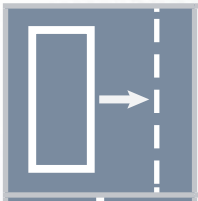
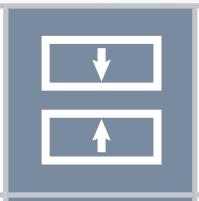
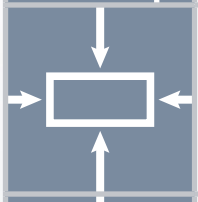
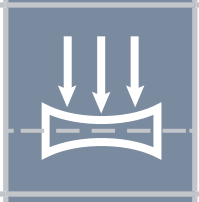
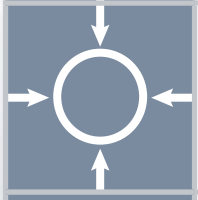
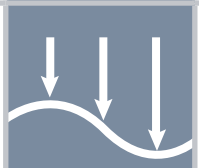
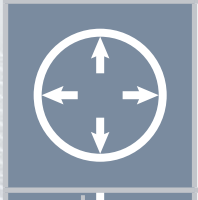
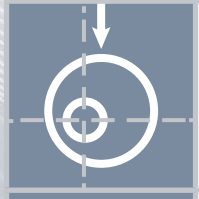
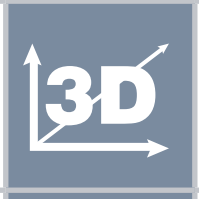
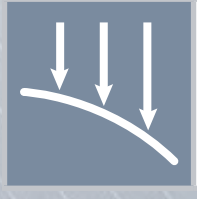
RIFTEK
Sensors & Instruments

OPTOELECTRONIC INSTRUMENTS AND SYSTEMS FOR GEOMETRIC QUANTITIES MEASUREMENT

PRODUCT CATALOG 2026

	DISPLACEMENT AND POSITION MEASUREMENT		GAP MEASUREMENT
	THICKNESS AND WIDTH MEASUREMENT		PROFILE MEASUREMENT
	OUTER DIAMETER AND PROFILE MEASUREMENT		LEVEL MEASUREMENT
	INNER DIAMETER AND PROFILE MEASUREMENT		2D MEASUREMENT
	VIBRATION AND RUN-OUT MEASUREMENT		3D MEASUREMENT
	STRAIGHTNESS AND FLATNESS MEASUREMENT		MACHINE VISION SYSTEMS

ISO 9001-2015

Company «RIFTEK» was founded in 1993. The enterprise specializes in development and fabrication of optoelectronic instruments for measuring of geometrical quantities.

The basic product line includes:

- laser triangulation position sensors;
- 2D and 3D laser profilers;
- absolute linear encoders;
- 1D and 2D Optical micrometers;
- hardware and software for welding robots systems;
- specialized systems for measuring dimensions, displacements and distances, thickness, diameter, etc.;
- measurement instruments for railway transport;
- machine vision systems.

RIFTEK products are delivered in more than 70 countries. Company representative offices operate in 45 countries.

We offer integrated solution to control and automation problems — from measurement sensors to multifunctional measuring and control systems.

LASER TRIANGULATION SENSORS, RF60x SERIES

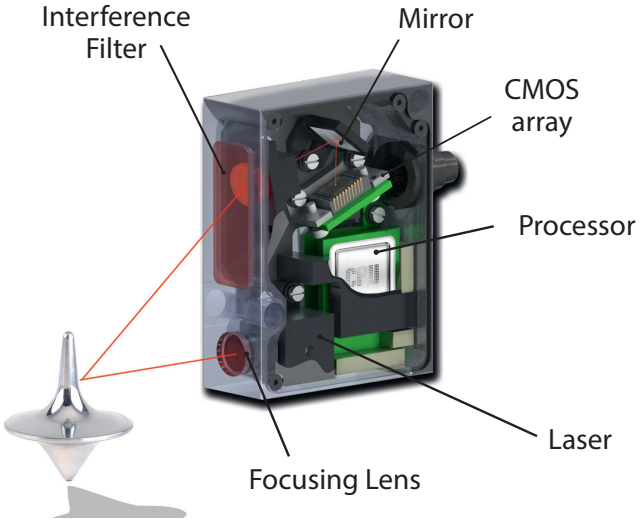
PURPOSE

Contactless dimensions, surface profile, deformation, vibration measurement, sorting, sensing presence or absence, positional checking, bulk materials and liquids level measurement.

OPERATION

Sensor operation is based on the principle of optical triangulation.

Radiation of a semiconductor laser is focused by an objective on an object. The radiation scattered at the object is collected on the CMOS array by the input lens. Object motion causes a corresponding motion of the image. Built-in signal processor calculates the distance to the object according to the light spot image position on the CMOS array.



MAIN FEATURES

- Measuring ranges from 2 to 2500 mm
- ±1 µm accuracy
- Sampling rate up to 70 kHz
- RS232/RS485/Ethernet/CAN/ CANopen
  +4...20 mA/0...10V/ModbusRTU
- Binocular sensors
  for laser scanning
- Binary and ASCII data formats
- Sensors with BLUE lasers
  to control high temperature,
  mirrored and semitransparent objects
- Sensors with IR lasers
- Mutual synchronization of the sensors
  (master-slave)
  for multi-axis measurement tasks
- Service Software
  for parameter setting and results visualization
- Free SDK and examples
  for Windows, Linux, .NET, MATLAB, LabVIEW

MODELS

RF603 — universal sensors

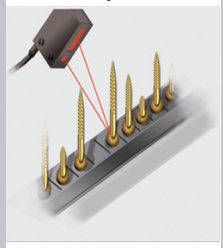
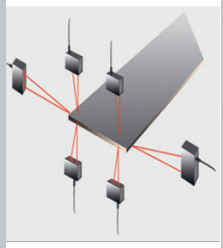
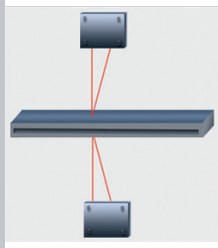
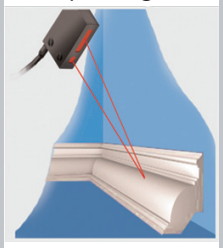
RF603HS — high speed sensors

RF600 / RF600HS — sensors with increased base distance and large measurement range. High speed sensors

RF602 — super compact sensors

RF607 — high-precision high-speed sensors

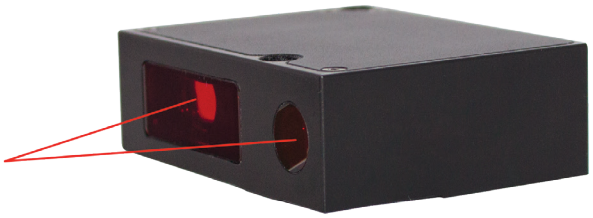
RF609 / RF609Rt / RF609Wi-Fi — laser probes for inner surface control

liquid level	automotive	object	dimensions	thickness	profiling
					
measurement	industry tests	sorting	measurement	measurement	

PARAMETER		VALUE
Output interface	digital	RS232 (max. 460.8 kbit/s) or RS485 (max. 921.6 kbit/s) or RS232 and CAN V2.0B (max 1Mbit/s) or Ethernet and (RS32 or RS485)
	analog	4...20 mA (≤500 Ω load) or 0...10 V
Synchronization input		2.4 – 5 V (CMOS, TTL)
Logic output		programmed functions, NPN: 100 mA max; 40 V max for output
Power supply, V		9 ...36
Power consumption, W		1.5..2
Environment resistance	Enclosure rating	IP67 (for the sensors with cable connector only)
	Vibration	20g/10...1000Hz, 6 hours, for each of XYZ axes
	Shock	30 g / 6 ms
	Operation temperature, °C	-10...+60, (-30...+60 for the sensors with built-in heater), (-30...+120 for the sensors with built-in heater and air cooling housing)
	Permissible ambient light, lx	>30000
	Relative humidity	5-95% (no condensation)
	Storage temperature, °C	-20...+70
Housing material		aluminum

LASER TRIANGULATION SENSORS, RF60x SERIES

- Varied diode powers
- Binocular sensors
- Available with Red, Blue or IR laser diodes
- Accuracy ± 0.05% working range

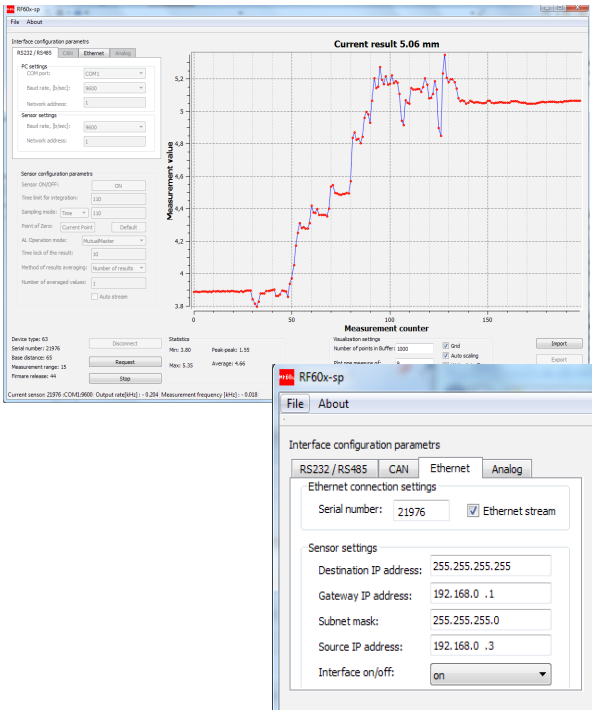


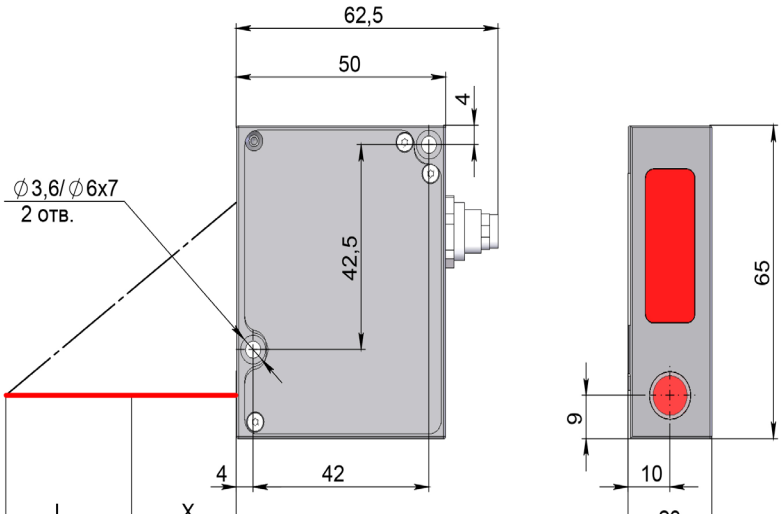
OPTIONS

- Protective housing with air and water cooling
- Custom versions with non-standard base, range or housing shape
- Special version for use in high vibration conditions
- Special flexible cable for robotic applications
- Variants with round and elliptical spot

SOFTWARE

- Setting sensor parameters
- Receiving, storage, visualization
- Speed and acceleration calculation



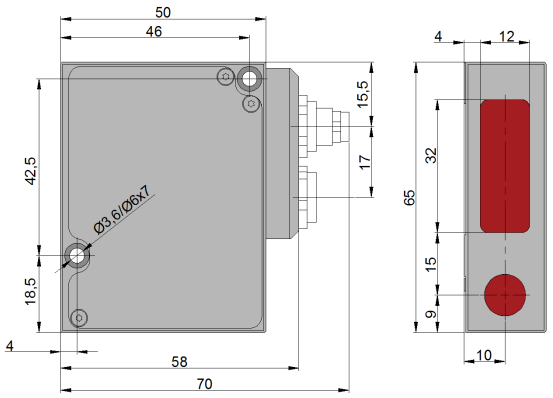


RF603-	R-X/4	X/2	X/5	X/10	X/15	X/25	X/30	X/50	X/100	X/250	X/500	X/750	X/1000	X/1250
Base distance X, mm	39	15	15	15, 25 60	15, 30 65	25, 45 80	35, 55 95	45, 65 105	60, 90 140	80	125	145	245	260
Measurement range, mm	4	2	5	10	15	25	30	50	100	250	500	750	1000	1250
Linearity, %	±0.05 of the range												±0.1	
Resolution, %	0.01 of the range (for the digital output only)												0.02	
Temperature drift	0.02% of the range/°C													
Max. measurement frequency, Hz	9400													
Light source	red semiconductor laser, 660 nm wavelength or UV semiconductor laser 405/450 nm wavelength (BLUE version)													
Light source: model	**RF603**													
Light source: output power	≤0.2	≤3 mW												
Light source: laser safety Class	1	3R (IEC60825-1)												
Light source: model		**RF603L**												
Light source: output power		≤0.95 mW												
Light source: laser safety Class		2 (IEC60825-1)												
Light source: model											**RF603P**			
Light source: output power											≤20 mW			
Light source: laser safety Class											3B (IEC60825-1)			
Weight (without cable)	100													

Note 1: RF603-R-39/4 sensor is designed to use with mirror surfaces and glass.

LASER TRIANGULATION SENSORS, RF60x SERIES

HIGH SPEED SENSORS — RF603HS Series

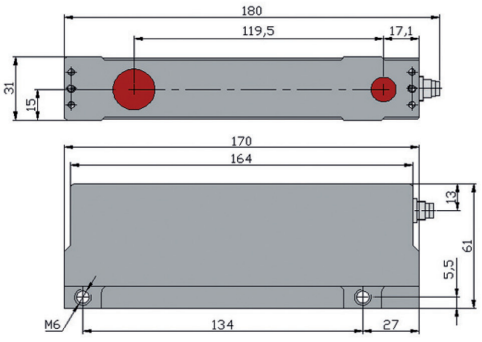


- Universal high-speed compact laser sensors
- Sampling rate up to 70 kHz
- Available with Red and Blue laser diodes
- Ideal for registration of high speed events and vibration measurement

RF603HS-	X/2	X/5	X/10	X/15	X/25	X/30	X/50	X/100	X/250	X/500	X/750
Base distance X, mm	15	15	15, 25 60	15, 30 65	25, 45 80	35, 55 95	45, 65 105	60, 90 140	80	125	145
Measurement range, mm	2	5	10	15	25	30	50	100	250	500	750
Max. measurement frequency, kHz	70										
Linearity, %	±0.1 (70 kHz) of the range										
Resolution, %	0.01 (70 kHz) of the range										
Temperature drift	0.02% of the range/°C										
Light source	red semiconductor laser (660 nm wavelength) or blue semiconductor laser (405/450 nm wavelength)										
Output power	≤4.8 mW						≤20 mW		≤80 mW		
Laser safety Class	3R (IEC/EN 60825-1:2014)						3B (IEC/EN 60825-1:2014)				
Weight (without cable)	110										

LARGE-BASE AND LONG RANGE SENSORS — RF600 Series

- High-precision measurement of the position of remote objects
- High-speed (70 kHz) sensors

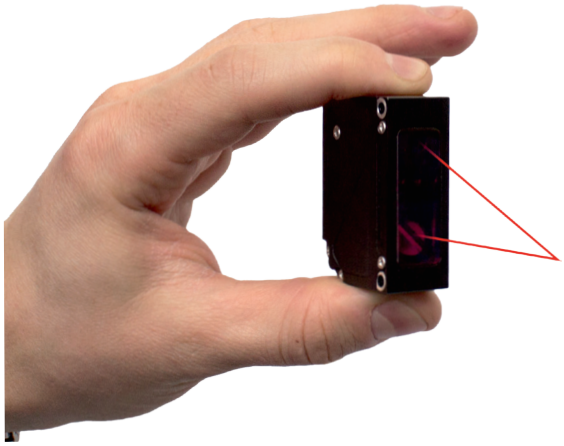


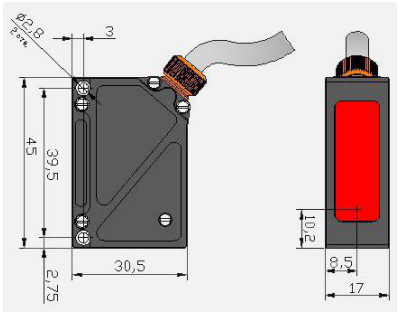
RF600-	X/10	X/30	X/40	X/100	X/250	X/500	X/600	X/1000	X/1000	X/1500	X/2000	X/2500	X/20	X/50
Base distance X, mm	230	300	330	500	230	300, 1000	230	1300	380	390	410	420	540	535
Measurement range, mm	10	30	40	100	250	500	600	1000	1000	1500	2000	2500	20	50
Max. measurement frequency	9.4 kHz, 70 kHz													
Linearity, % of the range	±0.05									±0.1			±0.05	
Resolution, % of the range	0.01 of the range (digital output only)									0.03			0.01	
Temperature drift	0.02% of the range/°C													
Light source	red semiconductor laser, 660 nm wavelength or UV semiconductor laser 405/450 nm wavelength (BLUE version)													
Output power	≤4.8 mW							80 mW						
Laser safety Class	3R (IEC60825-1)										3B (IEC60825-1)			
Weight (without cable)	500												2000	

LASER TRIANGULATION SENSORS, RF60x SERIES

SUPER COMPACT LASER SENSORS — RF602 Series

- Unique combination of dimensions, performance and operating ranges





RF602-	20/10	20/25	30/50	50/100	65/250	105/500
Base distance X, mm	20	20	30	50	65	105
Measurement range, mm	10	25	50	100	250	500
Max. measurement frequency	9400 Hz					
Linearity, % of the range	±0.05					
Resolution, % of the range	0.01 (digital output only)					
Temperature drift	0.02% of the range/°C					
Light source	red semiconductor laser, 660 nm wavelength or UV semiconductor laser 405/450 nm wavelength (BLUE version)					
Output power, mW	≤0.95 mW					
Laser safety Class	2 (IEC60825-1)					
Weight (without cable), gram	40					

SPECIALIZED LASER SENSORS FOR PAVEMENT PROFILE AND TEXTURE MEASUREMENT — RF60i Series

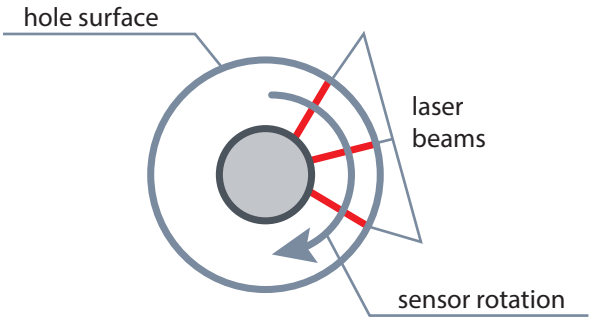
- Accuracy ± 0.03% of working range
- Sampling rate up to 70 kHz

MODEL	SPECIFIC FEATURES	ASSIGNMENT	
RF603P-125/500 RF603P-245/1000	■ high resistance to solar radiation ■ stable operation on wet surfaces	Pavement profile measurement	
RF607-195/500	■ 70 kHz operating frequency ■ round laser spot, diameter <1 mm		
RF607-210/230 RF607-230/250	■ 70 kHz operating frequency ■ round laser spot, diameter <0.8 mm ■ accuracy ±0.03% of the range	Pavement roughness (texture) measurement	
RF603Txt-30/30	■ reduced triangulation angle ■ round laser spot, diameter <60 µm ■ simultaneously obtaining profile and image of the surface		

LASER TRIANGULATION PROBES — RF609, RF609Rt and RF609Wi-Fi Series

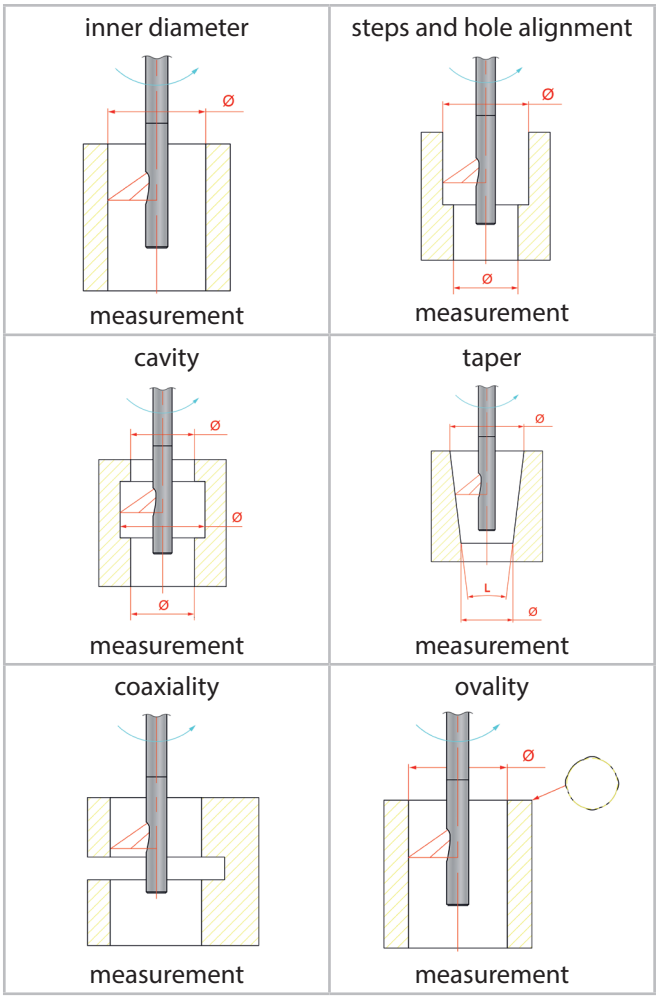
- Smallest triangulation sensor on the market
- Probe diameter — from 5 mm
- Measured inner diameter - from 5.2 mm
- Accuracy - from ±2 µm
- Sampling rate - up to 9.4 kHz
- Probes with BLUE laser
  to control reflecting and semitransparent objects
- Probes with built-in slip ring
- Probes with Wi-Fi

Contactless measurement of inner diameter, ovality, coaxiality, cylindricity and shape of holes, tubes, hosepipes, bushes, gun barrels, etc.

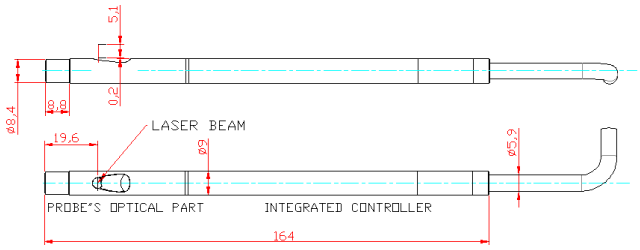


The probe is inserted into the hole and probe or sample is driven in rotation. Laser triangulation sensor built in the probe measures the distance to the hole wall synchronously with the rotation angle. The set of the polar surface coordinates allows to calculate the required parameters. Additional linear translation allows to build 3D model of the hole.

