>2-Punkt Teach</b> Setzt den Schwellenwert in die Mitte von Position A & B 	<b>2-Punkt Teach</b> Setzt den Schwellenwert in die Mitte der eingelernten Teachpunkte SP = sqrt(TP1 * TP2) 	<b>Nicht aktiv</b> Für die SmartReflect Lichtschranken ist das Level 2 nicht aktiv	<b>Dynamischer Teach-In</b> (O200.G, O200.R, O200.Z, O200.E) Ebenfalls verfügbar für den Fenster-Modus. Wird das Teach-Level 1 ausgewählt, startet die Datenaufnahme automatisch. Mit einem TAP wird diese beendet. (Akzeptierte Dauer: 2 ... 15 sek.) Der Schwellenwert & das Fenster werden auf Basis der min. & max. Werten definiert.

\*Dieser Wert kann per IO-Link verändert werden. Weitere Details finden Sie im IO-Link Manual verfügbar auf www.baumer.com

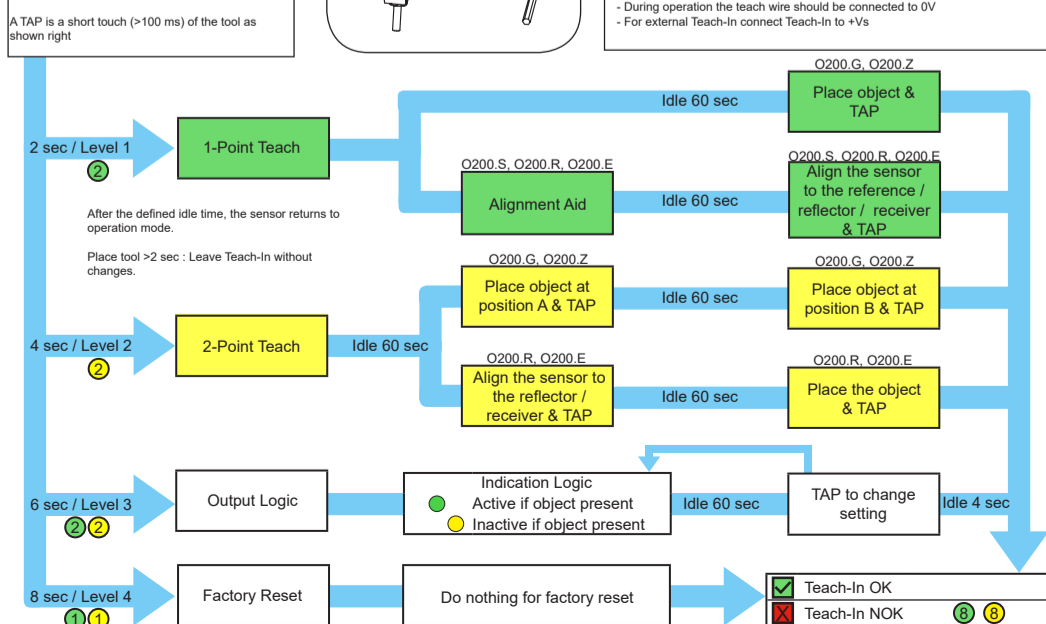
# Teach-in Instruction

**Enter Teach Level**  
- Place ferromagnetic tool as shown right to activate qTeach® or connect Teach-In wire to +Vs  
- Green and yellow LED light up if tool / Teach-In is recognized properly  
- Remove after n sec for desired level



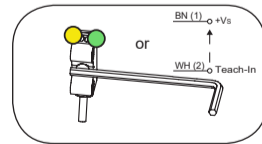
## General Information

- qTeach® locks 5 min after power up
- If locked, qTeach® can be reactivated by re-applying power or by connecting the Teach-In wire to +Vs
- External teach-in is always possible (no locking)
- In teach mode the output changes to 0V
- During operation the teach wire should be connected to 0V
- For external Teach-In connect Teach-In to +Vs



