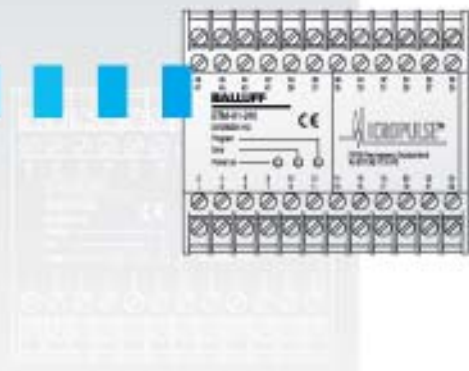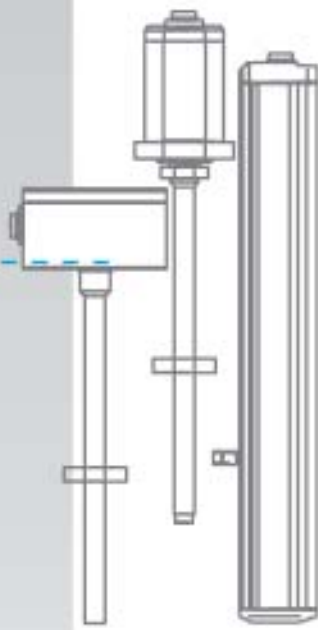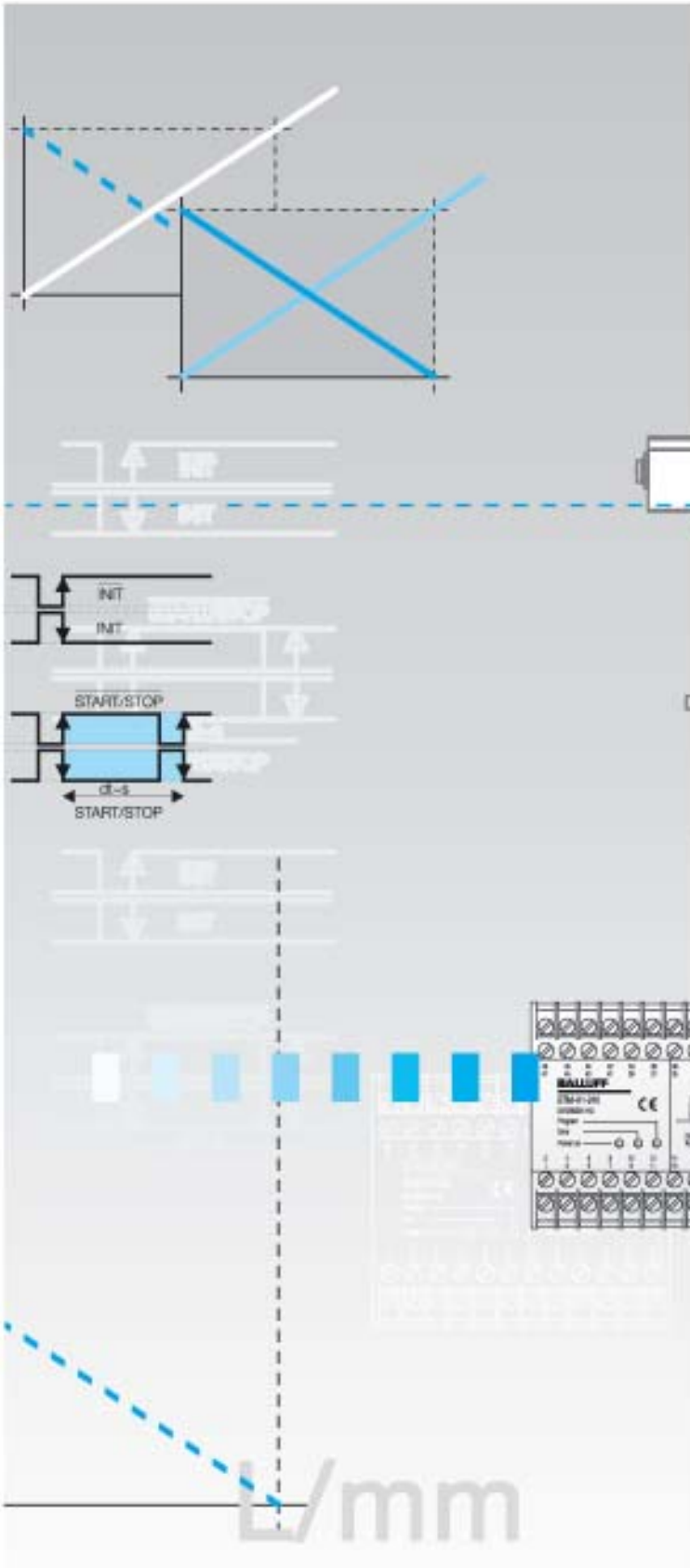A series of processor cards with various functions and interface variations has been developed for use with the Series BTL5-P... transducers with digital pulse interface. These cards are required if your controller does not have a Balluff P-interface but you wish to take advantage of the advantages it brings (noise-immunity, cable lengths up to 500 m). The BTA/BTM processors convert the pulses sent by the BTL5-P transducer into standard digital or analog signal formats.

