OTV-IML
Incremental Magnetic Linear Encoders

Product Specification | OTV Sensing

OTV-IML-DS-EN-001 · Revision A · 13 November 2026

Compact and miniature readheads, high-speed feedback, separate 5 V / 24 V models, reference and limit signals, motor-track feedback and PCB-level integration.

Contact: thomas@otvsensing.com | https://otvsensing.com/incremental-magnetic-linear-encoders/

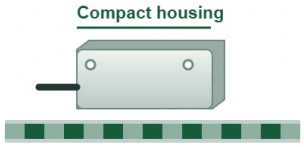
OTV SENSING / INCREMENTAL MAGNETIC LINEAR ENCODERS

Match the readhead to your axis.

Compare mechanical space, motion speed, clearance and integration features.

01 Compact axes

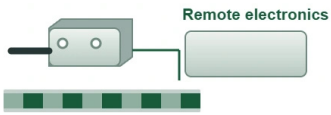
IML200-C33 / C36 / R32



Multiple mounting profiles
0.5 µm resolution options
RS422 differential A/B/Z

02 Small spaces

IML200-M / MR / MX



15 mm-long sensing heads
Remote processing electronics
Mounting-profile options

03 High-speed axes

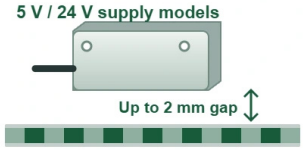
IML200-HS



Up to 11 m/s at 0.5 µm
Non-contact magnetic feedback
RS422 differential A/B/Z

04 Larger clearance

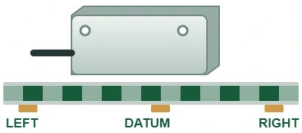
IML500-5V / IML500-24V



1.5 mm recommended gap
RS422 / TTL output options
Single-ended / differential / Sin/Cos

05 Reference & limits

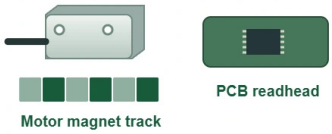
IML200-L



Unique reference configuration
Left and right limit signals
Position and travel I/O in one head

06 Embedded motion

IML-MC / IML200-PCB



Compatible motor magnet tracks
PCB-level linear readheads
Integration-specific configurations

Specifications are configuration-dependent. Match the readhead, scale, output and receiving electronics as a system. Drawings are selection references; the drawing for the ordered configuration governs installation.

01 | Model selection

Model	Supply	Digital resolution	Maximum speed	Main feature
IML200-C33	5 V	Down to 0.5 µm	8 m/s at 0.5 µm	Compact axes; periodic or unique reference
IML200-C36	5 V	Down to 0.5 µm	8 m/s at 0.5 µm	Alternative housing and mounting geometry
IML200-HS	5 V	Down to 0.5 µm	11 m/s at 0.5 µm	High-speed axes and alternative mounting profiles
IML200-M	5 V	0.5 / 1 µm	Up to 5 m/s, configuration-dependent	Small readhead with electronics in DB15 or separate box
IML200-MR	5 V	0.5 / 1 µm	Up to 5 m/s, configuration-dependent	Miniature unique-reference layout
IML200-MX	5 V	0.5 / 1 µm	Up to 5 m/s, configuration-dependent	Thin miniature profile
IML200-R32	5 V	Down to 0.5 µm	8 m/s at 0.5 µm	Unique reference in a 32 mm housing
IML500-5V	5 V	2.5–625 µm selectable	Up to 9 m/s, configuration-dependent	5 V supply; larger mounting clearance
IML500-24V	24 V	2.5–625 µm selectable	Up to 9 m/s, configuration-dependent	24 V supply; separate model identity
IML200-L	5 V encoder supply	1 µm	Up to 5 m/s, configuration-dependent	Unique reference and left/right limit outputs in one head
IML-MC	5 V	1 µm	Up to 5 m/s, configuration-dependent	Read a matched motor magnet track, with UVW commutation
IML200-PCB	5 V	1 / 2 / 10 µm	Up to 5 m/s, configuration-dependent	Board-level incremental feedback for embedded designs

Resolution, positioning accuracy and repeatability are different specifications. Maximum speeds apply only to the stated or selected output configuration. Sin/Cos is an IML500 family option; digital resolution values do not specify analog system resolution.

