InteliSENS™ Non-Contact Speed & Length

- Accurate, Reliable, Intelligent
- Non-Contact, Zero Slippage, Laser Doppler Technology
- Automatic Direction Detection with Measurement Down to Zero

PROTON PRODUCTS                      Measure | Control | Qualify                      www.protonproducts.com
PROTON PRODUCTS is a leading manufacturer of instrumentation and control equipment for industrial processes. The Company is owner-managed and manufactures products that are designed and produced in-house. PROTON PRODUCTS continues to expand its range of technologies and applications with affordable, innovative solutions to improve quality and productivity for its customers.

PROTON PRODUCTS InteliSENS family of non-contact laser Doppler speed and length sensors are robustly engineered for harsh metals industry environments, setting new performance standards for hot mills, cold mills and process lines. Their measurement techniques ensure high accuracy without slippage, drift or mechanical wear. The InteliSENS series has no moving parts for maintenance-free operation and delivers repeatable, precise measurement accuracy of better than ±0.05%

Steel & Aluminum Processes:
- Hot Casting Mills: Slab, billet & bloom
- Roughing Mills
- Hot Rolling Mills
- Cold Rolling Mills
- Finishing Mills
- Leveler Lines
- Inspection Tables
- Pickling Lines
- Tinning and Galvanizing Lines
- Process Lines
- Slitting Lines
- Gauge integration

Speed & Length Applications:
- Mass Flow Measurement
- Rolling Process Elongation Control
- Shear & Slitting Control
- Automatic Gauge Control
PROTON PRODUCTS Laser Doppler sensors set new standards of performance with non-contact speed and length measurement for all metals applications. They are designed to replace inaccurate, high-wear, high-maintenance, contacting measurement devices:

► **Precise measurement**: Calibrated to UKAS Product Certification delivers accuracy of between ± 0.02% and ± 0.05% for high operator confidence and utilization. Sensors are subjected to temperature cycling tests before final QC testing. Each sensor is supplied with a unique calibration certificate associated with the sensor serial number.

► **High-resolution measurement**: Tracks minute speed and length product movement for hot and cold rolling applications.

► **High reliability**: Solid-state digital technology with no moving parts for rock solid performance.

► **Intelligent communications**: Standard communications protocols for fast commissioning and easy integration with PLC’s, DCS, automation platforms, reporting systems and metals gauging equipment.

► **Application-matched designs**: Engineered for all metals processes with stand-off distances ranging from 150mm to 2500mm.

► **X-BOX Extreme Environmental Unit**: Rugged double-wall stainless steel enclosure with air wipes, vortex coolers, water cooling and air amplifiers for hot mill operations.

► **S-BOX Harsh Environmental Unit**: Rugged stainless steel enclosure protects the measurement path from airborne cold rolling mill contaminants.
**InteliSENS SLR Series Hot Casting Mill Benefits**

- Direct strand measurement provides accurate, repeatable cut length control
- Crop shear optimization improves caster yield and reduces downstream scrap with discrete plate, billet and bloom length control
- Accurate speed measurement helps optimize chemistry change, ladle changes, spray practice and other casting process variables
- High-resolution, non-contact speed & length measurement with better than 0.05% accuracy provides highly stable continuous caster operations
- Rugged X-BOX Environmental Unit and its optional accessories provides high-reliability measurement for harsh hot-mill environments

**Key Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>± 0.05%</td>
</tr>
<tr>
<td>Internal Measurement Rate</td>
<td>100kHz</td>
</tr>
<tr>
<td>Measurement Output Interval</td>
<td>40μ seconds</td>
</tr>
<tr>
<td>Minimum/Maximum Line Speed</td>
<td>SLR120120: 0/10,000m/min, SLR250200: 0/25,000m/min, SLR200100: 0/5000m/min all bi-directional</td>
</tr>
</tbody>
</table>