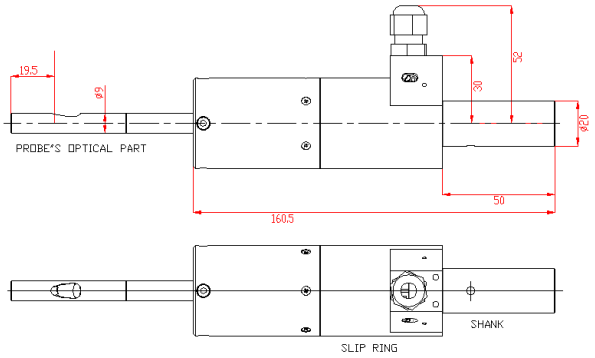
Parameter (Rt version – sensor with built-in sleep ring)	RF609 (609Rt)-5/13	RF609 (609Rt)-9/19	RF609 (609Rt)-16/48
Measured diameters, mm	5…13	9…19	16…48
Diameter measurement accuracy, µm	±2	±2	±10
Sensor measurement frequency, Hz	9400		
Rotational speed for Rt version, no more rps	4		
Laser safety Class	2 (IEC60825-1)		
Interface	RS232 or RS485 or Ethernet or Wi-Fi		
Synchronization input: trigger, A-B encoder, V	2.4-24		
Minimal distance to the hole bottom, mm	20		
Hole depth, mm	by request		
Power supply, V	9…36		
Power consumption, W	1.5-2		
* for other measured diameters and hole depth ranges please consult factory			



RF609-9/19



RF609Rt-9/19

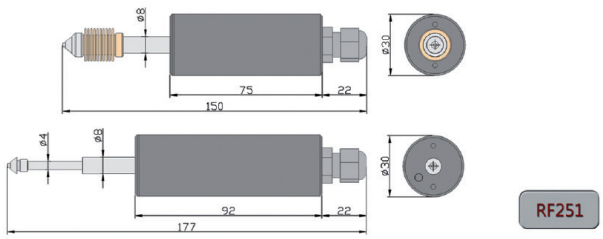


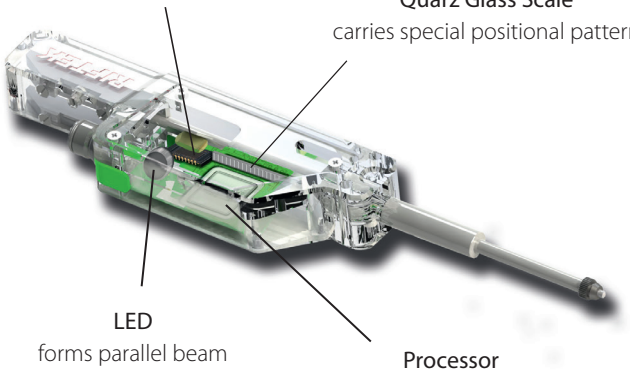
ABSOLUTE LINEAR ENCODERS, RF25x SERIES

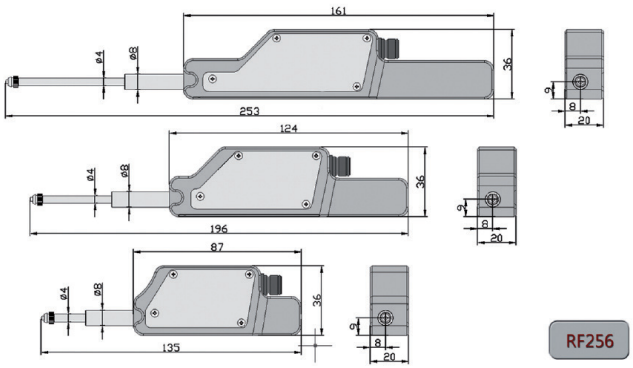
ABSOLUTE LINEAR POSITION SENSORS (ABSOLUTE LINEAR ENCODERS) — RF25X Series

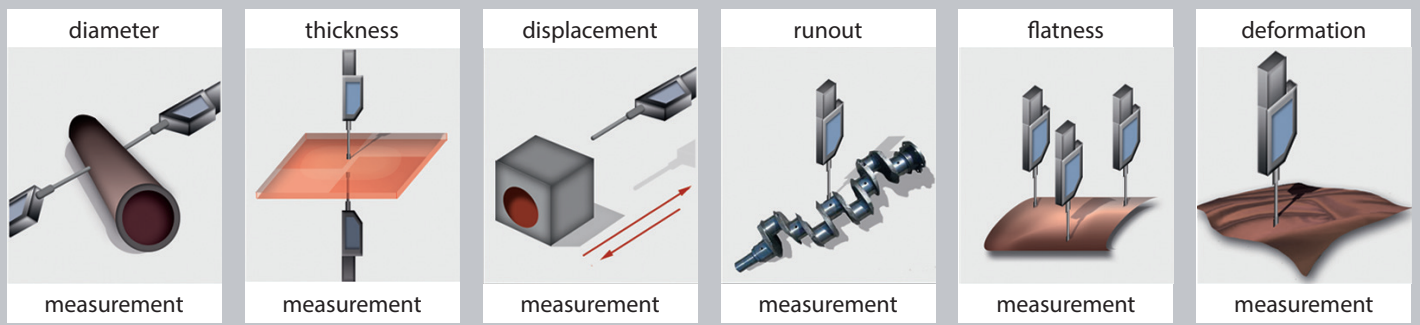
Absolute linear encoders are designed for measuring and checking displacements, dimensions, run-outs, surface profiles and deformations of engineered objects.

- Innovative technology of absolute measurement
- Measuring ranges from 3 to 55 mm
- 0.1 µm resolution
- Emulation of incremental encoder signals









RF25X-		RF251-3	RF251-25	RF256-15	RF256-35	RF256-55
Measurement range, mm		3	25	15	35	55
Accuracy (at T=20 °C), µm		±2			±3	
Resolution, µm		0.1 or 0.5 or 1 or 5 or 10				
Output interface	digital	RS422	(RS485 and SSI or RS232) and (EncD5 or EncD10 – emulation of quadrature signals of incremental trans-ducers)			
	analog	no	0…20 mA (<500 Om load) or 0…10 V			
Synchronization input		no		opto-isolated		
Logical outputs		no	two outputs, NPN: 100 mA max; 40 V max			
Indication		no		two-color LED (red/green)		
Power supply, V		12 (without analogue output) 15 (with analogue output)				
Power consumption, W		0.75				
Enclosure rating		IP57	IP50			
Operating temperature, °C		-40…+50	-10…+50			
Weight (without cable), gram		70	110	110	150	180

1D OPTICAL MICROMETERS, RF65x SERIES

PURPOSE

Contactless diameter, gaps and technological object position measurement.

WORKING PRINCIPLE

The micrometer operation is based on the so-called 'shadow' principle. The micrometer consists of two blocks – transmitter and receiver. Radiation of a semiconductor LED is collimated by a lens. With an object placed in the collimated beam region, shadow image formed is scanned with a photo-detector array. A processor calculates the position (size) of the object from the position of shadow border (borders).

MODELS

RF651 — universal micrometers

RF656 — high-precision micrometers with telecentric optics

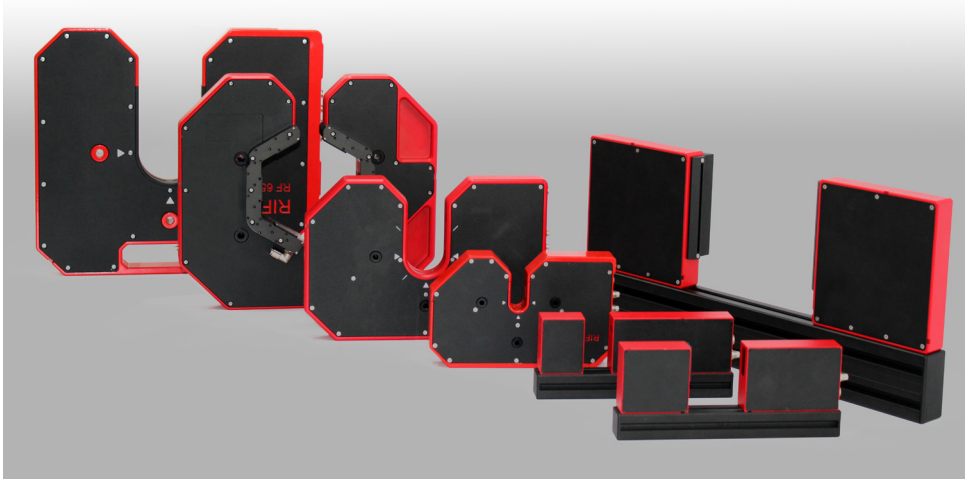
RF656XY and RF656.3 — two and three axis micrometers

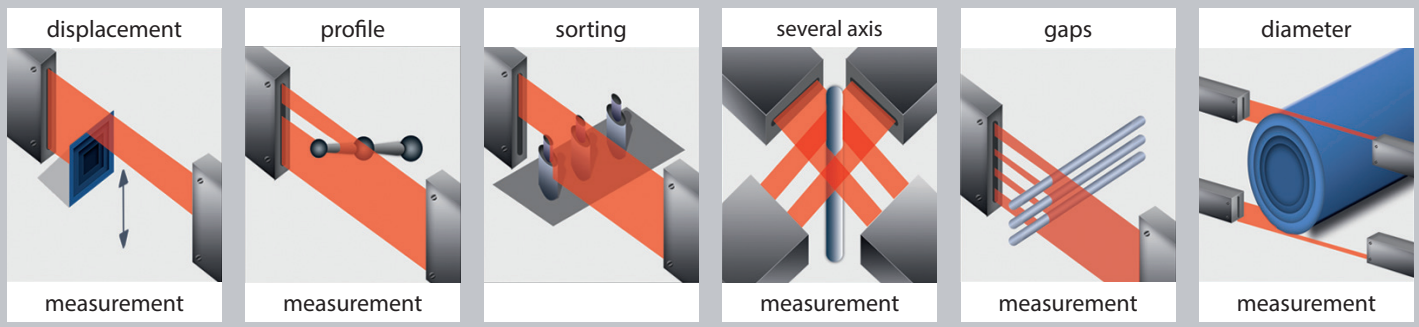
RF656.2D, RF657.2D, RF657R.2D — 2D optical micrometers

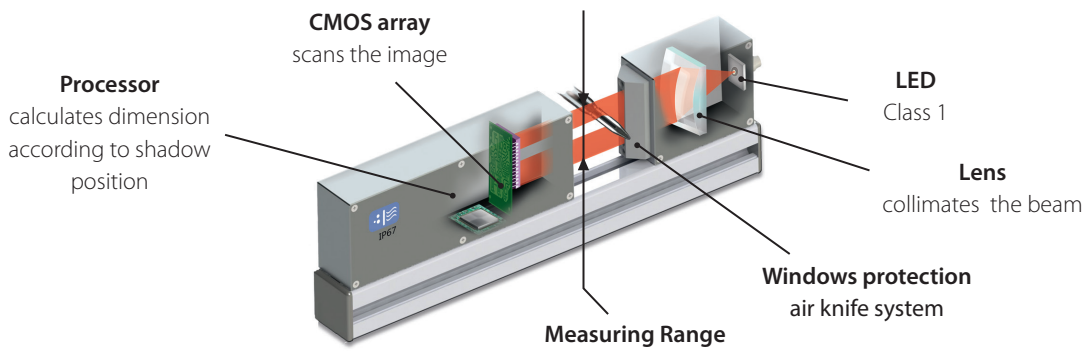
RF659 — edge sensors

MAIN FEATURES

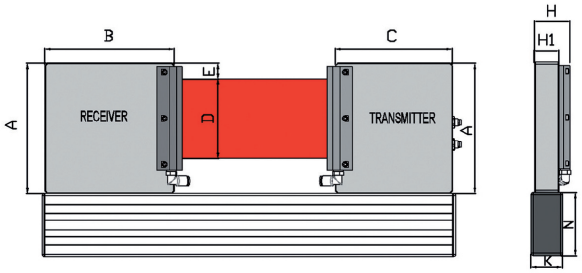
- Measurement range from 5 to 100 mm
- Up to ±0.3 µm accuracy
- Up to 10 000 Hz sampling rate
- RS232/RS485/Ethernet +4...20 mA/0...10V
- Micrometers with telecentric lens
- Mutual synchronization of the sensors (master-slave) for multi-axis measurement tasks
- Service Software for micrometers parameterization
- Free SDK and examples for Windows, Linux, .NET, MATLAB, LabVIEW
- Dual, three and multi axis Micrometers
- Air-knife window protection



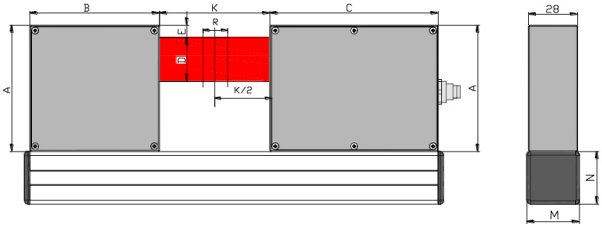




	A, mm	B, mm	C, mm	D, mm	E, mm	H, mm	H1, mm	K, mm	N, mm
RF651-25	51	139	62	25	13	28	42.5	30	30
RF651-50	91	120	134	50	20	31	45.5	40	80
RF651-75	128	132	132	75	15	31	45.5	40	80
RF651-100	165	165	150	98	20	31	45.5	40	80



	A, mm	B, mm	C, mm	D, mm	E, mm	K, mm	R, mm	M, mm	N, mm
RF656-5	66	50	158	5	14	28	2	30	30
RF656-10	50	70	126	10	11.5	56	6	30	30
RF656-25	72	74	106	25	7	63	10	30	30
RF656-50	105	134	110	50	20	150	25	30	60
RF656-75	135	148	125	75	17	200	40	40	80
RF656-100	175	170	160	100	20	300	50	40	80



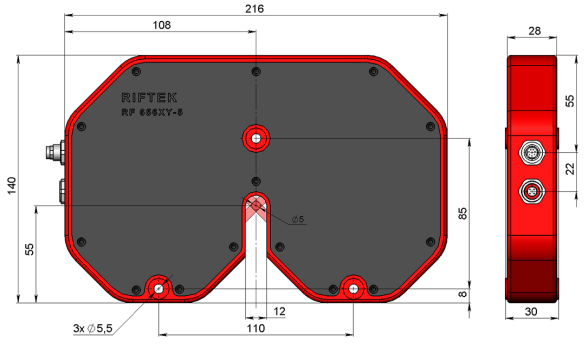
RF65X-		RF651-25	RF651-50	RF651-75	RF651-100	RF656-5	RF656-10	RF656-25	RF656-50	RF656-75	RF656-100
Measurement range, mm		25	50	75	100	±1x5	±3x10	±5x25	±7x50	±9x75	±10x100
Minimum size of the object, mm		0.5	1	1.5	2	0.05 (0.1)	0.1 (0.2)	0.25 (0.5)	0.5 (1)	0.75 (1.5)	1 (2)
Accuracy[1], µm		±5	±10	±15	±20	±0.3	±0.5	±1	±2	±3	±5
Measurement frequency, Hz		500	500	500	500	500	2000	2000	2000	2000	2000
Light source		LED									
Laser safety class		1 (IEC60825-1)									
Output interface	digital	RS232 (max. 921.6 kbit/s) or RS485 (max. 921.6 kbit/s) or Ethernet & (RS32 or RS485)									
	analog										
Synchronization input		2.4 – 5 V (CMOS, TTL)									
Logic output		three outputs, NPN: 100 mA max; 40 V max									
Power supply, V		24 (9 …36)									
Power consumption, W		1.5..2									
Housing material		aluminum									
Weight (without cable), gram		600	2000	2600	4000	700	700	700	1600	3200	4500

[1] typical data obtained when a knife edge was used to interrupt the beam and distance between transmitter and receiver is equal of two measurement range

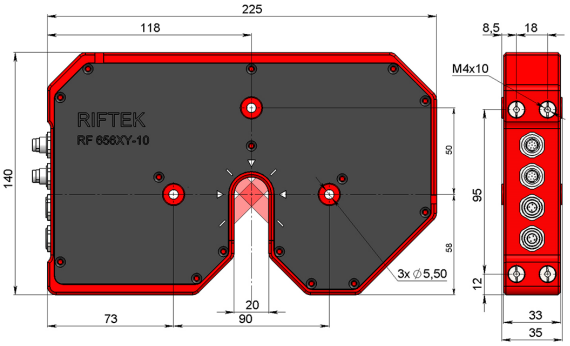
RF656 TWO AND THREE AXIS MICROMETERS. TWIN MICROMETERS

The parameters for each axis of the micrometer match to the parameters of the corresponding single-axis micrometer, see Table above.

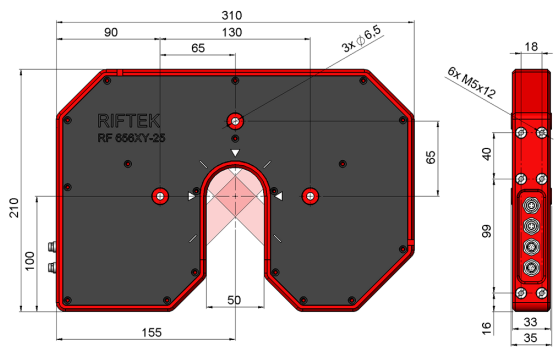
RF656XY-5



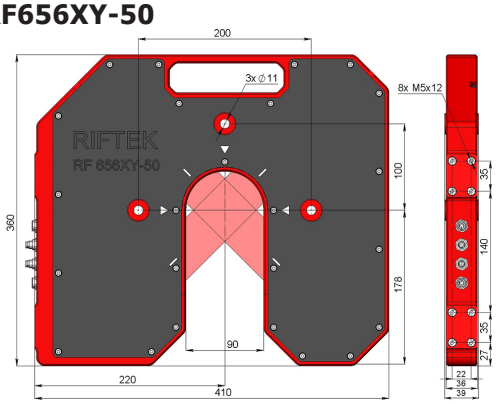
RF656XY-10



RF656XY-25



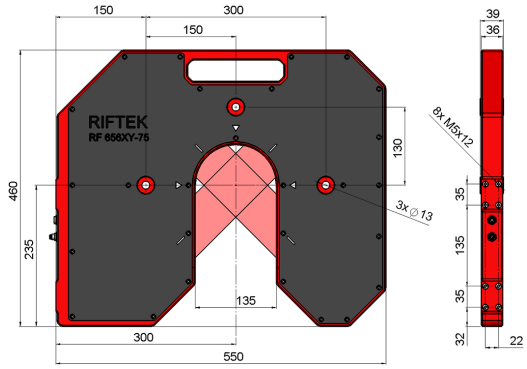
RF656XY-50



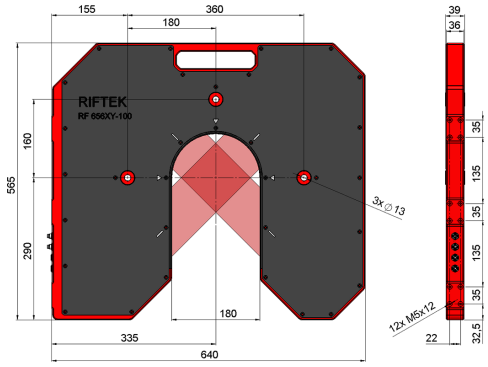
1D OPTICAL MICROMETERS, RF65x SERIES

RF656 TWO AND THREE AXIS MICROMETERS. TWIN MICROMETERS

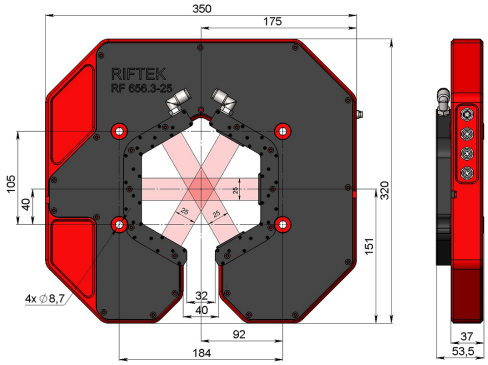
RF656XY-75



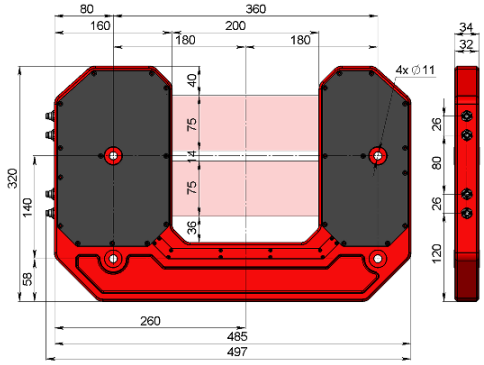
RF656XY-100



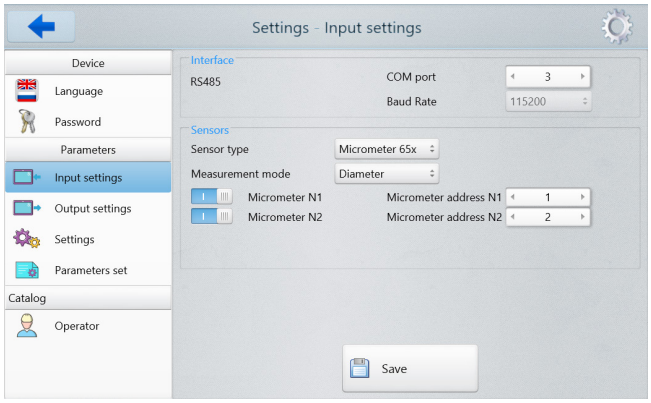
RF656.3-25

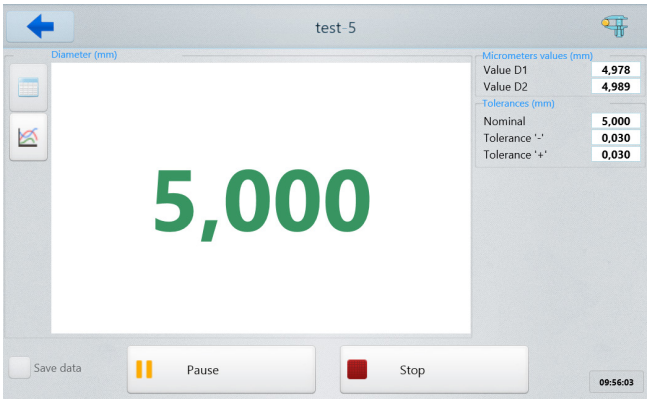


RF656TWIN-75



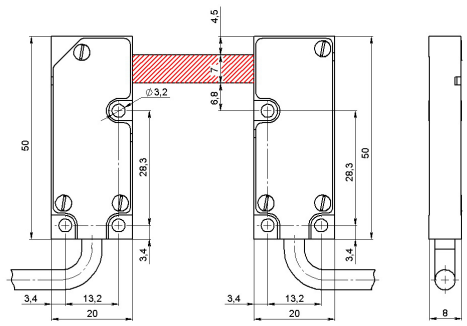
SOFTWARE





EDGE AND DIAMETER SENSORS RF659 Series

The sensors are intended for non-contact measuring and monitoring the position of the edge (edges) of various objects, such as tapes, plates, substrates, etc.



