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samba (S) sensors
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Exactly how accurate
pressure data do you need?



samba preclin
EXCITINGLY SMALL™

Measurements with exciting opportunities

Just imagine the exciting things you can do with an extremely accurate, fast sampling pressure sensor – that is no bigger than a grain of salt on a hair. Exciting opportunities open in all kinds of life science applications. The Samba Preclin transducer is also completely insensitive to all type of electro-magnetic fields.

Monitoring more straightforward than ever
With a Samba Preclin transducer, intravascular blood pressure (IBP) and left ventricular pressure (LVP) monitoring become more straightforward than ever. Inserted through the carotid or femoral artery you can receive accurate, high-resolution data to support your discoveries. Read, for example, how Chiba University in Japan used Samba Sensor's equipment in their research on myocardial infarction in *Nature Medicine* Vol. 11, No. 3, 2005.¹

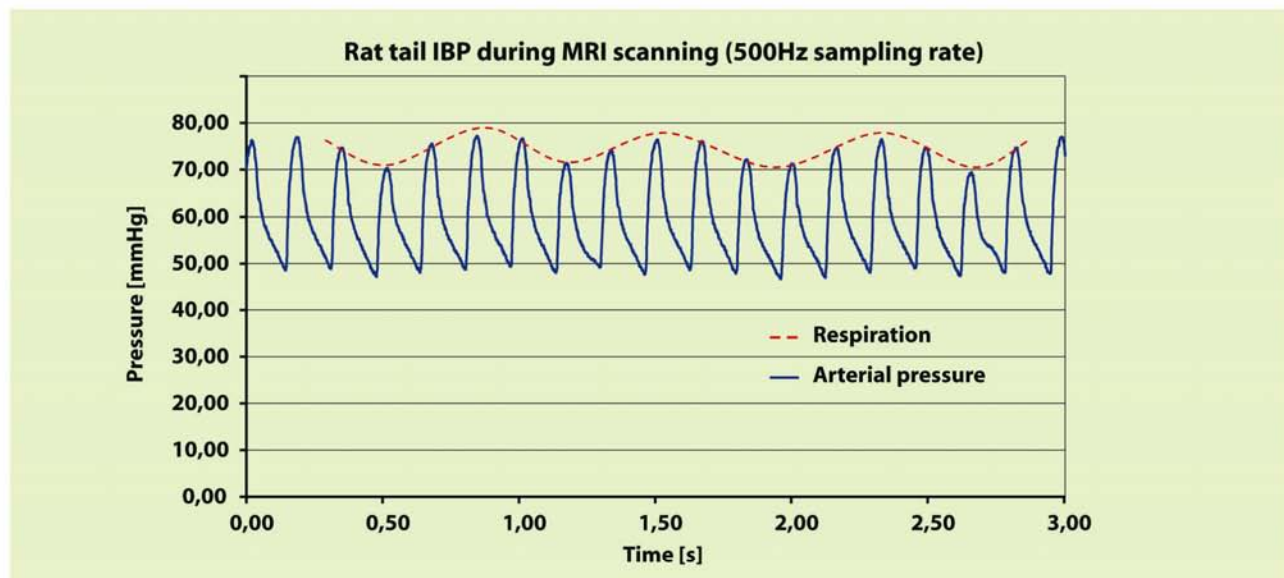
Pressure patterns never observed before
The small size allows you to insert the sensor directly into the brain tissue or in the brain



ventricles and measure very rapid trauma events. The extremely fast sampling rate and sensitivity enable you to see pressure patterns never observed before. A perfect example of these possibilities can be found in an article in *European Journal of Neuroscience* Vol. 21, No. 10, 2005.²