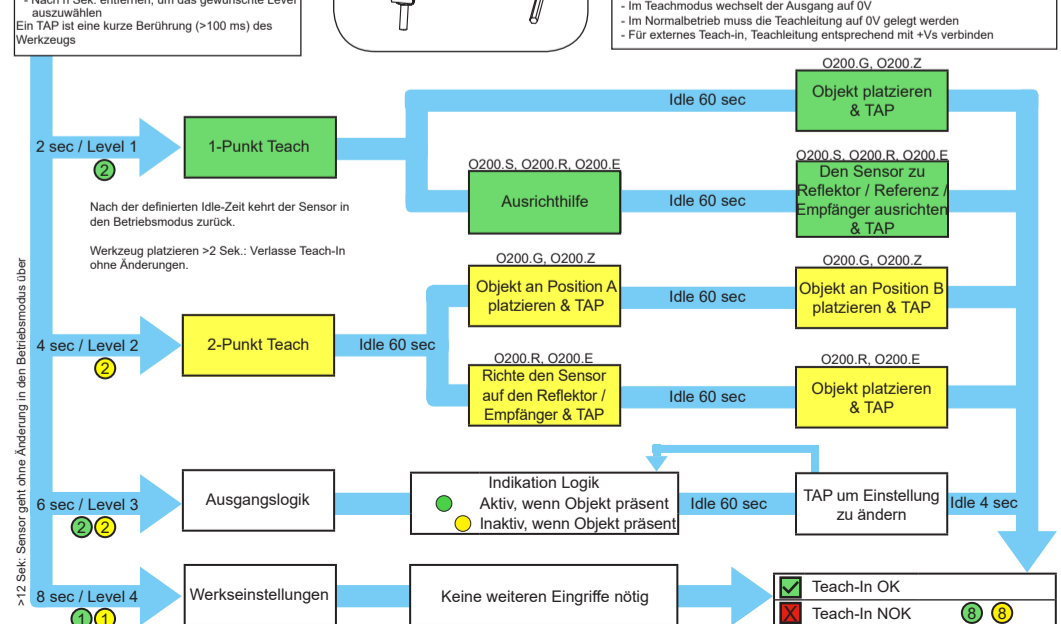
# Teach-in Anleitung

**Teach Level auswählen**  
- Platziere das ferromagnetische Werkzeug wie rechts dargestellt um qTeach® zu aktivieren oder verbinde die Teachleitung mit +Vs  
- Die grüne und gelbe LED leuchten auf, wenn das Werkzeug korrekt erkannt wird  
- Nach n Sek. entfernen, um das gewünschte Level auszuwählen  
Ein TAP ist eine kurze Berührung (>100 ms) des Werkzeugs

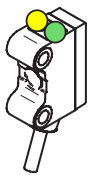


## Allgemeine Information

- qTeach® verriegelt 5 min nach dem Einschalten
- Falls gesperrt, kann qTeach® durch ein erneutes Einschalten oder durch den Anschluss der Teach-In-Leitung für >15 Sek. an +Vs reaktiviert werden
- Externes Teach-In ist immer möglich (keine Verriegelung)
- Im Teachmodus wechselt der Ausgang auf 0V
- Im Normalbetrieb muss die Teachleitung auf 0V gelegt werden
- Für externes Teach-In, Teachleitung entsprechend mit +Vs verbinden



Indication LED



Légende

- LED ON
- ① LED clignotante 1 Hz
- ② LED clignotante 2 Hz
- ⑧ LED clignotante 8 Hz

Mode de fonctionnement

FR

Indicateurs LED	Vert	Jaune
Power On	●	
Court-circuit	①	
Sortie 1 activée		●
Sortie 1 signal proche du seuil		⑧
Mode Teach-In	Voir Instructions Teach-In	

Indicazioni LED



Legenda

- LED acceso
- ① LED lampeggia a 1 Hz
- ② LED lampeggia a 2 Hz
- ⑧ LED lampeggia a 8 Hz

Modalità operativa

IT

Indicazioni LED	Verde	Giallo
Power On	●	
Corto circuito	①	
Uscita 1 attiva		●
Uscita 1 prossima alla soglia		⑧
Modalità di Teach-In	vedi istruzioni Teach-In	

