MANUAL GAUGING REFERENCE GUIDE

MARPOSS

ABOUT US

Marposs was founded in 1952. It provides shop-floor solutions for measurement, inspection and testing in the production environment, and offers standard or customized solutions for each stage of the production process.

Marposs' solutions include:

- gauging equipments for mechanical components, before, during and after the production process;
- monitoring solutions on machine tools;
- assembly and testing for many industry sectors;
- automatic machines and inspection stations for production lines

Marposs is one of the main suppliers to the automotive industry providing solutions for both traditional and electric mobility, and additionally operates in the aerospace, biomedical, hi-tech, white appliance, and glass containers industries.

Marposs Group employs 3500 people around the world and is present in 34 countries with more than 80 sales offices.

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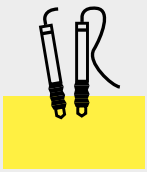
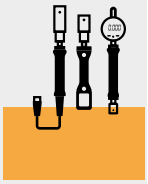
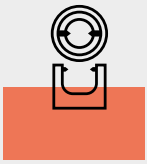
Displacement Sensors



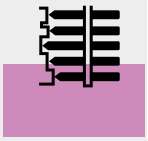
Bore Gauges Line



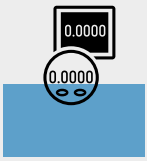
Forks and Ring Gauges



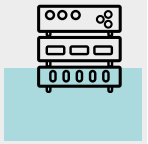
Bench Gauges



Indicators and Electronic Display Units



Interface Boxes for Data Acquisition



Software

MARPOSS

REDCrown2 LINE

THE SECOND GENERATION OF PENCIL PROBES

Displacement Sensors

Evolving from market latest quality requirements **REDCrown2™** is the line of pencil probes developed to meet industry's global performance specifications. As a result of experience in the metrology market place & with input from measurement integrators throughout the world REDCrown2 sets the new metrological standard.
The REDCrown2 line includes also the digitalized (DIGICrown2™) and the USB version (REDCrown2 USB™).

REDCrown2

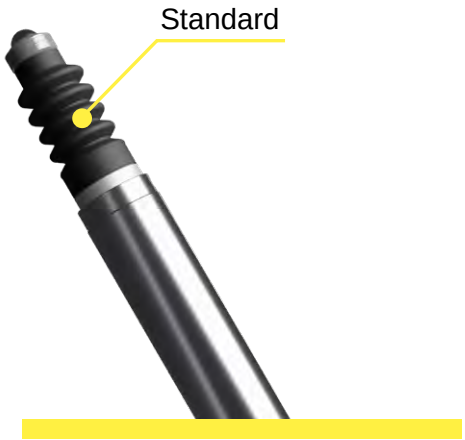
A line of analogue pencil probes, available with LVDT and HBT circuitry in many compatibility types.

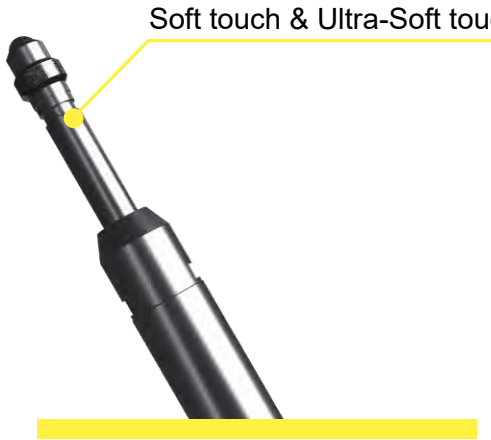
DIGICrown2

Digitized version, with high levels of accuracy and versatility used in combination with DIGICrown network system and GAGEPod interface box.

REDCrown2 USB

A probe version linearized with the USB interface integrated in the standard USB connector for direct connection to any USB host device.





Product **features**

The precision engineered design incorporates ball cage movements, improved protection from electrical/magnetical interference, by the introduction of Mu-metal shielding and added robustness throughout, all produced from a refined manufacturing process. Performance of **REDCrown2** is guaranteed to give excellent accuracy under the harshest conditions where high reliability is constantly required in the manufacturing field.

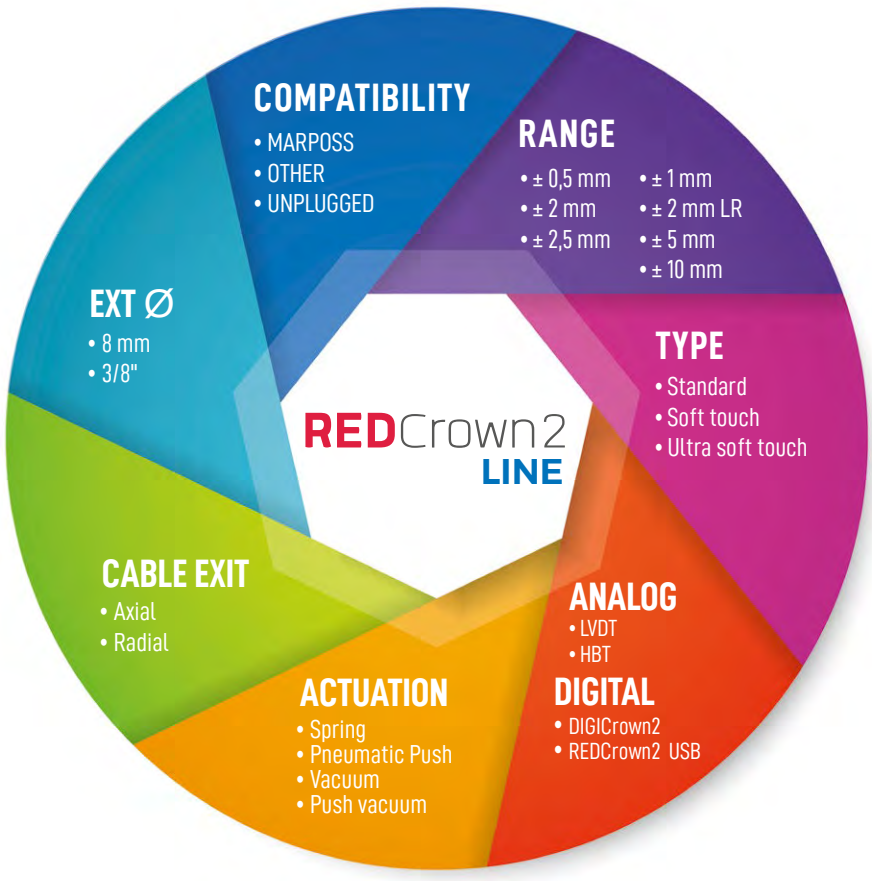
The **REDCrown2** line and its digitized versions **DIGICrown2** and **REDCrown2 USB**, offer a variety of measuring solutions.

The two main families, Standard (with gasket-IP 65) and Soft Touch (without gasket-IP 54), are available with the following options:

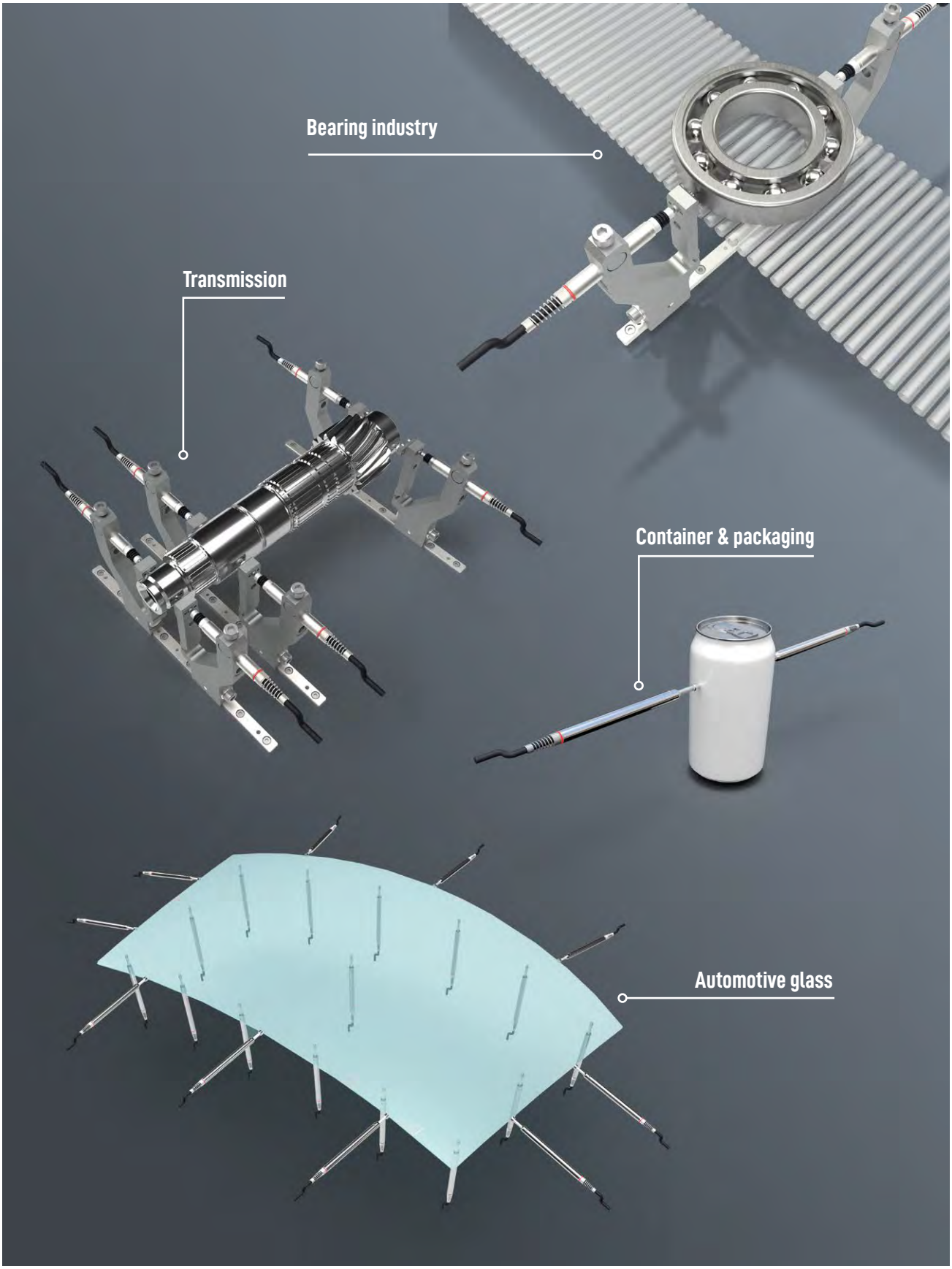
- With HBT and LVDT type transducers;
- Seven measuring ranges: ±0,5mm, ±1mm, ±2mm, ±2mmLR, ±2,5mm, ±5mm and ±10mm;
- Actuation / retraction by Spring, Pneumatic or Vacuum methods;
- Analogue connection: Marposs standard connector or compatible connectors for interfacing with competitor's electronics;
- Digital connection for DIGICrown network system™;
- Direct USB connector for simple interfacing to computers;
- The unplugged version allows customer to complete the probes using their preferred type of connector;
- OEM “private label” versions with customized body logos, part numbers and dedicated packaging for your product.

Product mix

Please refer to the below reported scheme in order to have the REDCrown2 line product mix overview.
In case you are looking for a dedicated solution don't hesitate to contact Marposs.

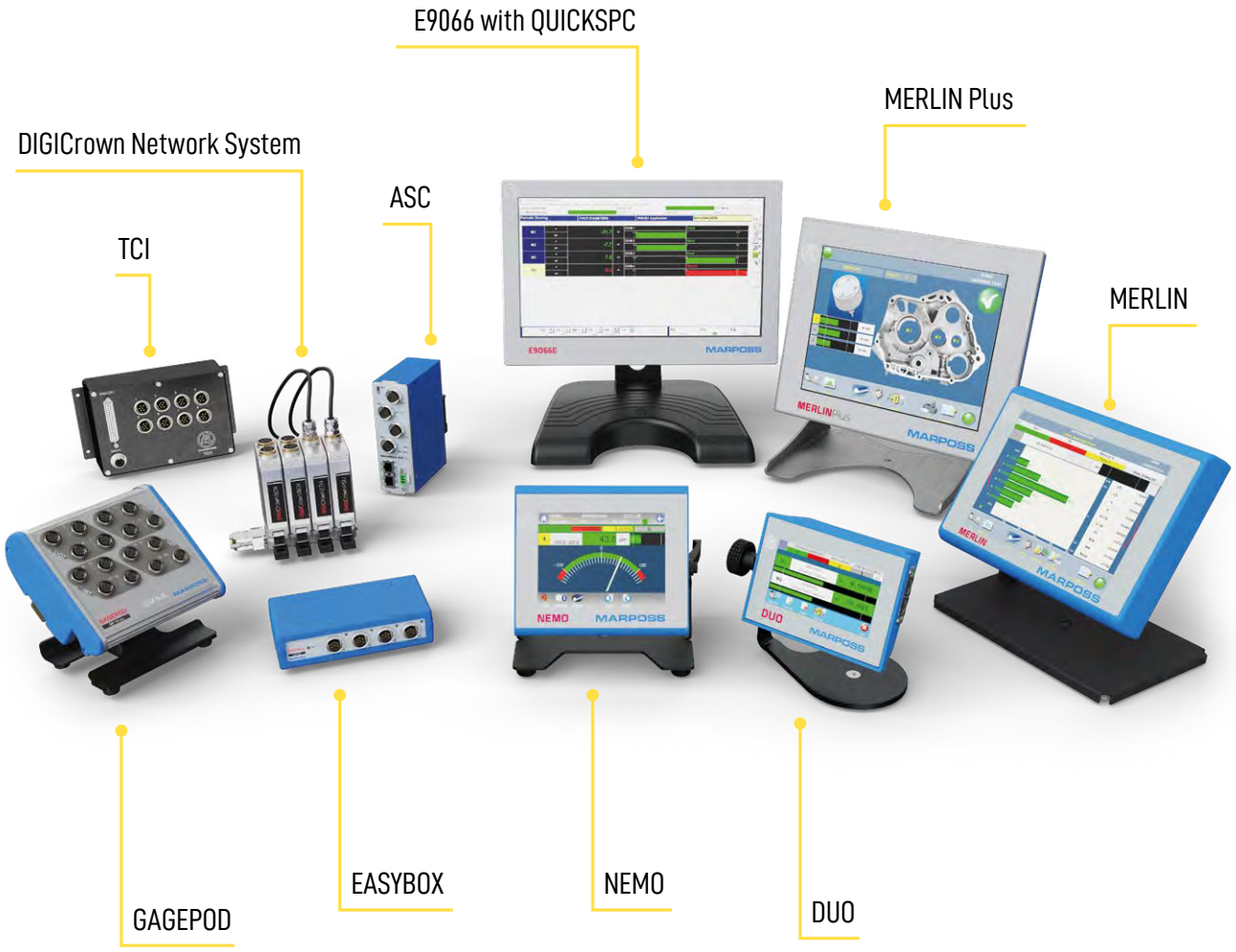


Application **examples**



CONNECTIVITIES

Through the Marposs interface boxes, the REDCrown2 line can be connected to all Electronic display units and software.



REDCROWN2 LVDT

REDCrown2 LVDT is a line of pencil probes available in standard (with gasket –IP65) on configuration, with highly precise ball cage movements and various connection options according to the conditioning and display interfaces used.
The analogue version, with LVDT transducer, allows the use of the product with standard Marposs amplifiers, or with third party amplifiers available on the market.
These probes are available both with and without connector (unplugged).

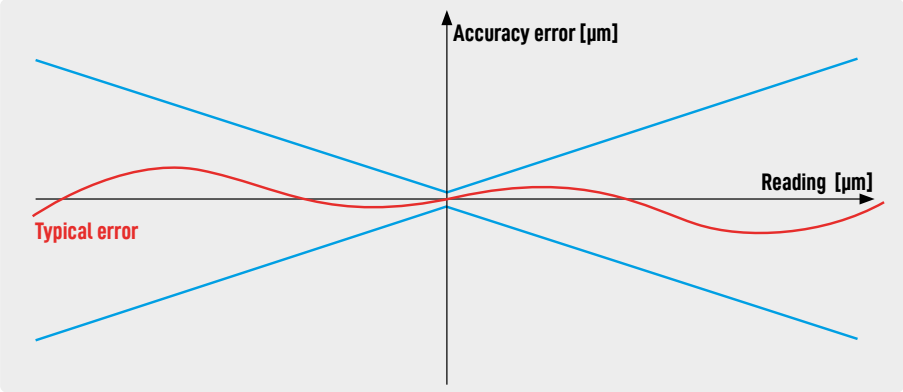
Mechanical specifications		**±0,5 mm**	**±1 mm**	**±2 mm**	**±2 mm LongRange**
Measuring range	[mm]	1	2	4	4
Mechanical travel	[mm]	1,5	3	6,6	11
Body Ø	[mm]	8	8	8	8
Cable length	[m]	2	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100	-20 to +100
Contact thread		M2,5	M2,5	M2,5	M2,5
Accuracy error	[µm]	(**)	±(0,3 + 5*|K|)	±(0,3 + 7*|K|)	±MIN(0,3 + 10*|K|; 12 + 2*|K|)
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25	<0,25

Standard MARPOSS (with gasket)		**±0,5 mm**	**±1 mm**						**±2 mm**						**±2 mm LongRange**					
Sensitivity	[mV/V/mm]	230	230						230						230					
Calibration spec.			3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF						3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF						3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF					
Spring strength	[N/mm]	0,17	0,14		0,04		0,023		0,023		0,03		0,02		0,023		0,03		0,02	
Measuring force	[N±25%]	1,00	0,70		0,8 to 2,2		0,4		0,70		0,7 to 2		0,5		0,70		0,7 to 2		0,4	
PP pressure	bar psi				0,5 to 1 7,5 to 14,5						0,5 to 1 7,5 to 14,5						0,5 to 1 7,5 to 14,5			
Vacuum retract pressure	bar psi						-0,45 to -0,6 -6,5 to -8,7						-0,45 to -0,6 -6,5 to -8,7						-0,45 to -0,6 -6,5 to -8,7	
Gasket		Fluoroelast.	Fluoroelastometer						Fluoroelastometer						Fluoroelastometer					
Protection grade		IP65	IP65						IP65						IP65					
Contact type		carbide	carbide						carbide						carbide					
Cable (A=axial - R=radial)		A R	A R		A R		A R		A R		A R		A R		A R		A R		A R	
Actuation (*)		S	S		PP		V		PV	S		PP		V		PV	S		PP		V		PV
Trade name		F05 FR05	F10	FR10	FPA10	FP10	FVA10	FV10	- -	F20	FR20	FPA20	FP20	FVA20	FV20	- -	F21	FR21	FPA21	FP21	FVA21	FV21	- -
Order code		B3PR01L0000 B3PR01L1200	B3PR02L0000	B3PR02L1200	B3PR02L0400	B3PR02L1600	B3PR02L0560	B3PR02L1760	- -	B3PR05L0199	B3PR05L1399	-	B3PR05L1759	-	-	- -	B3PR1020199	B3PR1021399	B3PR1020559	B3PR1021759	B3PR1020599	B3PR1021799	- -

Soft Touch (without gasket)		**±0,5 mm**	**±1 mm**						**±2 mm**						**±2 mm LongRange**					
Sensitivity	[mV/V/mm]	230	230						230						230					
Calibration spec.			3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF						3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF						3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF					
Spring strength	[N/mm]	0,070	0,06		0,045				0,016		0,01				0,016		0,010			
Total Measuring force	[N±25%]	0,3	0,30		0,18 to 1,9			0,14 to 2,3	0,30		0,18 to 1,9			0,14 to 2,3	0,30		0,18 to 1,9			0,14 to 2,3
PP pressure	bar psi				0,5 to 2 7,3 to 29			0,125 to 2 1,825 to 29			0,5 to 2 7,3 to 29			0,125 to 2 1,825 to 29			0,5 to 2 7,3 to 29			0,125 to 2 1,825 to 29
Vacuum retract pressure	bar psi							-0,45 to -0,6 -6,5 to -8,7						-0,45 to -0,6 -6,5 to -8,7						-0,45 to -0,6 -6,5 to -8,7
Protection grade		IP50	IP50(IP54 PP version)						IP50(IP54 PP version)						IP50 (IP54 PP version)					
Contact type		Nylon (PA66)	Nylon (PA66)						Nylon (PA66)						Nylon (PA66)					
Cable (A=axial - R=radial)		A R	A R		A R		A R		A R	A R		A R		A R		A R	A R		A R		A R		A R
Actuation (*)		S	S		PP		V		PV	S		PP		V		PV	S		PP		V		PV
Trade name		F05L FR05L	F10L	FR10L	FPA10L	FP10L	- -		FPVA10L	FPV10L	F20L	FR20L	FPA20L	FP20L	- -		FPVA20L	FPV20L	F21L	FR21L	FPA21L	FP21L	FVA21L	FV21L	FPVA21L	FPV21L
Order code		B3PR01L5000 -	B3PR02L5000	B3PR02L6200	B3PR02L5400	B3PR02L6600	- -		B3PR02L5800	B3PR02L7000	B3PR05T5199	-	-	-	-	-	-	-	B3PR1025199	B3PR1026399	B3PR1025559	B3PR1026759	- -		B3PR1025999	B3PR1027199

* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - ** Accuracy = ±MAX(0,5 + 2*|K|; 7*|K|) NOTE: K= Reading (mm)

ACCURACY ERROR



Mechanical specifications		**±2,5 mm**	**±5 mm**	**±10 mm**
Measuring range	[mm]	5	10	20
Mechanical travel	[mm]	6,6	11	21
Body Ø	[mm]	8	8	8
Cable length	[m]	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100
Contact thread		M2,5	M2,5	M2,5
Accuracy error	[µm]	±MIN(0,3 + 10*|K|; 11 + 2*|K|)	±MAX(5,0 + 2*|K|;7*|K|)	±MAX(10 + 2*|K|;7*|K|)
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25

Standard MARPOSS (with gasket)		**±2,5 mm**								**±5 mm**								**±10 mm**							
Sensitivity	[mV/V/mm]	115								115								23							
Calibration spec.		3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF								3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF								3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF							
Spring strength	[N/mm]	0,023		0,03		0,02				0,03		0,02		0,02				0,03		0,016		-			
Measuring force	[N±25%]	0,70		0,7 to 2		0,5				0,70		0,8 to 2		0,4				0,1		0,7 to 2		-			
PP pressure	bar			0,5 to 1								0,5 to 1								0,5 to 1					
	psi			7,5 to 14,5								7,5 to 14,5								7,5 to 14,5					
Vacuum retract pressure	bar					-0,45 to -0,6								-0,45 to -0,6								-			
	psi					-6,5 to -8,7								-6,5 to -8,7								-			
Gasket		Fluoroelastometer								Fluoroelastometer								Fluoroelastometer							
Protection grade		IP65								IP65								IP65							
Contact type		carbide								carbide								carbide							
Cable (A=axial - R=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)		S		PP		V		PV		S		PP		V		PV		S		PP		V		PV	
TRADE NAME		F25	FR25	FPA25	FP25	FVA25	FV25	-	-	F50	FR50	FPA50	FP50	FVA50	FV50	-	-	F100	FR100	FPA100	FP100	-	-	-	-
ORDER CODE		B3PR05L0000	B3PR05L1200	B3PR05L0400	B3PR05L1600	B3PR05L0560	B3PR05L1760	-	-	B3PR10L0000	B3PR10L1200	B3PR10L0400	B3PR10L1600	B3PR10L0560	B3PR10L1760	-	-	B3PR20L0000	B3PR20L1200	B3PR20L0400	B3PR20L1600	-	-	-	-

Soft Touch (without gasket)		**±2,5 mm**								**±5 mm**								**±10 mm**							
Sensitivity	[mV/V/mm]	115								115								23							
Calibration spec.		3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF								3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF								3,5355V_{RMS} @7,5kHz with load 1MΩ//360pF							
Spring strength	[N/mm]	0,016		0,01						0,02		0,07						0,030		0,010					
Total Measuring force	[N±25%]	0,30		0,18 to 1,9				0,14 to 2,3		0,30		0,18 to 1,9				0,14 to 2,3		0,30		0,18 to 1,9				0,14 to 2,3	
PP pressure	bar			0,5 to 2				0,125 to 2				0,5 to 2				0,125 to 2				0,5 to 2				0,125 to 2	
	psi			7,3 to 29				1,825 to 29				7,3 to 29				1,825 to 29				7,3 to 29				1,825 to 29	
Vacuum retract pressure	bar							-0,45 to -0,6								-0,45 to -0,6								-0,45 to -0,6	
	psi							-6,5 to -8,7								-6,5 to -8,7								-6,5 to -8,7	
Protection grade		IP50(IP54 PP version)								IP50(IP54 PP version)								IP50(IP54 PP version)							
Contact type		Nylon (PA66)								Nylon (PA66)								Nylon (PA66)							
Cable (A=axial - R=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)		S		PP		V		PV		S		PP		V		PV		S		PP		V		PV	
TRADE NAME		F25L	FR25L	FPA25L	FP25L	-	FV25L	FPVA25L	FPV25L	F50L	FR50L	FPA50L	FP50L	FVA50L	FV50L	FPVA50L	FPV50L	F100L	FR100L	FPA100L	FP100L	-	-	FPVA100L	FPV100L
ORDER CODE		B3PR05L5000	B3PR05L6200	B3PR05L5400	B3PR05L6600	-	B3PR05L6760	B3PR05L5800	B3PR05L7000	B3PR10L5000	B3PR10L6200	B3PR10L5400	B3PR10L6600	-	-	B3PR10L5800	B3PR10L7000	B3PR20L5000	B3PR20L6200	B3PR20L5400	B3PR20L6600	-	-	B3PR20L5800	B3PR20L7000

REDCrown2 HBT is a line of pencil probes available in standard (with gasket –IP65) or soft touch (without gasket –IP54) configuration, with highly precise ball cage movements and various connection options according to the conditioning and display interfaces used.
The analogue version, with HBT transducer, allows the use of the product with standard Marposs amplifiers, or with third party amplifiers available on the market.
These probes are available both with and without connector (unplugged).

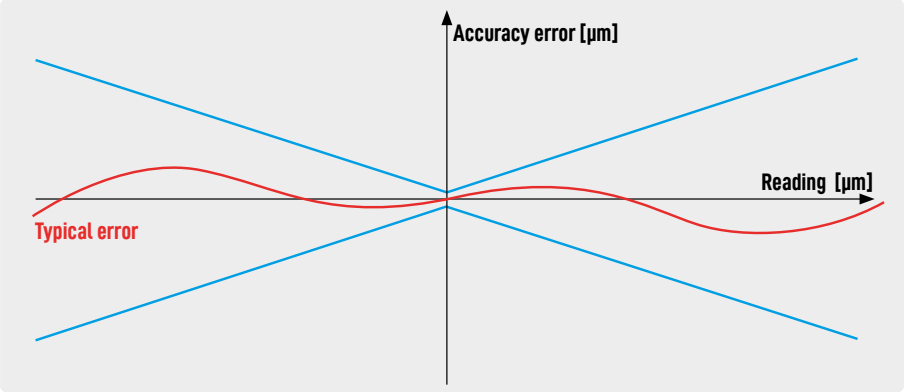
Mechanical specifications		**±0,5 mm**	**±1 mm**	**±2 mm**	**±2 mm LongRange**
Measuring range	[mm]	1	2	4	4
Mechanical travel	[mm]	1,5	3	6,6	11
Body Ø	[mm]	8	8	8	8
Cable length	[m]	2	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100	-20 to +100
Contact thread		M2,5	M2,5	M2,5	M2,5
Accuracy error	[µm]	(**)	±(0,3 + 5*|K|)	±(0,3 + 7*|K|)	±MAX (2,0 + 2*|K|;7*|K|)
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25	<0,25

Standard MARPOSS (with gasket)		**±0,5 mm**	**±1 mm**	**±2 mm**	**±2 mm LongRange**
Sensitivity	[mV/V/mm]	73,75	73,75	73,75	73,75
Calibration spec.		3,5355V_{RMS} @7,5kHz with load 2KΩ±0,1%	3,5355V_{RMS} @7,5kHz with load 2KΩ±0,1%	3,5355V_{RMS} @7,5kHz with load 2KΩ±0,1%	3,5355V_{RMS} @7,5kHz with load 2KΩ±0,1%
Spring strength	[N/mm]	0,17	0,14 / 0,04 / 0,023	0,023 / 0,03 / 0,02	0,023 / 0,03 / 0,02
Measuring force	[N±25%]	1,00	0,70 / 0,8 to 2,2 / 0,4	0,70 / 0,7 to 2 / 0,5	0,70 / 0,7 to 2 / 0,4
PP pressure	bar		0,5 to 1	0,5 to 1	0,5 to 1
	psi		7,5 to 14,5	7,5 to 14,5	7,5 to 14,5
Vacuum retract pressure	bar		-0,45 to -0,6	-0,45 to -0,6	-0,45 to -0,6
	psi		-6,5 to -8,7	-6,5 to -8,7	-6,5 to -8,7
Gasket		Fluoroelast.	Fluoroelastometer	Fluoroelastometer	Fluoroelastometer
Protection grade		IP65	IP65	IP65	IP65
Contact type		carbide	carbide	carbide	carbide
Cable (A=axial - R=radial)		A | R	A | R | A | R | A | R | A | R	A | R | A | R | A | R | A | R	A | R | A | R | A | R | A | R
Actuation (*)		S	S / PP / V / PV	S / PP / V / PV	S / PP / V / PV
Trade name		H05 | HR05	H10 | HR10 | HPA10 | HP10 | HVA10 | HV10 | - | -	H20 | HR20 | HPA20 | HP20 | HVA20 | HV20 | - | -	H21 | HR21 | HPA21 | HP21 | HVA21 | HV21 | - | -
Order code		B3PR01N0000 | B3PR01N1200	B3PR02N0000 | B3PR02N1200 | B3PR02N0400 | B3PR02N1600 | B3PR02N0560 | B3PR02N1760 | - | -	B3PR05N0199 | B3PR05N1399 | - | B3PR05N1759 | - | - | - | -	B3PR10N0199 | B3PR10N1399 | B3PR10N0559 | B3PR10N1759 | B3PR10N0599 | B3PR10N1799 | - | -

Soft touch - TESA (without gasket)		**±0,5 mm**	**±1 mm**	**±2 mm**	**±2 mm LongRange**
Sensitivity	[mV/V/mm]	73,75	73,75	73,75	73,75
Calibration spec.		3V_{RMS} @13KHz with load 2KΩ±0,1%	3V_{RMS} @13KHz with load 2KΩ±0,1%	3V_{RMS} @13KHz with load 2KΩ±0,1%	3V_{RMS} @13KHz with load 2KΩ±0,1%
Spring strength	[N/mm]	0,070	0,06 / 0,045	0,016 / 0,01	0,016 / 0,010
Total Measuring force	[N±25%]	0,3	0,30 / 0,18 to 1,9 / 0,14 to 2,3	0,30 / 0,18 to 1,9 / 0,14 to 2,3	0,30 / 0,18 to 1,9 / 0,14 to 2,3
PP pressure	bar		0,5 to 2 / 0,125 to 2	0,5 to 2 / 0,125 to 2	0,5 to 2 / 0,125 to 2
	psi		7,3 to 29 / 1,825 to 29	7,3 to 29 / 1,825 to 29	7,3 to 29 / 1,825 to 29
Vacuum retract pressure	bar		-0,45 to -0,6	-0,45 to -0,6	-0,45 to -0,6
	psi		-6,5 to -8,7	≤0,9	-6,5 to -8,7
Protection grade		IP50	IP50(IP54 PP version)	IP50(IP54 PP version)	IP50 (IP54 PP version)
Contact type		Nylon (PA66)	Nylon (PA66)	Nylon (PA66)	Nylon (PA66)
Cable (A=axial - R=radial)		A | R	A | R | A | R | A | R | A | R	A | R | A | R | A | R | A | R	A | R | A | R | A | R | A | R
Actuation (*)		S	S / PP / V / PV	S / PP / V / PV	S / PP / V / PV
Trade name		H05L | HR05L	H10L | HR10L | HPA10L | HP10L | - | - | HPVA10L | HPV10L	H20L | HR20L | HPA20L | HP20L | - | - | HPVA20L | HPV20L	H21L | HR21L | HPA21L | HP21L | HVA21L | HV21L | HPVA21L | HPV21L
Order code		B3PR01T5000 | -	B3PR02T5000 | B3PR02T6200 | B3PR02T5400 | B3PR02T6600 | - | - | B3PR02T5800 | B3PR02T7000	B3PR05T5199 | - | - | - | - | - | - | -	B3PR10T5199 | B3PR10T6399 | B3PR10T5559 | B3PR10T6759 | - | - | B3PR10T5999 | B3PR10T7199

* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - ** Accuracy = ±MAX(0,5 + 2*|K|; 7*|K|) NOTE: K= Reading (mm)

ACCURACY ERROR



Mechanical specifications		**±2,5 mm**	**±5 mm**	**±10 mm**
Measuring range	[mm]	5	10	20
Mechanical travel	[mm]	6,6	11	21
Body Ø	[mm]	8	8	8
Cable length	[m]	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100
Contact thread		M2,5	M2,5	M2,5
Accuracy error	[µm]	±MAX (2,5 + 2*|K|;7*|K|)	±MAX(5,0 + 2*|K|;7*|K|)	±MAX(10 + 2*|K|;7*|K|)
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25

Standard MARPOSS (with gasket)		**±2,5 mm**								**±5 mm**								**±10 mm**							
Sensitivity	[mV/V/mm]	36,875								29,5								7,375							
Calibration spec.		3,5355V_{RMS} @7,5kHz with load 2KΩ±0,1%								3,5355V_{RMS} @7,5kHz with load 2KΩ±0,1%								3,5355V_{RMS} @7,5kHz with load 2KΩ±0,1%							
Spring strength	(N/mm)	0,023		0,03		0,02				0,03		0,02		0,02				0,03		0,016		-			
Measuring force	(N±25%)	0,70		0,7 to 2		0,5				0,70		0,8 to 2		0,4				0,1		0,7 to 2		-			
PP pressure	bar			0,5 to 1								0,5 to 1								0,5 to 1					
	psi			7,5 to 14,5								7,5 to 14,5								7,5 to 14,5					
Vacuum retract pressure	bar					-0,45 to -0,6								-0,45 to -0,6								-			
	psi					-6,5 to -8,7								-6,5 to -8,7								-			
Gasket		Fluoroelastometer								Fluoroelastometer								Fluoroelastometer							
Protection grade		IP65								IP65								IP65							
Contact type		carbide								carbide								carbide							
Cable (A=axial - R=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)		S		PP		V		PV		S		PP		V		PV		S		PP		V		PV	
Trade name		H25	HR25	HPA25	HP25	HVA25	HV25	-	-	H50	HR50	HPA50	HP50	HVA50	HV50	-	-	H100	HR100	HPA100	HP100	-	-	-	-
Order code		B3PR05N0000	B3PR05N1200	B3PR05N0400	B3PR05N1600	B3PR05N0560	B3PR05N1760	-	-	B3PR10N0000	B3PR10N1200	B3PR10N0400	B3PR10N1600	B3PR10N0560	B3PR10N1760	-	-	B3PR20N0000	B3PR20N1200	B3PR20N0400	B3PR20N1600	-	-	-	-

Soft touch - TESA (without gasket)		**±2,5 mm**								**±5 mm**								**±10 mm**							
Sensitivity	[mV/V/mm]	73,75								29,5								7,375							
Calibration spec.		3V_{RMS} @13KHz with load 2KΩ±0,1%								3V_{RMS} @13KHz with load 2KΩ±0,1%								3V_{RMS} @13KHz with load 2KΩ±0,1%							
Spring strength	[N/mm]	0,016		0,01						0,02		0,07						0,030		0,010					
Total Measuring force	[N±25%]	0,30		0,18 to 1,9				0,14 to 2,3		0,30		0,18 to 1,9				0,14 to 2,3		0,30		0,18 to 1,9				0,14 to 2,3	
PP pressure	bar			0,5 to 2				0,125 to 2				0,5 to 2				0,125 to 2				0,5 to 2				0,125 to 2	
	psi			7,3 to 29				1,825 to 29				7,3 to 29				1,825 to 29				7,3 to 29				1,825 to 29	
Vacuum retract pressure	bar							-0,45 to -0,6								-0,45 to -0,6								-0,45 to -0,6	
	psi							≤0,9								-6,5 to -8,7								-6,5 to -8,7	
Protection grade		IP50(IP54 PP version)								IP50(IP54 PP version)								IP50(IP54 PP version)							
Contact type		Nylon (PA66)								Nylon (PA66)								Nylon (PA66)							
Cable (A=axial - R=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)		S		PP		V		PV		S		PP		V		PV		S		PP		V		PV	
Trade name		H25L	HR25L	HPA25L	HP25L	-	-	HPVA25L	HPV25L	H50L	HR50L	HPA50L	HP50L	-	-	HPVA50L	HPV50L	H100LL	HR100L	HPA100L	HP100L	-	-	HPVA100L	HPV100L
Order code		B3PR05T5000	B3PR05T6200	B3PR05T5400	B3PR05T6600	-	-	B3PR05T5800	B3PR05T7000	B3PR10T5000	B3PR10T6200	B3PR10T5400	B3PR10T6600	-	-	B3PR10T5800	B3PR10T7000	B3PR20T5000	B3PR20T6200	B3PR20T5400	B3PR20T6600	-	-	B3PR20T5800	B3PR20T7000

DIGICROWN2

DIGICrown2, digitized version, is the probe line that provides, combined with the DIGICrown network system following advantages:

- **ACCURACY**. High levels of measuring accuracy is guaranteed by the linearization data stored in the memory of the connector. The DIGICrown box is able to read the error map and perform an automatic compensation.
- **PLUG & GAUGE**. The memory in the connector allows any DIGICrown2 probe to be connected to the DIGICrown network system without requiring individual probe programming.
- **FLEXIBILITY.** The modularity of the system can create a network where 2 input-channels interface boxes are provided with the exact number of probes required. In a comprehensive DIGICrown network the DIGICrown2 can be combined with any type of incremental sensor, with analogue output sensors, and various I/O interfaces to provide a complete machine integration.
- **VERSATILITY.** The application can be designed by selecting the most suitable probe for the measuring task (for any measuring range the models are available with spring or pneumatic push, with axial or radial cable output and with or without gasket), and connecting it to the interface box.
- **APPLICATIONS.** Both static and synchronized dynamic measurements can be performed (maximum sampling frequency 4,000 samples/sec).
- **CONNECTIVITY.** The DIGICrown2 probe is designed for the DIGICrown network and GAGEPod systems.

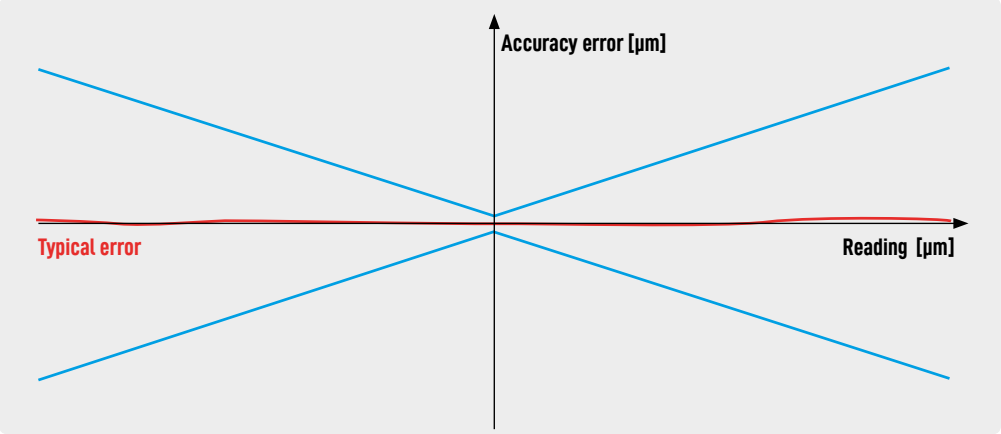
Mechanical specifications		**±0,5 mm**	**±1 mm**	**±2 mm**	**±2 mm LongRange**
Measuring range	[mm]	1	2	2	4
Mechanical travel	[mm]	1,5	3	6,6	11
Body Ø	[mm]	8	8	8	8
Cable length	[m]	2	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100	-20 to +100
Contact tread		M2,5	M2,5	M2,5	M2,5
Accuracy error	[µm]	±(0,2+K*1)	±(0,2+K*1)	±(0,3+|7*K|)	-
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25	<0,25

Standard (with gasket)		**±0,5 mm**	**±1 mm**			**±2 mm**			**±2 mm LongRange**		
Spring strength	[N/mm]	0,17	0,14	0,04	0,023	0,023	0,03	0,02	0,023	0,03	0,02
Measuring force	[N±25%]	1,00	0,70	0,8 to 2,2	0,4	0,70	0,7 to 2	0,5	0,70	0,7 to 2	0,4
PP pressure	bar			0,5 to 1			0,5 to 1			0,5 to 1	
	psi			7,5 to 14,5			7,5 to 14,5			7,5 to 14,5	
Vacuum retract pressure	bar				-0,45 to -0,6			-0,45 to -0,6			-0,45 to -0,6
	psi				-6,5 to -8,7			-6,5 to -8,7			-6,5 to -8,7
Gasket		Fluoroelast.	Fluoroelastometer			Fluoroelastometer			Fluoroelastometer		
Protection grade		IP65	IP65			IP65			IP65		
Contact type		carbide	carbide			carbide			carbide		
Cable (A=axial - R=radial)		A R	A R	A R	A R	A R	A R	A R	A R	A R	A R
Actuation (*)		S	S	PP	V	PV	S	PP	V	PV	S	PP	V	PV
Trade name		D01 RD01	D02 RD02	PAD02 PD02	VAD02 VD02	- -	D04 RD04	PAD04 PD04	VAD04 VD04	- -	- -	- -	- -	- -
Order code		B3PD01N0000 B3PD01N1200	B3PD02N0000 B3PD02N1200	B3PD02N0400 B3PD02N1600	B3PD02N0560 B3PD02N1760	- -	- -	- -	- -	- -	- -	- -	- -	- -

Soft touch (without gasket)		**±0,5 mm**	**±1 mm**			**±2 mm**			**±2 mm LongRange**		
Spring strength	[N/mm]	0,070	0,06	0,045		0,016	0,01		0,016	0,010	
Total Measuring force	[N±25%]	0,3	0,30	0,18 to 1,9	0,14 to 2,3	0,30	0,18 to 1,9	0,14 to 2,3	0,30	0,18 to 1,9	0,14 to 2,3
PP pressure	bar			0,5 to 2	0,125 to 2		0,5 to 2	0,125 to 2		0,5 to 2	0,125 to 2
	psi			7,3 to 29	1,825 to 29		7,3 to 29	1,825 to 29		7,3 to 29	1,825 to 29
Vacuum retract pressure	bar				-0,45 to -0,6			-0,45 to -0,6			-0,45 to -0,6
	psi				-6,5 to -8,7			-6,5 to -8,7			-6,5 to -8,7
Protection grade		IP50	IP50(IP54 PP version)			IP50(IP54 PP version)			IP50 (IP54 PP version)		
Contact type		Nylon (PA66)	Nylon (PA66)			Nylon (PA66)			Nylon (PA66)		
Cable (A=axial - R=radial)		A R	A R	A R	A R	A R	A R	A R	A R	A R	A R
Actuation (*)		S	S	PP	V	PV	S	PP	V	PV	S	PP	V	PV
Trade name		D01L RD01L	D02L RD02L	PAD02L PD02L	- -	PVAD02L PVD02L	D04L RD04L	PAD04L PD04L	- -	PVAD04L PVD04L	- -	- -	- -	- -
Order code		B3PD01N5000 -	B3PD02N5000 B3PD02N6200	B3PD02N5400 B3PD02N6600	- -	B3PD02N5800 B3PD02N7000	- -	- -	- -	- -	- -	- -	- -	- -

* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - ** Accuracy = +/-MAX(0,5+2*K;7*K) *** K= Reading (mm)

ACCURACY ERROR



Mechanical specifications		**±2,5 mm**	**±5 mm**	**±10 mm**
Measuring range	[mm]	5	10	20
Mechanical travel	[mm]	6,6	11	21
Body Ø	[mm]	8	8	8
Cable length	[m]	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100
Contact tread		M2,5	M2,5	M2,5
Accuracy error	[µm]	±(0,6+K*2)	±(0,6+K*2)	±(1,2+K*2)
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25

Standard (with gasket)		**±2,5 mm**				**±5 mm**				**±10 mm**			
Spring strength	[N/mm]	0,023	0,03	0,02		0,03	0,02	0,02		0,03	0,016	-	
Measuring force	[N±25%]	0,70	0,7 to 2	0,5		0,70	0,8 to 2	0,4		0,1	0,7 to 2	-	
PP pressure	bar		0,5 to 1				0,5 to 1				0,5 to 1		
	psi		7,5 to 14,5				7,5 to 14,5				7,5 to 14,5		
Vacuum retract pressure	bar			-0,45 to -0,6				-0,45 to -0,6				-	
	psi			-6,5 to -8,7				-6,5 to -8,7				-	
Gasket		Fluoroelastometer				Fluoroelastometer				Fluoroelastometer			
Protection grade		IP65				IP65				IP65			
Contact type		carbide				carbide				carbide			
Cable (A=axial - R=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)		S		PP		V		PV		S		PP		V		PV	
Trade name		D05	RD05	PAD05	PD05	VAD05	VD05	-	-	D10	RD10	PAD10	PD10	VAD10	VD10	-	-	D20	RD20	PAD20	PD20	-	-	-	-
Order code		B3PD05N0000	B3PD05N1200	B3PD05N0400	B3PD05N1600	B3PD05N0560	B3PD05N1760	-	-	B3PD10N0000	B3PD10N1200	B3PD10N0400	B3PD10N1600	B3PD10N0560	B3PD10N1760	-	-	B3PD20N0000	B3PD20N1200	B3PD20N0400	B3PD20N1600	-	-	-	-

Soft touch (without gasket)		**±2,5 mm**				**±5 mm**				**±10 mm**			
Spring strength	[N/mm]	0,016	0,01			0,02	0,07			0,030	0,010		
Total Measuring force	[N±25%]	0,30	0,18 to 1,9		0,14 to 2,3	0,30	0,18 to 1,9		0,14 to 2,3	0,30	0,18 to 1,9		0,14 to 2,3
PP pressure	bar		0,5 to 2		0,125 to 2		0,5 to 2		0,125 to 2		0,5 to 2		0,125 to 2
	psi		7,3 to 29		1,825 to 29		7,3 to 29		1,825 to 29		7,3 to 29		1,825 to 29
Vacuum retract pressure	bar				-0,45 to -0,6				-0,45 to -0,6				-0,45 to -0,6
	psi				-6,5 to -8,7				-6,5 to -8,7				-6,5 to -8,7
Protection grade		IP50(IP54 PP version)				IP50(IP54 PP version)				IP50(IP54 PP version)			
Contact type		Nylon (PA66)				Nylon (PA66)				Nylon (PA66)			
Cable (A=axial - R=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)		S		PP		V		PV		S		PP		V		PV	
Trade name		D05L	RD05L	PAD05L	PD05L	-	-	PVAD05L	PVD05L	D10L	RD10L	PAD10L	PD10L	-	-	PVAD10L	PVD10L	D20L	RD20L	PAD20L	PD20L	-	-	PVAD20L	PVD20L
Order code		B3PD05N5000	B3PD05N6200	B3PD05N5400	B3PD05N6600	-	-	B3PD05N5800	B3PD05N7000	B3PD10N5000	B3PD10N6200	B3PD10N5401	B3PD10N6600	-	-	B3PD10N5800	B3PD10N7000	B3PD20N5000	B3PD20N6200	B3PD20N5400	B3PD20N6600	-	-	3PD20N5800	3PD20N7000

REDCROWN2 USB

REDCrown2 USB is the version with USB connector, which provides following advantages.

- **ACCURACY**. The high level of accuracy is guaranteed during the production when the compensation of the linearity and sensitivity errors are stored in each probe. Each unique unit is certified and identified by a serial number, to ensure complete traceability.
- **PLUG & GAUGE**. All the conditioning and interface electronics of the transducer are integrated in the USB connector, therefore no additional connecting devices are required to use the product.
- **EASY TO USE**. The measurement can be displayed with Marposs electronics (Nemo, Merlin Line, E9066) or by connecting directly with USB host devices, where REDCrown2 USB is visible as a standard virtual COM.
- **APPLICATIONS**. Both static and dynamic measurements can be performed (maximum sampling frequency 1000 samples/s).
- **SOFTWARE INTERFACES**. For the measurement integration the Marposs software (U-Com, Merlin Plus SW, Easy Acquisition SW and Quick SPC) are available; alternatively a simple list of protocol commands for an easy and quick integration in other programming environments can be used.

Other USB accessories to manage I/O (U2I/O), Encoders (U1-E) and footswitch (U1-FS) are available.

