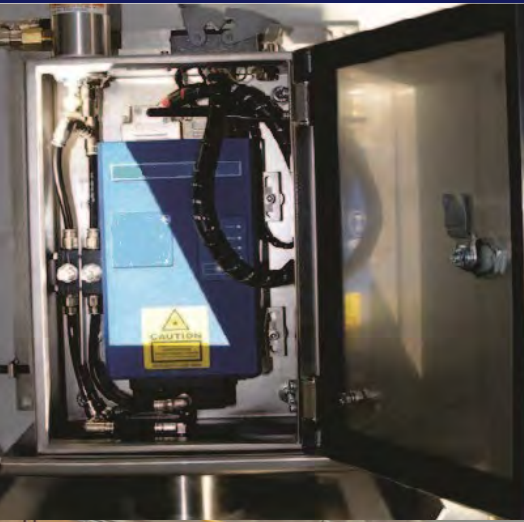




LASER SPEED & LENGTH

MEASUREMENTS



NEW:
SBOX-V Modular System and
SBOX-L Baukasten System

Metal Industries

INTRODUCTION

- **VLX and VLZ Series** gauges directly replace traditional, high maintenance, contact-type speed & length measuring devices, with accurate “state-of-the-art” Laser Doppler Technology.
- **Easy to install, integrate and use** on production Processes such as hot and cold rolling, hot strip slab lengths, billet crop shear, pipe/tube/rod Mill, continuous casting, temper mill, elongation control, process lines (coating, forming, slitting, cutting) as well as on non-ferrous extrusion and rolling processes.
- **Simple Integration** into any process has never been more easy. A multiplicity of Interfaces are provided to satisfy the most demanding process engineer.
- **Fast Payback and increase profit** Accurate, non-contact Laser Doppler Technology for Speed or Length control, provides process optimisation, reduces scrap, increases uptime and improves material yield.
- **Harsh Applications** : Standard VLX or VLZ Sensors and special engineered Harsh environment sensors in SLH, SLX or SLX-H Environmental Enclosures are available for applications on Hot Mills and Harsh environments, specific to the Metallurgical, Metal and Steel Industries.

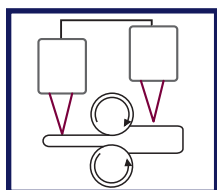
NON-CONTACT LASER DOPPLER SPEED AND LENGTH



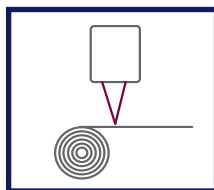
- **Accuracy:** Better than 0.05%
- **Repeatability:** Better than 0.02%
- **Non-Contact:** no slippage, no wear, on any surface !
- **No Moving Parts:** no wear, no drift, no maintenance
- **Industrial Design:** for Extreme factory environments
- **Easy Integration:** modern communications
- **Simple Operation:** no operator settings required
- **Permanent Calibration:** calibrated to UKAS traceable standards
- **Reliable:** 24/7 Technology
- **Excellent Value:** low cost of ownership



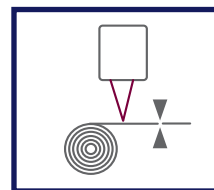
Some APPLICATIONS



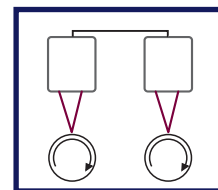
Differential Speed control on hot or cold sequential rolling Mill



Speed/Length control on process lines



Cut to length control on coil, profile, tube, rod or steel wire process lines



Speed synchronisation and Speed balancing

NON CONTACT LASER DOPPLER: NO SLIPPAGE, NO WEAR !



Cut to length control on continuous tube welding line.



VLX120120 High Temperature Unit with combined Water and Air Cooling designed for Hot mills and harsh applications.

CONNECT UP TO THE WORLD OF AUTOMATION

What no mechanical Speed or Length measuring system can offer you, you may expect from the FAE non-contact Laser Doppler Sensors.