Parameter	Value
Distance between transmitter and receiver	30 mm
Measurement range	7 mm
Accuracy	±20 µm

2D OPTICAL MICROMETERS, RF65x.2D SERIES

PURPOSE

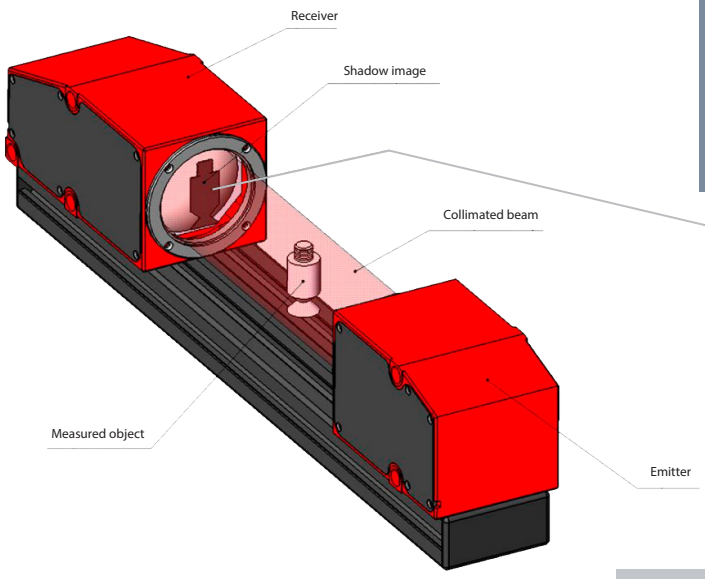
Micrometers are designed for non-contact two-dimensional measurements of linear dimensions, diameters, angles, thread pitch, shape of parts, etc.

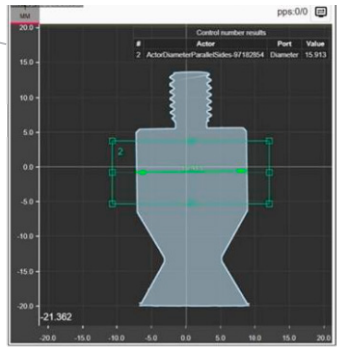
WORKING PRINCIPLE

The micrometer operation is based on the so-called shadow principle. The micrometer consists of two parts - an emitter and a receiver. The light from the LED is collimated by the lens. When placing an object in the area of the collimated beam, the resulting shadow image of the object is scanned by a 2D CMOS sensor. Based on the location of the shadow border, the computer calculates the dimensions of the object.

MAIN FEATURES

- Speed: up to 50 images per second
- Measurements and tolerance control are performed accorfing to an algorithm created by the user from a library of ready-made blocks
- Various combinations of blocks and connections between them make it possible to create an almost unlimited number of measurement functions and measure products of varying complexity
- 15 µs exposure allows measuring fast moving objects
- Mode of automatic generation of a measurement scheme based on the dxf file of the part
- Automatic recognition and capture of the product in the field of view
- Support for Ethernet/IP, Modbus TCP, UDP protocols
- Logical outputs for controlling actuators and signaling the validity of the product





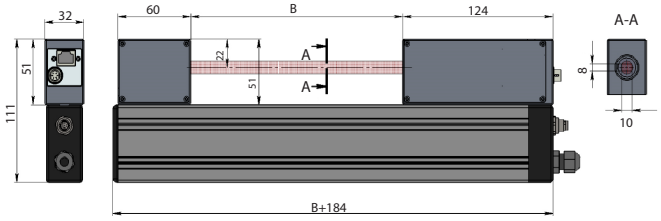
Measurement of geometric quantities

General technical characteristics of RF65x.2D sensors	
Interface	Ethernet / 1000 Mbps
Synchronization inputs	1 channel
Logic outputs	2 channels
Speed, measurements/s	50 for RF656.2D and 20 for RF657.2D

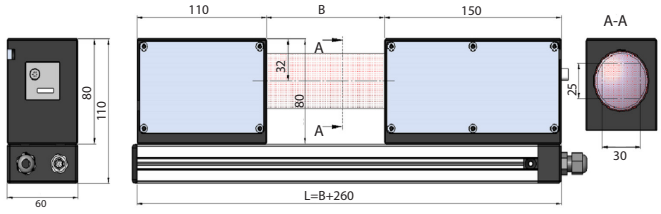
RF656.2D Series

RF656.2D	-8x10	-25x30	-30x40	-40x50
Measurement range, mm	8x10	25x30	30x40	40x50
Measurement error, µm	±1,5	±2,5	±3	±4,5
Distance along the axis at which the measurement error is applied, mm	1	3	3	4
Minimum object size, mm	0,07	0,2	0,25	0,35
Speed, measurements/s	up to 65			
Exposure time, us	100			
Light sourse	LED, 630 nm, RED			

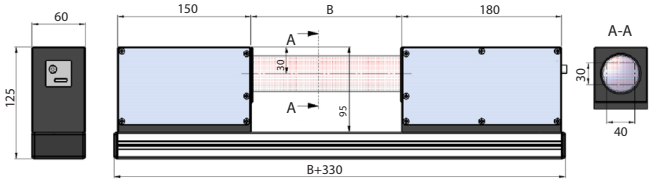
RF656.2D-8x10



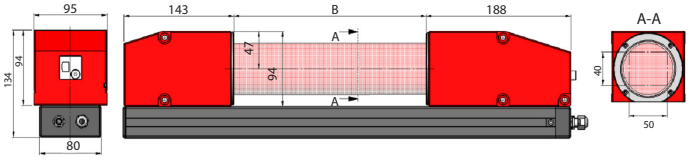
RF656.2D-25x30



RF656.2D-30x40



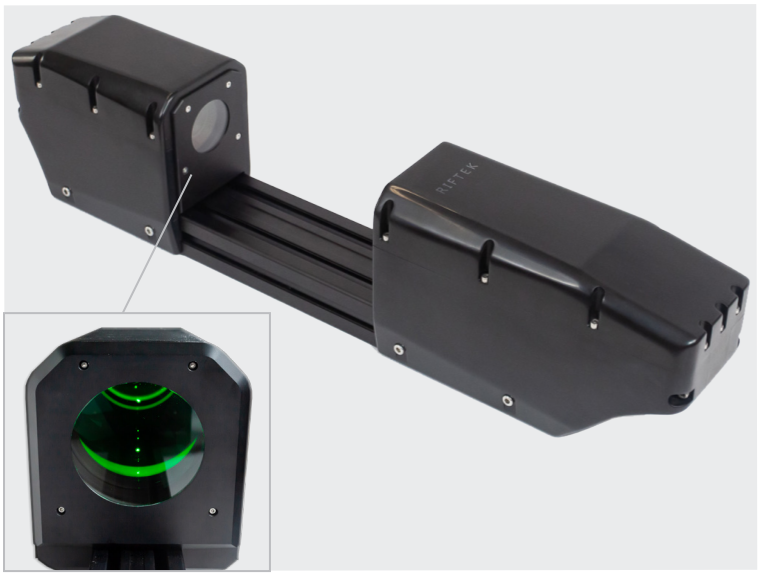
RF656.2D-40x50



2D OPTICAL MICROMETERS, RF65x.2D SERIES

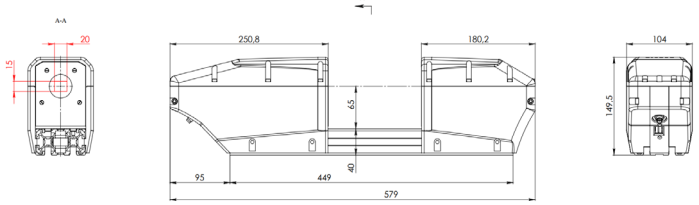
RF657.2D and RF657R.2D Series

- Versions with rectangular and round FOV
- Dual telecentric optical system
- Increase accuracy and ranges
- Very low exposure time for high-speed measurement

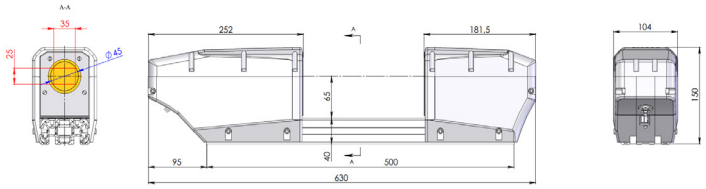


RF657.2D, RF657R.2D	-15x20, - 25	-25x35, - 45	-40x50, -70	-60x80, -100
Measuring range, mm	15x20, Ø25	25x35, Ø45	40x50, Ø70	60x80, Ø100
Measurement error, um	±0,8	±1,2	±2	±3
Distance along the axis at which the measurement error is applied, mm	±5	±10	±15	±20
Minimum object size, mm	0,1	0,13	0,2	0,3
Speed, measurements/s	24, 4			
Exposure time, us	15			
Light source	LED, 525 nm, GREEN			
Dimensions, mm	580x150x104	630x150x104	930x206x112	1250x257x184

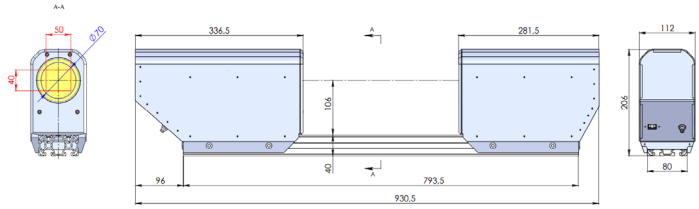
RF657.2D-15x20 and RF657R.2D-25



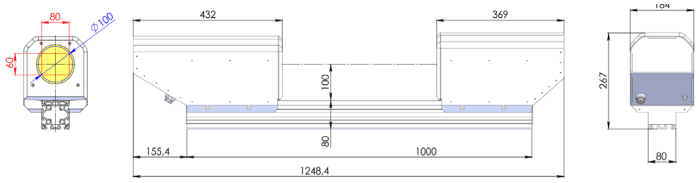
RF657.2D-25x35 and RF657R.2D-45



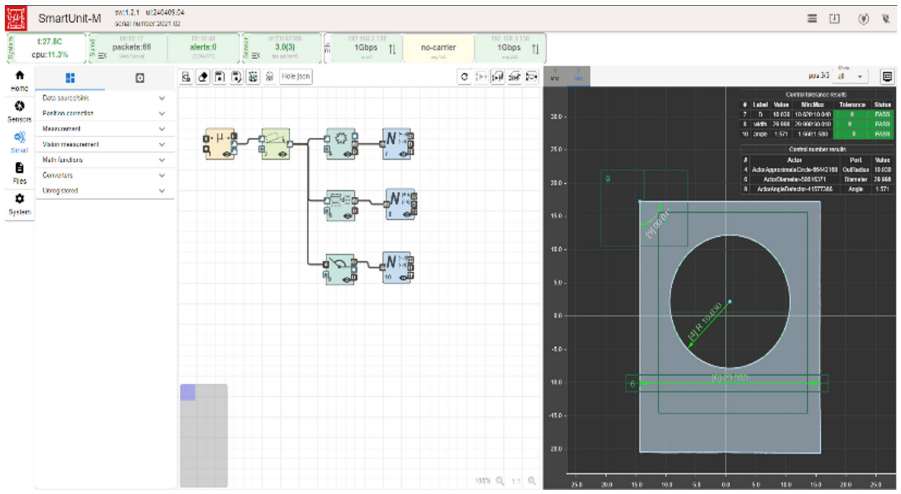
RF657.2D-40x50 and RF657R.2D-70



RF657.2D-60x80 and RF657R.2D-100



SOFTWARE



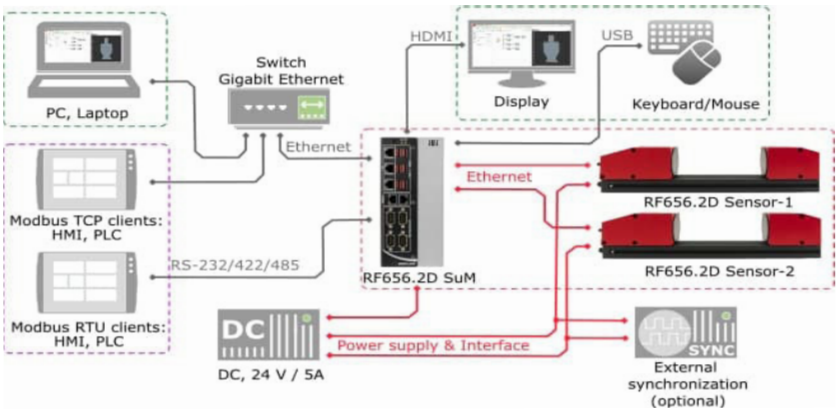
Integrated WEB-Interface for checking the operation of the micrometer, setting parameters, accumulating and displaying a shadow image and a profile of parts, and creating the measurement scheme

Measurements and tolerance control are made according to the algorithm created by the user. To build the measurement algorithm, a simple and visual tool is proposed - the measurement scheme. The scheme is formed from a library of ready-made blocks. Various combinations of blocks and connections between them allow the user to create an almost unlimited number of measuring functions and measure products of varying complexity. Measurement results can be transmitted via various protocols (Ethernet/IP, Modbus TCP, UDP), as well as to the logical outputs of the micrometer for controlling actuators and signaling the suitability of the product.

HOW IT WORKS

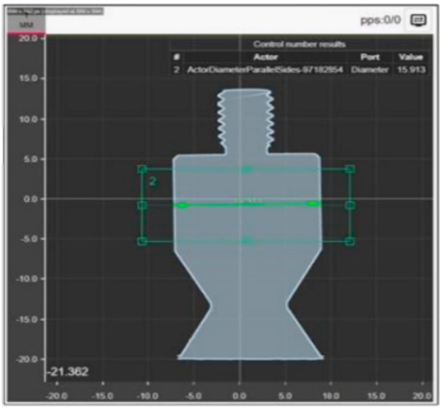
STEP 1

Connect equipment according to options:



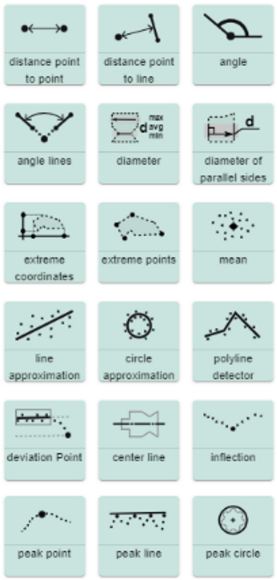
STEP 2

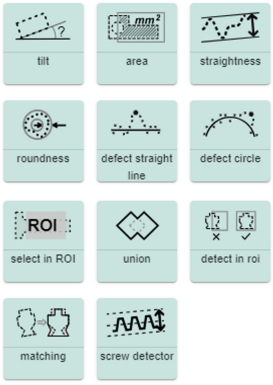
Place the sample part in the FOV:



Apply appropriated Smart-block to the selected areas:

Measurement

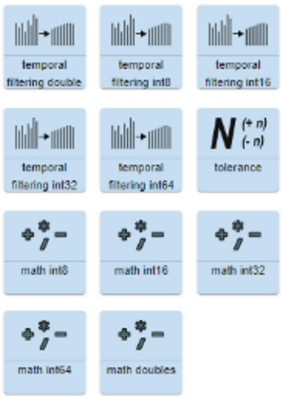




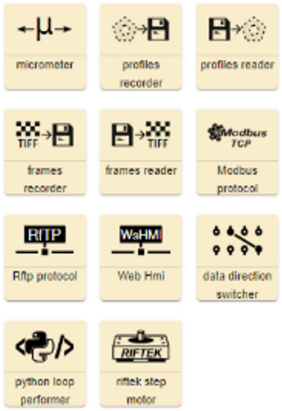
Position correction

Converters

Math functions



Data source/sink



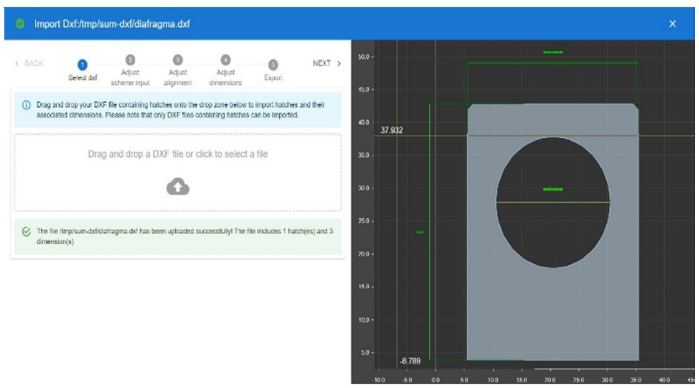
CREATE MEASUREMENT SCHEME

STEP 3

OR

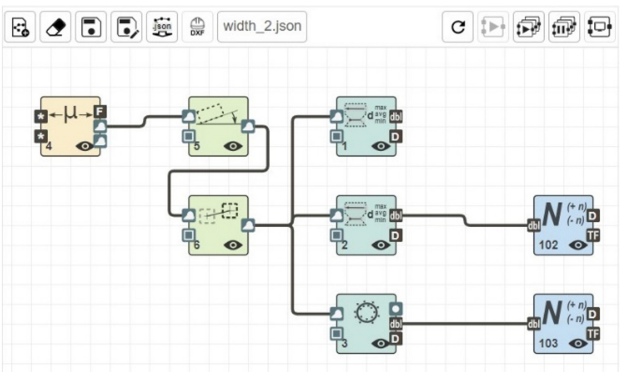
STEP 1

Download **.dxf file** of the part and follow instruction (Adjust alignment, Select dimensions and Set tolerances)



STEP 2

Get Measurement scheme automatically



LASER PROFILERS, RF62x SERIES

PURPOSE

Non-conact measuring and checking of surface profile, dimensions, deformations, flatness, gaps, volume, 3D models construction.

WORKING PRINCIPLE

Profiler operation is based on the principle of optical triangulation.

Radiation of a semiconductor laser is formed by a lens in a line and projected to an object. Radiation scattered from the object is collected by the lens and directed to a two-dimensional CMOS image sensor. The image of object outline thus formed is analyzed by a signal processor, which calculates the distance to the object (Z-coordinate) for each point of the set along the laser line on the object (X-coordinate). Profilers are characterized by base distance (beginning of the range), SMR, for Z-coordinate, measuring range (MR) for Z-coordinate, measuring range for X-coordinate at the beginning of Z (Xsmr) and measuring range for X-coordinate at the end of Z (Xemr).

MAIN FEATURES

- Measuring ranges from 10 to 1010 mm
- 0.01% linearity
- Sampling rate up to 16000 profiles/s
- Profilers with RED, BLUE and IR lasers
- Laser Safety Class 2M
- Dual camera profilers
- Trigger and encoder synchronization, mutual synchronization
- WEB-interface
- Free SDK and examples for Windows, Linux, .NET, MATLAB, LabVIEW
- Specialized profilers for hole control
- Profilers with air and water cooling
- Profilers with powerful lasers (1.2W red, 1.5W blue, 10W IR)
- Built-in standard industrial protocols and interfaces for robots

MODELS

RF627Smart — profilers with in-built measurement functions and industry protocols

RF627BiSmart — dual-camera profilers with in-built measurement functions and industry protocols

RF628 — high speed profilers

RF629 — high speed profilers with increased resolution

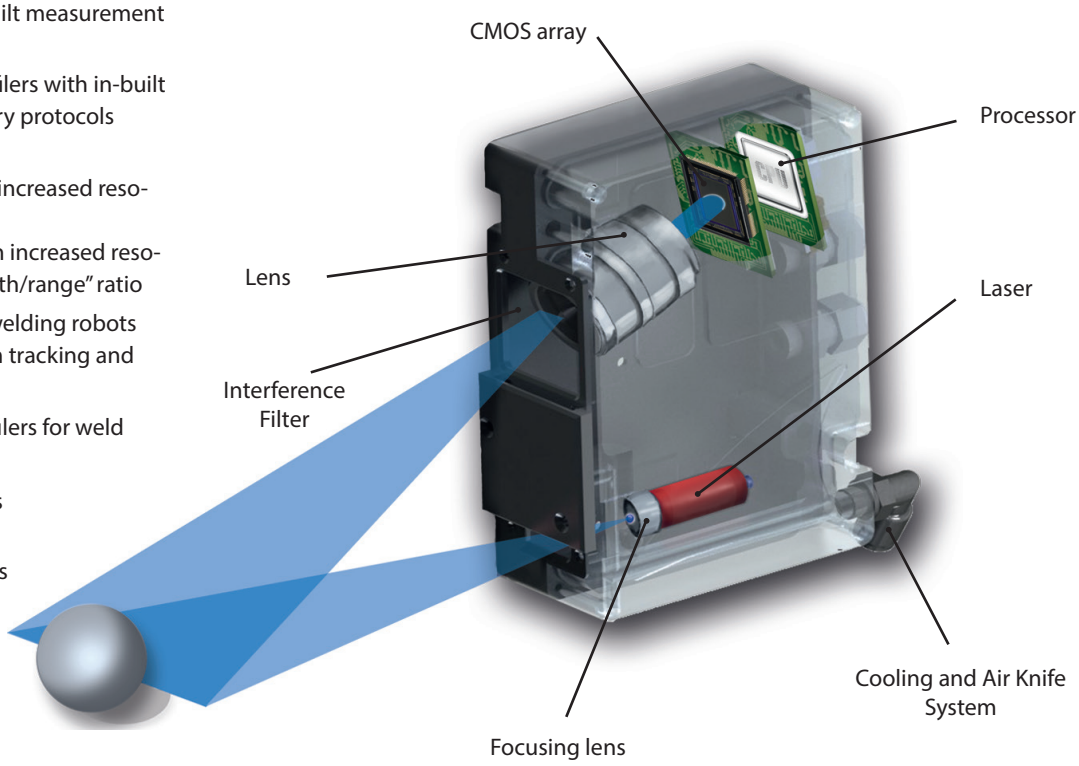
RF6292 — high speed profilers with increased resolution and increased "laser line length/range" ratio

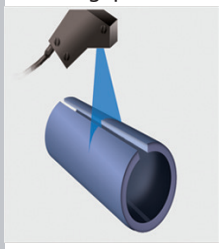
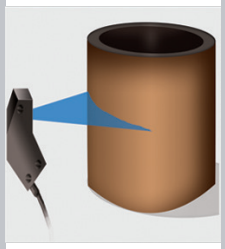
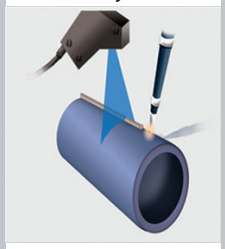
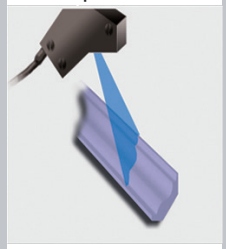
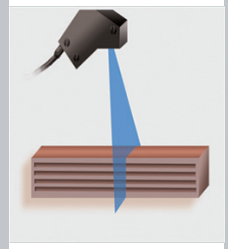
RF627Smart-Weld — profilers for welding robots with in-built functions of weld seam tracking and measurement