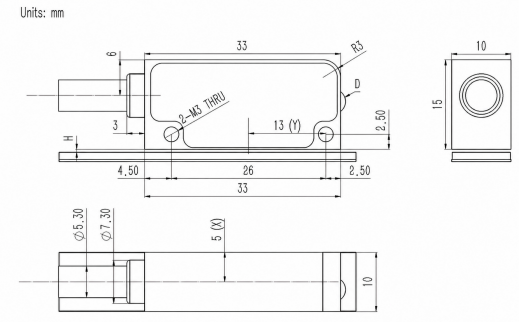
System travel is determined by the matched scale or motor track. A 50 m travel entry is not a 50 m cable rating and does not establish full-travel accuracy.

02 | IML200-C33

Compact axes; periodic or unique reference



Parameter	Specification
Supply voltage	5 V
Supply tolerance	±5%
Current consumption	60 mA maximum at 25 °C
Digital resolution	0.5 / 1 / 2 / 2.5 / 5 µm ordering options
Output	RS422 differential A/B/Z
Positioning accuracy	≤40 µm over the stated 1 m test
Repeatability	±1 µm
Maximum system travel	50 m*
Maximum speed	8 m/s at 0.5 µm
Housing / body size	33 × 15 × 10 mm
Mounting-hole spacing	26 mm
Reading gap	<1 mm
Matched scale	Matched 2 mm MS20-family scale
Reference option	Periodic or unique reference configuration
Operating temperature	−30 to +80 °C
Storage temperature	−40 to +105 °C
Protection	IP67



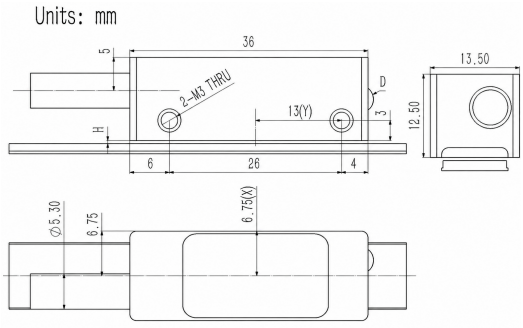
Positioning accuracy: catalogue 1 m laser-interferometer test at 0.5 mm gap. Maximum speed 8 m/s is stated at 0.5 µm resolution.

03 | IML200-C36

Alternative housing and mounting geometry



Parameter	Specification
Supply voltage	5 V
Supply tolerance	±5%
Current consumption	60 mA maximum at 25 °C
Digital resolution	0.5 / 1 / 2 / 2.5 / 5 µm ordering options
Output	RS422 differential A/B/Z
Positioning accuracy	≤40 µm over the stated 1 m test
Repeatability	±1 µm
Maximum system travel	50 m*
Maximum speed	8 m/s at 0.5 µm
Housing / body size	36 × 13.5 × 12.5 mm
Mounting-hole spacing	26 mm
Reading gap	<1 mm
Matched scale	Matched 2 mm MS20-family scale
Reference option	Periodic or unique reference configuration
Operating temperature	−30 to +80 °C
Storage temperature	−40 to +105 °C
Protection	IP67

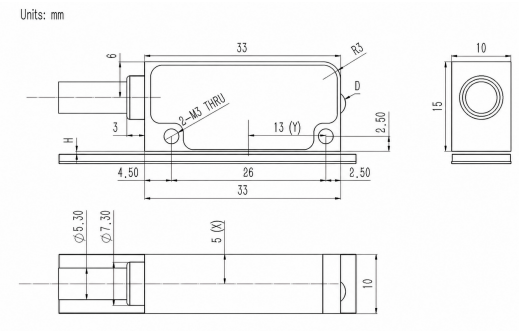


Positioning accuracy: catalogue 1 m laser-interferometer test at 0.5 mm gap. Dimensions are stated as the three body dimensions; use the view orientation on the selected drawing.

