IMS probes, SD1 dial gauge, CD43/70 displays

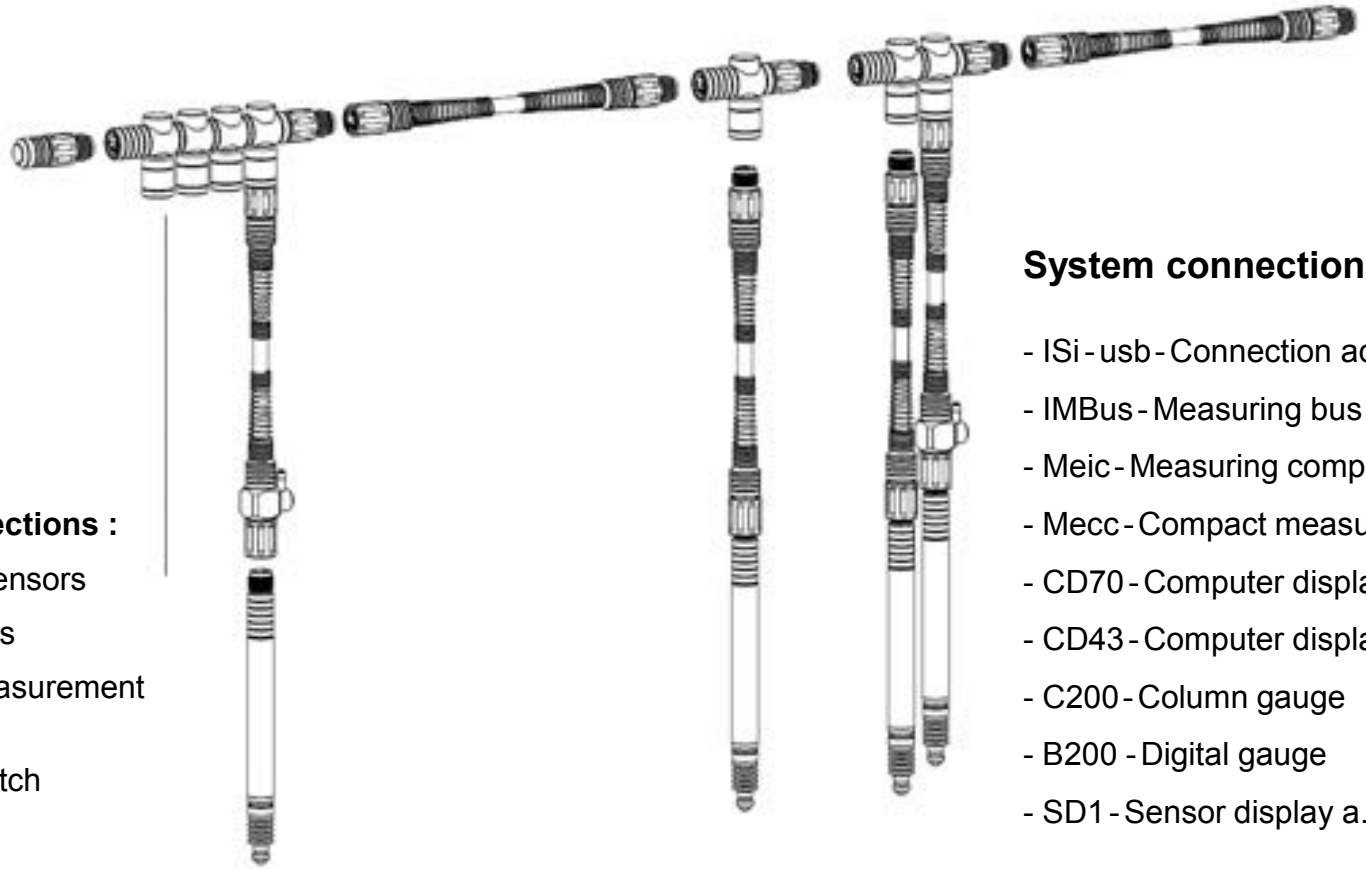
IBR Messtechnik GmbH & Co. KG

Product range

IBR Product range :

* High-precision and high-resolution measuring probe with integrated measurement electronics
* High-precision and high-resolution dial gauges
* Computer displays and bus system for the measuring probes
* Radio modules for the measuring probes and dial gauges

ISi-Bus : *Overview*



Sensor connections :

temperature sensors

rotary encoders

pneumatic measurement converters

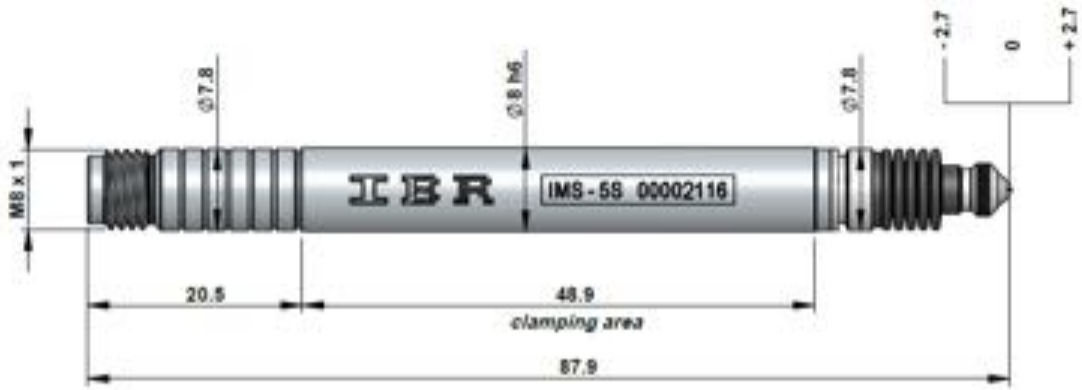
hand / foot switch

…..

System connections :

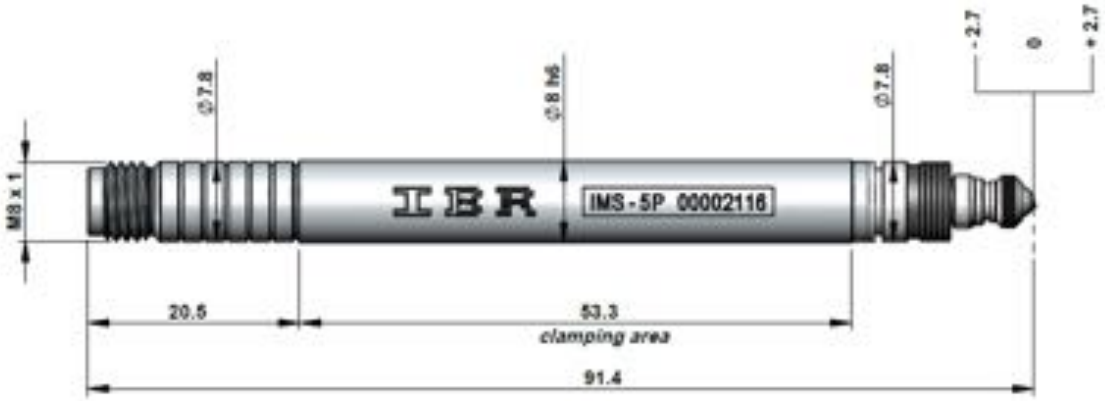
- ISi - usb - Connection adapter f. PC
- IMBus - Measuring bus
- Meic - Measuring computer
- Mecc - Compact measuring computer
- CD70 - Computer display 7"
- CD43 - Computer display 4.3"
- C200 - Column gauge
- B200 - Digital gauge
- SD1 - Sensor display a. dial gauge