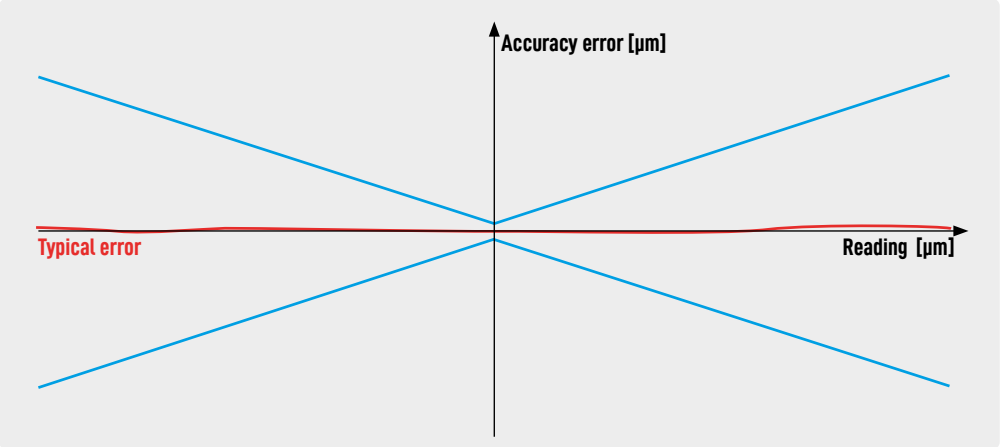
Mechanical specifications		**±0,5 mm**	**±1 mm**	**±2 mm**	**±2 mm LongRange**
Measuring range	[mm]	1	2	4	4
Mechanical travel	[mm]	1,5	3	6,6	11
Body Ø	[mm]	8	8	8	8
Cable length	[m]	2	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100	-20 to +100
Contact tread		M2,5	M2,5	M2,5	M2,5
Accuracy error	[µm]	±(0,2+K*1)	±(0,2+K*1)	±(0,3+|7*K|)	-
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25	<0,25

Standard (with gasket)		**±0,5 mm**	**±1 mm**			**±2 mm**			**±2 mm LongRange**		
Spring strength	[N/mm]	0,17	0,14	0,04	0,023	0,023	0,03	0,02	0,023	0,03	0,02
Measuring force	[N±25%]	1,00	0,70	0,8 to 2,2	0,4	0,70	0,7 to 2	0,5	0,70	0,7 to 2	0,4
PP pressure	bar			0,5 to 1			0,5 to 1			0,5 to 1	
	psi			7,5 to 14,5			7,5 to 14,5			7,5 to 14,5	
Vacuum retract pressure	bar				-0,45 to -0,6			-0,45 to -0,6			-0,45 to -0,6
	psi				-6,5 to -8,7			-6,5 to -8,7			-6,5 to -8,7
Gasket		Fluoroelast.	Fluoroelastometer			Fluoroelastometer			Fluoroelastometer		
Protection grade		IP65	IP65			IP65			IP65		
Contact type		carbide	carbide			carbide			carbide		
Cable (A=axial - R=radial)		A R	A R	A R	A R	A R	A R	A R	A R	A R	A R
Actuation (*)		S	S	PP	V	PV	S	PP	V	PV	S	PP	V	PV
Trade name		U05 UR05	U10 UR10	UPA10	UP10	UVA10	UV10 - -	U20 UR20	UPA20	UP20	UVA20	UV20 - -	- - - - - - - -
Order code		B3PR01Y0000 B3PR01Y1200	B3PR02Y0000 B3PR02Y1200	B3PR02Y0400	B3PR02Y1600	B3PR02Y0560	B3PR02Y1760 - -	- - - - - - - -	- - - - - - - -

Soft touch (without gasket)		**±0,5 mm**	**±1 mm**			**±2 mm**			**±2 mm LongRange**		
Spring strength	[N/mm]	0,070	0,06	0,045		0,016	0,01		0,016	0,010	
Total Measuring force	[N±25%]	0,3	0,30	0,18 to 1,9	0,14 to 2,3	0,30	0,18 to 1,9	0,14 to 2,3	0,30	0,18 to 1,9	0,14 to 2,3
PP pressure	bar			0,5 to 2	0,125 to 2		0,5 to 2	0,125 to 2		0,5 to 2	0,125 to 2
	psi			7,3 to 29	1,825 to 29		7,3 to 29	1,825 to 29		7,3 to 29	1,825 to 29
Vacuum retract pressure	bar				-0,45 to -0,6			-0,45 to -0,6			-0,45 to -0,6
	psi				-6,5 to -8,7			-6,5 to -8,7			-6,5 to -8,7
Protection grade		IP50	IP50(IP54 PP version)			IP50(IP54 PP version)			IP50 (IP54 PP version)		
Contact type		Nylon (PA66)	Nylon (PA66)			Nylon (PA66)			Nylon (PA66)		
Cable (A=axial - R=radial)		A R	A R	A R	A R	A R	A R	A R	A R	A R	A R
Actuation (*)		S	S	PP	V	PV	S	PP	V	PV	S	PP	V	PV
Trade name		U05L -	U10L	UPA10L	UP10L	- -	UPVA10L	UPV10L	U20L	UR20L	UPA20L	UP20L	- -	UPVA20L	UPV20L	- - - - - - - -
Order code		B3PR01Y5000 -	B3PR02Y5000	B3PR02Y5400	B3PR02Y6600	- -	B3PR02Y5800	B3PR02Y7000	- - - - - - - -	- - - - - - - -

* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - ** Accuracy = +/-MAX(0,5+2*K;7*K) *** K= Reading (mm)

ACCURACY ERROR



Mechanical specifications		**±2,5 mm**	**±5 mm**	**±10 mm**
Measuring range	[mm]	5	10	20
Mechanical travel	[mm]	6,6	11	21
Body Ø	[mm]	8	8	8
Cable length	[m]	2	2	2
Operating temperature	[°C]	-10 to +65	-10 to +65	-10 to +65
Storage temperature	[°C]	-20 to +100	-20 to +100	-20 to +100
Contact tread		M2,5	M2,5	M2,5
Accuracy error	[µm]	±(0,6+K*2)	±(0,6+K*2)	±(1,2+K*2)
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25

Standard (with gasket)		**±2,5 mm**				**±5 mm**				**±10 mm**			
Spring strength	[N/mm]	0,023	0,03	0,02		0,03	0,02	0,02		0,03	0,016	-	
Measuring force	[N±25%]	0,70	0,7 to 2	0,5		0,70	0,8 to 2	0,4		0,1	0,7 to 2	-	
PP pressure	bar		0,5 to 1				0,5 to 1				0,5 to 1		
	psi		7,5 to 14,5				7,5 to 14,5				7,5 to 14,5		
Vacuum retract pressure	bar			-0,45 to -0,6				-0,45 to -0,6				-	
	psi			-6,5 to -8,7				-6,5 to -8,7				-	
Gasket		Fluoroelastometer				Fluoroelastometer				Fluoroelastometer			
Protection grade		IP65				IP65				IP65			
Contact type		carbide				carbide				carbide			

Cable (A=axial - R=radial)	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)	S		PP		V		PV		S		PP		V		PV		S		PP		V		PV	
Trade name	U25	UR25	UPA25	UP25	UVA25	UV25	-	-	U50	UR50	UPA50	UP50	UVA50	UV50	-	-	U100	UR100	UPA100	UP100	UVA100	UV100	-	-
Order code	B3PR05Y0000	B3PR05Y1200	B3PR05Y0400	B3PR05Y1600	B3PR05Y0560	B3PR05Y1760	-	-	B3PR10Y0000	B3PR10Y1200	B3PR10Y0400	B3PR10Y1600	B3PR10Y0560	B3PR10Y1760	-	-	-	-	-	-	-	-	-	-

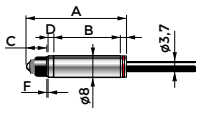
Soft touch (without gasket)		**±2,5 mm**			**±5 mm**			**±10 mm**		
Spring strength	[N/mm]	0,016	0,01		0,02	0,07		0,030	0,010	
Total Measuring force	[N±25%]	0,30	0,18 to 1,9	0,14 to 2,3	0,30	0,18 to 1,9	0,14 to 2,3	0,30	0,18 to 1,9	0,14 to 2,3
PP pressure	bar		0,5 to 2	0,125 to 2		0,5 to 2	0,125 to 2		0,5 to 2	0,125 to 2
	psi		7,3 to 29	1,825 to 29		7,3 to 29	1,825 to 29		7,3 to 29	1,825 to 29
Vacuum retract pressure	bar			-0,45 to -0,6			-0,45 to -0,6			-0,45 to -0,6
	psi			-6,5 to -8,7			-6,5 to -8,7			-6,5 to -8,7
Protection grade		IP50(IP54 PP version)			IP50(IP54 PP version)			IP50(IP54 PP version)		
Contact type		Nylon (PA66)			Nylon (PA66)			Nylon (PA66)		

Cable (A=axial - R=radial)	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Actuation (*)	S		PP		V		PV		S		PP		V		PV		S		PP		V		PV	
Trade name	U25L	UR25L	UPA25L	UP25L	-	-	UPVA25L	UPV25L	U50L	UR50L	UPA50L	UP50L	-	-	UPVA50L	UPV50L	U100L	UR100L	UPA100L	UP100L	-	-	UPVA100L	UPV100L
Order code	B3PR05Y5000	B3PR05Y6200	B3PR05Y5400	B3PR05Y6600	-	-	B3PR05Y5800	B3PR05Y7000	B3PR10Y5000	B3PR10Y6200	B3PR10Y5400	B3PR10Y6600	-	-	B3PR10Y5800	B3PR10Y7000	-	-	-	-	-	-	-	-

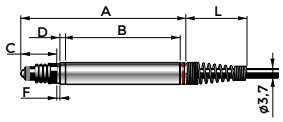
DIMENSIONS

STANDARD

AXIAL SPRING



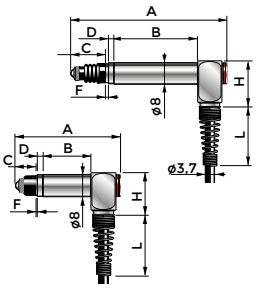
Pencil probe ±0,5mm



	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	36,20	59,40	83,35	106,35	83,35	114,45	162,45
B	24,35	41,25	61,05	75,50	61,05	86,60	120,65
C	7,10	12,80	17,25	25,30	16,75	22,30	39,45
D	2,00	2,00	2	2,00	2,00	2,00	2,00
E	2,05	-	-	-	-	-	-
F	0,70	1,30	1	1,50	1,50	1,50	-
G	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
L	-	22,00	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-	-

F= Max. pretravel adj. value

RADIAL SPRING

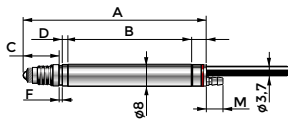


Pencil probe ±0,5mm

	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	37,50	57,78	84,85	107,85	84,85	115,95	163,95
B	17,20	31,20	54,1	88,58	54,10	79,65	112,50
C	7,10	12,80	17,25	25,30	16,75	22,30	39,45
D	2,00	2,00	2,00	2,00	2,00	2,00	-
E	1,50	-	-	-	-	-	-
F	0,70	1,30	1	1,50	1,50	1,50	-
G	-	-	-	-	-	-	-
H	15,20	15,20	15,20	15,20	15,20	15,20	15,20
L	22,00	22,00	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-	-

F= Max. pretravel adj. value

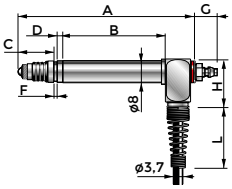
AXIAL PNEUMATIC PUSH



	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	-	65,98	86,65	109,65	86,65	117,75	166,75
B	-	44,55	61,05	75,50	61,05	86,60	120,65
C	-	12,80	17,25	25,30	16,75	22,30	39,45
D	-	2,00	2,00	2,00	2,00	2,00	-
E	-	-	-	-	-	-	-
F	-	1,30	1	1,50	1,50	1,50	-
G	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
L	-	-	-	-	-	-	-
M	-	6,00	6,00	6,00	6,00	6,00	6,00

F= Max. pretravel adj. value

RADIAL PNEUMATIC PUSH

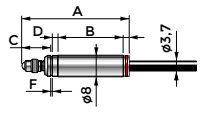


	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	-	71,75	84,85	107,85	84,85	115,95	163,95
B	-	36,10	54,1	68,55	52,60	78,15	112,50
C	-	12,80	17,25	25,30	16,75	22,30	39,45
D	-	2,00	2,00	2,00	2,00	2,00	-
E	-	-	-	-	-	-	-
F	-	1,30	1	1,50	1,50	1,50	-
G	-	7,50	-	7,50	7,50	7,50	7,50
H	-	15,20	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00	22,00
M	-	7,5	7,5	7,5	7,5	7,5	7,5

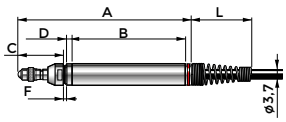
F= Max. pretravel adj. value

SOFT TOUCH

AXIAL SPRING



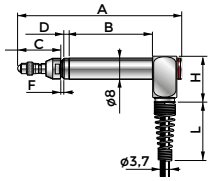
Pencil probe ±0,5mm



	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	39,90	63,00	87,00	106,35	87,00	114,45	162,45
B	24,35	41,25	61,05	75,50	61,05	86,60	120,65
C	10,65	16,40	20,9	28,80	20,40	22,30	39,45
D	2,00	2,00	2	-	2,00	-	-
E	2,05	-	-	-	-	-	-
F	0,70	1,30	1	-	1,50	-	-
G	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
L	-	22,00	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-	-

F= Max. pretravel adj. value

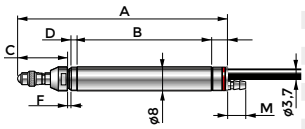
RADIAL SPRING



	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	-	61,43	88,50	107,85	88,50	115,95	163,95
B	-	31,20	54,1	68,55	54,10	79,65	112,50
C	-	16,40	20,9	28,80	20,40	16,90	39,45
D	-	2,00	2	-	2,00	-	-
E	-	-	-	-	-	-	-
F	-	1,30	1	-	1,50	-	-
G	-	-	-	-	-	-	-
H	-	15,20	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-	-

F= Max. pretravel adj. value

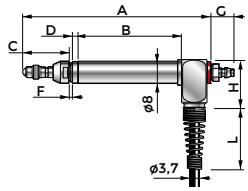
AXIAL PNEUMATIC PUSH



	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	-	69,63	90,30	109,65	90,30	117,75	165,75
B	-	44,55	61,05	75,50	61,05	86,60	120,65
C	-	16,40	20,90	28,80	20,40	16,90	39,45
D	-	2,00	2,00	-	2,00	-	-
E	-	-	-	-	-	-	-
F	-	1,30	1	-	1,50	-	-
G	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
L	-	-	-	-	-	-	-
M	-	6,00	6,00	6,00	6,00	6,00	6,00

F= Max. pretravel adj. value

RADIAL PNEUMATIC PUSH



	±0,5	±1	±2	±2LR	±2,5	±5	±10
A	-	66,30	88,50	107,85	88,50	115,95	163,95
B	-	36,10	52,6	68,55	52,60	78,15	112,50
C	-	16,40	20,40	28,80	20,40	16,90	39,45
D	-	2,00	2,00	-	2,00	-	-
E	-	-	-	-	-	-	-
F	-	1,30	1	-	1,50	-	-
G	-	7,50	-	7,50	7,50	7,50	7,50
H	-	15,20	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22	22,00	22,00	22,00	22,00
M	-	7,5	7,5	7,5	7,5	7,5	7,5

F= Max. pretravel adj. value

All dimensions are referred to zero position

All drawings and 3D models available on Marposs website

ULTRA-SHORT PROBE The probe model D01S has been designed to offer a total measuring range of 1 mm with a dimension of only 22,4 mm.The high accuracy and the ease of use (same simple fixing as every probe with 8 mm body diameter) allows to extend the use of this model in all applications where compactness is a must.

ULTRA-SOFT TOUCH PROBE The probe model PAD10UL has been designed to grant a measuring force of 0,12 N at 0,2 bar in horizontal position and 0,05 N at 0,2 bar in vertical position with contact upward. This model allows to measure parts with delicate surfaces that cannot be marked by the contact tip, or light components that could be bent by excessive measuring force.

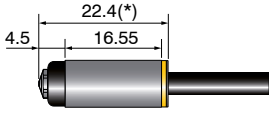
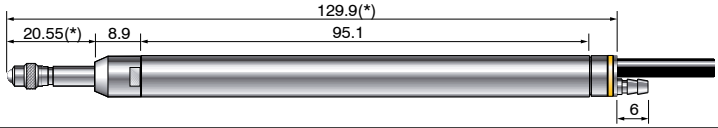
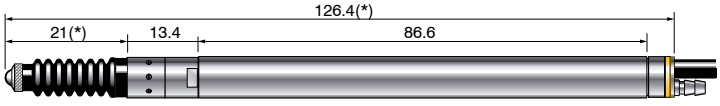
SOFT TOUCH & DUST-PROOF PROBE The PAD10J is a probe model that combines a low measuring force with the use of a front-gasket, to guarantee protection against dust and solid particles. The special design allows to blow air through radial holes located on the jacket, with no deformation of the gasket in operating conditions.

Specifications		**±0,5 mm**	**±5 mm**	**±5 mm**
Cable (A=axial - R=radial)		A	A	A
Actuation (*)		S	PP	PP
Measuring range	[mm]	1	10	10
Mechanical travel	[mm]	1,5	11	11
Body Ø	[mm]	8	8	8
Spring strength	[N/mm]	0,17	0,003	0,007
Measuring force	[N±25%]	0,60	0,12	0,30
PP pressure	bar	-	0,20	0,5 ÷ 2
	psi	-	2,90	7,3 ÷ 29
Vacuum retract pressure	bar	-	-	-
	psi	-	-	-
Cable length	[m]	2	2	2
Gasket		Fluoroelastometer	-	Fluoroelastometer
Repeatability (2.77 σ)	[µm]	≤0,15	≤0,15	≤0,15
Zero thermal drift	[µm/°C]	<0,25	<0,25	<0,25
Operating temperature	[°C]	(-10)÷(+65)	(-10)÷(+65)	(-10)÷(+65)
Storage temperature	[°C]	(-20)÷(+100)	(-20)÷(+100)	(-20)÷(+100)
Protection grade		IP65	IP54	IP54
Contact type		Carbide	Nylon (PA66)	Nylon (PA66)
Contact thread		M2,5	M2,5	M2,5

DIGITAL HBT MARPOSS		**D01S B3PD01S0000**	**PAD10UL B3PD10N5410**	**PAD10J B3PD10N0558**
Accuracy error	[µm]	±(0,2+K*1)	±(0,6+K*2)	±(0,6+K*2)
ANALOG HBT TESA		**H05S B3PR01T0100**	**HPA50UL B3PR10T5410**	**-**
Sensitivity	[mV/V/mm]	73,75	29,5	-
Calibration spec.		3_VRMS @13KHz with load 2KΩ±0,1%	3_VRMS @13KHz with load 2KΩ±0,1%	-
Accuracy error	[µm]	±(0,2+K**1)	±(0,2+K**1)	-

* Movement S= spring - PP= pneumatic push. K= Reading [mm]

DIMENSIONS

±0,5 mm	**D01S** **H05S**	
±5 mm	**PAD10UL** **HPA50UL**	
	PAD10J	

(*) Dimensions at zero position.
For other special models (i.e. Gravity actuation) please contact Marposs

STANDARD COMPATIBLE MODELS

TESA (HBT)

Standard	± 0,5 mm		± 1 mm		± 2 mm	
	A	R	A	R	A	R
Spring	B3PR01T0000	B3PR01T1200	B3PR02T0000	B3PR02T0000	B3PR05T0199	B3PR05T1399
Pneum. push	NA	NA	B3PR02T0400	B3PR02T0400	-	-
Vacuum	NA	NA	B3PR02T0560	B3PR02T0560	-	-

Soft touch	± 0,5 mm		± 1 mm		± 2 mm	
	A	R	A	R	A	R
Spring	B3PR01T5000	B3PR01T6200	B3PR02T5000	B3PR02T6200	B3PR05T5199	-
Pneum. push	NA	NA	B3PR02T5400	B3PR02T6600	-	-
Vacuum	NA	NA	B3PR02T5560	B3PR02T6760	-	-

MERCER (HBT)

Standard	± 0,5 mm		± 1 mm		± 1,5 mm	
	A	R	A	R	A	R
Spring	B3PR01R0000	B3PR01R1200	B3PR02R0000	B3PR02R1200	B3PR05R0199	-
Pneum. push	NA	NA	B3PR02R0400	B3PR02R1600	-	-
Vacuum	NA	NA	B3PR02T0560	B3PR02T1760	-	-

METEM (HBT)

Standard	± 0,5 mm		± 1 mm		± 2 mm	
	A	R	A	R	A	R
Spring	B3PR01S0000	B3PR01S1200	B3PR02S0000	B3PR02S1200	-	-
Pneum. push	NA	NA	B3PR02S0400	B3PR02S1600	-	-
Vacuum	NA	NA	B3PR02S0560	B3PR02S1760	-	-

Soft touch	± 0,5 mm		± 1 mm		± 2 mm	
	A	R	A	R	A	R
Spring	B3PR01S5000	B3PR01S6200	B3PR02S5000	B3PR02S6200	-	-
Pneum. push	NA	NA	B3PR02S5400	B3PR02S6600	-	-
Vacuum	NA	NA	B3PR02S5560	B3PR02S6760	-	-

MAHR (HBT)

STANDARD	± 05 mm		± 1 mm		± 2 mm	
	A	R	A	R	A	R
Spring	B3PR01P0000	B3PR01P1200	B3PR02P0000	B3PR02P1200	B3PR05P0199	-
Pneum. push	NA	NA	B3PR02P0400	B3PR02P1600	-	-
Vacuum	NA	NA	B3PR02P0560	B3PR02P1760	-	-

MICROCONTROL (LVDT)

Standard	± 0,5 mm		± 1 mm		± 1,5 mm	
	A	R	A	R	A	R
Spring	B3PR01K0000	B3PR01K1200	B3PR02K0000	B3PR02K1200	-	-
Pneum. push	NA	NA	B3PR02K0400	B3PR02K1600	-	-
Vacuum	NA	NA	B3PR02K0560	B3PR02K1760	-	-

Soft touch	± 0,5 mm		± 1 mm		± 1,5 mm	
	A	R	A	R	A	R
Spring	-	-	-	B3PR02K6200	-	-
Pneum. push	NA	NA	B3PR02K5400	B3PR02K6600	-	-
Vacuum	NA	NA	-	-	-	-

Don't hesitate to contact Marposs for any other compatible model not listed in that pages (i.e. Solartron).

STANDARD COMPATIBLE MODELS

TESA (HBT)

Standard	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	B3PR05T0199	B3PR10T1399	B3PR05T0000	B3PR05T1200	B3PR10T0000	B3PR10T1200	B3PR20T0000	B3PR20T1200
Pneum. push	B3PR10T0559	B3PR10T1759	B3PR05T0400	B3PR05T1600	B3PR10T0400	B3PR10T1600	B3PR20T0400	B3PR20T1600
Vacuum	B3PR10T0599	B3PR10T1799	B3PR05T0560	B3PR05T1760	B3PR10T0560	B3PR10T1760	-	-

Soft touch	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	B3PR10T5199	B3PR10T6399	B3PR05T5000	B3PR05T6200	B3PR10T5000	B3PR10T6200	B3PR20T5000	B3PR20T6200
Pneum. push	B3PR10T5559	B3PR10T6759	B3PR05T5400	B3PR05T6600	B3PR10T5400	B3PR10T6600	B3PR20T5400	B3PR20T6600
Vacuum	B3PR10T5599	B3PR10T6799	B3PR05T5560	B3PR05T6760	B3PR10T5560	B3PR10T6760	B3PR20T5560	B3PR20T6760

MERCER (HBT)

Standard	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	-	B3PR10T1799	B3PR05R0000	B3PR05R1200	B3PR10R0000	B3PR10R1200	B3PR20R0000	B3PR20R1200
Pneum. push	-	-	B3PR05R0400	B3PR05R1600	B3PR10R0400	B3PR10R1600	B3PR20R0400	B3PR20R1600
Vacuum	B3PR10T0599	-	B3PR05R0560	B3PR05R1760	B3PR10R0560	B3PR10R1760	-	-

METEM (HBT)

Standard	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	-	-	B3PR05S0000	B3PR05S1200	B3PR10S0000	B3PR10S1200	B3PR20S0000	B3PR20S1200
Pneum. push	-	-	B3PR05S0400	B3PR05S1600	B3PR10S0400	B3PR10S1600	B3PR20S0400	B3PR20S1600
Vacuum	-	-	B3PR05S0560	B3PR05S1760	B3PR10S0560	B3PR10S1760	-	-

Soft touch	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	-	-	B3PR05S5000	B3PR05S6200	B3PR10S5000	B3PR10S6200	B3PR20S5000	B3PR20S6200
Pneum. push	-	-	B3PR05S5400	B3PR05S6600	B3PR10S5400	B3PR10S6600	B3PR20S5400	B3PR20S6600
Vacuum	-	-	B3PR05S5560	B3PR05S6760	B3PR10S5560	B3PR10S6760	B3PR20S5560	B3PR20S6760

MAHR (HBT)

Standard	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	-	-	B3PR05P0000	B3PR05P1200	B3PR10P0000	B3PR10P1200	B3PR20P0000	B3PR20P1200
Pneum. push	-	-	B3PR05P0400	B3PR05P1600	B3PR10P0400	B3PR10P1600	B3PR20P0400	B3PR20P1600
Vacuum	-	-	B3PR05P0560	B3PR05P1760	B3PR10P0560	B3PR10P1760	-	-

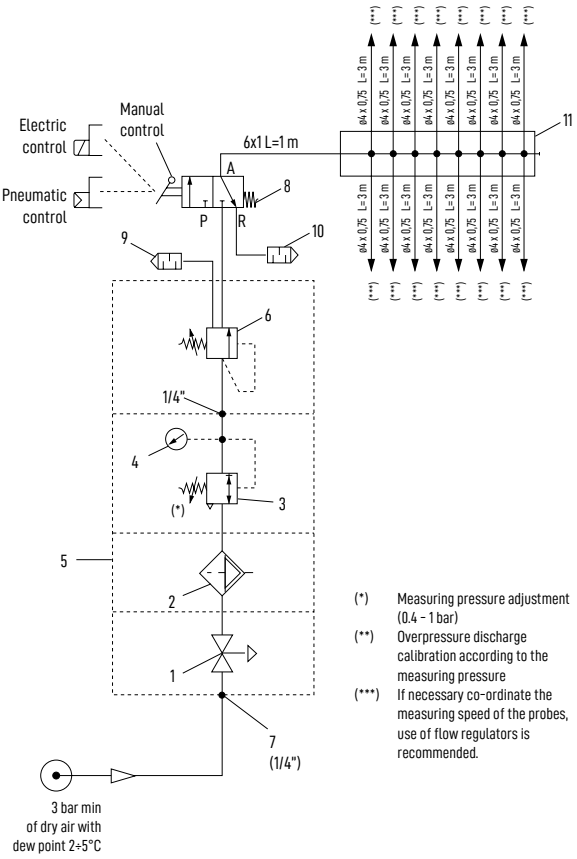
MICROCONTROL (LVDT)

Standard	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	-	-	B3PR05K0000	B3PR05K1200	B3PR10K0000	B3PR10K1200	B3PR20K0000	B3PR20K1200
Pneum. push	-	-	B3PR05K0400	B3PR05K1600	B3PR10K0400	B3PR10K1600	B3PR20K0400	B3PR20K1600
Vacuum	-	-	B3PR05K0560	B3PR05K1760	B3PR10K0560	B3PR10K1760	-	-

Soft touch	± 2 mm LongRange		± 2,5 mm		± 5 mm		± 10 mm	
	A	R	A	R	A	R	A	R
Spring	-	-	B3PR05K5000	B3PR05K6200	B3PR10K5000	B3PR10K6200	B3PR20K5000	B3PR20K6200
Pneum. push	-	-	B3PR05K5400	B3PR05K6600	B3PR10K5400	B3PR10K6600	B3PR20K5400	B3PR20K6600
Vacuum	-	-	-	-	B3PR10K5560	-	-	-

For applications with pneumatic push and vacuum retraction probe type, the pneumatic system should be sized as shown in the below schemes.
Air supply: air must be dry and unoiled, with dew point in the range 2-5 °C and filtered to 5 µm.

Pneumatic system for measuring probes

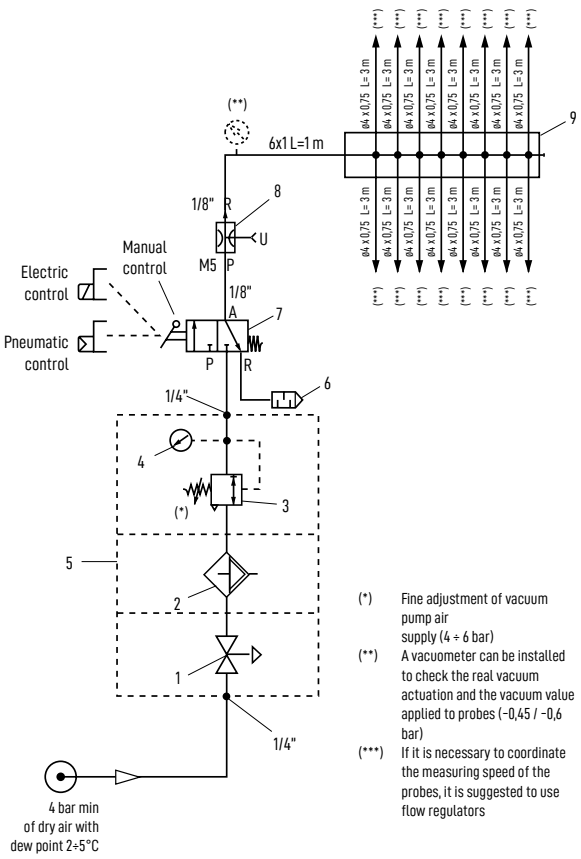


(*) Measuring pressure adjustment (0.4 - 1 bar)
(**) Overpressure discharge calibration according to the measuring pressure
(***) If necessary co-ordinate the measuring speed of the probes, use of flow regulators is recommended.

Ref	Q.ty	Description
1	1	ON-OFF valve 1/4"
2	1	Filter 5µ with semi automatic discharge
3	1	Pressure regulator
4	1	Pressure gauge ø 50 1/8" scale 0÷4 bar
5	2	Rapid terminal with bracket 72
6	1	Overpressure discharge valve
7	1	Beam 1/4"
8	1	Monostable lever 3-way 2-position valve
9	1	Silencer 1/2"
10	1	Silencer 1/8"
11	1	Distributor for max 16 probes

Application specs for pneumatic push probes:
- Standard version with gaiter: 0,4÷1 bar
- Version without gaiter: 0,5÷2 bar

Pneumatic layout for vacuum contact retraction



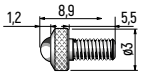
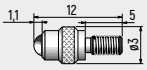
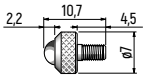
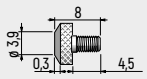
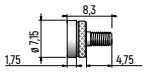
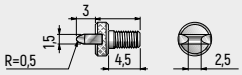
(*) Fine adjustment of vacuum pump air supply (4 ÷ 6 bar)
(**) A vacuometer can be installed to check the real vacuum actuation and the vacuum value applied to probes (-0,45 / -0,6 bar)
(***) If it is necessary to coordinate the measuring speed of the probes, it is suggested to use flow regulators

Ref	Q.ty	Description
1	1	ON-OFF valve 1/4"
2	1	Filter 5µ with semi automatic discharge
3	1	Pressure regulator
4	1	Pressure gauge ø 50 1/8" scale 0÷4 bar
5	2	Rapid terminal with bracket 72
6	1	Silencer 1/2"
7	1	Monostable lever 3-way 2-position valve
8	1	Vacuum pump
9	1	Distributor for max 16 probes

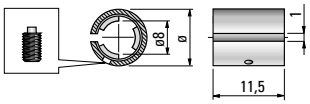
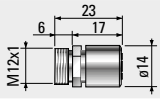
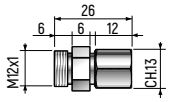
Application specs for probes with spring push and vacuum retraction:
- Standard version with gaiter: -0,45÷ -0,6 bar
- Version without gaiter: 0,5÷2 bar

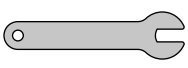
OPTIONAL SPRINGS AND ACCESSORIES

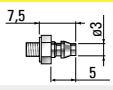
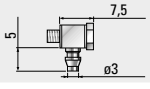
Springs		±0,5 mm	±1 mm	±2 mm	±2LR mm	±2,5 mm	±5 mm	±10 mm
	0,3 (N)	B1024099751	-	-	-	-	-	-
	1 (N)	-	B1042414237	-	-	B1042414435	B1042414537	-
	1,6 (N)	-	-	-	-	B1042414441	B1042414561	B1042414736
	2 (N)	B1024099753	B1042414236	-	-	B1042414436	B1042414536	-
	2,5 (N)	B1024099754	B1042414235	-	-	B1042414437	-	-

Contacts (thread M2,5)	Description	Order code
	Contact radius R1,5 mm - Widia (standard)	B3394241450
	Contact radius R1,5 mm - Nylon (soft-touch)	B3394156100
	Contact radius R2,5 mm - Widia	B3392409910
	Flat contact - Widia	B3392409912
	Full-Flat contact - Widia	B3394241401
	Cut contact - Widia	B3392409914

Extension cables	Description	Order code
 LVDT / HBT	Cable extension 1 m	B6735932026
	Cable extension 2 m	B6735932015
	Cable extension 5 m	B6735932016
	Cable extension 10 m	B6735932017
	Cable extension 15 m	B6735932037

Clamping	Description	Order code
	Bushing outside ø 10 mm*	B1019826001
	Bushing outside ø 3/8"*	B1019826002
	Dowel M3x10	B1024099760
	Dowel 4-40 UNC x .375"	B1024099761
	Tongs bushing ø 8 - Compact version	B2042414100
	Tongs bushing ø 8 - For standard wrench	B2042414200

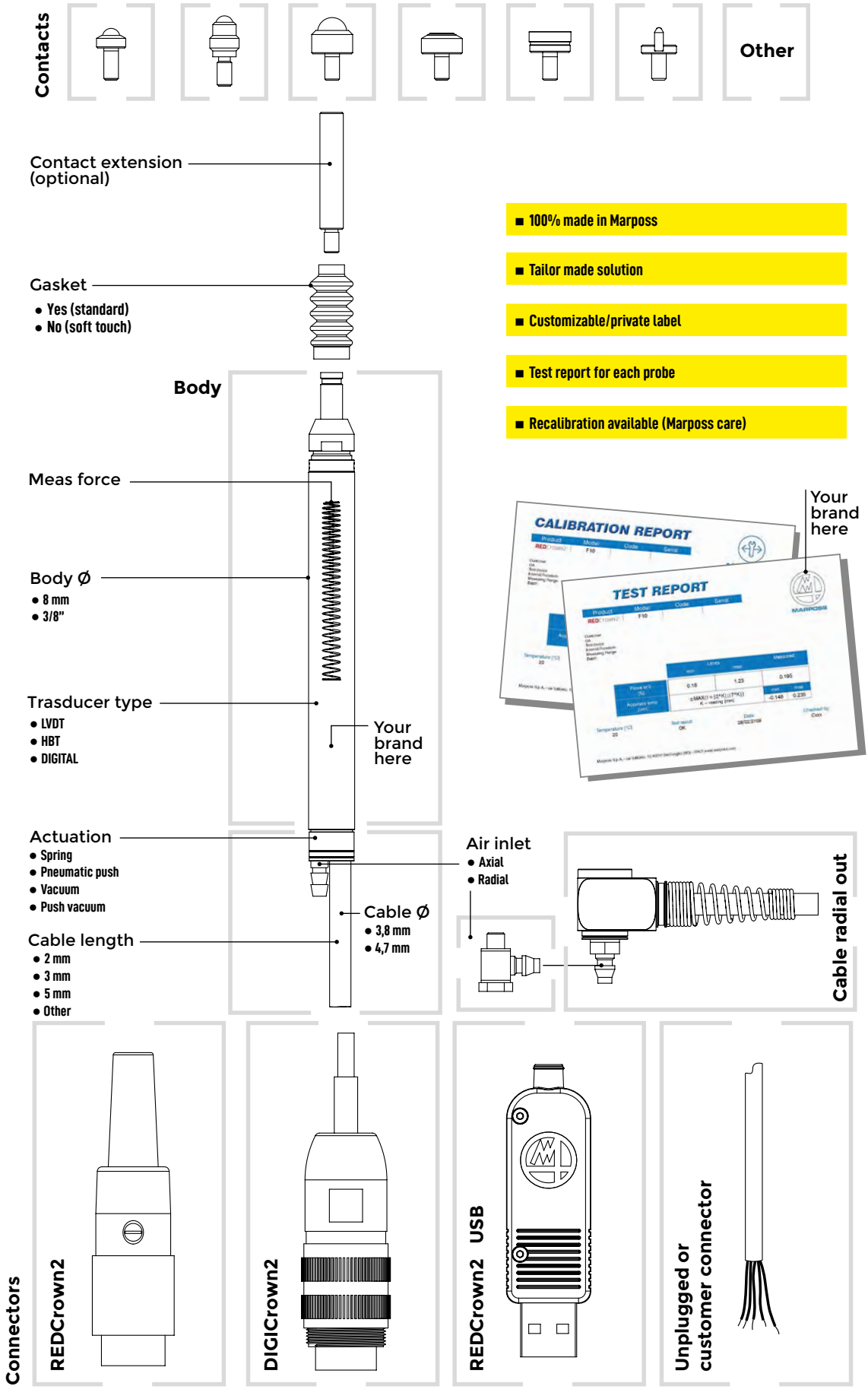
Wrench	Description	Order code
	Pre-travel regulator wrench	B1346040027

Air adaptors	Description	Order code
	Axial air adaptor	B4430RSMV03
	Radial air adaptor	B4430RSMVAB

* Recommended hole tolerance: G7

CREATE YOUR OWN PROBE

Scale 1:1



AMA

ADVANCED
MEASURING
ARMSET

Displacement Sensors

AMA™ is a line of mechanical measuring devices developed to satisfy the requirements of the market of measurement application providers. Based on their versatility and universal applicability, fixture makers, gauge makers and engineering sources will produce the right solution for their customers' applications.

Product **features**

The AMA line is characterized by 15 different designs, 8 mm and 3/8" clamping diameter, high precision and reliability, 12 mm thickness, variety of mounting options, wide range of contact offsets. AMA elements can be applied in combination with any pencil probe sensor type or indicators. Pneumatic actuation, available on some models, allows contact retraction to eliminate interference with the workpiece during manual and automatic part loading and unloading.

They represent the basic version working by "fulcrum"

TB10 and TB10C have a working range of 1000 µm.

The small size of these measuring armsets allows a reduced overall installation dimension.

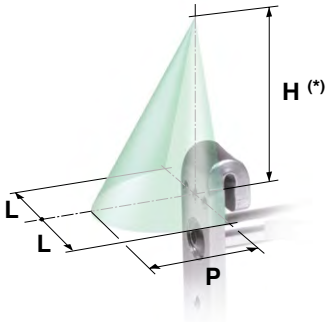
TB10C requires a pencil probe shorter (±0,5 mm) than that for TB10 (±1 mm), due to the different position of the measuring gauge locking point.

TB16 and TB16C have a working range of 1600 µm.

The small size of these measuring armsets allow a reduced overall installation dimension.

TB16C requires a pencil probe shorter (±0,5 mm) than that for TB16 (±1 mm), due to the different position of the measuring gauge locking point.

APPLICATION LIMITS



In case of vertical off-set, the Arm ratio (usually 1:1) changes as for below table:

Model	H (*) [mm]	L [mm]	P [mm]
TB10	30	14	20
TB10C	30	14	20
TB16	50	14	20
TB16C	50	14	20

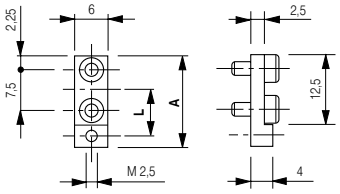
(*) With a vertical off-set the Arm Ratio changes:
mod. TB10 [30/(30 + h)] mod. TB16 [50/(50 + h)] with h = 0 to H

		TB10		TB10C		TB16		TB16C	
NON ADJUSTABLE FEATURES		**ø 8 mm**	**ø 3/8"**	**ø 8 mm**	**ø 3/8"**	**ø 8 mm**	**ø 3/8"**	**ø 8 mm**	**ø 3/8"**
Contact thread		M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF
Working range	[µm]	1000 (0/+300)		1000 (0/+300)		1600 (0/+300)		1600 (0/+300)	
Suggested pretravel (•••)	[µm]	300		300		300		300	
Suggested overtravel (•••)	[µm]	700		700		1300		1300	
Measuring force at 300 µm from the front stop	[N]	F_{probe} ± 0,3 (••)		F_{probe} ± 0,3 (••)		F_{probe} ± 0,3 (••)		F_{probe} ± 0,3 (••)	
Stiffness K measured on the contact (only armset)	[N/mm]	0,9 ± 0,3		0,9 ± 0,3		0,4 ± 0,2		0,4 ± 0,2	
Mechanical repeatability error (2.77 σ) (assembled through the measuring gauge)	[µm]	≤ 0,15 (•)		≤ 0,15 (•)		≤ 0,15 (•)		≤ 0,15 (•)	
Mechanical repeatability error (2.77 σ) (assembled to one side)	[µm]	≤ 0,15 (•)		≤ 0,15 (•)		≤ 0,4 (•)		≤ 0,4 (•)	
Mechanical repeatability error (2.77 σ) (assembled to the base)	[µm]	≤ 0,4 (•)		≤ 0,4 (•)		≤ 0,4 (•)		≤ 0,4 (•)	
Maximum sensitivity error		± 1%		± 1%		± 1%		± 1%	
Linearity error on the working range	[µm]	≤ 2		≤ 2		≤ 2		≤ 2	
Thermal drift	[µm/°C]	≤ 0,2		≤ 0,2		≤ 0,2		≤ 0,2	
Operating and storage temperature	[°C]	-10 to 65		-10 to 65		-10 to 65		-10 to 65	
Weight	[g]	49		47		62		60	
Order code		B2927364005	B2927364035	B2927364006	B2927364036	B2927364003	B2927364033	B2927364004	B2927364034

(•) With standard Marposs Red Crown F10 pencil probe. The performance is recorded at the suggested zero.
(••) F probe = Force of the measuring gauge. Ex.: with 0,8N measuring gauge, F = 0,8 ÷ 0,3 N
(•••) As the mechanical zero device is not available to identify any fixed positioning inside the measuring range, the "suggested zero position" (at 300µm from the front stop) is the one with minimum measuring errors.

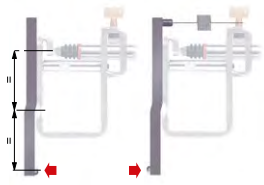
ACCESSORIES

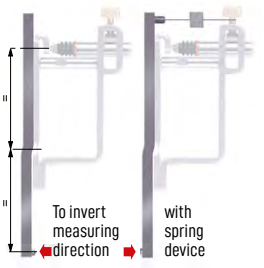
OFF-SET ARMSET (arm ratio 1:1)



Model		A	OFF-SET L	Order Code
TB10	M 2,5	16,5 [mm]	8,5 [mm]	B2924017150
TB10C		18 [mm]	10 [mm]	B2924017151
TB16	4-48 UNF	16,5 [mm]	8,5 [mm]	B2924017152
TB16C		18 [mm]	10 [mm]	B2924017152

STRAIGHT ARMSET (arm ratio 1:1)

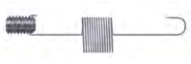




Model		Order Code
TB10	8 [mm]	B3192736405
TB10C	3/8"	B3192736435
TB16	8 [mm]	B3192736403
TB16C	3/8"	B3192736433

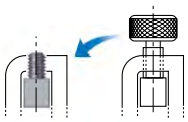
SPRING DEVICE

Model	Order Code
TB10 - TB16	V2027364001
TB10C - TB16C	V2027364002



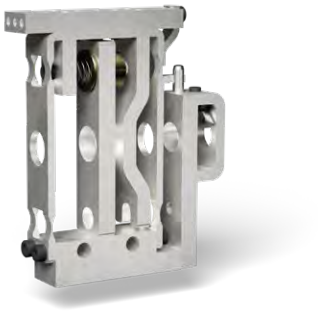
ALTERNATIVE CLAMPING DEVICE
(alternative to standard clamping)

Order Code
B2027364000



AMA TP
TRANSMISSION
PARALLELOGRAM DEVICE

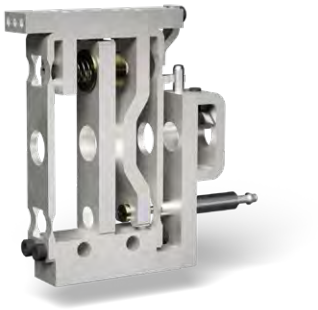
They represent the version working by “parallelogram”. This design allows the devices to work with larger measuring ranges than the TB line. The TP elements work with an ARM ratio 1:1, not affected by the use of contact extension (within some design defined limits, see the Application Limits section). The available ranges are 1,2 mm and 6 mm.



TP12E and TP12I have a working range of 1200 µm, therefore a pencil probe with ±1 mm measuring range is suitable.

They are used in combination with SPRING push pencil probes and can be used for checking external or internal diameters.

On the top of the device an adjustable slide (accessory) can be assembled, that allows a fine adjustment of the contact position.

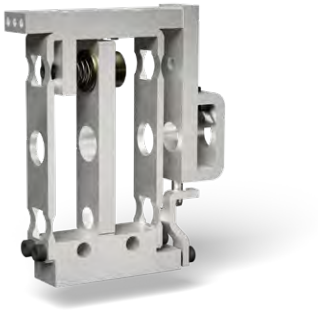


TP12EP and TP12IP have a working range of 1200 µm, therefore a pencil probe with ±1 mm measuring range is suitable.

These models additionally feature a pneumatic piston, that allows the use of the elements with pneumatic retraction.

They are used in combination with SPRING push pencil probes and can be used for checking external or internal diameters.

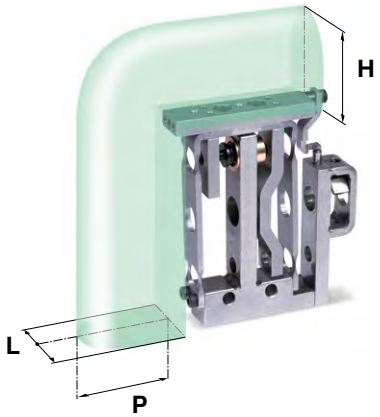
On the top of the device an adjustable slides (accessory) can be assembled, that allows a fine adjustment of the contact position.



TP12SE and TP12SI are the self-centering versions of TP12E and TP12I Self-centering measuring gauges for I.D. and O.D. can be designed by means of these models.
The most significant advantages are:

- Measurements can be carried out with two contact points and one indicator or pencil probe, with consequent costs reduction of the complete application.
- Only one repeatability error on one measuring transducer, instead of two repeatability errors on two measuring probes in case of measurement carried out with non self-centering elements.

APPLICATION LIMITS



The area indicates where the contact can be positioned using an offset armset, whilst guaranteeing the correct arm set mechanical functioning.

H Max	L Max	P Max
[mm]	[mm]	[mm]
40	14	40

The A.R. remains 1:1 within the area, regardless of the offset, as the movement is of a parallelogram type and not of a fulcrum type.
The maximum permitted values are highlighted in the table.

AMA TP
TRANSMISSION
PARALLELOGRAM DEVICE

TP60E and TP60I have an extended measuring range up to 6 mm, and are suitable for checking external or internal diameters.

These elements work in combination with a ±5 mm pencil probe.

Alternatively also indicators can be used to close the measuring application loop.

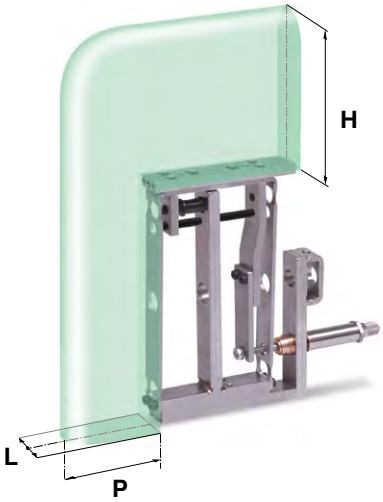
TP60SE and TP60SI are the self-centering versions of TP60E and TP60I

Self-centering measuring gauges for I.D. and O.D. can be designed by means of these models.

The most significant advantages are:

- Measurements can be carried out with two contact points and one indicator or pencil probe, with consequent costs reduction of the complete application.
- Only one repeatability error on one measuring transducer, instead of two repeatability errors on two measuring probes in case of measurement carried out with non self-centering elements.

APPLICATION LIMITS



The area indicates where the contact can be positioned, using an offset armset, whilst guaranteeing the correct armset mechanical functioning.

H Max	L Max	P Max
[mm]	[mm]	[mm]
90	14	50

The A.R. remains 1:1 within the area, regardless of the offset, as the movement is of a parallelogram type and not of a fulcrum type.
The maximum permitted values are highlighted in the table.

AMA TP
TRANSMISSION
PARALLELOGRAM DEVICE

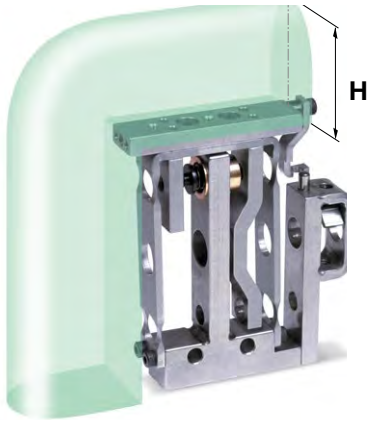
		TP12E		TP12I		TP12EP		TP12IP		TP12SE		TP12SI	
NON ADJUSTABLE FEATURES		**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**
Contact thread		M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF
Working range	[µm]	1200 (0/+300)		1200 (0/+300)		1200 (0/+300)		1200 (0/+300)		1200 (0/+300)		1200 (0/+300)	
Retraction field	[µm]	0		0		900 (0/+100)		900 (0/+100)		0		0	
Pretravel	[µm]	350 ± 50		350 ± 50		350 ± 50		350 ± 50		350 ± 50		350 ± 50	
Overtravel	[µm]	800 min		800 min		800 min		800 min		800 min		800 min	
Stiffness K measured on the contact	[N/mm]	0,75 ± 0,2		0,95 ± 0,2		0,75 ± 0,2		0,95 ± 0,2		1,2 ± 0,2		0,8 ± 0,2	
Mechanical repeatability error (2.77 σ)	[µm]	≤ 0,2 (•)		≤ 0,2 (•)		≤ 0,2 (•)		≤ 0,2 (•)		≤ 0,6 each pair (•)		≤ 0,6 each pair (•)	
Maximum sensitivity error		± 1,5%		± 1,5%		± 1,5%		± 1,5%		± 1,5%		± 1,5%	
Linearity error on the working range	[µm]	≤ 2		≤ 2		≤ 2		≤ 2		≤ 2		≤ 2	
Thermal drift	[µm/°C]	≤ 0,2		≤ 0,2		≤ 0,2		≤ 0,2		≤ 0,2		≤ 0,2	
Operating and storage temperature	[°C]	-10 to 65		-10 to 65		-10 to 65		-10 to 65		-10 to 65		-10 to 65	
Operative pressure	[MPa]	-		-		0,3 to 0,7		0,3 to 0,7		-		-	
Weight	[g]	147		147		154		154		132		132	
ADJUSTABLE FEATURES													
Measuring force at 350 µm from the front stop	(N) ± 0,15	F_{min} = F_{probe} + 0,25 (••)		F_{min} = 1,2 - F_{probe} (••)		F_{min} = F_{probe} + 0,25 (••)		F_{min} = 1,2 - F_{probe} (••)		F_{min} = 1,2 - F_{probe} (••)		F_{min} = F_{probe} + 0,25 (••)	
Maximum measuring force	[µm]	$F_{MAX} \geq F_{probe}$ + 0,05 (••)		$F_{MAX} \geq$ 1,5 - F_{probe} (••)		$F_{MAX} \geq F_{probe}$ + 0,05 (••)		$F_{MAX} \geq$ 1,5 - F_{probe} (••)		$F_{MAX} \geq$ 1,5 - F_{probe} (••)		$F_{MAX} \geq F_{probe}$ + 0,05 (••)	
Order code		B29240512 00	B29240512 02	B29240512 01	B29240512 03	B30240512 04	B30240512 06	B30240512 05	B30240512 07	B29240512 08	B29240512 09	B29240512 28	B29240512 29

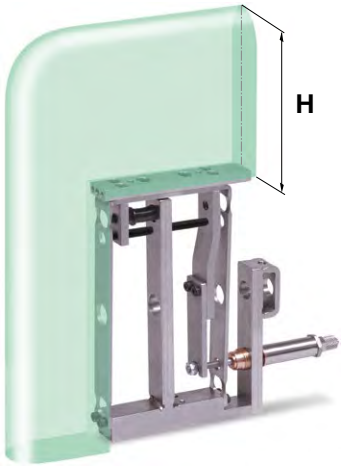
(•) With standard Marposs Red Crown F10 pencil probe.
(•••) F probe = Force of the measuring gauge.
The armset is provided at F min minimum measuring force.

		TP60E		TP60I		TP60SE		TP60SI	
NON ADJUSTABLE FEATURES		**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**	**ø 8 mm**	**3/8"**
Contact thread		M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF	M2,5	4-48 UNF
Maximum working range	[µm]	6000 (0/+300)		6000 (0/+300)		6000 (0/+300)		6000 (0/+300)	
Stiffness K measured on the contact	[N/mm]	0,15 ± 0,1		0,25 ± 0,1		0,25 ± 0,1		0,15 ± 0,1	
Mechanical repeatability error (2.77 σ)	[µm]	≤ 0,3 (•)		≤ 0,3 (•)		≤ 0,6 each pair (•)		≤0,6 each pair (•)	
Maximum sensitivity error		± 1,5%		± 1,5%		± 1,5%		± 1,5%	
Linearity error on the working range	[µm]	≤ 6		≤ 6		≤ 6		≤ 6	
Thermal drift	[µm/°C]	≤ 0,2		≤ 0,2		≤ 0,2		≤ 0,2	
Operating and storage temperature	[°C]	-10 to 65		-10 to 65		-10 to 65		-10 to 65	
Operating pressure	[MPa]	0,3 to 0,6		0,3 to 0,6		0,3 to 0,6		0,3 to 0,6	
Weight	[g]	292		294		267		267	
ADJUSTABLE FEATURES									
Adjusted working range	[µm]	5700 ± 100		5700 ± 100		5700 ± 100		5700 ± 100	
Retraction range	[µm]	5700 ± 100		5700 ± 100		5700 ± 100		5700 ± 100	
Measuring force at zero (ref. of the travel centre + 2750 µm)	(N) ± 0,15	F_{min} = F_{probe} + 0,2 (••)		F_{min} = 2,6 - F_{probe} (••)		F_{min} = 2,6 - F_{probe} (••)		F_{min} = 0,2 - F_{probe} +0,2 (••)	
Maximum measuring force	(N)	$F_{MAX} \geq F_{probe}$ + 0,5 (••)		$F_{MAX} \geq$ 3,0 F_{probe} (••)		$F_{MAX} \geq$ 3,0 F_{probe} (••)		$F_{MAX} \geq F_{probe}$ + 0,5 (••)	
Order code		B29240514 00	B29240514 30	B29240514 01	B29240514 31	B29240514 09	B29240514 07	B29240514 06	B29240514 08

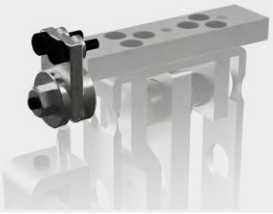
(•) With standard Marposs Red Crown FR11 pencil probe. The performance is recorded at the travel centre.
(••) F probe = Force of the measuring gauge.
The armset is provided at F min minimum measuring force.

AMA TP
TRANSMISSION
PARALLELOGRAM DEVICE





ACCESSORIES

Model	Model		H(*) MAX (mm)	S	Order code	
Slide	TP12	M 2,5	20	4	B2924051211	Retooling range 0 ÷ 15 mm 
			40	6	B2924051219	
		4-48 UNF	20	4	B2924051212	
			40	6	B2924051220	
	TP60	M 2,5	90	6	B2924051405	
		4-48 UNF	90	6	B2924051435	
Armset	TP12	M 2,5	(**A** = 30 mm)		B3192405120	Armset 
		4-48 UNF			B3192405123	
	TP60	M 2,5	(**A** = 60 mm)		B3192405140	
		4-48 UNF			B3192405143	
Off-set Armset	M 2,5		8,5 mm		B2924017150	Off-set Armset 
			10 mm		B2924017151	
	4-48 UNF		8,5 mm		B2924017152	
			10 mm		B2924017153	
Pretravel/ Overtravel limiter	TP12 (any model)				B2924051260	

(*) The Arm Ratio is 1:1 for any contact position.
Note: the pretravel/overtravel limiter must always be used when TP12 is equipped with Red Crown F05/H05 probes having a measuring range of ± 0,5 mm.

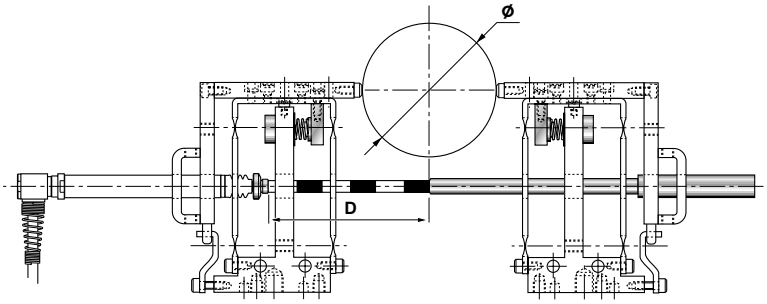
AMA TP
TRANSMISSION
PARALLELOGRAM DEVICE

SELF-CENTERING KIT

Model	ø	Order Code
TP12	8 mm	B2924051210
	3/8"	B2924051213
TP60	8 mm	B2924051410
	3/8"	B2924051413

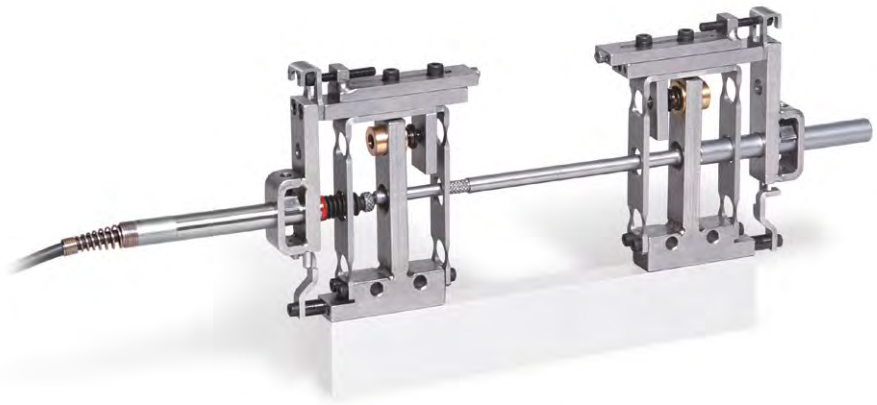
Extensions (D)

ø	Order Code
10 mm	B1024017105
15 mm	B1024017106
20 mm	B1024017107
25 mm	B1024017108
30 mm	B1024017109
70 mm	B1019750093
80 mm	B1019750122



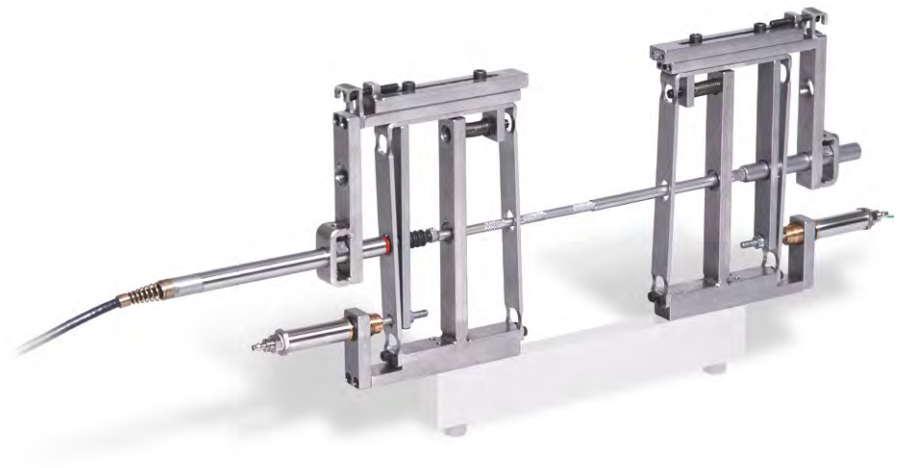
Model													
TP12	ø [mm]	0-3	3-8	8-13	13-18	18-23	23-28	28-33	33-38	38-43	43-48	48-53	53-58
	D [mm]	10	15	20	25	30	35	40	45	50	55	60	65
TP60	ø [mm]	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-	-
	D [mm]	-	10	20	30	40	50	60	70	80	90	-	-

D should be obtained with the lowest number of extensions.



Self-centering group for external ø 20 mm obtained with:

- TP12SE (Q.ty 2)
- Slide (Q.ty 2)
- Self-centering kit (Q.ty 1)
- 30 mm extension (Q.ty 1)



Self-centering group for external ø 75 mm obtained with:

- TP60SE (Q.ty 2)
- Slide (Q.ty 2)
- Self-centering kit (Q.ty 1)
- 70 mm extension (Q.ty 1)

AMA TS
TRANSMISSION
SHOULDER DEVICE

TS12 has a working range of 1200 µm, **TS21** has a range of 1800 to 2100 µm, therefore a pencil probe with ±1 mm measuring range is suitable.

They are used in combination with SPRING push pencil probes and can be used for measurements related to shoulders where a limited space is available.

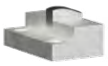
TS12E adds to TS12 characteristics a better repeatability due to the built-in transducer. It is available with LVDT and HBT transducer, also compatible with Tesa electronics.

		TS12		TS21				TS12E LVDT	TS12E HBT	TS12E HBT TESA
NON ADJUSTABLE FEATURES		**ø 8 mm**	**3/8"**	**ø 8 mm**		**ø 3/8"**				
Arm ratio (min and max value)		1		1,50	1,75	1,50	1,75	1	1	1
Suggested pretravel (•••)	[µm]	300		450	525	450	525	550 600	550 600	550 600
Suggested overtravel (•••)	[µm]	900		1350	1375	1350	1375	700 800	700 800	700 800
Contact thread		M2		M2		M2		M2	M2	M2
Measuring force at suggested zero	[N]	F_{probe} + 0,8 ± 0,2 (••)		F_{probe} + 0,4 ± 0,2 (••)	F_{probe} + 0,25 ± 0,2 (••)	F_{probe} + 0,4 ± 0,2 (••)	F_{probe} + 0,25 ± 0,2 (••)	0,8 ± 0,2	0,8 ± 0,2	0,8 ± 0,2
Mechanical repeatability error (2.77 σ)	[µm]	≤ 0,5 (•)		≤ 0,5 (•)		≤ 0,5 (•)		≤ 0,3	≤ 0,3	≤ 0,3
Maximum sensitivity error		± 2%		± 2%		± 2%		± 0,5%	± 0,5%	± 0,5%
Linearity error	[µm]	≤ 5 (in 1000 µm)		≤ 10		≤ 10		≤ 3	≤ 3	≤ 3
Thermal drift	[µm/°C]	≤ 0,2		≤ 0,2		≤ 0,2		≤ 0,25	≤ 0,25	≤ 0,25
Protection degree		-		-		-		IP65	IP65	IP65
Operating and storage temperature	[°C]	-10 to 65		-10 to 65		-10 to 65		-10 to 65	-10 to 65	-10 to 65
Weight	[g]	80	82	80		82		80	80	80
Sensitivity	[mV/V/mm]	-		-		-		73,75 ± 0,5%	73,75 ± 0,5%	73,75 ± 0,5%
Calibration spec.	LVDT	-		-		-		10 Vpp @ 7,5 kHz with load 2 kΩ ± 0,1%	10 Vpp @ 7,5 kHz with load 2 kΩ ± 0,1%	3 Vrms @ 13 kHz with load 2 kΩ ± 0,1%
ADJUSTABLE FEATURES										
Working range	[µm]	1200 (0/+200) to 900		1800 (0/+200) to 1350	1800 (0/+200) to 1375	1800 (0/+200) to 1350	2100 (0/+200) to 1575	1000	1000	1000
Order code		B2927364100	B2927364130	B2927364101		B2927364131		B3427364150	B3427364005	B3427364100

(•) With standard Marposs Red Crown F10 pencil probe. The performance is recorded at the suggested zero.
(••) F probe = Force of the measuring gauge.
(•••) As the mechanical zero device is not available to identify any fixed positioning inside the measuring range, the "suggested zero position" (at 450□m from the front stop with arm ratio 1,5) is the one with minimum measuring errors.