**InteliSENS SLR Series Billet & Bloom Benefits**

- Communicates with Automatic Gauge Controls (AGC) to accurately position the roller displacement at each stand for precise elongation measurement, optimum mass flow control and efficient rolling mill performance
- Contact output to an on-line shear unit minimizes scrap through accurate marking and cutting of tube, rod & bar products
- Enables process optimization through high-resolution speed and length measurement from standstill through crawl and reversing operations
- Rugged X-BOX Environmental Unit and its optional accessories provides high-reliability measurement for harsh hot-mill rolling environments

**Standard Communications**

- Ethernet, RS232, RS422/485

**Optional Communications**

- Ethernet/IP, DeviceNET, PROFINET, PROFINET
Hot Casting Mill Applications
Billet, Bloom & Slab

Hot Billet & Bloom Rolling Applications
Tube, Rod, Bar, Rail & Structural
InteliSENS SLR Series Hot Roughing & Roughing Mill Benefits

► Communicates with Automatic Gauge Controls (AGC) to accurately position the roller displacement at each stand for precise elongation measurement, optimum mass flow control, maximum reversing mill productivity and high quality

► Speed measurement provides coil box synchronization, crop optimization and cooling control

► Accurate, high-resolution speed and length measurement enables tight process optimization from standstill through crawl and reversing operations

► Contact output to an on-line shear unit minimizes scrap through accurate marking and cutting of discrete lengths

► Rugged X-BOX Environmental Unit and its accessories provides high-reliability measurement for harsh hot-mill environments

Key Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>± 0.05%</td>
</tr>
<tr>
<td>Internal Measurement Rate</td>
<td>100kHz</td>
</tr>
<tr>
<td>Measurement Output Interval</td>
<td>40µs seconds</td>
</tr>
<tr>
<td>Minimum/Maximum Line Speed</td>
<td>SLR120120: 0/10,000m/min</td>
</tr>
<tr>
<td></td>
<td>SLR250200: 0/10,000m/min</td>
</tr>
<tr>
<td></td>
<td>SLR200100: 0/5000m/min</td>
</tr>
<tr>
<td></td>
<td>all bi-directional</td>
</tr>
<tr>
<td>Standard Communications</td>
<td>Ethernet, RS232, RS422/485</td>
</tr>
<tr>
<td>Optional Communications</td>
<td>Ethernet/IP, DeviceNET, PROFIBUS, PROFINET</td>
</tr>
</tbody>
</table>
Hot Roughing Mill Applications
Roughing, Edger and Plate Reversing

Mass Flow Automatic Gauge Control

Hot Rolling Mill Applications
Hot Strip, Skelp & Plate Rolling

Mass Flow Automatic Gauge Control

PROTON PRODUCTS  Measure  Control  Qualify  www.protonproducts.com
IntelliSENS SLM Series Cold Rolling Mill Benefits

- Communicates with Automatic Gauge Controls (AGC) to accurately position the roller displacement at each stand for precise elongation measurement, optimum mass flow control, maximum cold rolling productivity and high quality.
- Accurate, high-resolution speed and length measurement enables process optimization from standstill through crawl and normal running.
- Contact output to an on-line shear unit minimizes scrap through accurate marking and cutting of discrete sheet, strip and foil products.
- S-BOX Air accelerator removes laminar surface lubricants to provide a clean optical path for greater measurement accuracy and reliability.
- Rugged S-BOX Environmental Unit and its optional accessories provides high-reliability measurement performance for harsh cold rolling mill environments.

Key Specifications

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>± 0.05%</td>
</tr>
<tr>
<td><strong>Internal Measurement Rate</strong></td>
<td>100kHz</td>
</tr>
<tr>
<td><strong>Measurement Output Interval</strong></td>
<td>40µ seconds</td>
</tr>
<tr>
<td><strong>Minimum/Maximum Line Speed</strong></td>
<td>0/10,000m/min uni-directional</td>
</tr>
<tr>
<td><strong>Standard Communications</strong></td>
<td>Ethernet, RS232, RS422/485</td>
</tr>
<tr>
<td><strong>Optional Communications</strong></td>
<td>Ethernet/IP, DeviceNET, PROFIBUS, PROFINET</td>
</tr>
</tbody>
</table>
Cold Rolling Mill Applications
Sheet, Strip & Foil