IMS probes : *IMS - 5S*



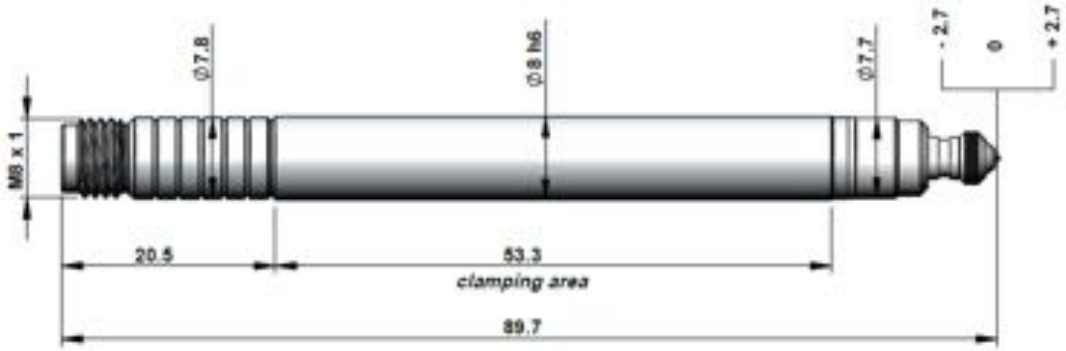
Technical data : IMS - 5S			
Metrological characteristics		**Characteristics of integrated temperature sensor**	
Measuring range	5 mm	Measuring range	-20 °C ... 80 °C
Resolution	0.1 µm	Resolution	0.25 °C
Accuracy	< 1 µm	Accuracy	± 1.5 °C
Measuring rate	1500 measuring values / sec		
Measuring force	0.7 N (optional 0.4 N, 1.2 N, 1.6 N, 2.0 N)		
Electrical characteristics		**Environmental conditions**	
Supply voltage	2.7 ... 3.6 V	Operation / Storage temp.	0 ... 50 °C / -20 ... 80 °C
Power consumption	2.8 µA / measurement per second		

IMS probes : *IMS - 5P*



Technical data : IMS - 5P	
Metrological characteristics	**Characteristics of integrated temperature sensor**
Measuring range: 5 mm	Measuring range: -20 °C ... 80 °C
Resolution: 0.1 µm	Resolution: 0.25 °C
Accuracy: < 1 µm	Accuracy: ± 1.5 °C
Measuring rate: 1500 measuring values / sec	
Measuring force: 0.65 bar approx 0.7 N / 0.8 bar approx 1 N	
P_{max} = 1 bar	
Electrical characteristics	**Environmental conditions**
Supply voltage: 2.7 ... 3.6 V	Operation / Storage temp.: 0 ... 50 °C / -20 ... 80 °C
Power consumption: 2.8 µA / measurement per second	

IMS probes : *IMS – 5J*



Technical data : IMS - 5J			
Metrological characteristics		**Characteristics of integrated temperature sensor**	
Measuring range	5 mm	Measuring range	-20 °C ... 80 °C
Resolution	0.1 µm	Resolution	0.25 °C
Accuracy	< 1 µm	Accuracy	± 1.5 °C
Measuring rate	1500 measuring values / sec		
Measuring force	1.0 bar approx 0.7 N / 1.25 bar approx 1 N P_{max} = 3.5 bar		
Electrical characteristics		**Environmental conditions**	
Supply voltage	2.7 ... 3.6 V	Operation / Storage temp.	0 ... 50 °C / -20 ... 80 °C
Power consumption	2.8 µA / measurement per second		

IMS probes : *Technical data*

Comparison of ind. probes
Technical data :

Mechanical characteristics	old: Standard	new: IMS
Compact tube case, stainless steel 8h6	✓	✓
High protection class for rough environments	✓	✓
Clearance-free ball bearing for precise mea.	✓	✓
Gauge spindle Ø 4, gauge slide M2.5	✓	✓
Actuation by spring, vacuum, compressed air	✓	✓
Cable pluggable at measuring probe for simple mounting / exchange on fixtures	(rarely)	✓
Simple extension of cables without influence on measuring values		✓
Bus cables for drastic reduction of connection cables and wiring		✓

Interface		
Simple wiring with ISi connection adapters and pluggable ISi extension cables to a bus with up to 60 probes / sensors (ISi bus)		✓
Identification of IMS measuring probes : Type, serial number, ..., next date of inspection can be requested directly from the probe		✓

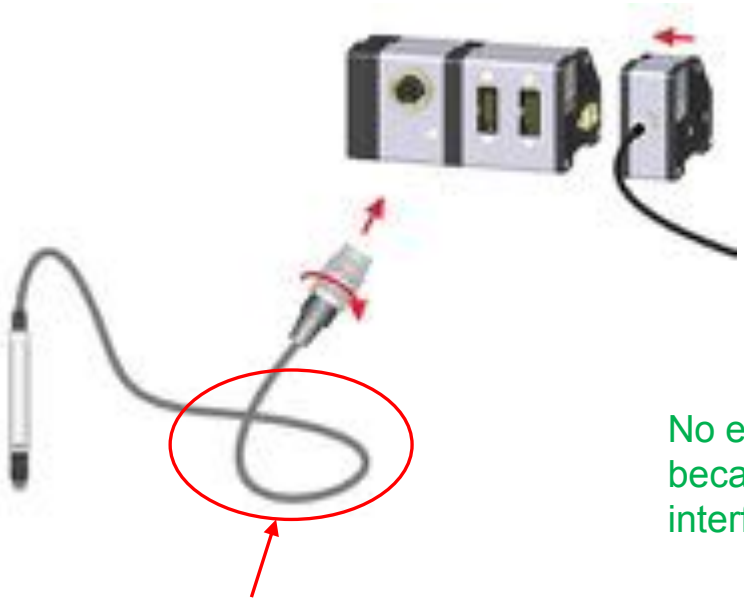
Characteristics of integrated electronics		
Optimal stable sensor signals without influence by cable / external interferences		✓
Individual error correction of each probe		✓
Adjustment tolerance of sensitivity [%]	0.3...0.6	< 0.05
Max. linearity error (+/- 2 mm) [µm]	< 24	< 1
Temperature drift [ppm / °C]	100	20
No error by external measuring electronics		✓
Integrated temperature measurement provides temperature of measuring probe / fixture		✓

Technical data of measuring probe : IMS-5S

Metrological characteristics	
Measuring range	5 mm
Resolution	0.1 µm
Accuracy	< 1 µm
Measuring rate	2000 measuring values / sec (0.1 µm)
Measuring force	0.7 N (Standard)

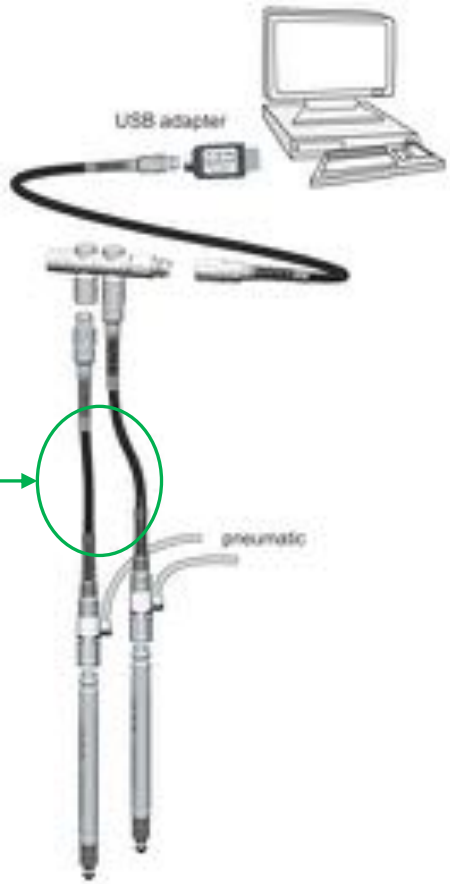
Electrical characteristics	
Supply voltage	2.6 ... 3.6 V
Power consumption	2.8 µA / measurement per second