**BTA**

Processors

BUS interface modules

Digital display Cam controller

**Features:**

– The processors are configured in a Eurocard format for use in 19" racks and card holders / top-hat rail fitting.
– The position values are updated at a frequency of max. 2 kHz, so that the actual position can be captured even at high traverse speeds with negligible lag error.
– High resolution (down to 0.01 mm) provided by microcontroller-controlled digitizing.
– Parallel data format selectable binary, BCD or Gray.
– Data format SSI (only BTM-H)
– Noise-immune data transmission between processor and transducer provided by RS485/422 differential drivers, with cable lengths up to 500 m.
– ERROR output for immediate notification of cable break, defective or missing magnet.

| Series | | **BTA-A** | **BTA-C** | **BTA-E** | |
|---|---|---|---|---|---|
| Output signal | Position | analog | analog | analog | |
| | Velocity | analog | analog | analog | |
| Input interface (transducer) | | **P** | **P** | **P** | |



| Ordering code | BTA-A1_-_ _ _ _ | BTA-C1_-_ _ _ _ | BTA-E1_-_ _ _ _ | |
|---|---|---|---|---|
| Features | Resolution 0.1 mV/0.2 µA, LED function display, Endpoint adjust 15 %, Span adjust 15 %, Velocity output, Error output (relay) | Resolution 0.1 mV/0.2 µA, LED function display, Null adjust 15 %, Span adjust 15 %, Velocity output, Error output (relay) | Resolution 0.1 mV/0.2 µA, LED function display, Null adjust 15 %, Span adjust 15 %, Velocity output, Error output (relay) | |
| Stroke length of transducer | 50...5500 mm | 50...5500 mm | 50...5500 mm | |
| Housing | Edge connector, 32-pin, DIN 41612 F, 19" plug-in card | Edge connector, 32-pin, DIN 41612 F, 19" plug-in card | Edge connector, 32-pin, DIN 41612 F, 19" plug-in card | |
| Supply voltage | 20...28 V DC | | | |
| Current draw | 130 mA at 24 V DC | 130 mA at 24 V DC | 130 mA at 24 V DC | |
| Operating temperature | 0...60 °C | 0...60 °C | 0...60 °C | |
| Update time for standard interface | 1 kHz analog voltage | 1 kHz analog voltage, current | 1 kHz analog voltage, current | |
| Output signals | Position | analog 0...10 V and 10...0 V | analog 0...10 V and 10...0 V 0...20 mA | analog 0...10 V and 10...0 V 4...20 mA | |
| | Velocity | analog ±10 V at ±2.5 m/s | analog ±10 V at ±2.5 m/s | analog ±10 V at ±2.5 m/s | |
| Accessories (please order separately) | card holder 48-pin Form F/627164 | card holder 48-pin Form F/627164 | card holder 48-pin Form F/627164 | |

▶ Please enter code for output signal and nominal stroke in ordering code!
**Micropulse analog processor**
Ordering example:
**BTA-A1_-_ _ _ _-E**

**Output signal**
- 0 rising, use only for current output
- 7 falling, use only for current output
- 1 rising/falling, use only for voltage output

