

# BALLUFF

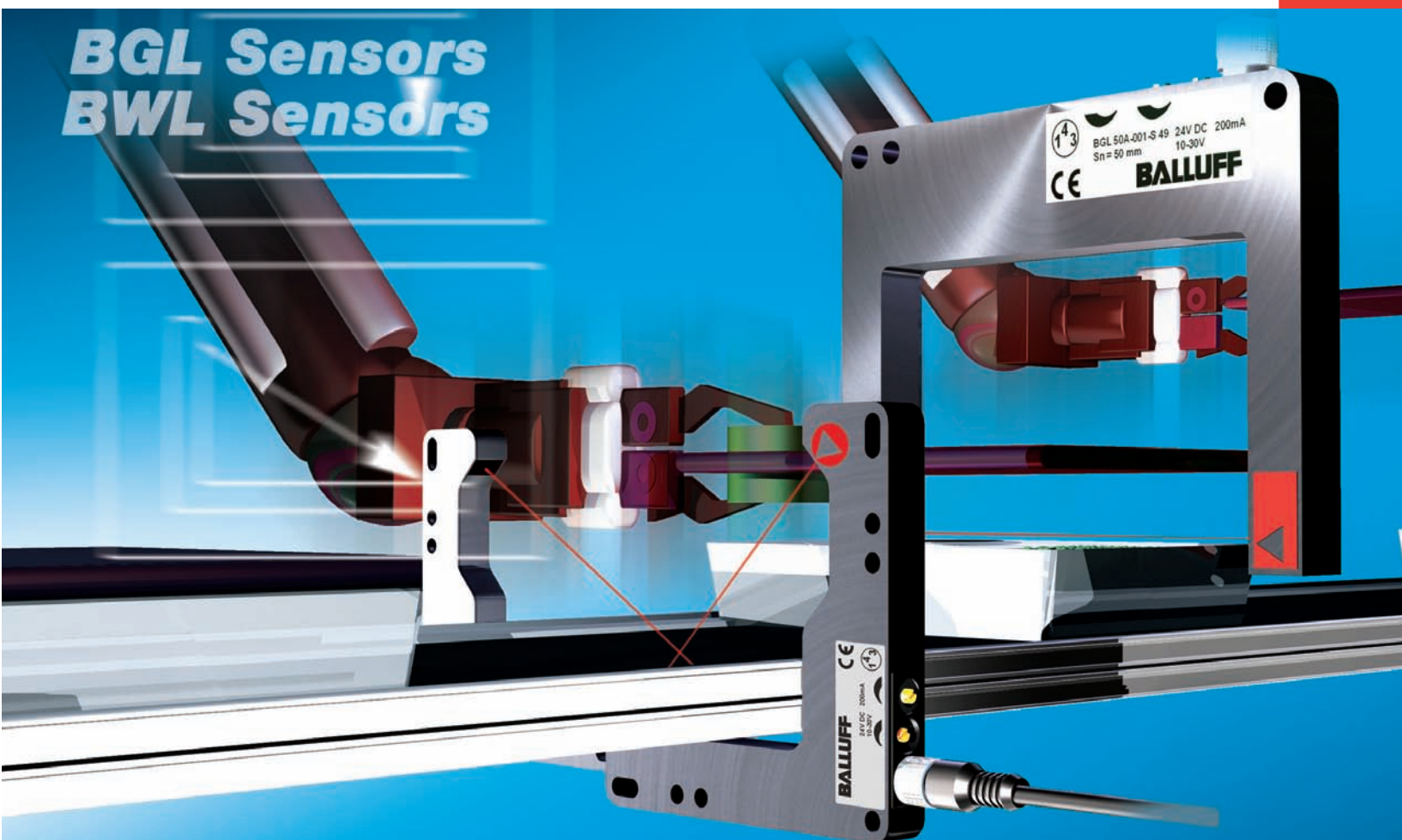
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## ***SENSORS*** ***INCORPORATED***

507 Kelsey Street • Delano, MN 55328  
Phone 763-972-1040 Fax 763-972-1041  
Toll Free 888-920-0939  
Sensorsincorporated.com

## Harnessing the Power of Thru-beams

The BGL/BWL self-contained thru-beam sensor family



# Balluff Self-Contained Thru-beam Sensors

Ultra accurate, ultra adaptable, ultra reliable

From part handling to error proofing, Balluff self-contained thru-beam sensors are designed to streamline any production process. No more alignment problems, fragile installations, and fiber optic complexity. Their rugged features and built-in reliability make them a natural to meet demanding applications such as part positioning, edge detection, gripper positioning, parts ejection, pallet transfer, pick and place, and Poka-Yoke.