IMS probes : *Technical data*



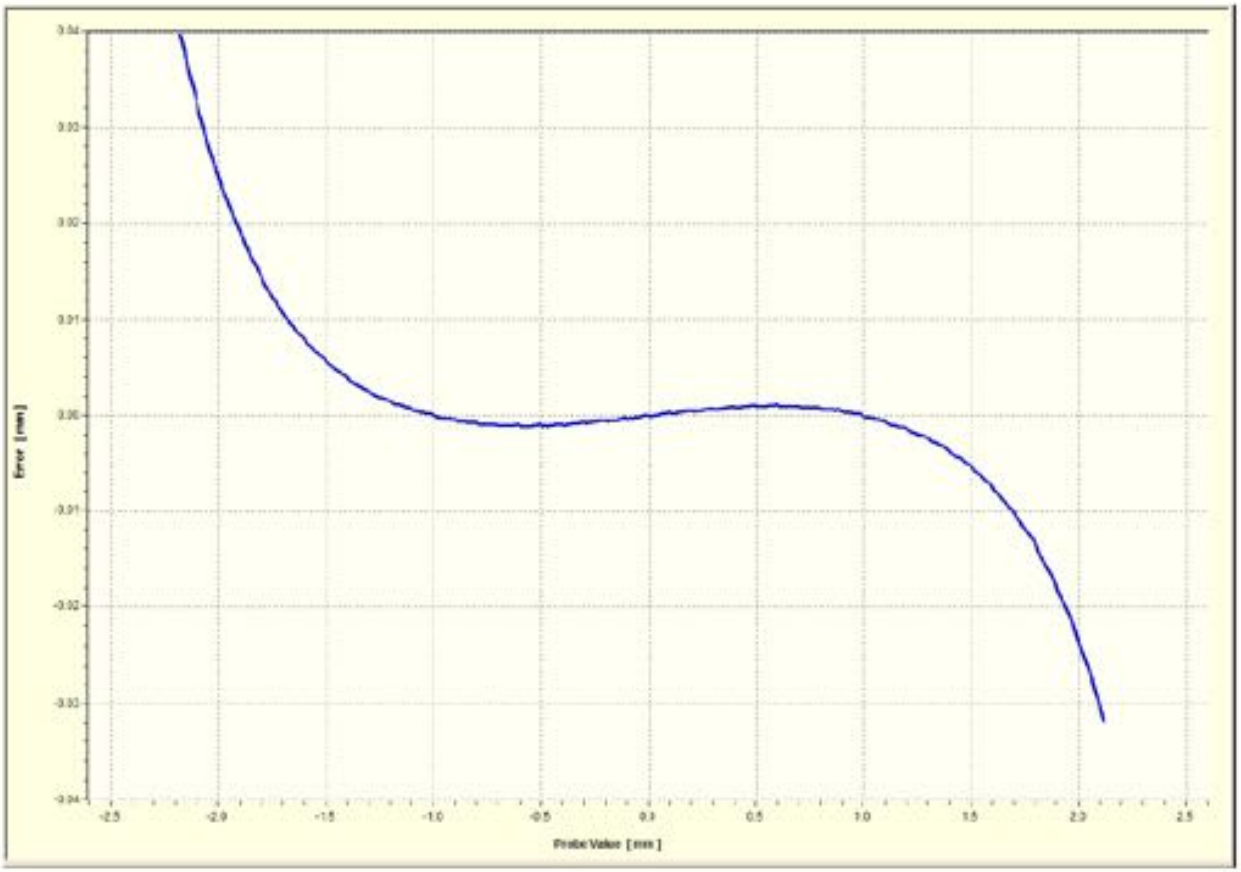
External interference can influence the analogue signal via the connection cable.

No external interference, because this is a digital interface.



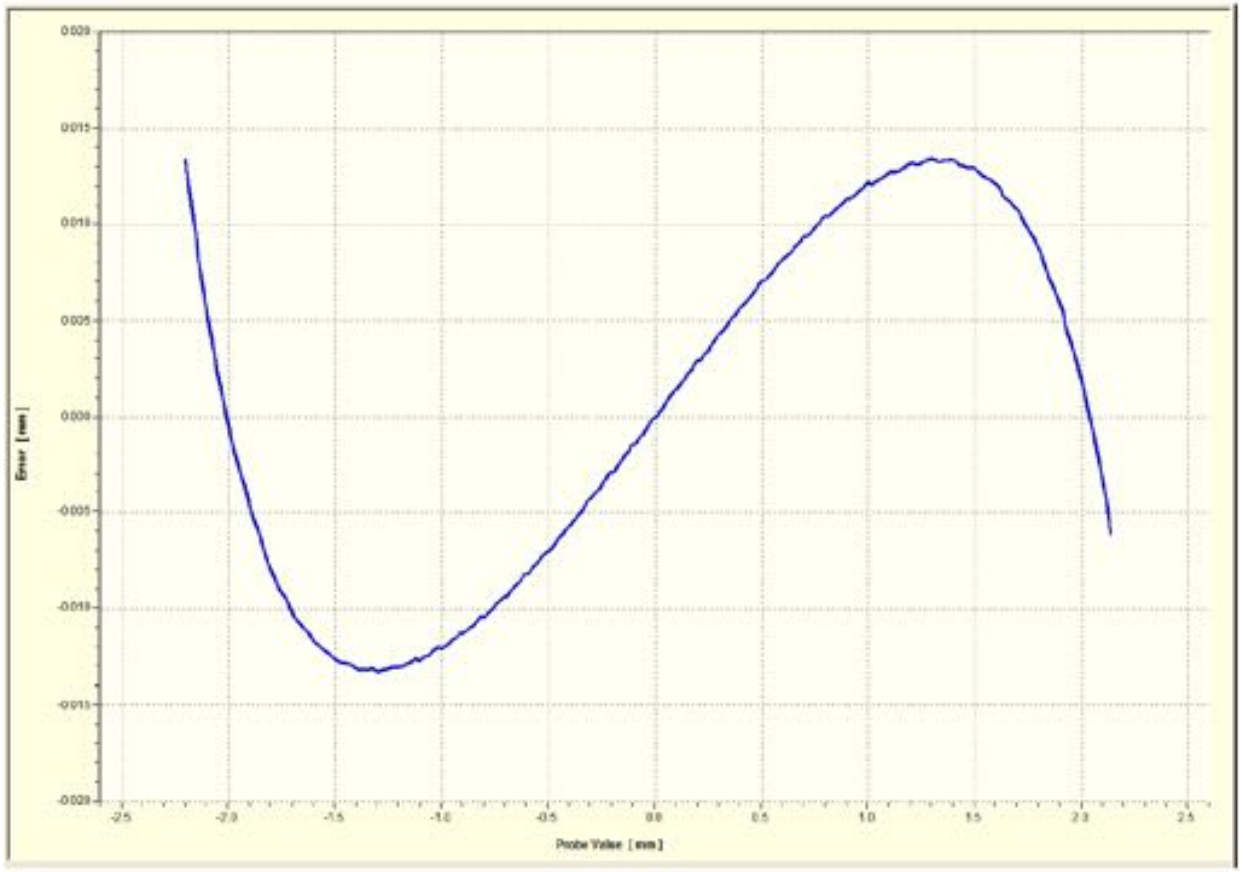
IMS probes : *Linearity Tesa GT21*

Tesa GT21, Ser.-Nr. : 1U469063
IBR IMB-im1 **Calibrated for +/- 1.000 mm measuring range**