Description Teach-In Niveau 1 & 2

	O200.G, Suppression d'arrière-plan	O200.R, O200.Z, O200.E	O200.S, Barrière SmartReflect	Méthodes de Teach-in optionnelles*
<b>Niveau 1</b>	<b>Teach 1-point</b> Régler le point de commutation à la position de l'objet +TPO* (Teach point offset, typ. 0% o 10%) 	<b>Teach 1-point</b> Apprendre le signal et régler le seuil le plus sensible possible Threshold = Signal * TPO TPO: Voir l'emballage (typ. 33%) 	<b>Teach 1-point</b> Apprendre la position de la référence (distance) Tolerance: Voir l'emballage (typ. +/- 12%) 	Configurable via IO-Link <b>Mode fenêtre</b> (uniquement O200.G) Niveau 1 / Teach 1-point: Régler une fenêtre de +/- 10% autour de la position de l'objet Niveau 2 / Teach 2-point Régler une fenêtre dans laquelle l'objet sera détecté
<b>Niveau 2</b>	<b>Teach 2-point</b> Régler le point de commutation entre la position A & B 	<b>Teach 2-point</b> Régler le point de commutation au milieu des points d'apprentissage SP = sqrt(TP1 * TP2) 	<b>Pas active</b> Pour la barrière SmartReflect, le Teach niveau 2 n'est pas actif Si le niveau 2 est activé, le capteur quitte immédiatement ce niveau sans changement	<b>Teach-in dynamique</b> (O200.G, O200.R, O200.Z, O200.E) Disponible également pour le mode fenêtre Entre dans le Teach niveau 1 pour démarrer l'acquisition de données et TAP pour arrêter l'acquisition de données. (Durée : 2...15 sec) Le point de commutation ou la fenêtre est définie par la valeur Min & Max détectée.

\* Cette valeur est ajustable via IO-Link. Consultez le manuel IO-Link disponible sur www.baumer.com

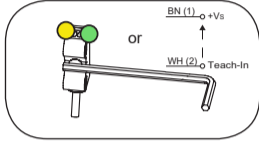
Descrizione dei livelli 1 e 2 Teach-In

	O200.G, Sensori a soppressione di sfondo	O200.R, O200.Z, O200.E	O200.S, Sensori SmartReflect	Configurazioni opzionali*
<b>Livello 1</b>	<b>Teach a 1 punto</b> Impostazione del punto di commutazione alla posizione desiderata +TPO* (Teach point offset, typ. 0% o 10%) 	<b>Teach a 1 punto</b> Impostazione automatica della soglia di commutazione in funzione dell'intensità restituita (massima sensibilità) Threshold = Signal * TPO (typ. 33%) 	<b>Teach a 1 punto</b> Teach-In della posizione dello sfondo Tolerance: Vedere imballaggio (typ. +/- 12%) 	Configurazioni tramite IO-Link <b>Funzionamento a finestra</b> (solo O200.G) Livello 1/Teach 1 punto: Viene impostata una finestra di +/-10% relativa alla posizione dell'oggetto da rilevare Livello 2/Teach a 2 punti: Viene impostata una finestra tra due punti all'interno dei quali l'oggetto deve essere rilevato
<b>Livello 2</b>	<b>Teach a 2 punti</b> Impostazione del punto di commutazione a metà tra la posizione A e la posizione B 	<b>Teach a 2 punti</b> Impostazione della soglia di commutazione a un valore medio tra l'intensità restituita dei segnali appresi SP = sqrt(TP1 * TP2) 	<b>Non attivo</b> Per le fotocellule SmartReflect, il Teach-In al livello 2 non è attivo Accedendo a tale livello, non si apportano modifiche	<b>Modalità Teach-In dinamico</b> (solo O200.G, O200.R, O200.Z, O200.E) Disponibile anche nel funzionamento a finestra. Entrare nel livello 1 di configurazione per avviare l'acquisizione dinamica ed effettuare un TAP per terminarla (durata 2...15 sec). Il punto di commutazione o la finestra vengono definiti in base al valore minimo e al valore massimo acquisiti.

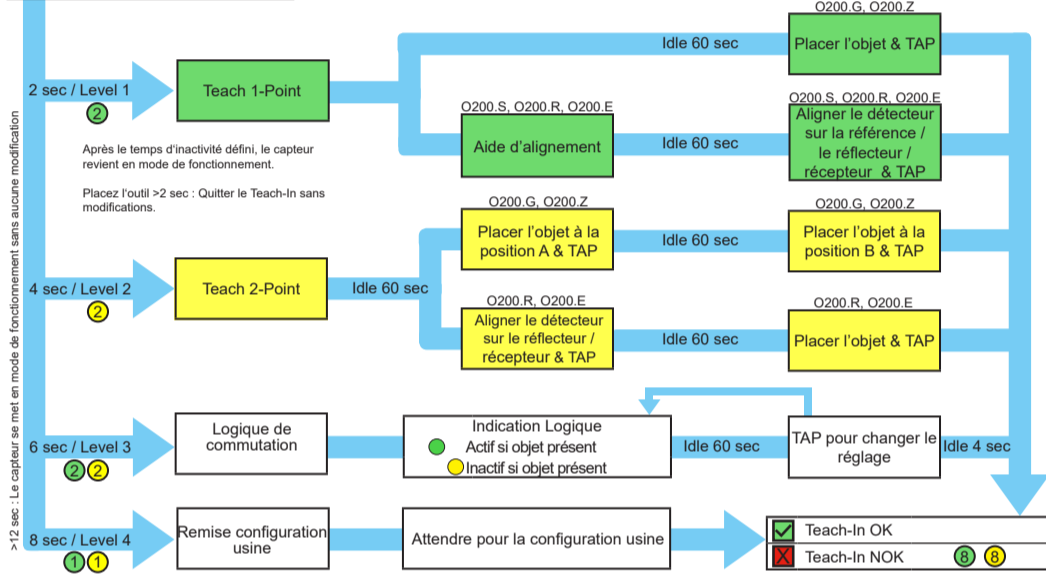
\*Questo valore è modificabile via IO-Link. Consultare il manuale IO-Link disponibile sul sito www.baumer.com