04 | IML200-HS

High-speed axes and alternative mounting profiles

Parameter	Specification
Supply voltage	5 V
Supply tolerance	±5%
Current consumption	60 mA maximum at 25 °C
Digital resolution	Down to 0.5 µm; select the required ordering resolution
Output	RS422 differential A/B/Z
Positioning accuracy	≤50 µm over the stated 1 m test
Repeatability	±1 µm
Maximum system travel	50 m*
Maximum speed	11 m/s at 0.5 µm
Reading gap	<1 mm
Matched scale	Matched 2 mm MS20-family scale
Reference option	Reference configuration selected with the scale
Operating temperature	−30 to +80 °C
Storage temperature	−40 to +125 °C
Protection	IP67



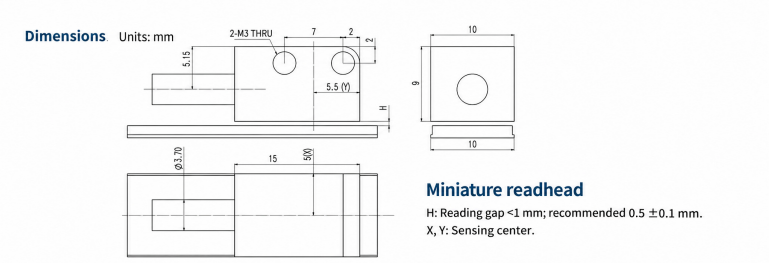
Positioning accuracy: catalogue 1 m laser-interferometer test at 0.2 mm gap. The source covers multiple mounting profiles; shared electrical values do not define one universal housing. The illustrated rectangular mounting profile is a selection reference.

05 | IML200-M / MR / MX

Miniature sensing heads with processing electronics in a DB15 connector or a separate box. Reserve space for both the sensing head and remote electronics.



Parameter	IML200-M	IML200-MR	IML200-MX
Body dimensions	15 × 9 × 10 mm	Selected drawing governs	15 × 9 × 6 mm drawing envelope
Digital resolution	0.5 / 1 µm	0.5 / 1 µm	0.5 / 1 µm
Reference	Selected scale configuration	Unique reference with matched scale	Selected scale configuration
Supply	5 V ±5%	5 V ±5%	5 V ±5%
Current	Idle ≤20 mA; operating ≤50 mA	Idle ≤20 mA; operating ≤50 mA	Idle ≤20 mA; operating ≤50 mA
Output	TTL differential quadrature; selected A/B/Z wiring	TTL differential quadrature; selected A/B/Z wiring	TTL differential quadrature; selected A/B/Z wiring
Positioning accuracy	<30 µm catalogue figure	<30 µm catalogue figure	<30 µm catalogue figure
Repeatability	1–1.5 µm	1–1.5 µm	1–1.5 µm
System travel	50 m, matched-scale dependent	50 m, matched-scale dependent	50 m, matched-scale dependent
Maximum speed	Up to 5 m/s; configuration-dependent	Up to 5 m/s; configuration-dependent	Up to 5 m/s; configuration-dependent
Reading gap	<1 mm; recommended 0.5 ±0.1 mm	<1 mm; recommended 0.5 ±0.1 mm	<1 mm; recommended 0.5 ±0.1 mm
Mounting-hole spacing	7 mm on supplied drawings	7 mm on supplied drawings	7 mm on supplied drawings
Operating temperature	−5 to +60 °C	−5 to +60 °C	−5 to +60 °C
Storage temperature	−10 to +70 °C	−10 to +70 °C	−10 to +70 °C
Protection	IP67 sensor	IP67 sensor	IP67 sensor



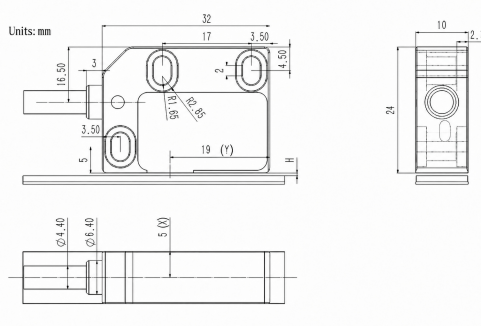
The narrow MX drawing recommends a 5 mm-wide magnetic strip. Cable routing can comprise a head-to-processing section N and an output section M; specify both lengths.