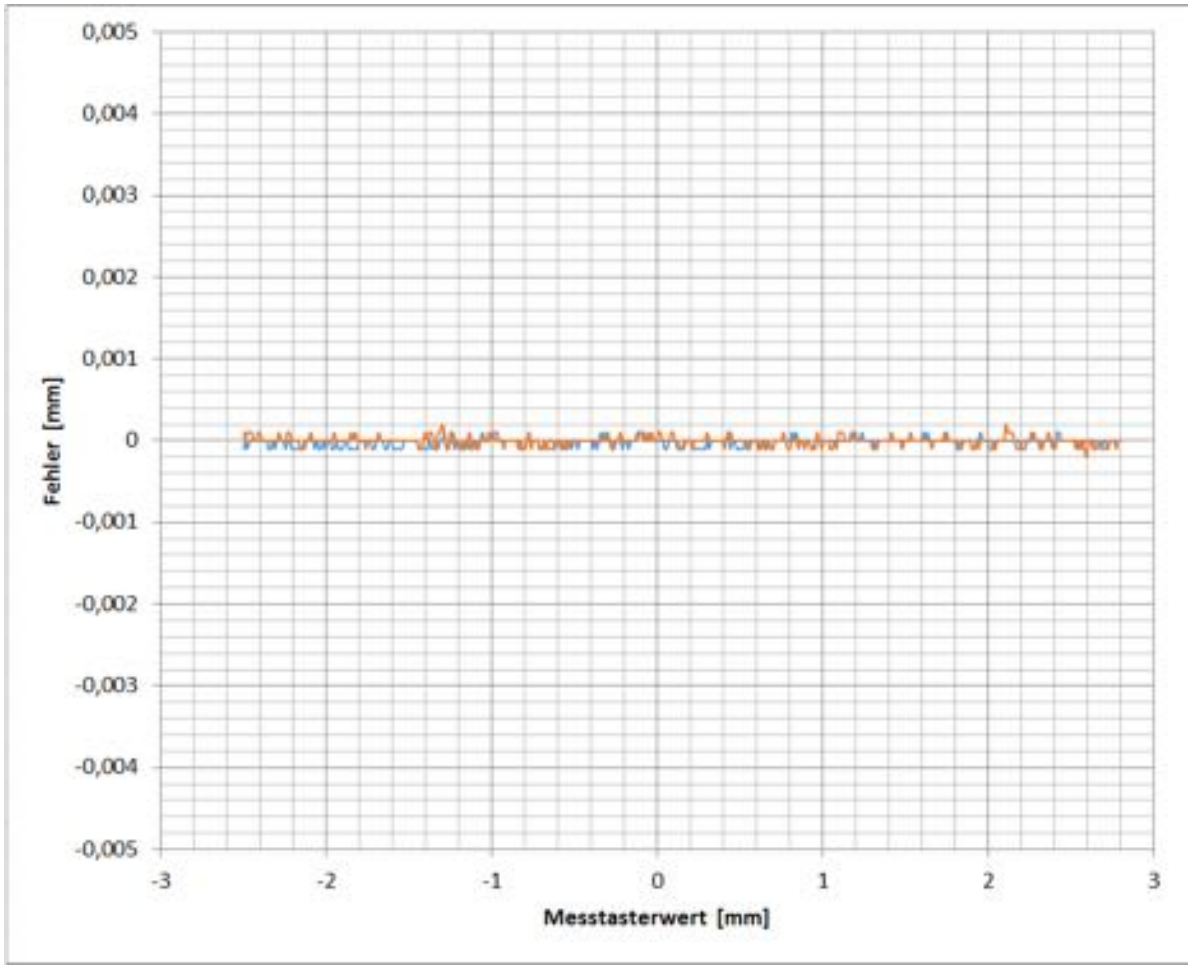


IMS probes : *Linearity Tesa GT21*

Tesa GT21, Ser.-Nr. : 1U469063
IBR IMB-im1 Calibrated for +/- 2.000 mm measuring range



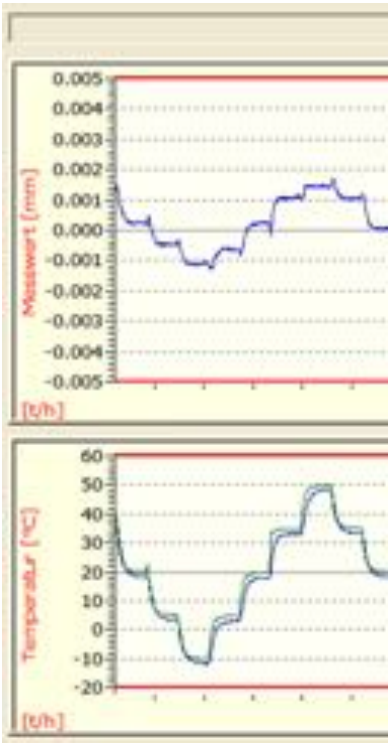
IMS probes : *Linearity IMS-5 series*



IMS probes : *Temperature drift compensation*

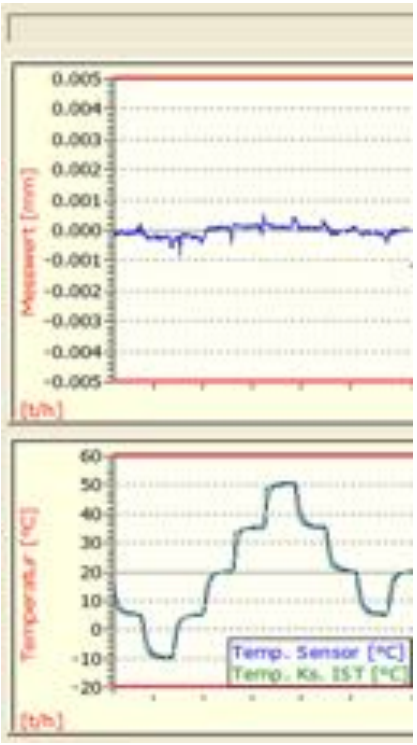
Standard inductive probe

60°C temperature change
➔ 3.0 µm mea. value drift



not compensated

IMS probe



60°C temperature change
➔ 0.3 µm mea. value drift

compensated

ISi-Bus : *Connection cables*

ISi-cca *ISi bus connection cable, axial*
F390 1xx

ISi-ccr *ISi bus connection cable, radial*
F390 3xx

ISi-ccap *ISi bus connection cable, axial, pneumatic connection*
F390 2xx

ISi-ccrp *ISi bus connection cable, radial, pneumatic connection*
F390 4xx

All connectors comply with protection IP 65 and are made out of stainless steel.

All cables are PUR coated and EMC - technically shielded.

The compressed air / vacuum connection is done by a hose with size 2.5 x 4 mm.

ISi-Bus : *Connection adapters*

ISi-ca1

ISi-ca4

ISi-ca2

ISi-bt

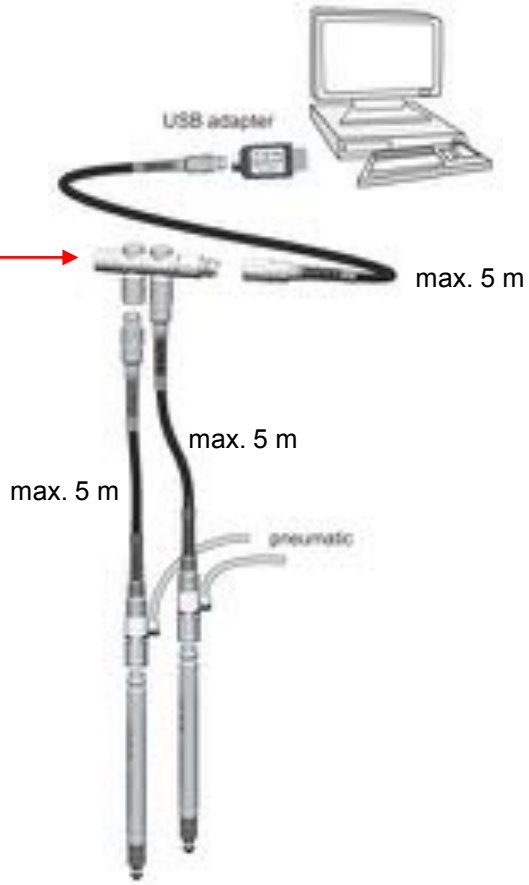
ISi-Bus : *Connection cables / adapters*

Maximum length of a connection cable : 5 m

Maximum length of cables between 2 sensors : 10 m

If longer cables are needed, the IMBus can be used.
(Maximum length of the IMBus : 1200 m)

Important notice :
In the ISi-Bus, no connectors are allowed to stay open.
If a connector is not used to connect a sensor or hand / foot switch, it has to be closed with a bus terminator (ISi-bt).