Instructions Teach-In

**Entrée en mode Teach:**  
 - Placer l'outil ferromagnétique comme indiqué ci-contre pour activer qTeach® ou connecter le fil Teach-In au +Vs  
 - Si le Teach est activé correctement, les LED jaune et verte s'allument  
 - Enlever après n sec pour le niveau souhaité  
 Un TAP est une courte touche (>100 ms) de l'outil comme présenté ci-contre

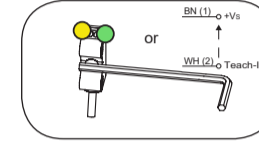


**Information Générale**  
 - qTeach® se verrouille 5 min après la mise sous tension.  
 - Si il est verrouillé, qTeach® peut être réactivé en réappliquant l'alimentation ou en connectant le fil de Teach-In pendant >15 sec. à +Vs  
 - Le Teach externe est toujours disponible (Pas de verrouillage)  
 - En mode Teach la sortie est à 0V  
 - En mode normal l'entrée Teach est à 0V  
 - Pour un Teach externe, connecter l'entrée Teach correspondant au +Vs

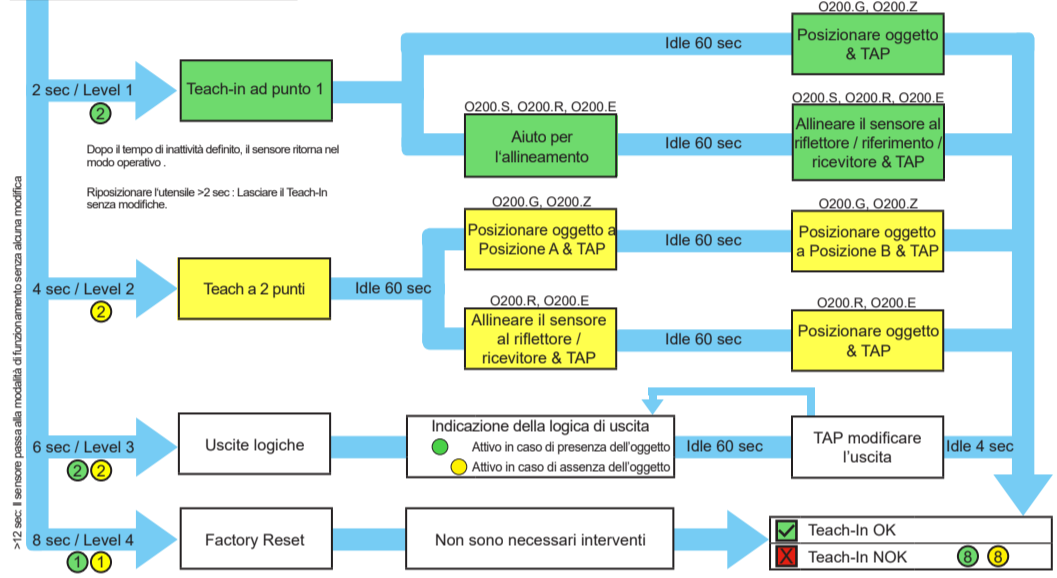


Istruzioni Teach-In

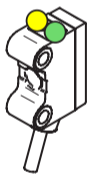
**Selezionare il livello di Teach-In**  
 - Posizionare l'utensile ferromagnetico come mostrato a destra di attivare qTeach® o collegare il cavo Teach-In a +Vs  
 - Se l'utensile viene riconosciuto correttamente, entrambi i LED si accendono  
 - Rimuovere dopo n sec. per il livello desiderato  
 TAP indica un breve tocco con l'utensile sul punto di teach.