ACCESSORIES

Contact for **TS12** (ar 1:1)



Order Code
B3292736401

Contact for **TS12** (ar 1:1)

R	Order Code
5	B3292736405
20	B3292736410

Contact for **TS12E** (ar 1:1)

Order Code
B3292736430

Armset for grooves for **TS21** (ar 1:1.75)

Order Code
B3292736415

Workpiece loading direction

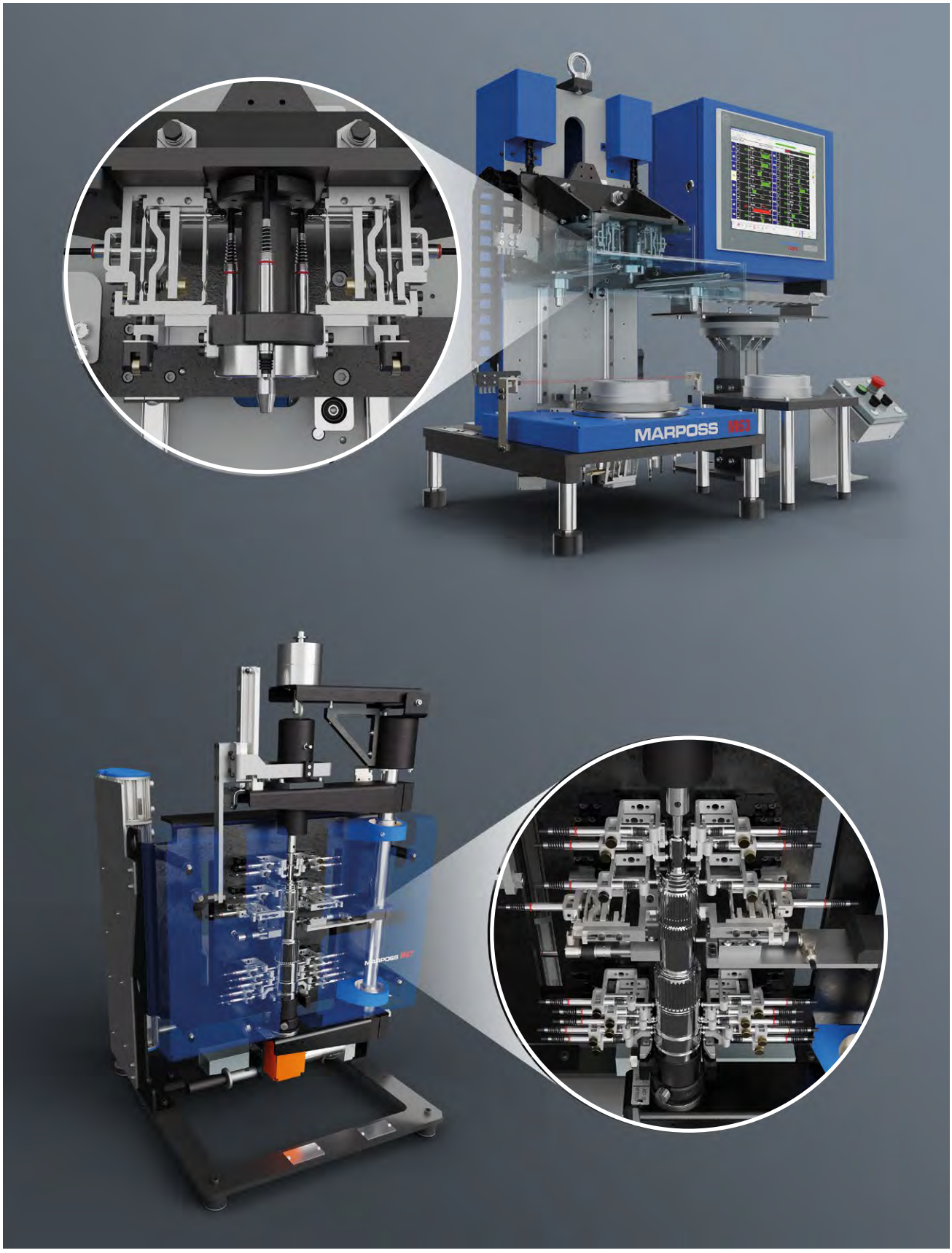
Interface block for Quick set support bracket

Order Code
B2927364150

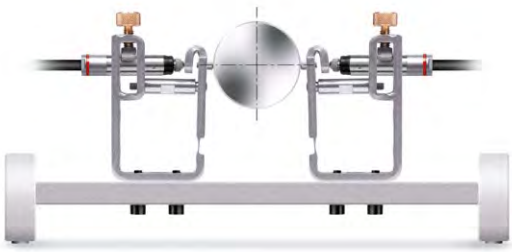
Side cover

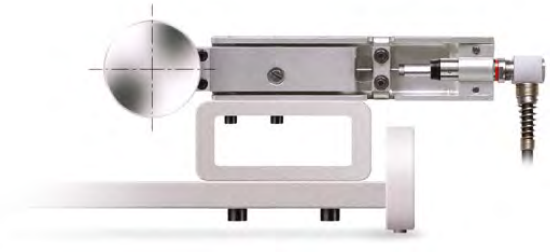
Order Code
B1027364145

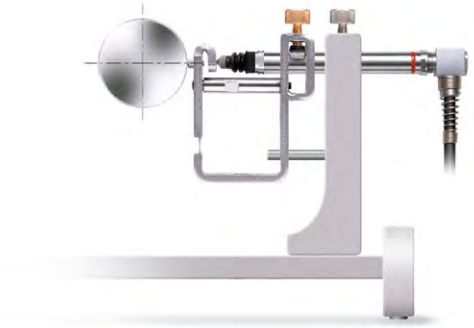
Application examples

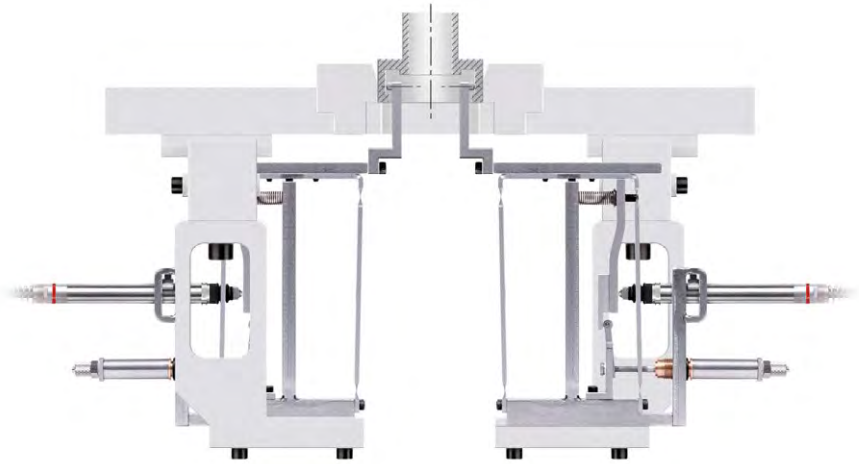


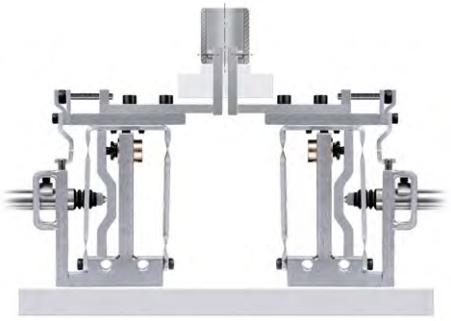
HOW TO DESIGN YOUR OWN APPLICATION

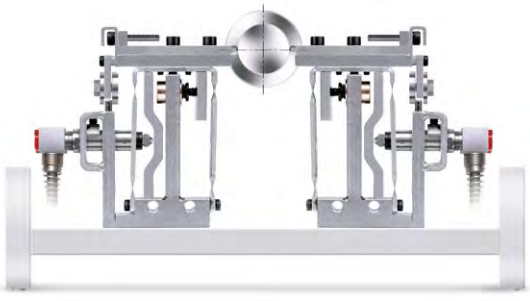












M1STAR

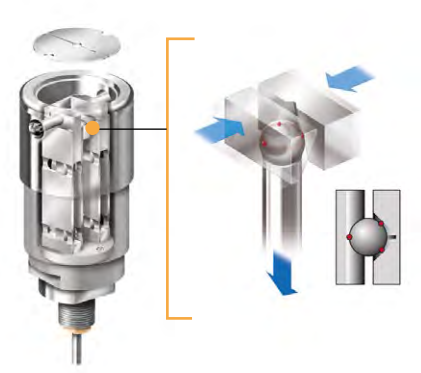
MBG AND EBG
HAND HELD GAUGES
FOR INNER DIAMETERS

Bore Gauges Line

M1Star is the premium line of manual variable gauges for high precision measuring of bores (Ø 3,0 mm to 375 mm) in any industrial environment, at a competitive price. They are the ideal solution for post-process and final control of diameters, ovality, taper and cilindricity.
The Marposs **M1Star** variable gauge is composed by an interchangeable gauge head, the measuring element of the instrument, and by a handle, which controls the signal conversion and transmission. The gauge head can be mechanical (Mechanical Bore Gauge **MBG**) or with integrated transducer (Electronic Bore Gauge **EBG**).

Product **features**

The M1Star MBG is an extremely versatile solution that may also gauge deep or interrupted bores.
The mechanical transmission measuring system provides both excellent metrological performance (repeatability <1 micron) and the lowest price range. The measurement is transduced to the display device by a transfer rod with a spherical head that slides on a cradle formed of a V shaped guide and an inclined plane.
The M1Star EBG is the most advanced solution on the market for variables manual gauging. The gauging system includes an electronic differential LVDT or HBT transducer that transforms the measurement into an electronic signal. The system is completely friction free and guarantees a repeatability of less than 0,5 microns over the entire field of application.
They can be totally retooled or repaired by simply replacing nosepiece and contacts.
The extensive linearity range of the transducers requires only one zero-setting ring.
Most advanced engineering and production processes guarantee fast delivery times.



M1STAR MBG

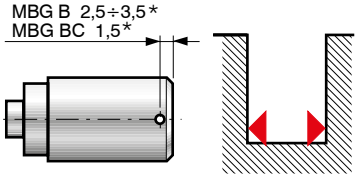
Measurable diameters: 3 to 300 mm (0.12”-11.81”). Special versions available for bigger diameters
Maintenance free construction requires only periodic cleaning of the precision mechanism
Extensive range of accessories to measure at more than 500 mm depth and to measure bores that are perpendicular to the axis of introduction
Durable measuring transmission system, capable of more than 10.000.000 measuring cycles
Mechanical transmission measuring system compatible with any pencil probe, dial or digital indicator
Compatible with the bore gauge accessories of third parties

M1STAR EBG

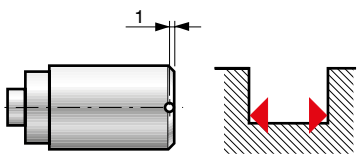
Measurable diameters: 3 to 375 mm (0.12”-14.76”), with a measurement section depth up to 500 mm
Completely friction-free measurement reading system ensures repeatability within 0.5 microns, constant over the entire application range.
Available with Marposs standard LVDT or HBT transducer
The compatibility to third party electronic units is obtained by means of special cables
The connection between plug head and cable is made with a connector, allowing quick replacement of the plug head itself
Designed to be used in the harshest production environments
Guaranteed IP67 protection (waterproof, dirt and dust sealed) with excellent resistance to impacts and accidental falls, plus replaceable tear resistant cable make the EBG sturdy and reliable, thus reducing maintenance costs and downtimes to a minimum
The M1Star EBG is also available for customized OEM supplies

M1STAR STANDARD VERSIONS

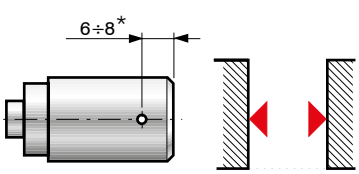
The M1Star plug head is available with 4 choices for the dimension “C” (distance between the contact axis and the top of the nosepiece), for blind, superblind or through bores:



MBG-B/BC Plug Heads
For blind bores.



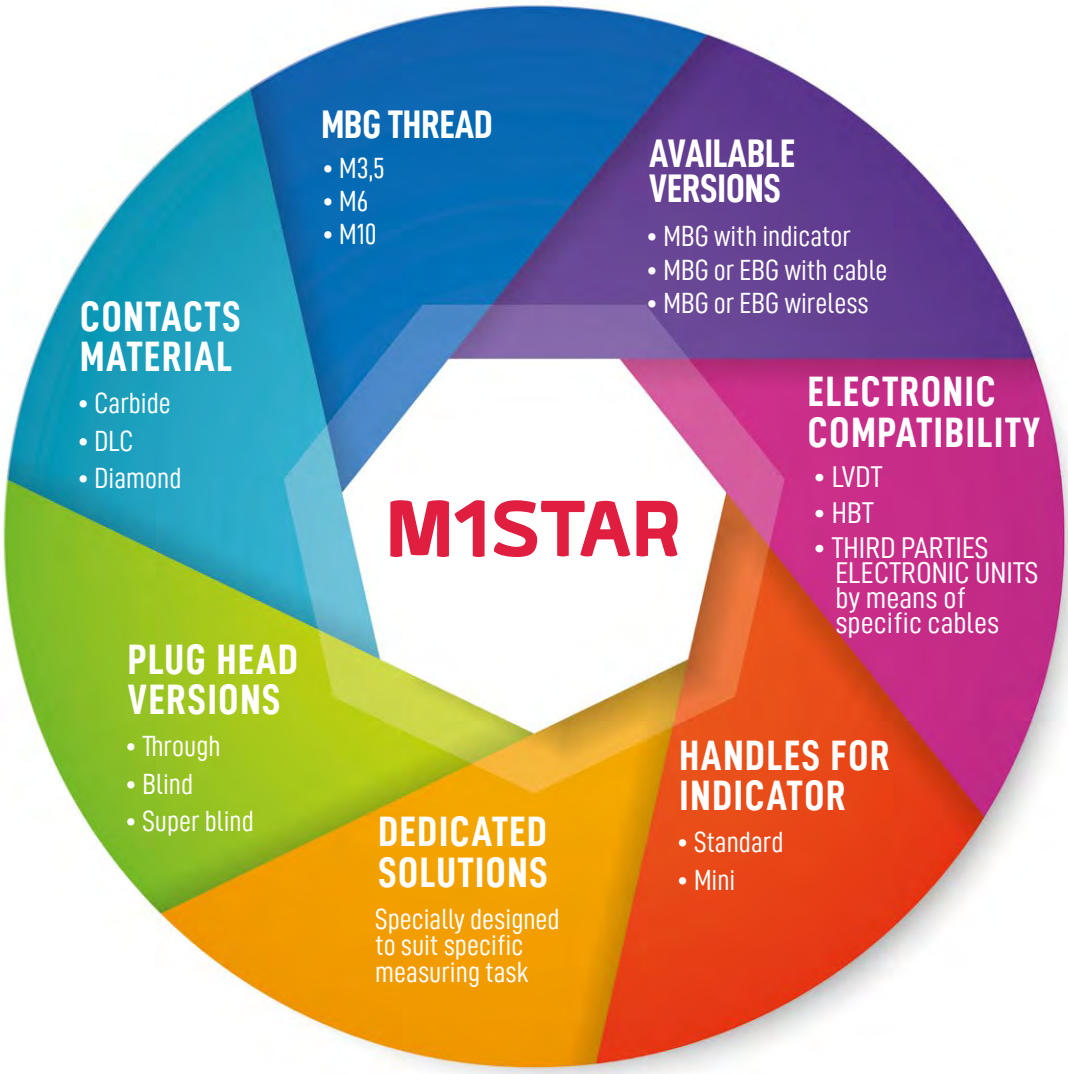
MBG-SB Plug Heads
For superblind bores.



MBG-T Plug Heads
For through bores.

* the final dimension depends on the diameter and on the gauge type (please refer to page 4 and 5 for details)

Product mix



COMPATIBILITY WITH ELECTRONIC UNITS

M1Star with cable can be connected, through a Marposs data acquisition interface box such as Easy Box or Gage Pod, to any Marposs industrial PC or any commercial PC with Marposs software installed, as well as to E4N or Duo directly.
The wireless M1Star can be connected, through its dongle, to Nemo, Merlin Line, E9066 Line or any commercial PC with Marposs software installed.

M1 STAR - MBG Mechanical Bore Gauge

GAUGE HEAD: it is the measuring element of the bore gauge. It can be replaced by simply unscrewing it from the handle.

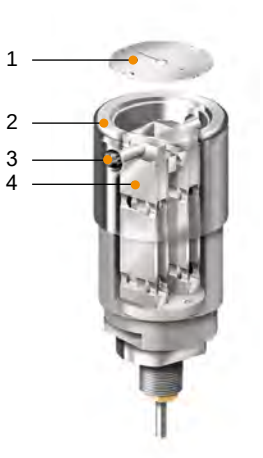
1 **CAP**: stainless steel disk protecting the internal mechanical elements from accidental damages.

2 **NOSEPIECE**: made of tempered stainless steel, it is the guiding element that ensures the measurement results are not affected by the operator's manual skill.

3 **MEASURING CONTACTS**: standard contacts are made of tungsten carbide and, in relation to the diameter range, come in two different radii chosen according to the bore surface roughness:
R1: standard radius for Ra ≤ 2 µm / Rz ≤ 6,3.
R2: bigger radius for Ra > 2 µm / Rz > 6,3.

Diamond or DLC-coated contacts are also available. Diamond contacts are suggested for soft aluminum or highly wearing applications; DLC-coated ones (3000 HV) for aluminum and relevant alloys.

4 **MEASURING ARMSET**: it is made by either 2 or 4 fulcrum elements, depending on the diameter range. The measurement is transferred to the display device by a transfer rod with spherical head that slides on a cradle formed by a V-shaped guide and an inclined plane.



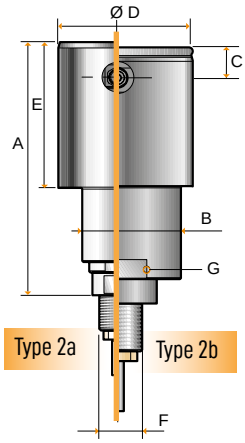
TECHNICAL SPECIFICATIONS

Description	WORKING RANGE								
Standard measuring range	3≤ø<4,5	4,5 ≤ø< 5,5	5,5≤ø<26			26≤ø<300			
for type B and T [mm]	0,055	0,070	0,120			0,150			
Extended Measuring Range	3≤ø<4,5	4,5≤ø<5,5	5,5≤ø<7,5	7,5≤ø<15	15≤ø<26	26≤ø<38	38≤ø<100	100≤ø<150	150≤ø ≤300
for type B and T [mm] (*)	-	-	-	0,120 - 0,170	0,120 - 0,200	0,150 - 0,200	0,150 - 0,400	0,150 - 0,350	0,150 - 0,300
Standard measuring range	3≤ø<4,5	4,5≤ø<5,5	5,5≤ø<26			26≤ø<60	60≤ø<150		150≤ø ≤ 300
for type SB and BC [mm]	0,055	0,070	0,120			0,150	0,120		0,080
Repeatability (2,77 σ) [µm]	≤ 1								

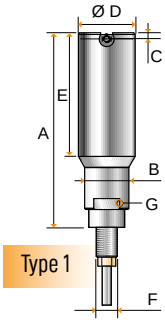
(*) By unscrewing the contacts fastened to the measuring armset by means of a screw with Heli-Coil, the measuring ranges can be extended up to the values indicated in the table.

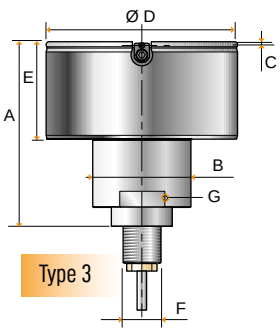
MECHANICAL SPECIFICATIONS

D=minimum bore diameter			3≤D<4	4≤D<4,5	4,5≤D<5,5	5,5≤D<7,5	7,5≤D<9,5	9,5≤D<15	15≤D<16	16≤D<20	20≤D<26	26≤D<32	32≤D≤300	4,5≤D<5,5	5,5≤D<7,5	7,5≤D<9,5	9,5≤D<15	15≤D<16	16≤D<26	26≤D<32	32≤D<40	40≤D<150	150≤D≤300
gauge head type			B											T									
drawing type			1	1	2a	2a	2a	2a	2a	2a	2b			2a	2a	2a	2a	2a	2b		2b		
A [mm]			22,3	22,3	22,3	25,8	34,5	40,5	40,5	41	48,7			25,8	28,8	37,5	43,5	43,5	51,2		53,2		
B ø [mm]			4,3	3,9	4,5	5,3	7,4	9,4*	11,8	11,8	25,9			4,5	5,3	7,4	9,4*	11,8	25,9		25,9		
C [mm]			2,5	2,5	2,5	3	3	3	3	3,5	3,5			6	6	6	6	6	6		8		
E min [mm]			15,8	14,4	14,8	17,4	22,6	22,6	22,6	22,5	27,3**			18,3	20,4	25,6	25,6	25	29,8	31,8	32,3		
F [mm]			M3,5x0,35					M6x0,75			M10x1			M3,5x0,35			M6x0,75		M10x1				
G [mm]			3 A/F		4 A/F		6 A/F	8,5 A/F			23 A/F			3,5 A/F	4 A/F	6 A/F	8,5 A/F	23 A/F					
Contact Radius [mm]	Carbide or DLC-coated	R1	0,25		0,5		1,5	2	2	2	4			0,25	0,5	1,5	2	2	4		4		
		R2	0,75		1		2,5	3,5	5	5	10			0,75	1	2,5	3,5	5	10		10		
	Diamond	R1	-		-		0,75	0,75	0,75	2	2	2	4	-	-	0,75	0,75	0,75	2	2	4	4	
		R2	-		-		-	-	-	5	-	10		-	-	-	-	-	5	-	10	10	



D=minimum bore diameter			3≤D<4	4≤D<4,5	4,5≤D<5,5	5,5≤D<7,5	7,5≤D<9,5	3≤D<4	4≤D<4,5	4,5≤D<5,5	5,5≤D<7,5	7,5≤D<9,5	9,5≤D<15	15≤D<26	26≤D≤300
gauge head type			BC					SB							
drawing type			1	1	2a	2a	2a	1	1	1	1	1	1	1	3
A [mm]			21,3	21,3	21,3	24,3	33	20,8	20,8	20,8	23,8	32,5	38,5	38,5	48,7
B ø [mm]			4,3	3,9	4,5	5,3	7,4	4,3	3,9	4,5	5,3	7,4	9,4*	11,8	25,9
C [mm]			1,5	1,5	1,5	1,5	1,5	1	1	1	1	1	1	1	1
E min [mm]			14,8	13,4	13,8	15,9	21,1	14,3	12,9	13,3	15,4	20,6	20,6	20	27,3**
F [mm]			M3,5x0,35					3<D<9.5 F= M 3,5x0.35					M6x0,75		M10x1
G [mm]			3 A/F		4 A/F		6 A/F	3 A/F		3,5 A/F	4 A/F	6 A/F	8,5 A/F		23 A/F
Contact Radius [mm]	Carbide or DLC-coated	R1	0,25		0,5		1,5	0,25			0,5	1,5	2	2	4
		R2	0,75		1		2,5	0,75			1	2,5	3,5	5	10
	Diamond	R1	-		-		0,75	-			-	-	-	-	-
		R2	-					-				-	-	-	-





* ø11,8 for12≤ø<15 mm
** 27,8 for 150≤D<300

M1 STAR - EBG Electronic Bore Gauge

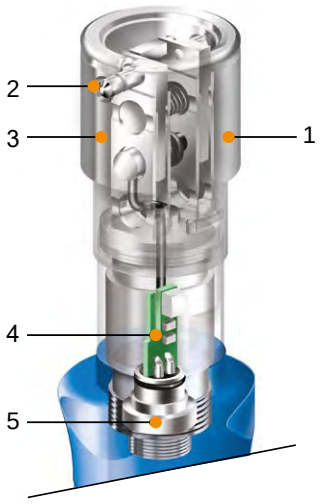
1 **NOSEPIECE**: it is the guiding element ensuring that operator's ability does not affect the measurement result.

2 **MEASURING CONTACTS**: they are available in various radii and materials (carbide, diamond and DLC), depending on the type of part to be measured.

3 **MEASURING ARMSET:** this element is composed, depending on the measuring range, of two or four fingers with a fulcrum. The built-in LVDT or HBT transducer is extremely precise, reliable and durable (IP67 waterproof, frictionless) and mechanically transduces the acquired measurement into an electrical signal proportional to the movement.

4 **SIGNAL-PROCESSING ELECTRONIC UNIT**: the embedded electronic circuit allows to perform a fine adjustment of the sensitivity and is totally protected (IP67 protection degree).

5 **CONNECTOR**: it connects the plug head to the cable, making retooling a simple operation and reducing the cost for repairs.

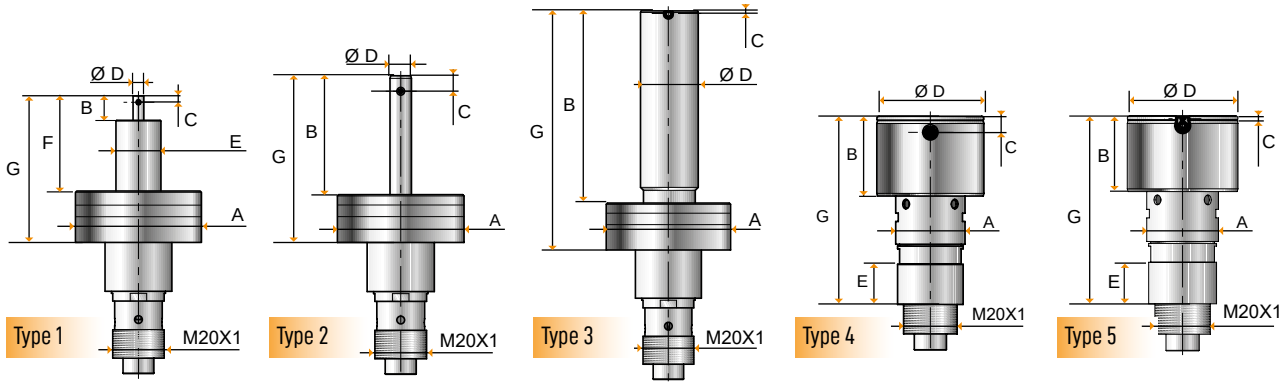


TECHNICAL SPECIFICATIONS

Description	WORKING RANGE						
Standard measuring range	3≤ø<8		8≤ø<13	13≤ø<26	26≤ø<50	50≤ø<150	150≤ø≤375
for type B and T [mm]	0,050		0,060	0,060	0,070	0,070	0,080
Extended Measuring Range	3≤ø<6	6≤ø<8	3≤ø<13	13≤ø<26	26≤ø<38	38≤ø<150	150≤ø≤375
for type B and T [mm]	0,050 - 0,070	0,050 - 0,100	0,060 - 0,150	0,060 - 0,200	0,070 - 0,200	0,070 - 0,350	0,080 - 0,300
Standard measuring range				Ø 13 - 26	Ø 26 - 50	50≤ø<150	150≤ø≤375
for type SB [mm]				0,060	0,070	0,070	0,080
Repeatability (2,77 σ) [µm]	≤ 0,5						
Thermal Drift [µm/°C]	≤ 0,3						

The working range can be further extended, on request, through a dedicated design of the bore gauge

MECHANICAL SPECIFICATIONS



D=minimum bore diameter			3≤D<4	4≤D<5	5≤D<6	6≤D<7	7≤D<8	8≤D<9	9≤D<10,5	10,5≤D<13	13≤D<20	20≤D<26	26≤D<32	32≤D≤375	3≤D<4	4≤D<5	5≤D<6	6≤D<7	7≤D<8	8≤D<9	9≤D<10,5	10,5≤D<13	13≤D<20	20≤D<26	26≤D<32	32≤D<40	40≤D≤375	13≤D<26	26≤D≤375
gauge head type			B												T													SB	
drawing type			1				2						4		1				2						4			3	5
A [mm]			49				49						25,9 *		49	49	49	49	49	49	49	49	49	49	25,9	25,9	25,9*	49	25,9*
B ø [mm]			9,5	12,5	17,5	22,5	42,5	62,5	82,5	82,5	83	83,5	27,3	27,3	13	16	21	26	46	66	86	86	86	86	29,8	29,8	31,8	81,8	27,3
C [mm]			2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	3	3,5	3,5	3,5	6	6	6	6	6	6	6	6	6	6	6	6	8	1	1
E min [mm]			17,5	17,5	17,5	17,5	N/A								17,5	17,5	17,5	17,5	N/A									N/A	
F [mm]			37	37	57	57	N/A								40,5	40,5	60,5	60,5	N/A									N/A	
G [mm]			57	57	77	77	61	81	101	101	102,5	103	67,8	67,8	60,5	60,5	80,5	80,5	64,5	84,5	104,5	104,5	105,5	105,5	70,3	70,3	72,3	101,3	67,8
Contact Radius [mm]	Carbide or DLC-coated	R1	0,25			0,5	0,5	1,5	1,5	1,5	2	2	4	4	0,25	0,25	0,25	0,5	0,5	1,5	1,5	1,5	2	2	4	4	4	2	4
		R2	-	-	-	1	1	2,5	2,5	2,5	5	5	10	10	-	-	-	1	1	2,5	2,5	2,5	5	5	10	10	10	5	10
	Diamond	R1	-	-	-		0,4	0,4	0,4	0,75	2	2	2	4	-	-	-	-	0,4	0,4	0,4	0,75	2	2	2	4	4	-	-
		R2	-	-	-	-	-	-	-	-	5	5	-	10	-	-	-	-	-	-	-	-	5	5	-	10	10	-	-

"T" handles available from Ø>200mm

*29 for 74≤D≤375

HANDLES AND ACCESSORIES FOR MBG

1 HANDLE: used to hold the plug gauge, it has been specifically designed for best handling.
It can be:
an indicator holder (for digital or dial indicators - 1C), that can be selected in a suitable size: standard or mini.

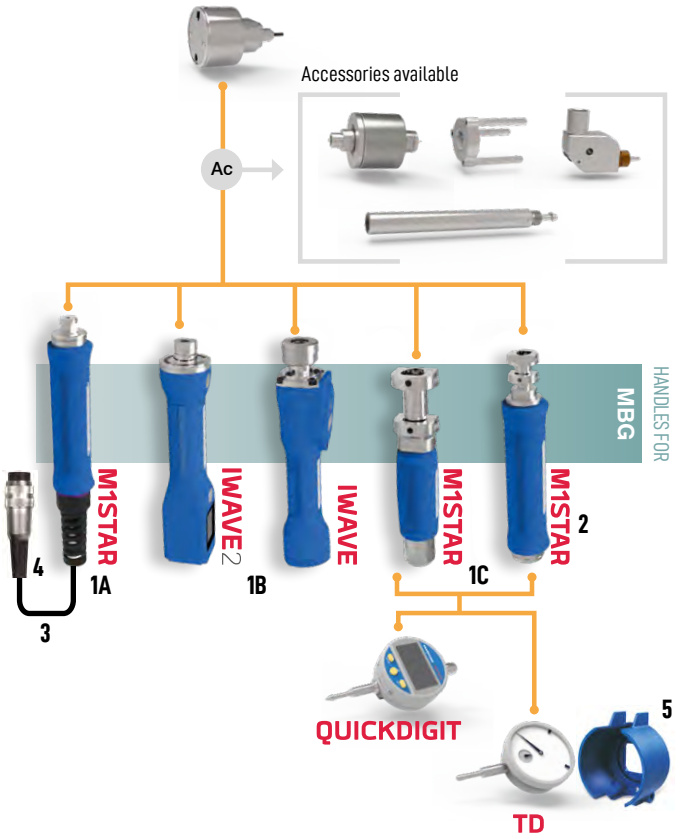
a wireless transmission handle as I-Wave2, with color display and automatic orientation, or I-Wave (1B), a pencil probe holder (in electro-mechanical applications - 1A)

2 NUMBER PLATE: it can be marked with the bore gauge size or any other information required by the user.

3 CABLE GUIDE and CLAMP: they are present in the pencil probe holder and prevent damages of the cable due to tearing, pulling or bending at cable exit.

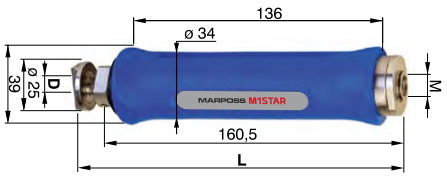
4 CABLE: it is a special reinforced cable (ø 4,7 mm) specifically developed for use in manual gauges, which considerably reduces the risk of damage and unintended torsion.

5 PROTECTIVE SHELLS: guarantee the indicator from accidental damages caused by dropping or side impact, etc.



INDICATOR HANDLES

Thread M	Clamping Diameter	Order code
M3,5	8 mm h6	B2TCL3S0000
	3/8"	B2TCL4S0000
M6	8 mm h6	B2TCL6S0000
	3/8"	B2TCL7S0000
M10	8 mm h6	B2TCLAS0000
	3/8"	B2TCLBS0000



L max		L min	
M3,5/M6 192 [mm]	M10 190 [mm]	169 [mm]	D= 8 mm
M3,5/M6 212 [mm]	M10 210 [mm]	189 [mm]	D= 3/8"

MINI INDICATOR HANDLES

Thread M	Clamping Diameter	Order code
M3,5	8 mm h6	B2TCS3S0000
	3/8"	B2TCS4S0000
M6	8 mm h6	B2TCS6S0000
	3/8"	B2TCS7S0000
M10	8 mm h6	B2TCSAS0000
	3/8"	B2TCSBS0000

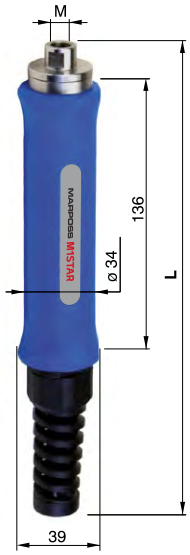
L max		L min	
M3,5/M6 110 [mm]	M10 108 [mm]	88 [mm]	D= 8 mm
M3,5/M6 130 [mm]	M10 128 [mm]	108 [mm]	D= 3/8"

INDICATOR PROTECTIVE SHELLS

Description	Depth (P)	Order code
Protective shell for mechanical Indicator	39 mm	B2T0DIPS001
Protective shell for digital Indicator	52 mm	B2T0DIPS000
Protective dome for the upper lifting rod of Quick Digit indicator		B2T0DICS000

PENCIL PROBE HANDLES

Thread M	L	Type	Order code
M3,5	237,5 [mm]	Without Pencil Probe - 8 mm h6 Clamping Diameter	B2TPL300000
		With RedCrown2 LVDT ±2 mm, cable length L=2 m, Lumberg SV50/6 connector	B2TPL3F2000
		With RedCrown2 HBT ±2 mm, cable length L=2 m, Lumberg SV50/6 connector	B2TPL3H2000
M6	237,5 [mm]	Without Pencil Probe - 8 mm h6 Clamping Diameter	B2TPL600000
		With RedCrown2 LVDT ±2 mm, cable length L=2 m, Lumberg SV50/6 connector	B2TPL6F2000
		With RedCrown2 HBT ±2 mm, cable length L=2 m, Lumberg SV50/6 connector	B2TPL6H2000
M10	239,5 [mm]	Without Pencil Probe - 8 mm h6 Clamping Diameter	B2TPLA00000
		With RedCrown2 LVDT ±2 mm, cable length L=2 m, Lumberg SV50/6 connector	B2TPLAF2000
		With RedCrown2 HBT ±2 mm, cable length L=2 m, Lumberg SV50/6 connector	B2TPLAH2000



A full range of pencil probe handles is available on request, such as for example:
- handle with 3/8"clamping diameter
- RedCrown probe with cable length L=4 m or 5 m
- RedCrown probe with Lumberg S3
- RedCrown unplugged probe compatible to amplifiers of other manufacturers (AirGage, Hommel/Etamic, Mahr Federal, Metrel, Metem, Mercer, Mitutoyo, Tesa, etc.)

HANDLES WITH WIRELESS TRANSMISSION

	Description	Order code
	I-Wave2 Handle with Direct-Lock for plug heads with M10 thread	B3TJ5SDI100
	I-Wave2 Handle with Direct-Lock for plug heads with M6 thread	B3TJ5SDI060
	I-Wave2 Handle with Direct-Lock for plug heads with M3,5 thread	B3TJ5SDI035
	I-Wave2 Handle with Starlock system for plug heads (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	B3TJ6SDI000
	I-Wave Handle with alkaline batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	B3TJ0SFB000
	I-Wave Handle with Li-Ion inductive batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	B3TJ0SFI000
	Mini I-Wave with Li-Ion inductive batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	B3TJ2SDJ000

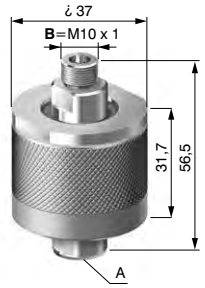
(*) M3,5 and third party gauge heads adapters are available on request.
For chargers and other accessories please refer to the Wave Line catalogue.

ROTARY SPACERS

Rotary spacers make it possible to have the indicator dial always facing the operator, even during dynamic measurements.

Plug gauge thread A (*)	Order code
M6X0,75	B2TR060S000
M10X1	B2TR100S000

(*) NOTE: **Thread A**: plug gauge-side thread - **Thread B**: handle-side thread

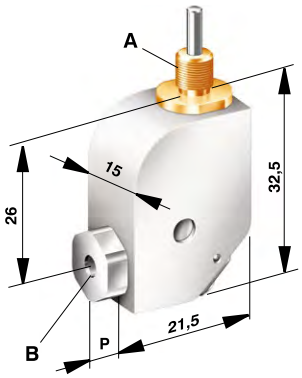


ANGLE ADAPTORS

The angle adaptors are needed when space is limited and the position of the bore is a 90° to the direction of insertion.

Thread B (*)	Thread A (*)	P [mm]	Order code
M3,5 X 0,35	M6 X 0,75	3,7	B2TAS630000
M6 X 0,75		4,2	B2TAS660000
M10 X 1		13,1	B2TAS6A0000
M3,5 X 0,35	M10 X 1	3,7	B2TASA30000
M6 X 0,75		4,2	B2TASA60000
M10 X 1		13,1	B2TASAA0000

(*) NOTE: **Thread A**: handle-side thread - **Thread B**: plug gauge-side thread



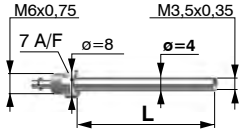
DEPTH EXTENSIONS

The extensions make it possible to reach the deeper measuring positions, when inserted between the plug head and the handle:

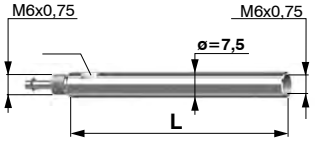
length	Order code		
L [mm]	ø 4 [mm]	ø 7 [mm]	ø 15 [mm]
20	2TXMS40020	2TXMS70020	-
30	2TXMS40030	2TXMS70030	-
40	2TXMS40040	2TXMS70040	-
50	2TXMS40050	2TXMS70050	B2TXMSF0050
65	2TXMS40065	2TXMS70065	B2TXMSF0065
80	2TXMS40080	2TXMS70080	B2TXMSF0080
100	2TXMS40100	2TXMS70100	B2TXMSF0100
125	2TXMS40125	2TXMS70125	B2TXMSF0125
250	-	2TXMS70250	B2TXMSF0250
500	-	-	B2TXMSF0500

(*) NOTE: **Thread A**: handle-side thread - **Thread B:** plug gauge-side thread

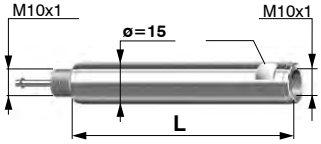
ø 4



ø 7,5

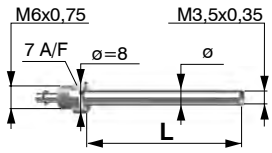
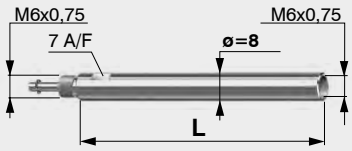


ø 15



SPECIAL DEPTH EXTENSIONS

For special applications and used where the extension diameter must not exceed the plug head size:

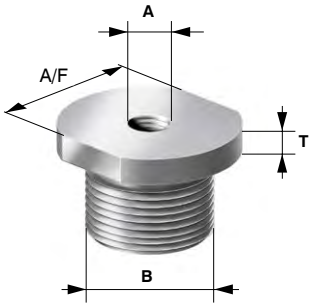
Ø [mm]	L [mm]	Order code	
3,8	20	B2TXMS30020	
	65	B2TXMS30065	
4,8	65	B2TXMS50065	
	80	B2TXMS50080	
5,3	65	B2TXMS60065	
	80	B2TXMS60080	
8	65	B2TXMS80065	
	80	B2TXMS80080	
	100	B2TXMS80100	
	125	B2TXMS80125	

THREAD ADAPTORS

Thread adaptors improve applications capability and interchangeability of the accessories.

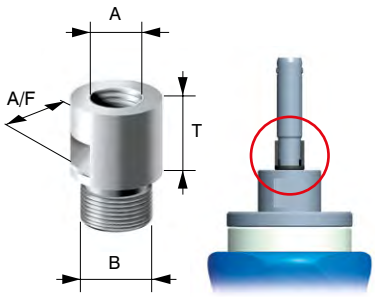
Standard thread adaptors:

Range	Thread A (*)	Thread B (*)	A/F	T [mm]	Order code
3 - 9,5	M3,5X0,35	M6X0,75	7	1	B1TA0350600
3 - 9,5	M3,5X0,35	M10X1	13	2	B1TA0351000
9,5 - 26	M6X0,75	M10X1	13	2	B1TA0601000



Protective thread adaptors (for plug heads with M3,5x0,35 thread)

Range	Thread A (*)	Thread B (*)	A/F	T [mm]	Order code
3 - 4	M3,5X0,35	M6X0,75	6	6	B1TAP350600
4 - 4,5			6	6	B1TAP350601
4,5 - 5,5			6	6	B1TAP350602
5,5 - 7,5			6	6	B1TAP350603
7,5 - 9,5			9	9	B1TAP350604



(*) NOTE: **Thread A**: plug head-side thread - **Thread** B: handle-side thread - The dimension **T** is designed according to the required measuring depth.

HANDLES AND ACCESSORIES FOR EBG

1 HANDLE: The ergonomic design and the antislip surface allow a safe handling of the bore gauge. It can be:
- a wireless transmission handle as Wave2, with color display and automatic orientation, or Wave (1A),
- a handle with cable (1B).

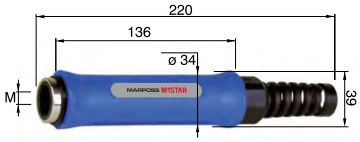
2 CABLE: It is a special reinforced cable (Ø 4,7 mm) specifically developed for use in manual gauges, with considerably reduces the risk of demage and unintended torsion. It complies with EMC Standards for manual gauges.

3 CONNECTION TO ELECTRONIC DISPLAY UNIT: for connection to electronic display units the EBG is supplied with a Lumberg type SV50/6 or S3. Extensions with dedicated connectors can be supplied, making it possible to achieve compatibility with many of the electronic display units available on the market.

4 NUMBER PLATE: it can be marked with the bore gauge size or any other information required by the user.

HANDLE FOR BORE GAUGE WITH CABLE

Description	Order code
Handle without cable	B2THS000000
Cable 2 m LVDT - connector SV50/6	B2TG0000026
Cable 3,5 m LVDT - connector SV50/6	B2TG0000356
Cable 5 m LVDT - connector SV50/6	B2TG0000056
Cable 2 m LVDT - connector S3	B2TG0000023
Cable 2 m TESA COMPATIBLE - connector SV50/6	B2TG00TS026
Cable 2 m HBT - connector SV50/6	B2TG0001026
Cable 3,5 m HBT - connector SV50/6	B2TG0001356
Cable 5 m HBT - connector SV50/6	B2TG0001056



HANDLES WITH WIRELESS TRANSMISSION

Description	Order code
Wave handle with alkaline batteries	B2TW0SFB000

Description	Order code
Wave handle with Li-Ion inductive batteries	B2TW0SFI000

Description	Order code
MiniWave with Li-Ion inductive batteries	B3TJ1SDJ000

For chargers and other accessories please refer to the Wave Line catalogue.

EXTENSIONS FOR BORE GAUGE WITH CABLE

The stainless steel extensions, when inserted between the plug head and the handle, make it possible to reach the correct position in a bore, where the measurement must be read. The following codes can be ordered:

Diameter Range [mm]	L [mm]	Order code
26<D≤375	20	B1TX0S00020
	30	B1TX0S00030
	40	B1TX0S00040
	50	B1TX0S00050
	65	B1TX0S00065
	80	B1TX0S00080
	100	B1TX0S00100
	125	B1TX0S00125
	250	B1TX0S00250
	500	B1TX0S00500

ACCESSORIES FOR BOTH MBG & EBG

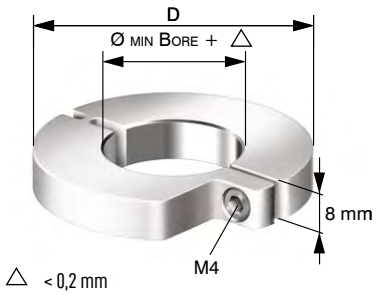
DEPTH STOPS

The depth stops are used to accurately define the position of the measuring section and can be placed at a specific position on either the nosepiece or depth extension.

DEPTH STOPS FOR NOSEPIECE

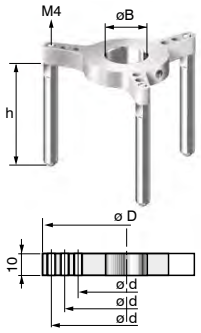
Ø min Bore		Ø D	
[mm]	[inch]	[mm]	[inch]
8 < 11	0.3150"< 0.4331"	33	1.29"
11 < 15	1.7716"< 1.9685"	37	1.45"
15 < 20	0.5905"< 0.7874"	42	1.77"
20 < 25	0.7874"< 0.9842"	51	2.00"
25 < 30	0.9842"< 1.1811"	56	2.20"
30 < 35	1.1811"< 1.378"	61	2.40"
35 <40	1.378"<1.5748"	66	2.59"

Ø min Bore		Ø D	
[mm]	[inch]	[mm]	[inch]
40 < 45	1.5748"< 1.7716"	71	2.79"
45 < 50	1.7716"< 1.9685"	76	2.99"
50 < 60	1.9685"< 2.3622"	86	3.38"
60 < 70	2.3622"< 2.7559"	96	3.77"
70 < 80	2.7559"< 3.1496"	106	4.17"
80 < 90	3,1496"< 3.5433"	116	4.56"
90 ≤100	3.5433"≤ 3.937"	126	4.96"



DEPTH STOPS FOR EXTENSION

Ø B [mm]	Ø D [mm]	h [mm]	Ø d [mm]	Order code
4	32	32,8	26	B2TDEM040A0
7,5	42	34,8	36	B2TDEM075A0
15	45	45	38	B2TDEM150A0
	75		44 56 68	B2TDEM150B0
	110		79 91 103	B2TDEM150C0
	160		117 129 141 153	B2TDEM150D0
	220		177 189 201 213	B2TDEM150E0
22	45	63,3	38	B2TDEE220A0
	75		44 56 68	B2TDEE220B0
	110		79 91 103	B2TDEE220C0
	160		117 129 141 153	B2TDEE220D0
	220		177 189 201 213	B2TDEE220E0



HOOKS

Hooks to hang the M1 Star MBG bore gauges are available in two styles, for all handle types as shown (see the figures).

Description	Order code
Eye hook for pencil probe handle	B1T0JHS0810
T-shaped hook for pencil probe handle	B1T0JHS0811
Eye hook for indicator handle	B1T0JHS0812

STAND

Used on the bench, this stand positions the gauge in vertical or horizontal position, or at any angle between –45° and +45° from vertical, allowing the workpiece to be referenced or located on the plug. With 1 or 2 extra plug support kit, it is possible to install up to 2 or 3 gauges on the same stand.

Description	Order code
Multiposition Stand for EBG and MBG	B2TS0001111
Extra plug support kit for stand 2TS0001111	B2TS0002222

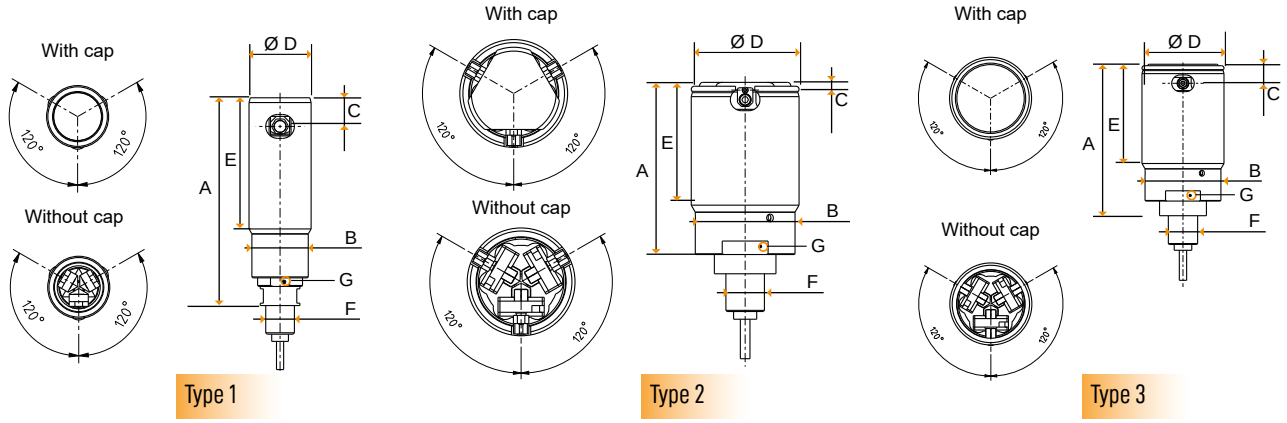
MBG WITH 3 CONTACTS

The MBG with 3 contacts every 120° is the ideal solution to measure squared shaped bores and trilobular shapes from 12 to 100mm (solutions for smaller or larger diameters are available on request).
The 3 independent contacts are extremely capable of measuring even small tolerances.
The 3-contact MBGs are available with 3 different “C” (distance between the contact axis and the top of the nosepiece) for blind, superblind or through bores and can be supplied with or without the protective cap.

TECHNICAL SPECIFICATIONS

Description	WORKING RANGE			
Standard measuring range	Ø 12 - 26		Ø 26 - 300	
for type B and T [mm]	0,120		0,150	
Extended Measuring Range	Ø 12 - 15	Ø 15 - 26	Ø 26 - 38	Ø 38 - 100
for type B and T [mm] (*)	0,120 - 0,170	0,120 - 0,200	0,150 - 0,200	0,150 - 0,400
Standard measuring range	Ø 12 - 26		Ø 26 - 60	Ø 60 - 100
for type SB	0,120		0,150	0,120
Repeatability (2,77 σ) [µm]	≤ 1,5			

MECHANICAL SPECIFICATIONS



D=minimum bore diameter	12≤D<16,5	16,5≤D<26	26≤D<30	30≤D<50	50≤D<100	26≤D<30	26≤D<30	30≤D<50	50≤D<100	12≤D<16,5	16,5≤D<26	26≤D<30	26≤D<30	30≤D<50	50≤D<100
Gauge head type	B					SB				T					
Drawing type	1	1	3	3	3	2	2	2	2	1	1	3	3	3	3
Cap	Yes/No	Yes/No	Yes	No	Yes/No	Yes	No	Yes/No	Yes/No	Yes/No	Yes/No	Yes	No	Yes/No	Yes/No
A [mm]	40,5	40,5	49,7	48,7	48,7	49,7	48,7	48,7	48,7	43,5		51,7	51,2	51,2	53,2
B ø [mm]	11,8	11,8	25,9	25,9	25,9	25,9	25,9	25,9	25,9	11,8	11,8	25,9	25,9	25,9	25,9
C [mm]	3	3	4,5	3,5	3,5	2	1	1	1	6	6	6,5	6	6	6
E min [mm]	21,4	22	29,1	29,1	27,3	29,1	29,1	27,3	27,3	24,4	25	31,6	31,6	29,8	31,8
F [mm]	M6x0,75	M6x0,75	M10x1	M10x1	M10x1	M10x1	M10x1	M10x1	M10x1	M6x0,75	M6x0,75	M10x1	M10x1	M10x1	M10x1
G [mm]	CH 8.5	CH 8.5	CH 23	CH 23	CH 23	CH 23	CH 23	CH 23	CH 23	CH 8.5	CH 8.5	CH 23	CH 23	CH 23	CH 23

D=minimum bore diameter			12≤D<15	15≤D<16	16≤D<20	20≤D<26	26≤D<32	32≤D<100	32≤D<100	12≤D<15	15≤D<16	16≤D<26	26≤D<32	32≤D<40	40≤D<100
Gauge head type			B						SB	T					
Contact Radius	Carbide or DLC-coated	R1 [mm]	2	2		2	4		4	2	2		4		4
		R2 [mm]	3,5	5		5	10		10	3,5	5		10		10
	Diamond	R1 [mm]	0,75	0,75	2	2	2	4	-	0,7	0,75	2	2		4
		R2 [mm]	-	-		5	-	10	-	-	-	5	-	10	10

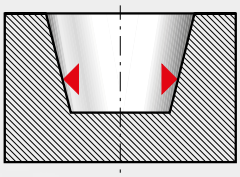
DEDICATED SOLUTIONS

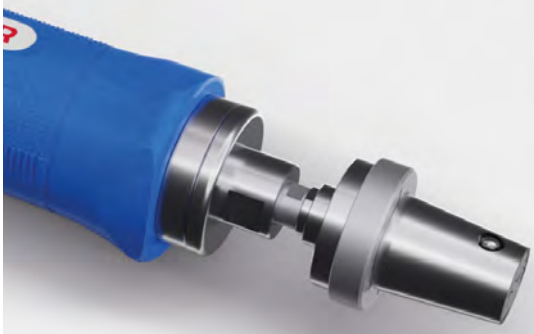
Dedicated Solutions complement the standard product line, and provide solutions for measuring conditions outside the capabilities of Standard Bore Gauges. A wide range of special gauging solutions are available, for your applications, with our range of dedicated plug heads (on request). Please include a workpiece drawing with your enquiry.
Below are just a few examples of possible solutions.

Conical Nosepiece

Usually supplied with a calibrated depth stop, it allows to measure the diameter of tapered bores in a specific position.

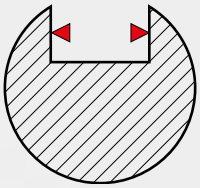
Example: knuckle joint.