RF627AVIKScan — hand-held profilers for weld seam geometry control

RF630 — profilers with 2048 points resolution, rate - up to 14kHz

RF631 — profilers with 4600 points resolution, rate - up to 6 kHz

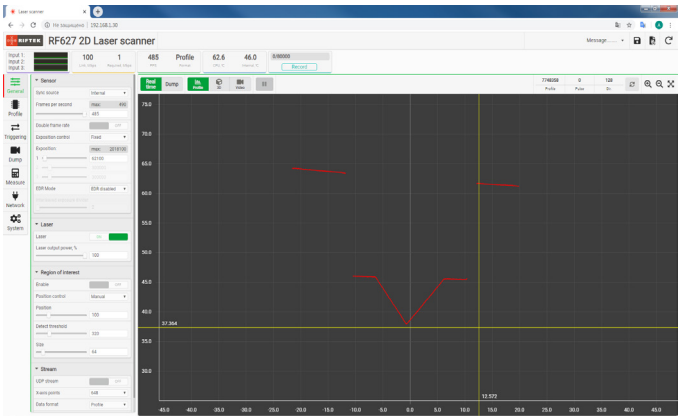


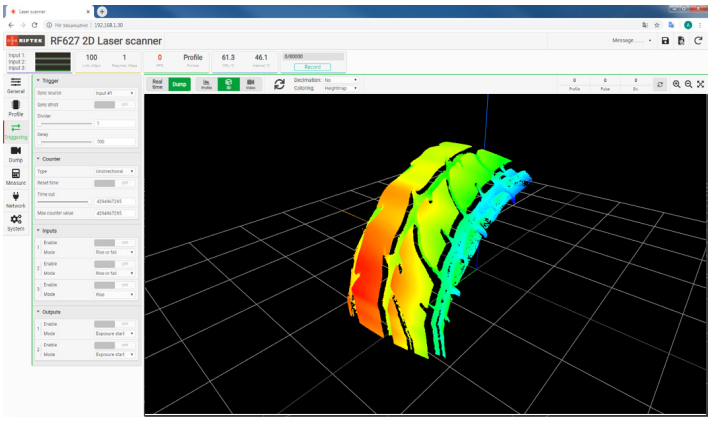
gaps	diameter	weld joint	profile	object	dimensions
					
control	measurement	control	measurement	recognition	measurement

SOFTWARE

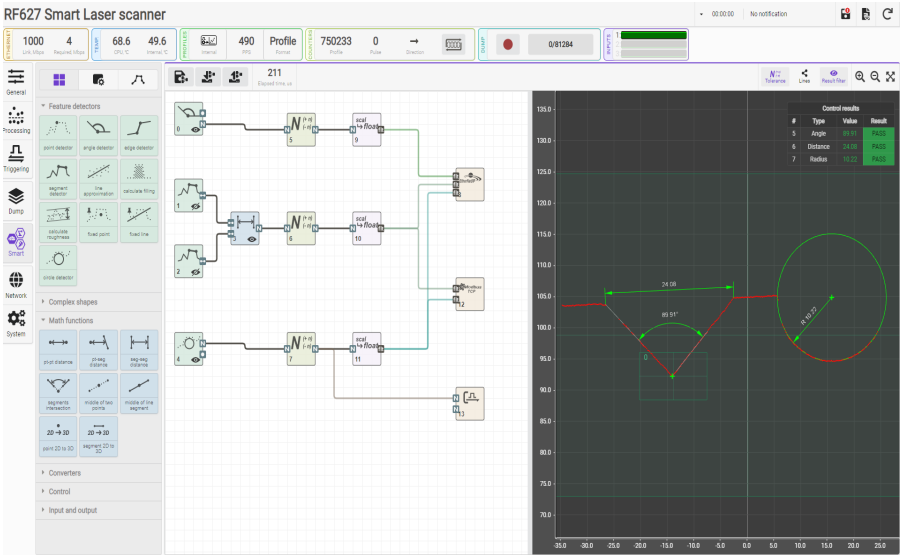
INTEGRATED WEB-INTERFACE
for profilers parameterization,
image and profile visualization

- Setting sensor parameters
- Data receiving, storage, visualization





SMART-PROFILERS



RF627Smart profilers makes it possible to measure geometric parameters of the object profile in real time directly in the profiler without connecting to a computer. Analysis, calculations, measurements, tolerance control are carried out according to the algorithm created by the user. To build the algorithm, a simple and intuitive tool is provided - a computation graph. The graph is formed from a library of ready-made blocks. Various combinations of blocks and connections between them allow the user to create an almost unlimited number of measuring functions, as well as to process profiles of any complexity. Measurement results can be transmitted via various protocols **(Ethernet/IP, Modbus TCP, UDP),** as well as to the logic outputs of the profiler in order to control the actuators and notify about product suitability.

RF62x Basic technical data

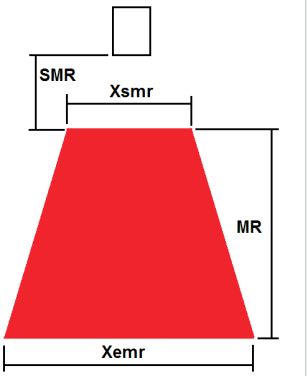
Laser	660 nm or 405 nm or 450 nm 808 nm Class 2M по IEC/EN 60825-1:2014 or Class 3B on request
Interface	Ethernet / 1000 Mbps
Synchronization inputs	RS422, 3 channels
Laser on/off hardware input	1
Outputs	RS422, 1 channel
Power supply	9...30 V or 12...36 V for profilers with Blue laser
Power consumption, not more	RF627Smart - 6 W (without a built-in heater) RF627BiSmart - 11 W, RF628 - 17 W RF629 и RF6292 - 17 W

Environment resistance	
Enclosure rating	IP67
Vibration	20 g / 10...1000 Hz, 6 hours for each of XYZ axes
Shock	30 g/6 ms
Operating ambient temperature, °C	-20...+40, or -40...+40 for profilers with built-in heater, or -40...+120 for profilers with built-in heater and cooling system
Relative humidity	5-95% (no condensation)
Storage temperature, °C	-20...+70
Housing/windows material	aluminum/glass

LASER PROFILERS, RF62x SERIES

SMART PROFILERS — RF627Smart Series

Overall specifications								
Sampling rate, Hz	Full range: 485 or 921 (DS mode), ROI: 4884 or 6379 (DS mode)							
Linearity Z, %FS	0.01 or 0.02 for DS mode							
Resolution, X axis	648 or 1296 points (programmable value)							
Range	**MR, mm**	**SMR, mm**	**EMR, mm**	**Xsmr, mm**	**Xemr, mm**	**Size, mm**		**Weight, g**
25/10-8/11	10	25	35	8	11	Fig. 1		0.37
65/25-20/22	25	65	90	20	22	Fig. 2		0.6
75/50-30/41	50	75	125	30	41			
70/100-48/82	100	70	170	48	82			
70/150-58/122	150	70	220	58	122			
95/150-53/106	150	95	245	53	106			
82/200-60/150	200	82	282	60	150			
90/250-65/180	250	90	340	65	180			
180/250-170/278	250	180	430	170	278	Fig. 3	L=326	2
190/300-160/300	300	190	490	160	300		L=283	1.9
220/300-203/330	300	220	520	203	330		L=374	2.1
260/400-210/400	400	260	660	210	400		L=350	2.2
325/500-268/500	500	325	825	268	500		L=415	2.3
400/600-320/600	600	400	1000	320	600		L=490	2.4
475/700-374/700	700	475	1175	374	700		L=558	2.5
545/800-425/800	800	545	1345	425	800		L=627	2.6
615/900-480/900	900	615	1515	480	900		L=696	2.7
690/1000-535/1000	1000	690	1690	535	1000		L=765	2.8
620/1165-430/1010	1165	620	1785	430	1010		L=554	2.5



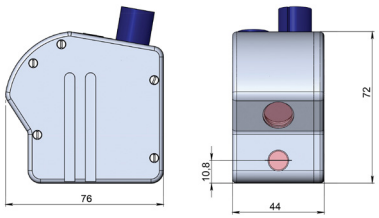


Figure 1

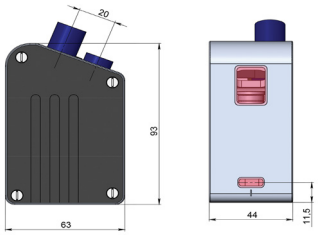


Figure 2

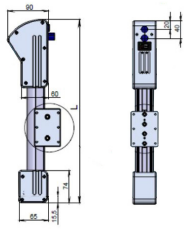
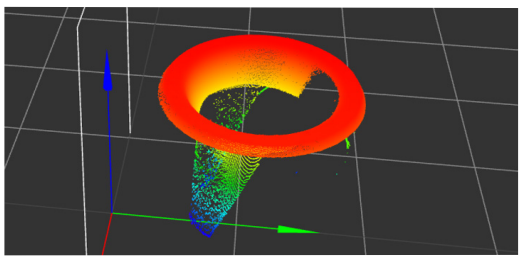


Figure 3

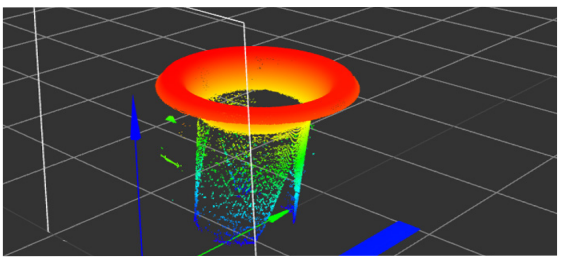
DUAL CAMERA PROFILERS — RF627BiSmart Series

- Profilers with a single laser and two receiving cameras for high-quality 3D model generation
- Sampling rate (full working range) – 520 profiles/s
- Resolution, X axis (combined profile) – 1456 or 2912 points
- Full support for Smart functions

Range	MR, mm	SMR, mm	EMR, mm	Xsmr, mm	Xemr, mm
65/25-20/22	25	65	90	20	22
75/50-30/41	50	75	125	30	41
70/100-48/82	100	70	170	48	82
70/150-58/122	150	70	220	58	122
95/150-53/106	150	95	245	53	106
82/200-60/150	200	82	282	60	150
90/250-65/180	250	90	340	65	180



3D model of a conical hole, monocular profiler



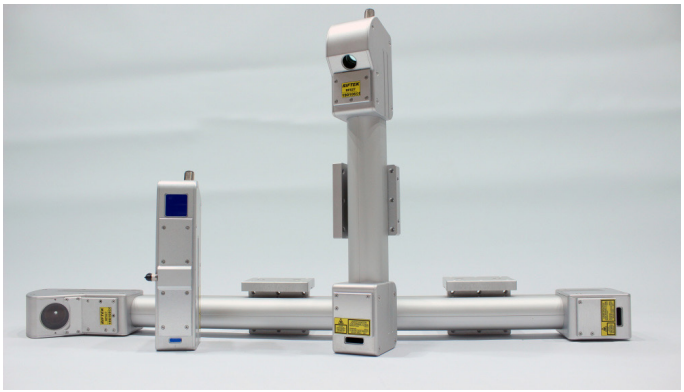
3D model of a conical hole, binocular profiler

HIGH SPEED PROFILERS — RF628 Series

- Sampling rate (full working range) > 4000 profiles/sec
- Sampling rate (ROI mode) – up to 16000 profiles/sec
- Linearity, Z axis – 0.01% of the range
- Resolution, X axis – 640 or 1280 points

Range	MR, mm	SMR, mm	EMR, mm	Xsmr, mm	Xemr, mm
65/10-11/12	10	65	75	11	12
75/25-20/22	25	75	100	20	22
90/50-32/44	50	90	140	32	44
125/75-42/58	75	125	200	42	58
150/100-50/74	100	150	250	50	74
150/150-64/112	150	150	300	64	112
210/300-148/276	300	210	510	148	276
285/400-198/376	400	285	685	198	376
370/500-250/466	500	370	870	250	466
450/600-300/556	600	450	1000	300	556
530/700-350/650	700	530	1230	350	650
610/800-400/744	800	610	1410	400	744
685/900-450/836	900	685	1585	450	836
765/1000-500/930	1000	765	1765	500	930

HIGH SPEED PROFILERS WITH INCREASED RESOLUTION — RF629, RF6292 Series



RF629

- Sampling rate (full working range) – 1000 Hz
- Sampling rate (ROI mode) – 16000 Hz
- Resolution, X axis – 1280 or 2560 points
- Linearity, Z axis – 0.01%

Range	MR, mm	SMR, mm	EMR, mm	Xsmr, mm	Xemr, mm
60/25-22/26	25	60	85	22	26
60/50-36/50	50	60	110	36	50
65/100-56/100	100	65	165	56	100
90/150-70/140	150	90	240	70	140
110/200-84/178	200	110	310	84	178
95/250-100/250	250	95	345	100	250
190/300-120/300	300	190	490	120	300
145/400-158/400	400	145	545	158	400
180/500-198/500	500	180	680	198	500
230/600-236/600	600	230	830	236	600
265/700-274/700	700	265	965	274	700
310/800-314/800	800	310	1110	314	800
345/900-352/900	900	345	1245	352	900
375/1000-392/1000	1000	375	1375	392	1000

RF6292

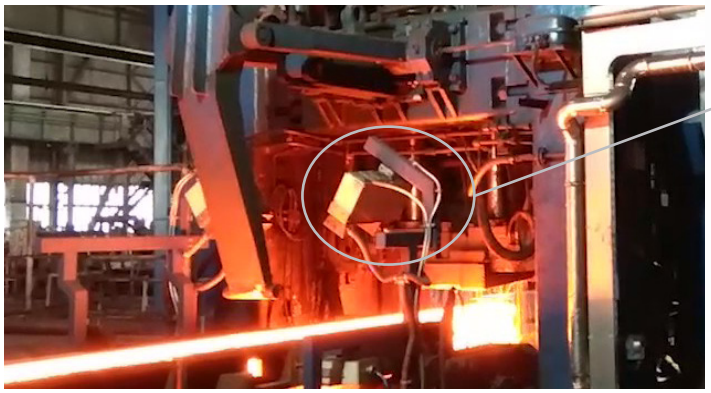
- Specialized profilers with Xend/Z ratio >2/5
- Sampling rate (full working range) > 4000 Hz
- Resolution, X axis – 1280 or 2560 points
- Linearity, Z axis – 0.01%

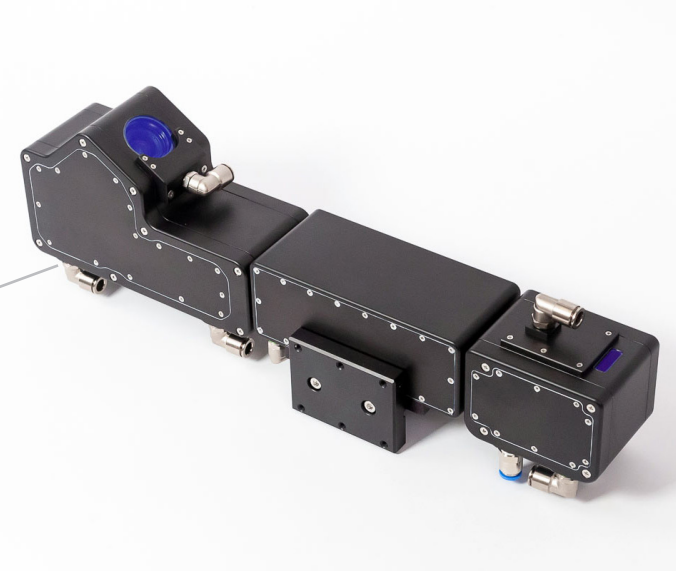
Range	MR, mm	SMR, mm	EMR, mm	Xsmr, mm	Xemr, mm
70/5-24/24	5	70	80	24	24
80/15-40/44	15	80	95	40	44
95/25-70/81	25	95	120	70	81
135/35-90/105	35	135	170	90	105
170/45-110/130	45	170	215	110	130
170/75-146/194	75	170	245	146	194
220/90-200/256	90	220	310	200	256
355/120-302/376	120	355	575	302	376
455/170-400/500	170	455	625	400	500
550/225-500/624	225	550	775	500	634

LASER PROFILERS, SPECIALIZED DEVICES

HOT OBJECTS MEASUREMENT

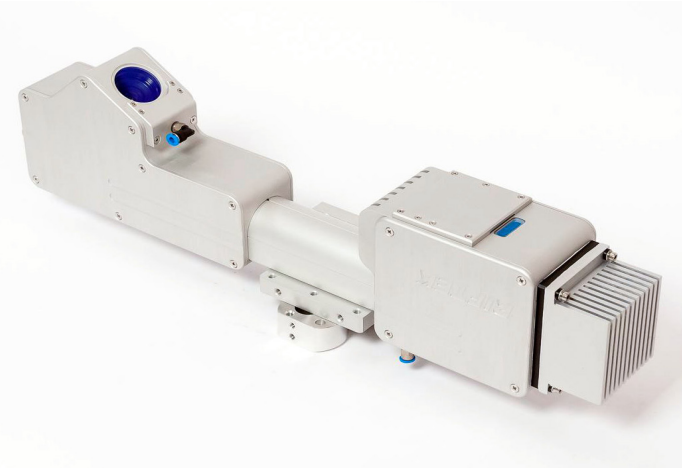
- 1.5W Blue laser
- Water cooling system
- Air protection
- Heat rejection windows





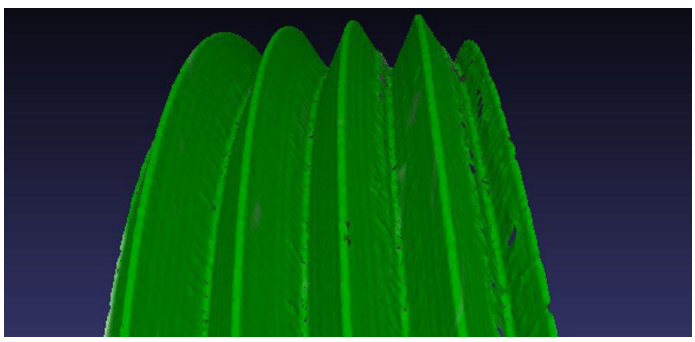
SURFACES PROFILING

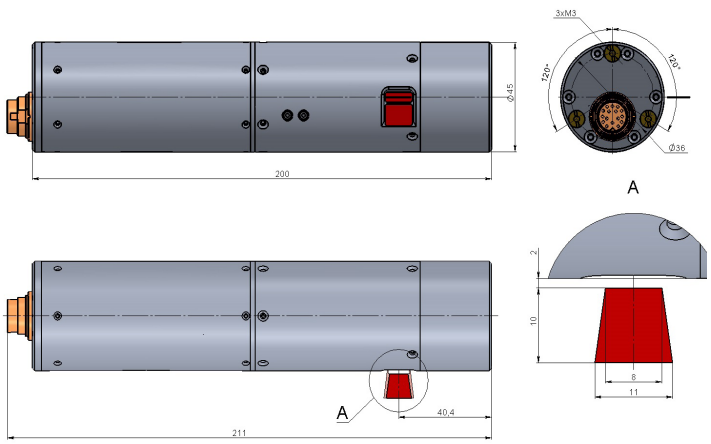
- 4W IR laser
- 10kHz rate
- 2560 points resolution
- Control of surface defects, in particular conveyor belts



SCANNING HOLES AND INTERNAL THREADS

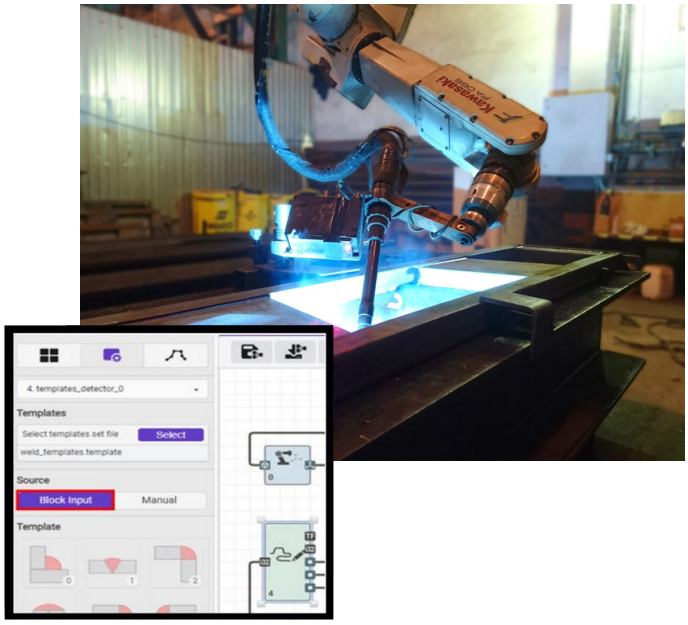
- Smallest profiler on the market
- Measured ID – from 49 mm





LASER SEAM TRACKING SYSTEM FOR WELDING AUTOMATION

LASER PROFILERS FOR WELDING ROBOTS — RF627SMART-WELD SERIES



MAIN FEATURES

- RF627Smart-Weld – laser profilers with direct connection to the robot controller
- Real-time recognition, tracking, and measurement
- Works with all surfaces, including shiny ones
- Connection to all common robot controllers

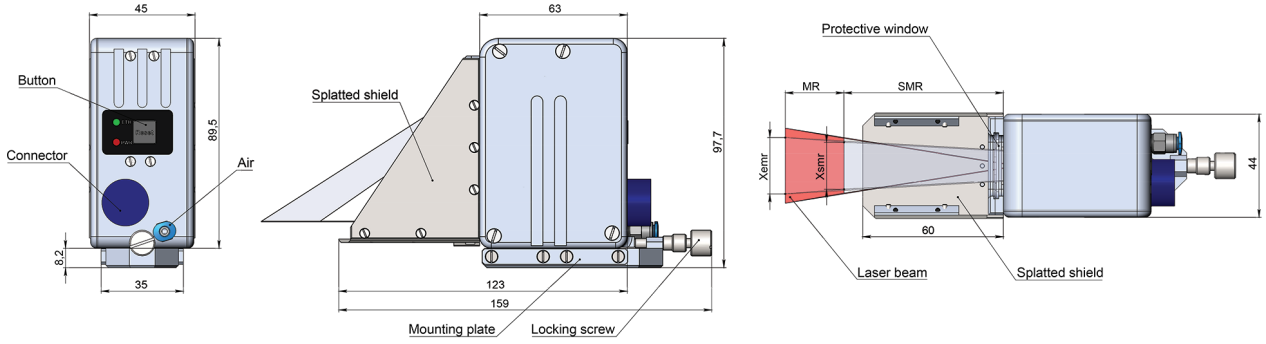
Laser Profilers RF627Smart-Weld Series. Working ranges

Range	SMR, mm	MR, mm	Xsmr, mm	Xemr, mm	Laser
65/25-20/22	25	65	20	22	Class 2M
70/50-30/41	50	70	30	41	
76/100-48/82	100	76	48	82	
70/130-40/86	130	70	40	86	
250/130-52/76	130	250	52	76	
82/200-60/150	200	82	60	150	
90/250-65/180	250	90	65	180	

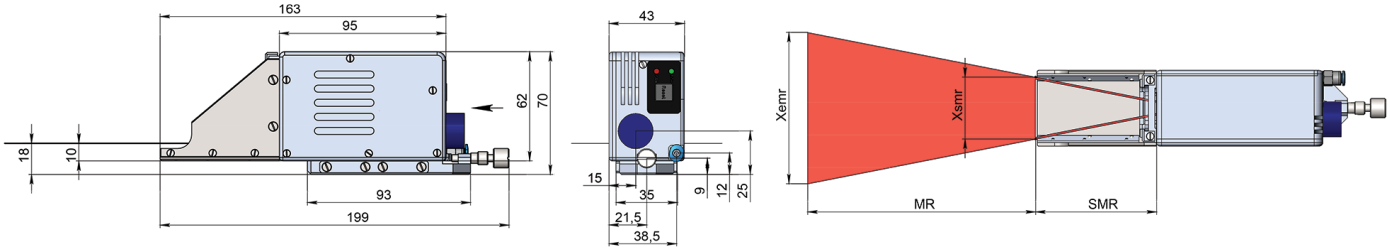
For the rest parameters — see RF627Smart Series

RF627SMART-WELD

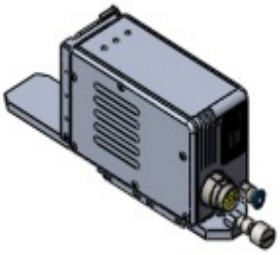
RF627Smart-Weld-68/25-20/22 и RF627Smart-Weld-90/250-65/180



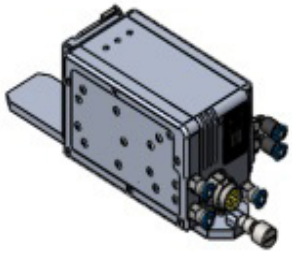
RF627Smart-Weld-70/130-40/86



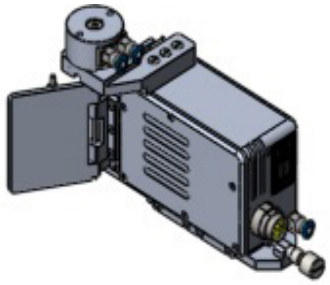
RF627SMART-WELD CONFIGURATIONS



Profiler for welding robot



Profiler for welding robot with cooling



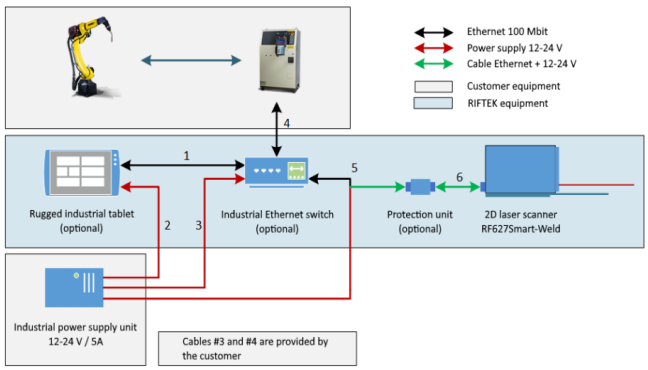
Profiler for welding robot with protective shutter

LASER SEAM TRACKING SYSTEM FOR WELDING AUTOMATION

HOW IT WORKS

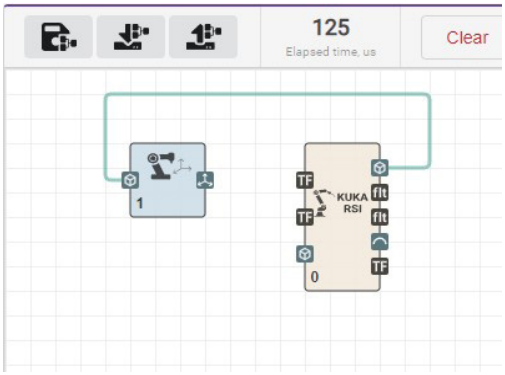
STEP 1

Connect the equipment according to the functional diagram:



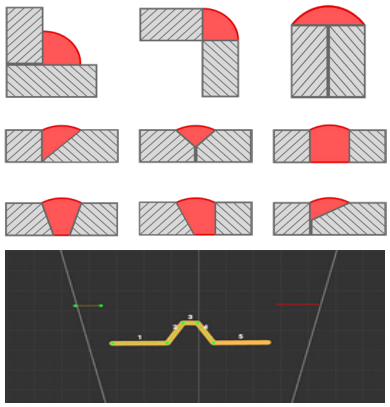
STEP 2

Calibrate the profiler relative to the robot.