**Informazione generali**  
 - La funzione di qTeach® si disattiva dopo 5min dall'accensione del sensore  
 - Se disabilitato qTeach® può essere riattivato mediante riapplicazione dell'alimentazione o collegando il filo Teach-In per >15 sec. a +Vs  
 - In modalità Teach-In l'output assume un valore pari a 0V  
 - Il Teach-In da remoto è sempre possibile (non si disattiva dopo 5 min)  
 - Durante il normale funzionamento del sensore il cavo Teach-In va messo a 0V  
 - Per il Teach-In da remoto, connettere il cavo di teach a +Vs



Información LED



Leyenda

- LED ON
- ① LED parpadeo 1 Hz
- ② LED parpadeo 2 Hz
- ⑧ LED parpadeo 8 Hz

Modo operativo

ES

Información LED	Verde	Amarillo
Power On	●	
Cortocircuito	①	
Salida 1 activa		●
Salida 1 señal dentro del intervalo		⑧
Modo Teach-In	Ver instrucciones Teach-In	

LED 指示灯



图例

- LED 亮
- ① LED 闪烁 1 Hz
- ② LED 闪烁 2 Hz
- ⑧ LED 闪烁 8 Hz

操作模式

CN

LED 指示灯	绿	黄
通电	●	
短路	①	
输出 1 激活		●
输出 1 信号接近阈值		⑧
Teach-in 模式	详见 Teach-in 说明	

Descripción Teach-In Nivel 1 & 2

	O200.G, Sensores con supresión de fondo	O200.R, O200.Z, O200.E	O200.S, Barreras SmartReflect	Métodos Teach-In opcionales*
<b>Nivel 1</b>	<b>1-Point Teach</b> Define el punto de conmutación en la posición del objeto +TPO* (Teach point offset, typ. 0% o 10%) 	<b>1-Point Teach</b> Aprende la señal y define el límite lo más sensible posible. Threshold = Signal * TPO TPO: Ver embalaje (typ. 33%) 	<b>1-Point Teach</b> Aprende la posición de la referencia (Distancia) Tolerance Ver embalaje (typ. +/- 12%) 	Ajustable via IO-Link <b>Modo ventana</b> (Solo O200.G) Nivel 1 / 1-Point Teach: Define una ventana de +/- 10% alrededor de la posición del objeto Nivel 2 / 2-Point Teach: Define una ventana donde se detectará el objeto
<b>Nivel 2</b>	<b>2-Point Teach</b> Define el punto de conmutación en la posición media entre A y B 	<b>2-Point Teach</b> Define el punto de conmutación en la posición media de los puntos de enseñanza SP = sqrt(TP1 * TP2) 	<b>No activo</b> Para las barreras SmartReflect, el nivel 2 no está activo Si se entra en el nivel 2, el sensor deja el nivel sin cambios inmediatamente	<b>Teach-in dinámico</b> (Solo O200.G, O200.R, O200.Z, O200.E) Disponible sólo en el modo ventana. Entrar en el nivel 1 para iniciar la adquisición de datos y activar para detener la adquisición de datos (duración de 2 a 15 s). El punto de conmutación o ventana se define por los valores mínimos y máximos detectados.

\*Este valor es ajustable via IO-Link. Por favor consulte el manual IO-Link disponible en www.baumer.com

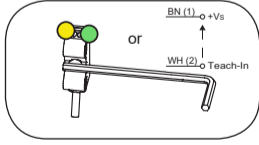
Teach-In 说明 1 级 & 2 级

	O200.G, 带背景抑制漫反射	O200.R, O200.Z, O200.E	O200.S, 智能反射	可选的设置方式*
<b>1级</b>	<b>1点设定</b> 将开关点设置在被测物位置后TPO* (Teach point offset) TPO: 查看包装 (通常为0%或10%) 	<b>1点设定</b> 设定反光板并将阈值设定得尽可能灵敏 Threshold = Signal * TPO TPO: 查看包装 (通常为33%) 	<b>1点设定</b> 设定参考面的位置 (距离) Tolerance: 查看包装 (通常为 +/- 12%) 	通过IO-Link配置 窗口模式 (仅 O200.G) 1级/1点设定 设定大约在被测物 ±10% 位置的窗口 2级/2点设定 设定前后两个位置之间的窗口 动态模式 (仅 O200.G, O200.R, O200.Z, O200.E) 也适用于窗口模式。 输入1级设定以开始数据采集, 输入 TAP以停止数据采集。(持续时间 2...15秒) 开关点或窗口由检测到的最小值和最大值定义。
<b>2级</b>	<b>2点设定</b> 设定开关点在A和B位置之间 	<b>2点设定</b> 设置TP1和TP2之间的阈值 SP = sqrt(TP1 * TP2) 	<b>未激活</b> 对于智能反射传感器, 2级设定未被激活 如果进入2级设定, 传感器将在不做任何改动下立即离开该设定。	