ISi-Bus : *Connection modules*

IMB - ISi1
(IMBus module)

USB - ISi
(PC connection adapter)

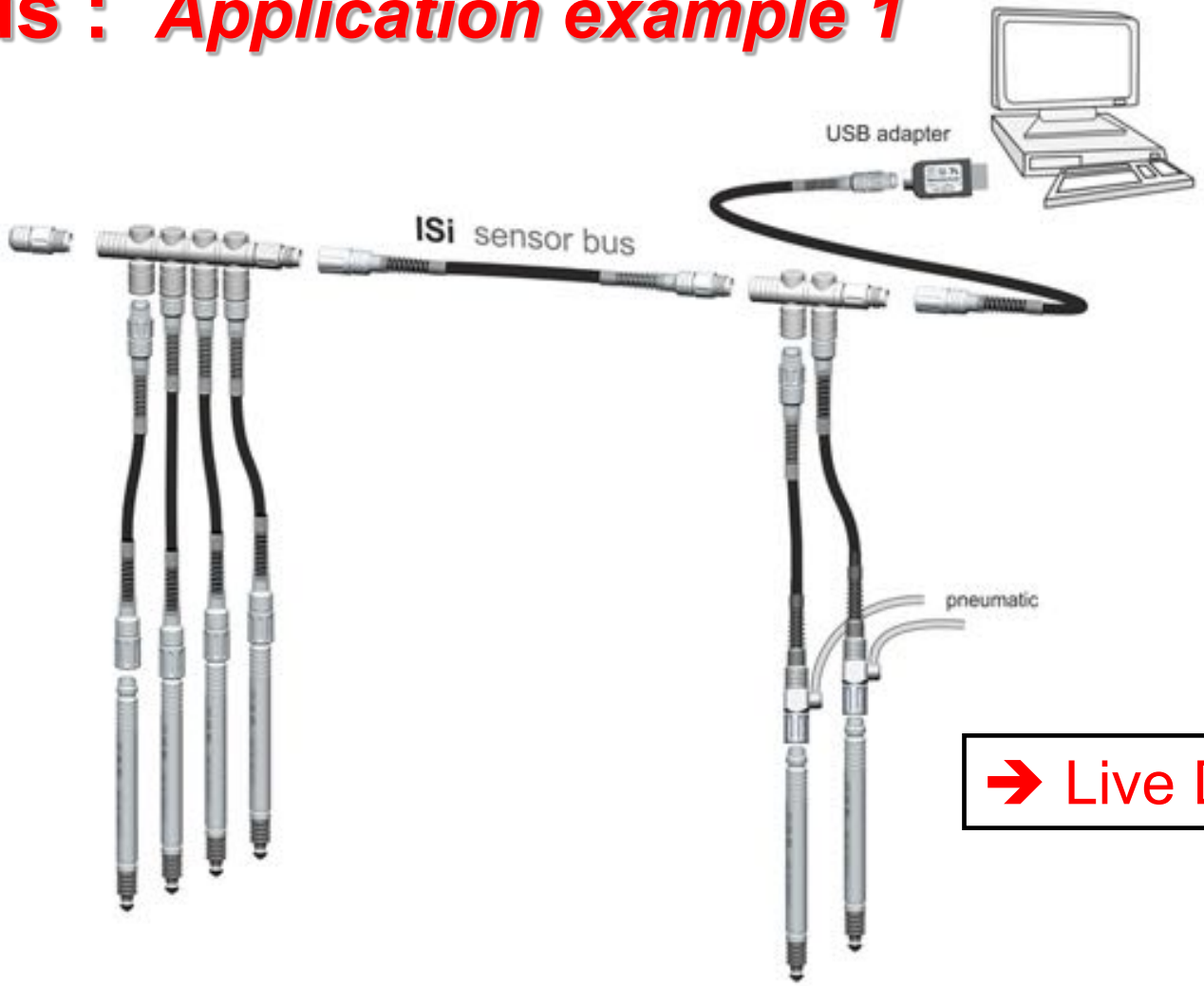
IMB - ISi4
(IMBus module)

Connection module for parallel operation of 4 sensors with ISi interface for high measuring rates

Connection modules for connection of 1... 60 sensors, hand / foot switches and I/O modules to an ISi bus

ISi-Bus : *Exhibition stand Control 2019*

ISi-Bus : *Application example 1*



➔ Live Demo

ISi-Bus : *Application example 2*

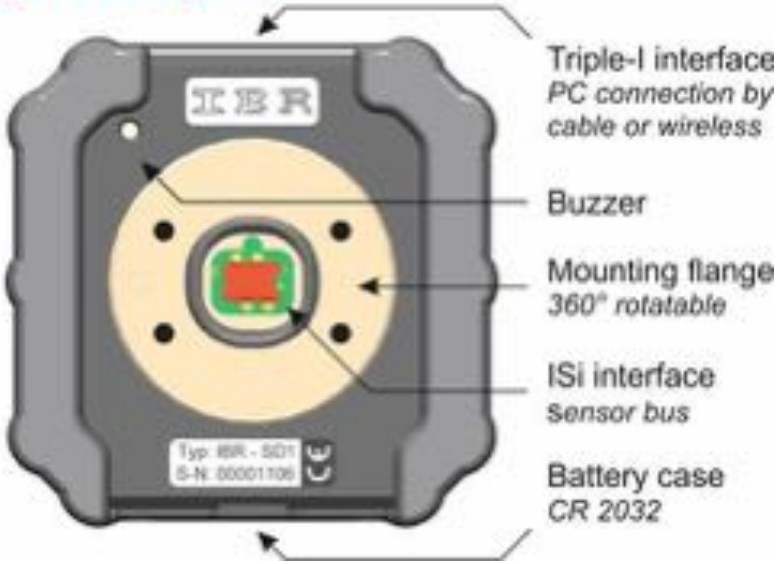
CD70 with 8 IMS-5S probes and hand switch

Mecc with 2 IMS-5P probes

Sensor display SD1 : *Elements*

Image : Front panel

Image : Back panel



High precision dial gauge SD1 - IB5

The SD1 - IB5 is a high precision dial gauge with a free of clearance ball bearing and a linearized, inductive absolute measuring system. The dial gauge was specially designed for industrial use in rough manufacturing environment.

Type	Article
SD1 - IB5	High precision dial gauge, spring pushed
SD1 - IB5P	High precision dial gauge, pneumatically pushed
SD1 - IB5V	High precision dial gauge with vacuum lifting

Technical data : SD1 - IB5

Mechanical characteristics	
Case	Aluminium, rubber shock protection
Front plane	Acryl glass (scratch-proof coated)
Dimensions / Weight	(W x H x D) 58 x 111 x 35.5 mm / 192 g
Electrical characteristics	
Power supply	Battery (CR2032)
Battery lifetime	approx. 8000 h
Metrological characteristics	
Measuring range	5 mm
Resolution	0.1 µm
Accuracy	< 1 µm
Measuring rate	adjustable, 2 ... 20 values / sec
Measuring force	0.7 N (optional 0.4 ... 2.0 N)
Environmental conditions	
Operation / Storage temp.	+41 ... +113 °F / -4 ... +158 °F
Protection class	IP65 (CEI / IEC 529)

EMC according to EN50081 - 2 and EN50082 - 2

Note :
The IB5 measuring sensor is fixed with 4 screws on the display and is to exchange.

Sensor display SD1 : *SD1-IB5J*

Modular dial gauge SD1 with probe holder PH5

The SD1 with the probe holder PH5 is a modular dial gauge designed to work with IMS measuring probes.

Type	Article
PH5	SD1 probe holder PH5 for IMS - serie

Technical data : SD1 + PH5

Mechanical characteristics

Case	Aluminium, rubber shock protection
Front plane	Acryl glass (scratch-proof coated)
Dimensions / Weight	(W x H x D) 58 x 111 x 35.9 mm / 165 g

Electrical characteristics

Power supply	Battery (CR2032)
Battery lifetime	approx. 8000 h
Measuring rate	adjustable, 2 ... 20 values / sec

Measuring system

Measuring range, resolution, accuracy, ... are defined by the connected measuring probe or sensor.
Example : Measuring probe IMS-5S → *Range 5mm, Resolution 0.1µm*

Environmental conditions

Operation / Storage temp.	+41 ... +113 °F / -4 ... +158 °F
Protection class	IP65 (CEI / IEC 529)

EMC according to EN50081 - 2 and EN50082 - 2

Connection adapter for Compact display SD1

The SD1 with the connection adapter CC1 is a very efficient, powerful display with ISi-Bus interface. Due to the ISi bus, several sensors, foot and hand switches and tolerance adapters can be connected.