## Get up and running fast.

These sensors install in no time. Their one-piece design makes them a snap to precisely target whatever aspect of the process is necessary. One cable does the job. No multiple fiber optic cables and separate amplifiers are needed to complicate the installation.

## Dramatically reduce downtime.

Once these sensors are up, they stay up. Unlike two-unit systems, all electronics and optics are contained in one incredibly robust, permanently aligned unit.

## Flexible

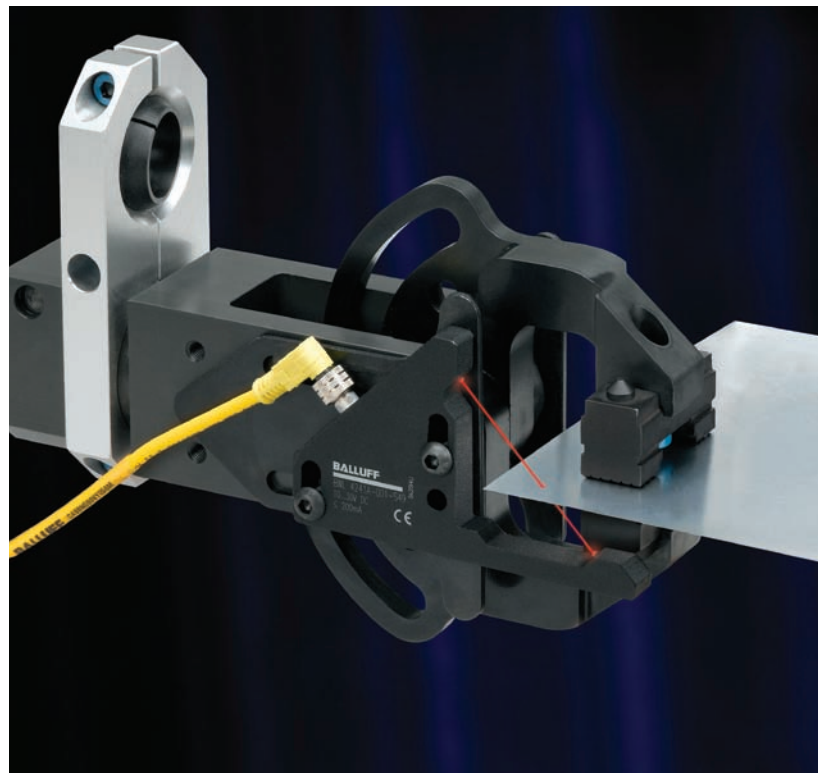
These sensors detect virtually any target regardless of color, shape, or reflectivity with high repeatability year after year.

## Choose your level of accuracy.

Visible red emission models have detection resolution down to 0.3 mm. Smaller gap class II laser versions boast resolution down to 0.06 mm throughout their beam.

## Reliable

These sensors need virtually no maintenance. Under normal conditions, they never go out of adjustment. Heavy duty versions are available for extremely harsh environments.

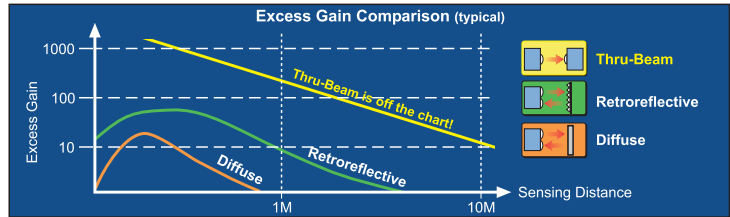


# Why use a thru-beam sensor?

## The advantages of thru-beams...

- Able to detect small parts with ease
- Extremely tolerant of dirty environments
- Completely immune to target color, reflectivity or surface condition
- Most repeatable non-contact sensing mode

When it comes to reliability and accuracy, there is no optical sensing mode better than thru-beam sensing. Their reliability is a result of the extraordinary levels of excess gain. Excess gain is the measurement of light energy above the level required for normal sensing. The more excess gain a sensor has, the more tolerant it is of dirt, moisture and debris accumulating on the sensor.