Whether connecting to PLC, PC, Scada, Network, Electronic Counters, etc...just make your choice from a host of interfaces to choose from: canbus, RS232, RS422, modbus, Ethernet TCP, Ethernet UDP, Industrial IP, profibus, profinet, devicenet, pulse outputs, analogue output, etc

CALIBRATION & CERTIFICATION

Following manufacture, every Sensor is tested for a period of 24 hours at an environmental temperature of 50°C. Then each unit is calibrated prior to shipping on a calibration rig to UKAS traceability. A dedicated Calibration Certificate to UKAS Traceability is supplied with each unit. Obtained accuracy is within 0.02-0.03% typical.



LASER SAFETY REGULATIONS

The gauge contains a Class 3B Laser Diode and complies with the European Safety Norm BS EN60825-1 and has the following safety provisions in compliance with the Bureau of Radiological Health Class 3B:

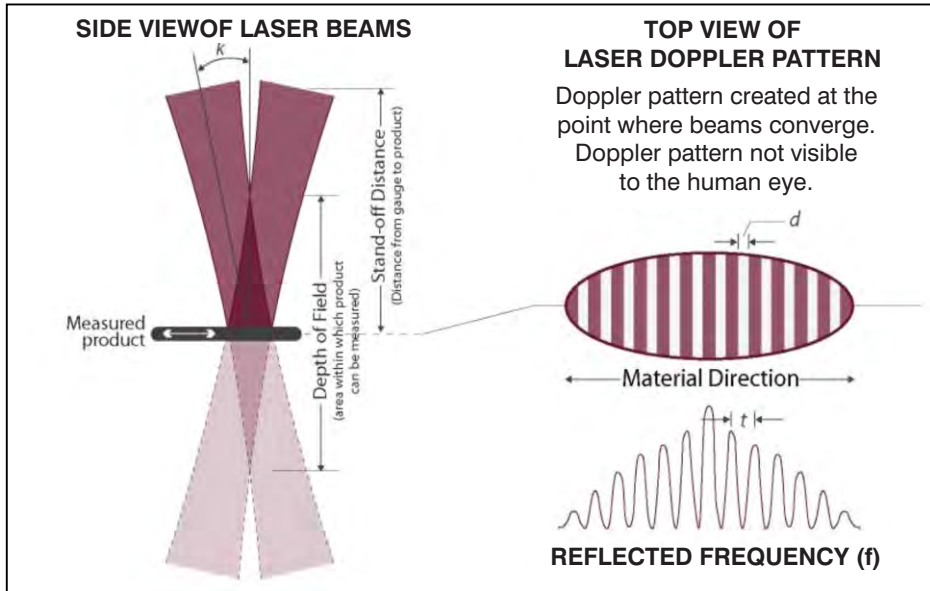
- Laser Emission Indication Light.
- Delayed Laser Start-up: Laser Emission indicator on before Laser reaches full power.
- Key-operated on-off Laser-switch provided (on Laser Interface Units)
- Laser Shutter: Laser beam blocking device: mechanical shutter with remote control

**VISIBLE LASER RADIATION
AVOID DIRECT EXPOSURE
TO BEAM
20mWmax
Wavelength λ : 620 - 690 nm
CLASS 3B LASER PRODUCT**

VLX & VLZ LASER DOPPLER TECHNOLOGY

The know-how of FAE in the field of Laser Optics, State of the Art micro Electronics, Fast Field Programmable Gate Arrays (FPGA), Fourier Transformation Technology (FFT) and Auto Correlation Technology, results in probably the most accurate and fastest non-contact Laser Doppler Sensor available today.

LASER DOPPLER



ULTRA- FAST OUTPUTS

Measuring Speed and Length is just one thing, but the Measuring Frequency and update rate as well as the Transmission Speed of data to the host system, relative to dynamic product speed variations, is another thing! VLX & VLZ provide unequalled Pulse Frequencies up to 1 Mhz and **an update Speed of 0.04mSec** which makes the system suitable for the most dynamic speed control and length control applications.