Technical data : SD1+CC1

Mechanical characteristics	
Case	Aluminium, rubber shock protection
Front plane	Acryl glass (scratch-proof coated)
Dimensions / Weight	(WxHxD) 58 x 58 x 32.8 mm / 149 g
Electrical characteristics	
Power supply	Battery (CR2032)
Battery lifetime	approx. 6000 h (incl. 2 probes)
Measuring rate	adjustable, 2 ... 20 values / sec
Connections	
ISi interface	Bus connection for sensors, hand / foot switch, tolerance adapter, ...
Triple-I interface	Connection for IBR radio modules or cable with USB / RS232 interface
Environmental conditions	
Operation / Storage temp.	+41 ... +113 °F / -4 ... +158 °F
Protection class	IP65 (CEI / IEC 529)

EMC according to EN50081 - 2 and EN50082 - 2

Type	Article
CC1-Connection adapter	Connection adapter for ISi-Bus
CE1-Extension adapter	Extension adapter for ISi-Bus
SD1-mounting bracket	Slewable mounting bracket
SD1-pedestal	Pedestal for compact display

Sensor display SD1 : *CE1 adapter*

For connecting a 2nd IMS probe, a hand / foot switch, …

to an SD1-IB5 / -PH5 :

SD1 short operating instruction :

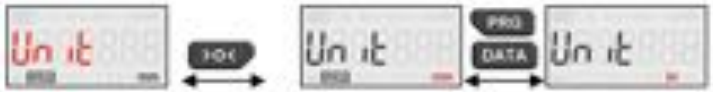
▼ ▲ ENTER ← Key function in programming menu

PRG DATA >O< ← Key function in measuring mode

Key function in :	Measuring mode	Programming menu
PRG	Call programming menu	▼ Decrease flashing display (- 1)
> 2 sec.	*Freely programmable favorite key*	Exit programming menu
DATA	Data transfer Start / Stop dynamic measurement	▲ Increase flashing display (+ 1)
> 2 sec.	*Freely programmable favorite key*	- - -
>O<	Zero adjustment	ENTER Confirm flashing display
> 2 sec.	*Freely programmable favorite key*	Exit menu item

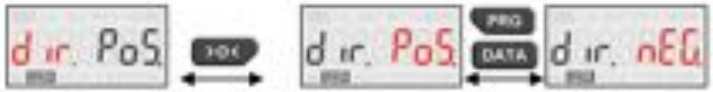
Sensor display SD1 : *Manual excerpt*

Basic function / Selection of the unit



Basic function / Selection of the resolution

Basic function / Selection of the measuring direction



Calibration / Zeroadjustment & Preset

Note :
All digits have to be set one by one with the buttons PRG and DATA. The change to the next digit is done by pressing the button >0<. If the button >0< is pressed > 2 sec., the complete number is confirmed regardless of which digit is active at the moment.

Calibration / 2 Master calibration

Windows configuration software SD1_Win.exe

Manufacturer configuration of SD1 functions (Level 1)

	Programmable :	Factory settings in SD1
Basic functions		
Selection of Unit	☑	mm
Selection of Resolution	☑	0.0001
Selection of measuring direction	☑	positive
Calibration		
Zeroadjustment / Preset	☑	20.0000 Preset
2-Master calibration	☑	-0.0500 Min-Master
		0.0500 Max-Master
Temperature forced calibration	☑	3.0 °C
Timer forced calibration	☑	Off
Measuring inputs		
Measuring input A	☑	☑ + A
Measuring input B	☐	☐ + B
Measuring modes		
☑ Static ☑ Min ☑ Max ☑ Mean (Max + Min)/2 ☑ TIR (Max - Min) ☑ Bore (2 point bore mea.)	☑	Static
Grading mode		
Number of grades	☑	Off
Display value on numeric display	☑	Measuring value
Tolerance limits		
◉ Nominal size with relative tolerance limits (e.g. 20 mm +0.02 / -0.01) ○ Absolute tolerance limits (e.g. 20.02 mm / 19.99 mm)	☑	20.0000 Nominal size; ☑ 0.0500 UT (+ Tolerance); -0.0500 LT (- Tolerance)
Tolerance LEDs		
Display colour	☑	Red Exceeding UT; Red Undercutting LT
Display output time	☑	2 seconds
Analogue display		
Mode of analogue display	☑	Bargraph
Origin of analogue display	☑	Center
Display control		
Freeze display on static measurement (hold)	☑	Off
Favorite buttons in measuring mode (button pressed for 2 sec)		
Display switchover : ☑ Dyn. mode (Min, Max, ...) ☑ Mea. value / grade ☑ Mea. value / nom. size variation ☑ Mea. value / temperature ☑ Mea. value / battery voltage ☑ Unit ☑ Resolution; Calibration : ☑ 2-Master calibration ☑ Delete zeroadjustment / cal.	☑	'PRG' button: Delete zeroadjustment / cal.
Device control : ☑ Switch gauge off ☑ Autom. data output on changing of mea. value (on / off)	☑	'DATA' button: Autom. data output on changing of mea. value (on / off)
	☑	'>0<' button: Switch gauge off
ISi hand / foot switch		

OK | Cancel | Help

➔ Live Demo

Sensor display SD1 : *Connection via radio*

Features

IMS probe :
- 0.1 µm resolution
- 1µm accuracy

ISM Radio modules :
- 1…500 adresses
- Transmission for live display
- Battery life 1 year *(CR2032)*
- *Long range*

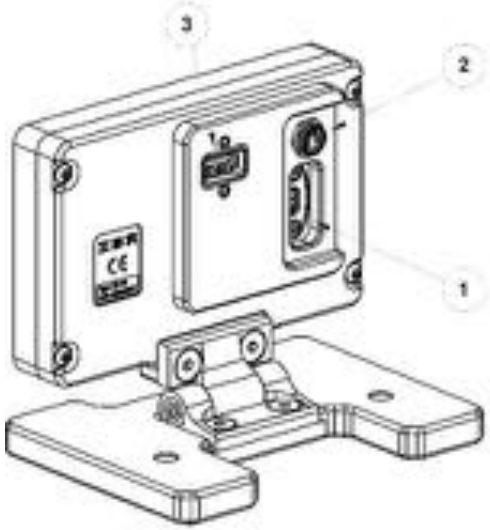
Sensor display SD1 : *Application example 1*

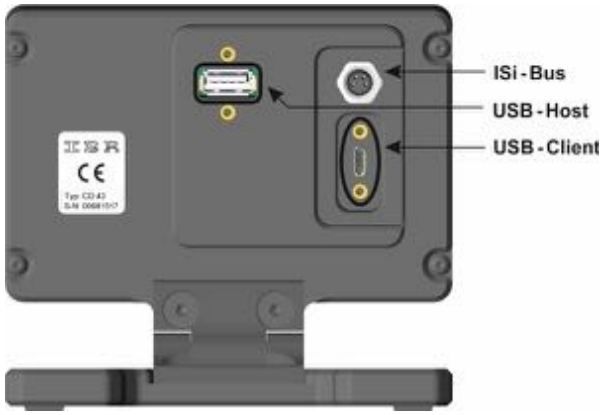
Radio measuring station with SD1 and Mitutoyo dial gauge

Sensor display SD1 : *Application example 2*

Measuring station with several SD1 dial gauges

Computer display CD43





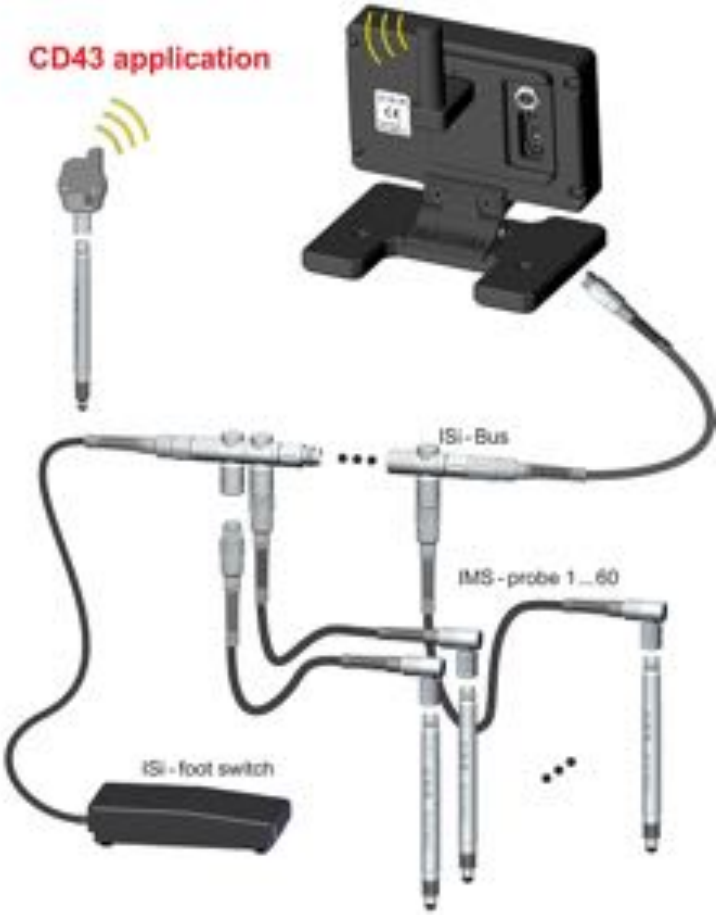
1. Micro USB for power supply or PC connection
2. ISi connector expandable with ISi adapters for connecting 1 ... 60 sensors as well as hand / foot switch and I/O modules
3. USB port for keyboard, mouse, flash drive, ...