**Nominal stroke**
transducer in [mm]

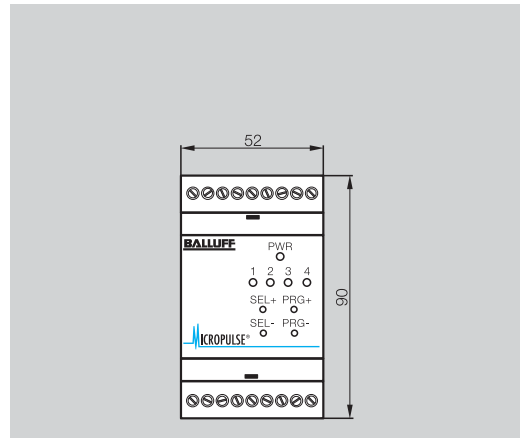▶ Please enter code for output driver in ordering code!
**Micropulse digital processor**
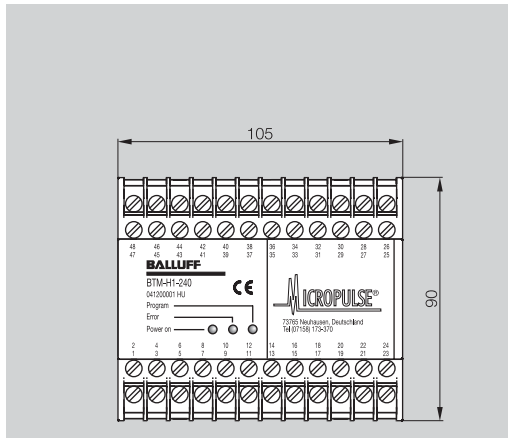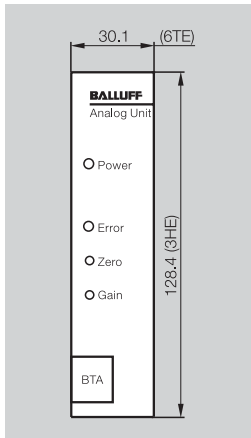Ordering example:
**BTM-H1-_ _ _**

**Output driver**
- 240 Source driver (PNP with SCP, 10...30 V) and 24-bit synchronous serial data transmission (SSI)
- 340 TTL outputs tri-state and 24-bit synchronous serial data transmission (SSI)

| | BTA-G | BTM-H1 | BTM-_1 |
|---|---|---|---|
| | analog | digital | analog |
| | analog | | analog |
| | **P** | **P** | **P** |



| BTA-G1_-_ _ _ _ | BTM-H1-_ _ _ | BTM-_1-_ _ _ |
|---|---|---|
| Resolution 0.1 mV/0.2 µA, LED function display, Null adjust 15 %, Span adjust 15 %, Velocity output, Error output (relay) | Resolution 0.01 mm, 0.025 mm, 0.1 mm, 1 mm, BCD, binary, Gray code, null point adjustment, Direction signal, DATA-READY, Min-Max programming, ENABLE, DATA HOLD, bus-compatible, ERROR output. Replaces processing units: BTA-D, BTA-H, BTA-P | Resolution 16 bits Up to 4 magnets on a single transducer can be processed individually. Analog velocity output. 100 % programmable measuring area, ERROR output |
| 50...5500 mm | 50...5500 mm | 25...4000 mm |
| Edge connector, 32-pin, DIN 41612 F, 19" plug-in card | Plastic housing for mounting on standard top-hat rail EN 50022-35 | Plastic housing for mounting on standard top-hat rail EN 50022-35 |
| 130 mA at 24 V DC | max. 500 mA | max. 300 mA |
| 0...60 °C | 0...60 °C | 0...70 °C |
| 1 kHz | 2 kHz | 2 kHz |
| analog | digital 22 Bit parallel BCD, binary, Gray code, | analog |
| voltage | 24 Bit synchronous serial (SSI) Gray code | Voltage or current see ordering code |
| analog −10...+10 V and +10...−10 V | digital TTL 5 V DC (BTM-H1-340) PNP source driver, 24 V DC (BTM-H1-240) | analog Voltage or current see ordering code |
| analog ±10 V at ±2.5 m/s | | analog ±10 V programmed for 1000 mm/s, adjustable over the range 50 mm/s...10 m/s |
| card holder 48-pin Form F/627164 | | |

▶ Please enter code for output signal and version in ordering code!