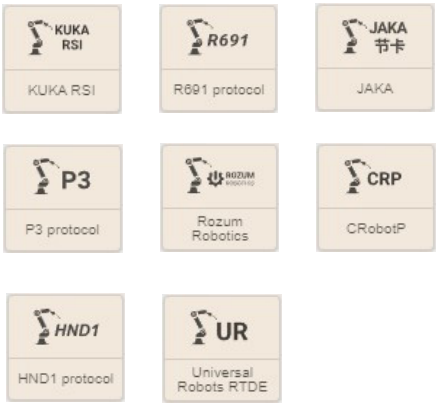
STEP 3

Using the profiler web interface, create a computation graph from the library of ready-made blocks, taking into account the features of the equipment, namely:



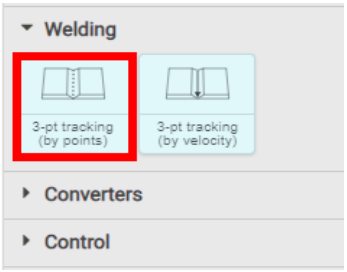
Select a tracking template or create your own using the template editor.

STEP 3.1



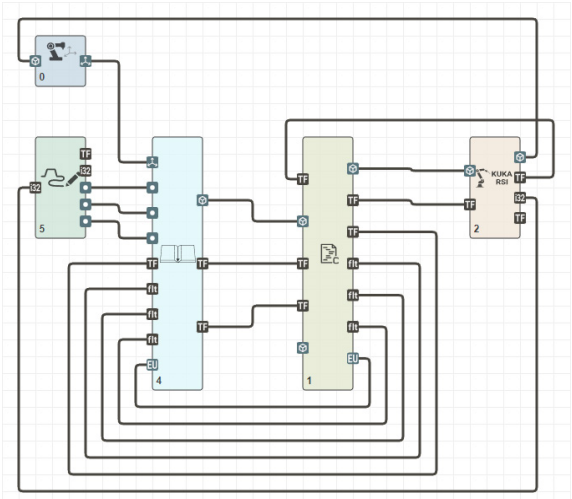
Select a Smart-block of the robot communication protocol.

STEP 3.2



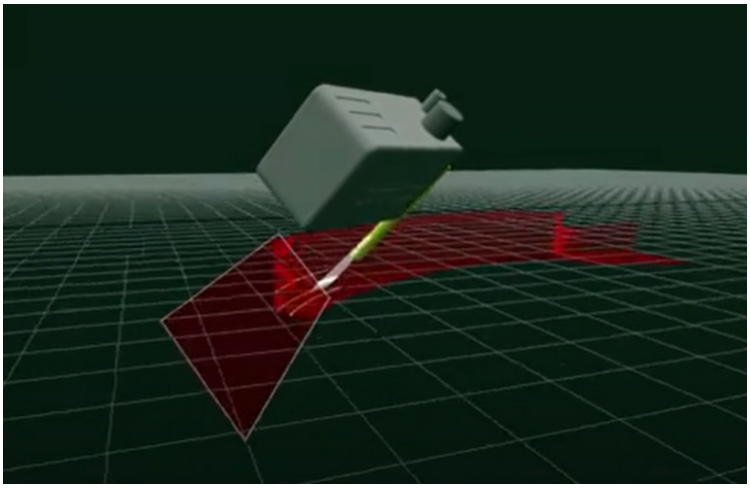
Select a Smart-block for the type of tracking:
1. Output values of the smart block – points and angles to which the actuator should move.
2. Output values of the smart-block – linear and angular velocities with which the actuator should move.

STEP 3.3



Add and configure the Smart block for script execution. Complete the construction of the tracking graph.

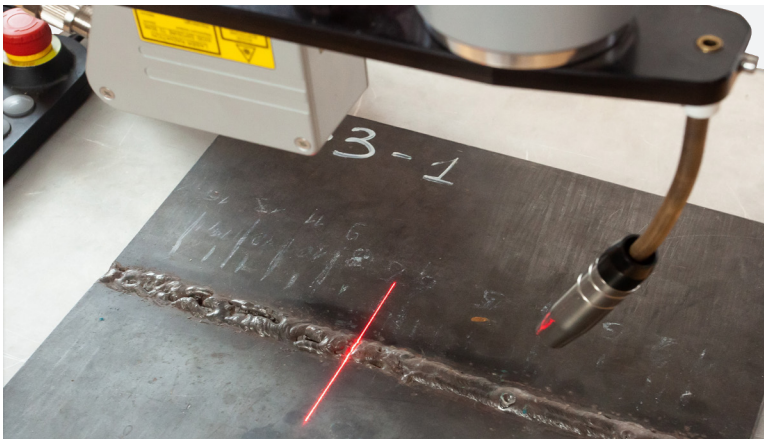
STEP 4 START WORKING

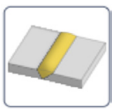
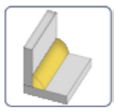
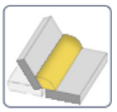


Observe the process on the computer screen.

ROBOTIC WELD BEAD GEOMETRY INSPECTION

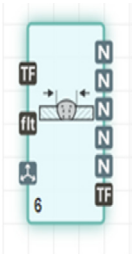
- Built-in software module for RF627Smart-Weld profiler
- Direct connection to the robot or any type of positioning system
- Measurements and tolerance control are formed from a library of ready-made blocks
- Visualization and recording of results



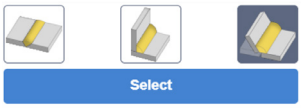
Features \ Weld Type	 Groove Weld	 Fillet weld	 Random weld
Seam width	+	+	+
Seam height	+		+
Leg left		+	+
Leg right		+	+
Angle left	+		+
Angle right	+		+
Undercut left	+	+	+
Undercut right	+	+	+
Plates mismatch	+		+
Joint angle	+	+	+
Size ratio	+		+
Cavity width	+	+	+
Cavity height	+	+	+
Triangle left leg		+	+
Triangle right leg		+	+
Convexity (+)/ concavity (-)		+	+
Seam throat		+	+
Seam Overthickness			+

STEP 1.1

Setting up the Weld seam inspection Smart-block

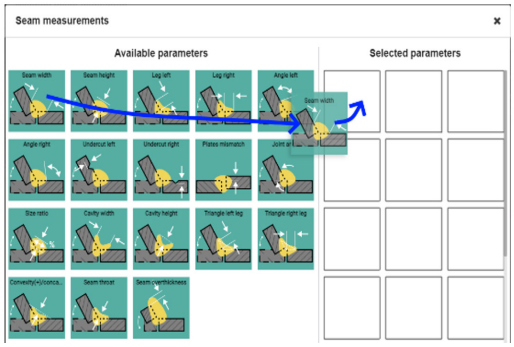


Select weld Type



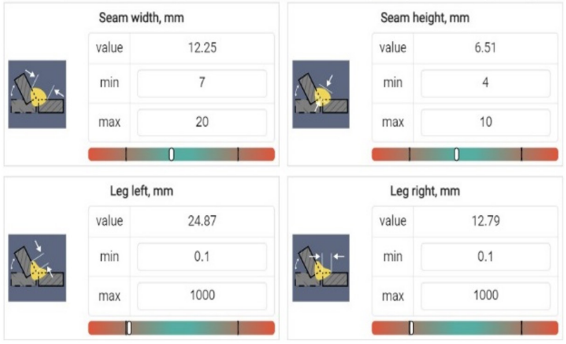
STEP 1.2

Drag and drop measured features



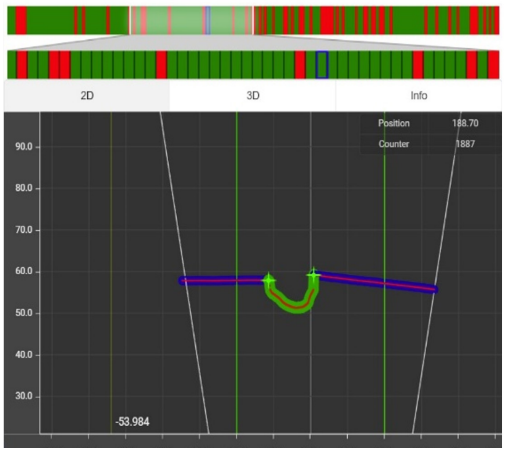
STEP 1.3

Set Tolerances



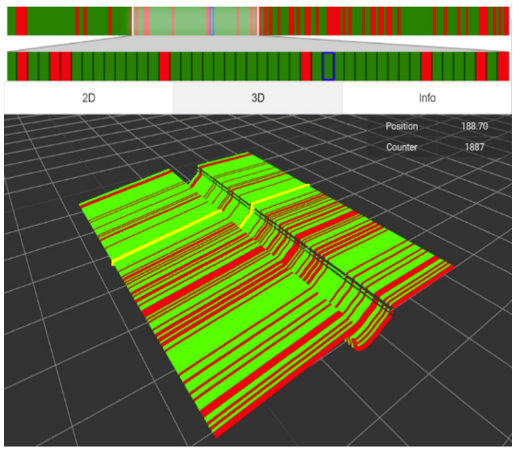
STEP 2

See the results in real time



STEP 3

Create protocols in 2D, 3D and tabular format



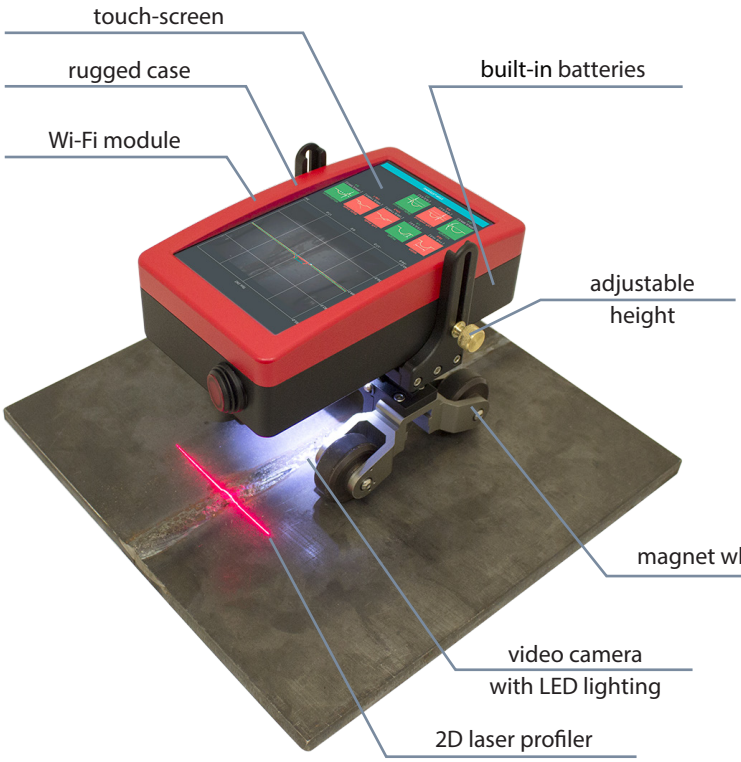
#	Position	Seam width (min: 7 max: 20)	Seam height (min: 4 max: 10)
1	150.600	12.29	6.60
2	151.400	12.29	6.60
3	151.900	12.29	6.59
4	152.400	47.25	3.05
5	152.900	44.05	3.05
6	153.400	49.60	3.04
7	153.900	46.64	3.04
8	154.400	12.29	6.59
9	154.900	12.29	6.60
10	155.400	12.29	6.60
11	155.900	12.29	6.60
12	156.400	12.29	6.60
13	156.900	12.29	6.60
14	157.400	12.29	6.59
15	157.900	12.29	6.60
16	158.400	12.29	6.60
17	158.900	12.29	6.60

START WORKING

LASER PROFILERS, RF62x SERIES

SPECIALIZED SCANNING SYSTEMS FOR WELDS, WELDED JOINTS AND EDGE PREPARATION

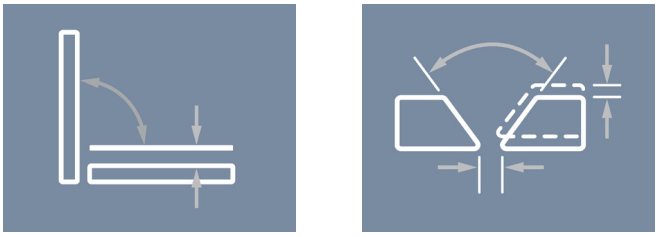
RF627AVIKScan



- Integrated in one system:
  - 2D profiler for measurement control automation
  - video camera for visual control automation
- Sampling rate — more than 2000 profiles/s
- Linear parameters measurement error — ±0.05 mm for 100 mm range
- Defect detection (porosity, cracks)
- Real time OK/NOK analysis
- Systems mounted on the robot
- Interchangeable measuring heads with different ranges

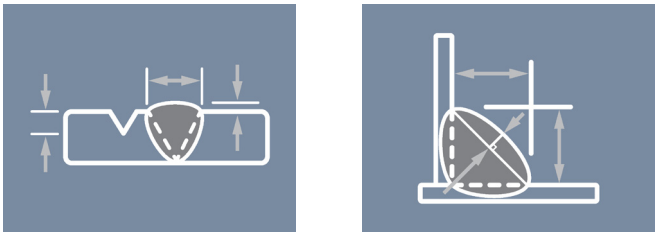
Parameter	Value
2D profiler VOF, mm	Z - 120, X - 30...110
Sampling frequency, profiles/s	>2000
Measurement error, mm	±0.05
X resolution, mm	0.025...0.08
Color camera resolution	1296 x 976
Camera speed, frames/s	120
Laser	red (660 nm) or blue (405 нм), Class 2
Working temperature, °C	-40...50
Measured parameters	width, height, angles, mismatch, undercut and so on

EDGE PREPARATION CONTROL



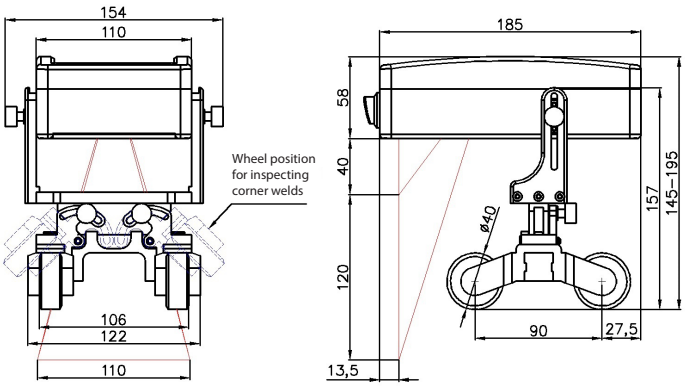
MEASUREMENT OF OFFSET, JOINT ANGLE, GAP WIDTH AND ETC.

WELD CONTROL

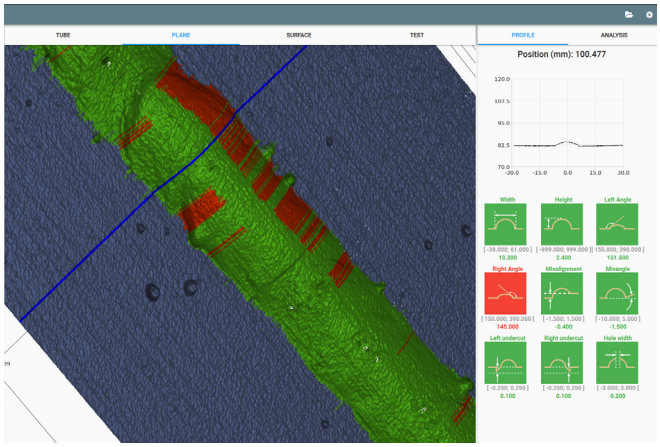


MEASUREMENT OF WELD HEIGHT AND WIDTH, CUTTING DEPTH, CAMBER AND ETC.

DESIGN



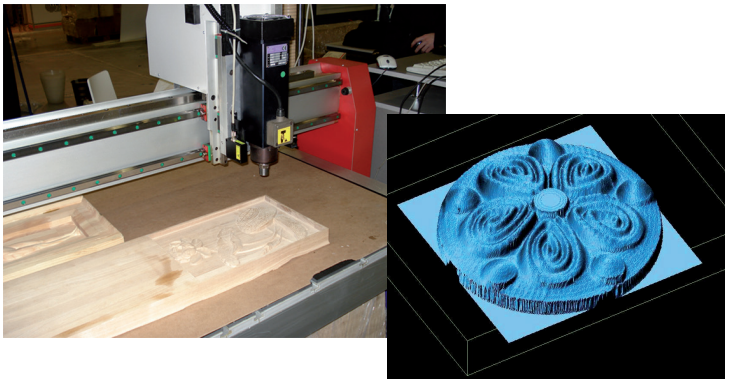
3D VISUALIZATION SOFTWARE



3D LASER SCANNING KIT — SHTRIKH-2 SERIES

3D Laser Scanning Kit is designed for mounting on any type of CNC machine and intended for non-contact scanning of products and obtaining 3D computer-simulated models.

In the scanning mode, the machine CNC system moves the sensor line-by-line over the item prototype. Thus, XYZ coordinate array for the surface is formed, i.e. a digital prototype model is created which is saved as a point cloud file as well as in a common STL format suitable for subsequent use in CNC.



Parameter	Value
Materials to be scanned	any material
Size of scanning area	arbitrary
Average scanning speed, points/s	up to 100 000

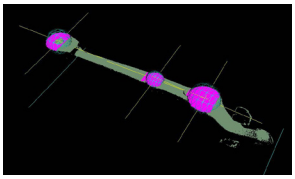
3D LASER MEASUREMENT MACHINE — RF1010SS

3D measuring machine is designed for non-contact measurement of geometrical parameters of objects, specifically sunflower seeds. Laser scanner RF625 Series, that is installed in the machine, scans the objects and identifies it's geometry. As result of scanning we get the parameters of every sunflower seed and their total quantity.

Parameter	Value
Nominal sampling rate, profiles/sec	250
Scanning speed, mm/s	100
Accuracy, μm	±150

3D LASER MEASUREMENT MACHINE — RF1010SL

3D Measurement Machine was specially developed to measure suspension arm's parameters for automotive industry. Laser scanner RF625 Series, which is installed in the machine, scans the suspension arm, measures and controls its geometrical parameters.



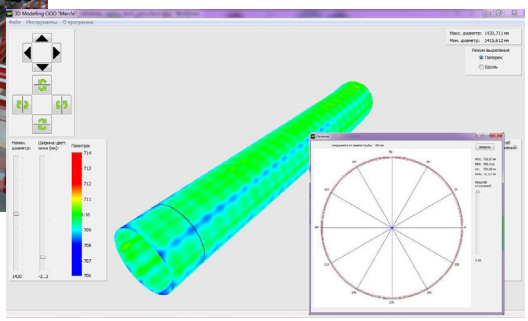
Parameter	Value
Nominal sampling rate, profiles/sec	250
Scanning speed, mm/s	50
Accuracy, % of the range	±0.1

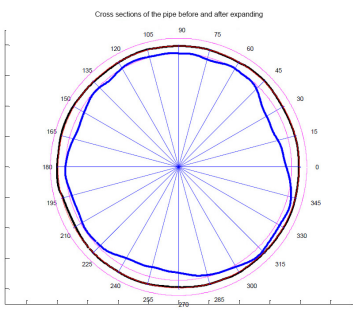
3D LASER MEASUREMENT MACHINE — RF1240TB Series

Developed together with MARVIE LLC

3D Measurement Machine is specially designed for control of geometric parameters of large diameter pipes. The machine consists of 24 wide-range high speed synchronized laser scanners type RF625-650 located on the outer circumference of the pipe, which makes it possible to inspect full profile of the pipe in the course of manufacture.

