

## Short description

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- The **wireless** measuring interface **MESAS tetra bluetooth** is a modular interface with 4, 8, 12 or 16 input ports for various types of transducers (Halfbridge / LVDT) and analogue voltage.
- The modular conception of MESAS tetra bluetooth provides a lot of flexibility due to the fact that up to 4 different types of measuring devices can be combined in one box.
- The receiver, of the size of a memory stick, is plugged into the USB interface of a Windows® XP or 2000 PC.



**Wireless transmission** of measuring data from the interface box to the measuring computer by **Bluetooth® technology**.

## YOUR ADVANTAGE

- No wires between measuring interface and computer
- Transmission range 80 m
- up to 16 inputs for connecting to any standard transducers
- Static and dynamic measurement.

## RANGE OF APPLICATION

- Any measuring task, where a high degree of mobility is needed.
- Any application, where the measuring gauge needs to be taken to the parts to be measured.

## Highlights

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- Mobile transmission by "bluetooth network"
- Easy handling
- 16 inputs for connecting to any standard inductive probe
- Powered by rechargeable battery
- Static and dynamic measuring

## Software

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- Drivers, Test program and communication software providing COM objects for in-process and out-of process communication with third-party software, like Microsoft® VBA® applications, Visual C, Borland Delphi etc.
- Software requirements
  - Operating system e.g. Microsoft® Windows® 2000 or XP
  - MESAS MQMD software or third-party software programmable for processing of COM objects, e.g. Microsoft® Excel®  
(This software is not included in the standard delivery.)

## Technical Data

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### Measuring inputs:

- Transducer inputs for Halfbridge/LVDT:  
Resolution: 0,1 µm, Range +/- 2mm  
Brands: Solartron, IET, Marposs, Mahr, Tesa  
... others on request
- Analogue inputs:  
Voltage DC +/- 5V, +/- 10V, 0-5V, 0-10V  
... others on request

### Power supply:

- built in AC power supply
- option: Built in battery with AC charging unit

### Schnittstelle zum PC:

- Microsoft® Windows® USB 2.0

### Anschlusskabel:

- Power cord 2 m for charging unit

### Sizes (W x H x D):

- 4 Inputs : approx. 125 x 60 x 96 mm
- 8/12/16 Inputs : approx 260 x 96 x 180 mm

### Weight:

- 4 Inputs : approx. 500 g
- 8/12/16 Inputs : approx. 3.500 g

### Protection type:

- IP 54, NMEA

### Transmission range:

- 80 m, 360°

## Description

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- The **measuring and evaluation system "MESAS pico15"** is the new industrial computer based system with 15-inch display.
- It is the high performance solution for measurement on manually operated, semi-automatic and fully automatic gauges.
- Up to 128 input channels
- Individual programming of measurement cycle control for static and dynamic measuring tasks
- Parallel measurement and evaluation
- Statistical evaluation ref. QS9000



## Standard Hardware Configuration

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- Motherboard Pentium with 512 MByte RAM
- Hard disk drive with minimum 80 GB Capacity incl. Controller
- Built in CD/DVD burner
- IBM-PC printer port
- Built in, high resolving 15"- Colour-Display incl. Interface
- Connector or keyboard and mouse on front side protective cover
- Interface for connecting 2 off external measuring interfaces MESA tetra
- I/O-Interface with 16 opto inputs and 16 relay outputs,
- PS/2 interface for MESAS softkey pad
- USB interfaces
- Network adapter RJ45
- External sprayproof softkey pad , protection type IP54

## Standard Software Configuration

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- MESAS MQMD single user measurement software with reporter for Microsoft Windows®
- Operating system Microsoft Windows®