**Micropulse analog module**
Ordering example:
**BTM-_1-_ _ _**

| **Output signal** | | **Version** | |
|---|---|---|---|
| A | 0...10 V, 10...0 V | 101 | 1 analog output, 1 magnet |
| | −10...10 V, 10...−10 V | 102 | 2 analog outputs, 2 magnets |
| E | 4...20 mA, 20...4 mA | 103 | 3 analog outputs, 3 magnets |
| | 0...20 mA, 20...0 mA | 104 | 4 analog outputs, 4 magnets |

**BTM-_1-102 -VM1000**

| **Output signal** | **Version** | | **Velocity** |
|---|---|---|---|
| A | 2 analog outputs, | 1 magnet | ±10 V at a velocity |
| E | | with velocity | of 1000 mm/s |

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**BTA**

**Processors**
BUS interface modules
Digital display
Cam controller

**BTA.**3

**WAGO digital pulse interface 750-635 for BTL5-P1-_ _ or BTL6-P1_ _-**

The digital pulse interface was developed for connecting Micropulse transducers (BTL5-P1-...). Die RS422 interface assures quick and noise-immune transmission of signals with a resolution down to 1µm. The absolute position of the Micropulse transducer is made available to the supervisory controller as a 24-bit value.
The controller can perform a null-point adjustment and configure the number of magnets.
The bus terminal with digital pulse interface can be driven by all bus drivers of the WAGO-I/O-SYSTEM 750, except the Economy variants.

Interfaces:
– InterBus
– PROFIBUS-DP
– CANopen
– DeviceNet
– Ethernet TCP/IP
– MODBUS
– CC Link

Resolution: 1 µm
Number of magnets configurable (1...4)

Further technical details and ordering from:

WAGO
Kontakttechnik GmbH
Hansastraße 27
32423 Minden
Phone +49/571/887-0
Fax +49/571/887-169
E-mail: info@wago.com
www.wago.com

**Phoenix Contact IMPULSE-IN terminal for BTL5-P1-_ _ or BTL6-P1_ _-**

The IB IL IMPULSE-IN is a terminal of the Inline product family from Phoenix Contact and processes the Micropulse transducer with pulse interface.
Since the IMPULSE-IN terminal senses the positions using the attractively-priced pulse interface, it permits especially cost-effective solutions. In addition the pulse interface has the advantage of real-time capability, making it specially suitable for applications with position or attitude control.
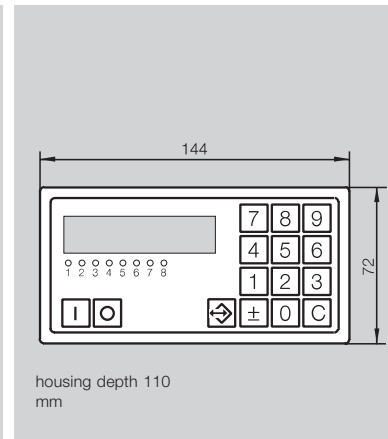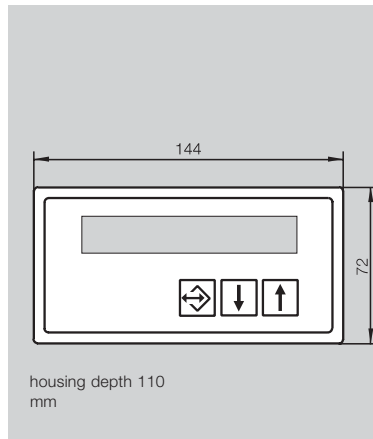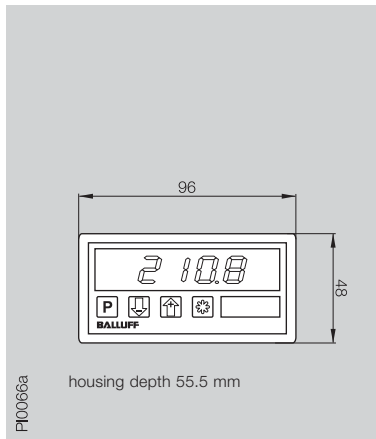
Interfaces:
– InterBus
– PROFIBUS-DP
– CANopen
– DeviceNet
– Ethernet