Optimize Cold Rolled Products with AGC
... balance multi-stand rolling operations for increased productivity
InteliSSENS SL/SLR Series Metals Coating Benefits

- Non-contact measurement avoids surface marking of coated finishes
- Accurate measurement without slippage, bounce or dirt accumulation
- Coordinated coat weight control efficiency during production transitions is considerably improved with accurate speed measurement
- High-resolution, non-contact speed & length measurement provides stable line speed control for uniform machine direction coat weight distribution
- Contact output to an on-line shear unit minimizes scrap through accurate marking and cutting of discrete coil lengths
- Rugged S-Box Environmental Unit and its optional accessories protects the sensor and measurement path from airborne contaminants

Key Specifications

<table>
<thead>
<tr>
<th></th>
<th>Accuracy</th>
<th>± 0.05%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Measurement Rate</td>
<td></td>
<td>200kHz</td>
</tr>
<tr>
<td>Measurement Output Interval</td>
<td></td>
<td>20µ seconds</td>
</tr>
<tr>
<td>Minimum/Maximum Line Speed</td>
<td></td>
<td>0.82/5,000m/min</td>
</tr>
</tbody>
</table>

Standard Communications

- Ethernet, RS232, RS422/485

Optional Communications

- Ethernet/IP, DeviceNET, PROFINET, PROFINET
InteliSENS SL/SLR Series Converting Line Benefits

- High measurement accuracy without slippage, bounce or dirt accumulation as with contacting encoders
- Rugged, reliable industrial design for many process line converting applications
- Precise speed and length measurement during line crawl and reversing operations
- Supports marking and cutting controls for discrete coil and metals foil lengths via a contact output to an on-line process shear
- Accurate cut length control avoids high value-add product give-away and short length delivery complaints

InteliSENS SL/SLR Series Gauge Integration Benefits

- Straightforward, cost-effective measurement integration solution with on-line thickness gauges without complex interconnections/ power supplies/communications devices/ air systems or environmental equipment

Key Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>SL6060</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>± 0.05%</td>
</tr>
<tr>
<td>Internal Measurement Rate</td>
<td>100kHz</td>
</tr>
<tr>
<td>Measurement Output Interval</td>
<td>40µ seconds</td>
</tr>
<tr>
<td>Minimum/Maximum Line Speed</td>
<td>0.82/5,000m/min</td>
</tr>
</tbody>
</table>

Standard Communications
- Ethernet
- RS232
- RS422/485

Optional Communications
- Ethernet/IP
- DeviceNET
- PROFINET
- PROFIBUS

PROTON PRODUCTS  Measure | Control | Qualify  www.protonproducts.com
Process Lines & On-Line Gauging Applications

Precision Cut-to Length Converted Products
...avoids product give-away and short-length delivery
X-BOX Environmental Unit: Stainless steel double-wall environmental protection housing for hot rolling mills. Includes unified electrical connector for electrical and communications plus air wipe and water cooling ports. Conforms to Class A Heavy Industrial CE and EMC Standards.

Air Driven Vortex Cooler (option): The X-BOX enclosure is fitted with a vortex cooler tube. The cold air stream is fed into the X-BOX to both cool the SLR gauge and provide airflow to keep dust, fumes and contaminants out of the enclosure. The hot air stream is vented out of the top of the vortex cooler tube.

Air Amplifier: Clean, high-pressure air (4-5 bar) is routed to the air amplifier at high-speed into the laser beam tube to create a cool, dry, clean measurement environment.

Gauge Water Cooling (option): SLR gauges may be water cooled via the integrated base block of the gauge for use with ambient temperatures above 50°C.

Air Wipe (option): Quick change window and air wipe unit for use in environments where condensation or particulates may be deposited on the optical window.

X-BOX Heat Baffle: Two sheet metal heat shields are mounted at the front of the enclosure to further isolate the unit from heat emanating from hot products.

Water Cooling Plate (option): The front of the X-BOX enclosure is fitted with a water cooling plate for additional cooling in very high temperature environments.

Shutter: In the event of a lost air purge, a manually operated shutter in the laser beam tube prevents contaminant entry.