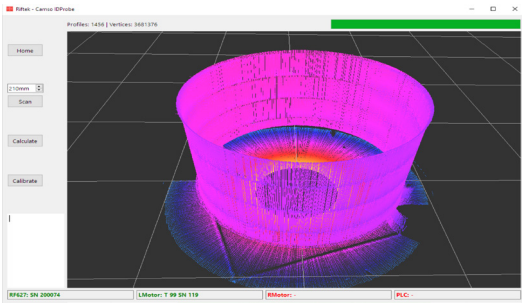
Parameter	Value
Pipes diameter range, mm	500...1450
Accuracy, mm	±0.1





3D LASER MEASUREMENTS

3D INSPECTION OF STEEL BAND RIMS

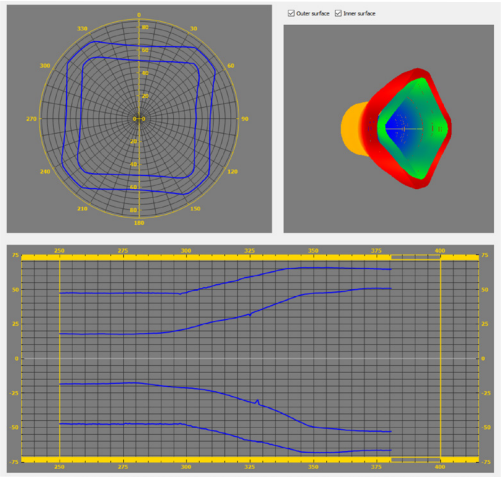


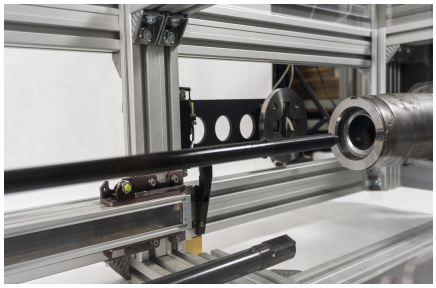
THE SYSTEM ON THE BASE OF ROTATING 2D PROFILER FOR CONTROL OF:

- Inner diameter
- Roundness
- Cylindricity
- Chamfer geometry

Parameter	Value
ID range, mm	100...400
Heigh range, mm	70..305
Accuracy, mm	±0,05

3D CONTROL OF HAMMERED AXLES SHAPE

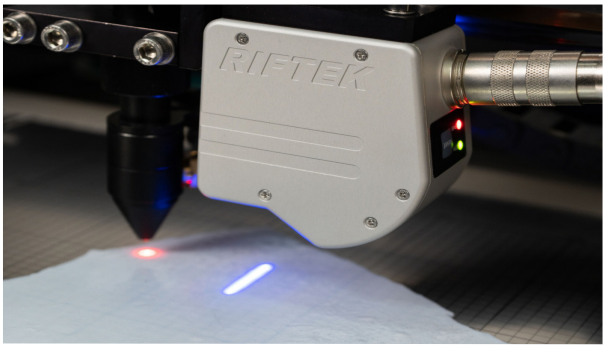




Synchronous circular scanning with point laser sensors of the external and internal surfaces of a product, calculation of geometric parameters and comparison with an ideal model.

Parameter	Value
ID range, mm	30...143
Accuracy, mm	±0,05
OD range, mm	62...180
Accuracy, mm	±0,1
Heigh range, mm	70...305
Depth of measurement, mm	500

3D MEASUREMENT AND CUTTING OF BIOLOGICAL TISSUE

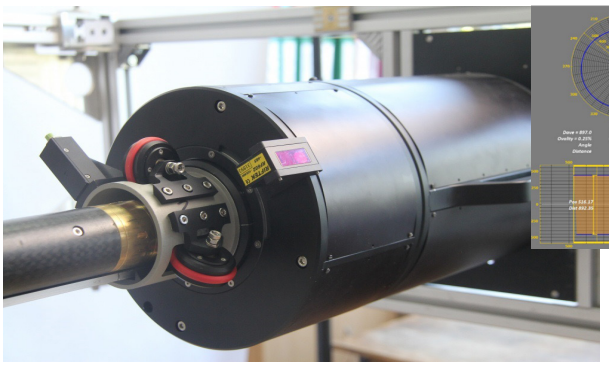


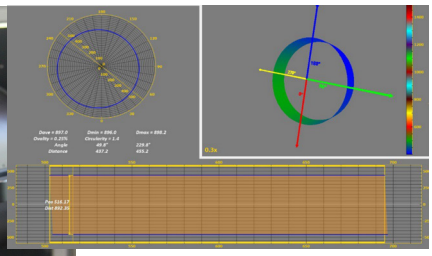
TURNKEY SOLUTION BASED ON A CNC MACHINE EQUIPPED WITH THE 2D LASER SCANNER

Non-contact measurement of the thickness distribution of biomaterials intended for the production of blood vessels and heart valves, as well as optimal automated laser cutting.

Parameter	Value
Thickness measurement accuracy, mm	±0,03
Scanning speed, mm/s	100
2D laser profiler	RF627.Blue-25/10-8/11

3D CONTROL OF CHARCOAL BURNERS





The automated laser system is designed to create a complete 3D computer model of the internal surface of the burner and calculate the degree of wear with high accuracy and resolution.

Parameter	Value
ID range, mm	440...1440
Accuracy, mm	±0,5
Depth range, mm	0...2000

INNER DIAMETER MEASUREMENT SYSTEMS

Systems are intended for contactless measuring of inner diameter and profiles of gun barrels, cylindrical and taper pipes, progressive cavity stators, turbodrills and so on.

TWO WORKING PRINCIPLES

- Multisensor measurement by stationary laser sensors - **RF040 Series**
- Inner surface laser scanning by rotating sensors - **RF096 Series**

SYSTEMS PARAMETERS

- Measured ID – from 6 mm
- Up to several µm accuracy
- Up to 32000 measured points on the surface in 2 seconds
- Calculation of ovality and roundness
- Surface defects detection and measurement
- 3D model of inner surface design

SYSTEM STRUCTURE

- Laser measurement module with
  - stationary sensors
  - rotating sensors
- Translation module intended for transportation of measurement module inside the pipe:
  - self propelled
  - any kind of pulling machine
- Software for PC
- Calibration rings

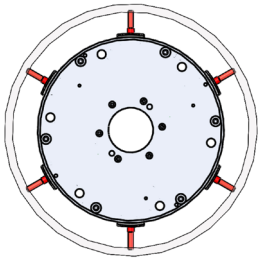
SYSTEM CAN CONTAIN

Centering frame to hold measurement module near pipe axis

OPTIONS

- Pipe straightness measurement module
- Video inspection module
- Wireless connection (Wi-Fi) module

MULTISENSOR MEASUREMENT HEAD — RF040 Series



The Multisensor Measurement Module contains up to 6 laser triangulation sensors located circumferentially in one housing at known fixed angles.

The measurement module is inserted into the pipe and moved by translation module to the definite position.

Calibrated laser sensors measure distances to the inner surface .

Software calculates diameter of the pipe.

LASER MEASURING HEAD FOR INNER DIAMETER CONTROL

Parameter	Value
6 laser triangulation sensors	
Diameter range, mm	65…115 or by request
Accuracy, % of range	±0.1

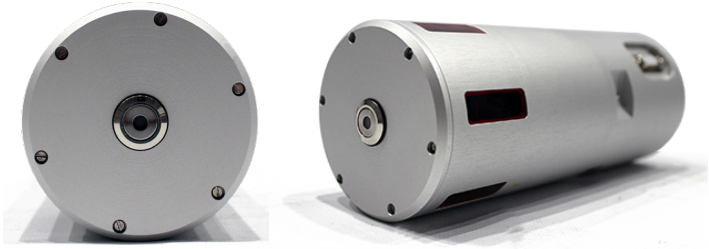
LASER MEASURING HEAD FOR NUCLEAR STATION PIPE DIAMETER CONTROL

Parameter	Value
Diameter of the module, mm	70
Diameter range, mm	95…195 mm (main range) 160…300 mm (extended range)
Accuracy, mm	0.05 mm (main range) 0.2 mm (extended range)

LASER MEASUREMENT MODULE FOR CONTROL OF LARGE DIAMETER FIBERGLASS PIPES

Parameter	Value
6 laser triangulation sensors	
Diameter range, mm	500-1250
Accuracy, mm	±0.2

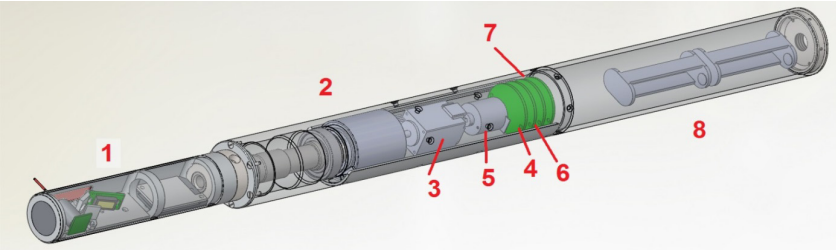
MULTISENSOR INNER DIAMETER MEASUREMENT SYSTEMS WITH WI-FI MODULE

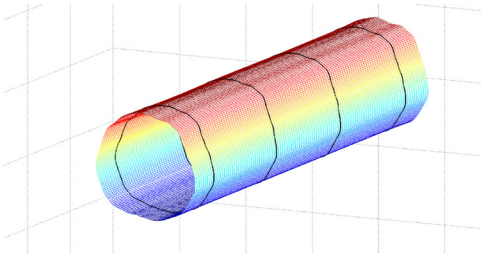


Parameter	Value
ID measurement range, mm	100…150
Accuracy, mm	±0.05
Measurement speed, ID /s	500
Light source	Red laser, 660 nm
Laser output power, mW	<1
Laser safety Class	2 (IEC60825-1)
Interface	Wi-Fi, USB
Time of continuous work, hour	4

INNER DIAMETER MEASUREMENT SYSTEMS

ROTATING MEASUREMENT HEAD — RF096 Series





MULTISENSOR MEASUREMENT MODULE CONTAINS

laser triangulation sensor 1 (one or several with different measurement range and stand-off distance), mounted on rotating platform 2, which contains motor 3 with electronic driver 4, and rotary encoder 5 coupled to the motor 3. The system also includes a tilt sensor 6, intended for control of inclination of rotating platform during measurement.

OPTIONS

built-in Wi-Fi module 7 is used for communication between the system and PC; the system can be powered from internal batteries 8.
2D laser scanner can be installed instead of points sensor.

The measurement module is inserted into the pipe and moved by pulling machine to the definite position.

Rotating laser sensor scans inner surface of the pipe and the module transmits polar coordinates of the surface (distance from rotation axis, measured by triangulation sensor and a corresponding angle, measured by encoder).

Software uses the set of transmitted coordinates

- to calculate:
  - ID of measured pipe
  - ovality and roundness
- to find:
  - surface defects
- to design
  - Full profile in definite section
  - 3D model of the pipe inner surface

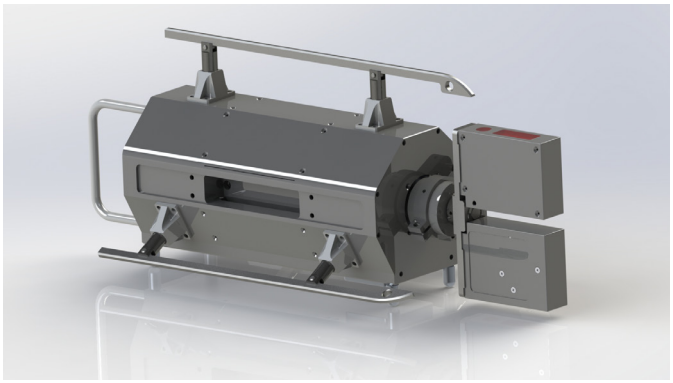
WHEEL CENTER BORE INNER DIAMETER MEASURING GAUGE

MODEL RF096-50/70-200-Clb

Non-contact scanning and inner surface geometry measurement of wheel center bore.

Parameter	Value
Rotating measurement head with 2 sensors	
ID range, mm	50…70
ID measurement accuracy, µm	±5
Depth of measurement, mm	200
Autocalibration	

MOBILE LASER SCANNING SYSTEM FOR PIPE DIAMETER CONTROL



- Rotating measurement head with 2 sensors
- Linear scanning along the tube

Parameter	Value
ID range, mm	146…176
ID measurement accuracy, µm	±10
Depth of measurement, mm	programmable, up to 70
Battery power supply	
Built-in Wi-Fi module	

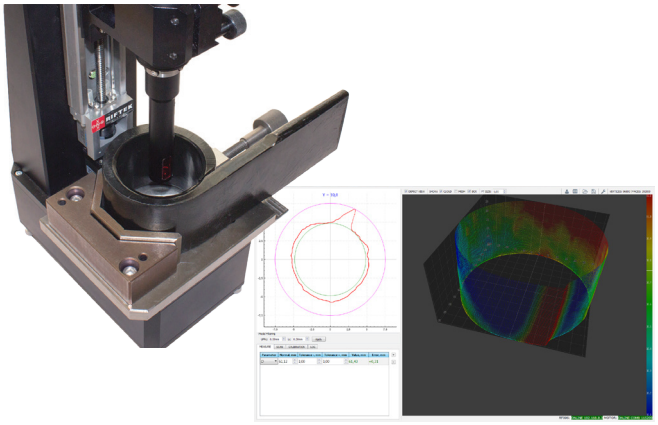
LASER SCANNING SYSTEMS FOR PIPE DIAMETER CONTROL

Parameter	Value
ID range, mm	45...55 or by request
ID measurement accuracy, µm	±2

LEAF SPRING HOLE INNER DIAMETER MEASUREMENT MACHINE

RF096-30/75-120

The machine is designed for contactless scanning and geometrical parameters measurement of the leaf springs holes.



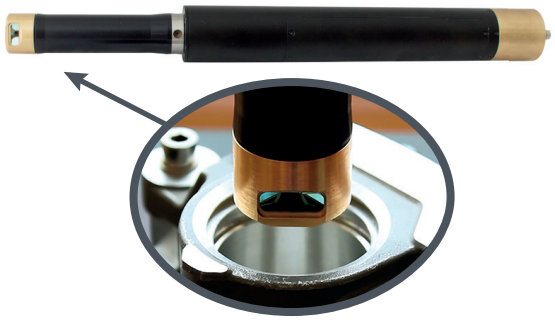
Parameter	Value
Measured diameters, mm	30-75
ID measurement accuracy, mm	±0.04
Depth of measured hole, mm	120
Measured parameters	diameter, roundness, conicity, cylindricity

LASER DEBRIS INSPECTION SYSTEM

RF096-Insp

The system is intended for non-contact detection of the debris inside the circular grooves of different technological items, for example brake calipers and so on.

The system can be used also for groove seal profiling (seal deformation inspection).

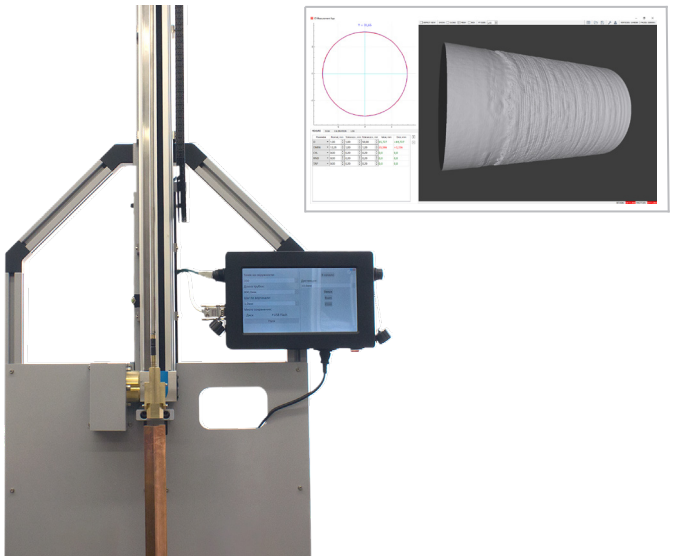


Parameter	Value
Inspected grooves diameter range, mm	35-53
Minimal size of detected debris, mm	0.1x0.1x0.1
Laser sensor linearity, µm	±10
Depth of measured hole, mm	120
Inspection time, s	1.2

PIPES ID MEASUREMENT MACHINE

RF096-9/16-800

The machine is designed for contactless scanning and geometrical parameters measurement of small diameter pipes.



Parameter	Value
ID measurement range, mm	9...19
Accuracy, mm	±5
Pipe length, mm	Up to 800

PIPES ID MEASUREMENT MACHINE

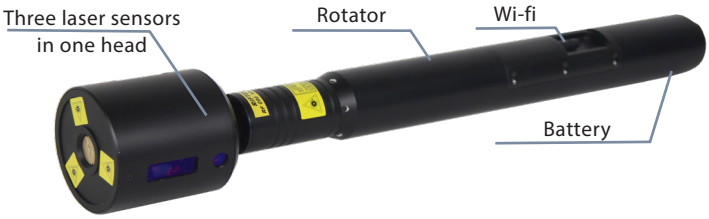
RF096-35/50-100

The machine is designed for in-line contactless scanning and geometrical parameters measurement of small diameter pipes.

Parameter	Value
ID measurement range, mm	35...50
Accuracy, mm	±5
Pipe length, mm	Up to 100

INNER DIAMETER MEASUREMENT SYSTEMS

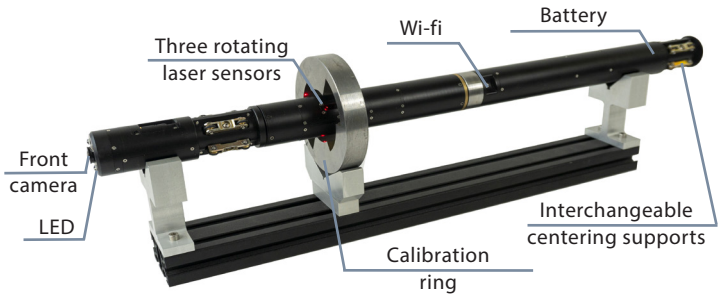
RF096 SYSTEMS FOR MEASUREMENT AUTOMATION

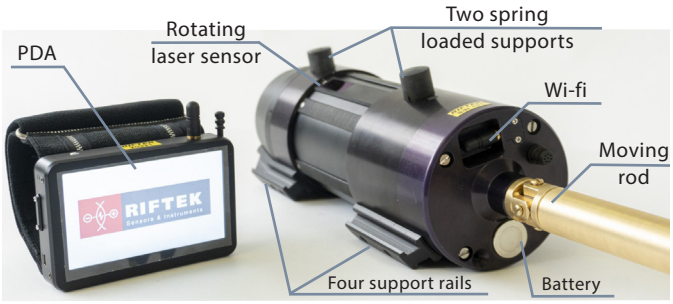


- Automated measurements of diameter, ovality, roundness
- Building 3D surface model

Parameter	Value
ID range, mm	from 9
Accuracy, um	from ±2
Resolution for cross-section, points	2048
Measurement speed, cross-sections/s	4

RF096 SYSTEMS WITH CENTERING FRAMES



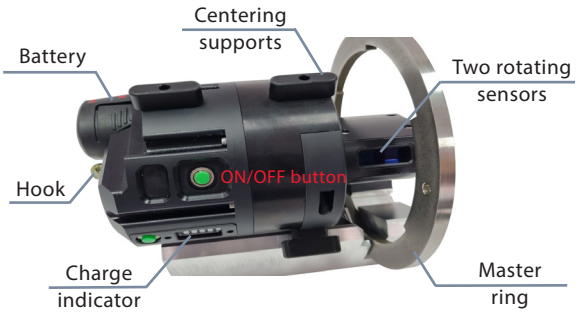


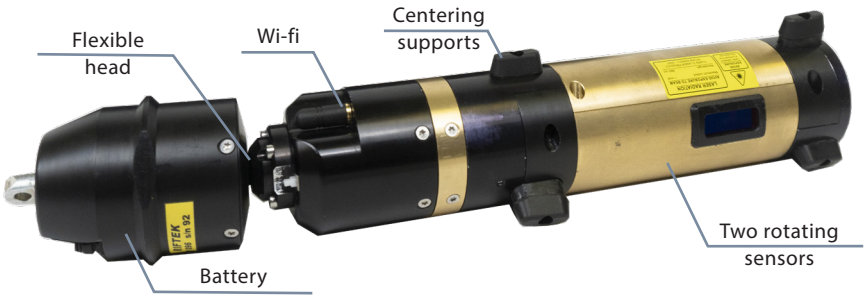
- The system is designed to control the internal diameter of extruders barrels

Parameter	Value
ID range, mm	40...95
Accuracy, um	±5
Resolution for cross-section, points	2048

- The system is designed to monitor wear on the inner surface of pipes

Parameter	Value
ID range, mm	105...130
Accuracy, um	±10
Resolution for cross-section, points	2048





The systems are designed to control the internal diameter of curved pipes

- Compact design

Parameter	Value
ID range, mm	145...160
Accuracy, um	±5
Resolution for cross-section, points	2048
Speed, cross-sections/s	4

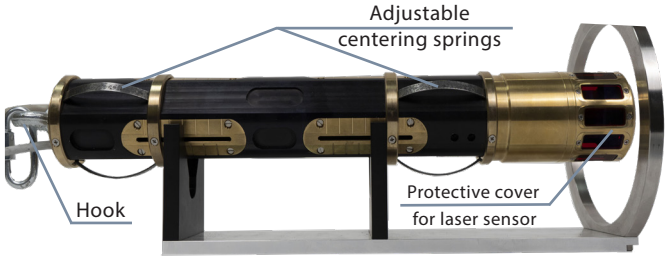
- Design with flexible connecting system components

Parameter	Value
ID range, mm	65...90
Accuracy, um	±10
Resolution for cross-section, points	2048
Speed, cross-sections/s	4

The system is designed for well inspections

- IP67 Enclosure rating

Parameter	Value
ID range, mm	105...130
Accuracy, um	±10
Resolution for cross-section, points	2048
Speed, cross-sections/s	4



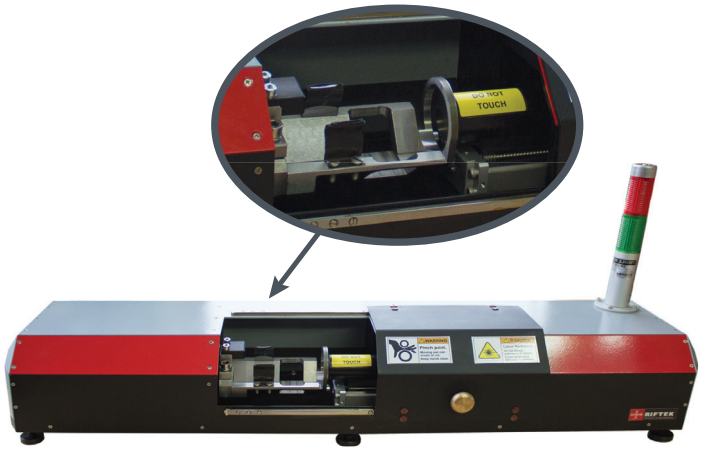
PIPE INNER DIAMETER MEASUREMENT MACHINE

MODEL RF096-32/42-100

The machine is designed for contactless scanning and geometrical parameters measurement of inner diameter of pipes, bushes, holes, tubes, and so on.

Application of the machine - large-scale production.

