

Product Data

Photoelectric Tachometer Probe — MM0024

USES:

- Contact-free detection of reflective objects
- Synchronisation of Brüel & Kjær instruments with rotary or reciprocating machine parts

FEATURES:

- Combined infra-red transmitter/receiver
- Operating range up to 800 mm (31.5 in) and 20000 RPM
- Low power consumption from 4 V to 12 V DC supply
- No physical contact with the machine element under test

The Brüel & Kjær Photoelectric Tachometer Probe MM0024 is especially designed for remote tuning and triggering of vibration measurement and balancing instrumentation in synchronism with rotating or reciprocating machine parts. It is ideal for use with the Brüel & Kjær Tracking Filter Type 1623, Vibration Analyzer Type 2515, Portable Balancing Sets Types 3517 and 3537 and Stroboscopes Types 4912 and 4913*, all of which include a combined trigger input and power socket which accepts the cable from the MM0024 directly.

The MM0024 connected with the QA0137 has the advantage that it may be located any distance between 50 and approximately 800 mm from the subject to be investigated, thus safely separating the Probe from possible contact with moving parts or an otherwise hazardous environment.

The light alloy casing of the Probe contains both a transmitter and receiver of infra-red radiation. The DC power supply to the transmitter and the output pulses from the receiver are conveyed to and from the Probe via a double shielded BNT socket at the rear of its housing (Fig. 1). A 3 m long cable AO0158, terminated with

* MM0024 is only suitable for use with the Time Delay and Slow Motion modes of the Stroboscope Type 4913 if the Probe is shielded against the Stroboscope's flash



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matching connectors, is supplied which facilitates direct connection to the Brüel & Kjær instruments Type 1623, 2515, 2976 (included with Types 3517 and 3537), 4912, 4913 and 2523.

Use of the Probe is very straightforward. It is mounted on a convenient static part of the machine using a magnetic clamp, or a suitable bracket. Alternatively, a camera tripod with standard 1/4" UNC (DIN

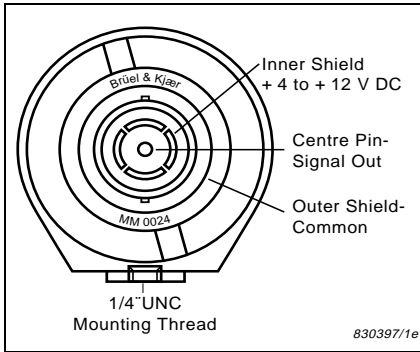


Fig. 1 Rear view of probe showing BNT socket connections

4503) thread can be employed instead. The Probe should be directed such that its infra-red window faces the subject on which a small strip of self-adhesive reflective tape has been previously attached. This has the property of reflecting the infra-red beam back to the receiver during each cycle of the moving part, resulting in a positive electrical pulse output from the receiver to the measurement instrumentation. A 3 metre roll of reflective tape is supplied with the Probe.

For optimal performance the Probe employs a light pulse transmitting technique, plus sensitive electronics for its receiver. Modulation of the transmitted beam at a pulse repetition frequency of 6 kHz permits a higher peak intensity to be developed than if an unmodulated beam were used. (Fig. 2a).

The receiver detects periodic trains of modulated light pulses corresponding only to reflections from the strip (Fig. 2b).