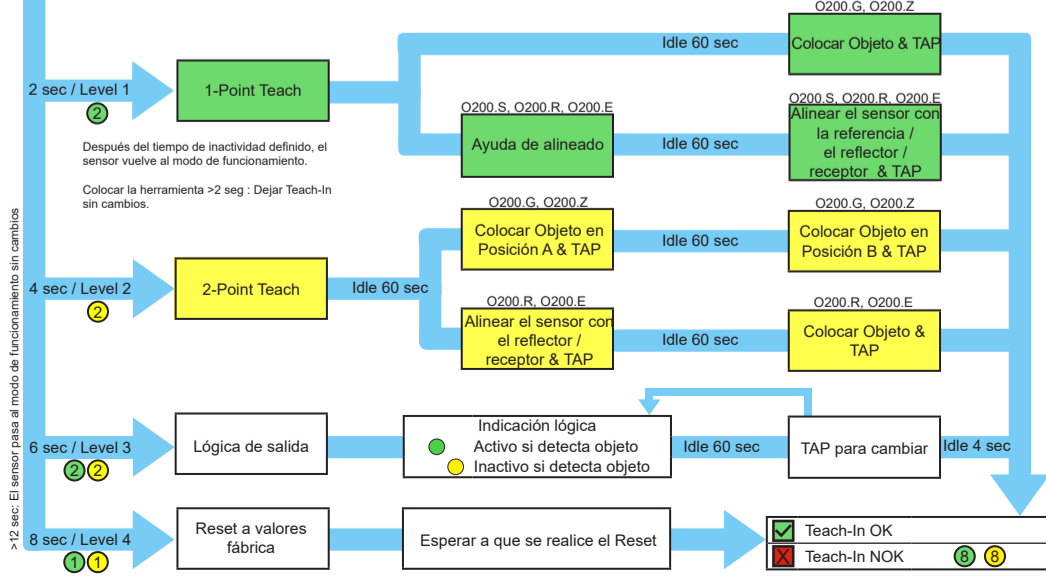
\*这个值是通过IO-Link来调整的。请在 www.baumer.com 上查询IO-Link手册

Instrucciones Teach-In

**Entrar en modo Teach:**  
 - Coloque la herramienta ferromagnética como indica la imagen para activar qTeach® o conectar el cable Teach-In a +Vs  
 - LEDs verde y amarillo encendidos si la herramienta o el teach-in se reconocen correctamente  
 - Retirar tras n segundos para el nivel deseado  
 Un TAP es un toque corto (>100 ms) de la herramienta

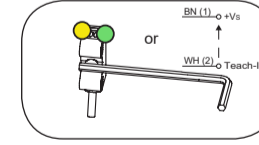


**Información general**  
 - qTeach® se bloquea 5 min después de la alimentación\*  
 - Si está bloqueado, qTeach® puede ser reactivado volviendo a dar alimentación o conectando el cable de Teach-In durante >15 seg. a +Vs  
 - El teach-in externo está siempre disponible (no se bloquea)  
 - En modo teach la salida cambia a 0V  
 - En modo normal el cable de teach se pone a 0V  
 - Para teach-in externo, conectar el cable teach a +Vs



设定说明

**进入设定等级:**  
 - 如右图所示放置金属工具或连接设定线至 +Vs  
 - 如果工具或设定被恰当地识别到, 绿色和黄色LED将亮起  
 - 在n秒后选定所需的等级是拿开触点是如右图所示用工具快速靠近感应区域



**总览:**  
 - qTeach® 开启5分钟后自行锁定  
 - 锁定之后, qTeach® 可以通过重新上电或者把外部示教线连接到 +Vs上大于15秒后进行激活  
 - 在设定模式下输出变至 0 V  
 - 在通常模式下设定先接至 0 V  
 - 对于外部设定, 将设定线连接至 +Vs  
 - 外部设定线永久有效 (无自锁)