Computer display CD43

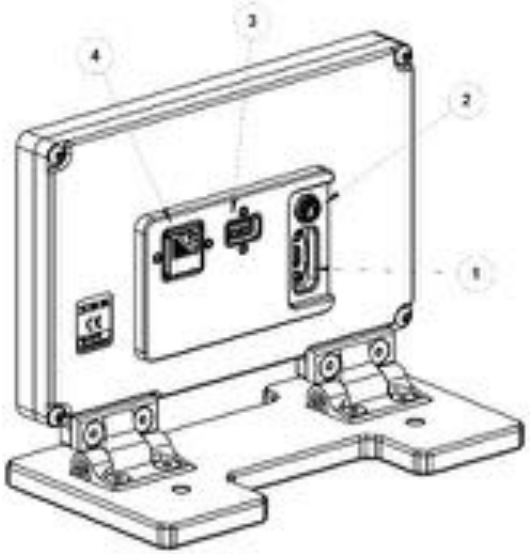
Technical data :

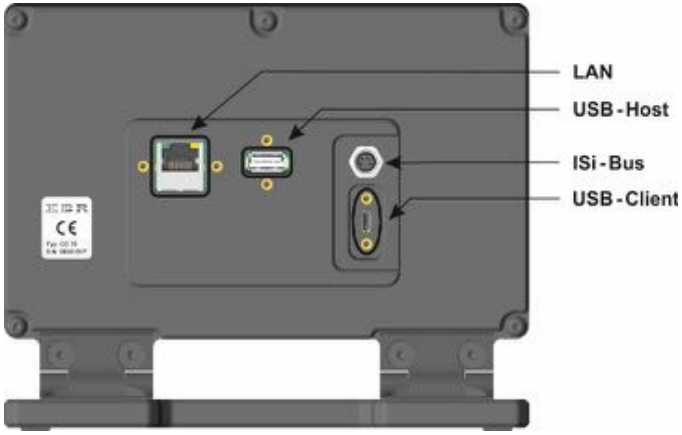
	Mechanical characteristics
Case with foot	Aluminium powder-coated
Dimensions / Weight	(W x H x D) 118 x 95 x 72.5 mm / 420 g
Protection class	Front side IP65, CEI / IEC 529
	Rear side IP64 with connector caps
	Electrical characteristics
External power supply	100 ... 240 VAC, 6 Watt
Max. power consumption	1.8 Watt (without sensors)
	Computer characteristics
Display	4.3" TFT, resolution 480 x 272 (adjustable angle of tilt)
Touch Screen	4-wire analogue resistive
CPU	Vybrid VF61, 500 MHz
Memory	256 MB RAM, 512 MB Flash
Operating system	Windows CE 7
Measuring software	ComGage Level 1
	Connections
Standard PC connections	1 x USB client, 1x USB host
ISi interface	60 sensors / clients
	Environmental conditions
Operation / Storage temp.	+41 ... +113 °F / -4 ... +158 °F

CD43 application



Computer display CD70





1. Micro USB for power supply or PC connection
2. ISi connector expandable with ISi adapters for connecting 1 ... 60 sensors as well as hand / foot switch and I/O modules
3. USB port for keyboard, mouse, flash drive, ...
4. LAN connctor for network connection

Computer display CD70

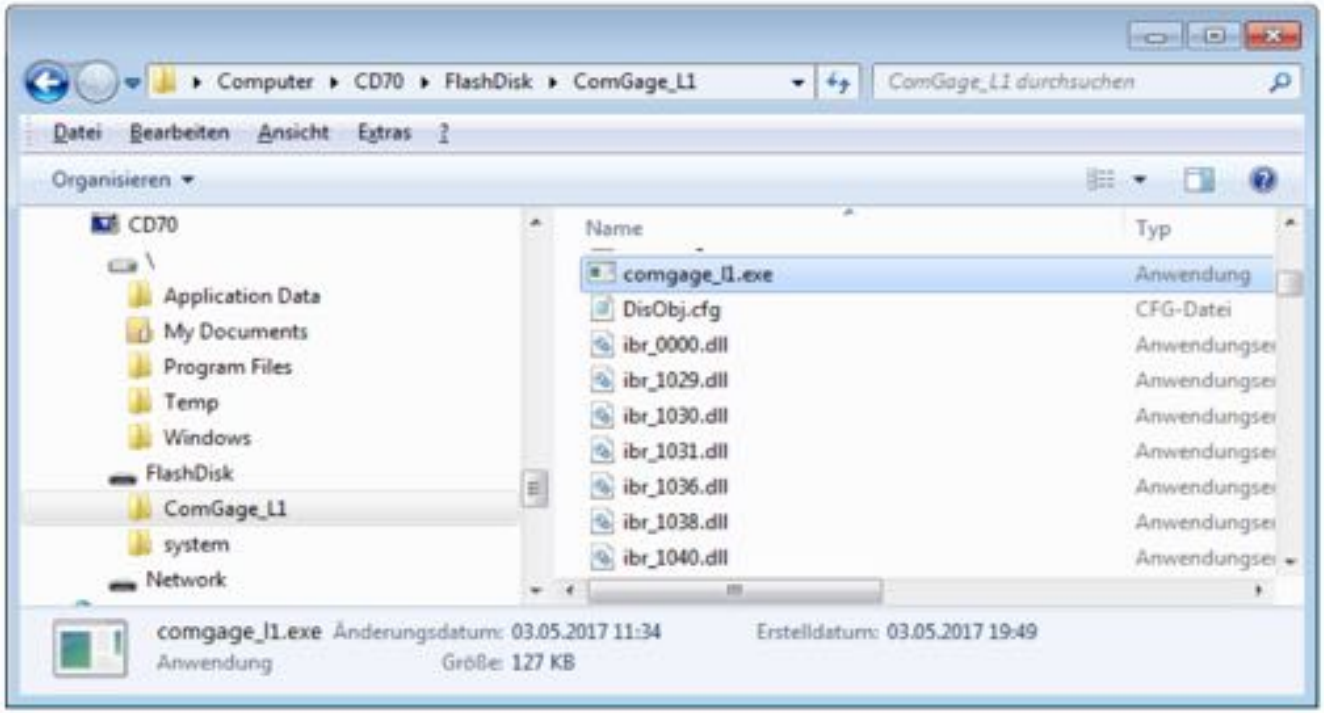
CD70 application

Technical data :