## Options

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- Measuring inputs:
  - with 16-bit resolution
  - up to 8 internal inputs plus max. 16 external inputs
  - max. 128 external inputs without internal inputs
  - 4 internal inputs for incremental probes replacing the internal standard inputs
- Microprocessor controlled serial interface for MESAS tetra universe/pneu
- Networking interface
- Wireless networking interface
- Touchscreen
- Profibus option
- Additional 16 opto inputs and 16 relay outputs
- Cordless ASCII keyboard and mouse
- Non-interruptible power supply
- External monitor and softkey pad for parallel terminal
- Adaption to other voltages (e.g. 110V / 60Hz ....)
- Check list programming, creating of part sketches, programming of machine control etc.
- Special programming e.g. FFT(Fast Fourier Transformation), Ovality and camber measurement, classification etc.
- On-screen visualisation for operator guidance
- Data export to Microsoft Excel® format (.csv)
- Data export to Q-DAS qs-STAT 3.x
- Automatic creation of checklists from external machine protocol
- Installation and commissioning, training
- Extended warranty

## Technical Data (Standard Configuration)

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<b>Power supply:</b>	240 V AC, 50 - 60 Hz (Optional 110 V) power cord 1,5m, incl. filterplug
<b>W x H x D:</b>	approx. 450 x 417 x 480 mm
<b>Protection type:</b>	IP54
<b>Weight:</b>	19,5 kg
<b>Environmental temperature:</b>	0-45 °C cooling by internal air circulation, no filters or fans to the outside
<b>Warranty:</b>	24 months from delivery, at MESAS

## Description

- The measuring and evaluation system "MESAS pico15 light" is an industrial computer based system with 15-inch display.
- It is the high performance solution for measurement on manually operated, semi-automatic and fully automatic gauges.
- Up to 64 input channels by external interface MESAS tetra USB
- Individual programming of measurement cycle control for static and dynamic measuring tasks
- Parallel measurement and evaluation
- Statistical evaluation ref. QS9000



## Standard Hardware Configuration

- Motherboard Via-CPU with 512 MByte RAM
- Hard disk drive with minimum 60 GB Capacity incl. Controller
- Built in, high resolving 15"- Color-Display incl. graphics adapter
- Connector or keyboard and mouse on front side protective cover
- 4-off USB connectors
- Network adapter RJ45
- External sprayproof softkey pad , protection type IP54

## Standard Software Configuration

- MESAS MQMD single user measuring software with reporter for Microsoft Windows®
- Operating system Microsoft Windows®

## Options

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- Wireless networking interface
- Profibus / Interbus option
- Upgrade 16 opto inputs / 16 opto outputs by external interface MESAS tetra USB
- Touchscreen
- Cordless ASCII keyboard and mouse
- Non-interruptible power supply
- External monitor and softkey pad for parallel terminal
- Adaption to other voltages (e.g. 110V / 60Hz ....)
- Check list programming, creating of part sketches, programming of machine control etc.
- Special programming e.g. FFT(Fast Fourier Transformation), Ovality and camber measurement, classification etc.
- On-screen visualisation for operator guidance
- Data export to Microsoft Excel® format (.csv)
- Data export to Q-DAS qs-STAT Me XX
- Automatic creation of checklists from external machine protocol
- Installation and commissioning, training
- Extended warranty

## Technical Data (Standard Configuration)

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<b>Power supply:</b>	110-240 V AC, 40 - 60 Hz
<b>W x H x D:</b>	approx. 450 x 417 x 280 mm
<b>Protection type:</b>	IP54
<b>Weight:</b>	15,5 kg
<b>Environmental temperature:</b>	0-45 °C cooling by internal air circulation, no filters or fans to the outside
<b>Cable length:</b>	power cord 1,5m, incl. filterplug
<b>Warranty:</b>	24 months from delivery, at MESAS

## Interfaces

- **MESAS tetra T/P 16**
  - with 16 inputs for transducers or analogue voltage
  
- **MESAS tetra T/P 8**
  - with 8 inputs for transducers or analogue voltage
  
- **MESAS tetra universe**
  - individual configuration of input modules for transducers, analogue voltage or current, incremental probes (linear or ROD)
  - 1 to 16 inputs
  