Unified Electrical and Communications Connector: A single heavy-duty connector provides unified electrical and communications access to the enclosed gauge. The INTERFACE and CAN/Power are fully accessible as well as the RS232 & PROFIBUS ports.

A 10m oilproof tape (option) armored replaceable cable connects to the enclosure.

Unified Services Unit (not shown): Provides filtered air which is dust, water and oil free.
Used to drive vortex coolers, air amplifiers and air wipes.

3D & Height Adjuster: Provides remote gauge height to optimally position the gauge distance to the product for the ideal depth of measurement field. Controlled via a communications link from the plant’s automation system, the 3D & Height Adjuster is installed inside the X-BOX enclosure.
**S-BOX for Rolling Mill & Harsh Process Environments**

Measurement Protection from Airbourne Contaminants

---

**S-BOX Environmental Unit:** Stainless steel environmental protection housing for harsh mill environments. Includes unified electrical connector for electrical and communications plus air wipe and water cooling ports. Conforms to Class A Heavy Industrial CE and EMC Standards.

**Unified Electrical and Communications Connector:** A single heavy-duty connector provides unified electrical and communications access to the enclosed gauge. The INTERFACE and CAN/Power are fully accessible as well as the RS232 & PROFIBUS ports. A 10m oilproof tape (option) armored replaceable cable connects to the enclosure.

---

**Air-Driven Vortex Cooler (option):**
The S-BOX enclosure is fitted with a vortex cooler tube. The cold air stream is fed into the S-BOX to both cool the SL gauge and provide airflow to keep dust, fumes and contaminants out of the enclosure. The hot air stream is vented out of the top of the vortex cooler tube.

**Gauge Water Cooling (option):** SL gauges may be water cooled via the integrated base block of the gauge for use with ambient temperatures above 50°C.

**Air Amplifier:** Clean, high-pressure air (4-5 bar) is routed to the air amplifier at high-speed into the laser beam tube to create a cool, dry, clean measurement environment.

**Water Cooling Plate (option):** The front of the S-BOX enclosure is fitted with a water cooling plate for additional cooling in very high temperature environments.

**Air Wipe (option):** Quick change window and air wipe unit for use in environments where condensation or particulates may be deposited on the optical window.

**Shutter:** In the event of a lost air purge, a manually operated shutter in the laser beam tube prevents contaminant entry.

**Air Services Unit (not shown):** Provides filtered air which is dust, water and oil free.

Used to drive vortex coolers, air amplifiers and air wipes.

---

**3D & Height Adjuster:** Provides remote gauge height to optimally position the gauge distance to the product for the ideal depth of measurement field. Controlled via a communications link from the plant’s automation system, the 3D & Height Adjuster is installed inside the S-BOX enclosure.
### InteliSENS SLR Series: Hot casting mill and hot rolling mills

**Measurement Configuration**

<table>
<thead>
<tr>
<th>InteliSENS SLR Series</th>
<th>SLR200100: Min Speed 2.7m/min. Min. Cut Speed 0.13m/min</th>
<th>SLR120120: Min Speed 4.0m/min. Min. Cut Speed 0.2m/min</th>
<th>SLR250200: Min Speed 2.9m/min. Min. Cut Speed 0.2m/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLR200100</td>
<td>Air Driven Vortex Cooler</td>
<td>Air Driven Vortex Cooler</td>
<td>Air Driven Vortex Cooler</td>
</tr>
<tr>
<td>SLR120120</td>
<td>Air Amplifier</td>
<td>Air Amplifier</td>
<td>Air Amplifier</td>
</tr>
<tr>
<td>SLR250200</td>
<td>Gauge Water Cooling Plate (option)</td>
<td>Gauge Water Cooling Plate (option)</td>
<td>Gauge Water Cooling Plate (option)</td>
</tr>
<tr>
<td></td>
<td>Air Wipe (option)</td>
<td>Air Wipe (option)</td>
<td>Air Wipe (option)</td>
</tr>
<tr>
<td></td>
<td>Shutter</td>
<td>Shutter</td>
<td>Shutter</td>
</tr>
<tr>
<td></td>
<td>3D &amp; Height Adjuster (option)</td>
<td>3D &amp; Height Adjuster (option)</td>
<td>3D &amp; Height Adjuster (option)</td>
</tr>
<tr>
<td></td>
<td>Heat Baffle Shield Plates</td>
<td>Heat Baffle Shield Plates</td>
<td>Heat Baffle Shield Plates</td>
</tr>
<tr>
<td></td>
<td>Unified Electrical &amp; Communications Connectors</td>
<td>Unified Electrical &amp; Communications Connectors</td>
<td>Unified Electrical &amp; Communications Connectors</td>
</tr>
</tbody>
</table>