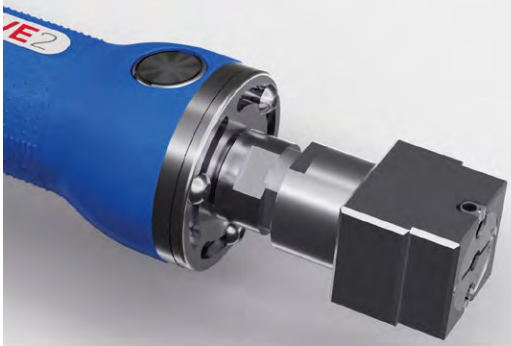




Squared Nosepiece

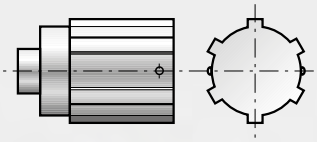
To be used for gap measurements, for example: keyways or splines.





Nosepiece with carbide bar inserts

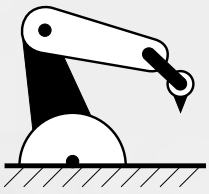
The carbide bars will increase the life of the gauge, reducing the wear on the nosepiece and preventing jamming caused by the presence of metal cinders swarf or debris.

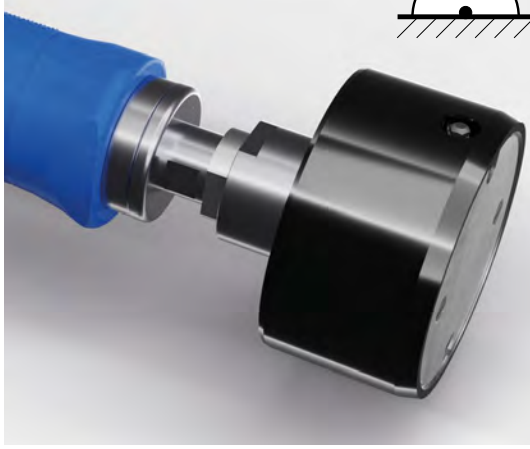


Nosepiece with DLC coating

The DLC coating improves the wear resistence of the nosepiece, increasing the surface hardness and reducing the surface friction coefficient.

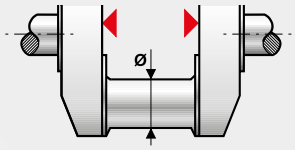
This is the ideal choice for demanding applications.





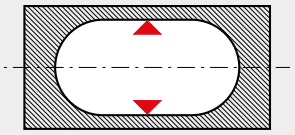
«V» Shaped Nosepiece

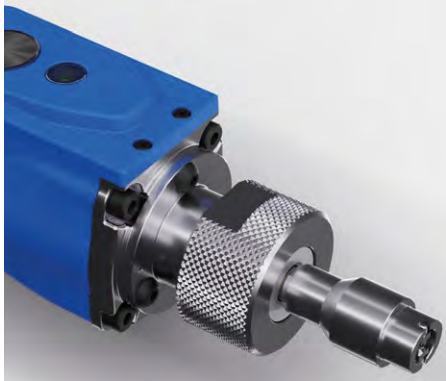
Gauges with V shaped nosepiece refer on the shaft and measure the distance between the faces of the counterweights, for the assembly of connecting rod bearing on crankshafts or camshafts.



Oval Nosepiece

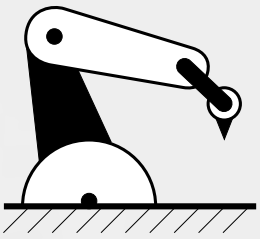
Designed for measuring oval bores or inter-connecting bores.
Example: lobe pump designs in fuel and oil pumps.





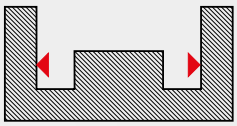
Nosepiece with Pilot Cone

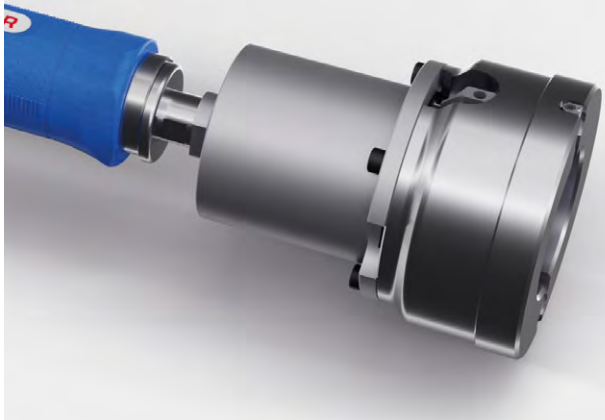
For CNC automatic applications, the cone helps the entry of the nosepiece into the workpiece, reducing the possibility of accidental damages.



Gauges to measure bores with central hub

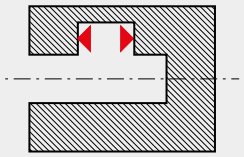
For the measuring of internal diameters where there is a central hub projection.
Example: automatic transmission components.





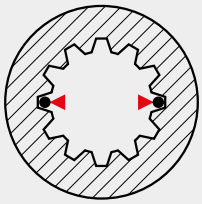
Right angle plug head

For measuring bores with perpendicular axis to the direction of gage insertion, or for limited space applications. Example: differential carrier.



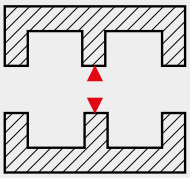
Plug head for Gears

The toothed nosepiece is manufactured to engage with the workpiece. The HSS material ensures high durability.
The accurate choice of contacts allows measurement of
Over ball diameter
Major diameter
Minor diameter
The wide range of solutions for the choice of armset allows the measurement of both even and odd gears.



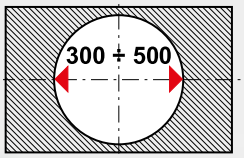
Long Nosepiece

The long nosepiece guides the plug head when measuring discontinuous or interrupted deep bores, improving ergonomics. It can be equipped with reference rings to help the user in the positioning.



Macrolight Nosepiece

A specific design reduces the weight of the nosepiece when measuring big size bores (up to 450mm diameter).



Application examples

MARPOSS

WAVE
LINE

WIRELESS HANDLES FOR HAND HELD GAUGES

Bore Gauges Line

The Marposs wireless handles overcome cable management issues in manual measurement instruments with Bluetooth® wireless technology. Wireless offers following advantages: no cable entanglement or breaks, ergonomic operations, measuring directly at the machine.
The signal is sent from an electronic or mechanical measurement gauge head to one of the Marposs data display and processing units.

Product **features**

Marposs product portfolio offers a full line of wireless handles which offers maximum flexibility and operating freedom while the measurements are performed, even in the most hostile environments. The Marposs wireless handles with or without display, send the signal from a Mechanical Gauge Head (MBG) or an Electronic Gauge Head (EBG) to a Marposs Electronic display unit, or commercial PC with Marposs Software or SW Drivers (DLL) installed.
The handles for MBGs suit a pencil probe that reduces the measuring error to the minimum. The handles for EBGs (single transducer) suit a connector, that merges safety of connection and ease of retooling. By simply pressing the button on top of the handle, it can communicate in real time with the electronic display, showing the measured value. With the same button it is possible to acquire data in order to perform statistical operations and to control advanced cycles or guided sequences.

IWAVE2
WAVE2

I-Wave2™ and **Wave2™** suit a 1.8" TFT color screen.
By integrating a computer into the gauging handle, they achieve an unprecedented level of convenience and performance in manual gauging technology.

IWAVE
M1WAVE

I-Wave™ and **M1Wave™** are available both with inductive Li-Ion batteries and with disposable alkaline batteries, allowing approx. 40 or 220 hours continuous working time, respectively.

MINIIWAVE
MINIWAVE

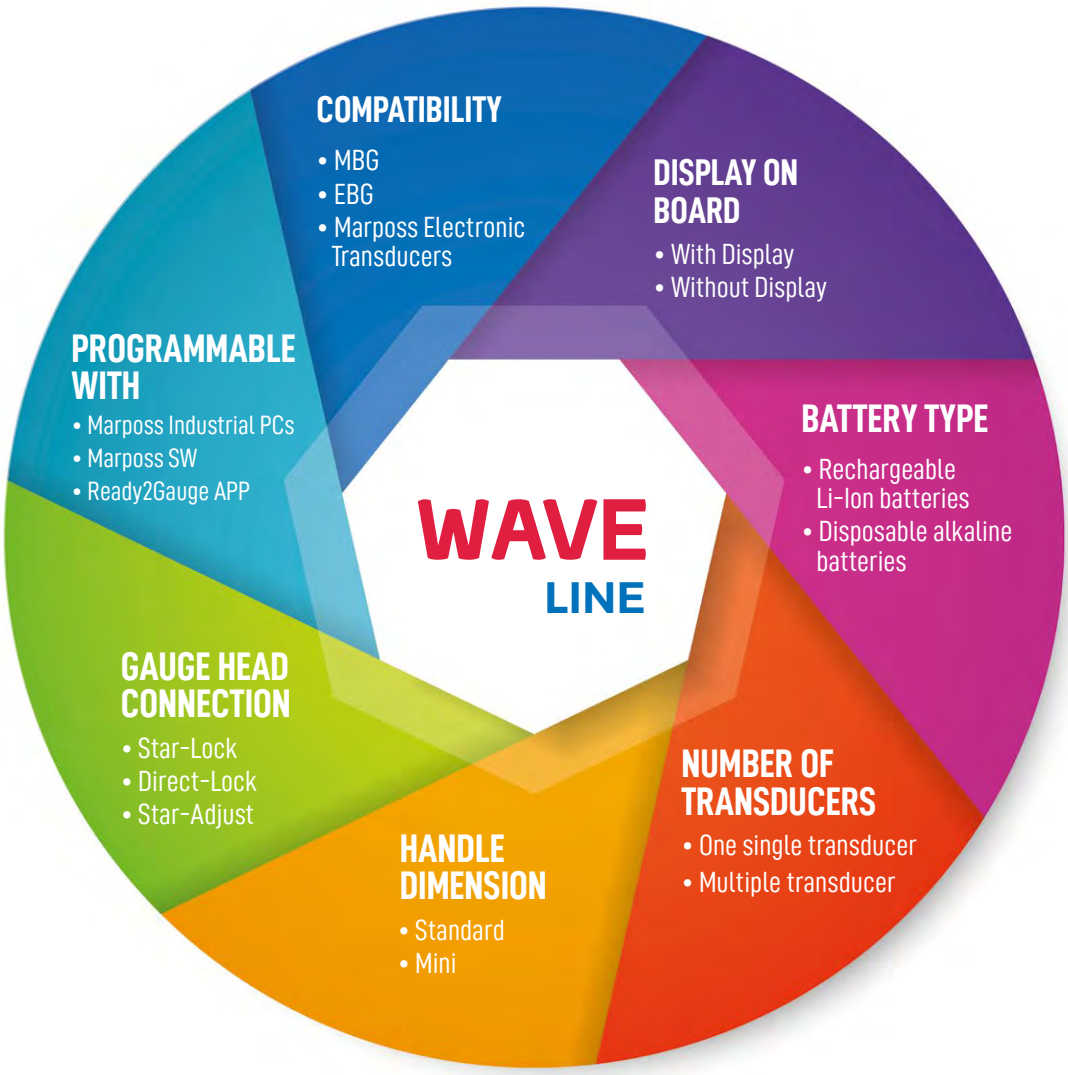
Mini I-Wave™ and **MiniWave™** are the small wireless handles suitable for measurement of small bores with M1Star, countersink and shafts with M3Star or M4Star.

MULTIWAVE

MultiWave manages multi-transducer electronic gauge heads for the simultaneous measurement of multiple sections, to check diameters and other geometries of a bore (ovality, taper, etc.) or shafts.
It can program the number of transducers to be used (max 7) or to set other important parameters with a specific software.

Product mix

The scheme below shows an overview of the options available in the Wave Line product mix.



WIRELESS HANDLES WITH DISPLAY

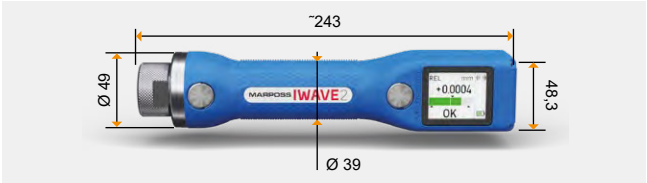
I-Wave2 and Wave2 are the rechargeable, wireless handles with integrated 1.8” TFT color screen.
Ergonomic design, dual buttons, display orientation mode, a gauge stand with inductive charging and a high degree of coolants and dust protection, make the I-Wave2 and Wave2 the ideal solution for dimensional inspection on the shop floor

- Intuitive 1.8” TFT graphic color display with automatic orientation allows immediate visualization of the measurement value to the operator from any direction.
- Live measurement is simultaneously displayed on the handle and the gauge computer via Bluetooth. By simply pressing one of the two buttons, it is automatically saved in the computer for statistical purpose.
- Seamless synchronization with the gauge computer.
- Possibility to operate in stand-alone mode with the Ready2Gauge (R2G) APP. R2G allows configuration settings, data storage and export. The virtual keyboard function is available in the Windows version.
- Offer 24/7 usability: thanks to the long life, fast recharging Li-Ion battery and the inductive charging stand.
- Software Drivers available to give the opportunity to connect the I-Wave2 to Marposs industrial PC E9066 Line as well as any commercial and industrial PC with Marposs software installed.
- Directly compatible with Nemo and Merlin Line Marposs industrial PCs.

I-WAVE2

I-Wave2 suits a ±2,5mm pencil probe, digitized and linearized in the full measuring range, granting the best metrological performance. Compatible with any M1Star MBG, M3Star MRG or Countersink gauge head, with M10, M6 or M3,5 thread, that can be screwed directly in the Direct-Lock version, or can be mounted very quickly by means of an adapter in the Star-Lock version. It is very easy to change the measuring head to convert the handle to a bore gauge, snap or depth gauge.

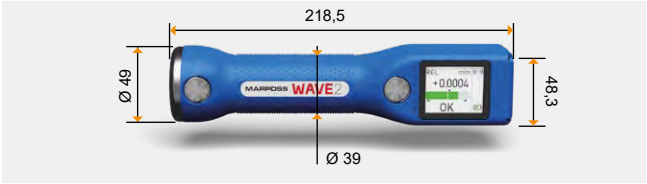
Direct-Lock for the safest connection in dedicated gauges



Star-Lock for frequent gauge head changeover

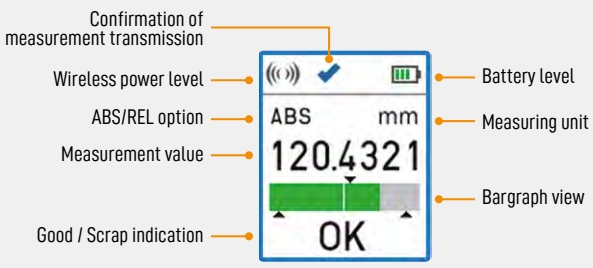
WAVE2

Compatible with any EBG gauge heads as well as other Marposs LVDT or HBT transducers.
Programmable to correct errors of the gauge head(function available in the advanced "full" version).

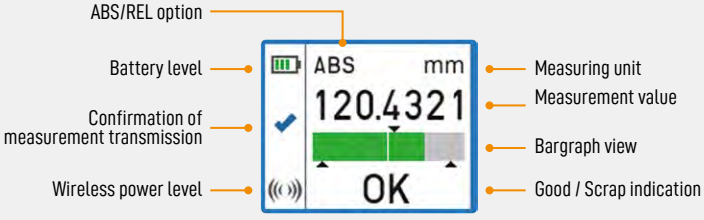


DISPLAY

PORTRAIT



LANDSCAPE



WIRELESS HANDLES WITH DISPLAY

Technical specifications	I-Wave2	Wave2
Compatibility	Mechanical Gauge Head M3.5/M6/M10	Electronic Gauge Head/RedCrown2/A124
Display	1.8" full color	
Wireless transmission technology	Bluetooth Smart	
Communication distance	10 m	
Ergonomic handle design	Dual buttons Line	
Compatibility with Marposs Electronic Display Units	Nemo, Merlin Line, E9066 Line	
Software for Windows OS	Easy Acquisition, Merlin Plus SW, Quick SPC, DLL	
Programming for stand alone use	by Ready2Gauge (R2G) APP for IOS or Android phone/tablet or Windows PC (FREE)	
Auto switch on	by accelerometer	
View display aspect	Portrait/Landscape-selectable	
Programmable auto shut down time	√	
Settable acoustic feedback	√	
IP rating	67	65
Weight	540 g	500g
Battery type	Li-Ion rechargeable	
Wireless charging system	Inductive	
Performance	Linearity deviation < 0.0003 mm over 5 mm travel	Accuracy error < (0.5% displayed value + resolution)
Maximum resolution	0.0001 mm	

I-WAVE2

	Description	Order code
	I-Wave2 Handle with Direct-Lock interface M18 thread	B3TJ5SDI000
	I-Wave2 Handle with Direct-Lock for plug heads with M10 thread	B3TJ5SDI100
	I-Wave2 Handle with Direct-Lock for plug heads with M6 thread	B3TJ5SDI060
	I-Wave2 Handle with Direct-Lock for plug heads with M3.5 thread	B3TJ5SDI035
	I-Wave2 Handle with Starlock system for plug heads (adapters for plug heads with M6 and M10 thread are included in the supply) (*)	B3TJ6SDI000

(*) M3.5 and third-party gauge head adapters are available on request.

WAVE2

	Description	Order code
	Wave2 display handle	B3TJESDI000
	Wave2 display handle - full*	B3TJFSDI000
	Interface adapter to fix EBG plug heads to Wave or Wave2 handle	B2TIESF0000
	Interface adapter to fix LVDT probes with SV50/6 connector to Wave or Wave2 handle	B2042421960
	Interface adapter to fix HBT probes with SV50/6 connector to Wave or Wave2 handle	B2042421959
	Interface adapter to fix LVDT probes with SV50/6 connector to Wave or Wave2 handle with flange Ø 59	B2042421966
	Interface adapter to fix HBT probes with SV50/6 connector to Wave or Wave2 handle with flange Ø 59	B2042421965

(*) Transducer compensation function available.
Other interface adapters to fix probes to Wave or Wave2 handles are available on request.

ACCESSORIES

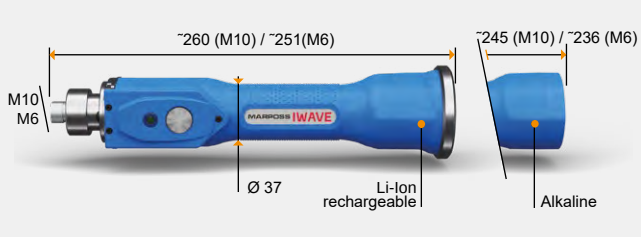
	Description	Order code
 Nose-Up  Nose-Down	Nose-Up stand with battery charger	B2T0IRBS030
	Nose-Down stand with battery charger	B2T0IRBS031
	Power supply unit for one stand with battery charger	B2T0IRCS010
	Power supply unit and junction box for up to four stands with charger	B2T0IRSS010
	Cable for connecting the stand charger to junction box (length 1m)	B2T0IRCS001
	Power supply cable with CE plug (L=2m)*	B4709009001
	I-Wave2 BT SMART USB adapter	B6872020044

(*) Other options available on request.

OTHER WIRELESS HANDLES

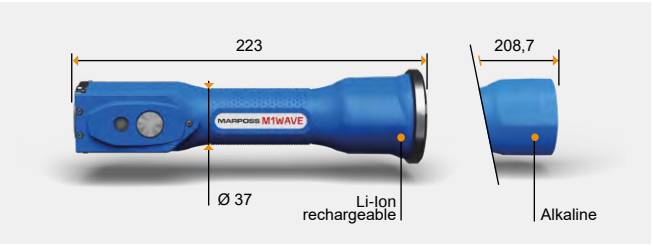
I-WAVE

- I-Wave suits a ±2mm pencil probe.
- It is compatible with any M1Star MBG, M3Star MRG or countersink gauge head with M10, M6 or M3,5 thread.
- The Star-Lock system grants the easy and quick gauge head assembly, by means of an adapter.
- The Star-Adjust system allows to assemble the gauge head with the mechanical zero close to the electric zero of the probe.
- I-Wave is available with both Li-Ion rechargeable or standard «C» alkaline batteries.



M1WAVE

- M1 Wave is composed of a standard EBG (Electronic Bore Gauge) plug head with built-in transducer and the Wave handle, containing the Bluetooth® transmitter and the power supply batteries.
- By simply replacing the plug head, the M1 Wave can be easily retooled to measure different diameters.
- M1Wave is available with both Li-Ion rechargeable or standard «C» alkaline batteries



MINI I-WAVE

- Mini I-Wave is an electronic interface that uses Bluetooth® wireless technology to manage mechanical plugs, such as Marposs MBG gauge heads with M10, M6 or M3,5 thread.
- The small dimension, light weight and double push bottons, make it suitable for small bores and countersink gauges.
- The Star-Lock system grants the easy and quick gauge head assembly, by means of an adapter.
- The two buttons have the same functionality.

MINI WAVE

- Mini Wave is an electronic interface that uses Bluetooth® wireless technology to manage any electrical plug gauge, such as Marposs EBG gauge heads:
- The small dimension, light weight and double push buttons, make it suitable for Marposs M3 Star ESG snap.
- Marposs equips wireless M4Star ERG rings to measure big diameters with Mini Wave to make them wireless.
- The two buttons have the same functionality.

MULTI WAVE

The MultiWave handle manages multi-transducer gauge heads and can be used to measure various sections and diameters at the same time inside the same bore or on the same shaft.

OTHER WIRELESS HANDLES

TECHNICAL SPECIFICATIONS	I-Wave		M1Wave		Mini I-Wave	Mini Wave	Multi Wave
Compatibility	M1Star MBG M10 M6 M3.5, M3Star MSG (by means of an adapter)*		M1Star EBG		MBG M10 M6 M3.5 M3Star MSG (by means of an adapter)*	M1Star EBG M3Star ESG	Marposs electronic transducers
Wireless transmission technology	BT 2.0						
Communication distance	10m						
Compatibility with Marposs Electronic Display Units	Nemo, Merlin line, E9066 line						
Software for Windows OS	Easy Acquisition, Merlin Plus SW, Quick SPC						
Max. Number of manageable signals	N/A		1		N/A	1	7
IP rating	67		67 (with the EBG installed)		54		65 (with a Marposs multiple gauge head installed)
Weight	750g	730g	600g	580g	390g	340g	745g
Battery type	Li-ion Recharg.	Alkaline "C"	Li-ion Recharg.	Alkaline "C"	Li-ion Recharg.		
Battery min. duration	40 hours**	220 hours**	40 hours**	220 hours**	36 hours**		
Time to reach the full charge of the battery	5-6 hours	N/A	5-6 hours	N/A	3 hours		5-6 hours
Time to reach 80% of full charge	2 hours	N/A	2 hours	N/A			2 hours
Order code	B3TJ0SFI000	B3TJ0SFB000	B2TW0SFI000	B2TW0SFB000	B3TJ2SDJ000	B3TJ1SDJ000	B3942432007

(*) The order code includes adapters for M10 and M6. M3.5 and third-party gauge head adapters are available on request.

(**) The duration of the battery can be further increased up to several months in normal operating conditions by means of the programmable auto shutdown option (Power safe mode)

ACCESSORIES

	Description	Order code
	StarAdjust interface (M10 and M6)	B2TIMSMT600
	Interface adapter to fix EBG plug heads to Wave handle	B2TIESF0000
	"Clip On" manual charger for I-Wave, Wave and MultiWave handle with Li-Ion Batteries (without PSU)	B2T0IRMS001
	Stand with battery charger for I-Wave and Wave handles with Li-Ion Batteries (without PSU)	B2T0IRBS001
	Stand with battery charger for MultiWave handle (without PSU)	B2T0IRBS005
	Power supply unit for one stand with battery charger	B2T0IRCS010
	Power supply unit and junction box for up to four chargers.	B2T0IRSS010
	Cable for connecting the stand charger to the junction box (length 1m)	B2T0IRCS001
	I-Wave/M1Wave/Mini I-Wave/MiniWave/MultiWave BT USB adapter	B47013J0101
	Stand with battery charger for Mini I-Wave and MiniWave handle (PSU included)	B47013J0101

Application examples

M3STAR

MSG AND ESG
HAND HELD GAUGES
FOR SHAFTS

Forks and ring gauges

M3 Star™ manual snap gauges are designed to measure outside diameters located between walls on shaft-like parts like crankshafts, transmission shafts and camshafts. They are easily re-tooled to measure different workpieces with the same gauge and are available in mechanical (Mechanical Snap Gauge **MSG**), wired and wireless (Electronic Snap Gauge **ESG**) configurations, to meet a broad range of measurement needs.

Product **features**

M3Star is an ergonomic, high-precision snap gauge that combines high technology and high quality in a compact body only 10mm wide. Two models are available to handle diameters from 5mm to 30mm and 30mm to 70 mm. The advanced design is easily re-tooled using only one hex wrench to position both the contacts and V-block. M3Star is supplied in the recommended configuration with the 20 mm thick “V” reference. 10mm and 14mm “V” references are also available for measurements in narrow spaces between shoulders. The snap head can be combined with various handles and accessories.

M3STAR MSG

M3Star MSG Mechanical Snap Gauge is designed to be used with a dial or digital indicator in either a mini or standard holder (8mm h6).
The Snap Head is also compatible with both the Marposs.
Wave Line wireless handle and pencil probe handle (M10).

M3STAR ESG

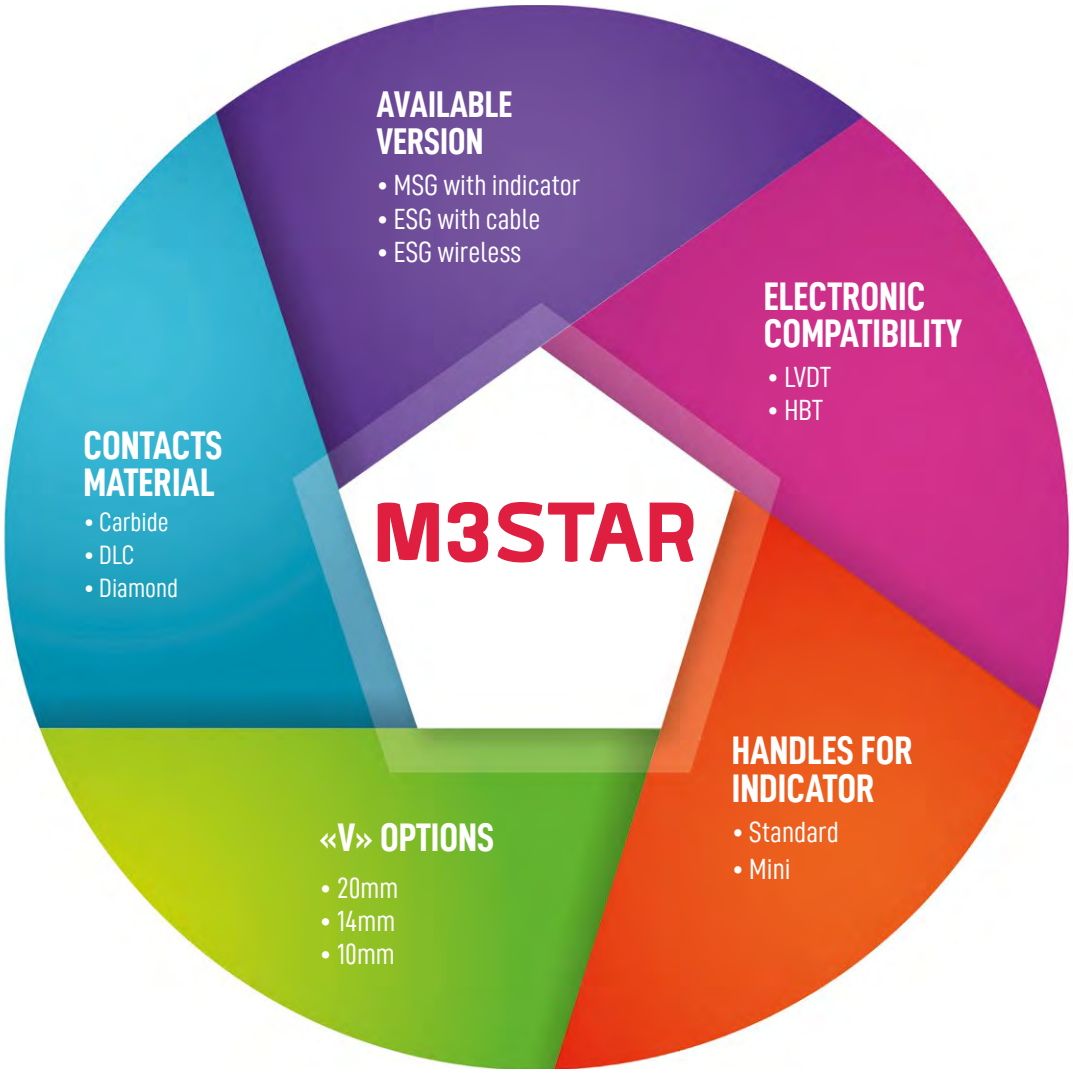
The M3 Star ESG Electronic Snap Gauge is available in cable or wireless versions equipped with integrated HBT or LVDT transducers.
The absence of friction in the measurement chain makes the M3 Star ESG exceptionally accurate.

TECHNICAL SPECIFICATIONS

	MSG	ESG
Thickness	10 mm	
Thickness of the "V" part reference	20 mm	
Measurable diameters and retooling range	5 - 15 mm	
	15 - 30 mm	
	30 - 50 mm	
	50 - 70 mm	
Working range	0,1 mm*	
Clamping diameter for indicator/probe	Clamping diameter for indicator/probe: 8 mm h6	Cable length 3.5m with SV50/6 connector
Repeatability error (2,77 σ)	≤1,5 µm	≤1 µm

* By unscrewing the contacts fastened to the measuring armset by means of a screw with Heli-Coil, the measuring ranges can be extended up to 0,4 mm accepting lower performance.

Product mix



COMPATIBILITY WITH ELECTRONIC UNITS

M3Star with cable can be connected, through a Marposs data acquisition interface box such as Easy Box or Gage Pod, to any Marposs industrial PC or any commercial PC with Marposs software installed, as well as to E4N or Duo directly.
The wireless M3Star can be connected, through its dongle, to Nemo, Merlin Line, E9066 Line or any commercial PC with Marposs software installed.

1 CONTACT PROTECTIONS:
protect the contacts from accidental damage.

2 BODY:
it is 10mm-thick designed to house and protect the measuring mechanism.

2.1 Mechanical measuring cells are housed in the M3Star MSG body and transfer the measurement to the dial indicator.

2.2 The electronic measuring cell with LVDT or HBT transducer is housed in M3Star ESG body and transfers the measurement to the display device.

3 MEASURING CONTACTS:
The easily-replaced threaded tungsten carbide contacts facilitate rapid retooling. DLC covered or Diamond contacts are optionally available.

4 “V”-PART REFERENCE:
Tungsten carbide planes in the support area reference the snap gauge to the workpiece cylindrical section to be measured. They are available in three versions with thicknesses of 20mm, 14mm or 10mm. A readjustment of the “V”-part with respect to the body allows the gauge center line to be changed to re-tool the gauge within the measuring range.

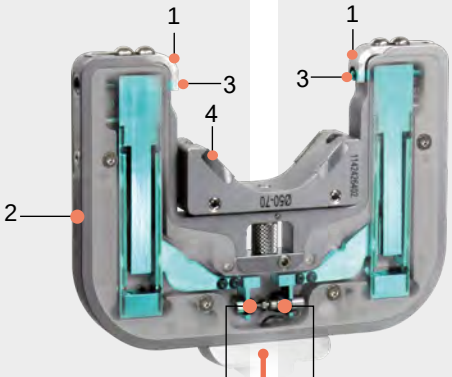
5 HANDLE:
The ergonomically designed handle is used to hold the snap gauge.

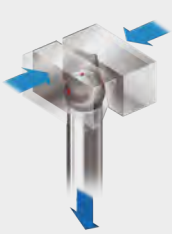
5.1 M3 Star MSG handle connects the Snap head to the dial indicator and is specifically designed for easy handling. it can be a Standard Indicator Holder (5.A) or a Mini Indicator Holder (5.B).

5.2 M3Star ESG is available with a standard handle with a 3,5m cable and SV/50 connector (5.C) or a Mini Wave handle (5.D).

6 NUMBER PLATE:
Can be marked with any information required by the customer.

M3STAR
Mechanical Snap Gauge





2.1

2.2

5.A

5.B

5.C

5.D

M3STAR
Electronic Snap Gauge

M3 STAR – MSG MECHANICAL SNAP GAUGE

The complete snap gauge includes the measuring head, plus handle, chosen to suit the customer's application.

COMPLETE SNAP GAUGE

Complete M3 Star MSG Order Code.

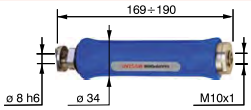
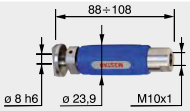
		Mini Indicator Handle 			Standard Indicator Handle 		
SNAP GAUGE	**RANGE** [mm]	**20mm "V"**	**14mm "V"**	**10mm "V"**	**20mm "V"**	**14mm "V"**	**10mm "V"**
	5.- 15	B3TBAMISAWS	B3TBAMITAWS	B3TBAMIUAWS	B3TBAIHSAWS	B3TBAIHTAWS	B3TBAIHUAWS
	15 - 30	B3TBAMISBWS	B3TBAMITBWS	B3TBAMIUBWS	B3TBAIHSBWS	B3TBAIHTBWS	B3TBAIHUBWS
	30 - 50	B3TBAMISCWS	B3TBAMITCWS	B3TBAMIUCWS	B3TBAIHSCWS	B3TBAIHTCWS	B3TBAIHUCWS
	50 - 70	B3TBAMISDWS	B3TBAMITDWS	B3TBAMIUDWS	B3TBAIHSDWS	B3TBAIHTDWS	B3TBAIHUDWS

THE SNAP HEAD

M3 Star Mechanical Snap Head Order Code.

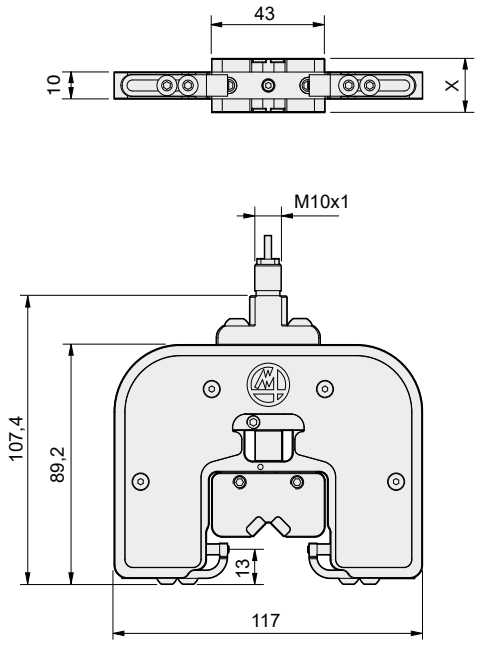
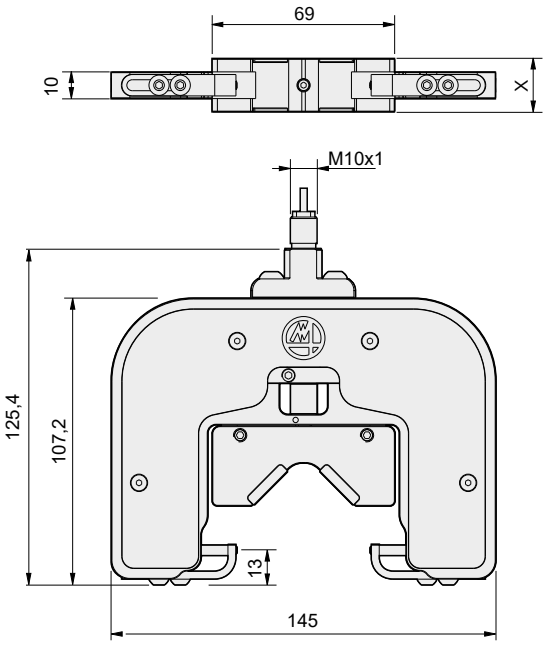
SNAP GAUGE	**RANGE** [mm]	**With 20mm "V " part reference**	**With 14mm "V " part reference**	**With 10mm "V " part reference**
	5.- 15	B3TTASAWXXS	B3TTATAWXXS	B3TTAUAWXXS
	15 - 30	B3TTASBWXXS	B3TTATBWXXS	B3TTAUBWXXS
	30 - 50	B3TTASCWXXS	B3TTATCWXXS	B3TTAUCWXXS
	50 - 70	B 3TTASDWXXS	B3TTATDWXXS	B3TTAUDWXXS

HANDLES

SNAP GAUGE	**Description**	**Order Code**
	Indicator handle	B2TCLAS0030
	Mini Indicator handle	B2TCSAS0030
	Protective shell for mechanical Indicator (P=38 mm)	B2T0DIPS001
	Protective shell for digital Indicator (P=52 mm)	B2T0DIPS000
	Protective shell for digital Indicator (P=52 mm)	B2T0DICS000

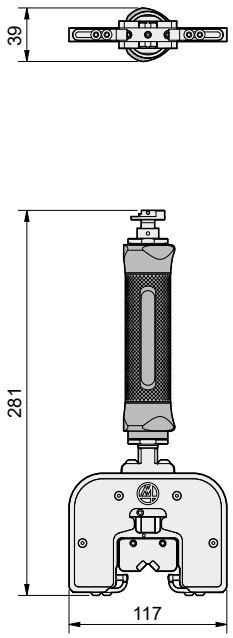
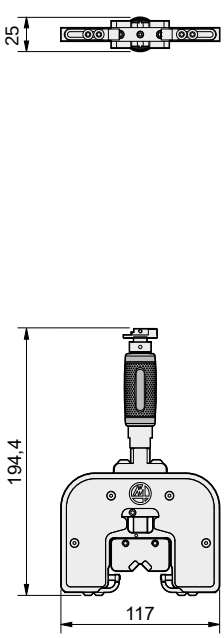
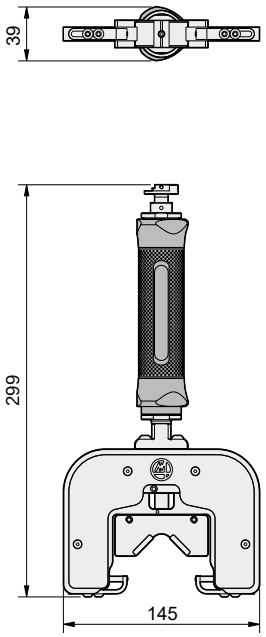
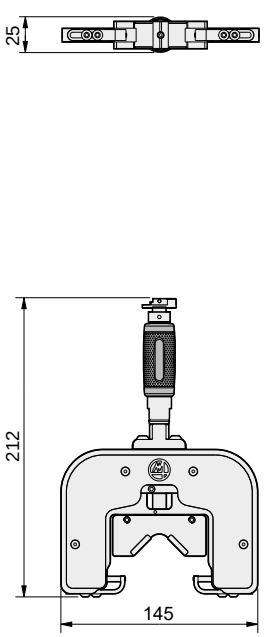
M3 STAR - MSG MECHANICAL SNAP GAUGE

MSG Snap Head

Measurable diameter 5≤D<30 mm	Measurable diameter 30≤D<70 mm
	

X= V reference part thickness	20 mm	14 mm	10 mm

Complete snap gauge

Measuring Range 5÷30		Measuring Range 30÷70	
			

M3 STAR – ESG ELECTRONIC SNAP GAUGE

The complete snap gauge includes the measuring head, plus handle, chosen to suit the customer's application.

COMPLETE SNAP GAUGE

Complete M3 Star ESG LVDT Order Code.

		Standard Handle with 3,5m cable			Mini Wave handle		
SNAP GAUGE	**RANGE** [mm]	**20mm "V"**	**14mm "V"**	**10mm "V"**	**20mm "V"**	**14mm "V"**	**10mm "V"**
	5.- 15	B3TBFE3SAWS	B3TBFE3TAWS	B3TBFE3UAWS	B3TBFEWSAWS	B3TBFEWTAWS	B3TBFEWUAWS
	15 - 30	B3TBFE3SBWS	B3TBFE3TBWS	B3TBFE3UBWS	B3TBFEWSBWS	B3TBFEWTBWS	B3TBFEWUBWS
	30 - 50	B3TBFE3SBWS	B3TBFE3TCWS	B3TBFE3UCWS	B3TBFEWSCWS	B3TBFEWTCWS	B3TBFEWUCWS
	50 - 70	B3TBFE3SDWS	B3TBFE3TDWS	B3TBFE3UDWS	B3TBFEWSDWS	B3TBFEWTDWS	B3TBFEWUDWS

Complete M3 Star ESG HBT Order Code

		Standard Handle with 3,5m cable			Mini Wave handle		
SNAP GAUGE	**RANGE** [mm]	**20mm "V"**	**14mm "V"**	**10mm "V"**	**20mm "V"**	**14mm "V"**	**10mm "V"**
	5.- 15	B3TBHE3SAWS	B3TBHE3TAWS	B3TBHE3UAWS	B3TBHEWSAWS	B3TBHEWTAWS	B3TBHEWUAWS
	15 - 30	B3TBHE3SBWS	B3TBHE3TBWS	B3TBHE3UBWS	B3TBHEWSBWS	B3TBHEWTBWS	B3TBHEWUBWS
	30 - 50	B3TBHE3SCWS	B3TBHE3TCWS	B3TBHE3UCWS	B3TBHEWSCWS	B3TBHEWTCWS	B3TBHEWUCWS
	50 - 70	B3TBHE3SDWS	B3TBHE3TDWS	B3TBHE3UDWS	B3TBHEWSDWS	B3TBHEWTDWS	B3TBHEWUDWS

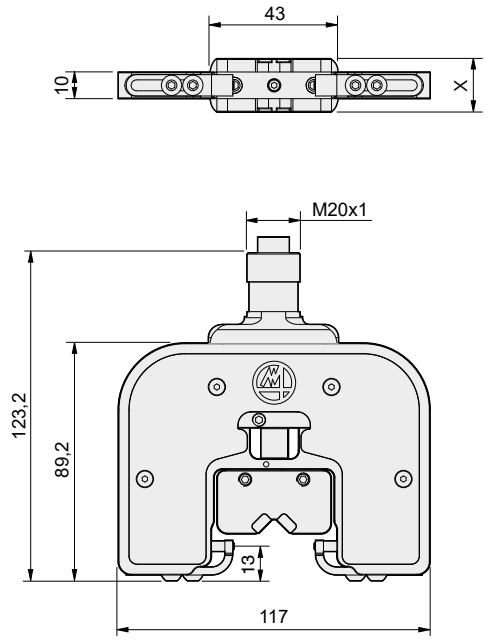
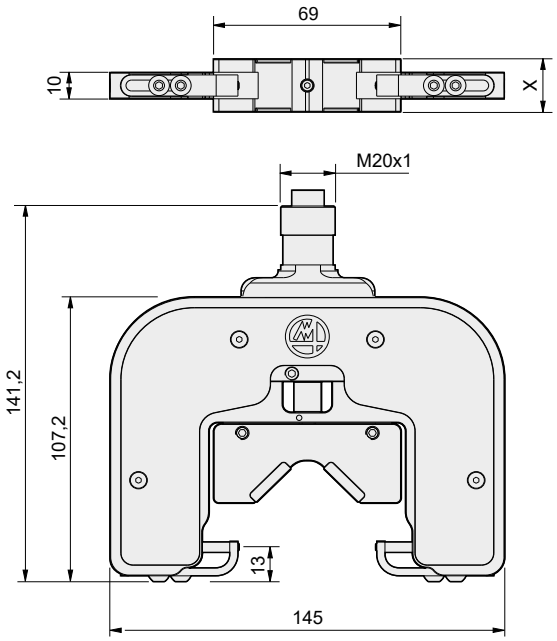
THE SNAP HEAD

M3 Star Electronic Snap Head Order Code.

		LVDT TRANSDUCER			HBT TRANSDUCER		
SNAP GAUGE	**RANGE** [mm]	**With 20mm "V " part reference**	**With 14mm "V " part reference**	**With 10mm "V " part reference**	**With 20mm "V " part reference**	**With 14mm "V " part reference**	**With 10mm "V " part reference**
	5.- 15	B3TTFSAWXXS	B3TTFTAWXXS	B3TTFUAWXXS	B3TTHSAWXXS	B3TTHTAWXXS	B3TTHUAWXXS
	15 - 30	B3TTFSBWXXS	B3TTFTBWXXS	B3TTFUBWXXS	B3TTHSBWXXS	B3TTHTBWXXS	B3TTHUBWXXS
	30 - 50	B3TTFSCWXXS	B3TTFTCWXXS	B3TTFUCWXXS	B3TTHSCWXXS	B3TTHTCWXXS	B3TTHUCWXXS
	50 - 70	B3TTFSDWXXS	B3TTFTDWXXS	B3TTFUDWXXS	B3TTHSDWXXS	B3TTHTDWXXS	B3TTHUDWXXS

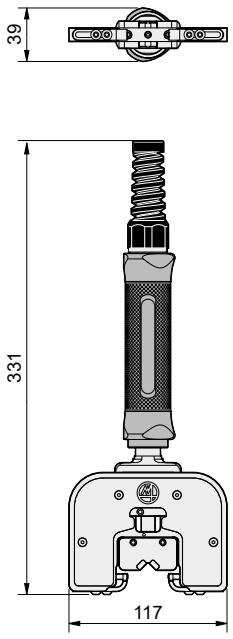
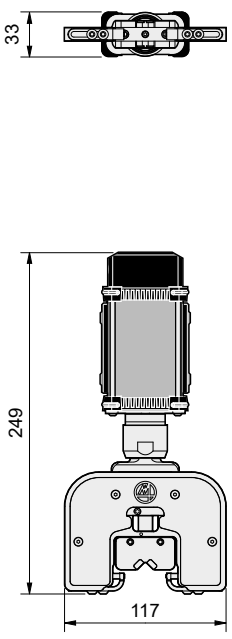
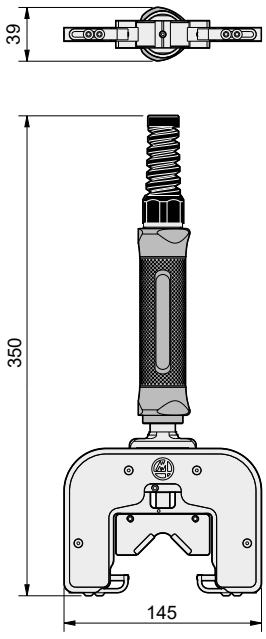
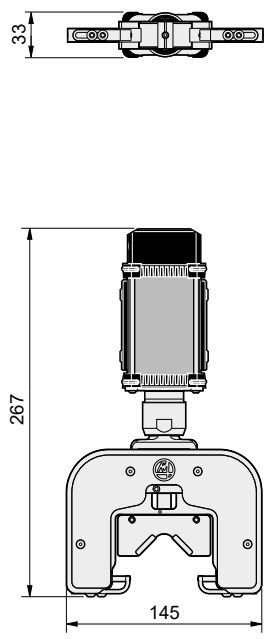
MECHANICAL SPECIFICATIONS

ESG Snap Head

Measuring Range 5÷30	Measuring Range 30÷70
	

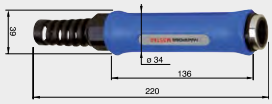
X= V reference part thickness	20 mm	14 mm	10 mm

Complete snap gauge

Measuring Range 5÷30		Measuring Range 30÷70	
			

HANDLES AND CABLES FOR ESG SNAP GAUGE

The complete snap gauge includes the measuring head, plus handle, chosen to suit the customer's application.

SNAP GAUGE	Description	Order Code
	Mini Wave Handle for wireless transmission	B3TJ1SDIJ000
	M3Star handle (without cable)	B2TH3000001
	Cable 2 mt LVDT - connector SV50/6	B2TG0000026
	Cable 3,5 mt LVDT - connector SV50/6	B2TG0000356
	Cable 5 mt LVDT - connector SV50/6	B2TG0000056
	Cable 2 mt LVDT - connector S3	B2TG0000023
	Cable 2 mt TESA COMPATIBLE - connector SV50/6	B2TG00TS026
	Cable 2 mt HBT - connector SV50/6	B2TG0001026
	Cable 3,5 mt HBT - connector SV50/6	B2TG0001356
	Cable 5 mt HBT - connector SV50/6	B2TG0001056

SPARES AND ACCESSORISES

Bodies (V part, contacts and contact protections not included).

	M3 STAR MSG		M3 STAR ESG		
				LVDT	HBT
5-30mm		B2942426421		B2942426422	B2942426423
30-70mm		B2942426411		B2942426412	B2942426413

V-PART REFERENCES

RANGE	20mm "V"	Order code	14mm "V"	Order code	10mm "V"	Order code
5 - 15 mm		B2942426459		B2942426463		B2942426457
15 - 30 mm		B2942426458		B2942426462		B2942426456
30 - 50 mm		B2942426455		B2942426465		B2942426453
50 - 70 mm		B2942426454		B2942426464		B2942426452

COMPONENTS

Contact (Carbide 1 piece)		Contact Protections (Carbide)		
Description	Order Code	Description		Order Code
	B3TXCX00026		M3Star 5÷30 mm	B2942426434
			M3Star 30÷50 mm	B2942426435
			M3Star 50÷70 mm	B2942426436

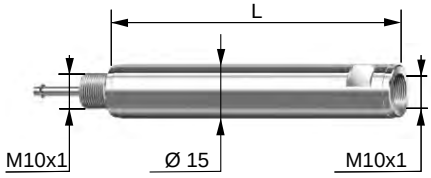
TOOLS

	Description	Order code
	2 mm Hex wrench	B4413675303
	2,5 mm Hex wrench	B4413675304

SPARES

	Description	Order code
	Protections kit for 5-30mm body	B2042426432
	Protections kit for 30-70mm body	B2042426406
	Spring – 1 piece	B1042426287
	Screw for spring limitation - 1 piece	B1042426286
	Transfer Rod	B2042433015
	Rod Bushing	B1042433204

DEPTH EXTENSIONS AVAILABLE ONLY FOR M3STAR MSG

	Length L (mm)	Order code
	50	B2TXMSF0050
	65	B2TXMSF0065
	80	B2TXMSF0080
	100	B2TXMSF0100
	125	B2TXMSF0125

STAND AVAILABLE ONLY FOR M3STAR ESG MINI WAVE

	Description	Order code
	Stand charger for M3 Star ESG with Mini Wave handle (power supply unit included).	B2T0IRBS004

Application examples

M4STAR

MRG AND ERG
HAND HELD GAUGES
FOR OUTER DIAMETERS

Forks and ring gauges

M4 Star is a family of high performance ring gauges for measuring parts such as shafts or pins. The gauge design is perfectly through, allowing the measuring of long shafts without limitations. The high technology and attention to ergonomics make M4Star a premium choice for outside diameter measurement.
M4 Star is available as Mechanical Ring Gauge (**MRG**) or Electronic Ring Gauge (**ERG**).

Product **features**

Intuitive and **easy to use, M4Star grants the best metrological performance** on any gauging diameter. The design ensures linearity over the entire measuring range and allows zeroing with a single master. The nosepiece design ensures the measurement being independent of the operator's manual skills.
M4 Star is available as Mechanical Ring Gauge (MRG) or Electronic Ring Gauge (ERG). The first can be equipped with dial or digital indicators, while the latter suits an electronic LVDT or HBT Marposs standard transducer.
M4Star ERG is available with wired or wireless connectivity.

M4STAR MRG

Measurable diameters from 5 to 125mm with an indicator.
Customizable C-dimension from 1 to 6mm which allows measurements to be taken very close to the flange.
One single comfortable handle for the smaller sizes and two small handles in the larger models.

M4STAR ERG

Integrated standard LVDT or HBT transducer.
Measurable diameters from 5mm to 125mm in the standard version.
One single comfortable handle for the smaller sizes and two small handles in the larger models.
The cable exit can be radial or axial.
Dedicated design possible: flexible and customizable, available also for diameters larger than 125mm.

TECHNICAL SPECIFICATIONS

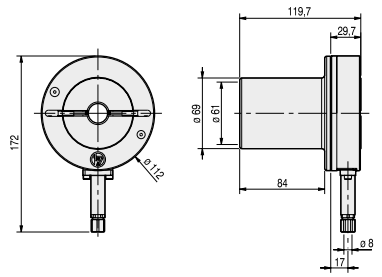
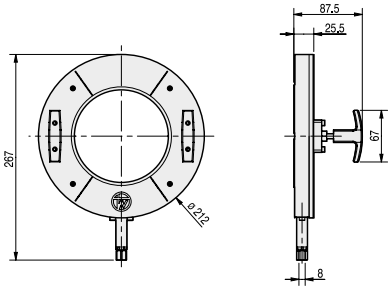
	M4Star MRG	M4Star ERG
C quote	customizable between 1 and 6 mm	customizable between 1 and 6 mm
Repeatability (2,77σ)]*	≤1 µm	≤0,5 µm
Working range	0,1mm	0,1mm

*the best performance can be achieved when measuring in the vertical direction.
When measuring ovality in the horizontal direction, the error might reach 2 µm over 360°.

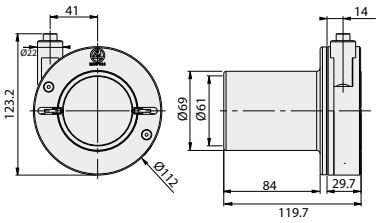
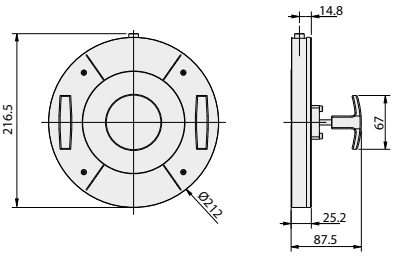
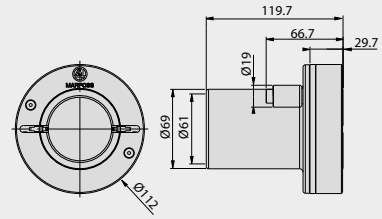
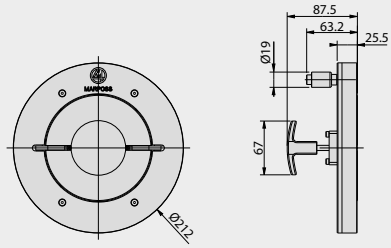
OPTIONS AVAILABLE

M4Star MRG and ERG can be equipped with standard contacts, made of tungsten carbide, or DLC-coated contacts (3000 HV) for aluminum and relevant alloys. Diamond contacts are also available for C>3,5. They are suggested for soft aluminum or highly wearing applications. Both the MRG and the ERG can be supplied stand mounted. The stand can be equipped with a slot for the pin master.

M4 STAR - MRG MECHANICAL RING GAUGE

Overall dimensions	Measurable diameter 5≤D<60 mm	Measurable diameter 60≤D<125 mm
MRG		

M4 STAR - ERG ELECTRONIC RING GAUGE

Overall dimensions	Measurable diameter 5≤D<60 mm	Measurable diameter 60≤D<125 mm
ERG with radial cable exit		
ERG with axial cable exit		

COMPATIBILITY WITH ELECTRONIC UNITS

M4Star with cable can be connected, through a Marposs data acquisition interface box such as Easy Box or Gage Pod, to any Marposs industrial PC or any commercial PC with Marposs software installed, as well as to E4N or Duo directly.
The wireless M4Star can be connected, through its dongle, to Nemo, Merlin Line, E9066 Line or any commercial PC with Marposs software installed.

Application examples

QUICKSET

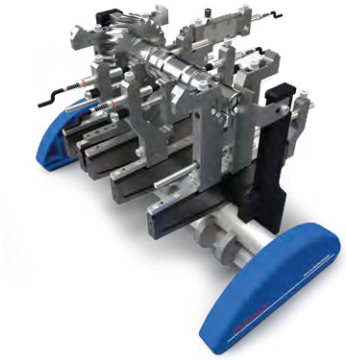
MODULAR
MEASURING
SYSTEM

Bench Gauges

Quick Set™ is a retoolable modular system that can be assembled in three different gauging configurations: horizontal and vertical for multidimensional and geometric checking of shaft-like parts; chuck for multidimensional and geometric checking on parts that cannot be referenced horizontally with Vees or held between centers, such as bushings, bearings, pistons and cylindrical parts that are manufactured with a flange.