- **MESAS tetra USB**
  - Modulare Interface with inputs for transducers, LVDT, Halfbridge, analogue voltage
  - 4, 8, 12, 16 inputs
  - Fits to any standard Windows® PC with USB 1.1 or 2.0, connector type A
  
- **MESAS tetra LAN**
  - Modulare Interface with inputs for transducers, LVDT, Halfbridge, analogue voltage
  - 4, 8, 12, 16 inputs
  - Ethernet (TCP/IP), Webservice (SOAP)
  
- **MESAS tetra pneu**
  - for attachment of pneumatic probes
  - 1 to 8 pneumatic input modules
  - up to 8 inputs for transducers



## Measuring system extensions

- Additional 16 opto-input and 16 relay-output
- Additional 16 opto-input and 16 driver-output
- Profibus or Interbus interface incl. software
- Interface for attachment of additional external interface boxes MESAS tetra T/P

- Interface for attachment of additional external interface boxes MESAS tetra universe/pneu
- 4-channel RS232-interface to connect 4 peripherals like IRdigit, printer etc.
- Multiport RS232-interface for more than 4 RS232 ports
- MESAS IRdigit external interface for digital measuring equipment: Mitutoyo, Mauser, Sylvac, TESA etc.

## Operating peripherals

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- External sprayproof operator panel, protection type IP54
- Standard ASCII keyboard ref. DIN 2137 for check list programming (editing of nominals, tolerances etc..)
- As above but membrane keyboard, sprayproof, IP65
- Startbox: 4 start buttons and 2 key switches
- Startbox: 6 start buttons, 2 key switches and 5 lights
- Startbox: 12 start buttons, 2 key switches and 5 lights
- Column with 5 light signals
- Pedal switch





## Printer

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- Monochrome-Matrix-Printer DIN A4 (type on request)
- Inkjet printer (type on request)
- Laser printer (type on request)

## Others

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- Option Tool correction
- Networking (Ethernet, Token-Ring, WIN, Novell, TCP/IP, PC-NFS) others on request

## Description

**MESAS tetra universe** is an extremely flexible interface with 16 ports for various types of transducers, analogue signals and incremental probes.  
The interface box is connected to the MESAS standard io card of a MESAS measuring computer system.  
Up to 4 MESAS tetra universe (64 measuring inputs) per standard io.



### Your advantage:

- Flexibility of a modular system
- Parallel multiprocessor technology provides high speed performance for very precise measuring tasks.
- Resolution variable (12 or 16 Bit)

The attached module list contains the existing standard modules. If the module you require is not included, please do not hesitate to contact us. We are going to design the suitable module for you.

## Technical Data

<b>Power:</b>	110/240 V AC, 50-60Hz, 30 VA Automatic adoption to existing voltage
<b>Interface:</b>	MESAS standard io
<b>W x H x D:</b>	330 x 140 x 205 mm
<b>Weight:</b>	3.5 kg
<b>Protection type:</b>	IP 54
<b>Cables:</b>	Power cord 1.5 m with filter plug 1 data cable 2.5 m with 25 pole connector

## Transducer modules

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with 12 bit -or 16 bit resolution available for:

- Tesa and compatibles
- Mahr
- Hirt
- Metem
- Air-Gage
- Solartron
- Feinprüf
- Mitutoyo
- Marposs
- Knäbel
- Mercer
- Novibra
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- 
- others on request

## Analogue modules

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with 12 bit -or 16 bit resolution available for:

- Voltage DC  $\pm$  3 Volt
- Voltage DC  $\pm$  5 Volt
- Voltage DC  $\pm$  10 Volt
- Voltage DC 0-10 Volt
- Current 0 - 20 mA
- Current 4 - 20 mA
- 
- others on request

## Incremental modules

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**Note:** Each incremental module takes two slots!