The accuracy of thru-beams result from a tightly, well-defined sensing area. This area, called the effective beam, is the size of the emitter and receiver lens. Since a target is detected by breaking a portion of the beam, the smaller the lens, the smaller the effective beam, and the more accurate the sensor.

## Pick the self-contained thru-beam sensor that is right for you

C Frame		L Frame		
Ideal housing for feeder bowl tracks, part gauging and part detection in tooling and robotic end effectors.		Ideal housing for large object detection, varying object size, confined spaces, two-up feed tracks and two axis movements.		
<b>Visible Red</b>	<b>Laser</b>	<b>Visible Red</b>	<b>Laser</b>	<b>Heavy Duty Infrared</b>
Most economical version	For extreme accuracy applications (i.e. gauging and small detail detection)	Most economical version	For extreme accuracy applications (i.e. gauging and small detail detection)	For harsh environments (i.e. cutting fluids, oil, and debris)

## Eliminating the disadvantages of fiber optics



### Troublesome Fiber Optics

Here is a typical feed track detection system using fiber optics. This somewhat fragile system consists of a separate emitter and receiver and an amplifier to control them. Care must be taken not to damage or misalign the fibers. The emitter and receiver fibers must be held in alignment, usually with an additional special custom bracket.

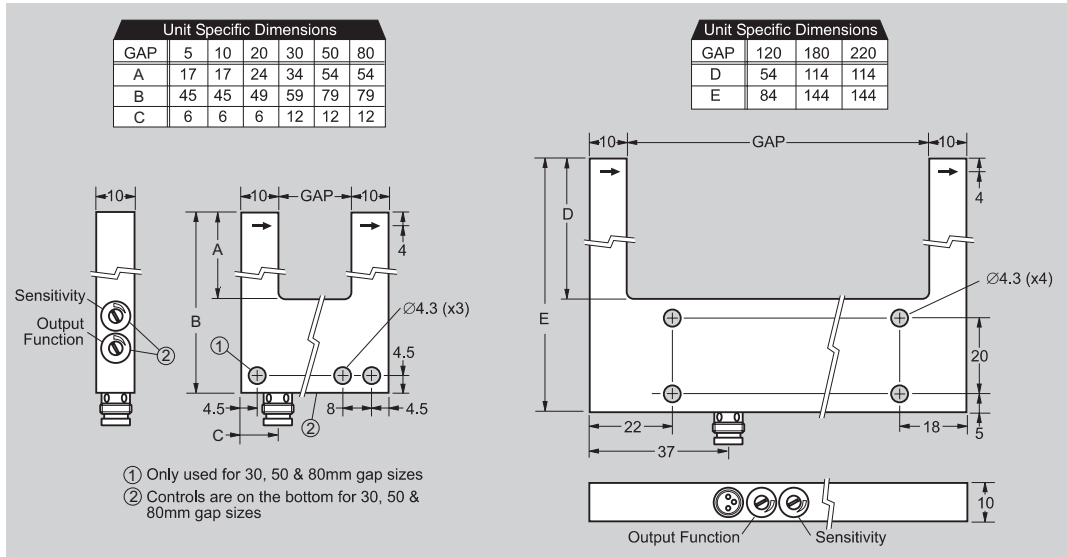


### A Superior Alternative to Fiber Optics

Here is the same system using Balluff's easy to use, one-piece unit. In this installation, there are no extra alignment brackets, no fiber amplifiers, and best of all, no fibers. The Balluff thru-beam is simply positioned on the track and connected to the bowl controller – installation complete.