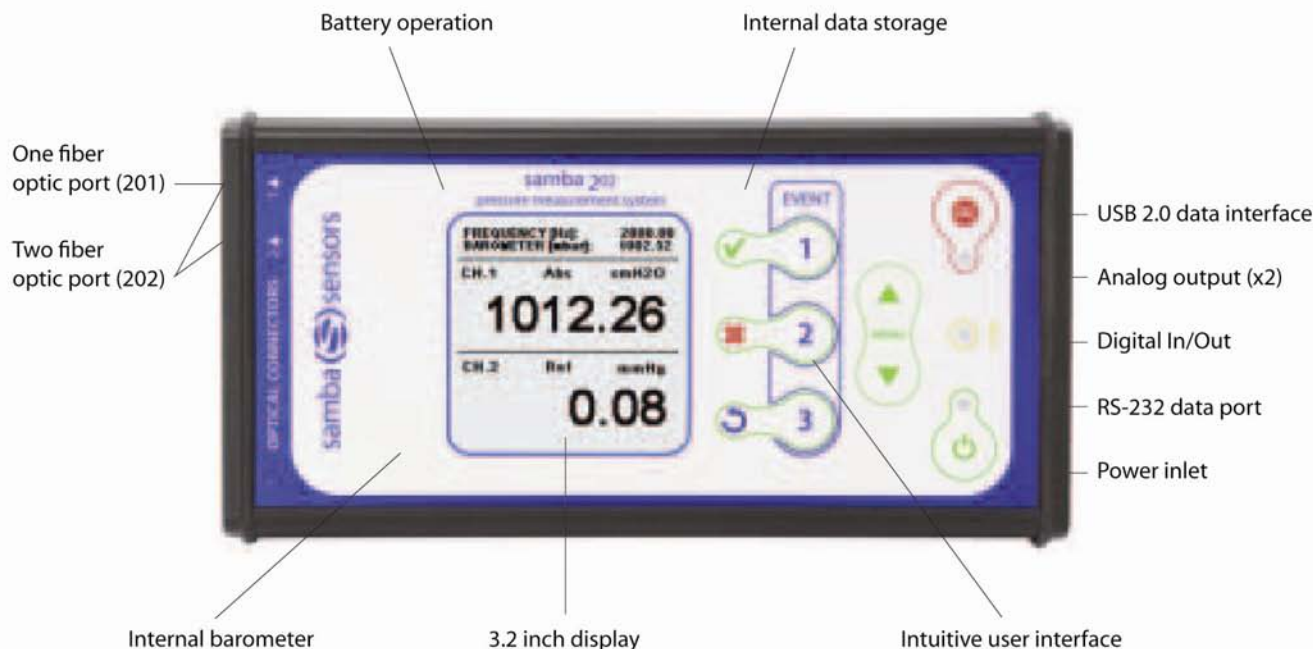
Insensitive to all electro-magnetic fields

Samba Preclin offers exciting opportunities when using MRI-scanners. The sensor gives you total freedom to monitor pressure while simultaneously capturing images in the latest high-end scanners. Gating also becomes more reliable and robust with the Samba Preclin transducer. If placed in the tail artery of a rat, both IBP and respiratory signals can be captured using a single sensor (see chart below).



B. Bjelke, MD, PhD. Karolinska Institute, Stockholm, Sweden 2003.

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The new, smart, portable Samba 201/202

Order as BIOPAC MPMS100A-1 (single channel) or MPMS100A-2 (dual channel)

Why Samba Preclin?

- Pressure can be measured with higher precision and in places previously not possible.
- Continuous pressure data can be retrieved in real time during MRI/CT/PET/SPECT scanning.
- A new tool to facilitate scientific work and improve results.
- New science and knowledge can be revealed leading to more publications.

Where to use Samba Preclin?

Preclinical research in the area of:

- Heart and Circulation
- Brain and Nervous System
- Lungs and Breathing
- Digestive System
- Kidney and Urinary System
- Reproduction System
- Muscles
- Diseases like Cancers, Stroke, Spinal Disorders and more

How to use Samba Preclin

The primary feature is the miniature size: 0.36 or 0.42 mm depending on version. The transducer can be applied into a tiny organ or tissue and smoothly inserted without causing unnecessary harm. Once in place, the transducer will not affect the actual environment it is set to measure.

The Samba Preclin transducer is also safe, meaning that no electricity and no bio-hazardous materials are involved. It is also insensitive to any form of electro-magnetic fields to make it fully compatible with high-end imaging technologies such as MR, CT, PET and SPECT.

If scanner triggering is desired the blood pressure signal can be used in favour of ECG to further increase image quality.