Further technical details and ordering from:

Phoenix Contact
GmbH & Co. KG
Flachsmarktstraße 8
32823 Blomberg
Phone +49/5235-300
Fax +49/5235-341200
E-mail:
info@phoenixcontact.com
www.phoenixcontact.com
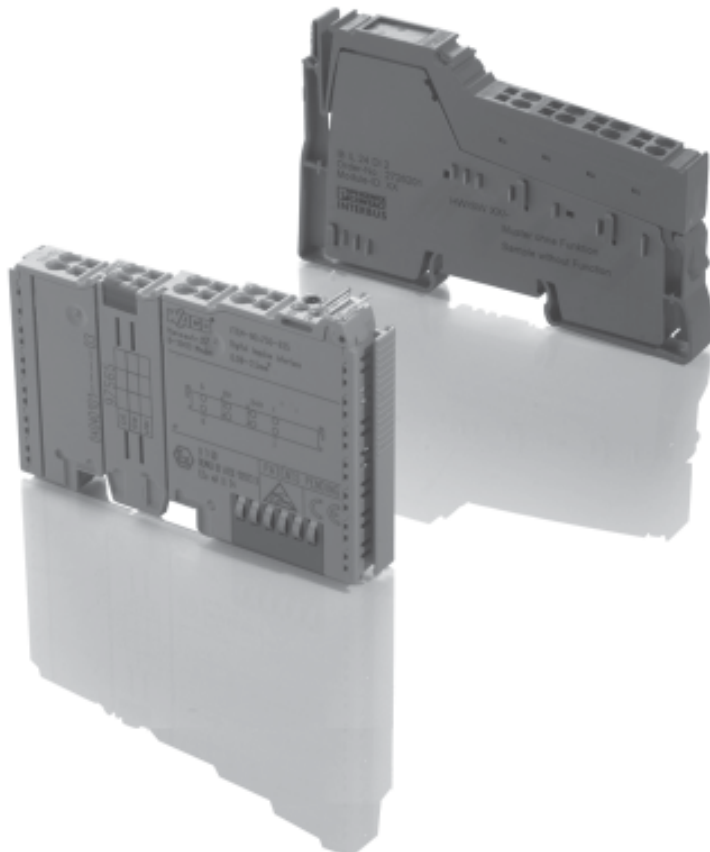
| | BDD-UM 3023 | BDD-AM 10-1-P | BDD-AM 10-1-SSD | BDD-CC 08-1-P | BDD-CC 08-1-SSD |
|---|---|---|---|---|---|
| | Digital display | Digital display | Digital display | Cam controller | Cam controller |
| | for analog input signals | for BTL5-P with | for BTL5-S with | for BTL5-P with | for BTL5-S with |
| | Current / voltage | P-interface | SSD interface | P-interface | SSD interface |



housing depth 55.5 mm

housing depth 110 mm

housing depth 110 mm

| Ordering code | BDD-UM 3023 | BDD-AM 10-1-P | BDD-AM 10-1-SSD | BDD-CC 08-1-P | BDD-CC 08-1-SSD |
|---|---|---|---|---|---|

**Features**

– 4-digit
– LED display 14 mm high red 7-segment
– programmable decimal point setting
– 12 bit AC/DC converter
– selectable measurement range
– voltage input 0-10V
– current input 0/4-20 mA
– scalable display range

– 7 1/2-digit display with sign
– LED display 14 mm high red 7-segment
– scalable units
– variable decimal point setting
– adjustable Null point
– operating voltage 10...32 V
– 2 programmable relay outputs, defined as
  – limit switch/comparator
  – dwell
  – 2-position (on if below, off if above set value)
– 1 configurable input
  – external Null set
  – latch display value
– isolated DIN housing for panel mount (mounting hardware included)

– 8 programmable outputs
– 8 directional switchpoints possible
– LED display, 14 mm high red 7-segment, 6-position
– LED switchpoint status on front panel
– 300 switchpoints can be distributed over up to 15 programs
– adjustable Nullpoint shift
– static and dynamic setpoints with deadtime compensation
– multiple BDD-CC 08 can be wired in parallel
– built-in transducer supply voltage 300 mA, 24 V
– isolated DIN housing for panel mount (mounting hardware included)