### Balluff Thru-beams:

- Take up less space on the track
- Eliminate extra wiring
- Eliminate adjustment headaches for the life of the installation
- Eliminate or reduce reliance on fiber optics
- Detect small parts down to 0.06 mm with outstanding repeatability of +/- .015 mm



Gap Sizes
5 mm
10 mm
20 mm
30 mm
50 mm
80 mm
120 mm
180 mm
220 mm

Visible Red	
PNP	NPN
BGL 5A-001-S49	BGL 5A-002-S49
BGL 10A-001-S49	BGL 10A-002-S49
BGL 20A-001-S49	BGL 20A-002-S49
BGL 30A-001-S49	BGL 30A-002-S49
BGL 50A-001-S49	BGL 50A-002-S49
BGL 80A-001-S49	BGL 80A-002-S49
BGL 120A-001-S49	BGL 120A-002-S49
BGL 180A-001-S49	BGL 180A-002-S49
BGL 220A-001-S49	BGL 220A-002-S49

Laser	
PNP	NPN
BGL 30A-003-S49	BGL 30A-004-S49
BGL 50A-003-S49	BGL 50A-004-S49
BGL 80A-003-S49	BGL 80A-004-S49
BGL 120A-003-S49	BGL 120A-004-S49

Resolution
Hysteresis
Repeatability
Housing material
Degree of protection
Operating temperature
Operating voltage
Switching frequency
Output

0.3 mm (5 - 30 mm models); 0.5 mm (50 - 80 mm); 0.8 mm (120 - 220mm)
0.1 mm (5 - 30 mm); 0.15 mm (50 mm); 0.2 mm (80 - 220 mm)
0.02 mm (5 - 30 mm); 0.04 mm (50 mm); 0.06 mm (80 mm); 0.08 mm (120 - 220 mm)
Anodized aluminum
IP 65
-10 ... +60° C
10 - 30 Vdc
1.5 kHz
PNP or NPN (selectable light/dark operation)

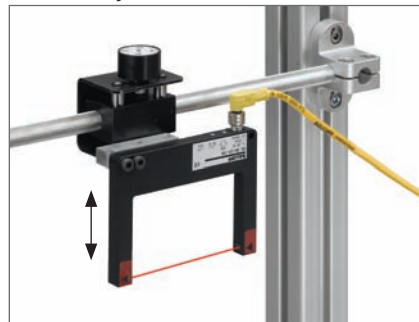
0.06 mm (30 mm); 0.1mm (50 mm); 0.2 mm (80 mm); 0.3 mm (120 mm)
0.01 mm (all models)
0.015 mm (all models)
Anodized aluminum
IP 65
-10 ... +60° C
10 - 30 Vdc
3 kHz
PNP or NPN (selectable light/dark operation)

### BGL Rod Mount

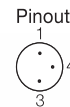
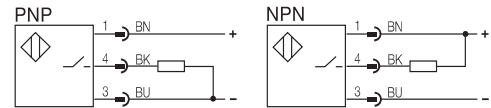