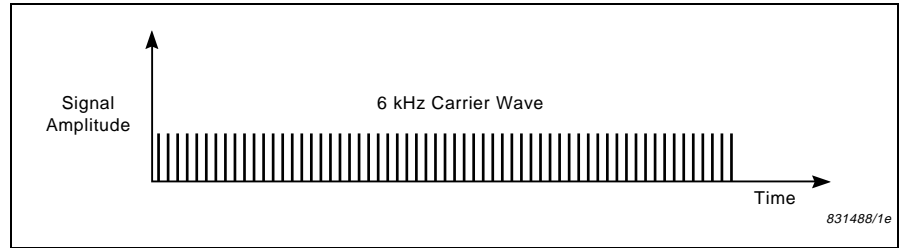


Fig. 2a Infra-red radiation modulated by 6kHz carrier wave

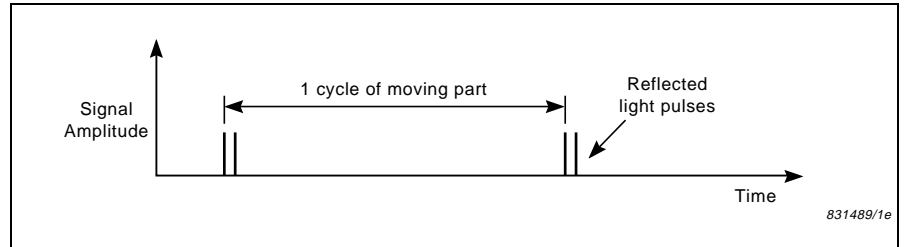


Fig. 2b Received signal showing bursts of reflected light pulses

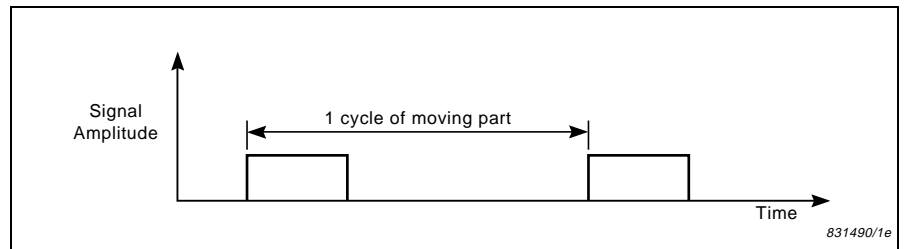


Fig. 2c Demodulated output signal from the receiver

The output pulses from the receiver are of constant magnitude (at approximately the same peak voltage as the DC power supply), irrespective of the distance separating the subject and the receiver up to a maximum of approximately 800 mm (Fig. 2c).

A small LED (Light Emitting Diode) flashes on the Probe body when reflected light pulses are received, giving the user a positive indication of correct orientation relative to the moving object.

Specifications MM0024

General Specifications

Transducer Type:

Combined Infra-red transmitter and receiver

Operating Range:

50mm up to approximately 800 mm

Frequency Range:

200 to 20000 RPM
(3.3 to 333.3 Hz)

Output Voltage:

Peak output voltage level is approximately the same as the power supply DC level (unloaded)

Polarity:

Positive for reflective surface

Output Load Impedance:

10 kΩ

Maximum Output Loadcurrent:

10 mA (sink current)

Response Time:

200 μs minimum for full output. Equivalent to a 10mm long reflective surface passing at 50 m/s

Connector:

Double shielded BNT. See Fig.1

Power Supply:

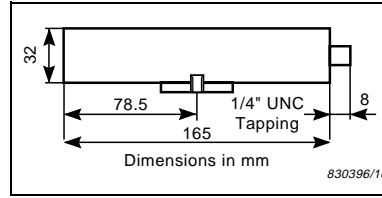
Input Voltage +4V to +12V DC

Current Consumption:

< 60mA with 6V supply
< 130mA with 12V supply

Note: All data stated without tolerances are typical values

Dimensions:



Weight:

171 grammes

Accessories

Accessories Included:

Product data BP 0334
3 m roll of reflective tape QA 0137
3 m long BNT to BNT cable AO 0158

Accessories Available:

Service Instructions BI 0731
3 m of reflective tape QA 0137
Tripod UA 0587

COMPLIANCE WITH STANDARDS:

CE	CE-mark indicates compliance with: EMC Directive
Safety	IEC 1010-1 (1990): Safety Requirements for Electrical Equipment for Measurement Control and Laboratory Use
EMC Emission	EN 50081-1 (1992): Generic emission standard. Part 1: Residential, commercial and light industry.
EMC Immunity	EN 50082-2 (1995): Generic immunity standard. Part 2: Industrial environment. (Final draft.) Note: The above is guaranteed using accessories listed in this Product Data sheet only.
Temperature	IEC 68-2-1 & IEC 68-2-2: Environmental Testing. Cold and Dry Heat. Operating Temperature: -10 to +55°C Storage Temperature: -25 to +70°C
Humidity	IEC 68-2-3: 90% RH (non-condensing at 40°C)
Mechanical	IEC 68-2-6: Vibration: 0.3 mm, 20 m/s ² , 10-500 Hz (non-operating) IEC 68-2-27: Shock: 1000 m/s ² (non-operating) IEC 68-2-29: Bump: 1000 bumps at 250 m/s ² (non-operating)

Brüel&Kjær reserves the right to change specifications and accessories without notice



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