VLX & VLZ LASER DOPPLER SENSORS with SLX ENCLOSURES



For harsh or very Hot Environments, FAE provides Standard VLX and VLZ or SLH and SLX Series of Sensors, each of them provided with various levels of cooling and protection.



STANDARD VLX Series and VLZ Series LASER DOPPLER Sensors

Standard VLX and VLZ Series Sensors are designed for “cold applications”, this means for normal environmental environments up to max 45°C. Although the Standard VLX and VLZ Series Sensor have standard a cooling channel embedded into its base, whereby air or water may be used for cooling, it only provides a base cooling that is in no way sufficient to protect the unit against extreme radiation levels of large (red) hot steel objects to be measured. Thus Standard Sensors can only be used up to 45°C ambient or 60°C ambient with the embedded cooling using pneumatic air or water as a cooling medium.

UNI-DIRECTIONAL and BI-DIRECTIONAL Systems

UNI-DIRECTIONAL VLX SERIES:

A Standard VLX SERIES Laser Doppler gauge cannot measure down to ZERO SPEED and cannot differentiate in Direction of movement. Most processes cannot change in direction, hence the fact that a Standard Laser Doppler System cannot differentiate direction of movement is not an issue. However Standard laser Doppler Systems have a minimum speed. The reason is that a Doppler signal is not available at stationary object. It requires a minimum speed to generate Doppler. The standard UNI-DIRECTIONAL VLX SERIES Laser Doppler systems have the lowest minimum speed of units available on the market !



Standard VLX Series Laser Doppler Speed Sensor, here shown with Air Pressured Lens Protection window and cooling in and outlets to the Base. May be used for Environmental Temperatures in the range 45°C to 60°C. FAE advices on the cooling requirements to be applied.

BI-DIRECTIONAL VLZ SERIES

VLZ SERIES Laser Doppler gauges use special opto-electronics technology and can detect the direction of motion and operate as from **ZERO SPEED**.



Standard VLZ Series Laser Doppler Sensor

APPLICATIONS OF STANDARD VLX AND VLZ SENSORS

VLX and **VLZ** Sensors are installed in Industrial processes worldwide. Many of these are in the metals industries for either Speed Control, Cut to length or Inspection of already cut length. Applications are numerous and references include very large multi national companies. It is not possible to list here all applications, but if you require details on specific applications please consult us.

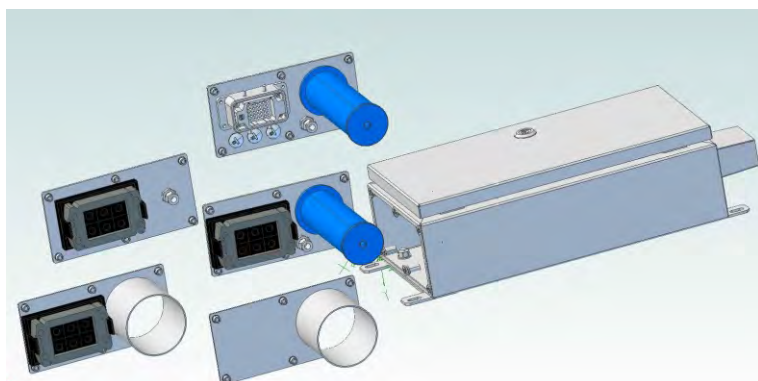


SI3060 Unit installed on a Steel bar inspection line.

SLX SERIES ENVIRONMENTAL ENCLOSURES

SBOX-V "Modular System"

The full stainless environmental Enclosure type SBOX-V "Modular System" offers various advantages and application flexibility.



The SBOX-V (400 x 200 x 120 mm) , made from 2 mm thick Stainless Steel.

The SBOX-V features a choice of 5 alternative top plates, providing unlimited flexibility in terms of application and configuration, at very moderate costs. Cooling with VORTEX Aircooler or by fresh air from an Air-Station.