06 | IML200-R32

Unique reference in a 32 mm housing



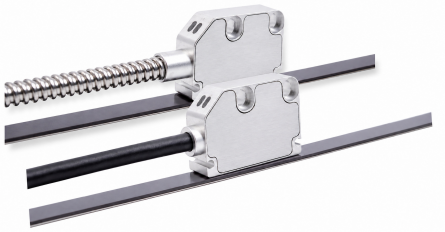
Parameter	Specification
Supply voltage	5 V
Supply tolerance	±5%
Current consumption	60 mA maximum at 25 °C
Digital resolution	Down to 0.5 µm; select the required ordering resolution
Output	RS422 differential A/B/Z
Positioning accuracy	≤50 µm catalogue figure
Repeatability	±1 µm
Maximum system travel	50 m*
Maximum speed	8 m/s at 0.5 µm
Housing / body size	32 × 24 × 10 mm
Mounting-hole spacing	17 mm
Reading gap	<1 mm
Matched scale	Matched MS20 / MSR20 scale configuration
Reference option	Unique reference, with matched scale
Operating temperature	−30 to +80 °C
Storage temperature	−40 to +105 °C
Protection	IP67



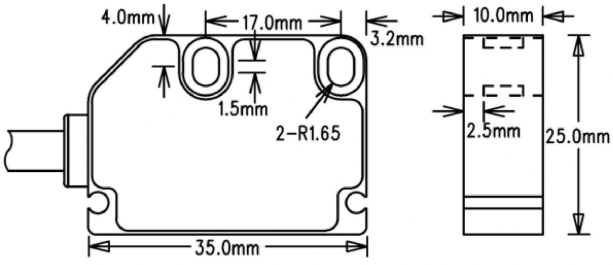
IP67 is the confirmed protection level. Use a matched unique-reference scale configuration. Cable parameters specific to this model are listed in Section 12.

07 | IML500-5V / IML500-24V

Separate ordering models for 5 V and 24 V input power with greater mounting clearance.



Parameter	IML500-5V	IML500-24V
Input supply	5 V ±5%	24 V ±5%
Current: idle / operating	≤20 / ≤50 mA	≤10 / ≤25 mA
Output options	RS422 / TTL; single-ended / differential digital; Sin/Cos analog by configuration	RS422 / TTL; single-ended / differential digital; Sin/Cos analog by configuration
Digital resolution	2.5 / 5 / 10 / 12.5 / 20 / 40 / 50 / 62.5 / 100 / 125 / 200 / 312.5 / 625 µm	2.5 / 5 / 10 / 12.5 / 20 / 40 / 50 / 62.5 / 100 / 125 / 200 / 312.5 / 625 µm
Positioning accuracy	<30 µm catalogue figure	<30 µm catalogue figure
Repeatability	±1 selected digital-resolution increment	±1 selected digital-resolution increment
Maximum speed	Up to 9 m/s; configuration-dependent	Up to 9 m/s; configuration-dependent
System travel	50 / 100 m catalogue configurations; matched scale required	50 / 100 m catalogue configurations; matched scale required
Body dimensions	35 × 25 × 10 mm	35 × 25 × 10 mm
Mounting-hole spacing	17 mm	17 mm
Reading gap	Up to 2 mm; recommended 1.5 mm	Up to 2 mm; recommended 1.5 mm
Matched scale	MS50-family, 5 mm catalogue pitch configuration	MS50-family, 5 mm catalogue pitch configuration
Operating temperature	−5 to +60 °C	−5 to +60 °C
Storage temperature	−10 to +70 °C	−10 to +70 °C
Protection	IP67 sensor	IP67 sensor