Ref. 1. Harada M et. al., "G-CSF prevents cardiac remodeling after myocardial infarction by activating the Jak-Stat pathway in cardiomyocytes", *Nature Medicine*, Vol.11, No. 3, pp. 305-311, 2005.

Ref. 2. Krave U et. al., "Transient, powerful pressures are generated in the brain by a rotational acceleration impulse to the head", *European Journal of Neuroscience*. Vol. 21, No. 10, pp. 2876-82, 2005.

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samba preclin

420/360 PRESSURE TRANSDUCERS

Order as BIOPAC TSD170 Series

The Samba Preclin pressure transducer comprises a silicon sensor element mounted on an optical fibre. Each transducer is calibrated at the factory before delivery to eliminate the need for customer calibration. The calibration data is stored on a



small EPROM positioned on the connector and is read automatically at start up.

TECHNICAL SPECIFICATIONS

| | | | |
|--|---|--|--|
| Sensor diameter | 0.36 mm (high pressure)/0.42 mm (low pressure) | Accuracy -0.1 to 5 bar | ±10 mbar and ±2.5% of reading (-0.1 to 3 bar) or ±10 mbar and ±4% of reading (3 to 5 bar) |
| Fiber diameter | 0.25 mm (bare fiber)/0.40 mm (fiber with radiopaque coating) | Accuracy -0.1 to 10 bar | ±15 mbar and ±2.5% of reading |
| Calibration | Factory calibration | Accuracy -0.1 to 17 bar | ±20 mbar and ±2.5% of reading |
| Measurement media | Fluid or gas | Temperature coefficient -50 to 350 mbar | <0.2 mbar/°C (20-45°C/ 68-113°F) |
| Tolerated bend radius | 10 mm | Temperature coefficient -0.1 to 5 bar | <3.5 mbar/°C (20-45°C/ 68-113°F) |
| Available pressure ranges | Low pressure: | Temperature coefficient -0.1 to 10 bar | <7 mbar/°C (20-45°C/ 68-113°F) |
| | -50 to 350 mbar | Temperature coefficient -0.1 to 17 bar | <14 mbar/°C (20-45°C/ 68-113°F) |
| | High pressure: | Long term stability | <0.5% of range |
| | -0.1 to 5 bar | Storage temperature | -40 to +80°C (-40 to 176°F) |
| | -0.1 to 10 bar | Transducer length | 4 m (13,1 ft) or 10 m (32,8 ft) for MRI |
| | -0.1 to 17 bar | | |
| Accuracy -50 to 350 mbar .. | ±0.5 mbar and ±2.5% of reading (-50 to 250 mbar) or ±4% of reading (250 to 350 mbar) | | |

samba 201/202

CONTROL UNIT

Order as BIOPAC MPMS100A-1/MPMS100A-2

The new Samba control unit is a compact, portable and battery operated unit equipped with internal memory for temporary data storage. The Samba 201 has one fiber optic port, while the Samba 202 is fitted with two ports, which allow for extended operations. The individual calibration data stored on the EPROM of each connected Samba transducer is automatically read by the control units to ensure exact



measurements. The USB 2.0 data interface simplifies the data transmission to your computer and the 3.2 inch display performs sharp figures.

TECHNICAL SPECIFICATIONS

| | | | |
|-----------------------------------|---|------------------------------------|--|
| Fiber optic ports | 1 (Samba 201), or 2 (Samba 202) | Analog output | 0-5V |
| Resolution | 0.1 mbar (~1 mm H ₂ O; Samba Preclin 420 transducer) | Battery operation | up to 8h (2 channels at 40 kHz) |
| Numerical resolution | 15 bit | Operating temperature | 15-35°C (59-95°F) |
| Data sampling rate | 1 to 40 000 Hz | Display | 3.2 inch, monochrome |
| Measurement | Absolute/Relative/Diff; Samba 202) | Dimensions | 215 x 110 x 45 mm (8.5 x 4.3 x 1.8 in) |
| Outputs | USB 2.0, Analog out, RS-232 | Weight | 950 g (2.1 lbs) |

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42 Aero Camino
Goleta, CA 93117
info@biopac.com