- Heidenhain Sinus 11  $\mu$ A (pp)
- Heidenhain 5 Volt TTL
- 
- others on request

## Description

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- **MESAS tetra USB** is an extremely flexible interface with 4, 8, 12 or 16 input ports for various types of transducers and analogue voltage.
- The interface box is connected to the standard USB port of a Microsoft® Windows® 2000 or XP computer.
- COM Objects allow to read measuring inputs into third-party software like Microsoft® Excel® VBA applications.



## YOUR ADVANTAGE

- Huge variety of connectable measuring equipment
- Flexibility of a modular system.
- High Speed Precision Measurement
- Fits to any Microsoft® Windows® 2000, XP PC with USB 1.1 or 2.0 Type A interface

## Software

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- Drivers, Test program and communication software providing COM objects for in-process and out-of process communication with third-party software, like z.B. Microsoft® VBA® applications, Visual C, Borland Delphi etc.
- Software requirements
  - Operating system e.g. Microsoft® Windows® 2000 or XP
  - MESAS MQMD software or third-party software programmable for processing of COM objects.
  - This software is not included in the standard delivery.

## Technical Data

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<b>Measuring inputs:</b>	<u>Transducer inputs for LVDT, Halfbridge:</u> Resolution: 0,1 µm, Range +/- 2mm Brands: Solartron, IET, Marposs, Mahr, Tesa ... others on request <ul style="list-style-type: none"><li>■ <u>Analogue inputs:</u> Voltage DC +/- 5V, +/- 10V, 0-5V, 0-10V ... others on request</li></ul>
<b>Power supply:</b>	<ul style="list-style-type: none"><li>■ 4 inputs : powered by USB</li><li>■ 8/12/16 inputs : External AC adapter (110-240V IN, 50-60Hz, 1A, 12 V OUT)</li></ul>
<b>Interface:</b>	<ul style="list-style-type: none"><li>■ Microsoft® Windows® USB 1.1 and 2.0</li></ul>
<b>W x H x D:</b>	<ul style="list-style-type: none"><li>■ 4 inputs : approx. 125 x 60 x 96 mm</li><li>■ 8/12/16 inputs : approx. 260 x 96 x 180 mm</li></ul>
<b>Weight:</b>	<ul style="list-style-type: none"><li>■ 4 inputs : approx. 0,5 kg</li><li>■ 8/12/16 inputs : approx. 3,5 kg</li></ul>
<b>Protection type:</b>	<ul style="list-style-type: none"><li>■ IP 54, NMEA</li></ul>
<b>Cables:</b>	<ul style="list-style-type: none"><li>■ Power cord 2 m, AC adapter cable 1,4 m</li><li>■ Data cable 2.5 m with USB A connector</li><li>■ (max. 5m for 4-channel interface)</li></ul>

## Options

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- 16 opto inputs / 16 driver outputs (not available for small 4-channel box)
- Rechargeable battery
- Wireless data transmission

## Hardware

	<b>pico-15 light</b>	<b>pico-15</b>	<b>ipc</b>
Max. measurement inputs	64 external USB only	8 internal, 128 external	128 external
Display TFT	internal	internal	external
Display size	15"	15"	frei
Touchscreen	optional	optional	optional
Keyboard / mouse connector	Frontside	Frontside	Backside
ext. operator panel IP54	yes	yes	yes
Motherboard / CPU	VIA	Pentium /Sempron	Pentium IV
RAM	512 MB	512 MB	256 MB
3,5 " floppy disk drive	opt.ext.	opt.ext.	1
DVD-Burner	-	1	1
Storage / harddrive	- / >60 GB	- / >80 GB	- / >80
Network RJ45	10/100 Mbit	10/100 Mbit	10/100 Mbit
Digital IO: OptoIn / OptoOut	optional 16/16 external	16/16 internal	16/16 internal
Maximum digital IO's	16/16 external	64/64 internal	64/64 internal
Profibus / Interbus interface	optional	optional	optional
Interface MESAS tetra	-	2 (max. 8)	2 (max. 8)
USB ports	4	4	2 (max. 6)
RS232 ports	-	1	2
Protection type	IP 54	IP 54	-
Sizes (W x H x D mm)	450x417x280	450x417x480	19", 4HE
Weight	15,5 kg	19,5 kg	8,5 kg
Power supply	110-240 V AC	110-240 V AC	110-240 V AC
Funk-LAN	optional	optional	optional
UPS	optional	optional	optional
Parallel screen and keyboard	optional	optional	optional
Touchscreen	optional	optional	optional