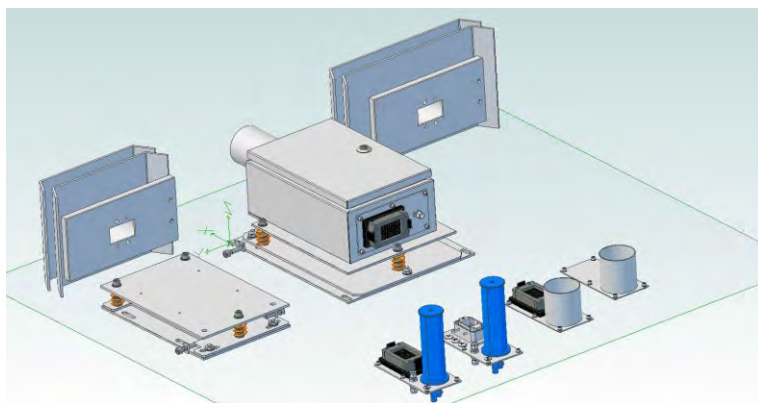
SBOX-L "Baukasten System"

The SBOX-L follows the same concept as the SBOX-V.

The SBOX-L is a very heavy Duty Environmental Enclosure designed for very harsh Cold , medium Hot or extreme Hot applications such as Hotcasters, Hot forming or Hot Rolling Mills, Cold Rolling Mill Applications, etc...

THE SBOX-L is virtually indestructible. It measures 360 x 250 x 150mm (without the nosing). It is designed for 600, 1200 and 2000 mm VLX and VLZ Series.

Likewise the SBOX-V the SBOX-L can be fitted with a selection of different Top Plates.



This Lay-Out shows the SBOX-L Baukasten System Basically there is one SBOX-L Basic Housing, which can be combined with a narrow or wide Base Plate with Spring Mounts and Micro adjusts. For High Radiation applications, either a narrow or wide Double Heat Deflector may be mounted with water cooled Baffle. There is a choice of 4 Back Plates, designed for either VORTEX TUBE COOLING or for EXTERNAL "AIR STATION" FAN COOLING.



SBOX-L Heavy Duty Environmental Enclosure

- Full Modular Design
- Standard or Slim-line Double Heat Deflector Plates
- Standard or Slim-line Water Cooled Radiation Baffle
- Double Tube Nosing
- Quick Change Air Pressured Window
- Cooled by VORTEC Tube Cooler
- All Cabling to Industrial HARTING connector
- Spring Loaded Mounting arrangement with fine adjust for rotation and perpendicularity
- Fully Stainless Steel
- Sturdy hinged door
- Indestructible design
- Mill proven design



SLX ENCLOSURE

The SLX is designed for the types 1200 or 2000 mm Stand-off Laser Doppler Sensors. The SLX is manufactured entirely in Stainless Steel. Designed for use into Aluminium or wet rolling mills. It provides cooling (provided from an Air Station) and several designed features for protection.



In Terms of Air Stations, we can supply Air Blowers up to 1200 Pa Pressure.

The above illustrations show some of the aspects of the SLX Environmental enclosure

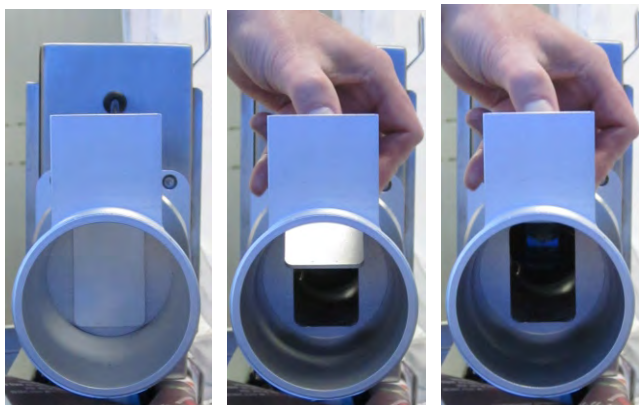
- Sturdy hinged door makes airtight seal with the enclosure
- All connections of the laser (Interface, profiBUS, Ethernet, canBUS, etc...) internally wired to a Military type socket
- Assembled Air (or water cooling) connections to the Base of the laser
- Quick Change Window with Air Cleaner fitted
- Long extended nosing encapsulates Laser path to object (possibility to skirt nosing down to object by flex tube front-end)
- Shutter designed into Nosing
- Cooling from Centrifugal Force Fan

Engineering Detail: Shutter designed into the SLX Nosing.