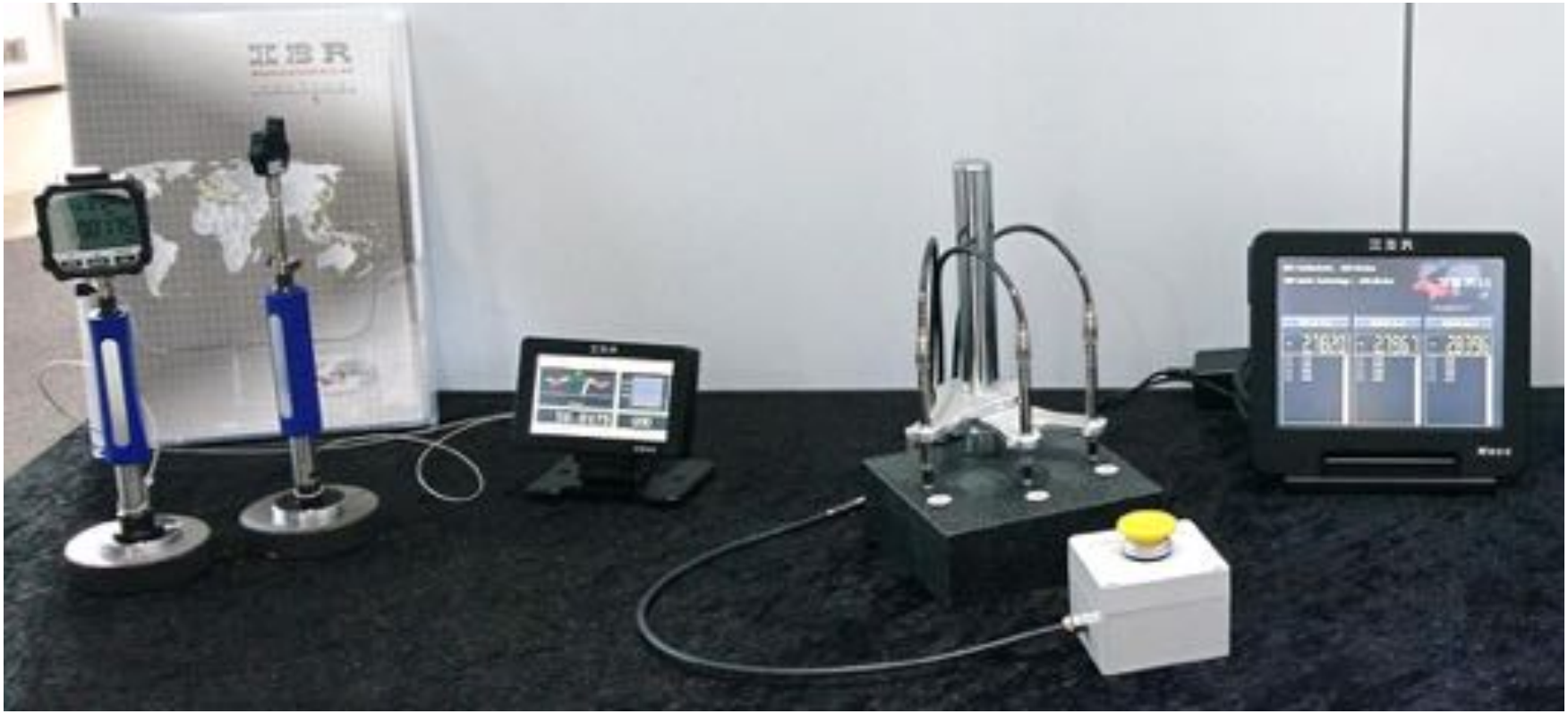
Mechanical characteristics	
Case with foot	Aluminium powder-coated
Dimensions / Weight	(WxHxD) 184 x 135 x 87.5 mm / 1.0kg
Protection class	Front side IP65, CEI / IEC 529
	Rear side IP64 with connector caps
Electrical characteristics	
External power supply	100 ... 240 VAC, 6 Watt
Max. power consumption	2.4 Watt (without sensors)
Computer characteristics	
Display	7.0" TFT, resolution 800 x 480 (adjustable angle of tilt)
Touch Screen	4-wire analogue resistive
CPU	Vybrid VF61, 500 MHz
Memory	256 MB RAM, 512 MB Flash
Operating system	Windows CE 7
Measuring software	ComGage Level 1 / ComGage Level 2
Connections	
Standard PC connections	1x USB client, 1x USB host, 1x LAN
ISi interface	60 sensors / clients
Environmental conditions	
Operation / Storage temp.	+41 ... +113 °F / -4 ... +158 °F

Access to flash memory of CD43 / CD70 computer displays via USB

On connection of a CD43 / CD70 via USB client connector (Micro-USB) to a Windows PC, the flash memory of the CD43 / CD70 computer display can be directly accessed via Windows Mobile Device Center Software.



Application example 1 : *Radio connections*

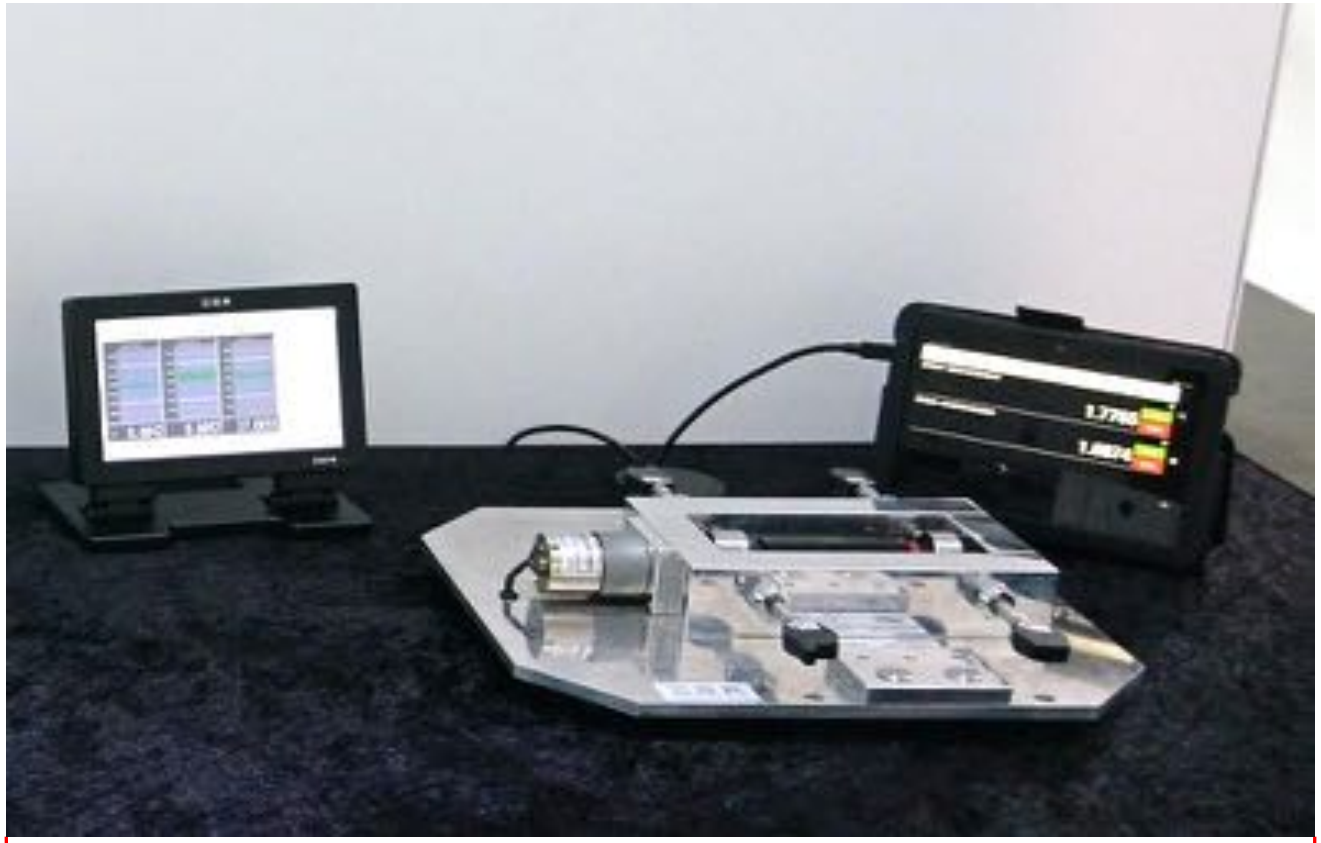


Bore gauges connected to a CD43

3 IMS probes connected to a Mecc

Application example 1 : *Radio connections*

Application example 2 : *Radio connections*



IMS-5S probes connected to a CD70 / tablet via radio

Application example 3 : *Mecc*

Application example 4 : *IMBus + ISi-Bus*