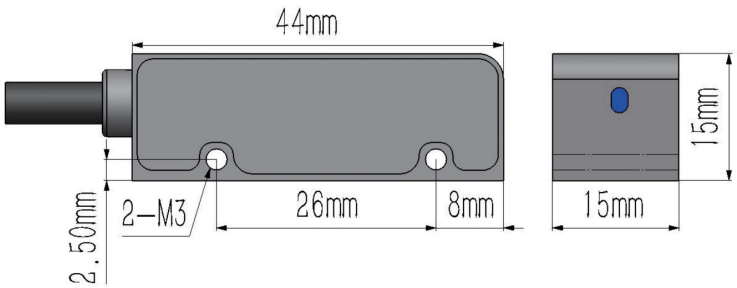
Input supply is not the output signal level. Confirm the chosen interface and receiver. Digital resolution values do not define Sin/Cos system resolution. Analog amplitude, offset and loading limits must be specified for the ordered configuration; no generic 1 Vpp value is assumed.

08 | IML200-L

Unique reference and left/right limit outputs in one head



Parameter	Specification
Supply voltage	5 V encoder supply
Supply tolerance	±5% for encoder supply
Current consumption	Idle <35 mA; operating <65 mA at 5 V
Digital resolution	1 µm
Output	RS422 / TTL differential A/B/Z; open-collector reference/limit I/O
Positioning accuracy	<60 µm catalogue figure
Repeatability	1.5 µm
Maximum system travel	50 m*
Maximum speed	Up to 5 m/s, configuration-dependent
Housing / body size	44 × 15 × 15 mm
Mounting-hole spacing	26 mm
Reading gap	0.2–0.3 mm; 0.2 mm indicated for best accuracy
Matched scale	Matched MS20-family scale and markers
Reference option	Unique reference + left/right limits



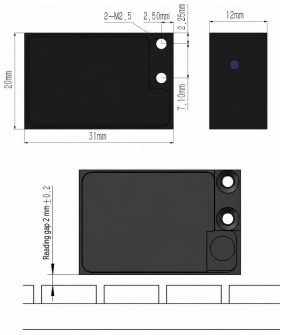
The 5–24 V I/O supply is separate from the 5 V encoder supply. Reference and limit outputs are open collector. These are control-position signals; no functional-safety rating is specified.

09 | IML-MC

Read a matched motor magnet track, with UVW commutation



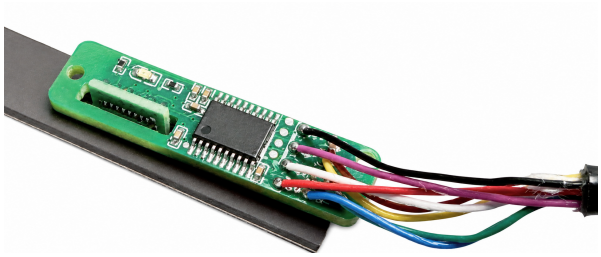
Parameter	Specification
Supply voltage	5 V
Supply tolerance	±5%
Current consumption	Idle ≤30 mA; operating ≤120 mA at 5 V
Digital resolution	1 µm
Output	RS422 incremental A/B + single-ended UVW
Positioning accuracy	<300 µm catalogue figure
Maximum system travel	50 m*
Maximum speed	Up to 5 m/s, configuration-dependent
Housing / body size	31 × 20 × 12 mm
Reading gap	2 mm, excluding protective cover
Matched scale	Matched motor stator magnet track; 20 / 24 / 30 / 32 / 36 mm catalogue pitch options
Reference option	Incremental feedback and UVW commutation
Operating temperature	−5 to +70 °C
Storage temperature	−25 to +125 °C
Protection	IP67 sensor