## Software

	femto	pico-15 light	pico-15	ipc
MESAS measurement software including short term statistics	yes	-	-	-
MESAS MQMD single user version incl. reporting tool	-	yes	yes	yes
MESAS MQMD multi user network version incl. reporting tool	-	optional	optional	optional
Check list programming	Choice of formulae	program m	program m	program m
Max. characteristics per check list	4	128	128	128
Max. check lists active	3	256	256	256
Data export to Microsoft Excel®	optional	optional	optional	optional
Data export to qs-STAT Me.XX	optional	optional	optional	optional
Automated creating of checklists from external machine protocol	-	optional	optional	optional
Check list import from SAP	optional	optional	optional	optional
Output of results to SAP	optional	optional	optional	optional
Machine control	optional	optional	optional	optional
On-screen visualisation for operator guidance	-	optional	optional	optional
Special programming and customized solutions	optional	optional	optional	optional
Operating system	Linux	Windows	Windows	Windows

Adam Opel GmbH	DE	Bochum
Adam Opel GmbH	DE	Rüsselsheim
AEG Hausgeräte GmbH	DE	Rothenburg/Tbr.
Albert Metz GmbH & Co. KG	DE	Blumberg
Alfing Kessler GmbH Maschinenfabrik	DE	Aalen
ALSTOM Power Generation AG	DE	Mannheim
Andreas Stihl AG & Co. KG	DE	Waiblingen
Audi AG	DE	Ingolstadt
Autoeuropa Automoveis LDA	PT	Palmela Portugal
BBZ	DE	Neunkirchen
Bergmann Automotive GmbH	DE	Barsinghausen
BMW AG Bayerische Motoren Werke AG	DE	München
Böhler GesmbH	AU	Kapfenberg
BorgWarner Transmission Systems	DE	Arnstadt
BorgWarner Transmission Systems	DE	Ketsch
Bosch Rexroth AG	DE	Hassfurt - Augsfeld
Bosch Rexroth AG	DE	Homburg
Bosch Rexroth Corporation Mobile Hydraulics	US	Fountain Inn
Brabant Components BV	NL	AL OSS
Briggs & Stratton	US	Menomonee Falls, WI
Carl Freudenberg Sparte Dichtung + Formteile	DE	Weinheim
CNC Zerspanungstechnik BLUG GmbH	DE	Tholey-Theley
Continental Teves AG & Co. OHG	DE	Gifhorn
Daimler-Benz Aerospace Airbus	DE	München
DaimlerChrysler AG	DE	Berlin-Marienfelde
DaimlerChrysler AG	DE	Gaggenau
DaimlerChrysler AG	DE	Hamburg
DaimlerChrysler AG	DE	Kassel
DaimlerChrysler AG	DE	Mannheim
DaimlerChrysler AG	DE	Rastatt
DaimlerChrysler AG	DE	Stuttgart
Dalian F.T.Z Enso Trading Co. Ltd	CN	Dalian City, P.R. China
DONCASTERS Precision Castings GmbH	DE	Bochum
EPCOS OHG	AU	Deutschlandsberg
Eppendorf-Netheler-Hinz GmbH	DE	Oldenburg
Eralmetall GmbH & Co. KG	DE	Klettgau-Erzingen
Euro-Tech Corporation	US	Menomonee Falls WI
Facab Lynen GmbH & Co. KG	DE	Eschweiler
Federal Mogul GmbH	DE	Burscheid
Federal Mogul GmbH	DE	Nürnberg
Federal Mogul	TR	Istanbul
Federal Mogul	PL	Gorzyce
Fissler GmbH	DE	Idar-Oberstein
Flamm AG	DE	Aachen