BMS CS-M-D12-\_\_\_-01

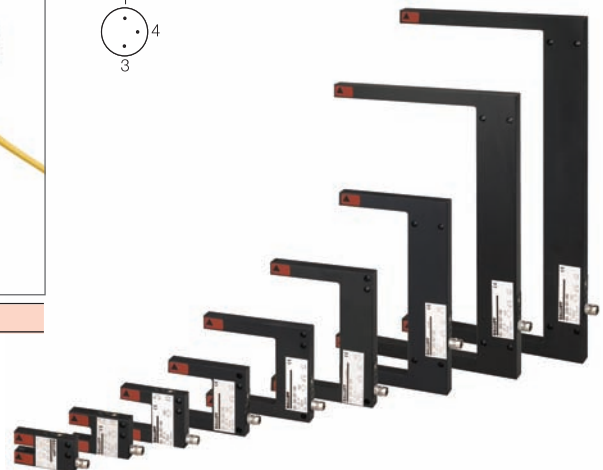
### Micro Adjustment Bracket



BMS CS-M-D12-CZ

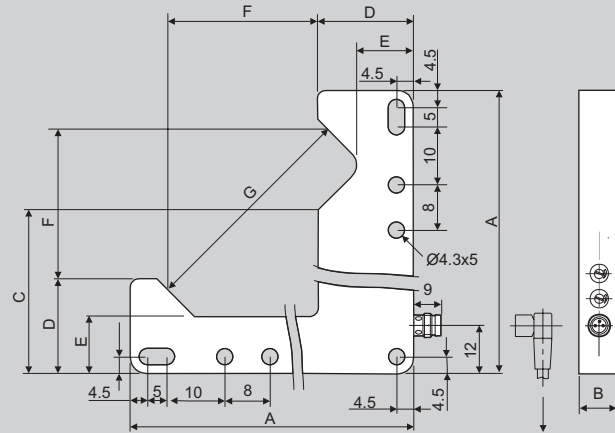


CX02 For BGL 5, 10, 20  
 CX03 For BGL 30, 50, 80  
 CX04 For BGL 120, 180, 220

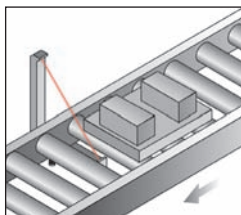
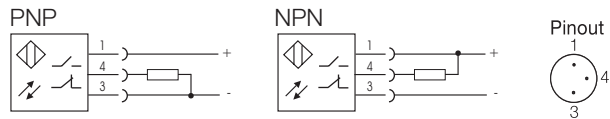




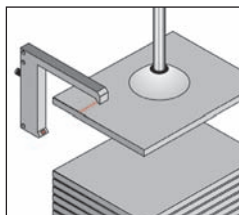
Unit Specific Dimensions					
	4040D	5454D	6868D	9090D	110110D
A	75	90	105	125	150
B	10	10	10	12	12
C	43	43	43	43	45
D	25	25	25	25	30
E	15	17	17	17	19
F	40	54	68	90	110
G	60	80	100	130	160



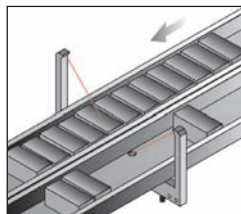
Gap Sizes	Visible Red		Laser	
	PNP	NPN	PNP	NPN
40 x 40 mm	BWL 4040-D-R011-S49	BWL 4040-D-R012-S49	BWL 4040-D-L011-S49	BWL 4040-D-L012-S49
54 x 54 mm	BWL 5454-D-R011-S49	BWL 5454-D-R012-S49	BWL 5454-D-L011-S49	BWL 5454-D-L012-S49
68 x 68 mm	BWL 6868-D-R011-S49	BWL 6868-D-R012-S49	BWL 6868-D-L011-S49	BWL 6868-D-L012-S49
90 x 90 mm	BWL 9090-D-R011-S49	BWL 9090-D-R012-S49	BWL 9090-D-L011-S49	BWL 9090-D-L012-S49
110 x 110 mm	BWL 110110-D-R011-S49	BWL 110110-D-R012-S49	BWL 110110-D-L011-S49	BWL 110110-D-L012-S49
Resolution	0.5 mm (40x40 & 54x54 models); 0.8 mm (all others)		0.1 mm (40x40); 0.2 mm (54x54 & 68x68); 0.3 mm (all others)	
Hysteresis	0.25 mm		0.02 mm	
Repeatability	≤ 0.04 mm (40x40); ≤ 0.06 mm (54x54); ≤ 0.08 mm (all others)		≤ 0.015 mm	
Sensitivity adjustment	Potentiometer (270°)		Potentiometer (270°)	
Housing material	Anodized aluminum, glass lens		Anodized aluminum, glass lens	
Degree of protection	IP 67		IP 67	
Operating temperature	-10...+60°C		-10...+60°C	
Operating voltage	10...30 Vdc		11...30 Vdc	
Switching frequency	1.5 kHz		3 kHz	
Output	PNP or NPN (selectable light/dark operation)		PNP or NPN (selectable light/dark operation)	