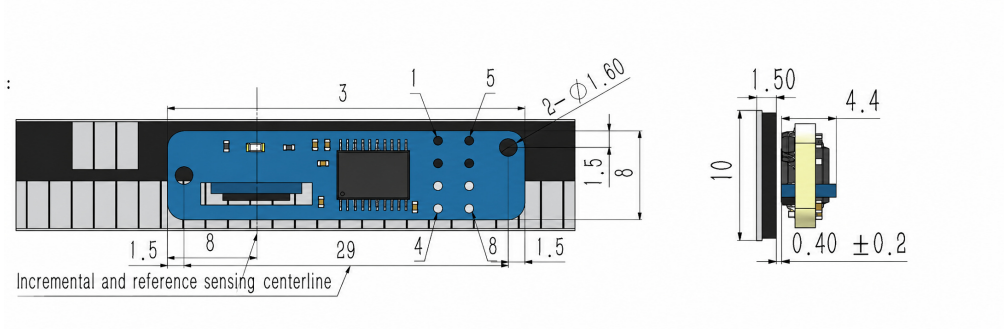
Reads compatible motor stator magnets instead of a separate encoder tape. Catalogue pitch options: 20 / 24 / 30 / 32 / 36 mm. Magnet geometry and UVW alignment must be matched.

10 | IML200-PCB

Board-level incremental feedback for embedded designs



Parameter	Specification
Supply voltage	5 V
Digital resolution	1 / 2 / 10 µm ordering options
Output	TTL / RS422 incremental A/B/Z
Maximum speed	Up to 5 m/s, configuration-dependent
Matched scale	Matched 2 mm magnetic scale
Reference option	Unique reference configuration
Operating temperature	−20 to +80 °C

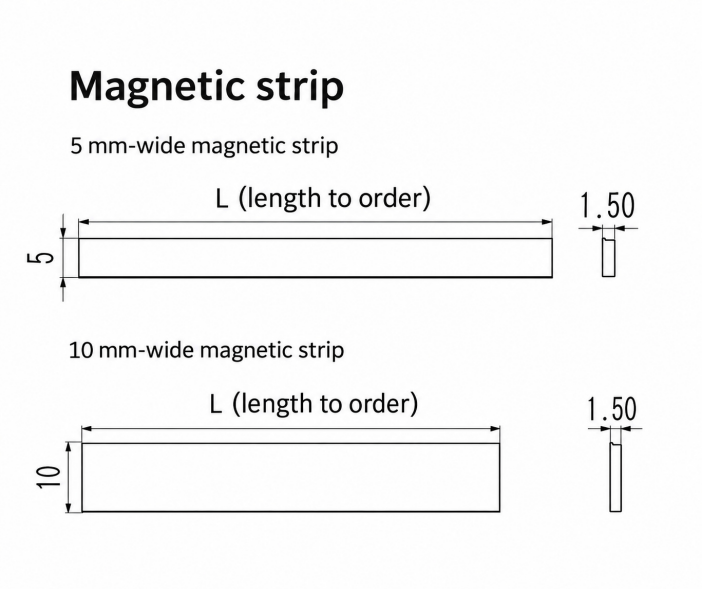


AB output rate is listed as up to 3.5 MHz in the source introduction. This does not establish an achievable rate at every resolution. The supplied drawing defines local mounting and sensing geometry; unlisted body-envelope, accuracy and enclosure ratings are not added.

11 | Matched scales and reference markers

The readhead and magnetic scale are a matched measuring system. Select scale family, mechanical width, mounting gap and reference pattern together.

Scale / track	Compatible family	Mechanical / reference information
MS20 / MSR20	Tape-based IML200 models	2 mm catalogue scale family; supplied strip drawings show 5 / 10 mm widths and 1.5 mm thickness. Select width for the head geometry.
MS50	IML500-5V / IML500-24V	5 mm catalogue scale family. Use the selected MS50 mechanical drawing; do not transfer MS20 dimensions to MS50.
Motor stator magnet track	IML-MC	Compatible 20 / 24 / 30 / 32 / 36 mm catalogue pitch options; no separate encoder tape.
Reference arrangement	Applicable reference models	Periodic or unique reference configurations require the matched strip/marker arrangement. Unique reference is not absolute position at power-up.