Parameter	Value
Measured diameters, mm	32..42
ID measurement accuracy, µm	±5
Depth of measured hole, mm	≤80
Measurement cycle (5 sections), s	13



HEAT EXCHANGER TUBE SHEETS MEASUREMENT

Parameter	Value
ID range, mm	9...19 and 16...46
Accuracy, um	±5 and ±10
Measurement cycle, s	5

HANDHELD ID MEASUREMENT GAUGES

Operational measurement of:

- Diameter
- Ovality
- Roundness

Series RF096-Dmin/Dmax-Lmin/Lmax-HH

Parameter	Value
ID range, mm	upon request
Accuracy, um	±10...20
Measurement cycle, s	3

SELF-PROPELLED ID MEASUREMENT SYSTEMS

MEASURING PRECISION PIPES

- Automatic measurement of ID, ovality, roundness along the pipe
- Two rotating laser sensors
- Battery supply and Wi-Fi connection
- Replacement wheels

Parameter	Value
Measured IDs, mm	82±1, 103±1
Measurement accuracy, um	±5
Distances between measured cross-sections	Programmable
Translation speed, mm/s	Programmable

- The specifications can be changed upon request

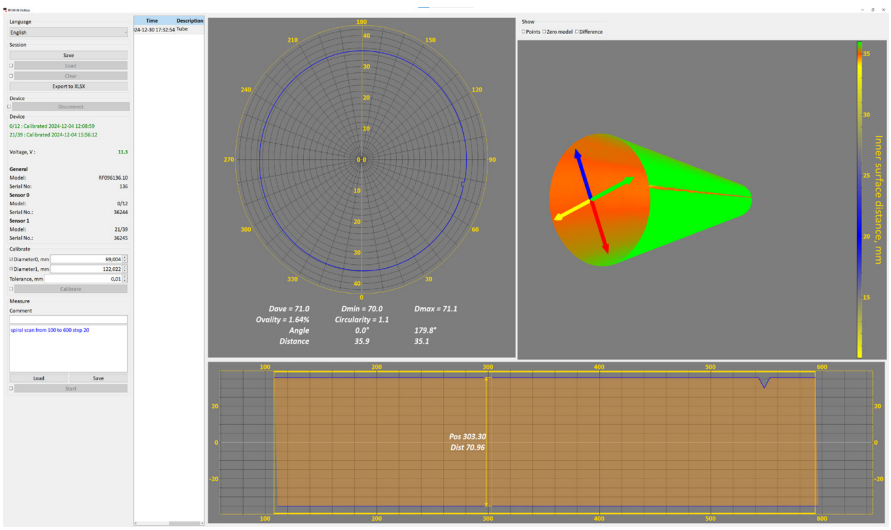
ID MEASURING AND SURFACE INSPECTION

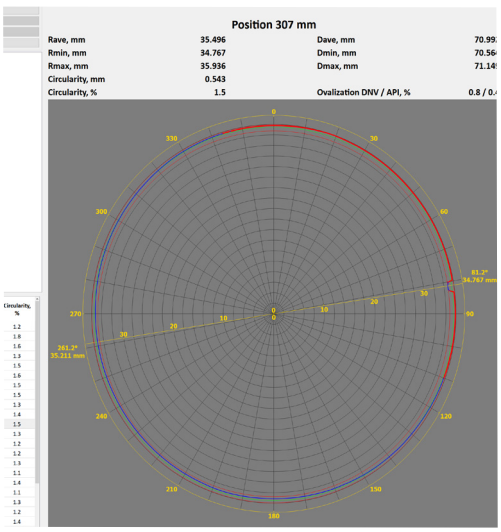
- Automatic measurement of ID, ovality, roundness along the pipe
- Two rotating laser sensors
- Battery supply and fiber optic connection
- Spring loaded centering frames
- Front camera

Parameter	Value
Measured IDs, mm	79±10, 122±10
Measurement accuracy, um	±10
Distances between measured cross-sections	Programmable
Translation speed, mm/s	Programmable

- The specifications can be changed upon request

SOFTWARE

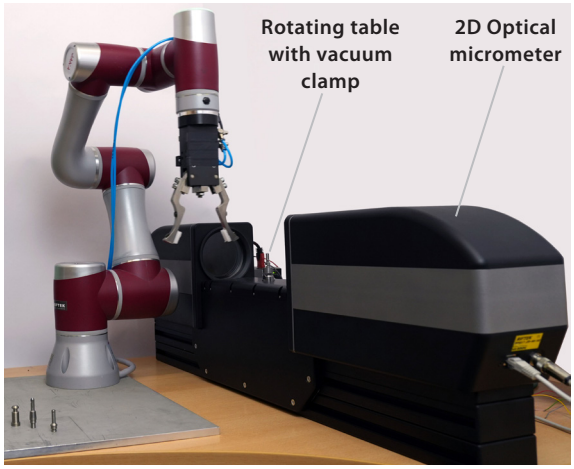


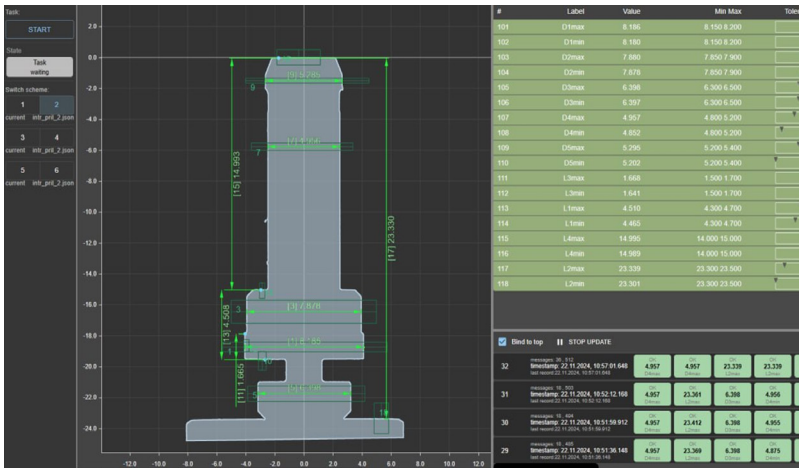


TURNED PARTS MEASUREMENT SYSTEMS

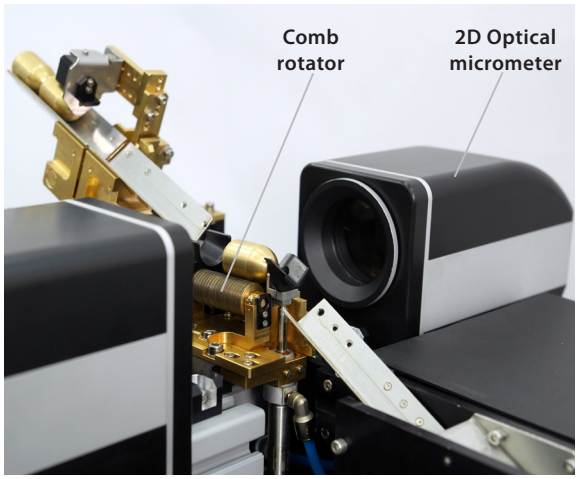
- The systems on the base of 1D and 2D Optical micrometers.
- Workpiece automatic recognition.
- Micron precision.
- Measurement of diameters, distances, angles, localization, perpendicularities, parallelisms, symmetries, runout, roundness, cylindricity, coaxiality, thread.
- Universal measurement software.

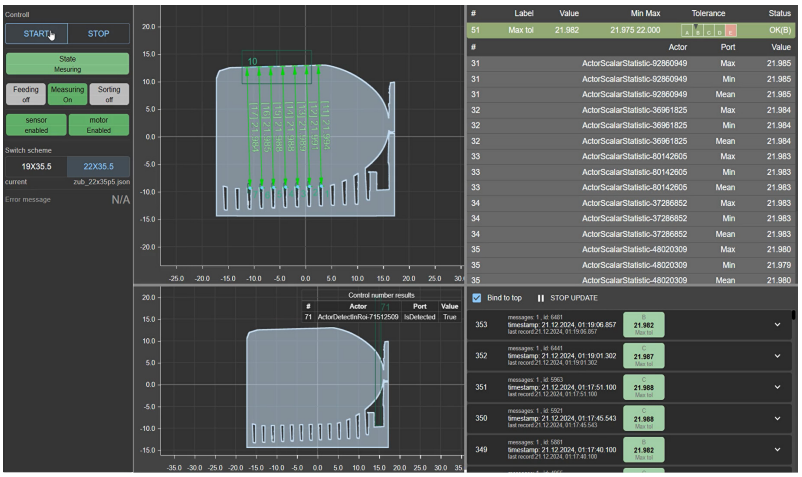
THE ROBOTIC CELLS FOR SMALL WORKPIECE MEASUREMENT



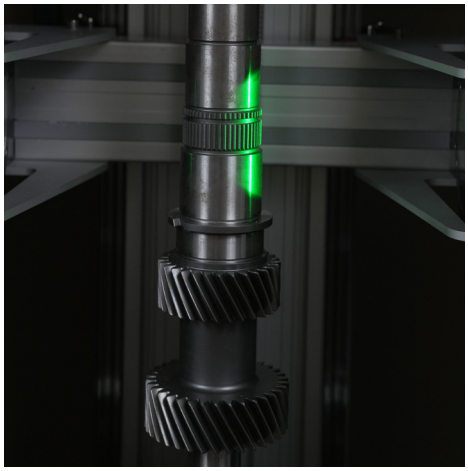


AUTOMATIC MEASUREMENT AND SORTING STATIONS

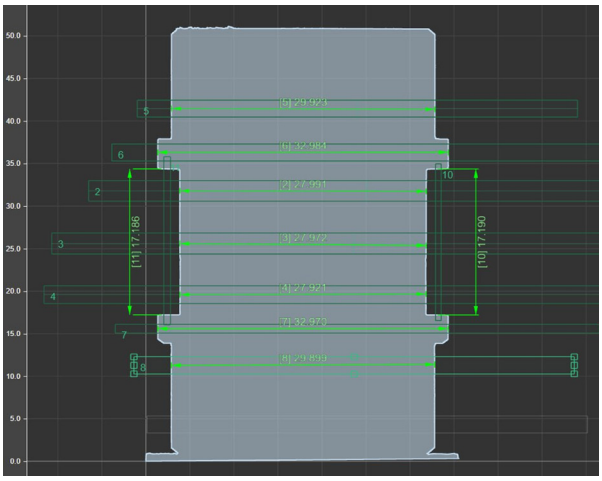




UNIVERSAL MEASUREMENT MACHINES



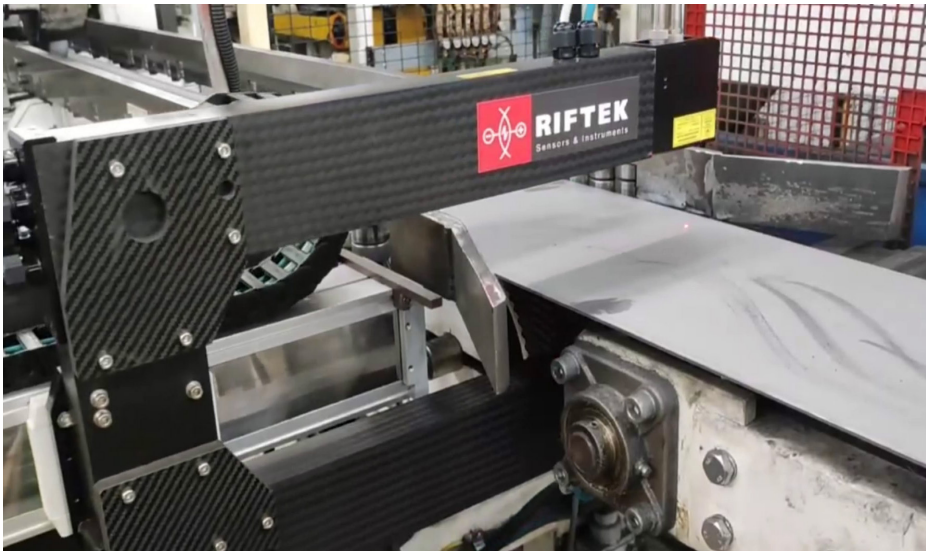
- Length up to 1000 mm
- Diameters up to 100 mm



THICKNESS MEASUREMENT SYSTEMS

RF160.20

The systems are designed for non-contact control of the thickness of various sheet materials (plastic, metal, rubber, wood).



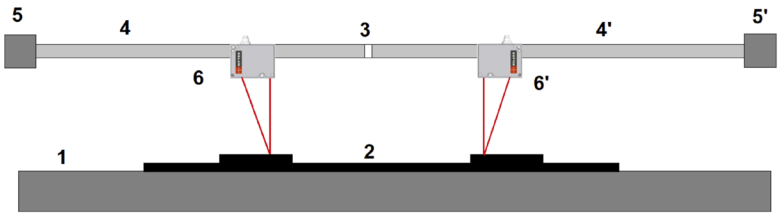
The turn-key solution comprises a stable C-frame on which two laser distance sensors are fixed. The C-frame is mounted on a linear stage that moves the sensors across the material being inspected. Both sensors measure distance to sheet surface. The system calculates the thickness of the sheet from the measured distances and the distance between the two sensors. To reduce the influence of temperature, an auto-calibration mode has been implemented - in their extreme position, the sensors measure the thickness of a master plate. Control cabinet with motor drivers, industry computer and software are included in the scope of delivery.

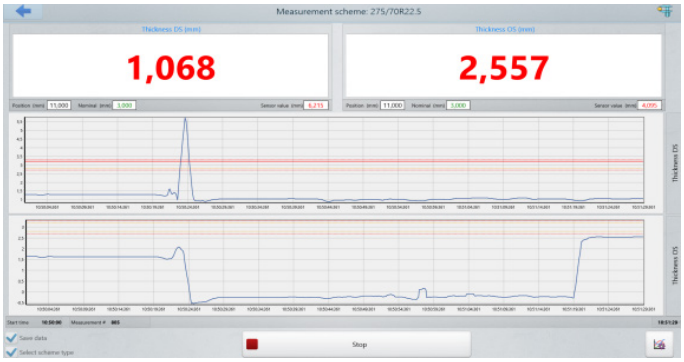
Parameter	Value
Thickness range, mm	Up to 50
Accuracy, um	±2
Translation speed, mm/s	100
Sensors speed, kHz	Up to 70

RF160.10

The system is designed for non-contact measurement of the thickness of sheet materials during calendering, for example, rubber intended for the production of car tires. Two IR laser sensors can measure thickness at fixed lines or making scanning movements across the material. The system is placed above the **calender roller (1)** with the **controlled material (2)** and contains the **support beam (3)**, on which **two linear motion modules (4 and 4')** with **stepper motors (5 and 5')** are installed. Each linear motion module carries the **laser triangulation sensor (6 and 6')**, which are mounted to automatically move along the calender.

Parameter	Value
Thickness measurement range, mm	10 or customized
Measurement error, um	±20
Scanning range, mm	500x2 or customized
Input interface for sensors connection	Ethernet
Measuring rate, Hz	9400
Power consumption, not more, W	500





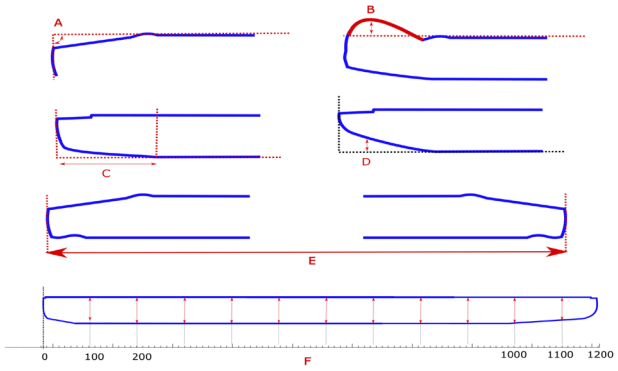
SOFTWARE FEATURES:

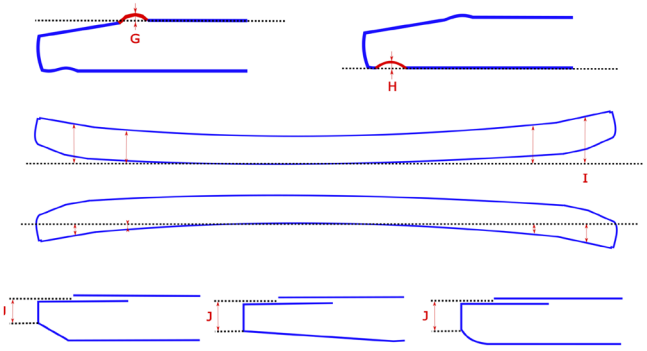
- Display results
- Limit value monitoring according to programmable tolerances
- Database support
- Statistical evaluation and display
- System calibration
- Interface to customer equipment

THE SYSTEM FOR GYPSUM BOARDS DIMENSIONAL MEASUREMENT — 3DGipsumB

MEASUREMENT PRINCIPLE: LASER SCANNING

The system performs inline measurement, display (both in digital and graphical form), and tolerance control of the following parameters:

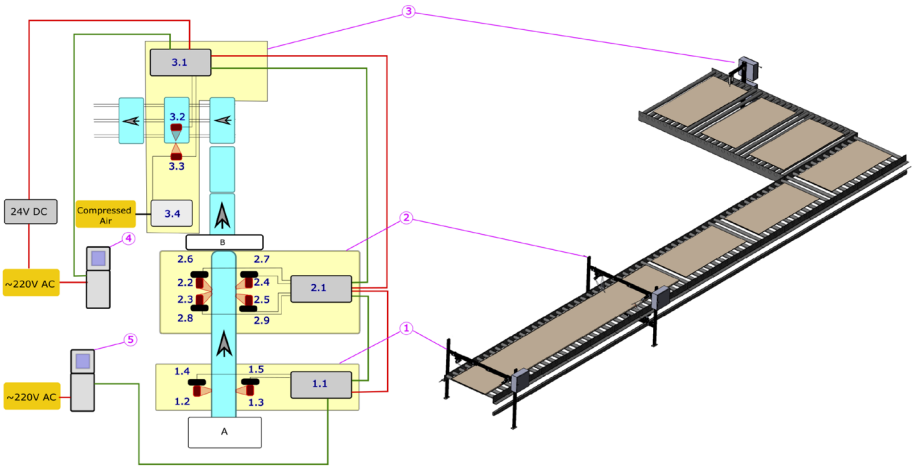




WHERE:

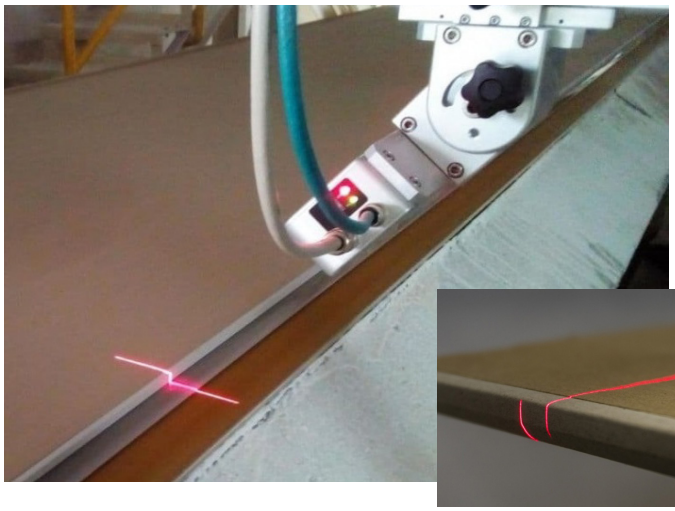
A - Edge angle;
B – Shoulder;
C - Taper length;
D - Taper depth;
E - Board width;
F - Board thickness;
I - Raising/lowering (lifting) the board edges;
J - Edge width.

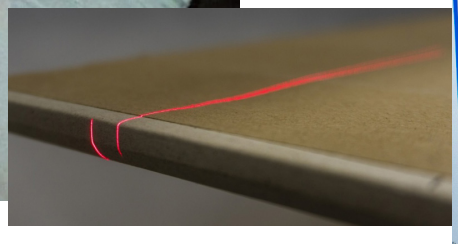
THE SYSTEM DESIGN



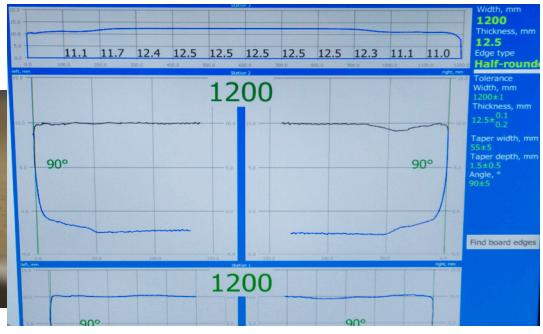
DESIGNATIONS:

1 – Measuring station 1.
2 – Measuring station 2.
3 – Measuring station 3.
4 – Additional operator terminal.
5 – Central computer.
A – Mixer / molding.
B – Slicing.
Red lines – 24V power supply (generated by the system).
Green lines – Ethernet network of the system.





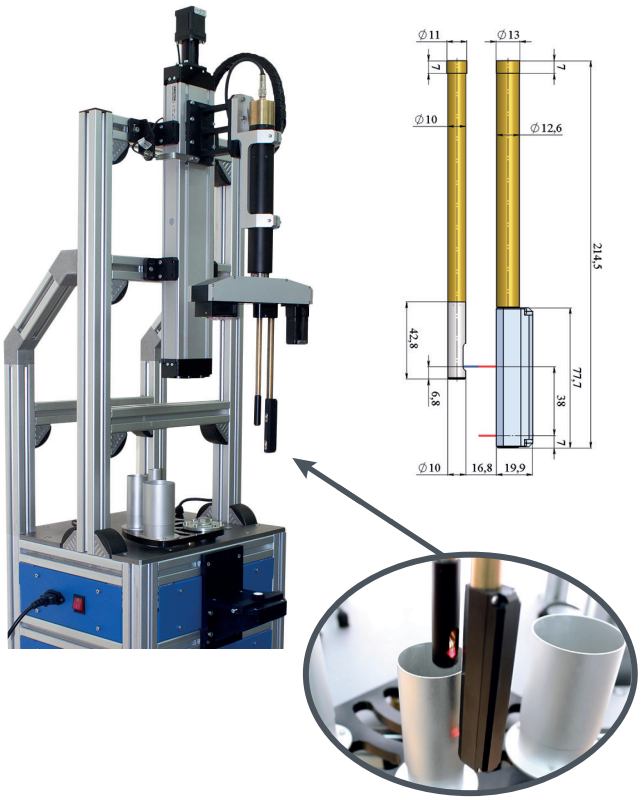
Parameter	Value
Width range, mm	400...1400
Thickness range, mm	2...45
Width measurement accuracy, mm	±0.1
Thickness measurement accuracy, mm	±1
Profile measurement accuracy, mm	±0.1
Laser sensors	RF627, RF603



SPECIAL MEASUREMENT SYSTEMS

LAMINATED TUBES GEOMETRY MEASUREMENT SYSTEM

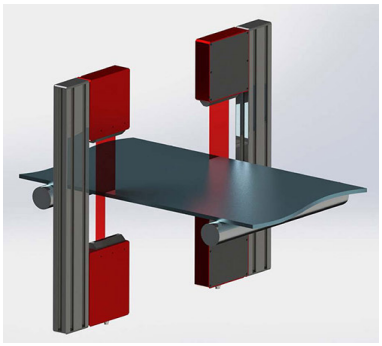
The system is designed for contactless scanning and geometrical parameters (outer and inner diameter, foil thickness, weld width, tube length) measurement of laminated tubes, made of PBL and ABL foil.