Ford Amazon Plant	BR	Camacari Bahia
Ford Aquitaine Industries	FR	Blanquefort-Cedex
Ford Brasil Ltda	BR	São Bernardo do Campo
Ford Espana S.A	ES	Valencia
Ford Motor Company Ltd.	GB	Southampton
Ford Motor Company Ltd.	GB	Liverpool
Ford Motor Company Ltd.	GB	Bridgend
Ford Motor Company	GB	Dagenham
Ford Motor Company	US	Dearborn
Ford Werke A.G.	BE	Genk
Ford Werke GmbH	DE	Düren
Ford Werke GmbH	DE	Köln
Ford Werke GmbH	DE	Saarlouis
Frankenstein Präzision	DE	St. Johann-Würtigen
Frenco Verzahnungslehren GmbH	DE	Altdorf
Freudenberg Produktionsservice KG	DE	Neuenburg
GAW GmbH	DE	Wernigerode
General Motors Powertrain Austria GmbH	AU	Wien
Georg Fischer GmbH & Co KG	DE	Mettmann
Getrag Ford Transmissions	GB	Halewood Liverpool
Getrag Ford Transmissions GmbH	DE	Köln
Getrag Ford Transmissions GmbH	FR	Blanquefort Cedex France
Gewerbliche Schulen des Lahn-Dill-Kreises	DE	Dillenburg
Grob-Werke	DE	Mindelheim
Gummiwerke Fulda	DE	Fulda
H.J. Küpper GmbH + Co.KG	DE	Velbert
Harley Davidson Inc.	US	Wauwatosa, WI
Harmonic Drive AG	DE	Limburg / Lahn
Heidelberger Druckmaschinen AG	DE	Heidelberg
Heidelberger Druckmaschinen AG	DE	Amstetten
Hermann Erkert GmbH Präzisionsteile	DE	Sulzbach/Murr
Hirtenberger Defence Systems GmbH & Co. KG	AU	Hirtenberg / Austria
Honsel Fonderie Lorraine S.A.	FR	Grosblierstroff
HPTEC GmbH	DE	Ravensburg
Ing. Erich Pfeiffer GmbH	DE	Radolfzell
Intra Corporation	US	Westland MI
ISE Innomotive Systems Europe GmbH	DE	Bergneustadt
ITP GmbH	DE	Völklingen
ITT Automotive Europe GmbH	DE	Gifhorn
ixetic Hückeswagen GmbH	DE	Hückeswagen
Jaguar Cars Ltd.	GB	Liverpool Halewood
Jaguar Cars Ltd.	GB	Allesley Coventry