Pitch terminology is retained from the supplied catalogue. No conversion between single-pole length, pole-pair pitch and signal period is assumed. Supply usable travel and required datum positions with the order.

12 | Cables, connectors and routing

Item	Specification / scope
C33 / C36 / HS / R32 cable	Catalogue maximum cable length 30 m under the stated laboratory condition with terminal supply reduced to 4.75 V. Verify the complete installation.
Miniature remote layout	Head-to-processing section N plus processing-to-output section M, or processing inside DB15. Examples include 0.5 / 3 / 5 m head leads; specify both sections.
IML500 lead / protection options	0.5 / 1 / 1.5 / 3 / 10 m examples; rubber-jacket or metal-conduit protection; selected flying-lead, DB9 or DB15 termination.
IML-MC / IML200-L	3 m catalogue cable example; selected connector or flying-lead configuration.
IML200-PCB	0.3 / 1 / 1.5 m ordering examples; flying leads, DB9, or board integration as selected.
Custom configuration	Cable length and connectors can be selected for the application.
R32-specific cable jacket	TPU, drag-chain-compatible, shielded twisted-pair construction
R32-specific conductor count	8
R32-specific outside diameter	5.3 ±0.15 mm
R32-specific shielding coverage	>98%
R32-specific internal bend radius	Dynamic: 25 mm; static: 10 mm
R32-specific endurance test	30 million cycles at 37 mm bend radius
R32-specific mass	Nominal 34 g/m

The R32 cable data does not apply automatically to other models. The 30-million-cycle test at 37 mm does not establish the same life at the 25 mm dynamic radius. The source lists conflicting IML500 default lengths; order the required length explicitly. Cable voltage drop, shielding and controller bandwidth must be checked together.

13 | Differential A/B/Z wiring

The following connector assignments are from the standard differential output tables for the C33 / C36 / HS / R32 and applicable miniature configurations. Use the connector view and approved wiring diagram for the ordered cable. A DB15 connector name alone does not identify its two-row or three-row construction.

Signal	Wire color	DB9 male pin	DB15 male pin
+5 V	Red	5	7
0 V / GND	Black	9	2
A+	Green	4	14
A−	Violet	8	6
B+	White	3	13
B−	Blue	7	5
Z+	Yellow	2	12
Z−	Brown	6	4
Shield	Shield / shell	Shell	Shell

A and B are quadrature signals. Select 4-core AB, 5-core ABZ, 6-core differential AB or 8-core differential ABZ only where supplied for the ordered version. Pin functions must be checked before connection.

This table is not a universal IML500 Sin/Cos pinout, and the IML200-L and IML-MC use different signal arrangements. No analog pin assignment is inferred.

14 | Reference/limit and PCB signal assignments

IML-MC supplies differential A/B position signals and single-ended U/V/W commutation signals. Select the compatible magnet-track pitch and controller connection; the presence of Z contacts in a source wiring table is not a general reference-channel guarantee.

IML200-L signal	Wire color	Supply / function
DVCC / DGND	Red / black	Encoder supply: 5 V / ground
A+ / A−	Green / violet	Differential incremental A
B+ / B−	White / blue	Differential incremental B
Z+ / Z−	Yellow / brown	Differential index
AVCC / AGND	Light brown / light green	I/O supply: 5–24 V / ground
R	Orange	Open-collector reference signal
H / T	Gray / pink	Open-collector limit signals
Shield	PE / shield	Shield termination

PCB-level readhead pads

IML200-PCB pad	Signal
1	A−
2	A+
3	0 V
4	5 V
5	B+
6	B−
7	Z+
8	Z−

Reference and limit I/O supply is separate from encoder power. The source describes limit outputs low when not sensing and reference output high when not sensing; verify polarity and pull-up arrangement for the ordered configuration. Do not treat H/T as certified safety limits.

15 | Specify and install the matched configuration

Send the information below to thomas@otvsensing.com for a matched OTV-IML configuration.