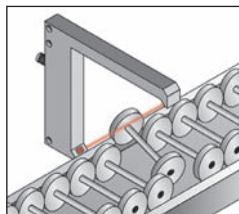
Conveyor systems



De-stacking

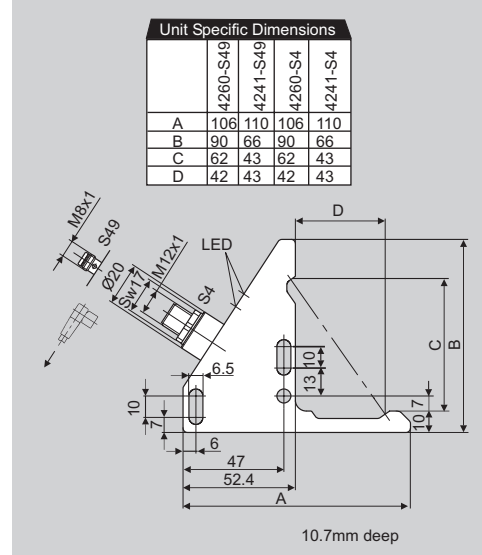
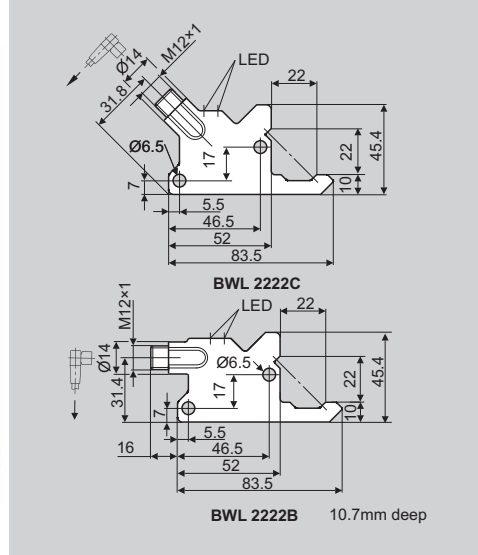


Two-up feed line



Misalignment





**Gap Sizes**

22 x 22 mm	45° connector
22 x 22 mm	Horizontal connector
42 x 41 mm	45° M12 connector
42 x 41 mm	45° M8 connector
42 x 60 mm	45° M12 connector
42 x 60 mm	45° M8 connector

**PNP**

BWL 2222C-001-S4
BWL 2222B-001-S4

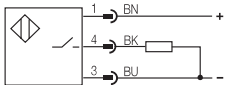
**Infrared**

**PNP**

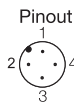
BWL 4241A-001-S4
BWL 4241A-001-S49
BWL 4260A-001-S4
BWL 4260A-001-S49

Light type	Infrared 880 nm
Resolution	1.0 mm
Hysteresis	0.5 mm
Repeatability	≤ 1.0 mm
Sensitivity adjustment	None
Housing material	Corrosion resistant steel
Degree of protection	IP 67
Operating temperature	-10...+60°C
Operating voltage	10...30 Vdc
Switching frequency	1.0 kHz
Output	PNP

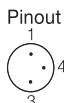
**PNP**



**S4**



**S49**



**Definitions:**

**Resolution**

The smallest part detectable or the smallest change in part position detectable.

**Hysteresis**

Distance the target is required to move to switch the output.

**Repeatability**

The sensor's accuracy when returning to the exact same point.



**Visit [www.balluff.com/bgl](http://www.balluff.com/bgl) and [www.balluff.com/bwl](http://www.balluff.com/bwl) for more information!**

**USA**

Balluff Inc.  
8125 Holton Drive  
Florence, KY 41042  
Phone: (859) 727-2200  
Toll-free: 1-800-543-8390  
Fax: (859) 727-4823  
E-Mail: balluff@balluff.com

**Canada**

Balluff Canada, Inc.  
2840 Argentia Road, Unit #2  
Mississauga, Ontario L5N 8G4  
Phone: (905) 816-1494  
Toll-free: 1-800-927-9654  
Fax: (905) 816-1411  
E-Mail: balluff.canada@balluff.ca

**Mexico**

Balluff de Mexico S.A. de C.V  
Prol. Av. Luis M. Vega #109  
Col. Ampliacion Cimataro  
Queretaro, QRO 76030  
Phone: (+52 442) 212-4882, 224-3583, 224-3171  
Fax: (+52 442) 214-0536  
E-Mail: balluff.mexico@balluff.com