This shutter is pneumatically operated and opens the shutter only when the Mill is into operation.

Obviously this requires the air supply (to open the shutter) to be controlled by PLC.

With closed shutter, the SLX is hermitically sealed for protection. Whilst the shutter is open, the internal of the SLX is heavily positive air pressured from the Air Station. With these provisions, VLX & VLZ Laser Sensors can operate reliable and without maintenance in the heaviest Mill Environments.



Pictures showing the very clever shutter arrangement designed into the nosing of the SLX.



Detail of Water Cooling to Baser of VLZ Series Laser Sensor note that water cooling is provided controlled so from a closed circuit Tank or a Temperature controller Chiller.

Detail of connections to the SLX:
Air Purge, Air Wipe + water cooling

SPECIFICATIONS

Standard Doppler	VLX3060	VLX6060	VLX120120	VLX200200
Minimum Speed	0.2 m/min	0.2 m/min	0.4 m/min	0.6 m/min
Maximum Speed	5000 m/min	5000 m/min	10000 m/min	10000 m/min
Bi-Directional and ZERO Speed	VLZ3060	VLZ6060	VLZ120120	VLZ200200
Minimum Speed	0 m/min	0 m/min	0 m/min	0 m/min
Maximum Speed	+/- 5000 m/min	+/- 5000 m/min	+/- 5000 m/min	+/- 5000 m/min

COMMON SPECIFICATIONS:

Nominal Stand-off Distance	300 mm	600 mm	1200 mm	2000 mm
Depth of view	60 mm	60 mm	120 mm	200 mm
Accuracy		better then 0,05%		
Repeatability		better then 0,02%		
Maximum acceleration rate		> 500 ms ²		
Update time for Pulses and Analogue Output		40 μ s (0,04 ms)		
Required Power Supply		15 - 25 Vdc, 20 Watts		
Industrial Protection Rating		IP67		
Environmental Temperature		0~ 45°C (higher temperatures possible with optional cooling)		
Sensor Dimensions (L x W x H)		230 x 130 x 75 mm		
Weight		3 Kg		
Laser-beam Diameter		4mm		
4 digital Inputs (2 are programmable)		2 x fixed: Laser enable and Optical Laser Shutter enable 2 x programmable I/P's :Reset Length, Hold Display, Hold Length, Hold Speed, Direction, Pause: contact or logic Input 24Vdc		
3 Programmable Relay outputs		Volt-free contacts, programmable for NC or NO use; Max.50Vdc 0,5A Choose from: Status sensor, Measurement OK, Laser on, Laser at open, final length 1 achieved, final length 2 achieved, etc. rettuhS ,pmet		
Serial Interface		choose from RS232, RS485 or RS422: length, speed, quality factor		
Ethernet		Ethernet TCP/IP or UDP/IP		
CANBUS		for communication with (optional) displays		
3 Pulse Outputs (European Market only)		Opto isolated differential outputs 5V tot 24V, freely programmable, Pulse rates up to 1 MHz, updated at a rate of 0.04 mSec		

Communication Options

1 Analogue Output	0- 10Vdc programmable O/P for Speed or QF updated at a rate of 0.04 mSec,
Optional Interfaces	profibus profiNET, Ethernet IP, deviceNET, ModBUS, and SSI

CONTACT

since 1976 

www.fae.it
e-mail: fae@fae.it

LASER
MEASURING SYSTEMS

FAE S.R.L. • Via Tertulliano, 41 • 20137 Milano
Tel. +39 02 55187133 • Fax +39 02 55187399