Order input	Information to provide
Model / mounting	Selected OTV model, available space and mounting drawing
Travel / motion	Usable travel, maximum speed, acceleration and duty cycle
Position performance	Required digital resolution, positioning accuracy and repeatability
Supply / receiver	5 V or 24 V input model where offered; receiver make/model and signal requirements
Output	RS422 or TTL; single-ended / differential or IML500 Sin/Cos option
Scale / reference	Matched scale family, width, reference positions and limit positions
Cable / connector	Lead length; miniature N and M sections; connector type, pinout and routing
Environment	Operating temperature, contamination, enclosure and bend-cycle requirement
Quantity / schedule	Sample quantity, annual quantity and required delivery date

Installation sequence: mount the matched scale; align the selected head at its specified gap; secure cables within the applicable bend limits; verify supply at the sensor; check A/B direction and index/reference behavior; then validate the full motion range and limit logic.

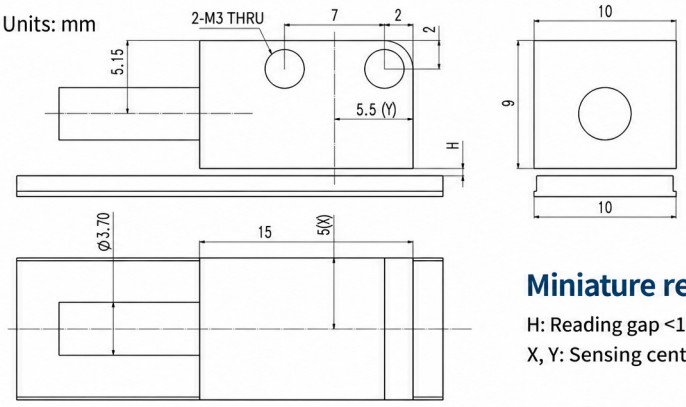
Small sample orders: approximately 1 week after configuration confirmation. Regular orders: approximately 2 weeks; final quotation and order confirmation govern delivery.

Maximum accuracy, speed, gap, output configuration and cable length cannot be assumed to apply simultaneously at every setting. OTV Sensing confirms the selected configuration before supply.

16 | Miniature mounting geometry

Mounting dimensions for the illustrated M and narrow MX profiles. Dimensions in mm; the drawing supplied with the ordered configuration governs.

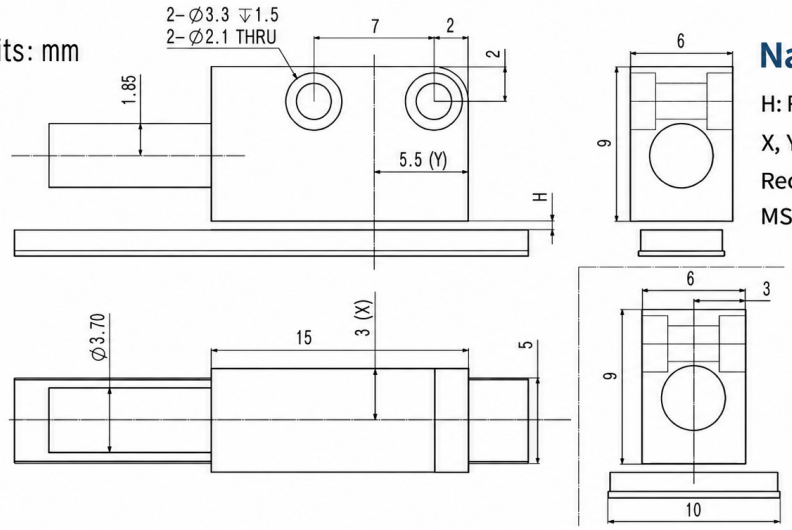
Dimensions Units: mm



Miniature readhead

H: Reading gap <1 mm; recommended 0.5 ±0.1 mm.
X, Y: Sensing center.

Units: mm



Narrow miniature readhead

H: Reading gap <1 mm; recommended 0.5 ±0.1 mm.
X, Y: Sensing center.
Recommended: 5 mm-wide magnetic strip;
MS20-5-XX (length).

For 10 mm-wide magnetic strip.