Jaguar Cars Ltd.	GB	Birmingham West Midlands
Johann A. Krause Systemtechnik GmbH	DE	Chemnitz
Kaba Schliesssysteme AG	CH	Wetzikon
Kabelwerke F.C. Ehlers	DE	Hamburg
Kampmann AG	DE	Herborn/ Schönbach
Karl Schmidt Unisia Inc. Marinette Facility	US	Marinette WI
Kelch Präzisionsteile GmbH	DE	Schorndorf
Klumpp GmbH & Co. KG Automatendreherei	DE	Bretten-Rinklingen
Kolbenco Südafrika	ZA	Gauteng South Africa
Kolbenschmidt Shanghai Piston Co. Ltd.	CN	Shanghai
Kronprinz Aluguss GmbH	DE	Solingen
KS Kolbenschmidt GmbH	DE	Hamburg
KS Kolbenschmidt GmbH	DE	Neckarsulm
KS Large Bore Pistons Inc.	US	Marinette Wisconsin 54143
KTM-Sportmotorcycle AG	AU	Mattinghofen
KUKA Schweissanlagen GmbH	DE	Augsburg
Lakatos und Söhne GmbH	DE	Niederwürzbach
Leistritz Turbinenkomponenten GmbH	DE	Remscheid
Linde AG	DE	Aschaffenburg
LUK Automobiltechnik GmbH & Co. KG	DE	Bühl
MAGNA Powertrain AG & Co KG	AU	Lannach
MAHLE Brockhaus GmbH	DE	Roßwein
MAHLE Brockhaus GmbH	DE	Plettenberg
MAHLE GmbH	DE	Stuttgart
MAHLE Metal Leve S.A.	BR	Mogi Guaçu
MAHLE Pistons France SARL Ingersheim	FR	Wintzenheim Cedex
MAHLE Spółka z o.o.	PL	Krotoszyn
MAHLE Ventiltrieb GmbH	DE	Bad Homburg v. d. H.
Mannesmann Rexroth AG	DE	Lohr am Main
Mercopack	ES	Zaragoza
Metal Usti nad Labem a.s	Cz	Trmice
Michelin Kronprinz GmbH	DE	Solingen
Miele & Cie. KG	DE	Gütersloh
Mitec engine.tec GmbH	DE	Krauthausen
Niederhoff & Dellenbusch GmbH & Co	DE	Heiligenhaus
Opel Powertrain GmbH	DE	Kaiserslautern
Opel Powertrain GmbH	DE	Rüsselsheim
Opel Powertrain GmbH	DE	Bochum
Otto Fuchs KG	ZA	East-London, Südafrika
Otto Fuchs KG	DE	Meinerzhagen
Otto Fuchs KG	DE	Viersen-Dülken
OVALO GmbH	DE	Limburg / Lahn

Peitz Zerspanungstechnik	DE	Hövelhof
Porsche AG	DE	Stuttgart
Punch Powertrain NV	BE	Sint-Truiden
Rege Motorenteile GmbH & Co. KG.	DE	Eisenach
Rege Motorenteile GmbH & Co. KG.	DE	Witzenhausen
Rexroth Bosch Group Brueninghaus Hydromatik GmbH	DE	Ulm-Elchingen
Rexroth Bosch Group Brueninghaus Hydromatik GmbH	DE	Horb Am Neckar
Risch GmbH & Co.	DE	Pforzheim
Robert Bosch GmbH	DE	St. Ingbert
Rotenburger Metallwerke GmbH & Co. KG	DE	Rotenburg a. d. Fulda
Rothrist Rohr (Schweiz) AG	CH	Rothrist
Rütten GmbH & Co. KG	DE	Velbert
Saab Automobile Powertrain AB	SE	Södertalje, Schweden
Saginaw Deutschland GmbH	DE	Kaiserslautern
Saint-Gobain Sekurit Modulartechnik GmbH	DE	Würselen
Schulte & Schmitt GmbH & Co. KG Leichtmetallgießerei	DE	Flossenbürg
Sealed Power Europe GmbH	DE	Barsinghausen
Selzer Fertigungstechnik GmbH & Co.	DE	Driedorf
SKF GmbH	DE	Lüchow
SKF Plain Bearings USA	US	Winsted, CT
Sram Deutschland GmbH	DE	Schweinfurt
Sulzer EUROFLAMM Germany GmbH	DE	Bremen
Tekersan Jant Sanayii A.S. Pasalar Mevkii	TR	Bilecik / Türkiye
Tekfor Cologne GmbH	DE	Köln
ThyssenKrupp Fahrzeugguss GmbH Kloth Senking Metallgießerei	DE	Hildesheim
Thyssen Fahrtreppen GmbH	DE	Hamburg
TRW Deutschland GmbH	DE	Blumberg
Vibracoustic GmbH & Co.KG	DE	Neuenburg
Visteon Deutschland GmbH	DE	Köln
Visteon Deutschland GmbH	DE	Düren
Visteon Deutschland GmbH	DE	Wülfrath
Volkswagen AG	DE	Braunschweig
Volkswagen AG	DE	Hannover
Volkswagen AG	DE	Kassel-Baunatal
Volkswagen AG	DE	Salzgitter
Volkswagen AG	DE	Wolfsburg
Volkswagen Poznan Sp. z o.o.	PL	Poznan
Volkswagen Sachsen GmbH	DE	Chemnitz
Volkswagen Sachsen GmbH	DE	Eisenach
Wieland Werke AG	DE	Ulm
ZF Friedrichshafen AG	DE	Friedrichshafen
ZF Getriebe GmbH	DE	Brandenburg
ZF Getriebe GmbH	DE	Saarbrücken