**SLR Series**

| SLR200100              | Stand-off Distance mm (in)                                | 1200 (47.2)                                          | 2000 (78.7)                                          |
| SLR120120              | Depth of field mm (in)                                    | 120 (4.72)                                           | 150 (5.91)                                           |
| SLR250200              | Maximum Speed m/min (ft/min)                              | 10000 (32800)                                       | 5000 (16400)                                        |
|                        | Measurement Update Rate (kHz)                            | 100                                                  | 100                                                  |
|                        | Measurement Output Rate (µs)                             | 40                                                   | 40                                                   |

### InteliSENS SL Series: Cold rolling mills

**Measurement Configuration**

<table>
<thead>
<tr>
<th>InteliSENS SL Series</th>
<th>SL120120</th>
<th>SL200200</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL120120</td>
<td>Stand-off Distance mm (in) 1200 (47.2)</td>
<td></td>
</tr>
<tr>
<td>SL200200</td>
<td>Depth of field mm (in) 120 (4.72)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum Speed m/min (ft/min) 10000 (32800)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Measurement Update Rate (kHz) 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Measurement Output Rate (µs) 40</td>
<td></td>
</tr>
</tbody>
</table>

**SL Series**

| SL120120             | Power supply and cable connection to the S-BOX. Supplies 24Vdc sensor power. |
| SL200200             | Power supply and cable connection to the S-BOX. Supplies 24Vdc sensor power. |

**Environmental Unit**

- Air-Driven Vortex Cooler
- Air Amplifier
- Gauge Water Cooling Plate (option)
- Air Wipe (option)
- Shutter
- 3D & Height Adjuster (option)
- Heat Baffle Shield Plates
- Unified Electrical & Communications Connectors

**Oilproof, Armored Cable**

Connects between the S-BOX and the Connector Box. Breakaway cable reduces replacement time, cost & sensor damage. 10m oilproof, tape- armored cable.

**Connector Box**

Breakaway connector box protects equipment in event of process damage.

**BT100**

Power supply and cable connection to the S-BOX. Includes DB9 connectors to access CAN, RS-232 and PROFIBUS ports. Supplies 24Vdc sensor power.

**SiDi-CDi4 Display & Mounting Kit**

Slimline color touch screen that connects via a CANbus cable. Enables the user to configure all measured parameters, including trending and graphical data.

**USB-RS232**

Converter cable RS232 9 Pin D type connector on one end and a USB connector on the other.

**PROTON PRODUCTS**

Measure | Control | Qualify | www.protonproducts.com
## InteliSENS SL/SLR Series: Process coating lines

**Measurement Configuration**

<table>
<thead>
<tr>
<th>InteliSENS SL/SLR Series</th>
<th>SLR6060</th>
<th>SLR100100</th>
<th>SLR120120</th>
<th>SL6060</th>
<th>SL100100</th>
<th>SL120120</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stand-off distance mm (in)</strong></td>
<td>600 (23.6)</td>
<td>1000 (39.37)</td>
<td>1200 (47.2)</td>
<td>600 (23.6)</td>
<td>1000 (39.37)</td>
<td>1200 (47.2)</td>
</tr>
<tr>
<td><strong>Depth of field mm (in)</strong></td>
<td>60 (2.36)</td>
<td>100 (3.94)</td>
<td>120 (4.72)</td>
<td>60 (2.36)</td>
<td>100 (3.94)</td>
<td>120 (4.72)</td>
</tr>
<tr>
<td><strong>Max speed ± m/min (± ft/min)</strong></td>
<td>5000 (16400)</td>
<td>10000 (32800)</td>
<td>10000 (32800)</td>
<td>5000 (16400)</td>
<td>10000 (32800)</td>
<td>10000 (32800)</td>
</tr>
<tr>
<td><strong>Measurement update rate (kHz)</strong></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Measurement output rate (µs)</strong></td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