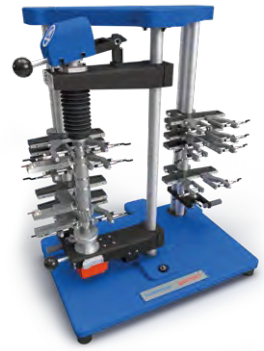
Product **features**

Its design concept ensures high flexibility and quick retooling, using shop-floor components available off the shelf.
30 mm diameter stainless steel bars assure rigidity and exact positioning of the bench gauge elements. The bar system allows size expansion of the bench.
The narrow 12 mm (0.47") width of all components allows a large number of measuring sections on a short part surface.
Several measuring assemblies can be mounted on the base to carry on diameter, distance and geometric measurements.
Part support options allow static as well as dynamic inspection.
It can accomodate any measuring gauge with clamping diameter 8 mm or 3/8", such as Red Crown2™, TD dial indicators or Quick Digit™ digital indicators.



QUICKSET
Horizontal

Parts can be supported and referenced through Vees or between centers. In association with Vees, optional part axial limiters and part radial limiters can be used to ensure correct part positioning and part introduction respectively.



QUICKSET
Vertical

Parts are supported and referenced between centers. Two versions are available, Single and Dual station; the second is used when a large number of measurements is required. Two different types of arms with center supports allow static or dynamic acquisitions respectively.

QUICKSET
Chuck

Parts can be supported and referenced through the serrated plate and a Vee.

TECHNICAL SPECIFICATIONS

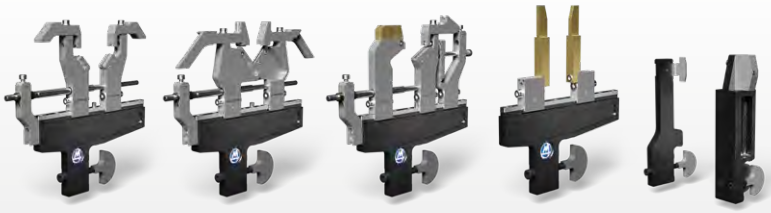
Gauge Configuration	Quick Set-Horizontal	Quick Set-Vertical	Quick Set-Chuck
Measurable Diameter	5 – 160 mm (0.02" – 6.30")	5 – 160 mm (0.02" – 6.30")	5 – 160 mm (0.02" – 6.30")
Max. Non-measurable Diameter	260 mm (10.24")	260 mm (10.24")	260 mm (10.24")
Max. Measurable Length	700 mm (27.56")	840 mm (33.07")	250 mm (9.84")
Weight	up to 14 kg	up to 8 kg (*)	-

(*) Special versions are available to measure heavier parts.

ASSEMBLIES FOR PART MEASURING

Quick Set **Horizontal**

Centers solution



"V" solution

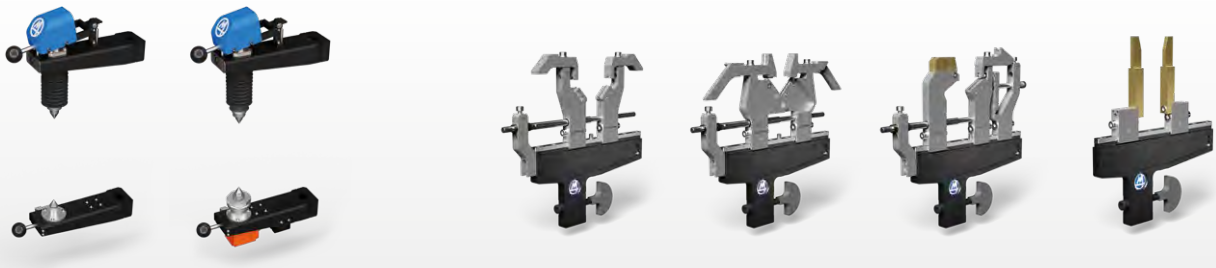
ASSEMBLIES FOR PART SUPPORT AND REFERENCE

ASSEMBLY OF BASE STRUCTURE

ASSEMBLIES FOR PART MEASURING

Quick Set **Vertical**

Quick Set **Chuck**

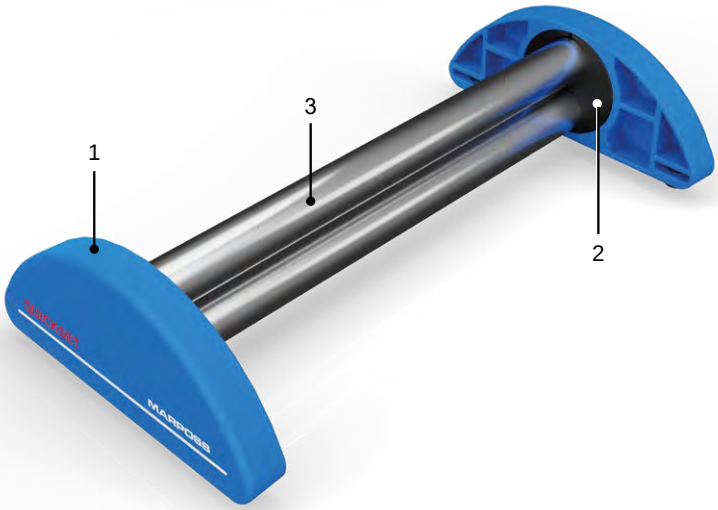


ASSEMBLIES FOR PART SUPPORT AND REFERENCE

ASSEMBLIES OF BASE STRUCTURE

Application examples

Assembly of **base structure**

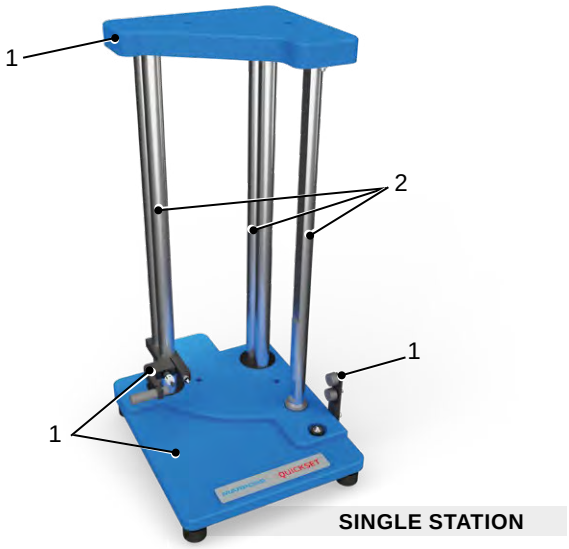


Bars Length		Bench with "V"				Bench with Pivoting centers unit	
		Max. part length with 2 introducing axial limiters		Max. part length with 1 introducing axial limiter and 1 measuring axial limiter		Max. part length	
200 mm	7.87"	100 mm	3.94"	70 mm	2.76"	80 mm	3.15"
300 mm	11.81"	200 mm	7.87"	170 mm	6.69"	180 mm	7.08"
400 mm	15.75"	300 mm	11.81"	270 mm	10.63"	280 mm	11.02"
500 mm	19.69"	400 mm	15.75"	370 mm	14.57"	380 mm	14.96"
600 mm	23.62"	500 mm	19.69"	470 mm	18.50"	480 mm	18.89"
800 mm	31.50"	700 mm	27.56"	670 mm	26.38"	680 mm	26.77"

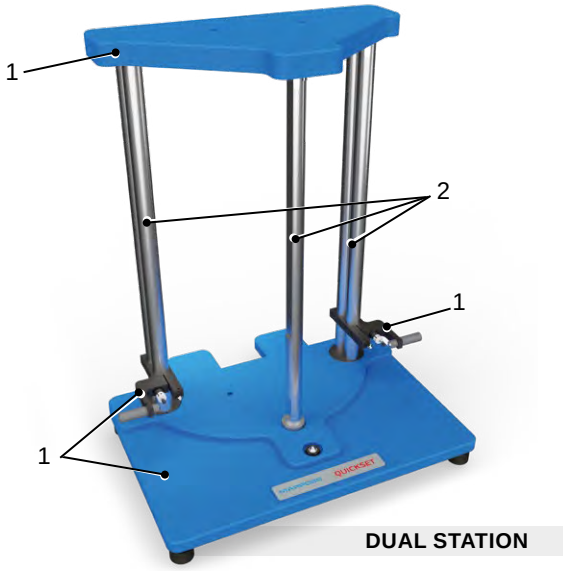
Note: longer bars are available on request

Ref.	Description	Order code
1	SUPPORT FEET (PAIR)	B2924017005
2	CLAMPING DEVICES (PAIR)	B2924017115
3	BARS L = 200 mm (PAIR)	B2924017010
	BARS L = 300 mm (PAIR)	B2924017020
	BARS L = 400 mm (PAIR)	B2924017030
	BARS L = 500 mm (PAIR)	B2924017040
	BARS L = 600 mm (PAIR)	B2924017050
	BARS L = 800 mm (PAIR)	B2924017070

Assemblies of **base structure**



SINGLE STATION



DUAL STATION

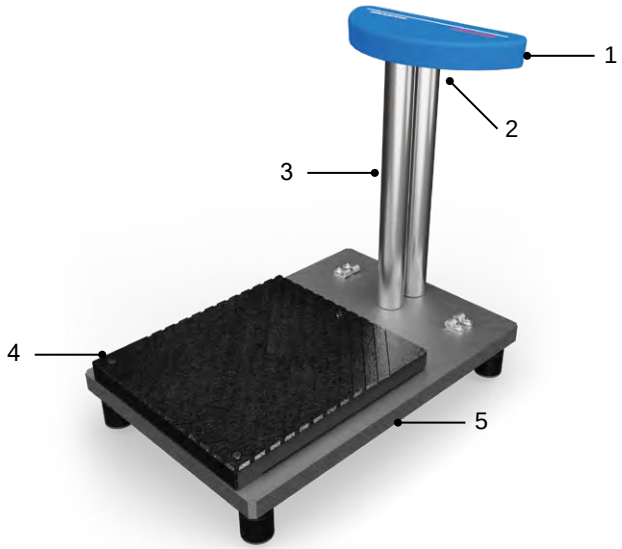
Bars Length		Quick Set-Vertical			
		Part length with static measurements		Part length with dynamic measurements	
500 mm	19.69"	190 mm	7.48"	100 mm	3.94"
600 mm	23.62"	290 mm	11.41"	200 mm	7.87"
700 mm	27.56"	390 mm	15.35"	300 mm	11.81"
800 mm	31.50"	490 mm	19.29"	400 mm	15.75"
900 mm	35.43"	590 mm	23.22"	500 mm	19.69"
1000 mm	39.37"	690 mm	27.16"	600 mm	23.62"
1150 mm	45.28"	840 mm	33.07"	750 mm	29.53"

Part length values are referred to bench gauges equipped with:
Standard interchangeable centers (see page 13-14) for static measurements
Cone center L = 100 mm, diameter 18 mm, for dynamic measurements

The assembly of base structure is composed of base and bars. Centers are supplied separately (see page 12).

Ref.	Description	Order code
1	SINGLE STATION BASE (INCLUDES UPPER AND LOWER PLATES AND STOPPERS)	B3024025503
	DUAL STATION BASE (INCLUDES UPPER AND LOWER PLATES AND STOPPERS)	B3024025003
2	BARS L = 500 mm	B3024025025
	BARS L = 600 mm	B3024025026
	BARS L = 700 mm	B3024025027
	BARS L = 800 mm	B3024025028
	BARS L = 900 mm	B3024025029
	BARS L = 1000 mm	B3024025030
	BARS L = 1150 mm	B3024025031

Assemblies for **base structure**



The assembly of base structure is composed of support plate, support feet, clamping devices, bars and serrated referencing plate.

Ref.	Description	Order code
1	SUPPORT FEET	B2924017005
2	CLAMPING DEVICE	B2924017115
3	BARS L = 300 mm (PAIR)	B2924017880
	BARS L = 500 mm (PAIR)	B2924017882
4	SERRATED REFERENCING PLATE (220 x 250 mm)	B2924017885
	CHROMED SERRATED REFERENCING PLATE (220 x 250 mm, HRC 68)	B2924017886
5	SUPPORT PLATE (INCLUSIVE OF RUBBER FEET)	B2924017890

Assemblies for **part support and reference**

WITH FRONTAL “V”

For Horizontal and Chuck versions

The frontal “V” accurately defines the measuring mechanical axis of the part. An assembly is composed of one support bracket and one frontal "V", and is available in two versions:

- with self-centering screw, for fast and frequent retooling
- without self-centering screw, for economical part positioning

Two assemblies are normally required to support the part.

	Support Bracket			Frontal “V”		
	Length		Order code	Range		Order code
Assembly with self-centering screw	200 mm	7.87"	B3024017540	5 - 10 mm	0.19" - 0.39"	B3024017633
				10 - 15 mm	0.39" - 0.59"	B3024017643
				15 - 24 mm	0.59" - 0.94"	B3024017653
				24 - 40 mm	0.94" - 1.57"	B3024017663
				40 - 70 mm	1.57" - 2.76"	B3024017673
				55 - 100 mm	2.16" - 3.94"	B3024017693
Assembly without self-centering screw	200 mm	7.87"	B3024017000	5 - 10 mm	0.19" - 0.39"	B3024017632
				10 - 15 mm	0.39" - 0.59"	B3024017642
				15 - 24 mm	0.59" - 0.94"	B3024017652
				24 - 40 mm	0.94" - 1.57"	B3024017662
				40 - 70 mm	1.57" - 2.76"	B3024017672
				55 - 100 mm	2.16" - 3.94"	B3024017692
	250 mm	9.84"	B3024017050	100 - 150 mm	3.94" - 5.91	B3024017695

Description	Order code
OPTIONAL GUIDE FOR VEE RANGE 55–100 mm (it has to be used when onto the same support bracket of the vee , two single transmissions are assembled to check the diameter (55–100 mm))	B2924017695

WITH CROSSED “V”

For Horizontal and Chuck versions

The crossed “V” is used for very frequent retooling and when a large retooling range is needed. An assembly is composed of one support bracket and one crossed “V”, and is available in two versions:

- with self-centering screw, for fast and frequent retooling
- without self-centering screw, for economical part positioning

Two assemblies are normally required to support the part.

	Support Bracket			Crossed “V”		
	Length		Order code	Range		Order code
Assembly with self-centering screw	200 mm	7.87"	B3024017540	5 - 100 mm	0.19" - 3.94"	B3024017553
Assembly without self-centeringscrew	200 mm	7.87"	B3024017000	5 - 100 mm	0.19" - 3.94"	B3024017552

WITH MEASURING “V”

For Horizontal and Chuck versions

The measuring “V” is used when both part reference and part diameter measurement have to be carried out in the same section

The assembly is available in two versions:
- with self-centering screw, for fast and frequent retooling
- without self-centering screw, for economical part positioning

An assembly is composed of one support bracket, one measuring “V”, and one single transmission unit or one direct sensor unit.
The measurement is performed by using a special contact for measuring “V” mounted on the single transmission unit or on the direct sensor unit (see Contacts for Measuring “V”). The special contact for measuring “V” and the sensor to be mounted in the transmission unit or in the direct sensor unit must be ordered separately.

	Support Bracket			Measuring “V”		
	Length		Order code	Range		Order code
Assembly with self-centering screw, for single transmission or direct sensor unit	200 mm	7.87"	B3024017540	5 - 35 mm	.19" - 1.39"	B3024017524
				35 - 65 mm	1.39" - 2.56"	B3024017526
Assembly without self-centering screw, for single transmission or direct sensor unit	200 mm	7.87"	B3024017000	5 - 35 mm	.19" - 1.38"	B3024017520
				35 - 65 mm	1.38" - 2.56"	B3024017522

Sensor Support	Clamping ø for Sensor	Order code
SINGLE TRANSMISSION UNIT	8 mm	B3024017155
	3/8"	B3024017157
DIRECT SENSOR UNIT	8 mm	B3024017145
	3/8"	B3024017147

WITH RADIAL LIMITERS

For Horizontal and Chuck versions

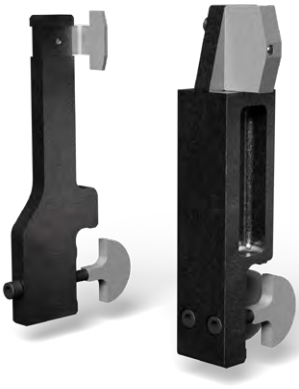
The part radial limiters ensure correct part introduction in the bench.
An assembly is composed of one support bracket and one pair of radial limiters.
Two versions of limiter are available:

- steel limiter
- brass limiter for parts with low hardness

	Support Bracket		
	Length		Order code
Assembly with radial limiters	200 mm	7.87"	B3024017000
	250 mm	9.84"	B3024017050

Description	Order code
STEEL RADIAL LIMITERS (PAIR)	B3024017200
BRASS RADIAL LIMITERS (PAIR)	B3024017210

AXIAL LIMITERS



For Horizontal version

The part axial limiter ensures correct part positioning in the bench.

Two versions are available:

- Introducing axial limiter to limit part position
- Measuring axial limiter used both to limit part position and as mechanical reference for a distance measurement carried out by a shoulder transmission unit (see Assemblies for part measuring).

This component is not assembled together with others, as it is fixed directly on the two bars of the horizontal bench.

Description	Order code
INTRODUCING AXIAL LIMITER	B3024017214
MEASURING AXIAL LIMITER	B3024017218

WITH ARMS FOR CENTER SUPPORTS

For Vertical version

These arms are suitable for static measurement acquisitions and accept standard, interchangeable universal and short center with cylindrical shank.

An assembly is composed of the two arms. Centers must be ordered separately or provided by the customer.

Description	Order code
UPPER ARM FOR STATIC MEASUREMENTS WITHOUT CENTER	B2924017190
LOWER ARM FOR STATIC MEASUREMENTS WITHOUT CENTER	B2924017220
UNIVERSAL CENTER (see page 13)	B1024017753
SHORT CENTER (see page 13)	B1024017755

For Vertical version

These arms are suitable for dynamic measurement acquisitions (the lower arm is equipped with a brushless motor) and accept standard MK2 cone centers.

An assembly is composed of the two arms. Centers must be ordered separately or provided by the customer.

Description	Order code
UPPER ARM FOR DYNAMIC MEASUREMENTS WITHOUT CENTER	B2924017170
LOWER ARM FOR DYNAMIC MEASUREMENTS WITHOUT CENTER, WITH FAULHABER MOTOR	B2942441808
LOWER ARM FOR DYNAMIC MEASUREMENTS WITHOUT CENTER, WITH COMMERCIAL MOTOR	B2942441809

WITH PIVOTING CENTERS UNIT

For Horizontal version

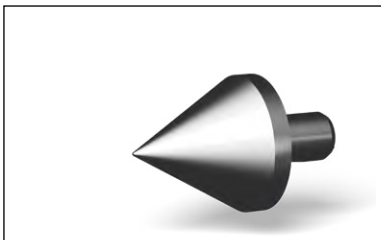
This unit is needed when the part to be measured is provided with center holes.

The part is loaded between the centers and then introduced into the measuring station.

It is recommended for small parts [max. part weight 3 kg and max. flywheel overall diameter 170 mm (6.69")].

An assembly is composed of one pair of pivoting supports and their connecting shaft, whose length depends on the length of the bars of the base structure assembly.
The centers, their supports and the dampers must be ordered separately.

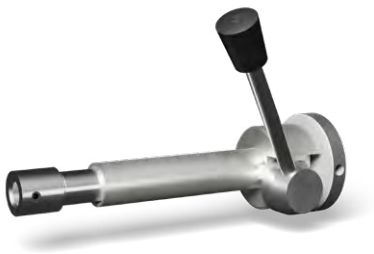
Dampers are available to avoid impacts during part introduction in the measuring station.



UNIVERSAL CENTER

SHORT CENTER

IDLE CENTER SUPPORT



IDLE CENTER RELOADING SUPPORT

FIXED CENTER SUPPORT

Pivoting Supports (pair)					Connecting shaft for pivoting supports		
Base Bars Length		Max Part Length		Order code	Length		Order code
200 mm	7.87"	80 mm	3.15"	B3024017355	360 mm	14.17"	B1024017369
300 mm	11.81"	180 mm	7.08"		460 mm	18.11"	B1024017371
400 mm	15.75"	280 mm	11.02"		560 mm	22.04"	B1024017373
500 mm	19.69"	380 mm	14.96"		660 mm	25.98"	B1024017375
600 mm	23.62"	480 mm	18.89"		760 mm	29.92"	B1024017377
800 mm	31.50"	680 mm	26.77"		960 mm	37.79"	B1024017379

Note: longer bars and connecting shafts are available on request

Description	Order code
FIXED CENTER SUPPORT	1024017567
IDLE CENTER SUPPORT	3024017325
IDLE CENTER RELOADING SUPPORT	3024017315
UNIVERSAL CENTER	1024017753
SHORT CENTER	1024017755
DAMPER (FOR MAX. PART WEIGHT 3 kg)	44331AC108

N.B. With this unit diameter, ovality and distance measurements only can be carried on. For measurements such as perpendicularity, T.I.R., concentricity, etc.,that are referred to the centers axis, please contact your nearest Marposs office.

Assemblies for **part measuring**

WITH SELF-CENTERING UNIT WITH TRANSMISSION

For all versions

The self-centering unit with transmission is used to carry out diameter measurements only. It can accommodate pencil probes and indicators with diameter 8 mm or 3/8".

The sensor is not in direct contact with the part and is therefore preserved during part loading/unloading.

The working range of the transmission unit is 1,150 mm.

An assembly is composed of one support bracket and one self-centering unit with transmission. The sensor and the two contacts to be mounted on the unit must be ordered separately (see Contacts and Armsets).

Support Bracket			Self-Centering Unit with Transmission			
Length		Order code	Range		Clamping ø for Sensor	Order code
200mm	7.87"	B3024017000	5 - 80 mm	0.20" - 3.15"	8 mm	B3024017460
					3/8"	B3024017462

WITH SELF-CENTERING UNIT WITH DIRECT SENSOR

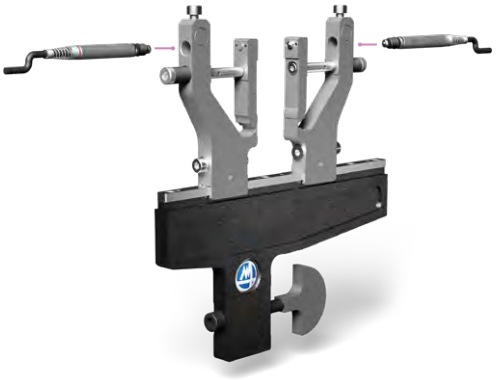
For all versions

The self-centering unit with direct sensor is used to carry out diameter measurements only. It can accommodate pencil probes and indicators with diameter 8 mm or 3/8”.

An assembly is composed of one support bracket and one self-centering unit with direct sensor. The sensor and the contact to be mounted on the unit must be ordered separately (see Contacts and Armsets).

Support Bracket			Self-Centering Unit with Direct Sensor			
Length		Order code	Range		Clamping ø for Sensor	Order code
200 mm	7.87"	B3024017000	5 - 80 mm	0.20" - 3.15"	8 mm	B3024017470
					3/8"	B3024017472

WITH SINGLE TRANSMISSION UNIT



For all versions

The single transmission unit is used to carry out diameter and form measurements. It can accomodate pencil probes and indicators with diameter 8 mm or 3/8”. The sensor is not in direct contact with the part and is therefore preserved during part loading / unloading.

The working range of each transmission unit is 1,150 mm.

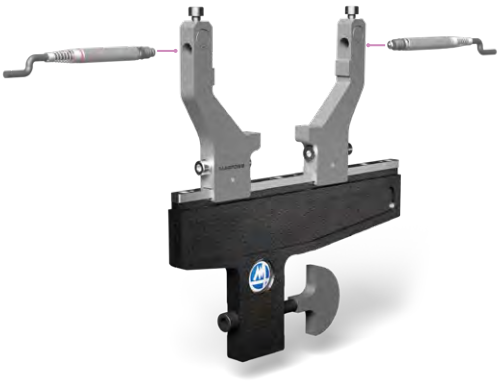
The assembly with only one transmission unit is particularly used for T.I.R. measurements.

An assembly is composed of one support bracket (L=200 mm or 250 mm) and one or two single transmission units. The sensor and the contact to be mounted on each unit must be ordered separately (see Contacts and Armsets).

Support Bracket				
Length		Range		Order code
200 mm	7.87"	3 - 118 mm	0.12" - 4.64"	B3024017000
250 mm	9.84"	3 - 160 mm	0.12" - 6.30"	B3024017050

Sensor Support	Clamping ø for Sensor	Order code
SINGLE TRANSMISSION UNIT	8 mm	B3024017155
	3/8"	B3024017157

WITH DIRECT SENSOR UNIT



For all versions

The direct sensor unit is used to carry out diameter and form measurements. It can accomodate pencil probes and indicators with diameter 8 mm or 3/8”.

An assembly is composed of one support bracket (L=200 mm or 250 mm) and one or two direct sensor units.

The sensor to be mounted on each unit must be orderd separately.

Support Bracket				
Length		Range		Order code
200 mm	7.87"	3 - 118 mm	0.12" - 4.64"	B3024017000
250 mm	9.84"	3 - 160 mm	0.12" - 6.30"	B3024017050

Sensor Support	Clamping ø for Sensor	Order code
DIRECT SENSOR UNIT	8 mm	B3024017145
	3/8"	B3024017147

WITH SHOULDER TRANSMISSION UNIT

For all versions

The shoulder transmission unit is used to carry out distance measurements. It can accomodate pencil probes and indicators with diameter 8 mm or 3/8”. The working range of this transmission unit is 1,50 mm.

The sensor is not in direct contact with the part and is therefore preserved during part loading/unloading.

Distance measurements can be carried out by using two assemblies or one assembly and a measuring axial limiter.

An assembly is composed of one support bracket and one shoulder transmission unit. The sensor, the armset and the contact to be mounted on the unit must be ordered separately (see Contacts and Armsets).

Support Bracket		
Length		Order code
200 mm	7.87"	B3024017000
250 mm	9.84"	B3024017050

	Clamping ø for Sensor	Order code
SHOULDER TRANSMISSION UNIT	8 mm	B3024017330
	3/8"	B3024017331

Accessories and Tools

PART PUSHER

For Horizontal version

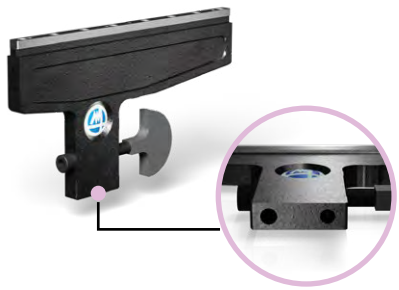
The part pusher ensures the contact between the part and the “V” supports.

It is particularly useful for parts with weight lower than 200 gr.

It is suitable for part diameters from 5 to 50 mm (0.19" - 1.97”).

Description	Order code
PART PUSHER	B3024017980

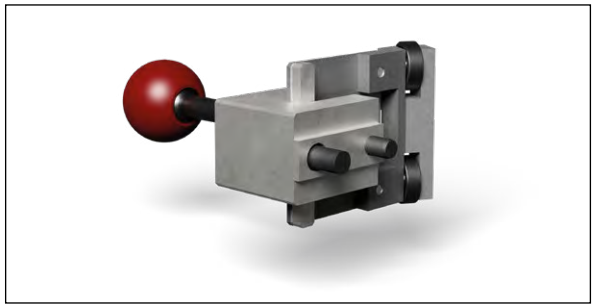
SUPPORT BRACKET WITH BACK HOLES



This support bracket is used with the Vertical version; it is equipped with two holes in the bottom that allow the use of the specific retooling tool to setup it horizontally.

Description	Order code
SUPPORT BRACKET WITH BACK HOLES	B2924025255

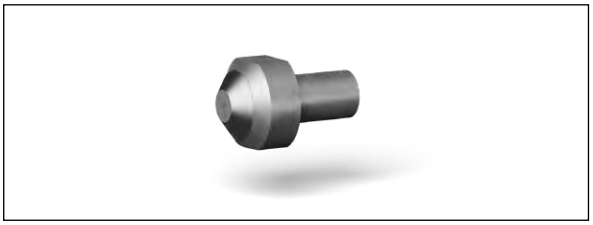
RETOOLING TOOL (ONLY FOR BRACKET WITH BACK HOLES)



This tool allows to setup the support bracket code B2924025255 horizontally.

Description	Order code
RETOOLING TOOL FOR BRACKET WITH BACK HOLES	B2924025050

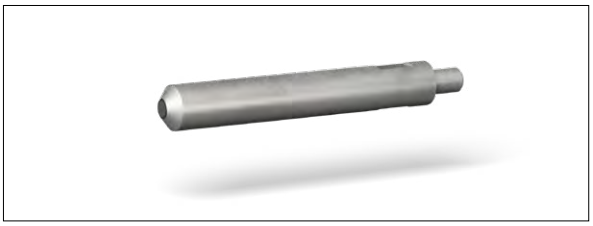
STANDARD CONTACTS



To be used with:
- Self-centering unit with transmission (Q.ty = 2)
- Self-centering unit with direct sensor (Q.ty = 1)
- Single transmission unit (Q.ty = 1)

Radius R		Thread	Material	Order code
10 mm	0.39"	M 2.5	CARBIDE	B3392401702
50 mm	1.97"	M 2.5	CARBIDE	B3392401705
100 mm	3.94"	M 2.5	CARBIDE	B3392401706
10 mm	0.39"	M 2.5	DIAMOND	B3392401722
50 mm	1.97"	M 2.5	DIAMOND	B3392401725
100 mm	3.94"	M 2.5	DIAMOND	B3392401726

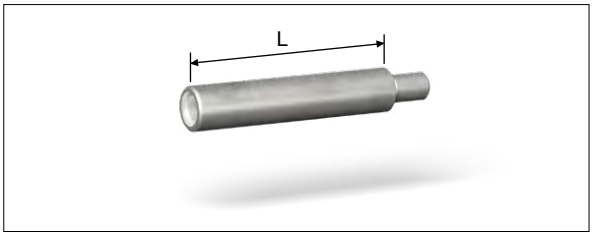
CONTACTS FOR MEASURING 'V'



Special carbide contacts to be mounted on the single transmission unit or directly on the sensor.

Radius R		Thread	Order code
10 mm	0.39"	M 2,5	B3392401701
50 mm	1.97"	M 2,5	B3392401720
100 mm	3.94"	M 2,5	B3392401721

CONTACT EXTENSIONS



To be used with:

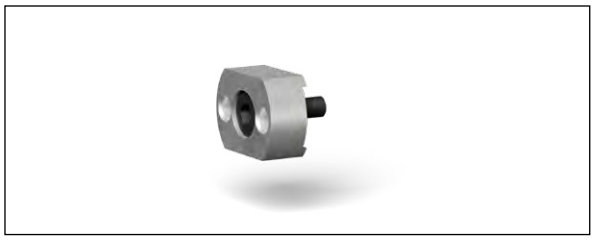
- Self-centering unit with transmission or direct sensor
- Single transmission unit
- Direct sensor unit
- Indicators

L		Thread	Order code
10 mm	0.39"	M 2.5	1024017105
15 mm	0.59"	M 2.5	1024017106
20 mm	0.79"	M 2.5	1024017107
25 mm	0.98"	M 2.5	1024017108
30 mm	1.18"	M 2.5	1024017109
10 mm	0.39"	4 - 48 UNF	1024017115
15 mm	0.59"	4 - 48 UNF	1024017116
20 mm	0.79"	4 - 48 UNF	1024017117
25 mm	0.98"	4 - 48 UNF	1024017118
30 mm	1.18"	4 - 48 UNF	1024017119

OFF-SET ARMS

ARMSET FOR SELF-CENTERING UNIT WITH TRANSMISSION

It is needed to carry out measurements very close to each other and close to a shoulder (min. 3 mm) by offsetting the contact.

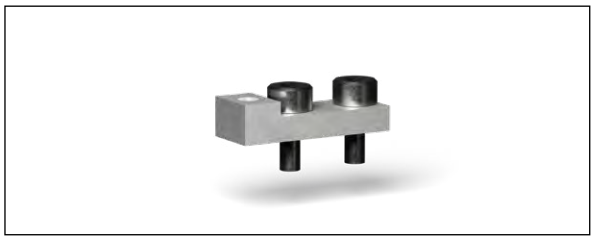


Min. distance between two measuring sections: 5,2 mm.

	Order code
Armset + fixing screw	B2924017405

ARMSET FOR SINGLE TRANSMISSION UNIT

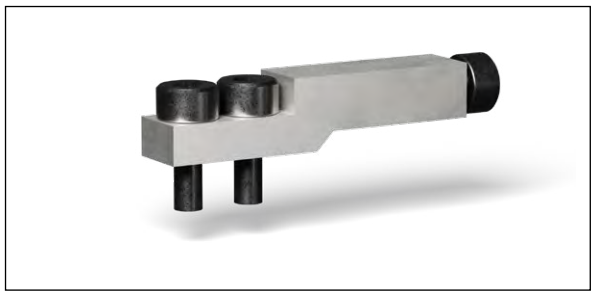
For contact off-set when measurements close to each other must be carried out.



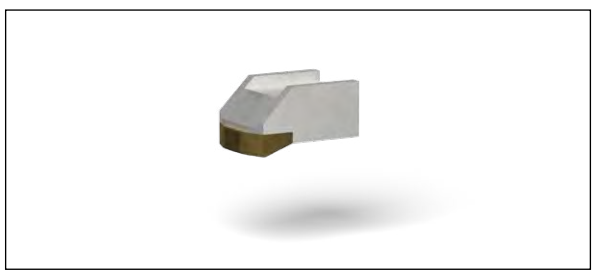
Min. distance between two measuring sections: 5,2 mm.

	Offset L		Order code
Armset + fixing screw	8.5 mm	0.33"	B2924017150
	10 mm	0.39"	B2924017151

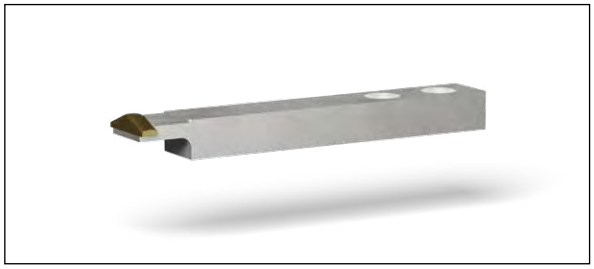
CONTACTS AND ARMSETS FOR SHOULDER TRANSMISSION UNIT



Armset
It is the interface for mounting the contact on the unit.



Contact
Available with carbide or diamond tip.



Armset for Grooves
It is equipped with a carbide contact and must be directly mounted on the unit.

Description	Order code
ARMSET	B2924017302
CARBIDE CONTACT	B3292401702
DIAMOND CONTACT	B3292401712
ARMSET FOR GROOVES	B3292401705

WRENCH SET

For bench assembly and set-up.

Description	Order code
WRENCH SET	B2924017990

QUICKDIGIT

DIGITAL INDICATORS

Indicators and electronic display units

Quick Digit™ is a line of digital indicators with highly accurate capacitive measuring system, available with 12,5 mm/0.5” measuring range (bigger ranges 25 mm/1.0”, 50 mm/2.0”, 100 mm/4.0” only on request). The large digits of the LCD display allow immediate and error-free reading of the measurement result. Measuring values can be classified through the tolerance indicator lights (green, yellow, red), and transmitted by cable or by Bluetooth® transmission technology.

Product **features**

Features common to all models are:

- Hardened and ground stainless steel measuring spindle
- M 2,5 interchangeable stainless steel contact
- Power supply: replaceable 3V lithium battery, type CR2032, 220 mAh
- Working temperature range: 5 ºC to 40 ºC
- Storage temperature range: - 10 ° C to 60 ºC
- Three buttons, with central button for selectable favorite function

Functions common to all models are:

- Direct metric / inch conversion
- Preset
- Dynamic Min./Max./TIR measuring mode
- Memory HOLD
- Input of a multiplicative coefficient
- Zero setting at any point within the measuring range
- Choice of measurement sign (positive or negative)
- Automatic switch-off into standby mode without loss of the origin value
- Data output

QUICKDIGIT / QUICKDIGITHR

Ø 59.5 mm Aluminum case, 270° rotatable.

Large 11 mm digits.

Available measuring ranges: 12.5 mm/0.5”, 25 mm/1.0”, 50 mm/2.0”, 100 mm/4.0”.

REF I / REF II dual reference point.

Resolution: 0,001 mm/.00005" for the Advanced model; 0,0001 mm/000004" for the Advanced HR model.

Available also with Bluetooth® transmission technology.

Setting and display of tolerance limits.

Measurement value classification through tolerance indicator lights (green, yellow, red).

‘Proximity’ and ‘Power’ data outputs; the Power output allows the use of the indicator without battery, when connected through the specific cable to an electronic unit/PC.

QUICKDIGIT

Ø 45 mm non-rotating Polyamide case.

Large 8,2 mm digits.

12,5 mm/0.5” measuring range.

Resolution: 0,001 mm/.00005".

Available also with Bluetooth® transmission technology.

Analog scale.

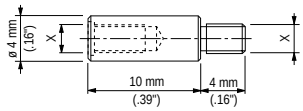
‘Power’ data output, that allows the use of the indicator without battery when connected through the specific cable to an electronic unit/PC.

HOW TO ORDER

Model	Meas. Range		Resolution		Accuracy	Repeatability (± 2σ)	Prot. degree	Meas. Force (± 20%)	Weight	Order Code
	[mm]	[inch]	[mm]	[inch]	[µm]	[µm]		[N]	[gr]	
5S	12,5	.20"	0,001	.00005"	4	2	IP67	0,50 - 0,9	70	B0E20501000
5S Bluetooth®	12,5	.49"	0,001	.00005"	4	2	IP67	0,50 - 0,9	70	B0E20501001
12,5 S Advanced	12,5	.49"	0,001	.00005"	3	2	IP54	0,65 - 0,90	120	B0E21201012
12,5 S Advanced HR	12,5	.49"	0,0001	.000004"	1,2	0,3	IP54	0,65 - 0,90	120	B0E21200000
12,5 S Advanced Bluetooth®	12,5	.49"	0,001	.00005"	3	2	IP54	0,65 - 0,90	120	B0E21201022
12,5 S Advanced HR Bluetooth®	12,5	.49"	0,0001	.000004"	1,2	0,3	IP54	0,65 - 0,90	120	B0E21200003
12,5 S Advanced HRA Bluetooth® with digital and analog display	12,5	.49"	0,0001	.000004"	1,8	0,5	IP51	0,65 - 0,90	120	B0E21200002

The value of the measuring force is referred to indicator in vertical position and with outgoing spindle.

ACCESSORIES

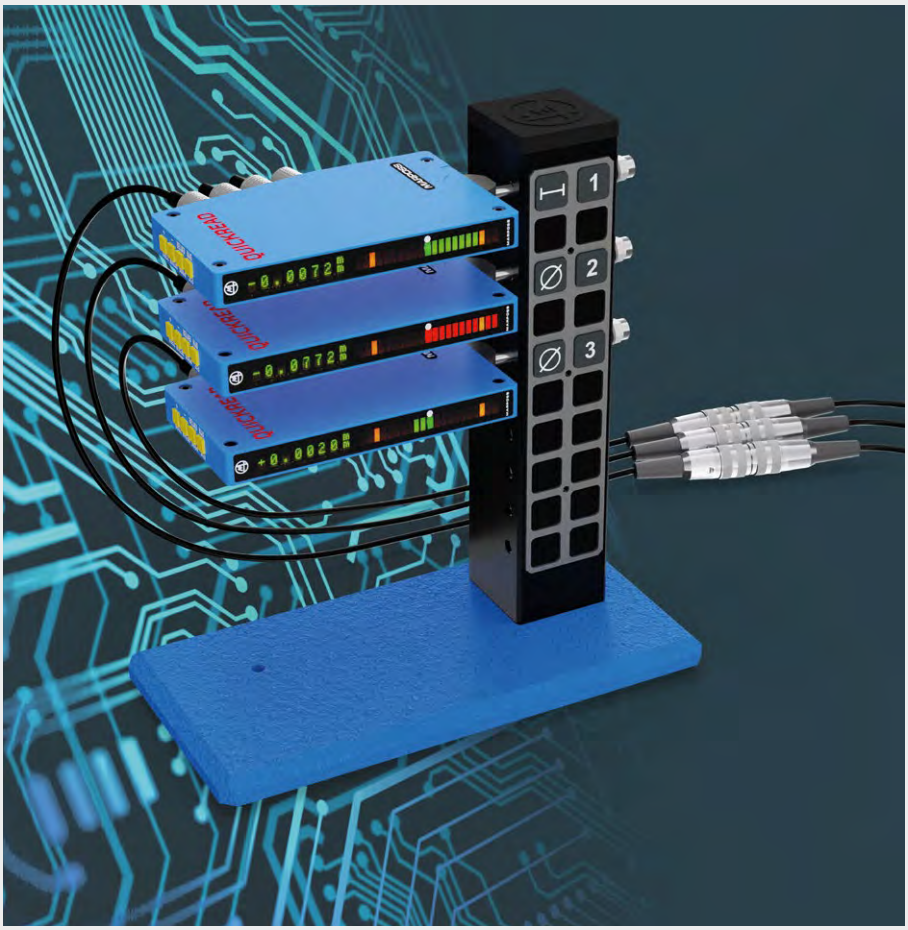
Description			Order code
	Contact extension for using 5S model with M1 Star MBG mini indicator handle	X= M2,5 thread	B1024017105
		X= 4-48 UNF thread	B1024017115
	Power – RS232 cable for bidirectional data transmission (L = 3 m)		B4420240001
	Proximity – RS232 cable for bidirectional data transmission (L = 3 m)		B4420240002
	Power – USB cable for bidirectional data transmission (L = 3 m)		B4420240003
	Proximity – USB cable for bidirectional data transmission (L = 3 m)		B4420240004
	Power – DIGIMATIC cable for bidirectional data transmission (L = 3 m)		B4420240005
	Proximity – DIGIMATIC cable for bidirectional data transmission (L = 3 m)		B4420240006

If Power cables are used, the battery removal is required and the power supply to the Quick Digit is given by the external display unit.

Application examples

QUICKREAD

COMPACT
ELECTRONIC
DISPLAY UNIT



Indicators and electronic display units

Quick Read™ is a 12 mm slim, compact display unit, with analog and digital displays, easily programmed via local keypad. It allows to connect half-bridge (HBT) standard sensors, manufactured by Marposs or by Tesa, with measuring range from ± 0,25 mm to ± 5 mm.
The 3-colour (green, yellow and red) analog display and 8-digit alphanumeric display provide clear definition and easy reading of the measurement results.

Product **features**

Two versions are available:

- For connection of one sensor to carry out one static measurement .
- For connection of one or two sensors to carry out one static or dynamic measurement [Hold, Max, min, Max-min, (Max-min)/2, (Max+min)/2]. To connect two sensors the specific Y-cable is needed.

FOR CONNECTION OF ONE SENSOR
ONE STATIC MEASUREMENT

FOR CONNECTION OF ONE OR TWO SENSORS
ONE STATIC OR DYNAMIC MEASUREMENT

QUICKREAD

Using the local keypad, the Quick Read™ can be easily programmed to set the digital display resolution, measuring unit, tolerance limits, master deviation, full scale, measurement multiplying coefficient, absolute or comparative reading of the measurement result and the data format for serial transmission.

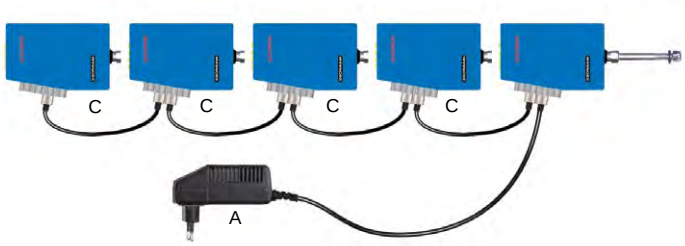
The RS232 output port allows for connection to a PC, statistical printer or data collector for SPC purposes, and to a PLC (data can be sent in ASCII or binary format).

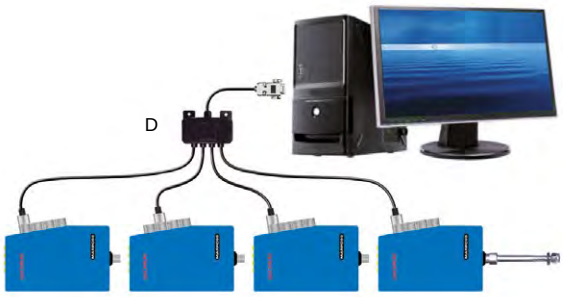
TECHNICAL SPECIFICATIONS

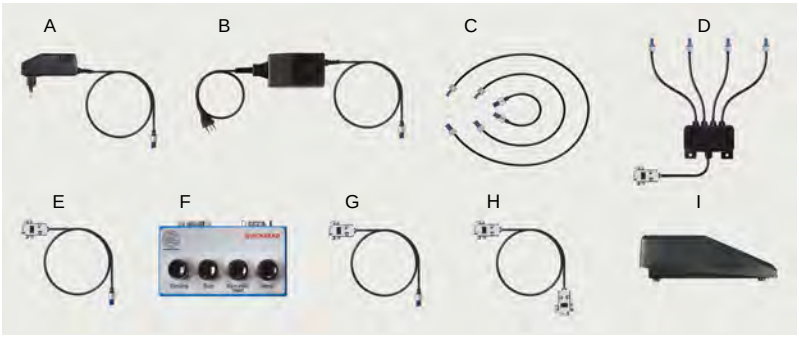
General specifications	
Dimensions of the case	110 x 69 x 12 mm (4.33" x 2.72" x 0.47")
Power supply	7 - 7,5 Vdc ± 5% (300 mA)
Protection level	IP50
Accuracy	± (1% reading value + resolution)
Measurement thermal drift	0,1 µm/°C for range up to ± 1 mm (0.04"); 0,2 µm/°C for range ± 2,5 mm (0.1") and ± 5 mm (0.2")
Output	RS232
Working temperature	0 to 50 °C
Storage temperature	- 40 to 50 °C
Digital display	
Resolution	0,0001/0,001 mm (0.00001"/0.00005") for measuring range up to ± 1 mm (0.04"); 0,001 mm (0.00005") for range ± 2,5 (0.1") and ± 5 mm (0.2")
Type	8 alphanumeric digits
Measurement multiplying coefficient	-2 to +2 with 0,01 step
Analog display	
Available scales	auto; 0,010 mm (0.0005"); 0,020 mm (0.001"); 0,050 mm (0.0025"); 0,100 mm (0.005"); 0,250 mm (0.01"); 0,500 mm (0.025"); 1,000 mm (0.05"); 2,5 mm (0.1"); 5 mm (0.25"); 10 mm (0.5")
Resolution	1/10 of the programmed scale, from 0,001 mm (.00005") to 1,000 mm (0.05")
Type	21 three colour LEDs (green, yellow, red)

HOW TO ORDER

Description	Order code
QUICK READ for one sensor (one static measurement)	B0E01991650
QUICK READ for one or two sensors (one static or dynamic measurement)	B0E01991660
QUICK READ for one or two sensors compatible to Tesa amplifiers (one static or dynamic measurement)	B0E01991670
Y-cable for connection of two sensors	B6735532001

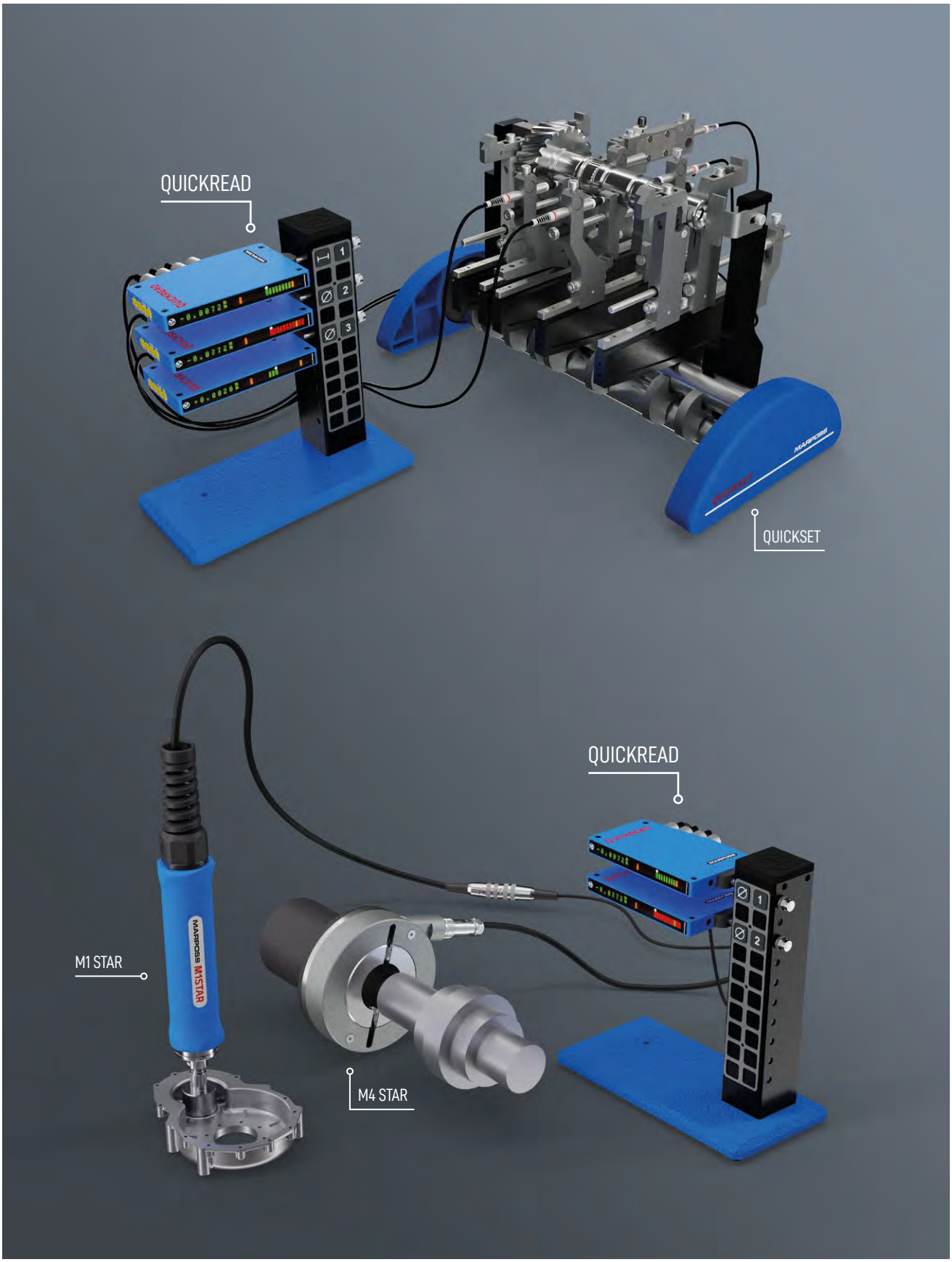






Ref.	Description	Order code
A	Power supply unit for max. 5 Quick Read, with EU plug	B6871140067
	Power supply unit for max. 5 Quick Read, with U.S. / JP plug	B6871140068
	Power supply unit for max. 5 Quick Read, with U.K. plug	B6871140069
B	Power supply unit for max. 5 Quick Read, with EU mains cable	B6871140070
	Power supply unit for max. 5 Quick Read, with U.S. / JP mains cable	B6871140071
C	Power jumper cable L = 150 mm	B6739696138
	Power jumper cable L = 300 mm	B6739696128
	Power jumper cable L = 600 mm	B6739696129
D	Chain serial cable (L = 4 m) for connection of up to 4 Quick Read to pushbutton box, footswitch or PC (9 pins); distance between Quick Read = 1m	B6739696396
E	Serial cable (L = 2 m) for connection of one Quick Read to pushbutton box, footswitch or PC (9 pins)	B6739696157
F	Pushbutton box for remote control of zeroing, dyn. cycle and data transmission to PC	B6139013100
G	Power supply cable (L = 2 m) for pushbutton box (power feed is from Quick Read)	B6739696301
H	Serial cable (L = 3 m) to connect pushbutton box to PC (9 pins)	B6737957002
I	Footswitch with 1,5 m cable for connection to pushbutton box or to Quick Read (in this case cable E is needed)	B6738099030
M	Stand (holds up to 10 units)	B2919916500

Application examples



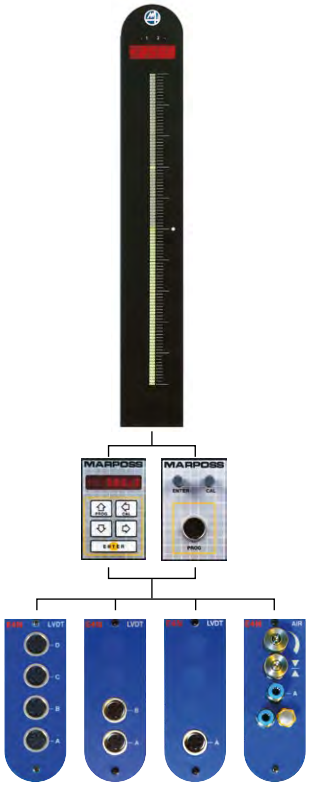
E4N

COLUMN
DISPLAY UNIT

Indicators and electronic display units

E4N™ is a column display unit designed to elaborate and display dimensional and geometrical measurements, either static or dynamic (Max, min, Range, Range/2, Average).
The measurement value is displayed:
- in an analog way on the 101 threecolour LED bargraph scale, showing the measurement status (green = good; red=scrap; yellow=prescrap).
- in a digital way on the eight-digit display, in comparative or absolute mode.

Product **features**



The column display unit can be configured according to specific application needs, employing different sensor modules provided with 1, 2 or 4 input channels.

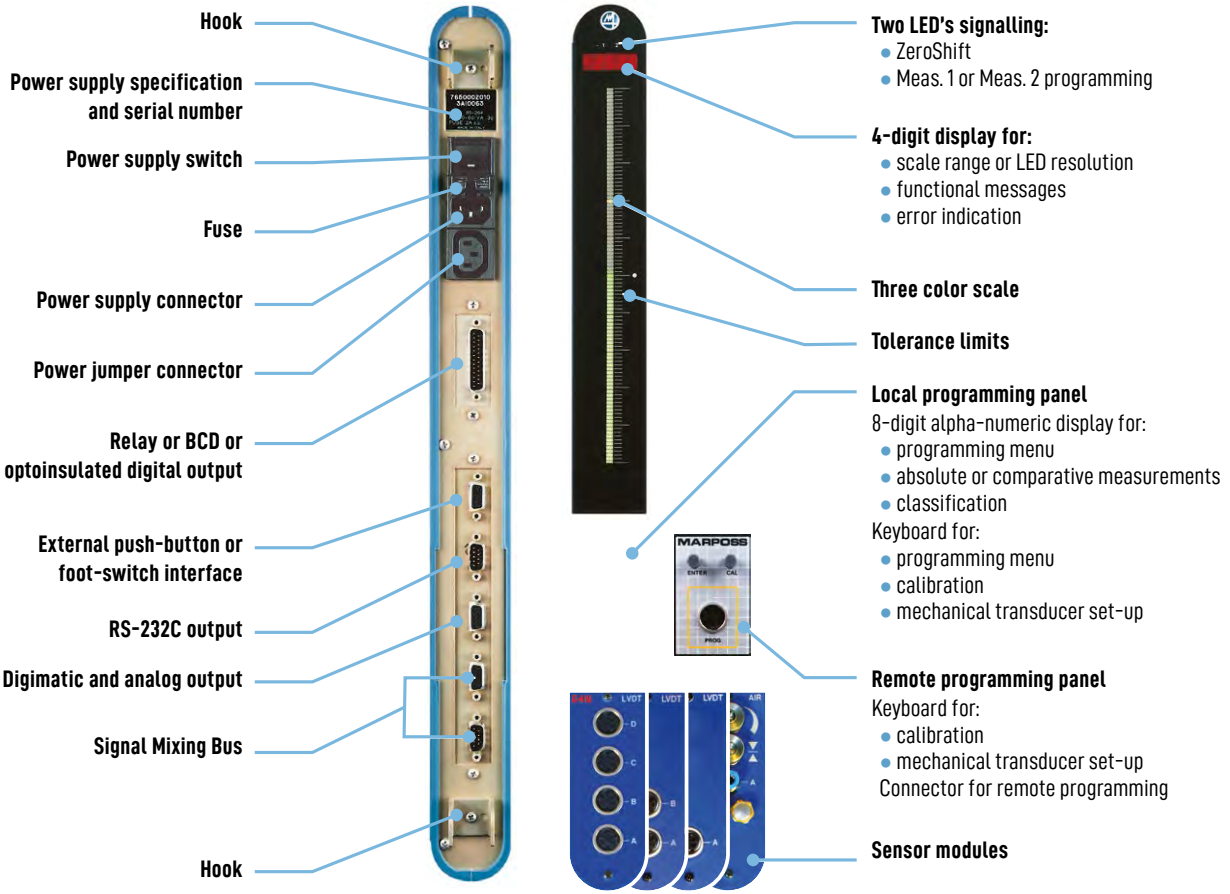
These modules can be:
- Full-bridge (LVDT), with 1, 2 or 4 channels
- Half-bridge (HBT) with 1, 2 or 4 channels
- AIR, pneumo-electronic converter with 1 channel

Each module is perfectly interchangeable with the other modules.
LVDT and HBT sensors with measuring range from ± 0,25 mm (0.001") to ± 5 mm (0.02") can be connected.