**BTA**

Processors
**BUS interface modules**
**Digital display Cam controller**
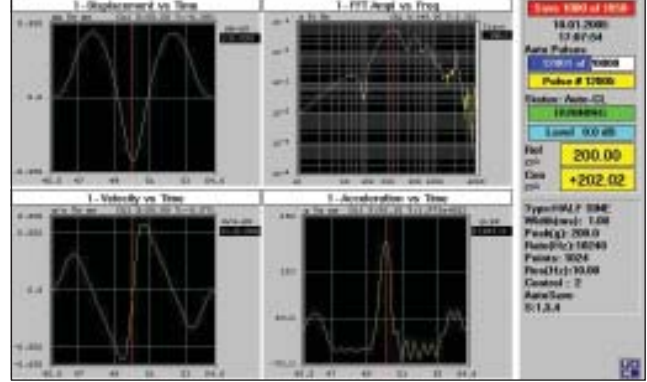
# Reliability doesn't happen by chance

**Tests and checks during the development process improve the product and give protection against "surprises" in service.**

**Objective:** Simulate the mechanical loads on a product over its working life. Balluff products are often fitted in machines when mechanical vibrations and impacts occur. For reliable operation they must be designed to be immune to vibration and shock. In the Balluff test laboratory all products are therefore tested before series release for their mechanical stability.

The features of the vibration test equipment at Balluff are as follows:

| Manufactured by | Unholtz-Dickie Corporation | |
|---|---|---|
| Model | SA 15-S092-BP | SAI60-H560B-24-LP |
| sinusoidal force vector | 4.4 kN | 35.6 kN |
| random force vector | 4.4 kN | 35.6 kN |
| shock force vector | 8.8 kN | 73 kN |
| max. sinusoidal acceleration | 100 g | 89 g |
| max. random acceleration | 100 g | 74 g |
| max. shock acceleration | 200 g | 210 g |
| max. sinusoidal velocity | 2.0 m/s | 1.9 m/s |
| max. shock velocity | 5.1 m/s | 3.5 m/s |
| max. amplitude | 51 mmp-p | 51 mmp-p |
| Frequency range up to | 3.5 kHz | up to 2.7 kHz |

The following tests can be performed on this equipment:

– Sinusoidal testing
– Noise testing
– Shocks

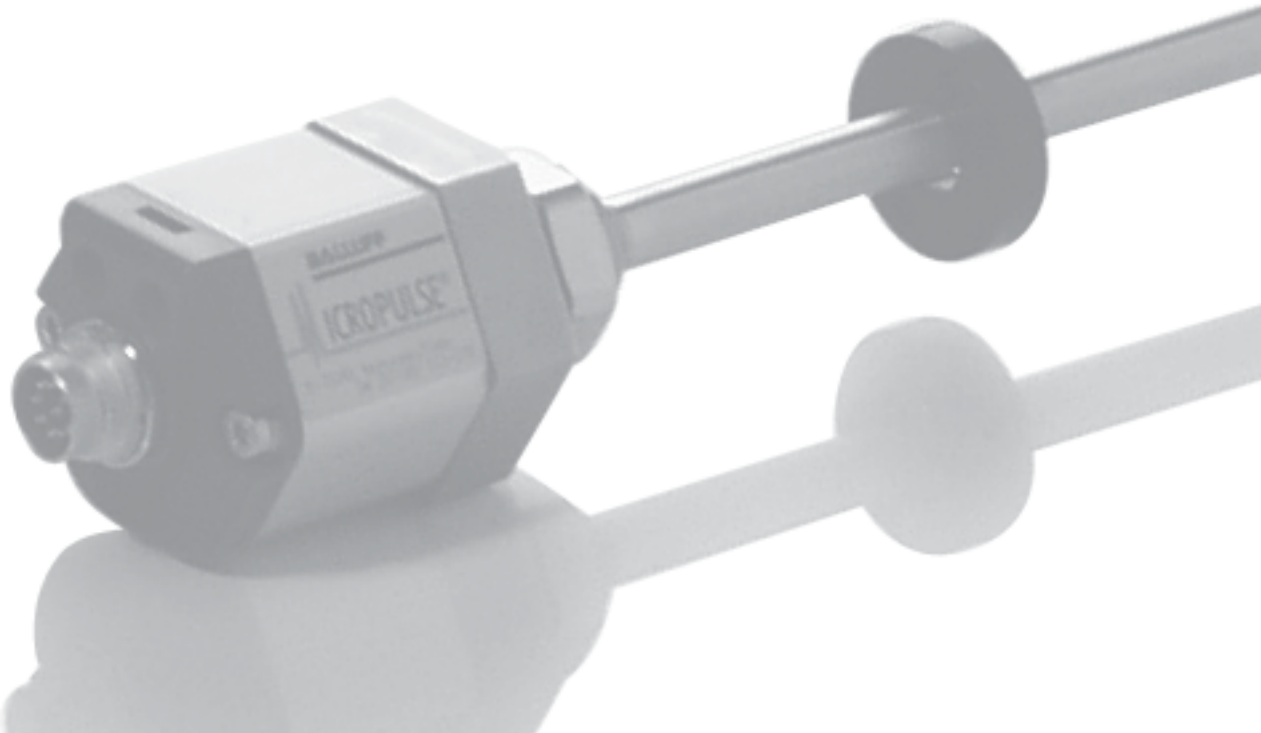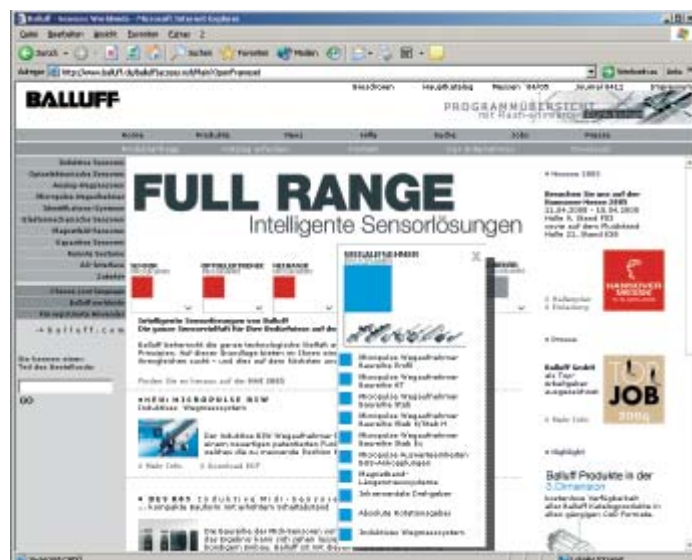in addition one equipment if fitted with an FFT analyzer.

Tests can be performed to the following standards:

MIL STD 202
EN 60068-2-6
EN 60068-2-27
EN 60068-2-29
EN 60068-2-64
DIN EN 50155
IEC / EN 61373
GL 2001

## Test equipment in the test laboratory

| | Tests | Test equipment |
|---|---|---|
| **1. Electro-magnetic compatibility (EMC)** | Immunity from discharge of static electricity (EN 61000-4-2) | ESD generator ESD 30C, EM test with IEC finger and relay discharge module |
| | Immunity from electro-magnetic fields (EN 61000-4-3) | GTEM cell 1500, MEB<br>Signal generator SMH, Rohde & Schwarz<br>HF amplifier model 100W1000M1, AR<br>HF amplifier model CBA9429, SCHAFFNER<br>HF circuit network RFSN, SCHAFFNER<br>Wattmeter NRVS, Rohde & Schwarz<br>Wattmeter head NRV-Z 51, Rohde & Schwarz<br>Directional coupler RK 100, MEB<br>Directional coupler C6187, VERLATONE<br>Field strength measurement system HI-4400, Holaday<br>Field strength measurement probe, Holaday<br>Software MEB IMM, SCHAFFNER |
| | Immunity from rapid transient interference (bursts) (EN 61000-4-4) | Burst generator EFT 500, EM-Test<br>Capacitive coupler HFK, EM-Test |
| | Immunity from abrupt voltage surges (EN 61000-4-5) | Hybrid generator CWG 10/503, Hilo-Test<br>Coupling / decoupling network CDN 104<br>Coupling / decoupling network CDN 202 |
| | Immunity from mains-borne high-frequency interference (EN 61000-4-6) | Signal generator SMH, Rohde & Schwarz<br>HF amplifier model 150A100A, AR<br>Coupling / decoupling network M2, MS3, S4, S9, AF2, AF4, RJ45/5<br>EM injection clamp F-203I-23mm, FCC<br>Software MEB IMM, Schaffner MEB |
| | Immunity from magnetic fields with power transmission frequencies (EN 61000-4-8) | Self-built test equipment, Balluff GmbH |
| | Immunity from voltage dips, short breaks in power supply and voltage fluctuations (EN 61000-4-11) | Self-built test equipment, Balluff GmbH |
| | Radiated emissions (EN 55011) | GTEM cell 1500, MEB<br>Measurement logger SM41, MEB<br>Software, MEB |
| | Mains-borne emissions (EN 55011) | Measurement logger ESHS 30, Rohde & Schwarz<br>Network simulator ESH3-Z5, Rohde & Schwarz |
| | Emissions, HF magnetic field (DIN EN 300 330-1) | Frame antenna HLA6120, SCHAFFNER<br>Measurement logger ESHS 30, Rohde & Schwarz |
| **2. Product-specific tests** | Making capacity / breaking capacity (EN 60947-5-2) | Self-built test equipment, Balluff GmbH |
| | Testing cable anchoring of devices with integral connection cables (EN 60947-5-2) | Self-built test equipment, Balluff GmbH |
| | Short circuit testing (EN 60947-5-2) | Self-built test equipment, Balluff GmbH |
| **3. Shock, sinusoidal and noise tests** | Shock, sinusoidal and noise testing<br><br><br>(EN 60068-2-6)<br>(EN 60068-2-27; EN 60068-2-29)<br>(EN 60068-2-64) | Shock and vibration equipment, model SA15-S092-PB and model H560B-24-LP, Unholtz-Dickie with software modules for:<br>Sinusoidal vibrations<br>Shocks<br>Noise tests<br>Signal analysis |
| **4. Other** | X-ray analysis | X-ray inspection equipment RTX 113, HEEB-INOTEC |

**BALLUFF**

**Inductive Sensors**
Inductive Proximity Switches BES
Inductive Limit Switches BES
Inductive Distance Sensors BAW
Magneto-inductive Position Sensors BIL

**Photoelectric Sensors**
Diffuse, Retroreflective, Through-beam BOS
Fiber Optics BFO
Slot Sensors BGL, Dynamic Optical Windows BOWA
Angle Sensors BWL, Light Grids BLG
Distance Sensors BOD, Color Sensors BFS
Contrast Sensor BKT, Luminescence Sensor BLT
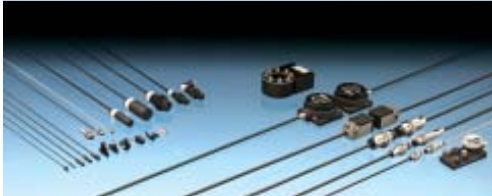
**Magnetic Field Sensitive,**
**Capacitive and Remote Sensors**
Sensors for Pneumatic Cylinders BMF
Magnetic Field Sensors BMF
Capacitive Sensors BCS
Remote Sensors

**Accessories**
Connectors BKS
Clamps and Brackets
Mounting System
Electrical Equipment

**Electromechanical and Inductive Sensors**
Electromechanical Single and Multiple Position Limit Switches BNS
Inductive Single and Multiple Position Limit Switches BNS
Electromechanical and Inductive Switch Inserts BSE/BES
BNL Cam Trays and BNN/BEN Cams
Precision Rotary Cam Switches BSW

**Micropulse Transducers,**
**Absolute/Incremental Encoders**
Micropulse Transducers BTL
Magnet Band Linear Encoders BML
Incremental Encoders BDG
Shaft Encoders BRG
Inductive Linear Position Sensor BIW

**Identification Systems**
Non-contact Data Communication – BIS C
Non-contact Data Communication at 125 kHz – BIS L
Non-contact Data Communication at 13,56 MHz – BIS M
Non-contact Data Communication with High Speed – BIS S

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AS-Interface® Power Supply
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| Phone |

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