## MESAS References

ZF Lemförder Fahrwerktechnik GmbH & Co. KG	DE	Damme
ZF Lenksysteme GmbH	DE	Bietigheim-Bissingen
ZF Lenksysteme GmbH	DE	Schwäbisch Gmünd
ZF Nacan Sistemas de Direcao LTDA	BR	Sorocaba - S.P. Brasil
ZF Sachs AG	DE	Schweinfurt
ZF Sachs Espana S.A.	ES	Lezama (Viscaya)
ZF Sachs Slovakia a.s.	SK	Trnava
ZF Steering	CN	Shanghai
Zodel Zerspanungstechnik GmbH	DE	Meckenbeuren

This table is an extract of our customers worldwide.

## MESAS References Tool correction

Interface	Customer	Machine type	Part
Profibus	ZF Friedrichshafen AG, Friedrichshafen	Hessap	
BCD Parallel	Kolbenschmidt AG Hamburg	Renault	piston
BCD/Paralle I	FAG Kugelfischer, Schweinfurt	Monforts	
BCD/Paralle I	Ford Werke AG Wülfrath	Wanderer HESSAP Pittler Gehring	stub axle spindle carrier spindle carrier cylinder bores
BCD/Paralle I	Ford Werke AG Valencia	Danobat Bliss Ryder	camshaft camshaft
BCD/Paralle I	Ford Werke AG Köln	Weisser	clutch hub
BCD/Paralle I	Hydromatik GmbH Ulm	Junker	drive shaft hydraulic pump
BCD/Paralle I	Mercedes Benz AG Gaggenau	Heyligenstaedt	transmission sh
BCD/Paralle I	Steyr-Daimler Puch GmbH A-Graz	EMAG	drive shaft
BCD/Paralle I	Volkswagenwerk AG Salzgitter	Diedesheim EMAG	flywheel flywheel
RS232	Fichtel & Sachs Schweinfurt	Gildemeister	shock absorber piston
RS232	ZF Friedrichshafen AG Schwäbisch Gmünd	Gildemeister	steering rack housing
RS232	ZF Friedrichshafen AG Friedrichshafen	Gildemeister Eltropilot L	annulus, planet gear cari
Limit check	Ford Motor Company Ltd GB-Dagenham	Mauser	cylinder head
Limit check	Ford Motor Company Ltd GB-Bridgend	Nagel	cylinder bore
Limit check	Ford Werke AG Wülfrath	Marwin	stub axle
Limit check	Ford Werke AG Düren	Monforts	drive shaft
Limit check	Ford Werke AG Köln	Cross Weisser Weisser Index Lamb Magdeburger	cylinder bore flywheel crankshaft camshaft cylinder block crankshaft

## MESAS References Tool correction

Limit check	Kolbenschmidt AG Neckarsulm	ExCello	piston
Limit check	Kolbenschmidt AG Hamburg	Traub	piston
Limit check	Mercedes Benz AG Gaggenau	Monforts	torque parts
Impulse	Ford Motor Company Ltd GB-Swansea	Index	camshaft
Impulse	Ford Werke AG Köln	Norton/Naxos	camshaft