Programmable measuring units: Millimeters, inches, grams, degrees.
Up to 8 sensors can be managed by connecting multiple columns via the bus cable, to carry out even complex measurements.

The E4N features a wide range of interfaces:
- Digimatic and analog to send data to statistical printers or data collectors
- RS232-C to send data to PC or standard printers
- Relay/BCD to provide a signal for alarms, resume lamps etc.
- connector to interface external push-buttons or footswitches.

It can be programmed via local keypad or PC (by means of the specific E4N-PC LINK software, which also allows data collection)



TECHNICAL SPECIFICATIONS

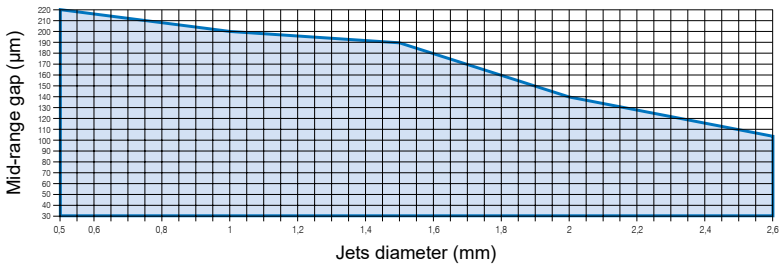
Characteristics	
Power supply	85/265 VAC 50/60 Hz ± 10%
Max. consumption	40 VA
Protection level	IP 50
Storage temperature	-40/+60 °C
Working temperature	0/+50 °C
Weight	3,7 kg approx
Arm ratio and sensitivity adjustment	from -4 to +4 with 0,001 step
Accuracy at 20°C	± 0,5 % reading value ± resolution
Scale	Up to 10 programmable ranges, from ±0,005 to ±5 mm (0.000250" to 0.2")
Scale resolution	1/100 of range, from 0,1 to 100 µm (0.000005" to 0.004")
Connector type	6 Pin (DIN 45322) for gauges with Lumberg SV50/6 connector
Air supply pressure for E4N Air	3 bar ± 0,1

E4N AIR APPLICATION RANGE

The MARPOSS and/or non-MARPOSS air gauges, with specifications inside the blue area of the diagrams, can be easily and immediately connected.
The parameters to be considered are the following:

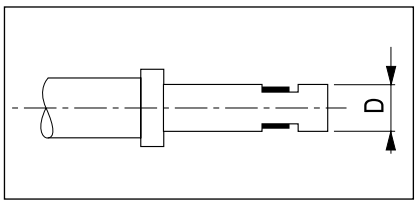
- number of air gauge jets
- diameter of air gauge jets
- "mid-range gap", as to the difference between the mid-tolerance diameter of the part to be measured and the distance between the air gauge jets.

2 JETS AIR GAUGE VERIFICATION DIAGRAM



EXAMPLE OF MEASUREMENT WITH AIR-PLUG

- number of jets : 2
- diameter of jets: 2mm
- diameter of the part to be measured = 10 mm ± 0.030
- mid tolerance diameter = 10 mm
- distance between the jets D = 9.90 mm
- "mid tolerance gap": (10 - 9.90) = 0.10 mm = 100 µm
  As shown in the above diagram the intersection between the value of the "mid-range gap", 100 µm , and the diameter of the jet, 2 mm , is inside the blue area: the application can be therefore realized.



HOW TO ORDER

Transd. Type	Transd. Input	Column with local Programmer: Basic Version	BCD Relais	Optoinsulated digital output	Column with remote programmer (E4N pc-link): Basic Version	BCD Relais	Optoinsulated digital output
LVDT	1	B76520020X0	B76520021X0	B7652002232	B76520040X0	B76520041X0	B7652004232
	2	B76520120X0	B76520121X0	B7652012232	B76520140X0	B76520141X0	B7652014232
	4	B76520220X0	B76520221X0	B7652022232	B76520240X0	B76520241X0	B7652024232
HBT	1	B76523020X0	B76523021X0	B7652302232	B76523040X0	B76523041X0	B7652304232
	2	B76523120X0	B76523121X0	B7652312232	B76523140X0	B76523141X0	B7652314232
	4	B76523220X0	B765213221X0	B7652322232	B76523240X0	B76523241X0	B7652324232
AIR	1	B76529020X0	B76529020X0	B7652902232	B76529040X0	B76529041X0	B7652904232

X = see note at bottom of page 4

ACCESSORIES

Description			Order Code
E4N AIR USA with local programmer (basic version)			B76529120X0
E4N AIR USA with local programmer (BCD relais)			B76529121X0
3 - colour meter module with local programmer (basic version)			B76529920X0
3 - colour meter module with local programmer (BCD relais)			B76529921X0
3 - colour meter module with remote programmer (basic version)			B76529940X0
3 - colour meter module with remote programmer (BCD relais)			B76529941X0
Amplifier module for 1 LVDT sensor			B6876004013
Amplifier module for 2 LVDT sensors			B6876004012
Amplifier module for 4 LVDT sensors			B6876004011
Amplifier module for 1 HBT sensor			B6876004005
Amplifier module for 2 HBT sensors			B6876004004
Amplifier module for 4 HBT sensors			B6876004003
Amplifier module for 1 MRT sensor			B6876004008
Amplifier module for 2 MRT sensors			B6876004007
Amplifier module for 4 MRT sensors			B6876004006
Amplifier module for 1 AIR sensor			B6876004009
BCD relais interface card			B6344360100
Optoinsulated digital output card			B6344360200
Bus cable for signals exchange among E4N columns			B6738057011
Y-shaped connecting cable from 1 LVDT sensor to 2 E4N inputs (L= 1,2 m)			B6735932014
RS232-cable	From remote programming module to a PC (L= 3 m)	25 pin	B6735916001
		9 pin	B6735957001
	From rear serial output to a PC (L= 3 m)	25 pin	B6737916000
		9 pin	B6737957002
	Chain serial cable from 2 E4N to a PC		B6739797030
	Chain serial cable from 3 E4N to a PC		B6739797029
	Chain serial cable from 4 E4N to a PC		B6739797028
Connecting cable from Digimatic output to Mitutoyo DP1 - DP2 - DP3 (L= 1 m)			B6738099016
Cable for analog output			B6738098009
External pushbutton panel (4 buttons) with cable (L= 1,5 m)			B6139012600
Footswitch with connecting cable to the column or to the pushbutton panel (cable L= 2 m)			B6738099015
Connecting cable of 2 E4N columns to pushbutton or footswitch keyboard			B6738097009
Connecting cable of 3 E4N columns to pushbutton or footswitch keyboard			B6738097010
Connecting cable of 4 E4N columns to pushbutton or footswitch keyboard			B6738097011
Connecting cable of 5 E4N columns to pushbutton or footswitch keyboard			B6738097012
Power supply cable (L= 2 m)		JP / USA	B4709009003
		WITHOUT PIN	B6739696566
		ITALY	B4709009002
		F/D	B4709009001
Power jumper cable from E4N to E4N			B4709009004
Adapter extension from Lumberg S3 to 6 pin connector on E4N for LVDT input (L= 400 mm)			B6738536000
Support stand (for up to 5 columns)			B6131410040
Support stand link studs (2 required for each additional module)			B1529040210
Card with adhesive stickers (Graphic symbols)			B1529040460
Air filtering and adjusting unit			B2915490053
2 x 90° quick clutch nipple			B2915490052
2 x straight quick clutch nipple			B2915490050
Sensitivity adjustment knob cover			B1015420614
Sensitivity and zero adjustment knob cover			B1015420615

X = 3 SW release 4.0; 5 SW release 2.72; 6 SW release 6.3 allowing elaboration and visualization of up to four measurements.

DUO

THE PREMIUM
AFFORDABLE
DISPLAY UNIT

Indicators and electronic display units

Duo™ is a premium 4.3'' electronic display unit allowing to perform simple measurement applications intuitively and rapidly.
As small as a smartphone, Duo is a powerful and ultra compact gauge computer.

Designed in response to customer needs, it is a "something in-between" display unit that provides premium features at an affordable price.

DUO Basic

Optional Fieldbus modules

DUO Bus

Duo is well-suited for simple manual applications when only a few measurements are needed on the shop floor at any given time. Featuring two sensor input channels, it can simultaneously display two measurements. The system is easy to configure and provides clear visualization of measurement status.

Duo is designed to work with Marposs LVDT and HBT manual gauges, such as bore gauges M1 and M1 Star, snap gauges M3 Star, ring gauges M4 and M4 Star, and RedCrown/RedCrown2 displacement sensors with a measuring range up to ± 10 mm. It is the perfect ensemble with Duo Air™, an analog A/E converter box that provides one or two LVDT output signals, offering a premium solution for air measuring devices. It can also connect HBT sensors from Tesa.

Data collected can be stored internally in the Micro SD memory providing powerful memory capacity, exported through the USB port, the RS232 port or the optional Fieldbus port.

Duo software guarantees a friendly and easy to use operator interface. The true flat touch-screen allows to program and acquire measurements without any additional input/command device. A data trigger can be made also with the external signal of a footswitch or with a data request from the host PC, through a serial or fieldbus protocol.

Easier cycle management through 2 IN (Start/Stop, zeroing), 2 OUT (part good or scrap) and one separate input for a footswitch.

Designed also for portable use, it can be powered by an external battery (at least 16000 mAh to guarantee one working shift).

TECHNICAL SPECIFICATIONS

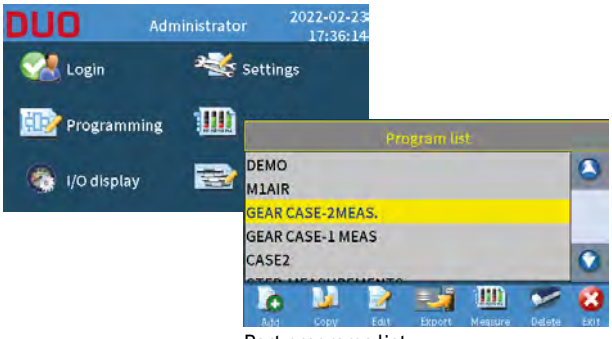
Main hardware characteristics	
Case	Robust industrial Aluminum case
Protection	IP54 on front panel; IP40 on rear panel
Touch screen	Capacitive, true flat
Storage media	Internal 4 GB Micro SD memory or removable USB memory device
LCD display tape	4.3" color TFT
Ethernet/Fieldbus	Available types are Ethernet/IP, Profibus, Profinet
Usb ports	1 x type B (only for power supply) + 1 x type A
Serial port	1 x RS232C + 1 x RS485
Bench-top support	Reclinable
Power supply	5V 1.4A
Dimension	130 x 95 x 50 mm (5.12" x 3.74" x 1.97")
Weight	1 kg
Operating temperature	5 to 45 °C (41 to 113 °F)
Storage temperature	-20 to 70 °C (-4 to 158 °F)

Product **features**

Single measurement

Multiple measurement

Home



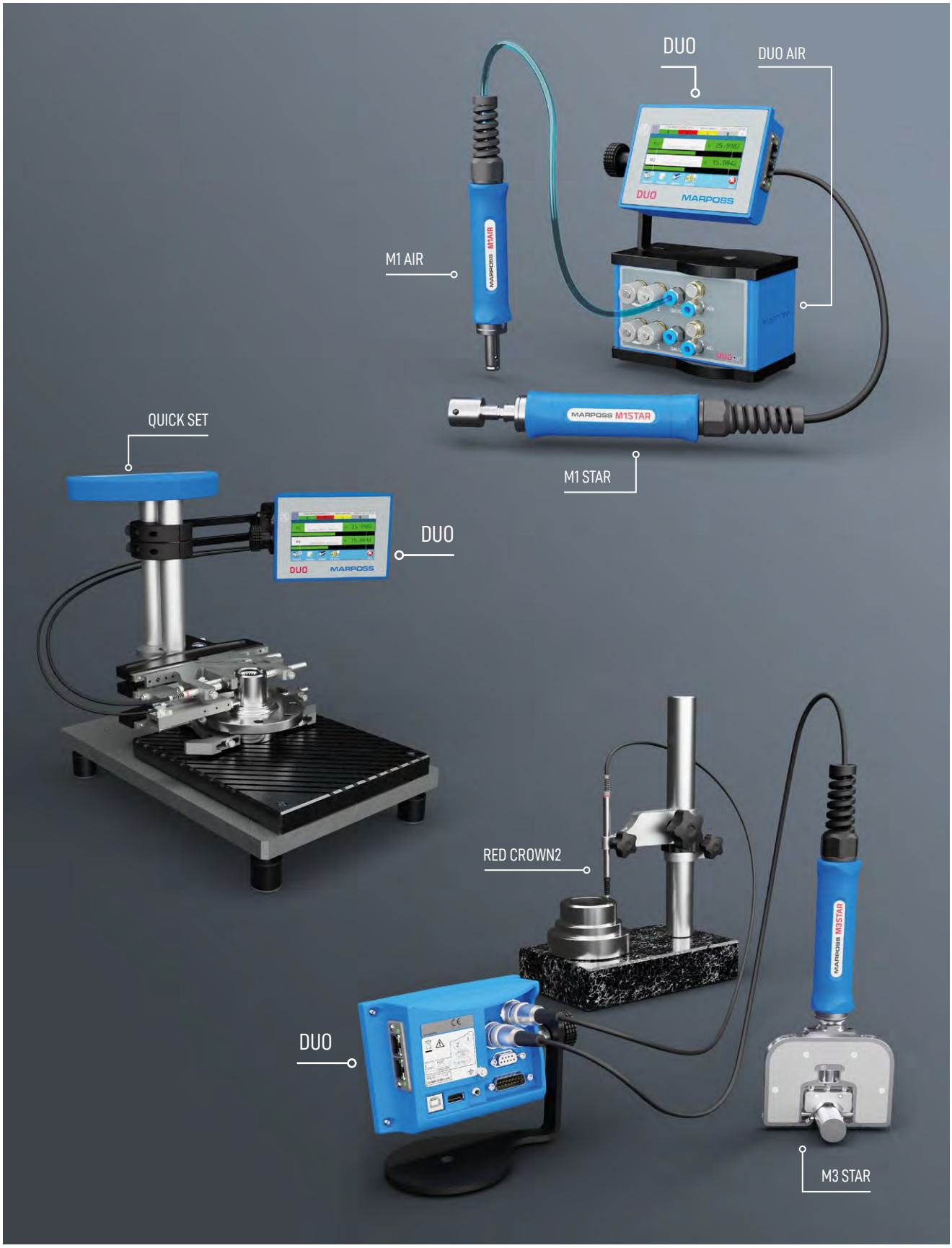
Part programs list

- Measurement capability up to 2 characteristics.
- Part counters.
- Dynamic acquisitions [Max, min, Range, Range/2, Average].
- Multiple zero setting modes (Zeroing / Sensitivity adj. / Zeroing & Sens. adj.).
- Multiple measurement display with numeric and graphical layout.
- Acquisition command through external signal (footswitch) or touch-screen.
- Measurement data transmission through Fieldbus (option), serial protocols or serial keyboard emulation.
- Remote data storage and export through removable USB memory device.
- Data storage format: .CSV (Microsoft® Excel Comma Separated Values), .DFQ (K-fields).
- Multi-language support for: English, Italian, German, French, Spanish, Portuguese, Swedish, Romanian, Dutch, Polish, Magyar, Czech, Russian, Taiwanese, Turkish, Japanese, Chinese, Korean.
- Programming interface designed to be used with touchscreen.
- Configuration Backup-Restore-Update by USB memory devices.
- Password protected multi-user management.

HOW TO ORDER

Description	Order code
DUO Basic for LVDT/HBT/Tesa HBT sensors	B830DUOD001
DUO Bus for LVDT/HBT/Tesa HBT sensors, with Profibus module	B830DUOD043
DUO Bus for LVDT/HBT/Tesa HBT sensors, with Profinet module	B830DUOD044
DUO Bus for LVDT/HBT/Tesa HBT sensors, with Ethernet/IP module	B830DUOD045
Footswitch with 2 m cable for data triggering function	B6131000110

Application examples



NEMO

SUBCOMPACT
EMBEDDED
GAUGE COMPUTER

Indicators and electronic display units

Nemo™ is a compact, robust and reliable gauge computer with 5.7" TFT touch screen display that has been designed for simple measuring applications with up to 16 sensors and 8 characteristics. It allows to perform simple measurement applications intuitively and rapidly.

Nemo is capable of acquiring data from traditional and wireless measurement devices and storing them locally in the built-in micro SD card or uploading them to a LAN network.

NEMO

2 USB

This version allows the connection of two Easy Box interfaces or Red Crown2 USB probes or USB dongles for wireless gauges.

NEMO

DIGI CROWN BOX + 2 USB

This version features three serial bus connectors for Digi Crown boxes and 2 USB ports for Easy Box interfaces or USB dongles for wireless gauges.

NEMO

8 USB

This version allows the connection of up to eight Easy Box interfaces or Red Crown2 USB probes or USB dongles for wireless gauges.

TECHNICAL SPECIFICATIONS

Main hardware characteristics	
Case	Robust industrial-grade plastic case
Protection	IP 54 on front panel; IP 40 on rear panel
LCD display type	5.7" color TFT
Touch screen	4 wire analog-resistive
Storage media	4 GB Internal SD Micro card
Ethernet lan	2 x 10/100 Mbps RJ45 connector
Digi Crown network	3xRS485
USB ports	2/8 x type B + 1 x type A
Serial port	1 x RS232C
Bench-top support	Reclinable
Dimensions	160 x 138 x 33 mm (6.3" x 5.4" x 1.3") L x H x D
Operating temperature	5 to 45 °C (41 ÷113 °F)
Storage temperature	-10 to 55 °C (14 ÷131 °F)

Product **features**

Main page

Multiple bargraph display

Settings

Characteristics programming

- Collecting data from a wide range of measurement devices, made by Marposs or third-parties, via USB, RS232, RS485 or Bluetooth;
- Multiple measurement display with numeric and graphical layout
- Acquisition command through external signal (footswitch, push buttons) or touch-screen
- Part counters
- Remote data storage through Ethernet LAN (Integrated FTP Server) or removable USB memory device
- Data storage format: .DFQ (Q-DAS® qs-STAT®) and CSV (Microsoft® Excel Comma Separated Values).
- Multi-language support for European and Asian languages
- Programming interface designed to be used with touch-screen
- Configuration Backup-Restore-Update by USB memory devices or through Ethernet LAN
- Password protected multi-user management.

HOW TO ORDER

Description	Order code
NEMO DIGI CROWN BOX + 2 USB	B830NA00002
NEMO 2 USB	B8830NA00011
NEMO 8 USB	B830NA00031
FOOTSWITCH with 2 m cable for data triggering function	B6738099035

Application examples

MARPOSS

MERLIN LINE

GAUGE COMPUTERS FOR MANUAL MEASUREMENTS

Indicators and electronic display units

Merlin line (Merlin™, Merlin Plus™ and Merlin Plus Box™), represents a range of solutions perfectly suitable for every needs in manual measurements. The Plus versions add powerful capabilities to the intuitive and user friendly interface of the Merlin thanks to the management of statistic, customizable measurements pages and detailed reports.

MERLIN

Small and robust, 8.4” display SVGA with 4:3 ratio, touch screen, True flat option;

Fanless and diskless;

Vesa 75 compliant;

N.5 USB 2.0 (including n.1 internal suitable for BT antenna);

N.1 10/100 Mbps RJ connector;

N.1 RS232 ports;

Table support and power supply included.

MERLINPlus

Compact and sturdy, 12.1” display with 4:3 ratio, XGA True flat, touch screen;

Fanless and diskless;

Vesa 75 compliant;

N.6 USB 2.0 (including n.1 internal suitable for BT antenna) ;

N.2 10/100/1000 Mbps RJ connector;

N.1 RS232 ports;

Table support and power supply included.

MERLINPlus Box

PC box in a sealed enclosure, without display;

Connectable to any DVI or VGA-compatible screen, with or without an integrated touch screen;

Fanless and diskless;

N.6 USB 2.0;

N.2 10/100/1000 Mbps RJ connector;

N.1 RS232 ports;

Table support and power supply included.

Product **features**

All the versions have the capability of:

- collecting data from a wide range of measurement devices, made by Marposs or third-parties, via USB, RS232, Ethernet or Bluetooth;
- standard multiple measurement display;
- data traceability;
- multi-language support for European and Asian languages;
- managing batches, data segregations, part counters and data storage in QDAS® (DFQ) or CSV format (including remote export through Ethernet LAN);
- multi-user password-protected management;
- statistical analysis with graphic display and numeric summary;
- Gauge Capability and R&R studies facilities.

The Plus versions have:

- customizable measurement pages;
- increased number of characteristics per each Part Program (up to 250);
- increased number of fields for data traceability;
- possibility of fast dynamic acquisitions (up to 4000 samples/s);
- multi monitor management (up to 3 additional monitors);
- reports management in PDF format;
- printing capabilities;
- configurable QR Code management to select batches, to read K-Fields, to start cycle and more;
- additional devices connectable (e.g. Aeroel gauges, Gagepod™);
- easier integration in a company network.

Application examples

TECHNICAL SPECIFICATIONS

Main hardware characteristics			
	MERLIN	**MERLIN PLUS**	**MERLIN PLUS BOX**
Case	Plastic	Aluminium	Plastic
Protection (front panel)	IP65		IP54
Touch screen	4 wire analog-resistive	5 wire anti-reflection	External DVI connection
LCD Display Type	8.4" 4:3 SVGA, True flat option	12.1" 4:3 XGA True Flat	-
Storage media	eMMC 4GB	mSATA 60/120/240 GB	SATA 2 60/120/240 GB
Ethernet LAN	1x 10/100 Mbps RJ45 connector	2x 10/100/1000 Mbps RJ45 connector	
USB ports	4 Host + 1 Internal	5 Host + 1 internal	6 Host
Serial Port	1xRS232C		
Bench-top support	Reclinable - VESA75 compliant		Fixed – DIN rail
Power supply	24Vdc (18 ÷ 36 Vdc)		
Relative humidity	5 to 80 % (non-condensing)		
Operating temperature	0 to 50		
Dimensions LxHxD	230x180x45 mm (9"x7"x 1.8")	324x323x200 mm (12.8"x12.7"x 7.9")	200x185x86 mm (7.9"x7.3"x 3.4")
CPU	ARM9TM 1 GHz	Intel Bay Trail J1900 2.0 GHz	

HOW TO ORDER

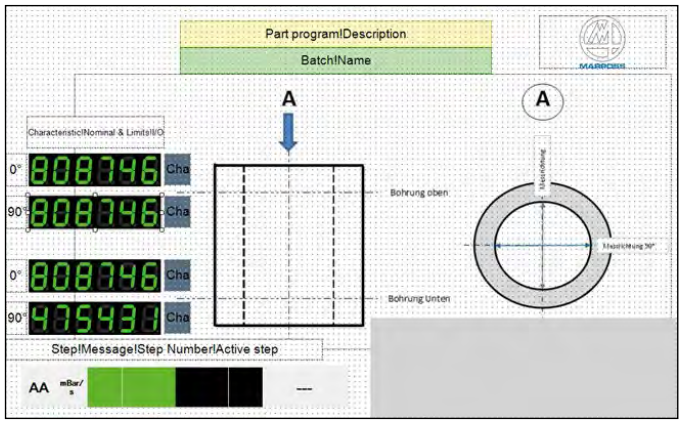
Description	Order code
MERLIN - Windows CE7, True flat, Western Operating System	B830MEADD01
MERLIN - Windows CE7, Western Operating System	B830MEADD00
MERLIN – Windows CE7, Japanese Operating System	B830MECDD00
MERLIN – Windows CE7, Korean Operating System	B830MEEDD00
MERLIN – Windows CE7, Chinese Operating System	B830MEFDD00
MERLIN PLUS – Windows 7P multi-language 2GB RAM, 60 GB SSD (*)	B830MPMEIC0
MERLIN PLUS – Windows 10 IoT multi-language 4GB RAM, 60 GB SSD	B830MPMFIC0
MERLIN PLUS – Windows 10 IoT multi-language 8GB RAM, 120 GB SSD	B830MPMFJD0
MERLIN PLUS BOX – Windows 7P multi-language 2GB RAM, 60 GB SSD	B830MBAABA0
MERLIN PLUS BOX – Windows 10 IoT multi-language 4GB RAM, 60 GB SSD	B830MBBBBB0
MERLIN PLUS BOX – Windows 10 IoT multi-language 8GB RAM, 120 GB SSD	B830MBBBCC0
MERLIN PLUS BOX – Windows 10 IoT multi-language 8GB RAM, 240 GB SSD	B830MBBBDC0

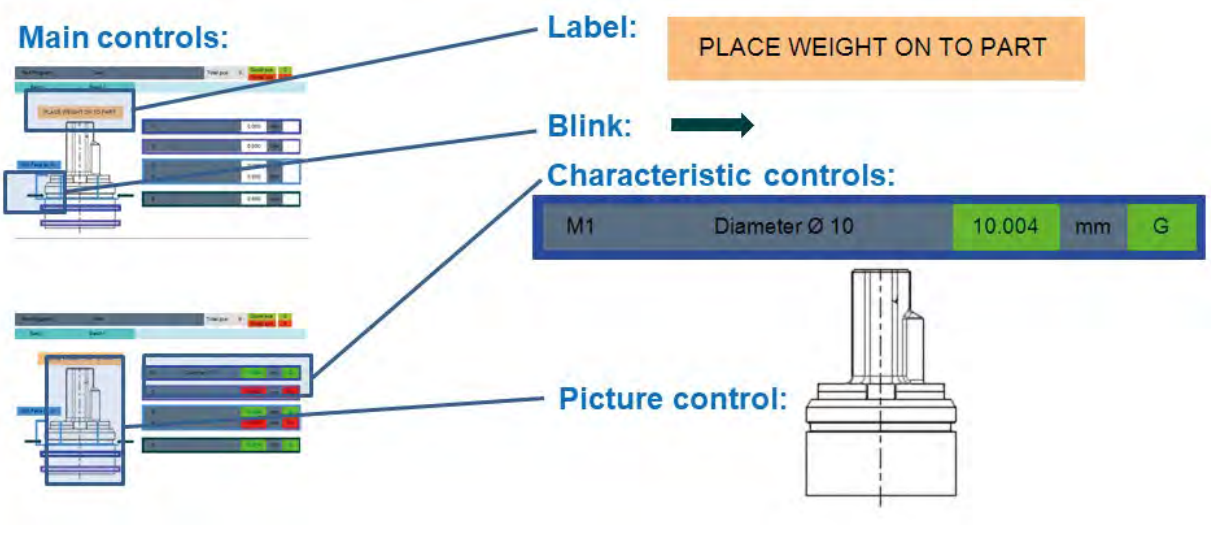
(*) preferably use the Windows 10 equivalent code B830MPMFIC0

MERLINPlusDesigner

Merlin Plus Designer™ can be used to create files that can be read from the Merlin Plus software so to customize the Measure pages, using various available objects such as measuring bars, images, blinking objects, graphs, charts or many others.

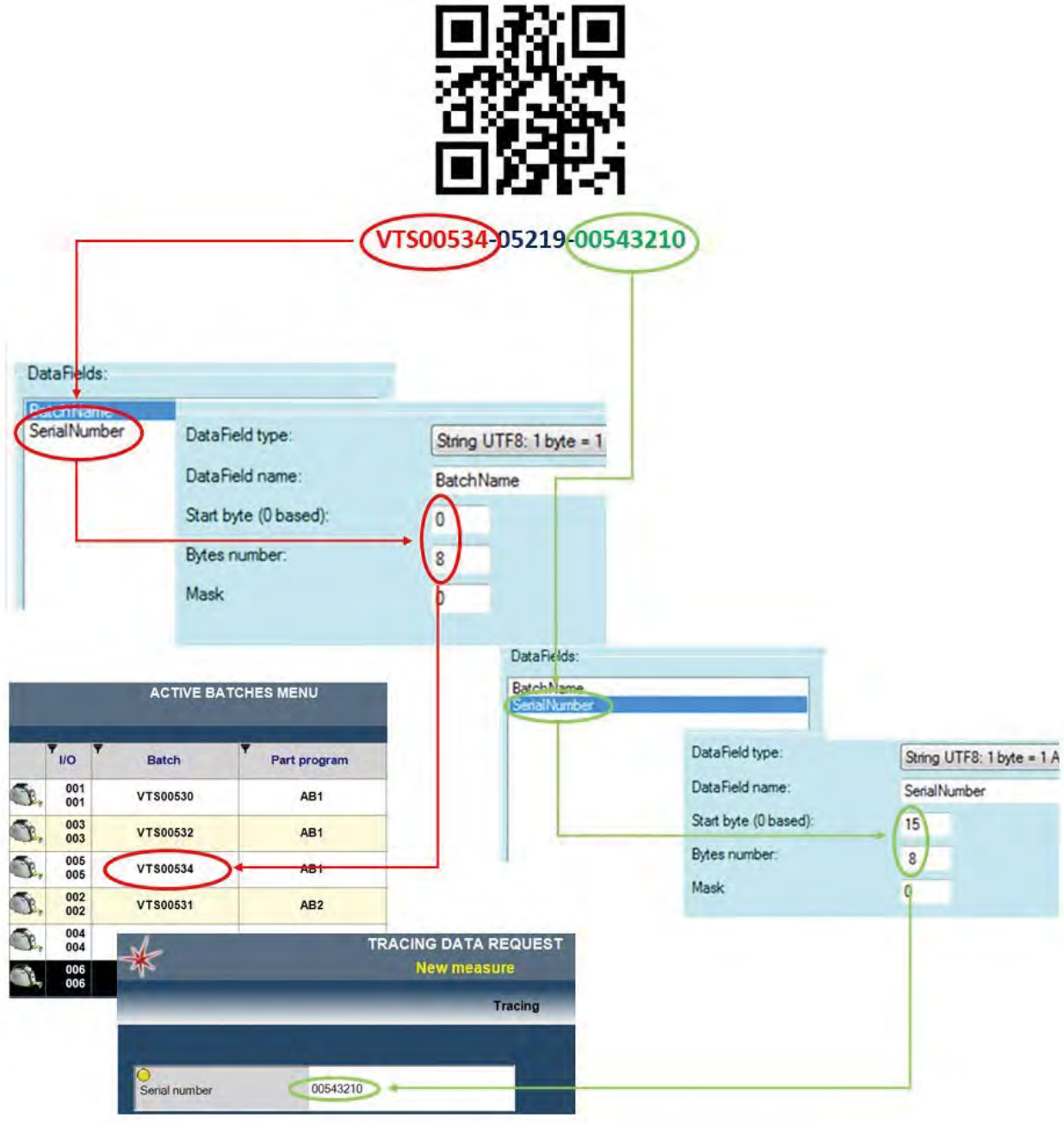
Customizing each Part program or each step with dedicated pages, can help in clarifying the measure steps or in guiding the operator, thus avoiding errors in keeping production under control.





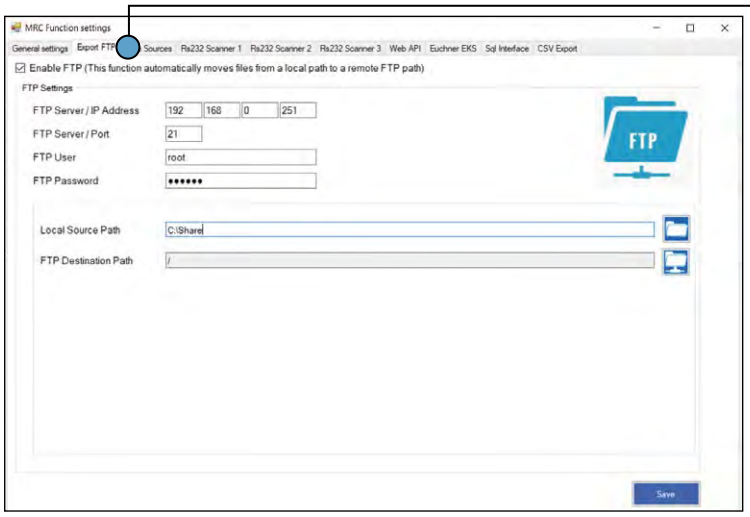
MRC (Marposs Remote Controller)

MRC is a software that runs in background, connected to the Merlin Plus software and can be used to easily configure various behaviours like QR Code / Barcode readers management and FTP or SQL export management.

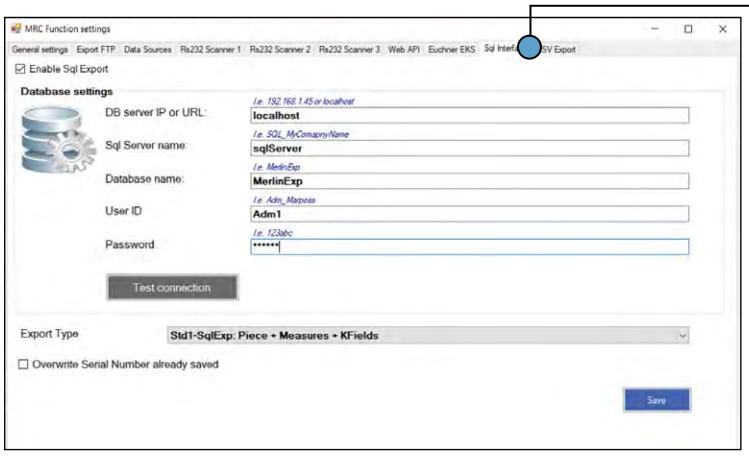


Selecting parts of the string, different functions are activated.

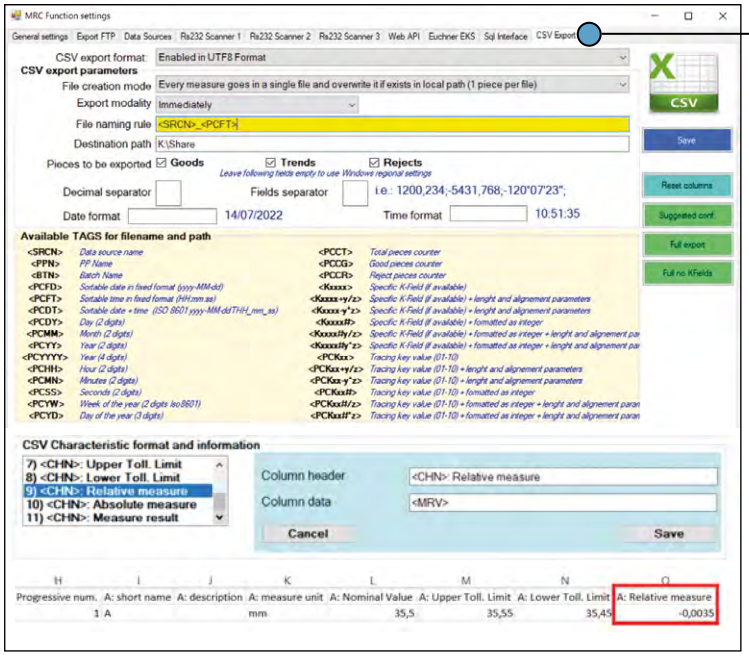
Export of files to a remote path via FTP



Export of files to an SQL Server



Configuration of exported CSV files



E9066
LINE

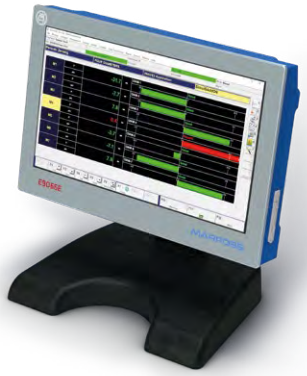
INDUSTRIAL
GAUGING
COMPUTERS

Indicators and electronic display units

The **E9066™** line of Industrial Computers is designed from the ground up to withstand harsh working environments and day-to-day operational abuse. Fanless, maintenance-free industrial PCs housed in factory-tested enclosures ensure the durability and reliability needed to meet any factory requirement. **E9066** industrial computers are seamlessly combined with **GagePod™** Data Acquisition modules and the **Quick SPC™** software suite for gauging applications, Process & Quality control, Factory Automation and real-time SPC.

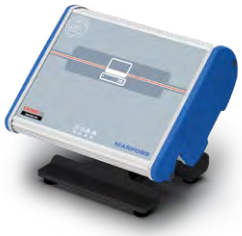
E9066T

True-flat touchscreen (5-wire resistive or multi-touch capacitive);
Display: 15” to 19” (4:3); 15.6” to 24” (16:9); Blind-panel (no display);
Fanless and diskless;
Panel-mount, bench-mount or swing-arm; wall & DIN-rail mount: pedestal;
6 USB ports;
4 Ethernet Gigabit ports;
1 RS232 port;
Industrial Fieldbus communication modules (e.g. Profibus®, Profinet®, EtherNet/IP™);
Integrated, on-board UPS with an industrial-grade battery pack;
Additional Ethernet, USB/Serial ports and PCI/PCIe expansion slots.



E9066E

True-flat 15.6” touchscreen;
Fanless and diskless;
Panel-mount, bench-mount or swing-arm;
5 USB ports;
2 Ethernet Gigabit ports;
1 RS232 port;
Industrial Fieldbus communication modules (e.g. Profibus®, Profinet®, EtherNet/IP™);
Integrated, on-board UPS with an industrial-grade battery pack.



E9066Ebb

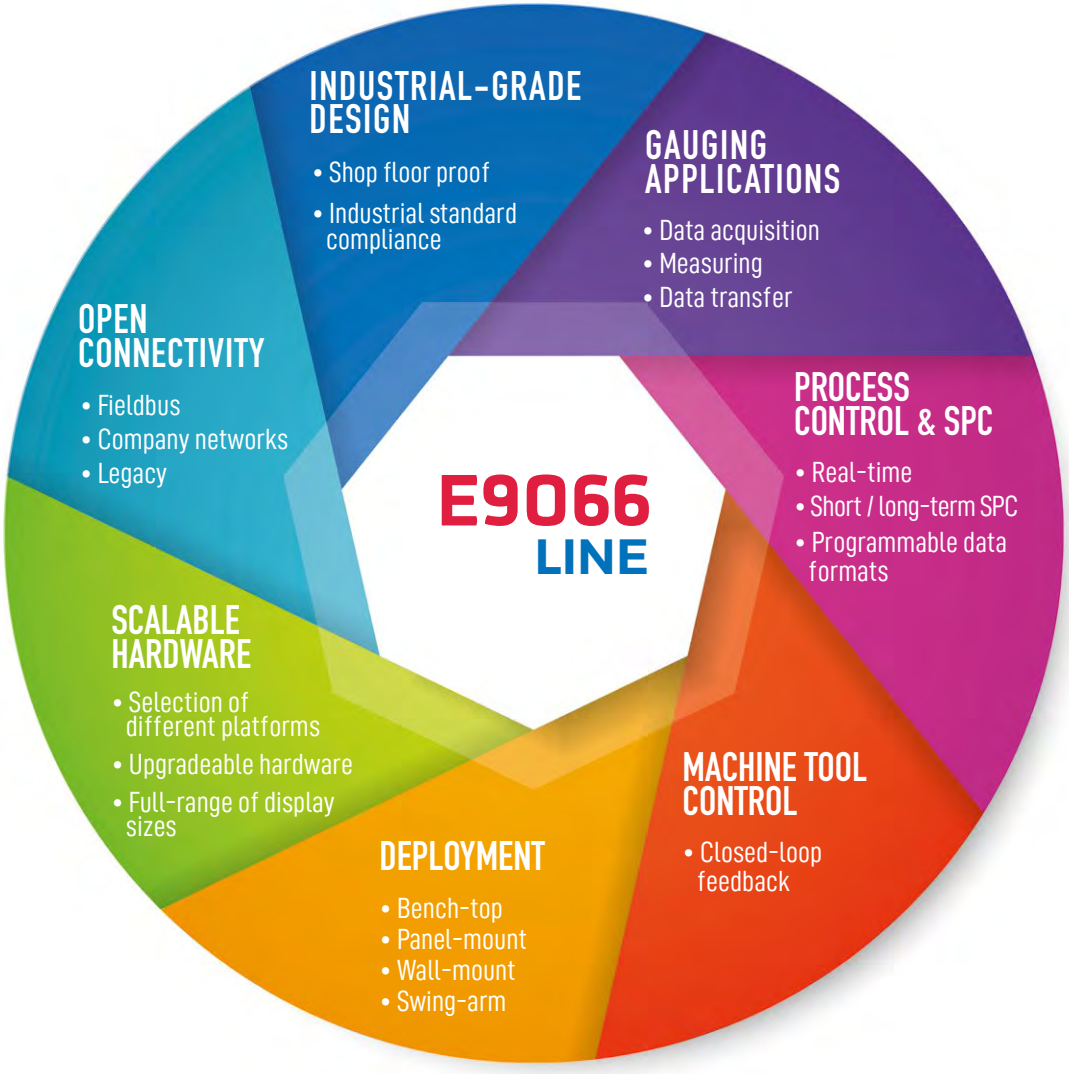
‘Barebone’ PC-in-a-box in a sealed enclosure, without display;
Connectable to any DVI or VGA-compatible screen;
Fanless and diskless;
6 USB ports;
2 Ethernet Gigabit ports;
1 RS232 port;
Table support and power supply.

Product **features** and **benefits**

E9066T™ : our top-of-the-line Industrial Computer, designed for mission-critical gauging applications, representing a truly innovative family of modular and reliable industrial computers for data collection, Industrial Control and Production/ Factory Automation.

E9066E™ : provides an efficient and cost-effective solution for Data Collection, Industrial Control and Production/Factory Automation. It is a diskless and totally fanless computer system, in a sealed, compact and shop-floor proof enclosure

E9066E-bb™ : a highly compact solution, well suited for space-constrained applications. This blind industrial computer is a stripped-down 'barebone' version of the E9066E, offering the flexibility to connect a display of any size.



INDUSTRIAL-GRADE DESIGN
- withstands the abuse of severe shop floor environments;
- compliance to international industrial standards for EMC, safety and noise immunity.

GAUGING APPLICATIONS
- from simple, manual gauging up to complex automatic gauging applications;
- real-time data acquisition and measuring applications from Easy Box™ GagePod™ and third-party data acquisition systems;
- data formats: standard (txt; csv...), industry (e.g. qs-stat®) and customer-specific.

INDUSTRIAL PROCESS CONTROL & SPC
- real-time;
- short / long-term SPC (Statistical Process Control);
- programmable data formats and data transfer strategies (user-defineable).

MACHINE TOOL CONTROL
- closed-loop machine tool feedback.

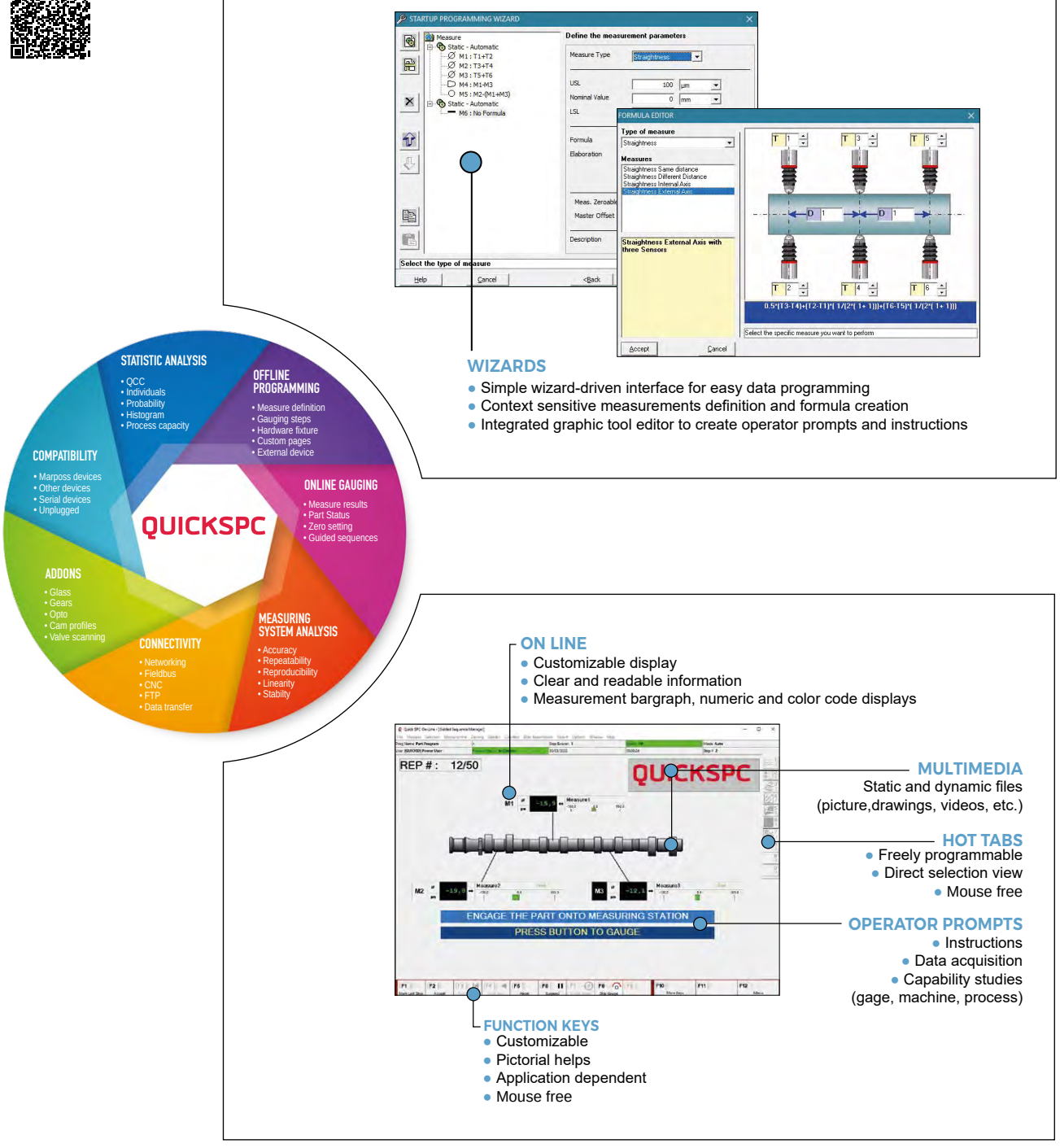
DEPLOYMENT
- bench-top / panel-mount / wall-mount /swing-arm.

SCALABLE HARDWARE
- selection of different platforms: INTEL® edge-computing IoT processors and high-end Core™ series;
- upgradeable hardware;
- full-range of display sizes.

OPEN CONNECTIVITY
- fieldbus (e.g. Profinet®, EtherNet/IP™ Profibus®...);
- company networks & Industry 4.0 protocols (e.g. OPC-UA...);
- customer-specific protocols.

RELIABILITY AND CONSISTENCY
- complete and comprehensive "measurement chain" of single-source components and applications from Marposs;
- consistent, scalable solutions from a single partner that ensures continuity of supply over time, and long-term technical support;
- easy-to-use technologies for all application needs.

QUICK SPC Software Suite



Quick SPC Measurement & SPC is a suite of software modules designed to meet any need, from simple measurement acquisition to complex gauging applications.
Framed by a simple, wizard-driven, common user interface, it is possible to complement the base product with software Add-ons specifically designed for specialized industries.
Combined with any **E9066** Industrial Computer and **GagePod™** Distributed Data Acquisition module, **Quick SPC** provides a complete and comprehensive 'measuring chain' composed of single sourced components and applications from Marposs, ensuring reliability and consistency along the supply chain.

TECHNICAL SPECIFICATIONS

Main hardware characteristics			
	E9066E-bb (barebone)	**E9066E**	**E9066T**
Technology			
Motherboard	All-in-one motherboard	All-in-one motherboard	All-in-one motherboard
Processor	INTEL® J1900 Quad Core 2.0GHz - 64 bit	INTEL® J1900 Quad Core 2.0GHz - 64 bit	INTEL® Core™- i7 / i5 / i3 (64bit)
RAM (min - max)	2GB - 8GB	2GB - 8GB	4GB - 32GB
SSD	128GB (min)	128GB (min)	128GB (min)
Operating System	Windows 10 IoT Enterprise	Windows 10 IoT Enterprise	Windows 10 IoT Enterprise
LCD Type & Size	n.a.	15.6 TFT	15/17/19/15.6/18.5/21.5/24 TFT
Resolution	n.a.	HD (1366x768) Full HD (1920x1080)	from XGA (1024x768) to Full HD (1920x1080)
Aspect ratio / Contrast	n.a.	16:9 / 900:1	4:3 / 16:9 - 700:1 / 1000:1
Brightness & Backlight	n.a.	400 cd/m^2 (400 nit) - LED backlight	450 - 350 cd/m^2 - LED backlight
Screen / touch	n.a.	True-flat, impact resistant & anti-glare 5 wire analog-resistive	True-flat. Impact resistant & anti-glare 5-wire resistive / multitouch capacitive
Protection	IP54 on front	IP65 on front	IP66 on front
Power supply	nominal 24Vdc (18Vdc ÷ 36Vdc)	nominal 24Vdc (18Vdc ÷ 36Vdc)	nominal 24Vdc (18Vdc ÷ 36Vdc)
Connectivity			
Ethernet ports	2 x 1Gbps (RJ45)	2 x 1Gbps (RJ45)	4 x 1Gbps (RJ45)
USB ports	6 x USB 2.0	2 x 2.0 (side); 2 x 2.0 (rear); 1 x 3.0 (rear)	1xUSB 2.0 (front); 2xUSB 3.0 (rear) 3xUSB 2.0 (rear)
Serial port	1 x RS232C (DBSUB9)	1 x RS232C (DBSUB9)	1 x RS232C (DBSUB9)
Compact Flash	n.a.	1 x Type I . SATA III	1 x Type I . SATA III
PS/2	n.a.	n.a.	1 (mouse/keyboard)
Video Out	DVI-I (DVI-D + VGA)	DVI-I (DVI-D + VGA)	DVI-D
Video out resolution	1920 x 1200 (24bit per pixel)	1920 x 1200 (24bit per pixel)	1920 x 1200 (24bit per pixel)
Options			
Bus expansion	n.a.	2 x miniPCI	2 x miniPCI
Fieldbus	n.a.	miniPCI. In alternative to 3rd Ethernet LAN	miniPCI
Ethernet ports (additional)	n.a.	1 x 1Gbps (RJ45). In alternative to Fieldbus	4 x Gbps (RJ45)
Serial port (additional)	n.a.	n.a.	1 x RS-232/422/485 (DBSUB15)
8 IN / 8 OUT	n.a.	miniPCI card	miniPCI card
UPS Uninterruptable Power Supply	n.a.	integrated on-board	integrated on-board
UPS battery pack	n.a.	Pb, 12V/13A max, 2500mA/h	Pb, 12V/13A max, 2500mA/h
Power supply unit	24Vdc AC/DC (option)	24Vdc AC/DC (option)	24Vdc AC/DC (option)
Mounting solutions			
Panel mount	n.a.	standard	standard
Benchmount	stand (option)	tilting stand	IP54 cabinet
Swing-arm	n.a.	VESA	on IP54 cabinet (RITTAL CP-xx)
Wall mount / DIN-rail	standard	n.a.	E9066T-BB PC box (no display)
Weight	2 Kg	9.5 Kg (PC + housing) 4 Kg (stand and base) 1.5 Kg (UPS battery pack)	6 Kg (PC) 12 Kg (9 kg cabinet + 3Kg stand) 1.5 Kg (UPS battery pack)
Environmental			
Relative humidity	from 5 to 80 % (non condensing)	from 5 to 80 % (non condensing)	from 5 to 80 % (non condensing)
Temperature (operating)	from 0 to 50 °C	from 0 to 50 °C	from 0 to 50 °C (SSD) / from 5 to 45°C (HDD standard)
Temperature (non operating)	from - 20 to 60 °C (-4 to 140 °F)	from - 20 to 60 °C (-4 to 140 °F)	from - 20 to 60 °C (-4 to 140 °F)

Product **portfolio**

Each **E9066** industrial computer running **Quick SPC** software can be easily connected to **GagePod**, **EasyBox** and other data acquisition and signal conditioning modules to provide complete, turnkey measurement applications for any need.

Application examples

DUOAir

ANALOG
A/E CONVERTER
BOX

Interface Boxes for Data Acquisition

Duo Air™ is an interface box for easy and economical management of a wide range of air gauges.

It can be supplied with one or two analog air-to-electronics converters with adjustable sensitivity and zeroing nozzles, to connect one or two Marposs and non-Marposs gauges respectively.

Product **features**

Each converter is supplying an LVDT output signal, which is conveniently managed by the Duo gauge computer to offer a compact and affordable solution for your measurement applications.

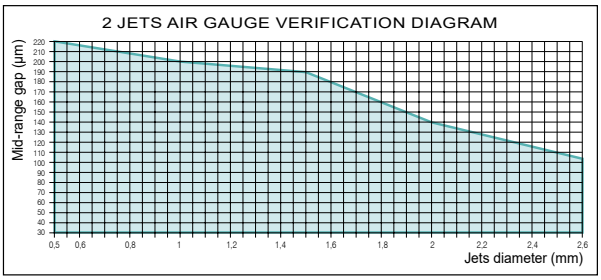
Duo Air is ideal for measurements with small tolerances, requiring high resolution (0.1 µm).

It is accurate, robust and versatile, accepting air gauges from different manufacturers.

Application **range**

The MARPOSS and non-MARPOSS air gauges, with specifications inside the blue area of the diagram, can be easily and immediately connected to Duo Air.
The parameters to be considered are the following:

- air supply pressure (3 bar ± 0.1)
- number of air gauge jets
- diameter of air gauge jets
- "mid-range gap", as to the difference between the mid-tolerance diameter of the part to be measured and the distance between the air gauge jets.



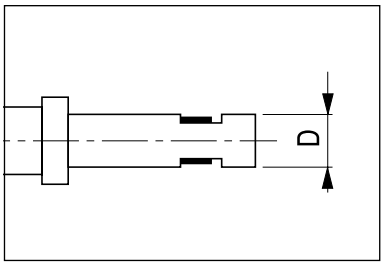
EXAMPLE OF MEASUREMENT WITH AIR-PLUG

- number of jets: 2
- diameter of jets: 2 mm (.0787")
- mid tolerance diameter of the part to be measured = 10 mm (.3937")
- distance between the jets D = 9.90 mm (.3898")

We obtain:

- "mid tolerance gap": (10 - 9.90) = 0.10 mm = 100 µm

As shown in the diagram the intersection between the value of the "mid-range gap", 100 µm (.0039"), and the diameter of the jet, 2 mm (.0787"), stays inside the blue area: the application can be therefore realized.