Parameter	Value
Measured diameters, mm	13...50
Diameter measurement accuracy, µm	±10
Foil thickness range, mm	0.05...0.5
Foil and weld thickness measurement accuracy, µm	±5
Tube length measurement accuracy, mm	±0.1
Interface to PC	Ethernet
Power supply	220

LASER SYSTEMS FOR SHEET MATERIALS THICKNESS CONTROL

- RF590 - Width Measurement System

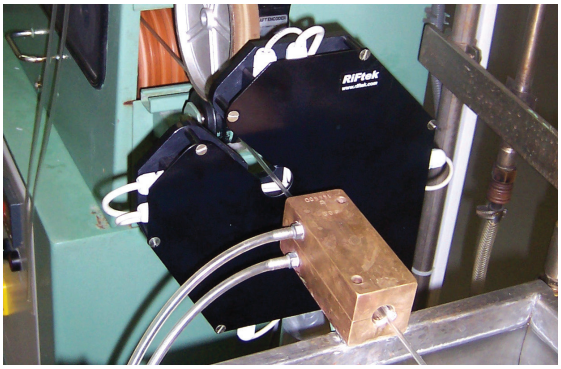


ADVANTAGES

- Manufacturing process optimization
- Continuous quality monitoring

ONLINE SYSTEMS FOR CONTROL AND REGULATION OF DIAMETER

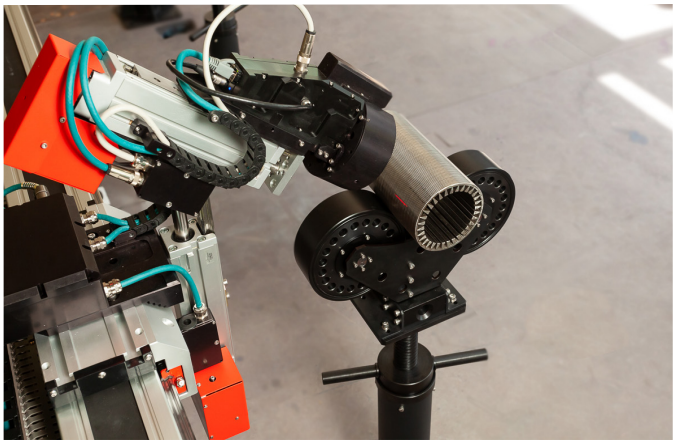
The systems are designed for non-contact measurement, control and regulation of diameter of technological objects (wire, fiber, hoses, tubes, rods, sausage casings) during their production.



Parameter	Value
Measured diameters, mm	0.3...100
Accuracy, µm	from ±1
Number of controlled sections	up to 6

JOHNSON FILTERS INSPECTION MACHINE

The inspection machine is designed to control the inter-wire gap along the length of the well filter.



DISTINCTIVE FEATURES:

- Limit value monitoring
- Database support
- Statistical evaluation
- System autocalibration
- Automatic focusing in the range of 15 mm
- Automatic search for the diameter section

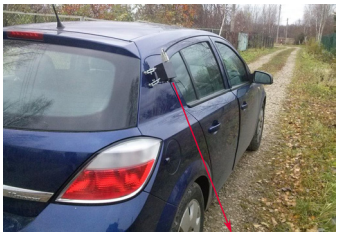
Parameter	Value
Filter length, meters	12
Gaps range, mm	0.05...2
Accuracy, mm	±0.01
Scanning speed mm/s	100

SPEED AND DISTANCE SENSORS

ISD-3 & ISD-5 Series

The sensors are intended for automotive and industrial application for precise contactless measurement of speed and length of nearly any moving object.

Designed for use in automobile and railway transport, metallurgy, cable, chemical, pulp and paper, textile and wood industries, in automated control systems, cutting and accounting systems.



ISD-3 Parameter	Value	Comments
Speed range, Km/h	0.4 – 200	At TTLout 400 Hz per m/s. Others on request
Speed accuracy	±0.2 % RMS	Determined on test bench (treadmill) at 18.38 km/h
Absolute distance accuracy*	±0.2 % RMS	After calibration at S >100 m
Measuring frequency, Hz	22	
Nominal distance to the road and tolerance (range of working distance), mm	280 ± 140 (140 – 420)	Up to 800 mm on request
System power supply (tolerance)	12 V nominal (11 – 14.5V)	
System power consumption, Wt	Sensor head: 10 Wt Processor unit: 5 Wt	
Sensor head operation temperature range, ˚C	-20…+50	
Weight of the sensor + mounting bracket, g	280 + 120	Without cable
Weight of the processor unit, g	400	
Sensor dimensions, mm	Ø55 x 205 + illuminator	
Processor unit dimensions, mm	120x100x35	
Sensor cable length, m	2.5	Up to 10 m on request
System power cable length, m	2	Up to 10 m on request
Environmental sensor head protection	IP67	
Magnetic fixing tool	4 magnets x 16 Kg strength	
Output signal	TTL (SMOS) 0 – 5 V meander type, 400 Hz per m/s (=400 pulses/m)	Others on request

ISD-5 Parameter	ISD-5 Standard	ISD-5 Mini	Comments
Speed range, m/s	0.02 - 20	0.005 - 5	Typical values. The less nominal working distance the less min and max speed range
Speed accuracy*, % RMS	±0.07 ±0.02	±0.15 ±0.05	No signal averaging With averaging 0.2 - 0.3 s, at V > 1 m/s
Length accuracy*, % RMS	<±0.05	<±0.1	While pre-calibration for path lengths > 2 m
Measuring frequency, Hz	16 - 54		
Nominal distance to the object (tolerance), cm	10, 20, 30, 50, 75, 100	10, 15, 20	Could be noted at ordering
Distance tolerance	±20-25% of nominal		Depends on the surface (on the edge of the range signal decreased)
Emitter type, mW	Visible or IR c.v. laser, 5 – 120	Visible c.v. laser, <5	class 3B – 3R
Power supply, V	12 (8 - 14)		Internal linear voltage regulators +5V in sensor and controller unit
Power consumption, Wt: Sensor Controller unit	0.5 - 2 1	0.5	
Temperature working range, ˚C	+15...+50		-10…+50 – with active thermostabilization option): -50..+80˚C with protect air cooling housing (option)
Sensor weight, g	320	70	
Sensor size, mm	85x79x46	58x43x30	Without connector, blend and fixing holes
Cable length from sensor to controller unit, V	1.8 or 3		Standard cable RS-232 or VGA with DB9 connectors are used. To extend a length it is possible to connect cables sequential
Sensor environmental protection	IP67		
Controller unit:			
Dimensions, mm	120x100x35		
Weight, g	350		
Analog out:	Length, 2000 pulces/m (=speed 2000 Hz/(m/s), meander 0 – 3 V, TTL compatible, up to 200 KHz		Typical values, user adjustable (see software description below)
Frequency out:	Ethernet (UDP protocol)		Others on request
Digital out:			
Physical data latency at measurement freq, ms 54 Hz 16 Hz	 9 31		Stable, =½ of measuring time, without averaging
Base Software	- Program to read data via Ethernet, visualization and saving data, - Program for sensor diagnostics, - Read data example (LabView 8.2.1 and higher), - Dynamic library (DLL) to read data via Ethernet, - Sensor parameters configuranion via any Internet browser		Custom software by request are possible

MEASUREMENT INSTRUMENTS FOR RAILWAY TRANSPORT

RAILWAY WHEEL PROFILE GAUGE — IKP Series

The laser profilometer is designed for measuring

- flange thickness, slope and height, rim/tire thickness,
- full profile scanning and analyze of wheel rolling surface,
- maintaining of electronic wear data base,
- control of tolerances and sorting in the course of checkup, examination, repair and formation of railway wheel sets.

The device is supplied with database and software package for wheel sets wear data storage and processing.

Measurements are made directly on rolling stock without wheel set roll-out.

Parameter	Value
Measurement range flange heigh, mm	20…45
-"- flange thickness, mm	20…50
-"- flange slope, mm	1…15
-"- rim thickness, mm	36…100 (30...90)
-"- diameter (calculation method), mm	400...1400
Measurement error flange height, mm	± 0.03
-"- flange thickness, mm	± 0.03
-"- flange slope, mm	± 0.1
-"- rim thickness, mm	± 0.1
-"- diameter, mm	± 0.1
Discreteness of indication all parameters, mm	0.01
Profile measurement range, mm	145
Discreteness of the profile formation, not worse than, mm	0.025 (5800 points for profile)
Measurement time, s	adaptive, depending on surface quality, 4 average
Power supply (laser scanning module)	3,7V, Li-ion rechargeable battery 5400mAh for standard IKP and 2400mAh for Short and SShort
The number of measurements that can be taken before battery recharge is not less than	5000 for standard IKP and 2200 for Short and Super-short
Laser module battery life time	5 million measurement cycles
Power supply (PDA)	3,7V Li-polymer battery 3300mAh
PDA memory capacity	100 000 measurements
Interface between laser scanning module and PDA	Bluetooth
Working temperature range, °C	-20…+50
Enclosure rating	IP42 or IP64

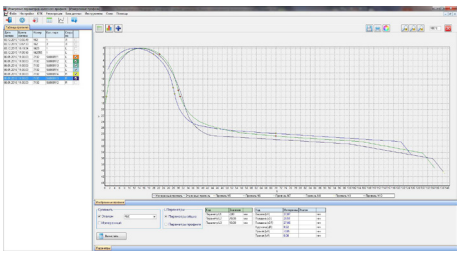
PDA is intended for control of the laser scanning module, data reception from the scanning module, indication of measurement result, parameter input and data storage.

Operator mounts the laser scanning module onto the wheel to be measured. Having received a command from PDA or PC, the laser module performs non-contact scanning of the wheel surface.

IKP-5 SOFTWARE

MAIN FEATURES

- User-Friendly Interface;
- Flexible setting of measured Parameters of the Wheel Flange;
- The list of Calculated Parameters:
  - Flange Height, Thickness and Slope,
  - Wear parameters (Vertical, Horizontal and Angular Wear, Hollow, Difference of Diameters, Even/Uneven Wear),
  - Angular Profile Parameters,
  - Rim Width and Thickness,
  - Wheel Diameter,
  - Wheel Defects (Slides and Cavities),
  - Special Flange Parameters of the Tram Wheel and etc.;
- Setting of displayed Identification Parameters of the Wheelset. I.e., you can select only required parameters (number, series, operator, mileage, and etc.) for displaying on the screen;
- Simple Calibration Procedure: it performs automatically by clicking one button;
- The possibility to compare several Saved Profiles;
- The possibility to align Measured Profile manually (by buttons) relative to the reference with saving;
- Possibility to save several Bluetooth-devices in the PDA memory and then to select the required one from the list. I.e. You save addresses of several IKP and after that you need only to select the required one from the list without a necessity of searching procedure (the same is for IMR and IDK);
- Possibility to connect PDA to PC as an External Storage Device (alternative of ActiveSync).



WHEEL DIAMETER MEASUREMENT GAUGE

IDK Series

Electronic gauge is designed for measuring wheel rolling circle diameter. Measurements are made directly on rolling stock without wheel set roll-out. The measurement of the diameter is performed according to the "three points" technique, without the complete wheel coverage.

The gauge contains numeric display to show the value of the wheel diameter. IDK-BT gauge contains Bluetooth interface for transfer results into wheel-set wear database management system.

Parameter	Value
Measurement range, mm	400…1400 or on request
Measurement error, mm	±0.2
Indication discreteness	0.1mm, 0.01mm * or 0.01 inch **
Position of measurement, S, mm	On request
Distance between axes of ball bearings (base), mm and diameters measurement range, mm	122±0.5 (400…750 mm) or 200±0.5 (400…950 mm) or 250±0.5 (600…1400 mm) or 300±0.5 (720…1400 mm)
Display	build-in, LED
Operating temperature, °C	-15…+55
Power supply	rechargeable battery 2 x AAA 1.2V
Weigh, kg	0.5
The number of measurements that can be taken before battery recharge is not less than	1000

SPECIAL MODELS OF IKP-5 AND IDK FOR TRAMWAY WHEELS

Special models of IKP-5 and IDK are designed especially for measurement of wheels with restricted space for device placement (tramway wheels):

- Laser Wheel Profile Gauge model **IKP-5-short** (Fig. A) with a shortened handle,
- Laser Wheel Profile Gauge model **IKP-5-Super short** (Fig. B) version for Ansaldo Breda low floor trams,
- Wheel Diameter Measurement Gauge model **IDK-compact** (Fig. C) with the measurement base (distance between ball supports) of the gauge 122 mm and diameter measurement range - 400…750 mm.

Fig. A

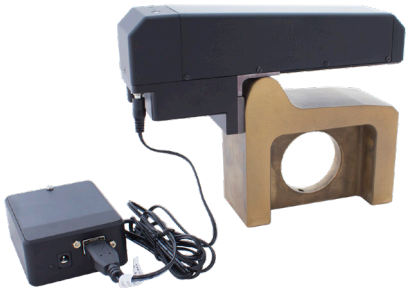
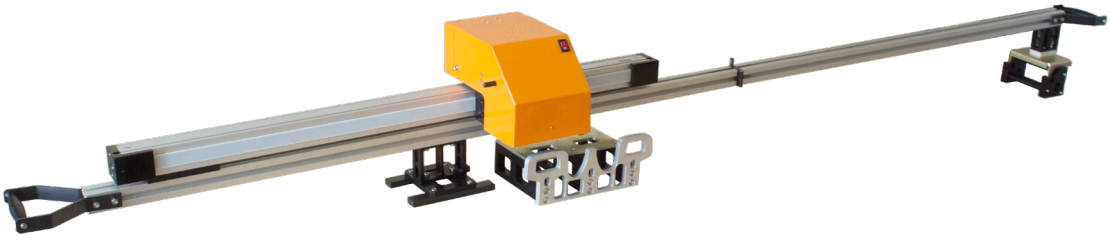


Fig. B

Fig. C

LASER PROFILOMETER FOR RAILROAD RAILS AND SWITCHERS



The device consists of frame for device placement on the rails and laser measurement head placed with possibility of linear translation. The measurements are carried out automatically. The measurement result is rails transfer profile.

Parameter	Value
Measurement range, mm	600
Measurement error, mm	±0.1

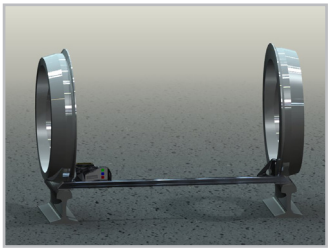
BACK-TO-BACK DISTANCE MEASURING GAUGES

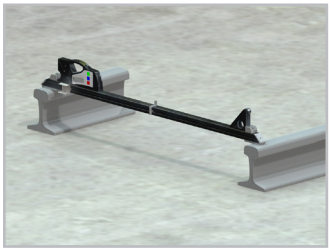
IMR and IMR-L Series

Electronic gauge is designed for measuring back-to-back distance of railway, metro and tram wheels in the course of checkup, examination, repair and formation of wheel sets. The method of measurement is based on direct measurement the distance by contactless laser sensor.

Measurements are made directly on rolling stock without wheel set roll-out.

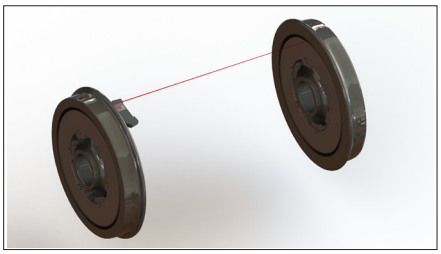
IMR SERIES





Parameter	Value
Measurement range, mm	L±25 (L – nominal distance)
Measurement error, mm	±0.1
Indication discreteness	0.1mm, or 0.01 inch **
Display	build-in, LED
Operating temperature, °C	-15…+50
Weigh, kg	1
Dimensions, mm	D+137x30x124
Power supply	rechargeable batteries 2xAAA, 1.2V

IMR-L SERIES



Parameter	Value
Measurement range, mm	1360…1440 or on request (nominal distance ± 15mm)
Measurement error, mm	±0.3
Indication discreteness	0.1mm, 0.01mm * or 0.01 inch
Display	build-in, LED
Operating temperature, °C	-15…+50
Weigh, kg	0.85
Dimensions, mm	234.2x87.7x32
Power supply	rechargeable batteries 4 x AA 1.2V
Connection to PC	Bluetooth

DISK BRAKES PROFILE GAUGE

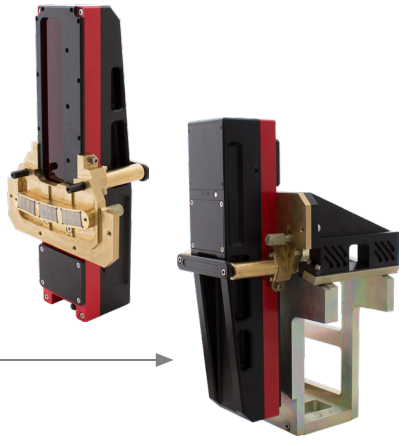
Profilometer uses non-contact method of registration with a laser sensor and a scanning device.

MAIN FUNCTIONALITY

- **obtaining data on the parameters of railway wheel disk brakes working surface;**
- **full profile scanning and analysis of the working surface of disk brakes;**
- **visualization of combined graphic images of the actual and new profiles of the wheel brake disks;**
- **support of the electronic database of profiles.**

Profilometer for measuring parameters of the disc brakes installed on the wheel.

Profilometer with a bracket for measuring parameters of the disk brakes installed on the wheelset axle.



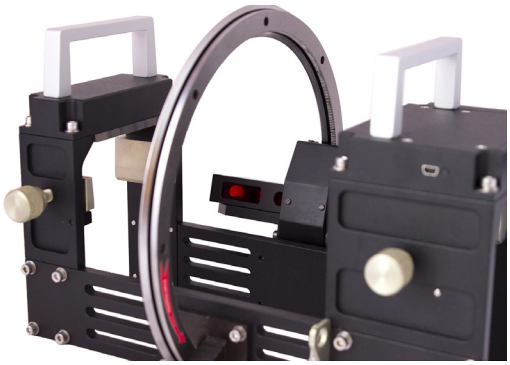
Parameter	Value
Measurement range, mm	30
Profile measurement range, mm	150
Measurement error	± 0.03
Discreteness of indication, mm	0.01
Discreteness of the profile formation, not worse than, mm	0.1
Power supply, laser module	3.7 Li-ion rechargeable battery 6800 mAh
Power supply, PDA	3.7 Li-polymer battery 3300 mAh
The number of measurements that can be taken before battery recharge is not less than	1000
PDA memory capacity	100 000 measurements
Interface between laser scanning module and PDA	Bluetooth
Working temperature range, °C	-15...+35
Enclosure rating	IP42

MEASUREMENT INSTRUMENTS FOR RAILWAY TRANSPORT

RAIL PROFILE MEASUREMENT GAUGE — PRP Series

Portable laser rail profilometer (PRP) is designed for non-contact registration of cross-section of the railhead acting face.

The profilometer uses non-contact method of registration with a laser sensor and a scanning device.



MAIN FUNCTIONALITY

- obtaining the information on the cross-section profile of the working railhead surface;
- full profile scanning and analyze of the railhead acting face;
- visualization of the combined graphical images of actual and new crosssection.

Parameter	Value
Railhead vertical wear, mm	-15.0 ...+20.0
Lateral railhead wear, mm	-15.0...+20.0
Redused railhead wear, mm	Up to 20.0
Scanning angle inside the rail track, degrees	108
Scanning angle outside the rail track, degrees	108
Measurement error, not more than, mm	±0.03
Scanning time, sec	10-12
Digital readout device (PDA) dimensions, mm	112.5x95.5x22.7
Laser module dimensions, mm	293x230x230
Power supply, laser module	3.7V, Li-ion battery, 6800mAh
Power supply, PDA	3.7V, Li-polymer battery, 3300mAh
The number of measurements that can be taken before battery recharge is not less than	500
PDA memory capacity, no less	100 000 measurements
Interface to PC	Bluetooth

AUTOMATIC REAL-TIME SYSTEM FOR MEASUREMENT OF WHEELSETS GEOMETRICAL PARAMETERS — 3DWheel Series

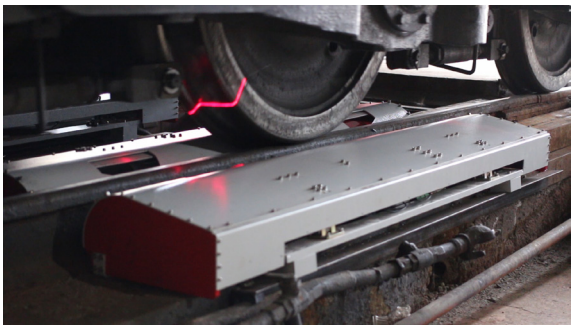
The system is intended for contactless automatic real-time measurement of geometrical parameters of railway vehicles (locomotives, railcars, subway, trams) and uses combination of 2D laser scanners mounted wayside in the track area and calibrated into one common coordinate system.

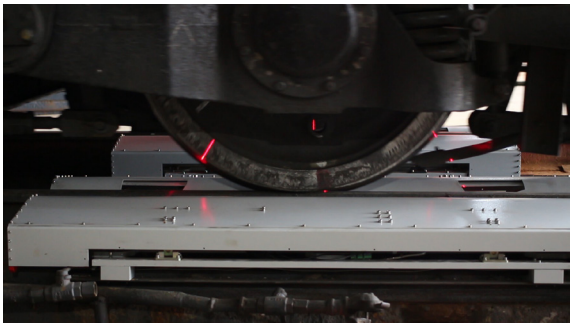
Measurement cycle starts when an inductive sensor detects a wheel.

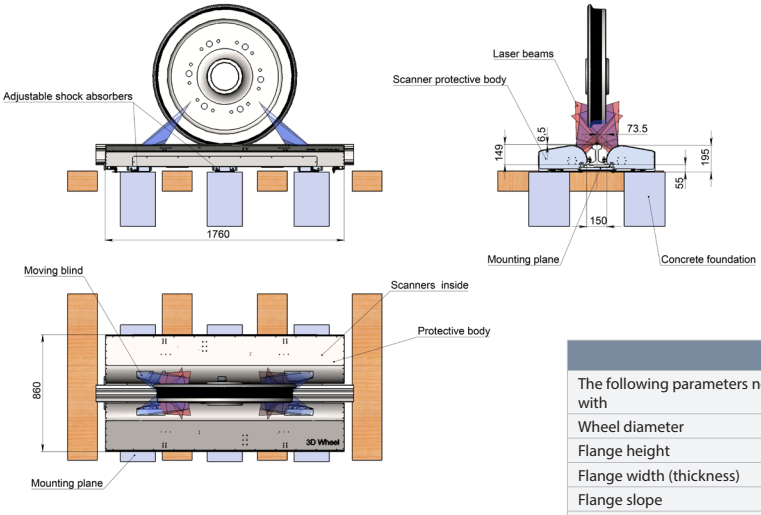
While the wheel passes through the system of synchronized 2D laser scanners its profile is taken at many sections.

All measurement readings for all the wheels are sent through Ethernet to control computer for profiles reconstruction and dimensions calculations.

Finally, all the data are collected in the host depot computer in wheel sets wear database.







Measurement error		
The following parameters need to be measured with	Maximum error. Train speed is up to 60 km/h	Maximum error. Train speed is up to 120 km/h
Wheel diameter	± 1.0	± 2.0
Flange height	± 0.5	± 0.75
Flange width (thickness)	± 0.5	± 0.75
Flange slope	± 0.5	± 0.75
Rim thickness	± 0.5	± 0.75
Wheel width	± 0.5	± 0.75
Back-to-Back distance	± 0.5	± 1.5

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