## InteliSENS SL/SLR Series: Converting lines & gauge integration

**Measurement Configuration**

<table>
<thead>
<tr>
<th>InteliSENS SL/SLR Series</th>
<th>SLR6060</th>
<th>SLR100100</th>
<th>SLR120120</th>
<th>SL6060</th>
<th>SL100100</th>
<th>SL120120</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stand-off distance mm (in)</strong></td>
<td>600 (23.6)</td>
<td>1000 (39.37)</td>
<td>1200 (47.2)</td>
<td>600 (23.6)</td>
<td>1000 (39.37)</td>
<td>1200 (47.2)</td>
</tr>
<tr>
<td><strong>Depth of field mm (in)</strong></td>
<td>60 (2.36)</td>
<td>100 (3.94)</td>
<td>120 (4.72)</td>
<td>60 (2.36)</td>
<td>100 (3.94)</td>
<td>120 (4.72)</td>
</tr>
<tr>
<td><strong>Max speed ± m/min (± ft/min)</strong></td>
<td>5000 (16400)</td>
<td>10000 (32800)</td>
<td>10000 (32800)</td>
<td>5000 (16400)</td>
<td>10000 (32800)</td>
<td>10000 (32800)</td>
</tr>
<tr>
<td><strong>Measurement update rate (kHz)</strong></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Measurement output rate (µs)</strong></td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>
**Principle of Operation**

\[ d = \frac{\lambda}{2 \sin K} \]  
- Fringe spacing is a function of laser wavelength and beam angle

\[ f \propto \frac{v}{d} \]  
- Doppler frequency is proportional to speed and inversely proportional to fringe spacing

\[ L = \int_0^T dvt \]  
- Speed is integrated to measure length

- A Bragg Cell is incorporated into the SLRM and SLR sensors for ‘standstill’ reversing mill measurement

**General Specifications**

<table>
<thead>
<tr>
<th>Measurement Units (Configurable)</th>
<th>Speed</th>
<th>meters/minute</th>
<th>feet/minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
<td>meters</td>
<td>feet</td>
</tr>
<tr>
<td>Length</td>
<td></td>
<td></td>
<td>yards</td>
</tr>
</tbody>
</table>

**Laser Safety Control Inputs**

- Laser: External closed SPST contact enabled laser diode
- Shutter: External closed SPST contact opens laser diode

**2x Logic Inputs (Configurable)**

- Electrical: Maximum voltage: +24Vdc
- Function:
  - Length reset
  - Display Hold
  - Length Hold
  - Speed hold
  - Direction
  - Pause

**3x Relay Outputs (Configurable)**

- Electrical: Isolated floating relay contacts
- Maximum voltage 50Vdc
- Maximum current: 0.5A
- Function:
  - Gauge OK
  - Laser at temp
  - Shutter open
  - Laser on
  - Measuring
  - Preset length 1
  - Preset length 2

**3x Pulse Outputs (Configurable)**

- Electrical: Opto-isolated differential pairs
- Output voltage: 5V or user supplied (up to 24v)
- Maximum frequency: 250kHz
- Function:
  - Quadrature
  - Index

**Analog Output (Configurable)**

- Electrical: Output voltage: 0 to 10v (end-user scalable)
- Function:
  - Speed
  - Good readings

**CANbus Communications**

- Connects to an optional PROTON PRODUCTS AIG2 interface display unit

**Serial Communications**

- RS232
- RS-422 / 485

**Optional Communications**

- (Factory installed, choice of one)
  - PROFIBUS
  - Ethernet/IP
  - DeviceNET

**Optional wireless communications**

- (Factory installed)
  - Bluetooth
InteliSENS Speed & Length Measurement:
Application-matched speed & length measurement for RESULTS
InteliSENS Speed & Length Measurement
... Innovative, robust measurements for the Metals Industries