Description	Order code
Duo Air with 1 air transducer input	B830DUOA001
Duo Air with 2 air transducer inputs	B830DUOA000
Connecting cable from Duo Air to Duo (L = 0.3 m)	B6735932033
Connecting cable from Duo Air to Duo (L = 1.0 m)	B6735932026
Connecting cable from Duo Air to Duo (L = 2.0 m)	B6735932015
Connecting cable from Duo Air to Duo (L = 5.0 m)	B6735932016
Connecting cable from Duo Air to Duo (L = 10.0 m)	B6735932017
Duo Air 1 ch.+ Duo Basic (standard 0.3 m connecting cable from Duo Air to Duo included in the supply)	PSDUD01201
Duo Air 1 ch.+ Duo Ethernet/IP (standard 0.3 m connecting cable from Duo Air to Duo included in the supply)	PSDUD01211
Duo Air 1 ch.+ Duo Profibus (standard 0.3 m connecting cable from Duo Air to Duo included in the supply)	PSDUD01221
Duo Air 1 ch.+ Duo Profinet (standard 0.3 m connecting cable from Duo Air to Duo included in the supply)	PSDUD01231
Duo Air 2 ch.+ Duo Basic (standard 0.3 m connecting cables from Duo Air to Duo included in the supply)	PSDUD01200
Duo Air 2 ch.+ Duo Ethernet/IP (standard 0.3 m connecting cables from Duo Air to Duo included in the supply)	PSDUD01210
Duo Air 2 ch.+ Duo Profibus (standard 0.3 m connecting cables from Duo Air to Duo included in the supply)	PSDUD01220
Duo Air 2 ch.+ Duo Profinet (standard 0.3 m connecting cables from Duo Air to Duo included in the supply)	PSDUD01230

EASYBOX

USB
INTERFACE
BOXES

Interface Boxes for Data Acquisition

Easy Box™ is a line of interface boxes for easy and economical management via USB port of inductive and incremental transducers, air gauges, Digimatic and serial gauges, I/O signals, thermocouples.
It can be used with the MARPOSS compact gauge computers (Nemo™, Merlin™, Merlin Plus™) and Industrial PC (E9066 Line), or with any commercial Personal Computer.

EASYBOX

U4F-HR to connect up to 4 MARPOSS standard full-bridge (LVDT) transducers, for applications requiring a very high measurement resolution.

U4H to connect up to 4 MARPOSS standard half-bridge transducers (HBT).

U4T to connect up to 4 half-bridge transducers (HBT) compatible with amplifiers of TESA.

EASYBOX

U4E to connect up to three incremental transducers such as linear probes, linear and rotary encoders, etc.

EASYBOX

UA4D to connect up to 4 Digimatic gauges (such as Mitutoyo calipers, digital indicators, etc..).

EASYBOX

U4S to connect up to 4 gauges with RS232 output (cable shall feature Cannon 9-pin female connector).

EASYBOX

U3AIR , U1AIR, U4AIR with adjustable sensitivity and zeroing nozzles to connect one, three, four air transducers respectively.

EASYBOX

U4TP-E, U4TP-K to connect up to four thermocouples type E, K respectively.

EASYBOX

U8I/O managing 8 Input/Output powered 24Vdc.

EASYBOX

U4P pushbutton box for remote control of data acquisition, zeroing, etc.

Application **fields**

The Easy Box is suitable for static measurement acquisition or for continuous acquisition where the workpiece is rotated manually or automatically.

Data **Triggering**

The Easy Box continuously provides to the PC (via USB port) the values of the sensors connected to the box.
Whenever a data trigger is necessary, it can be made in one of the following ways:
- With the external signal of a footswitch connected to the Easy Box
- With a data request from the host PC
- With the data send button available on the Digimatic device

Software **Packages**

- MARPOSS DLL drivers library for Windows® operating systems, allowing to interface Easy Boxes with any Windows 10® (or higher release) compatible application program with minimum software programming skills.
- Easy Acquisition™ software package for data acquisition and SPC on Excel® worksheets: a complete and easy to operate software package to import data, program measurements, perform data collection and SPC analysis and reporting.
- MERLIN PLUS process and quality control software for Windows®, combining the ease of use and the abilities of the Merlin Plus™ gauge computer with the capability of running on customer PC with various display formats.
- Quick SPC™ process and quality control software for Windows®, a suite of software products designed to comply with any requirement ranging from simple measurement acquisition to complex gauging applications.

Technical Specifications	U4H	U4F-HR	U4T	U4E	U4D
Number of input channels	4			3	4
Type of input channels	MARPOSS standard Half-Bridge (HBT)	MARPOSS standard Full-Bridge (LVDT)	Half Bridge (HBT) compatible with Tesa amplifiers	Digital and analog incremental transducers (*)	Mitutoyo Digimatic compatible
Programmable measuring ranges Normal Range Long Range Extra Long Range	± 250 µm (0.01")/± 1000 µm (0.04") ± 500 µm (0.02")/± 2000 µm (0.08") ± 625 µm (0.025")/± 2500 µm (0.1")	up to ±1000 µm (0.04") up to ±5000 µm (0.20") up to ±1000 µm	up to ±2000 µm (0.08") up to ±5000 µm (0.2")	depending on the transducer used	depending on the Digimatic gauge used
Output type	1 x USB (connector type B)				
Output transmission speed	12 MBit / sec.				
Sampling rate	max. 40 samples /s	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)			max. 40 samples /s (depending on the Digimatic gauge used)
Accuracy at 20° C	± 0.5% of the measuring value ± resolution			depending on the transducer used	depending on the Digimatic gauge used
Power supply source	from USB port			from USB port or external power supply	from USB port or external power supply
Current requirement	<350 mA (§§)		<100 mA (§)	<300 mA (§§)	<100 mA (§)
Number of Easy Box connectable to one USB port	Max. 16				
Data triggering modes	external footswitch / host command			external footswitch/ host command/ RS422/ 485 signal / 24V optoInsulated input	external footswitch/ host command/ Data send button on gauge
Footswitch option	1 input for each box (female connector ø 3.5 mm stereo Jack plug on box rear side)			(***)	
Protection degree	IP40 (on front panel) IP30 (on rear panel)				IP30 (on both front and rear panel)
Storage temperature	-40 to +70 °C				
Operating temperature	0 to +50° C				
Dimensions W x D x H	157 x 90 x 45 mm (6.2" x 3.5" x 1.8")				
Weight	ca. 0.6 kg				

(*) Any digital encoder or linear scale featuring differential Line Driver output, 6.4 MHz max. frequency, requiring 5 V power supply.
Any voltage analog encoder or linear scale featuring 1 Vpp sinusoidal output, 250 kHz max. frequency, requiring 5 V power supply. Any current analog encoder or linear scale featuring 11 µA output, 250 kHz. max. frequency, requiring 5V power supply, by means of a specific adapter (not included in the supply).
(**) For any gauge other than Mitutoyo requiring an external power supply.
(***) Common with data control (9-pin D-Sub connector on the rear side).
(§) Max. 4 boxes of this type can be connected to a HUB powered by a USB port. For connection of more than 4 boxes a self-powered HUB is required.
(§§) To connect more than one box to a HUB a self-powered HUB is required.

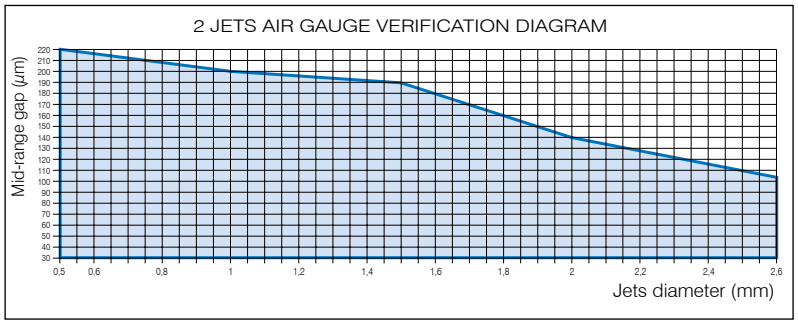
Technical Specifications	U4S	U1AIR(#)	U3AIR(#)	U4AIR(#)	U4TP-E	U4TP-K
Number of input channels	4	1	3		4	
Type of input channels	RS232	Air			Thermocouples type E	Thermocouples type K
Programmable measuring ranges Normal Range Long Range Extra Long Range	depending on the serial gauge used	±500 µm (0.02") ------ ------			0 - 100 °C	
Output type	1 x USB (connector type B)					
Output transmission speed	12 MBit / sec.					
Sampling rate	max. 40 samples /s (depending on the serial gauge used)	max. 40 samples /s (up to 1000 samples/s if used with Quick SPC)			max. 40 samples /s	
Accuracy at 20° C	depending on the serial gauge used	±0.5% of the measuring value ±resolution			±[0.6° + 0.2% (Tmeas.-T amb.)]	
Power supply source	from USB port					
Current requirement	<150 mA (§§)	<350 mA (§§)			<200 mA (§§)	
Number of Easy Box connectable to one USB port	Max. 16					
Data triggering modes	external footswitch / host command					
Footswitch option	1 input for each box (female connector ø 3.5 mm stereo Jack plug on box rear side)					
Protection degree	IP40 (on front panel) IP30 (on rear panel)					
Storage temperature	-40 to +70° C					
Operating temperature	0 to +50° C					
Dimensions W x D x H	157 x 90 x 65 mm (6.2" x 3.5" x 2.6")	157 x 103 x 65 mm (6.2" x 4.05" x 2.6")	224 x 159 x 150 mm (8.82" x 6.26" x 5.90")	224 x 159 x 150 mm (8.82" x 6.26" x 5.90")	157 x 90 x 45 mm (6.2" x 3.5" x 1.8")	
Weight	ca. 0.6 kg	ca. 1 kg	ca. 2.8 kg	ca. 3.8 kg	ca. 0.5 kg	

(#) Air supply: air must be dry and unoiled, filtered to 5 µm and at a pressure of 3 bar (the working range of the converter is 1,5 to 4 bar).
(§§) To connect more than one box to a HUB a self-powered HUB is required.

U1AIR / U3AIR / U4AIR APPLICATION RANGE

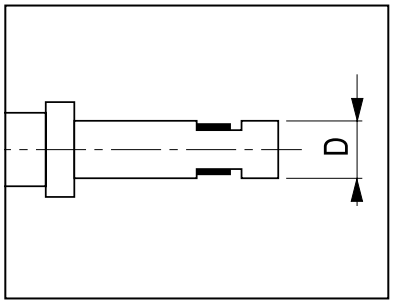
The MARPOSS and/or non-MARPOSS air gauges, with specifications inside the blue area of the diagram, can be easily and immediately connected to these models. The parameters to be considered are the following:

- air supply pressure
- number of air gauge jets
- diameter of air gauge jets
- "mid-range gap", as to the difference between the mid-tolerance diameter of the part to be measured and the distance between the air gauge jets.



EXAMPLE OF MEASUREMENT WITH AIR-PLUG

- air supply pressure: 3 bar ± 0.1
- number of jets : 2
- diameter of jets: 2mm (.0787")
- diameter of the part to be measured = 10 mm ± 0.030 (.3937" ± .0012")
- mid tolerance diameter = 10 mm (.3937")
- distance between the jets D = 9.90 mm (.3898")



We obtain:

- "mid tolerance gap": (10 - 9.90) = 0.10 mm = 100 µm
  As shown in the diagram the intersection between the value of the "mid-range gap", 100 µm (.0039"), and the diameter of the jet, 2 mm (.0787"), stays inside the blue area: the application can be therefore realized.

I/O MODEL

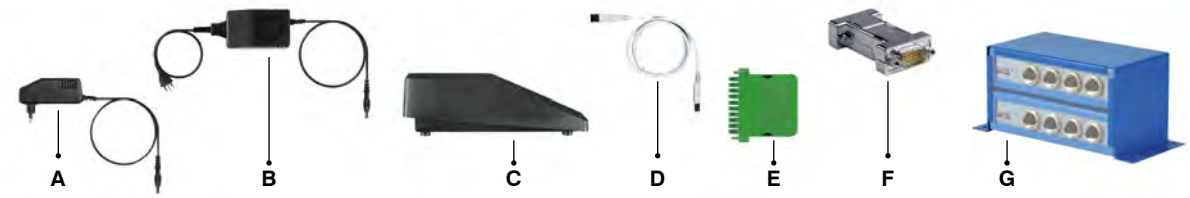
- 8 optoinsulated 24Vdc Input/Output, each free configurable as Input, Output or Input/Output.
- sink or source type I/O's (not in mix); the selection is made by means of a switch located on the rear side of the box
- output current for each Output can be (according to EN61131-2 Standard for Outputs in direct current at 24Vdc):
  max. 100 mA by use of 8 Outputs
  max. 250 mA by use of 4 Outputs
  max. 500 mA by use of 2 Outputs (available only for source type Output)
- The power supply for the Outputs (24Vdc for source outputs, 0V for sink outputs) can be interrupted for safety reasons without compromising the working of the Inputs.

U8 I/O

HOW TO ORDER

Description	Order Code
Easy Box U4F-HR (HIGH RESOLUTION) with 4 MARPOSS standard LVDT inductive inputs	B6871250022
Easy Box U4H with 4 MARPOSS standard HBT inductive inputs	B6871250000
Easy Box U4T with 4 HBT inductive inputs compatible with amplifiers of Tesa	B6871250030
Easy Box U4E with 3 incremental transducer inputs	B6871250090
Easy Box U1AIR with 1 air transducer input	B6871250101
Easy Box U3AIR with 3 air transducer inputs	B6871250111
Easy Box U4AIR with 4 air transducer inputs	B6871250122
Easy Box U4D with 4 DIGIMATIC inputs	B6871250012
Easy Box U4S with 4 RS232 inputs	B6871250060
Easy Box U4TP-E with 4 thermocouple inputs type E	B6871250080
Easy Box U4TP-K with 4 thermocouple inputs type K	B6871250086
Easy Box U8I/O with 8 INPUT/OUTPUT	B6871250050
Easy Box U4P pushbutton box	B6871250070

ACCESSORIES



Ref.	Description	Order Code
A	Power supply unit for Easy Box U4D, with EU plug (*)	B6871140155
	Power supply unit for Easy Box U4D, with U.S.A. plug (*)	B6871140156
	Power supply unit for Easy Box U4D, with U.K. plug (*)	B6871140157
A	Power supply unit for Easy Box U8I/O, with EU plug (**)	B6871140238
	Power supply unit for Easy Box U8I/O, with U.S.A. plug (**)	B6871140239
	Power supply unit for Easy Box U8I/O, with U.K. plug (**)	B6871140240
B	Power supply unit for Easy Box U4E, with EU mains cable	B6871140170
	Power supply unit for Easy Box U4E, with U.S.A. mains cable	B6871140171
B	Power supply unit for Easy Box U4D, with EU mains cable (*)	B6871140158
	Power supply unit for Easy Box U4D, with U.S.A. mains cable (*)	B6871140159
B	Power supply unit for Easy Box U8I/O, with EU mains cable (**)	B6871140238
	Power supply unit for Easy Box U8I/O, with U.S.A. mains cable (**)	B6871140239
C	Footswitch with 2 m cable for data triggering function (not for Easy Box U8I/O)	B6131000110
D	USB cable L= 1 m (type A-B) from Easy Box to the PC USB port	B4701300229
	USB cable L= 3 m (type A-B) from Easy Box to the PC USB port	B6871140239
E	Cable terminal for 10 pin connector of Easy Box U8I/O (one piece is always supplied in the packaging with the Easy Box)	B6872010015
F	Interface adapter for connecting analog current transducers feat. 11 µA output to Easy Box U4E	B6303540800
G	Protective and fixing case for 1 Easy Box type U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-K, U8I/O	B1502050600
	Protective and fixing case for 1 Easy Box type U1AIR or U4S	B1502050601
	Protective and fixing case for 2 Easy Box type U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-K, U8I/O	B1502050610
	Protective and fixing case for 3 Easy Box type U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-K, U8I/O or 2 Easy Box type U1AIR OR U4S	B1502050620

(*) For any gauge other than Mitutoyo requiring an external power supply.
(**) This power supply is required if the Easy Box U8I/O is not connected to an alternative 24V power supply.

Application examples

MARPOSS

DIGICrown
NETWORK SYSTEM

THE MOST FLEXIBLE
DIGITAL NETWORK FOR
GAUGING SOLUTIONS

Interface Boxes for Data Acquisition

DIGICrown™ is a digital network system for the acquisition of dimensional measurements using high precision sensors.
The modular system offers a high degree of standardization to the wide range of available interfaces for different input signals. This gives the product and end user an optimal ratio between performance and price.

Product **features**

DIGICrown system is a network that you can build with many different types of modules.
In combination with DIGICrown2™, pencil probes with high linearity performance, measurement applications with characteristics requiring superior accuracy can be achieved.
Sensors are available in standard and “soft touch” versions with spring or pneumatic push actuation and with measurement ranges from 1 mm up to 20 mm.
The main features of this network are:

- **Automatic recognition** of any DIGICrown2 model sensor makes the installation process easier and avoids possible programming errors when a sensor is changed for a different type or replaced.

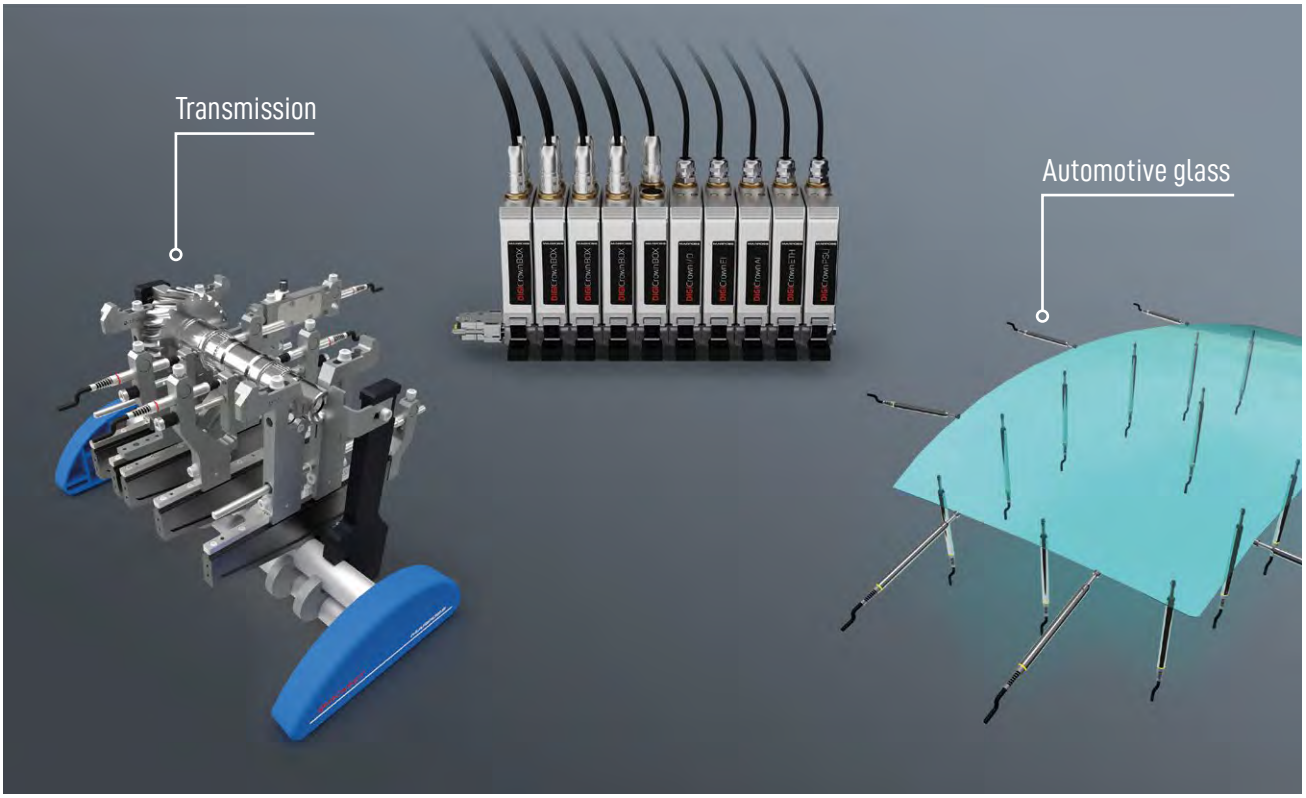
- **Mix of models**. Each sensor is equipped with identification data inside the connector, that the system recognizes, for a quick and easy connection to the relevant interface modules without any programming.

- **Modularity**. The same network different types of interface module modules to integrate various types of sensors such as LVDT/HBT (DIGICrown BOX), incremental linear scales (DIGICrown EI), analog signals (DIGICrown AI) and manage inputs/outputs (DIGICrown I/O).

- **Flexibility.** The network can be deployed with the optimal logistics to satisfy the application requirements on benches or measuring machines. The cost of the application is always directly proportional to the number of measurement points used.

DIGICrown Network System is based on a RS485 communication bus, providing safe and effective serial protocol suitable for industrial environments.
DIGICrown Network System interfaces PC (32bit or 64bit) or PLC via RS232, USB or Ethernet.

Application **examples**

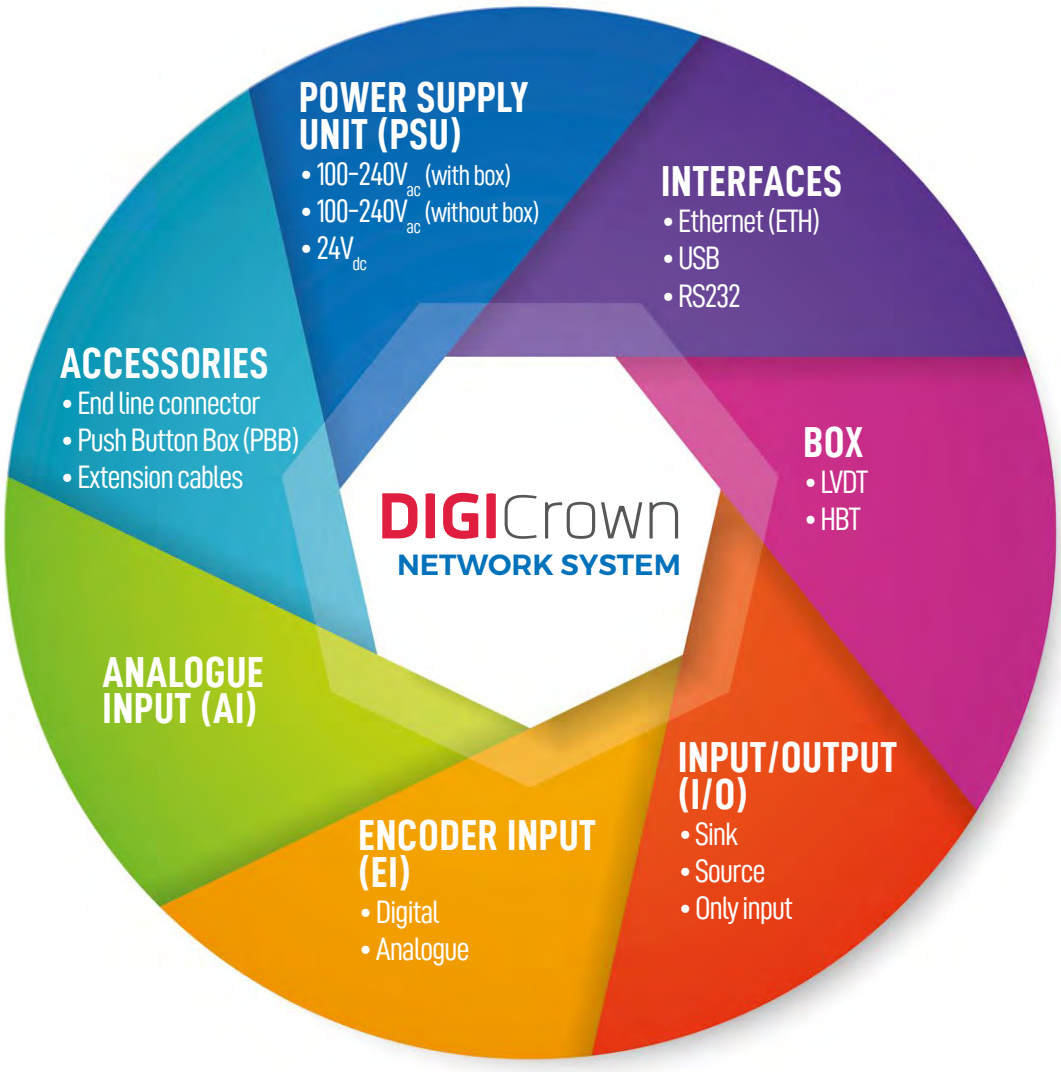


Performances

The system supports up to 744 sensors (62 sensors for 12 networks), all modules can be combined and mixed on the same network. This product is suitable for applications where 32bit or 64bit Windows operating systems are installed and employed. Dedicated software packages can solve measurement problems statically and dynamically using a mix of sensors types, while performing at acquisition speeds up to 4000 samples/sec with a synchronized DIGICrown Network System.

Product **mix**

Please refer to the below reported scheme in order to have the DIGICrown Network System product mix overview.



DIGICrown PSU

Power Supply Unit (PSU) 1. It is always in first module and supplies supply voltage to the complete network. It is available in 3 models, 2 types for 100-240V_{ac} (with or without box) and 1 type for 24V_{dc}.

DIGICrown ETH/DIGICrown USB/DIGICrown 232

The system can be connected to PC or PLC with three different interfaces. All these modules allow static or dynamic measurements acquisitions with synchronisation, for performance details please refer to the technical specifications table.

ETHERNET Interface (ETH) 2. The bus network baud rate is 2083 Kbps. In case of configuration with more than one network, the synchronization signal can be also extended to other networks (external synchronisation).

USB High Speed Interface (USB) 2. The interface creates a virtual COM Port. The bus network baud rate is 2083 Kbps.
In case of configuration with more than one network, the synchronization signal can be also extended to other networks through an additional cable (external synchronisation).

RS232 Interface (232) 2. The COM port baud rate is programmable up to 115.2 Kbps and the bus network baud rate is 625 Kbps.

DIGICrown BOX

Dual channel BOX 6. It allows the management of the entire Marposs DIGICrown probing line and all Marposs digitized sensors (A/E converter, D124, etc.). Please refer to REDCrwown2 line catalogue.
The DIGICrown BOX can acquire up to 4000 samples/s.

DIGICrown I/O

DIGICrown I/O interface 5. It is available in 3 versions with 8 Input/Output (sink or source) and only input (8 inputs). The inputs/outputs are opto-coupled, they can be singularly programmed as in or out. With this module it is possible to manage: solenoid valves (through power relays), acquisition of input signals by local cycle start/stop push-button panels, or acquisition of limit switch signals.

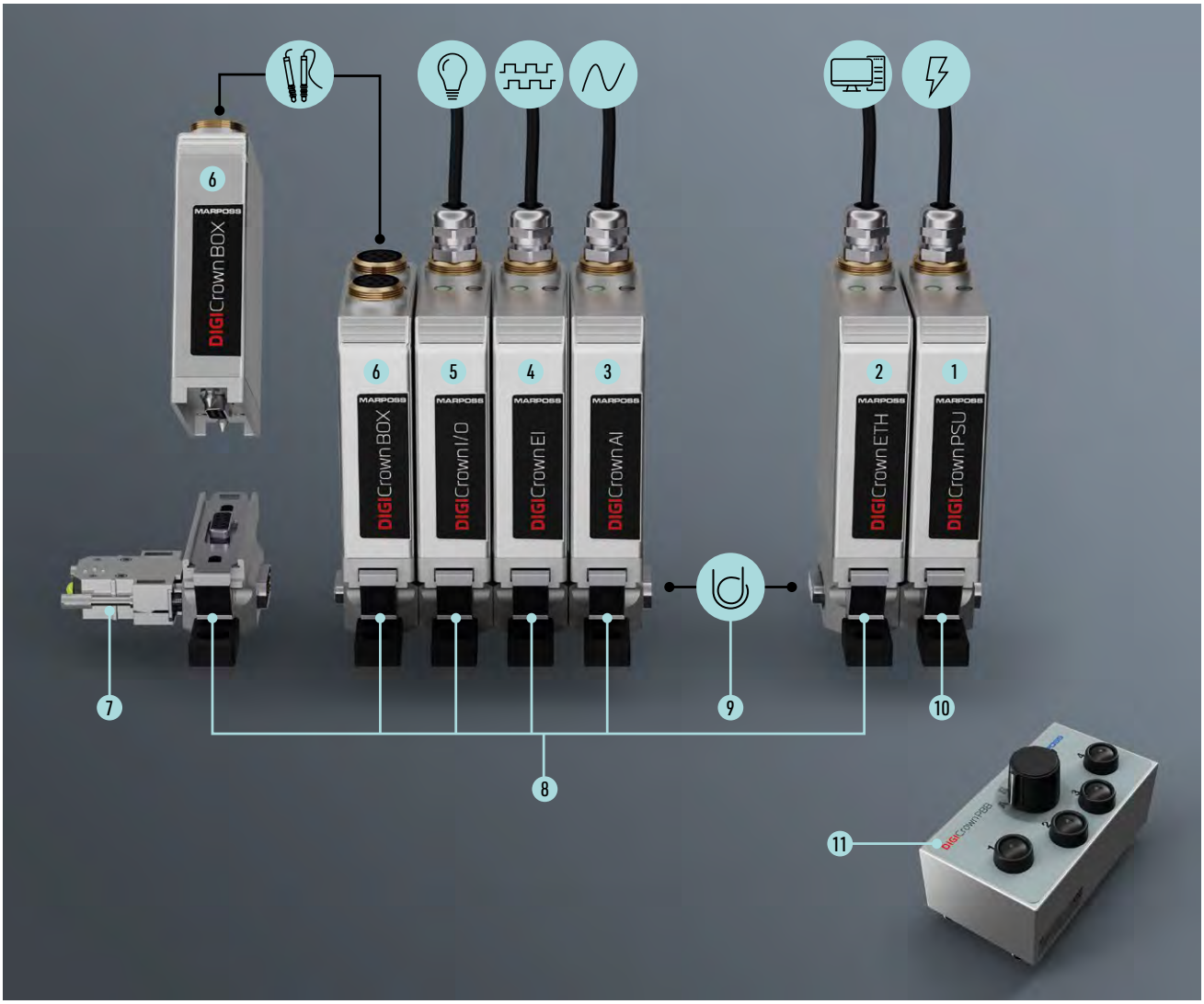
DIGICrown EI

Encoder Input (EI) 4. It is available in 2 models for analogue or digital, linear or rotary type encoders; spatial and temporal synchronisation are managed.

DIGICrown AI

Analogue Input (AI) 3. It allows to interface any third party sensor with voltage or current analogue signal.

HOW TO ORDER



INTERFACES

	Description	Order code
1	DIGICrown PSU 100-240 V_{ac} 7,5 V_{dc} 3A (with box)	B767W000001
	DIGICrown PSU 100-240 V_{ac} 7,5 V_{dc} 3A (Dsub9 - without box)*	B767W000011
	DIGICrown PSU (24 V_{dc} / 7,5 V_{dc})	B767W010000
2	DIGICrown ETH high speed sync	B767Y020500
	DIGICrown ETH high speed with external synchronisation (**)	B767Y020505
	DIGICrown USB high speed sync	B767Y010500
	DIGICrown USB high speed with external synchronisation (**)	B767Y010505
	DIGICrown 232	B767Y000100
3	DIGICrown AI	B767A000400
4	DIGICrown EI	B767E010500
	DIGICrown EI analog HSS	B767E100500
5	DIGICrown I/O sink	B767I000500
	DIGICrown I/O source	B767I010500
	DIGICrown I/O only input	B767I020500
6	DIGICrown BOX	B767X200400

(*) NOTE: This version does not require the usage of the DIGICrown PSC 10.
(**) External synchronisation means between two different DIGICrown networks

ACCESSORIES

	Description	Order code
7	End line connector	B6355200000
8	DIGICrown BUS	B6872030020
10	DIGICrown PSC (for DIGICrown PSU only)	B6872030021
11	DIGICrown PBB (Push Button Box)	B6139013200
	EU cable	B4147000016
	USA cable	B4147000017

EXTENSION CABLES

	Description	Order code
9	Connection cable 2 m	B6738057027
	Connection cable 3,5 m	B6738057029
	Connection cable 6 m	B6738057031
	Connection cable 10 m	B6738057033
	Connection cable 15 m	B6738057035

The **product**

DIGICrown is a flexible modular system that can be configured depending on the layout of the application. The network must always start with the power supply module in the first position (to supply all interfaces) and the communication interface (to the PC or PLC) in second place.
Starting from the third position up to the last (33rd), every interface can be used in the preferred order. Through the automatic configuration (feature available in the DIGICrown driver) it is possible to easily build the network and save the configuration file.
The network is now ready to be controlled from the Marposs acquisition software or to be integrated into third-party systems via dedicated software (Driver Library or SDK) or through ASCII serial protocol commands.

	POWER SUPPLY UNITS		
	PSU (100-240 V_{ac}) with box	PSU (100-240 V_{ac}) without box	PSU (24 V_{dc})
Scheme reference	1		
Order code	B767W000001	B767W000011	B767W010000
Max number of modules x net	up to 31 DIGICrown BOX (*) 8		up to 18 DIGICrown BOX (*) 8
Current consumption	-		0,8 A
Input	100-240 V_{ac}		24 V_{dc}
Output	7,5 V_{dc} / 3 A		7,5 V_{dc} / 1,7 A
Operating temperature [°C]	0 to +40		
Storage temperature [°C]	-20 to +70		
Protection degree	IP41		
Connection	cable	cable	jack
Network position	1st		
Connection to the DIGICrown net	DIGICrown PSC, 10	direct to DIGICrown BUS 8 of the selected interface 2. DIGICrown PSC not needed.	DIGICrown PSC, 10

(*) NOTE: please refer to the current consumption value in the next table to evaluate how many modules of different types can be managed.

	INTERFACES		
	RS 232	USB HIGH SPEED	ETHERNET
	2		
Order code	B767Y000100	B767Y010500	B767Y020500
Max. number of networks	12		
Number of interface x network	1		
PC operative system	WINDOWS 7® / WINDOWS 8® / WINDOWS 10®		
Power supply	+7,5 V_{dc} (-10 / +30%) external by DIGICrown PSU		
Current consumption	40 mA	90 mA	
Communication [toward pc]	1 RS232 channel, full duplex hardware handshake (RTS/CTS)	1 virtual com with usb interface (USB 1.1 / 2.0 compatible)	ETH (10/100)
Internal network baud rate [Kbaud]	625	2083	2083
Max managed sampling rate [samples/s]	-	up to 4000	
Operating temperature [°C]	0 to +60		
Storage temperature [°C]	-20 to +70		
Protection degree	IP43		
Connection	9 pin D-Sub female connector	type "A" USB connector	RJ45
Network position	2nd		
Connection to the DIGICrown net	DIGICrown BUS, 8		

The **application**

The DIGICrown BOX allows the system to manage contact sensors (LVDT or HBT). All Marposs sensors are provided individually calibrated and linearized to ensure high measure accuracy. For third-party sensors, interfacing can be provided by a DIGICrown AI module (Voltage or Current).
To integrate the network in automatic measurement applications, input/output modules in either source or sink format are available. The maximum number of interfaces that can be configured for the network is 31 (62 sensors).
Up to 12 DIGICrown network systems can be managed in the same application.

	ANALOGUE INPUT			ENCODER INPUT		INPUT / OUTPUT			BOX
				DIGITAL	ANALOGUE	SINK	SOURCE	ONLY INPUT	
Scheme reference	3			4		5			6
Order code	B767A000400			B767E010500	B767E100500	B767I000500	B767I010500	B767I020500	B767X200400
Max number of modules per net	31			31		31			31
Power supply	+7,5V^{dc} (-10/+30%) - from bus			+7,5V$_{dc}$ (-10/+30%) - from bus		+7,5V$_{dc}$ (-10/+30%) - from bus			+7,5V$_{dc}$ (-10/+30%) - from bus
Current consumption	100 to 150 mA depending on input type			115 mA (without encoder connected)		70 mA		80 mA	90 mA
Input (sensor)	voltage / current input			single ended (A,B,Z, ER) or differential (A+,A-,B+,B-, Z+,Z-,ER)	phases A, B, M and error	8 in/out opto-insulated Voff (min)= (Vio-5V) Von (max)= (Vio-15V) Every bit can be programmed as IN or OUT		8 IN for switch box Off: Rswitch > 500 kohm Ω On: Rswitch < 3300 ohm Ω	Two DIGICrown2 probes
Output (BUS)	serial communication toward bus, by DIGICrown protocol			serial communication toward bus, by DIGICrown protocol		serial communication toward bus, by DIGICrown protocol			serial communication toward bus, by DIGICrown protocol
Input type	voltage (±10V / ±5V / 0-10V)	current (±20mA / 4-20 mA)	resistance	TTL, HTL, RS422 push pull or open-collector	1Vpp or 11µApp	200mA for out (700mA max total)		-	1 / 2 / 5 / 10 / 20 mm
Resolution	0,02mV (±5V range) or 0,05mV (±10V)	0,0001 mA	0,1 Ω (range 50÷3.000 Ω) 0,01 Ω (range 50÷500 Ω)	depending on the device connected		-			0,05µm (1-2mm) / 0,2µm (4-10mm) / 0,5µm (20mm)
Sampling rate [Samples/s]	up to 4000			up to 4000		up to 4000			up to 4000
Operating temperature [°C]	0 to +60			0 to +60		0 to +60			0 to +60
Storage temperature [°C]	-20 to +70			-20 to +70		-20 to +70			-20 to +70
Protection degree	IP43			IP43		IP43			IP43
Connection	wires			9 pin D-SUB male connector		15 pin D-SUB male connector			Lumberg female connector
Network position	from the 3rd to the 33th			from the 3rd to the 33th		from the 3rd to the 33th			from the 3rd to the 33th
Connection to the DIGICrown net	DIGICrown BUS, 8			DIGICrown BUS, 8		DIGICrown BUS, 8			DIGICrown BUS, 8

CONNECTIVITIES

The DIGICrown Network System can be connected to all Marposs display units and software or integrated with third party software using the following options:

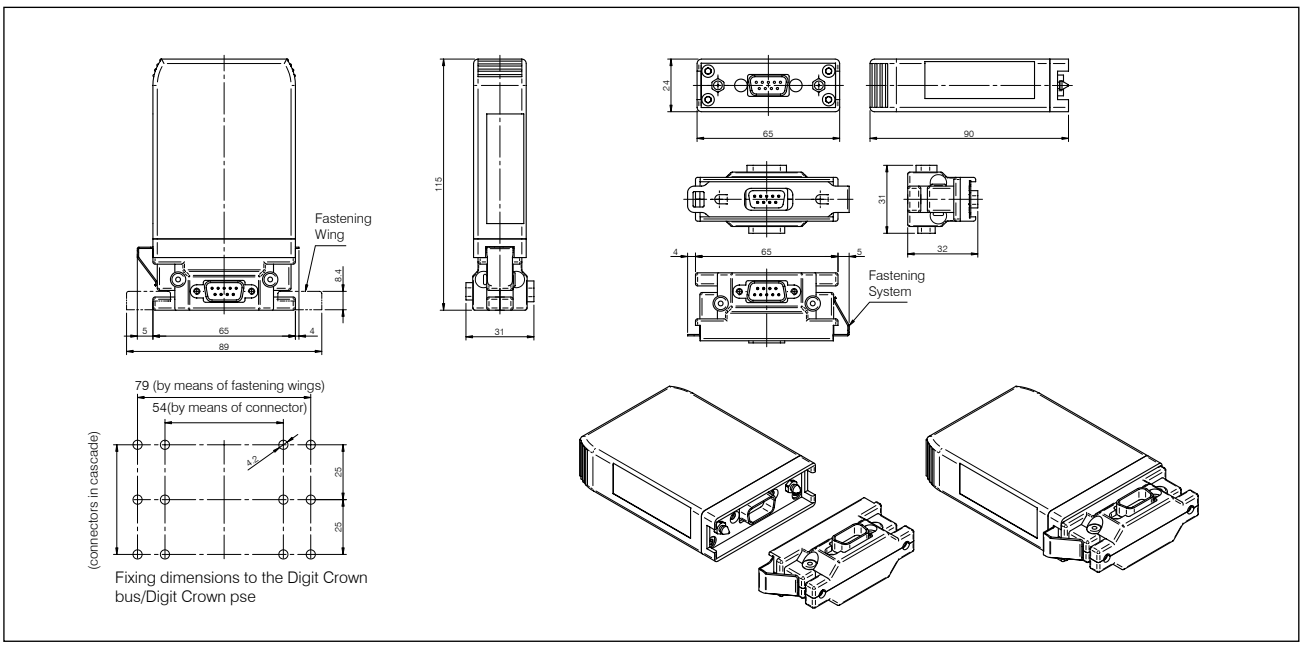
Marposs Driver Library is a COM object software that allow to easily build the configuration by the use of the Marposs DIGICrown.

SDK is a COM object software tool that allows OEMs to integrate DIGICrown network in third party application software. The user is completely free to build his dedicated software interface managing configurations and application too.

ASCII protocol commands
DIGICrown network is suitable also for PLC connection. Manuals, tools to practice the protocol commands and examples are available on request.

DIMENSIONS

Overall dimensions in mm of DIGICrown BOX, DIGICrown 232, DIGICrown PSU, DIGICrown I/O, DIGICrown BUS, DIGICrown PSC interfaces.



MARPOSS

TCI
LINE

TRANSDUCER CONDITIONING INTERFACE

Interface Boxes for Data Acquisition

TCI™ is a line of transducer conditioning interfaces composed of three models featuring one, four, eight channels respectively. It has been developed with technical and functional features particularly suitable to convert a position or dimensional measurement carried out by LVDT or HBT sensors into a signal compatible with most of the analog cards for data acquisition.
TCI interfaces are PLUG&PLAY units. They are delivered specifically calibrated for the sensor to be connected to. In this way the machine downtime is dramatically reduced, thanks to quicker installation and maintenance operations.

TCI

TCI1 to connect a single transducer. The power supply connector is included in the supply.

TCI

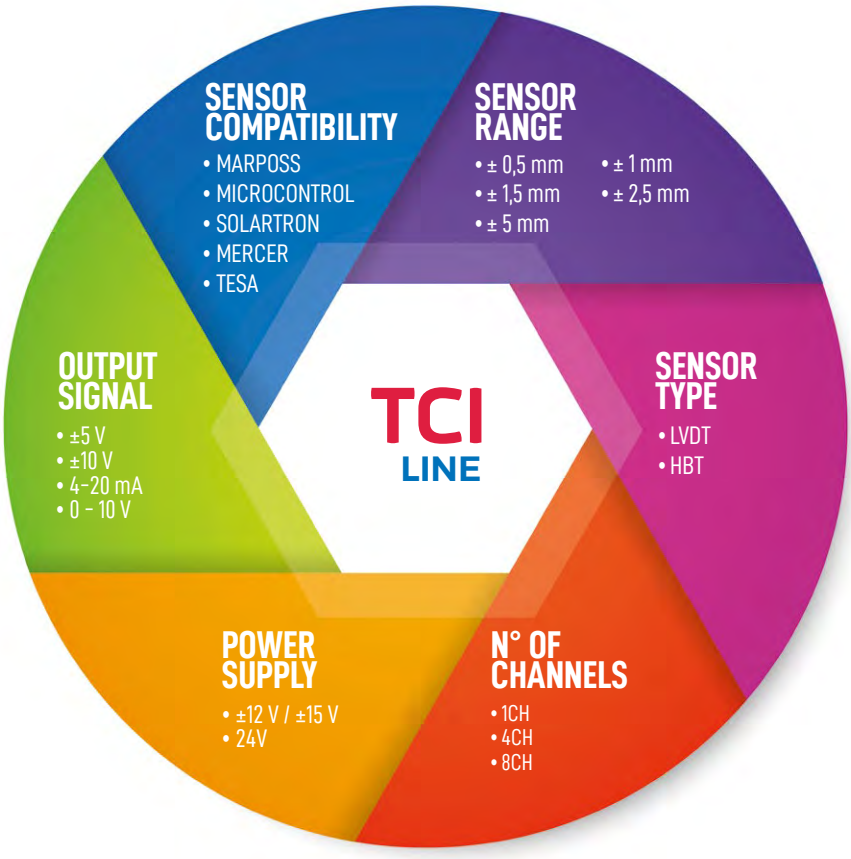
TCI4 to connect up to 4 transducers. The power supply connector is included in the supply. The D-Sub 37 for output signals is not included.

TCI

TCI8 to connect up to 8 transducers. The power supply connector is included in the supply. The D-Sub 37 for output signals is not included.

Product mix

Please refer to the below reported scheme in order to have the TCI line product mix overview.
In case you are looking for a dedicated solution don't hesitate to contact Marposs.



Product **features**

The output of this unit provides a direct electric signal (voltage or current), proportional to the measurement value of the sensor at the input stage. The output signal can be fetched by PLC analog cards, in order to control and manage process automations and to be further elaborated by systems such as SCADA supervisors.

Output **signal**

Two different output signals are available:
• Voltage (±5Vdc, ±10Vdc, 0-10Vdc)
• Current (4-20mA).

Power supply

The electrical supply is provided by the same connector used for the output signal. The TCI can be ordered both in dual voltage mode (±15Vdc/±12Vdc) and single voltage mode (24Vdc).

Sensors compatibility

Both LVDT (full bridge) and HBT(half bridge) sensors from Marposs and other manufacturers, such as Solartron, Tesa, etc., can be connected to the TCI. The specifications of the transducer model/brand to be connected to the TCI are required on the purchase order, in order to perform an ad-hoc calibration.

HOW TO ORDER

The code to order a TCI is defined by means of the following specifications.
1. Transducer type (LVDT or HBT)
2. Number of channels
3. Measuring range of the sensor
4. Power supply type
5. Compatibility (*)
6. Output type

Example

	B 6 7 4 6	T	N	X	A	C	U
		0	0	1	1	0	2
LVDT							
1 CHANNEL							
±1 mm							
24 V							
MARPOSS							
CURRENT 4-20 mA							

	B 6 7 4 6	T	N	X	A	C	U
TRANSDUCER TYPE	LVDT	0					
	HBT	1					
NUMBER OF CHANNELS	1 CH		0				
	4 CH		2				
	8 CH		3				
MEASURING RANGE	±0,5			0			
	±1			1			
	±1,5			2			
	±2,5			3			
	±5			4			
POWER SUPPLY	±15 V / ±12 V				0		
	24 V				1		
COMPATIBILITY (*)	Marposs					0	
	Microcontrol					1	
	Solartron					2	
	Mercer					3	
	Tesa					4	
OUTPUT SIGNAL	±5 V						0
	±10 V						1
	4-20 mA						2
	0 - 10 V						3

Note. (*) If the transducer type is not included in the list, please contact your nearest Marposs office to define the specific order code.

TECHNICAL SPECIFICATIONS

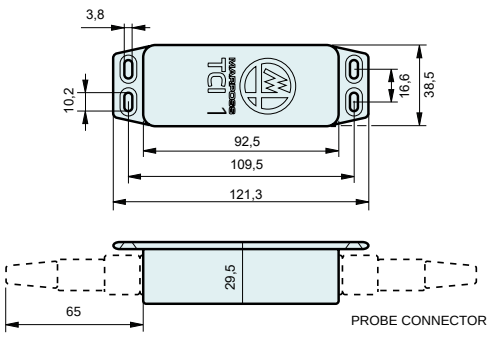
Mechanical specifications	TCI1	TCI4 and TCI8
Protection degree (with connectors plugged in)	IP52	IP54
Weight	0,14 kg	0,8 kg
Operating temperature	0°+ 50 °C	
Storing temperature	-25°+ 75 °C	
Operating relative humidity (not condensing)	20% - 80%	
Storing relative humidity (not condensing)	10% - 95%	

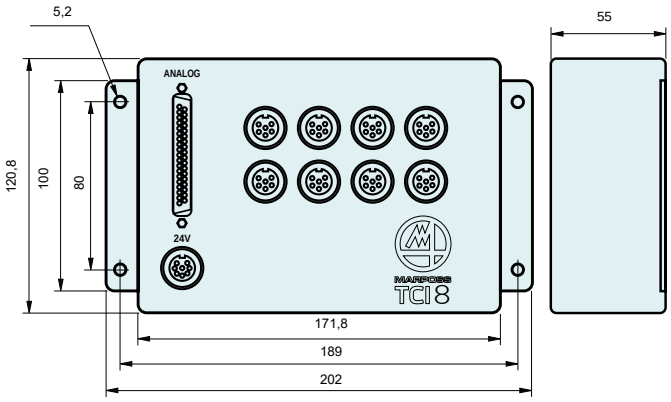
Electrical specifications	TCI1	TCI4 and TCI8
Linearity error	max 0.05% of the end scale	max 0.1% of the end scale
Gain drift	max 0.02% °C of the end scale	max 0.04% °C of the end scale
Offset drift	max 0.02% °C of the end scale	max 0.01% °C of the end scale
Power supply rejection ratio (gain+offset)	max 0.04% / V of the end scale (voltage: ±15V)	
Output ripple (AF spike excluded)	max 10 mV rms voltge output	
	20 µA rms current output	15 µA rms current output
Transducer frequency	Typical 5.1 KHz	Typical 5.0 KHz
Transducer voltage supply	Typical 3.3 Vrms	Typical 3.4 Vrms
Transducer current supply	Max 30 mA	
Bandwidth	Typical 500 Hz	

Voltage supply	TCI1	TCI4 and TCI8
±15 V	Dual filtered and stabilised ±15 Vdc ±5% Max. ripple allowed at 100/120 Hz: 50 mVpp	
Typical consume with transducer connected	Voltage output: ±20 mA Current output: ±40 mA	Voltage output: ±270 mA max. Current output: ±450 mA max.
±12 V (if configured with a tension output signal)	±12 Vdc ±5% Max. ripple allowed at 100/120 Hz: 50 mVpp	
Typical consume with transducer connected	Voltage output: ±20 mA Not available with current output	Voltage output: ±270 mA max. Current output: ±450 mA max.
+24 V	Single 24 Vdc ±10% Max. ripple allowed at 100/120 Hz: 200 mVpp	
Typical consume with transducer connected	Voltage output: 45 mA Current output: 65 mA	Voltage output: 300 mA max. Current output: 500 mA max.

Output signal		TCI1	TCI4 and TCI8
Tension mode	±5V	Maximum output current ±1 mA	
	±10V	Maximum output current ±1 mA	
	0-10V	Maximum output current ±1 mA	
Current mode	4/20 mA	Load impedance max. 250 ohm, min. 100 ohm	

DIMENSIONS





MARPOSS

ASC
LINE

EASY MEASUREMENT
INTEGRATION
INTO A PLC

Interface Boxes for Data Acquisition

ASC™ (Automation Signal Controller) is a Line of interface boxes designed to integrate transducers via Industrial Network Protocols and RS-232 interface into PLC and keep your production continuously under control.

ASC2/ASC4

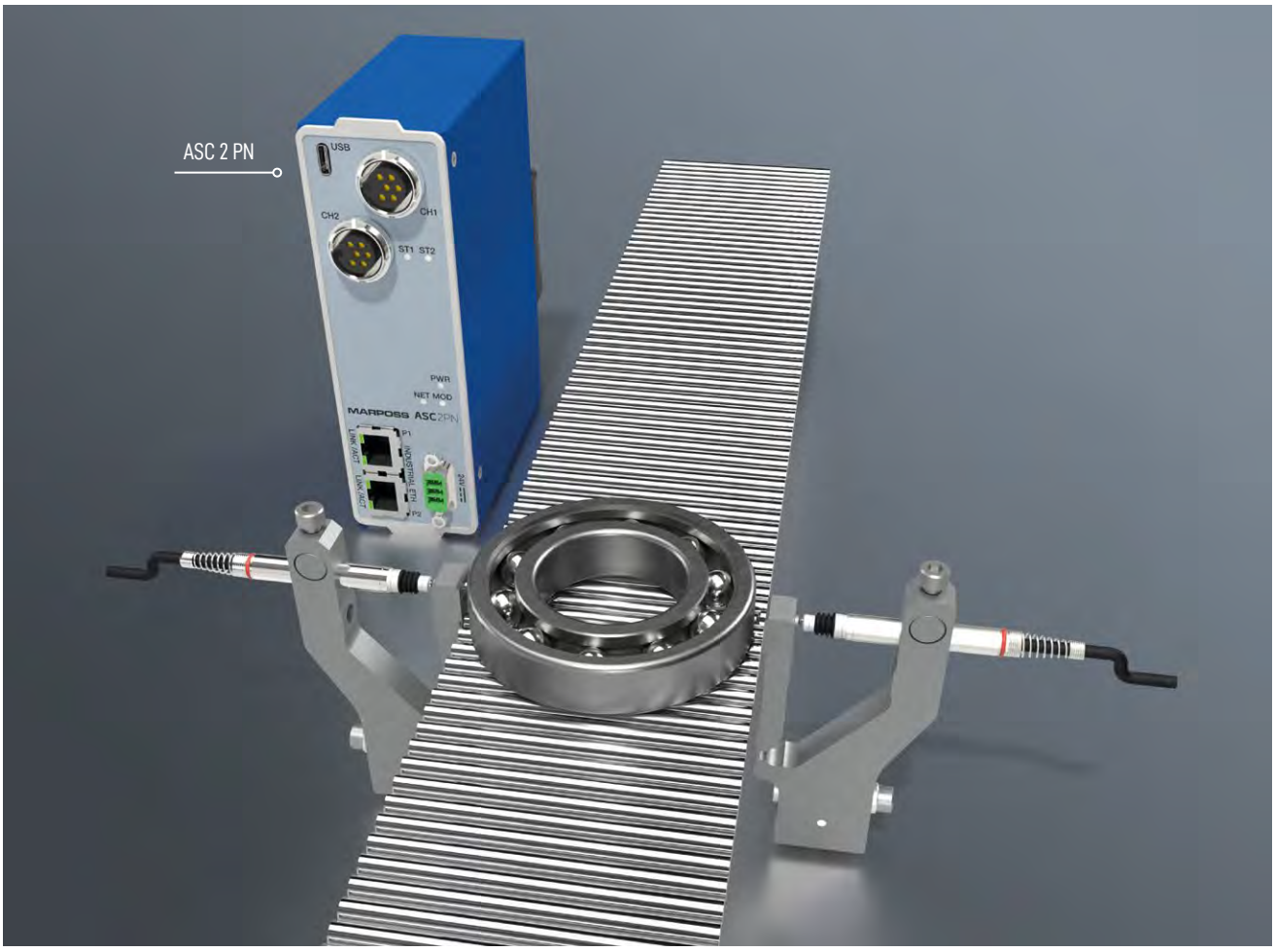
232: Delivers the transducer signal value via serial protocol. It is available with 2 and 4 channels and two different default baud rate (9600 and 115200). It is a plug&play product.

ASC2PN/ASC4PN

PN: Delivers the transducer signal or the measurement value via Profinet protocol. It is available with 2 and 4 channels.
The Industrial Ethernet connection allows a fast connection with machine PLC. ASC Tool allows to configure the ASC and in few steps to get the measure.

Don't hesitate to contact Marposs for any other Industrial Ethernet connection not reported in these pages.

Application examples



Product **features**

ASC Line is perfect for the automation needs; it can interface 2 or 4 sensors to PC or PLC. Available in many different models, depending on the number and the type of transducers, it's ready to be connected as a plug and play device.
The measure can be collected through Profinet or the RS-232 port using simple ASCII serial protocol commands.
Compact, robust and equipped with DIN rail mounting accessories, it is suitable for cabinet and automation applications layout in general.

Sensor compatibility

Both LVDT (full bridge) and HBT (half bridge with LVDT pinout) sensors can be connected to ASC. Analog (REDCrown2™) or digital (DIGICrown2™) pencil probes with ±0,5mm, ±1mm, ±2mm, ±2,5mm, ±5mm and ±10mm measuring range can be managed.

Output **signal**

Transducer values are continuously available through Profinet or RS-232 interface.

Power supply

ASC requires +24 V_{DC} nominal value with an allowed voltage input range of +24 V_{DC} -15/+20 %.

HOW TO ORDER

ORDER CODES - RS-232 OUTPUT (default baud rate 9600 bps)

MEASURING RANGE	mm	±0,5	±1	±2	±2,5	±5	±10
ANALOG LVDT	2 CHANNELS	B768231AL00	B768231AL20		B768231AL40	B768231AL60	B768231AL80
	4 CHANNELS	B768232AL00	B768232AL20		B768232AL40	B768232AL60	B768232AL80
DIGITAL LVDT/HBT	2 CHANNELS	B768231DL00					
	4 CHANNELS	B768232DL00					

ORDER CODES - RS-232 OUTPUT (default baud rate 115200 bps)

MEASURING RANGE	mm	±0,5	±1	±2	±2,5	±5	±10
ANALOG LVDT	2 CHANNELS	B768231AL01	B768231AL21		B768231AL41	B768231AL61	B768231AL81
	4 CHANNELS	B768232AL01	B768232AL21		B768232AL41	B768232AL61	B768232AL81
DIGITAL LVDT/HBT	2 CHANNELS	B768231DL01					
	4 CHANNELS	B768232DL01					

ORDER CODES - Profinet OUTPUT

MEASURING RANGE	mm	±0,5	±1	±2	±2,5	±5	±10
ANALOG LVDT	2 CHANNELS	B768PN1AL00	B768PN1AL20		B768PN1AL40	B768PN1AL60	B768PN1AL80
	4 CHANNELS	B768PN2AL00	B768PN2AL20		B768PN2AL40	B768PN2AL60	B768PN2AL80
DIGITAL LVDT/HBT	2 CHANNELS	B768PN1DL00					
	4 CHANNELS	B768PN2DL00					

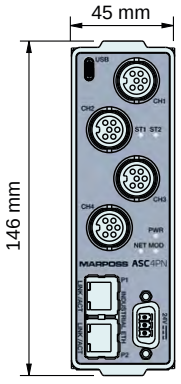
Technical Specifications							
Type	analog	LVDT (Marposs Standard)					
	digital	LVDT/HBT (pinout LVDT)					
Measuring range	[mm]	±0,5	±1	±2	±2,5	±5	±10
Resolution	[µm]	0,05		0,2	0,2	0,2	0,5
Sensitivity	[mV/V/mm]	230			115		23
Accuracy pencil probes (*)	REDCrown2 [µm]	±MAX(0,5 + 2*|K|; 7*|K|)	±(0,3 + 5*|K|)	±(0,3 + 7*|K|)	±MIN(0,3 + 10*|K|; 11 + 2*|K|)	±MAX(5,0 + 2*|K|;7*|K|)	±MAX(10 + 2*|K|;7*|K|)
	DIGICrown2 [µm]	±(0,2+K*1)	±(0,2+K*1)	±(0,3+|7*K|)	±(0,6+K*2)	±(0,6+K*2)	±(1,2+K*2)
Accuracy - ASC (*)	[µm]	±[0,1+0,2*K]	±[0,2+0,2*K]	±[0,4+0,2*K]	±[0,5+0,2*K]	±[1+0,2*K]	±[2+0,2*K]

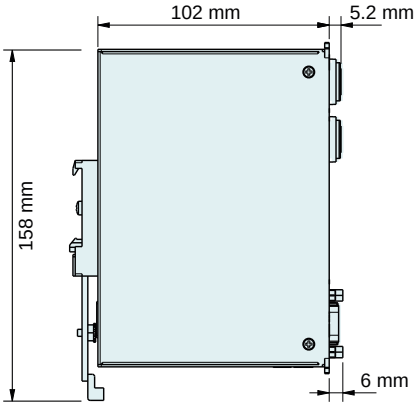
NOTE: K= Reading [mm]

ASC Serial RS-232 specifications	
Power supply [V_{DC}]	Nominal value +24 ; Input range -15/+20 %
Output type	1 RS-232 channel, full duplex; hardware handshake (RTS/CTS)
Baudrate [bps]	9600 / 19200 / 38400 / 57600 / 115200
Data bit	8
Stop bit	1
Parity	even
Sampling rate [sample/s]	up to 400 (depending on net configuration)
Electrical absorption [mA]	ASC 2: 90 ; ASC 4: 200
Protection degree	IP40
Storage temperature [°C]	-20 to 70
Operating temperature [°C]	0 to 55
Weight [g]	555

ASC Profinet specifications		
Power supply [V_{DC}]	Nominal value +24 ; Input range -15/+20 %	
Conformance Class	B	
Number of Connections	2	
Compliant Protocol	SNMP, LLDP, DCP	
Minimum update time [ms]	1	
Profinet Version	Profinet RT	
Device Type	Data I/O Communication Record Data Communication	
GSDML Version	2.41	
Profinet Device Connectors Type	2x RJ-45, 100 Mbit/s ports, available simultaneously	
Netload Class	III	
Ethernet features	Device configuration via Ethernet Secure Firmware update via Ethernet IT functions web server	
Electrical absorption [W]	ASC2 PN	P(typ) = 1.40 [W] P(max) = 2.35 [W]
	ASC4 PN	P(typ) = 2.30 [W] P(max) = 3.40 [W]
Protection degree	IP20	
Storage temperature [°C]	-20 to 70	
Operating temperature [°C]	0 to 55	
Weight [g]	ASC2 PN: 585 ASC4 PN: 603	

DIMENSIONS





The dimensions are the same for all versions.

GAGEPOD

DATA ACQUISITION
INTERFACE
SYSTEM

Interface Boxes for Data Acquisition

GagePod™ is a modular, distributed data acquisition and signal conditioning system, designed for simple manual gauging up to fully automatic measurement and inspection applications. Its modular design provides all the functionality you need, only when you need it, as part of an easy-to-customize "building block" system.
It connects to any Marposs **E9066™** industrial computer or commercial PC running Marposs **Quick SPC™** Statistical and Quality Control software suite.

GAGEPOD
GP-16 DAQ

connects up to 16 Marposs standard full-bridge (LVDT), half-bridge (HBT) sensors, Marposs Digicrown™ probes and TESA compatible probes. Any number of sensors can be managed contemporarily.

GAGEPOD
GP-16 I/O

manages 16 opto-insulated, 24Vdc digital input/output signals. A 32 I/O version is also available. Any number of digital input/outputs can be managed contemporarily.

GAGEPOD
GP-9 E

connects up to 9 incremental transducers such as linear probes, linear or rotary encoders, providing a synchronization input/output signal for external devices. Any number of encoders can be managed contemporarily.

GAGEPOD
GP-4M8

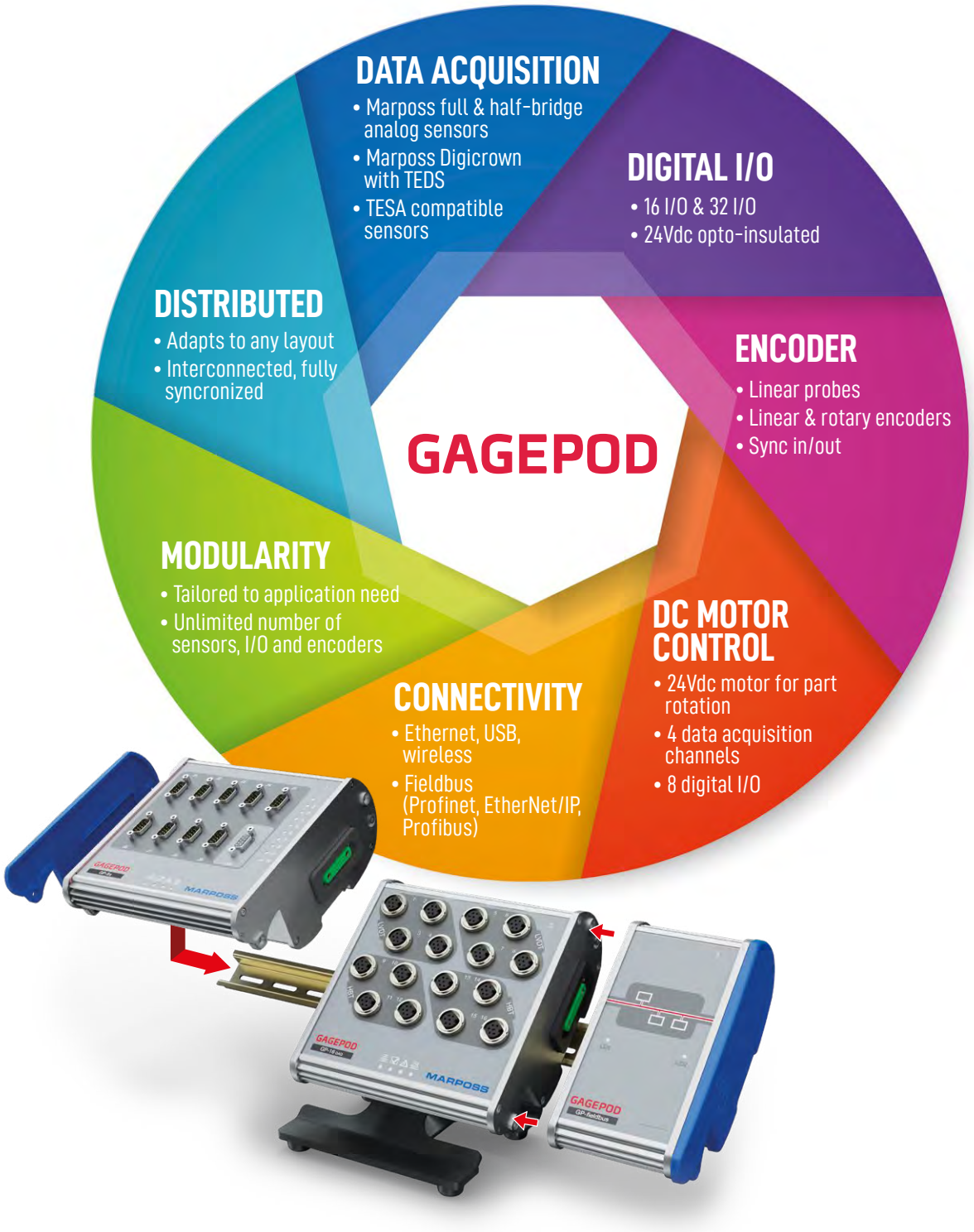
DC motor controller with integrated DAQ (4 channels) and 8 digital I/O.

GAGEPOD
GP-fieldbus

Industrial fieldbus module supporting Profibus®, Profinet® and Ethernet/IP™ protocols.

Product **features**

The GagePod system offers highly scalable and flexible solutions with unmatched performance when bundled with any **E9066** industrial computer and **Quick SPC** measurement & SPC software suite. It can be deployed as a **distributed system** by separating its modules, ultimately adopting its layout to your own workspace, whether it be a new application or an upgrade from previous technologies.



Application **examples**

MERLIN Plus SW

EASY TO CUSTOMIZE
AND INTUITIVE
MEASURING SOFTWARE

Software

Merlin Plus Software™ has been designed to simplify system configuration, measurement cycle definition and batch management.
Merlin Plus Software has been definitely outlined to fit simple manual applications and supports most of the Marposs measuring devices, as well as some third-party devices, connected via RS232, USB, Ethernet or Bluetooth®.

MINIMUM REQUIREMENTS

Merlin Plus Software requires a Marposs Industrial Computer (Merlin Plus, Merlin Plus Box, E9066) or any Windows® compatible PC, with:

- Operating System: Windows 10™ or Windows 7™ ;
- RAM: 2GB (recommended 4GB for Windows 10™);
- Display: 1024x768 XVGA;
- Hard disk space: 3GB free.

HOW TO ORDER

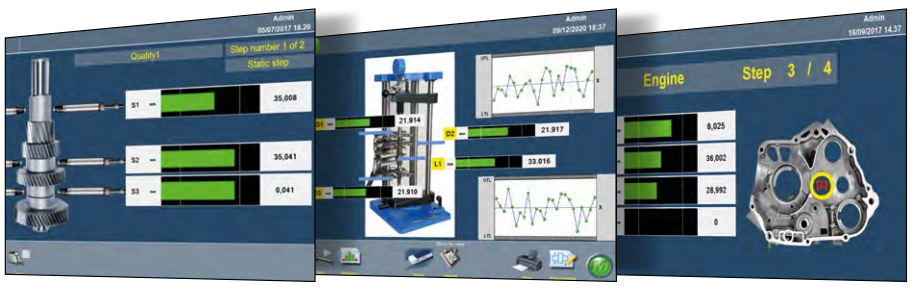
Description	Order code
Merlin Plus Software	BCM7000000E
Merlin Plus Designer	BCM7010000E
MRC - Marposs Remote Controller	BCM7030000E

Product **features**

Collecting data from a wide range of measuring devices, made by Marposs or third-parties, via USB, COM PORT, Ethernet or Bluetooth

Standard measurement pages

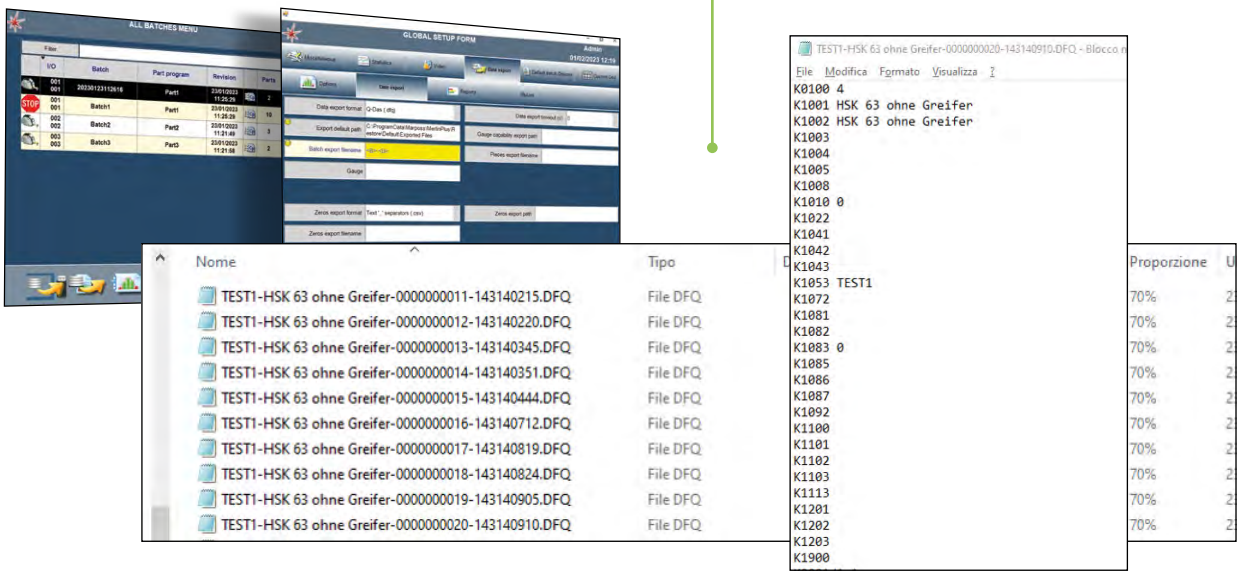
Customizable measurement pages

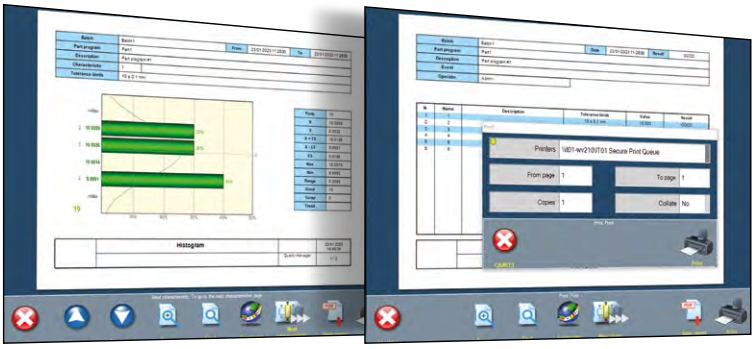


Data traceability

Multi-language support for European and Asian languages

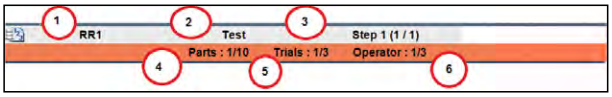
Managing batches, data segregations, part counters and data storage in QDAS® (DFQ) or CSV format (including remote export on a network)

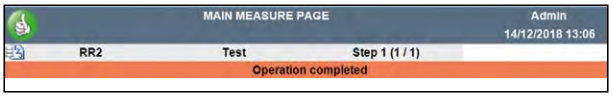


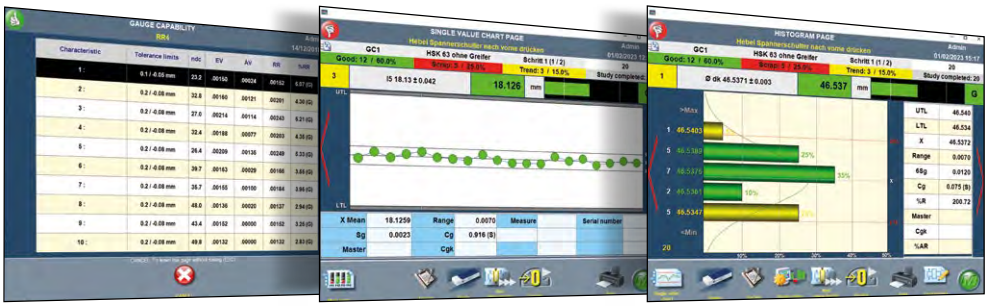


Reports management in PDF format and printing capabilities

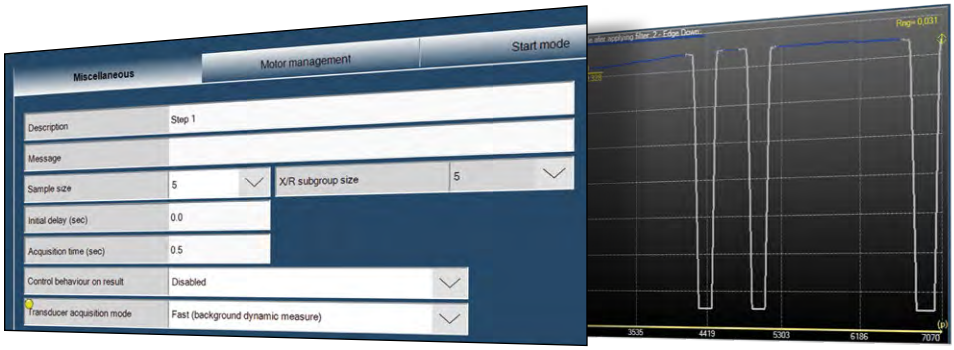
Statistical analysis with graphic display and numeric summary





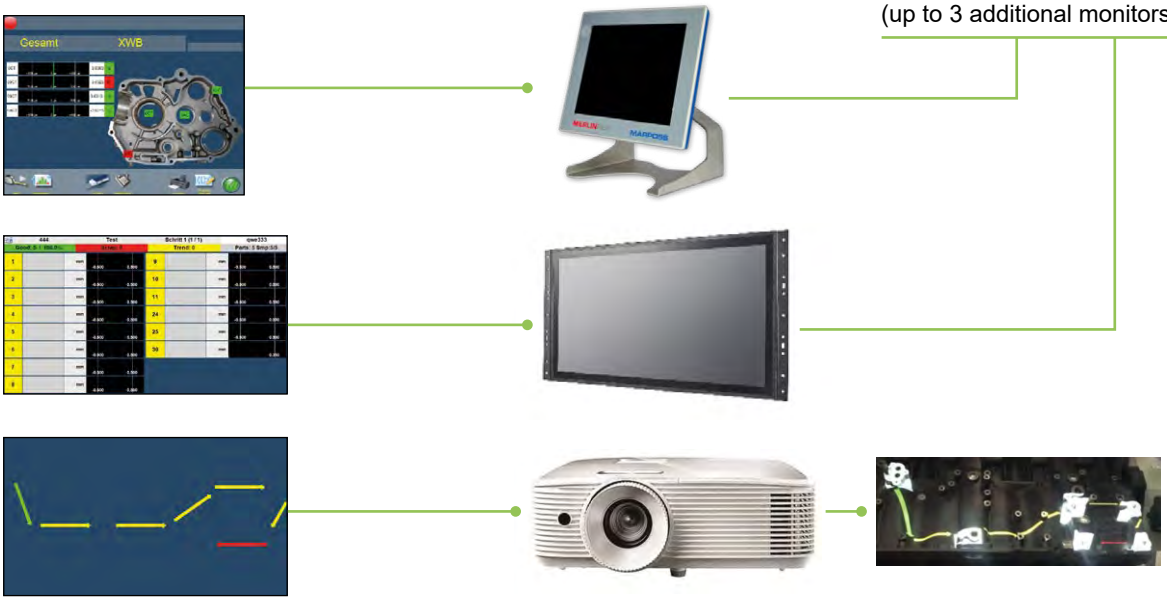


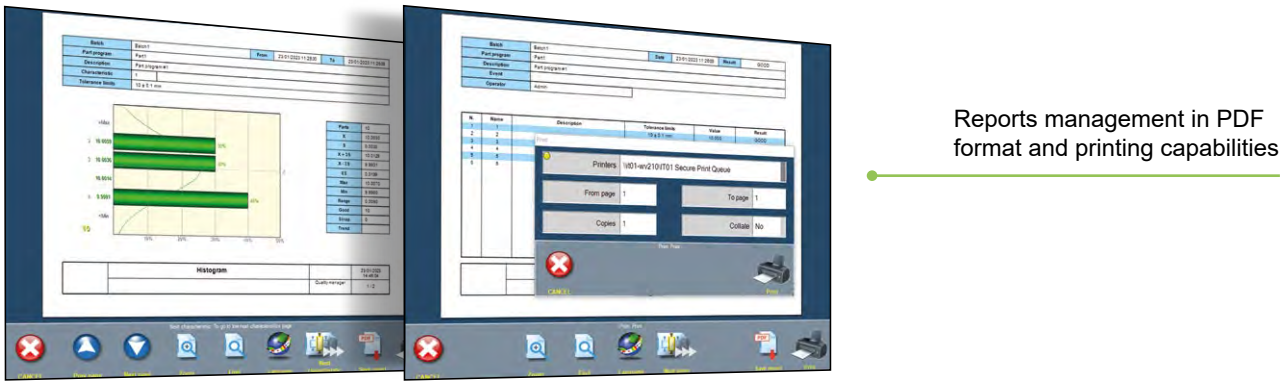
Gauge capability and R&R studies facilities



Possibility of fast dynamic acquisitions (up to 4000 samples/s) and filter utilities

Multi monitor management
(up to 3 additional monitors/projectors)





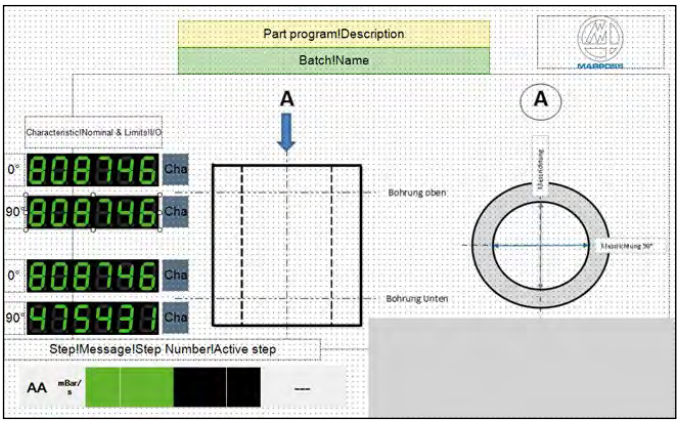
Reports management in PDF format and printing capabilities

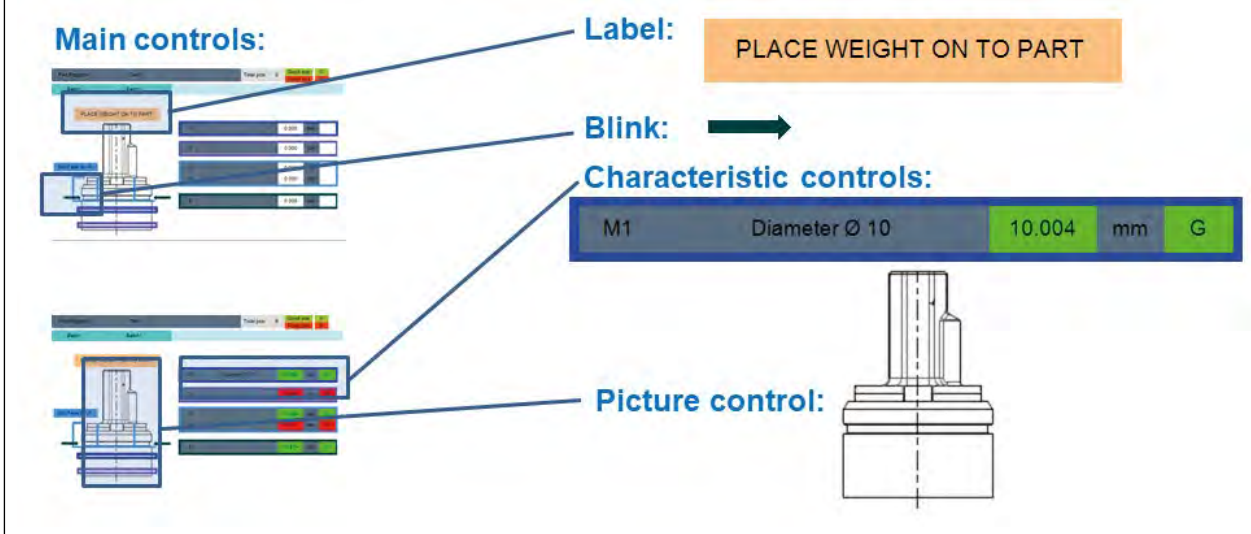
Table programming facility

MERLINPlusDesigner

Merlin Plus Designer™ can be used to create files that can be read from the Merlin Plus software so to customize the Measure pages, using various available objects such as measuring bars, images, blinking objects, graphs, charts or many others.

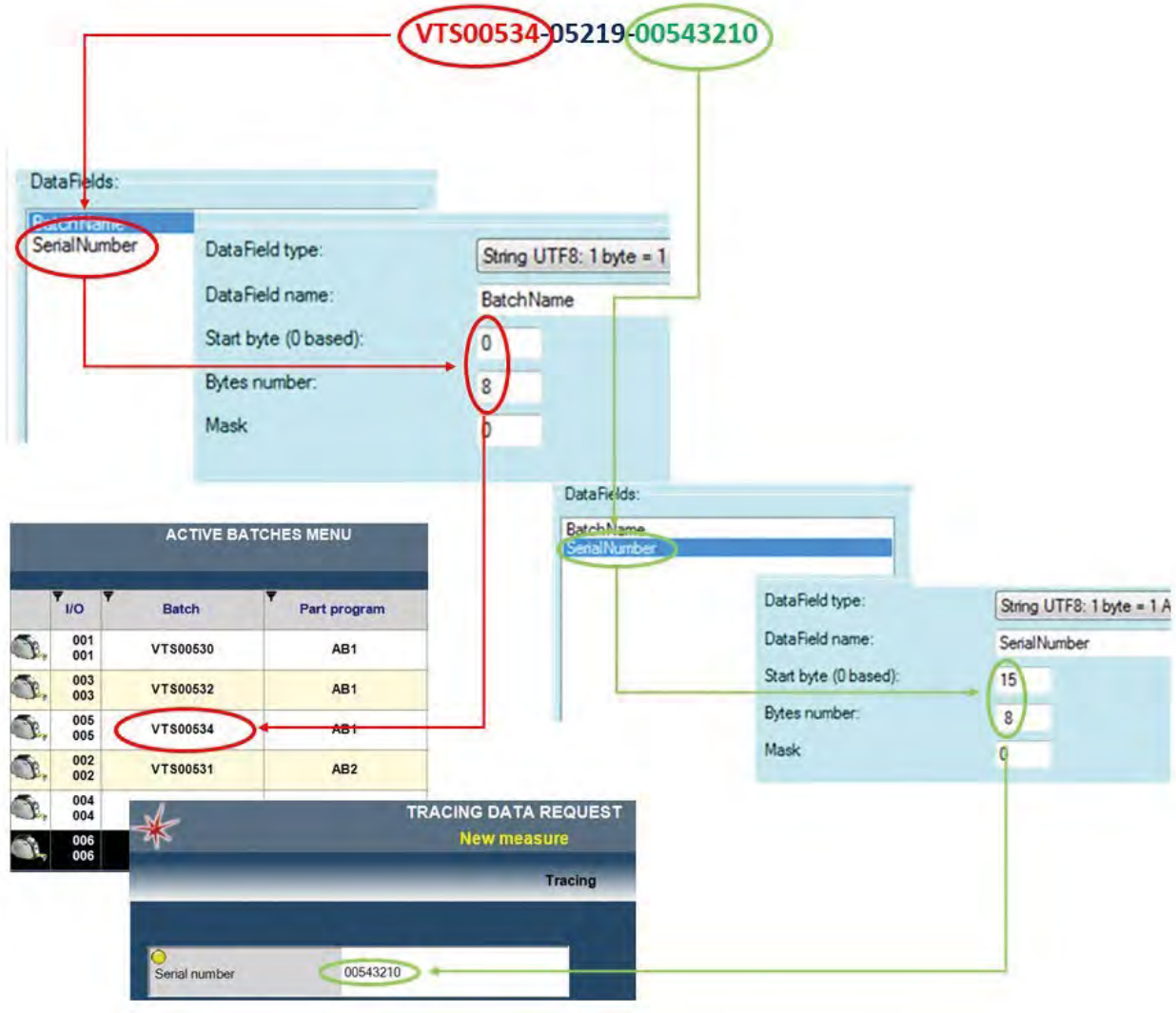
Customizing each Part program or each step with dedicated pages, can help in clarifying the measurement steps or in guiding the operator, thus avoiding errors in keeping production under control.





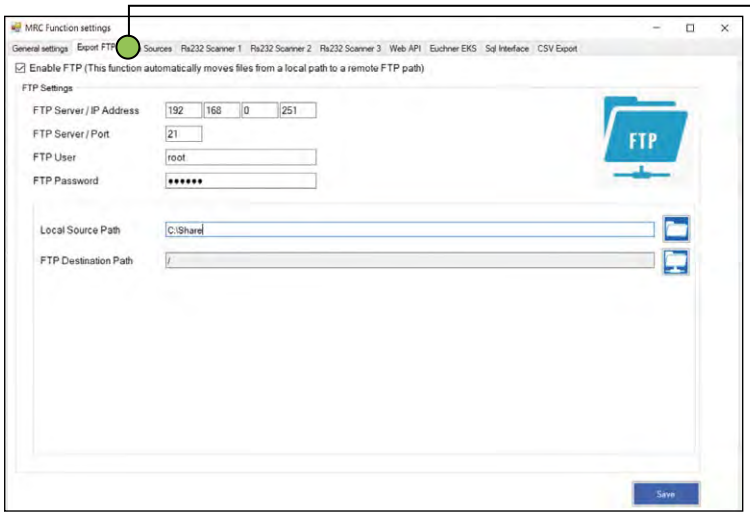
MRC (Marposs Remote Controller)

MRC is a software that runs in background, connected to the Merlin Plus software and can be used to easily configure various behaviours like QR Code / Barcode readers management and FTP or SQL export management.

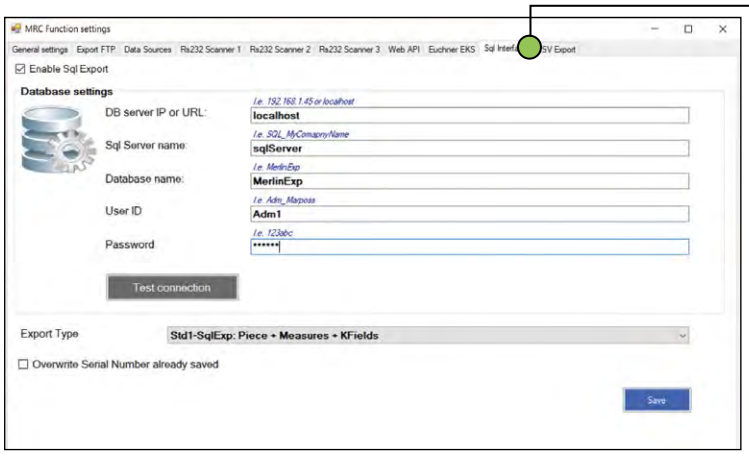


Selecting parts of the string, different functions are activated.

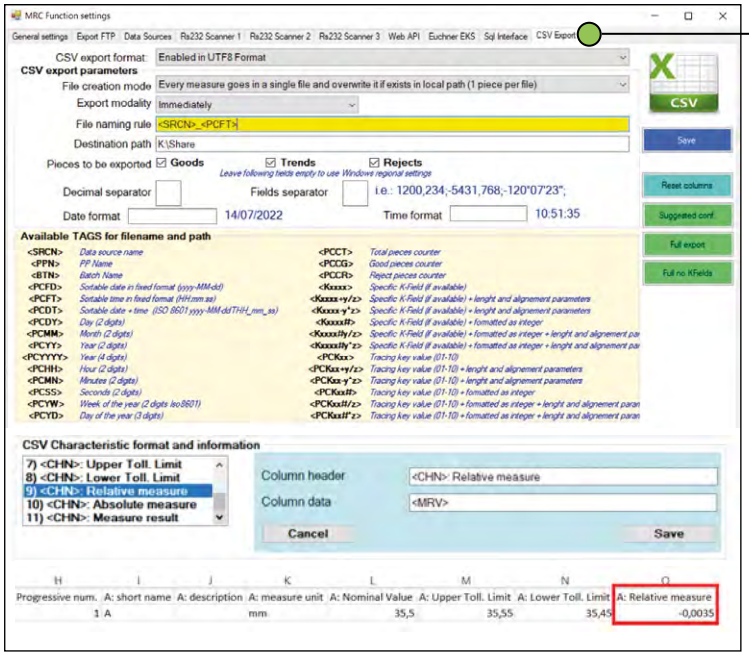
Export of files to a remote path via FTP



Export of files to an SQL Server



Configuration of exported CSV files



MARPOSS

QUICKSPC

SOFTWARE FOR PROCESS AND QUALITY CONTROL

Software

Quick SPC™ for Windows® is a suite of software products designed to comply with any requirement ranging from simple measurement acquisition to complex gauging applications. Framed in a simple, wizard driven, common user interface it is possible to complement the base product by means of software Add-ons purposely conceived for specialized industry fields.

Product **features**

Templates and wizard driven programming interfaces allow an easy, safe and ready to use software.

Self explanatory with its spreadsheet programming interface, Explorer-like navigation and on-line manuals.

Mouse-free Interface.

Safe and reliable with checks on programmed data consistency, data back-up and restore utility; multi-level user security access.

REDEFINING THE CONCEPT OF FLEXIBILITY

Fully customizable software environment matching current and future metrological and statistical needs: page layouts, short cuts, hot tabs, application templates, reports, customers' based statistical evaluations and more.

Powerful and versatile capable of connecting to a variety of analog and digital measuring devices and machine tool CNCs.

Comprehensive fully integrated software modules for data acquisition, measurement elaboration, statistical analysis, machine tool compensation, network integration and data storage.

CONFIGURATION AND PROGRAMMING

Configurable display layout for content, color, position, size, text, fonts, menus. Mouse-free interface for operators, plus fully compliant Microsoft Windows display functionalities. Spreadsheet programming interface, Explorer-style user interface, integrated MS Access database. Consistency control routine for all configuration and programming phases.

MEASUREMENTS AND ZERO SETTING

Static and digital dynamic measuring cycles. Unlimited number of measuring steps and part programs. Manages analog sensors (LVDT, Half-Bridge), strain gage, linear and rotary encoders, digital probes, serial input devices and manual data input. Live measurement display and fully guided operator prompted acquisition sequences using multimedia files (bmp, pcx, jpg, avi, mpg, etc.). Fully automatic machine tool control (Feedback) and multiple stations control for assembly applications. Zero setting and Min-Max mastering with consecutive, cumulative drift controls and non-zero-band controls.

STATISTICAL PROCESS CONTROL

Configurable and programmable data evaluation complying with International (ISO), National (DIN, AIAG, CNOMO) and customers guidelines. Embedded Q-DAS® statistical package for on-line, variable data analysis (control chart, machine and process capability). Certified qs-STAT® compliant data storage.

MEASURING SYSTEM ANALYSIS

Accuracy, Repeatability, Reproducibility, Linearity, Stability studies complying with International (ISO), National (DIN, AIAG, CNOMO) and customers guidelines. Fully programmable prompted acquisition sequences in both blind and full details measure mode. Measuring System Analysis traceability by storing each study separately together with all necessary references. Data evaluation can be run through Marposs® Measuring System Analysis (MSA) software module (option). Analysis can be seamlessly run through QDAS® MSA software package as well.

NETWORK

An ODBC-compliant data structure allows seamless integration to virtually any network client and data base architecture, including all the main Industrial Fieldbus.

UTILITIES

Step Sequencer Designer to create multi-level operator prompts, instruction and data acquisition pages. Serial Driver Programmer connects to virtually any serial device using ASCII-based protocols. Analog Probes Tuner (APT) to set-up sensors assembly when more than one sensor is used to create a measurement. Groups and Users to define multi-level password access, operator based software modules, displays, short cuts, hot tabs, icons, soft-keys. Customizable reporting and printing.

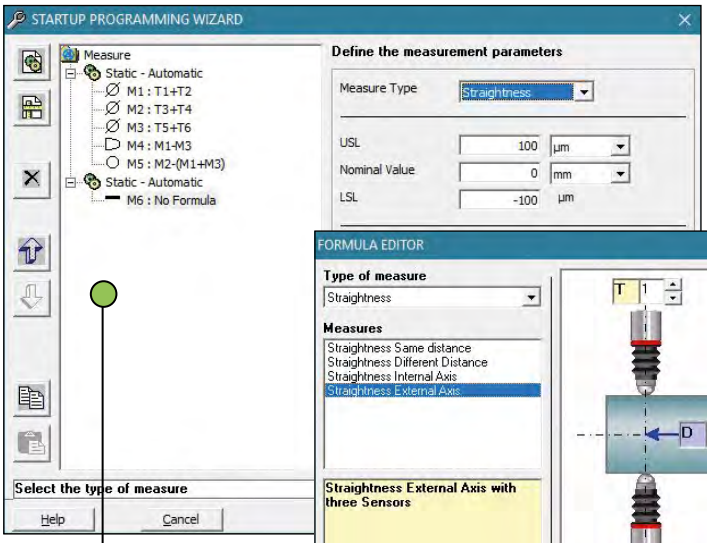
LANGUAGE VERSIONS

Change Language module allows to select among the following languages: English, French, German, Italian, Swedish, Portuguese and Spanish. Other language versions available upon request.

Minimum **Requirements**

Quick SPC™ requires a Marposs Industrial Computer (model E9066) or any Windows® compatible PC, with:

- Operating System Windows 10™ or Windows 7™
- A minimum of 4GB RAM (recommended 8GB for Windows 10™)
- 1028x768 XVGA display or bigger
- At least 3GB of free hard disk space.

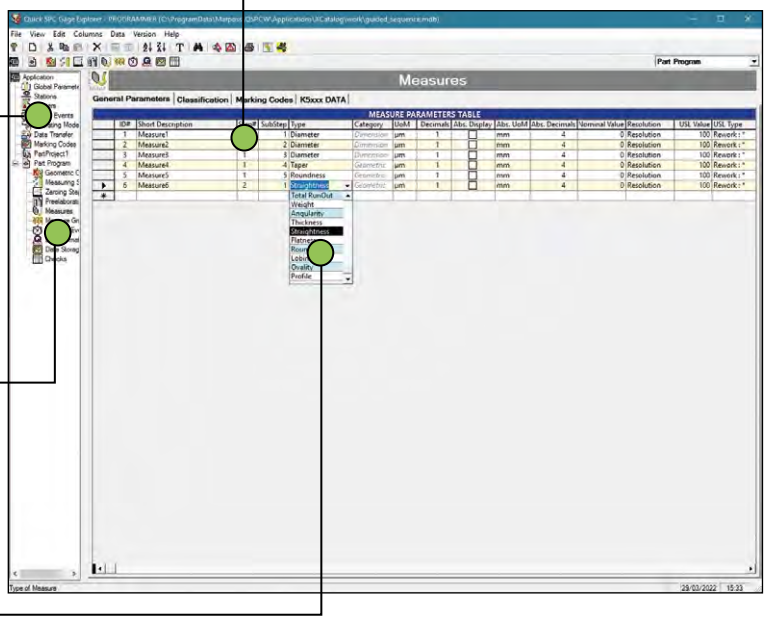


WIZARDS

- Simple wizard-driven interface for easy data programming
- Context sensitive measurements definition and formula creation
- Integrated graphic tool editor to create operator prompts and instructions

WORKING GRID

- Spreadsheet programming interface
- Completely customizable visualization
- Quick and safe template-based programming
- MS-ACCESS database environment



PROGRAMMABLE TOPICS

- MS-Windows® Explorer-style structure
- Intuitive organization of all arguments
- Direct access to all topics

STATISTICAL ANALYSIS

- Embedded Q-DAS® statistical software for on-line control charts, machine and process capability analysis
- Q-DAS® qs-STAT® compliant data storage

GUIDED PROGRAMMING

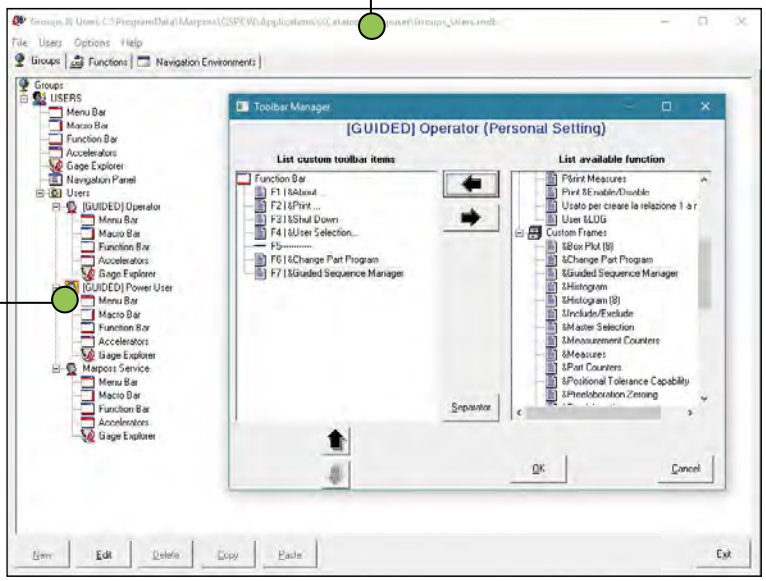
Guided programming using Online help, tooltips, pick-up lists, Wizards, etc.

GROUPS & USERS

Assignable groups/users rights, functions,hot tabs, function keys and accelerators

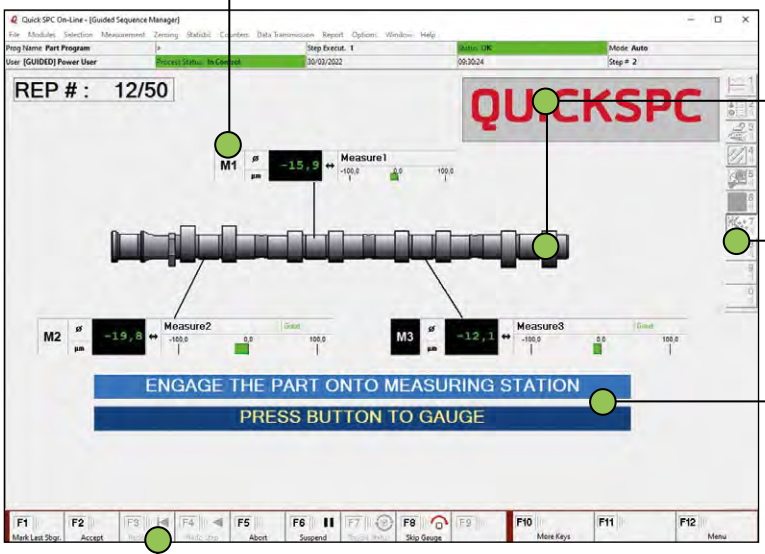
SECURITY

Separate groups/users profile management guaranteed by password validation



ON LINE

- Customizable display
- Clear and readable information
- Measurement bargraph, numeric and color code displays



MULTIMEDIA

Static and dynamic files (picture, drawings, videos, etc.)

HOT TABS

- Freely programmable
- Direct selection view
- Mouse free

OPERATOR PROMPTS

- Instructions
- Data acquisition
- Capability studies (gage, machine, process)

FUNCTION KEYS

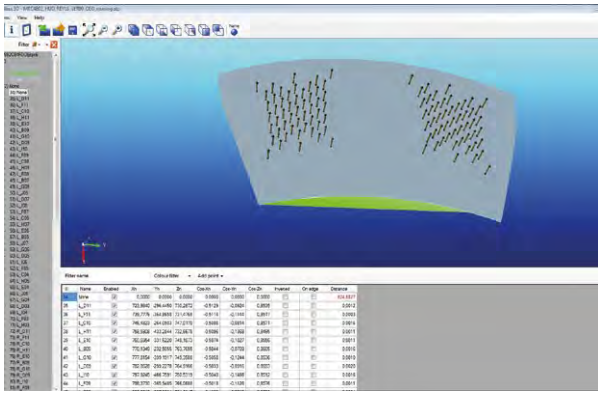
- Customizable
- Pictorial helps
- Application dependent
- Mouse free

Glass AddOn

The Glass AddOn is a software specifically developed for the automotive glass industry. It allows to manage all the glass measurements (shape, flatness, bending, symmetry, perimeter, etc..).

Intuitive programming through 3D file

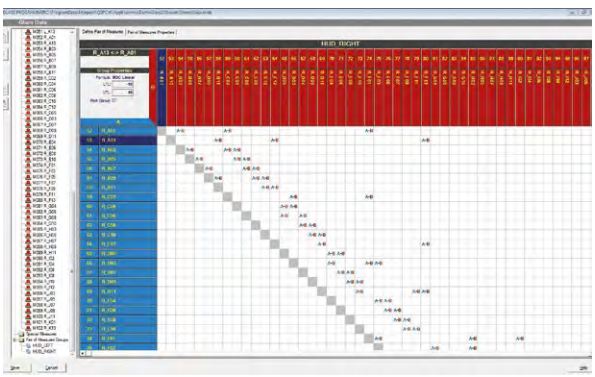
The measurements can be easily and quickly programmed by importing the 3D drawing of the glass following the programming wizard. User friendly interface and high precision measurement page. The measuring page is based on the 3D file; file ensures the visualization of the glass with high accuracy. The results can be easily understood thanks to a configurable display layout showing all measurement values. Colour coded measurement groups help linking the results to the real position on the glass. Additional pages for statistical evaluation are available.



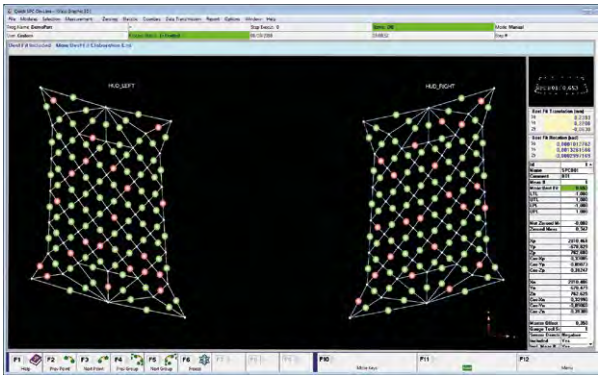
Programming interface through 3D file

Rate of change (ROC) elaboration

ROC is dedicated to take under control the shape of the glass. In particular it is very useful to measure the HUD area where a perfect flatness surface is a must to grant high quality images. In addition ROC can be also applied to measure the bending angle of the glass close to the border (attack angle).



ROC programming matrix



ROC measuring page

Different data transfer formats

Many formats available as standard (for example: CSV, TXT, Q-DAS®, Renault, PSA). Customised data format exportable through any industry network (Industry 4.0 ready) available on request.

Opto AddOn

Optoquick is the Marposs product line dedicated to precision measurement of workpieces in the manufacturing environment.
Optoquick delivers a superior balance between measurement performance, speed and flexibility.
It gives an unrivalled measurement performance in terms of accuracy, repeatability and stability.

FAST & PRECISE

For complete part quality validation in a few seconds

FLEXIBLE

Able to gauge multiple parts with a single system

OPTICAL & CONTACT

No matter what the specific measuring challenge is!

EASY TO USE

For efficient and fast measuring tasks

INDUSTRIAL

Able to operate on the shop floor with the best performance

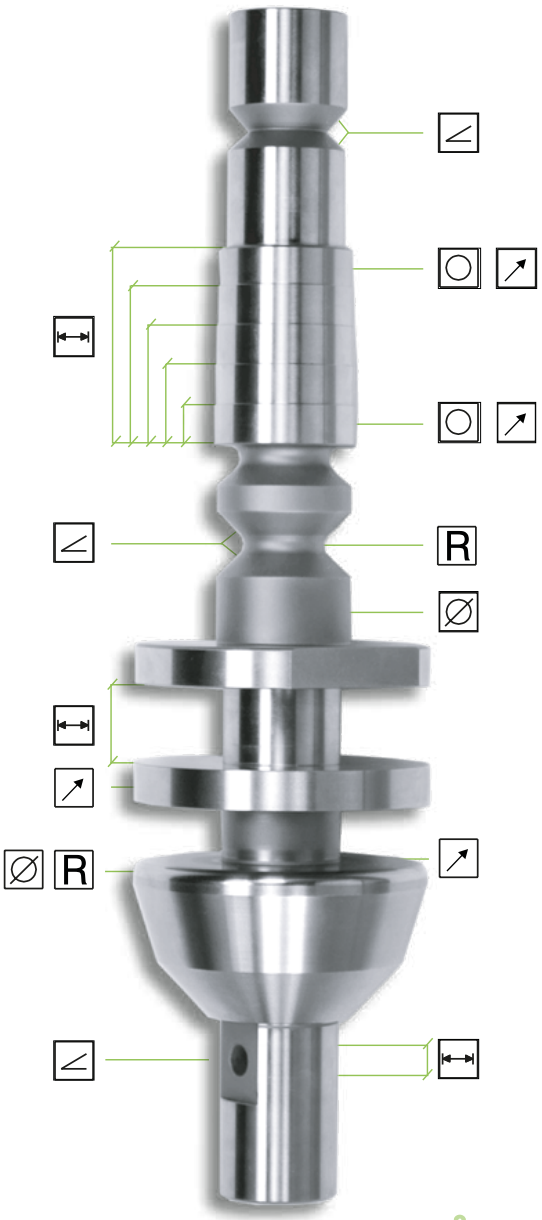
HIGH PRECISION GAUGING IN THE PRODUCTION PROCESS

- CAM SHAFTS
- CRANK SHAFTS
- GEAR SHAFTS
- DRIVE SHAFTS

TYPICAL MEASURING TASKS

Dimensional, position, form measurements

- Diameter
- Length
- Radius
- Chamfer
- Angle
- Radial run-out
- Axial run-out
- Concentricity
- Cylindricity
- Coaxiality
- Straightness
- Roundness
- Flatness
- Symmetry
- Parallelism
- Perpendicularity
- Cam profile
- Stroke and index



HIGH PRECISION GAUGING IN THE PRODUCTION ENVIRONMENT

Leading edge core technologies with full MARPOSS design. Optoquick delivers a superior balance between measurement performance, speed and flexibility. It is the perfect solution for the manufacturing environment. It gives an unrivalled measurement performance in terms of accuracy, repeatability and stability. It has been tested and proven in the hardest environmental conditions. Should large temperature changes be encountered, dynamic temperature compensation may also be incorporated.

EASY TO USE

Optoquick is fast and easy to use and requires no extensive training. Part loading is ergonomically developed giving an open and clear loading area with no obstructions. Operator safety is guaranteed by using optical safety barriers.
The graphical interface is carefully designed to give clear measurement results that show any part non-conformances on a clear visual part layout. This reduces operator training and increases productivity.

SIMPLY FAST

Optoquick is designed to perform comprehensive quality checks on parts within a few seconds. Image based technology assists in providing a short cycle time. Parts are measured while in motion and using intelligent image processing.
Optoquick can inspect several different features on the part at the same time. Fast quality checks with Optoquick results in higher productivity and optimizes production capacity.

SUPERIOR EFFICIENCY IN OPERATIONS

Optoquick helps operators with fast and accurate quality checks directly alongside machine tools. This reduces the “work-in-progress” by eliminating the time wasted for transporting parts to dedicated inspection areas.

Gears AddOn

The Gears AddOn package aims to expand the functionalities of Quick SPC for Windows® in order to make an application for the inspection of gears with double-flank method easy to realize and use.

The main effects coming from the installation of the "Gears" AddOn are:

- Additional programming topics for the QuickSPC programming environment
- Additional display pages for the QuickSPC On-Line environment
- COM component for FFT (Fast Fourier Transform) reckoning functions

A part may include several gears. Marposs gearing meters can check all of them simultaneously.
Each gear of a part requires a specific master.

The control programming can be achieved via a Wizard-Driven easy-to-use programming interface.

Profiles AddOn

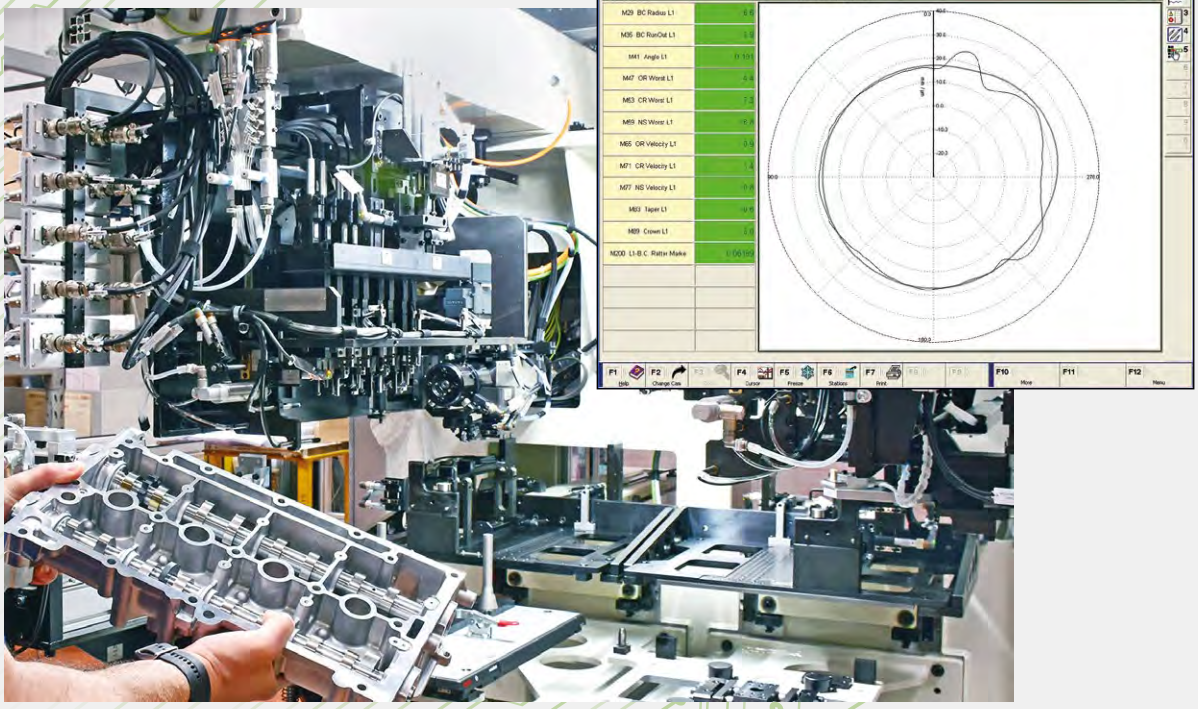
The Profiles AddOn package aims to expand the functionalities of Quick SPC for Windows® in order to realize and use an application with check of cams profile easily.

The main effects coming from the installation of the "Profiles" AddOn are:

- Additional programming topics for the QuickSPC programming environment
- Additional display pages for the QuickSPC On-Line environment
- COM component for profiles elaborations
- COM component for FFT (Fast Fourier Transform) reckoning functions

The following checks are typically available:

- Base circle radius
- Run Out of the base circle
- Profile error
- Profile velocity error
- Cam phase angle error
- Cam conicity
- Cam crown
- Cam chattering



Scanning AddOn

Scanning technology is an essential tool for making dimensional and form checks on matching mechanical parts with very tight clearance tolerances. The richness of metrological data and the immediacy of the graphical representation of the surface profiles enable you to fully control the critical production processes of these components.
It guarantees the best repeatability and accuracy required for the measurement of very precise mechanical components like injectors, pumps and hydraulic valves.

The main effects coming from the installation of the Scanning AddOn are:

- Additional programming topics for the QuickSPC programming environment
- Additional display pages for the QuickSPC On-Line environment
- COM component for profiles elaborations

The software provides:

- Graphical display of the surface profile
- Double profile display for the clearance check (using Marposs M39S Twin Station version)
- Zoom functions available in the axial and radial directions, for a more detailed display of the profile
- Manual exploration of the total profile
- Facility to display the measuring point diagram beside the profile display
- Facility to store and export files containing the measured profile data

For a full list of address locations, please consult the Marposs official website

Marposs has an integrated system to manage the Company quality, the environment and safety, attested by ISO 9001, ISO 14001 and OHSAS 18001 certifications.

Some models of the product line, or parts of them, may be subject to export restrictions if exported outside the European Union or may be subject to restrictive measures adopted by the competent national, supranational or international authorities.

worldwide addresses

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