

PRODUCT DATA

CCLD Laser Tacho Probe — MM-0360

Uses

- Non-contact measurement of rotational speed
- Synchronisation between rotating or reciprocating machine elements and measurement instruments

Features

- Works with CCLD, DeltaTron or ICP[®] inputs from 3 to 20 mA constant current
- CCLD power means:
 - No separate power supply required
 - Simple two-wire cabling
- Continuous wave laser for jitter-free order tracking and balancing applications
- Operating range to at least 70 cm (27")
- Low-speed measurements to 0 RPM* for wind turbine and ship propulsion applications
- High-speed measurements up to 300 000 RPM for supercharger measurements
- Manual test button to verify tachometer trigger level when the machine is not rotating or available
- Low sensitivity to background light
- Robust and IP 64 rated
- Flexible mounting options make it easy to attach:
 - ¼"–20 UNC (camera tripod), 10–32 UNF and M4 on the flat side of the probe
 - M22–1 threading with flange on the front
- Small size for measurements in tight locations



Introduction

CCLD Laser Tacho Probe MM-0360 is especially designed for contact-free speed measurements on rotating or reciprocating machine parts. MM-0360 produces a voltage pulse for each rotation of a shaft or cycle of a machine part.

MM-0360, used with retroreflective tape like the included QS-0056, has the advantage that it can be located any distance from 1.5 to at least 70 cm (0.6 to 27") from the test object, thus safely separating the probe from possible contact with moving parts or an otherwise hazardous environment.

Powering

MM-0360 can be used with any DeltaTron or ICP[®] constant current line drive (CCLD) supply that provides 3 mA to power the tacho probe.

MM-0360 is ideal for use with Brüel & Kjær data acquisition hardware:

- IDA^e multichannel data acquisition hardware
<http://www.bksv.com/doc/bu0228.pdf>

- LAN-XI multichannel data acquisition hardware
<http://www.bksv.com/doc/bp2215.pdf>
- Hand-held Vibration Analyzer Type 2250-H[†]
<http://www.bksv.com/doc/bp2183.pdf>

all of which include a combined trigger input and a current line drive (CCLD) supply to power the tacho probe.

Mounting

Use of the probe is very straightforward. Mount it in a convenient static location on or off the machine up to 70 cm from the target by using a magnetic mounting base such as the optional UA-0642 or a suitable bracket to connect to the M22–1 thread on the front of the probe. Alternatively, use a camera tripod with standard ¼"–20 UNC (DIN 4503) thread.

The probe should be aimed so that its visible laser beam faces the test object to which a small strip of self-adhesive reflective tape has been attached. The retroreflective tape backscatters the laser energy to the receiver. Backscattering of the light means that the probe can be more than 30° from perpendicular to the measurement surface.

Output Signal

For each pass of the target, a negative $0.8 V_p$ pulse is output, DC biased between +18.0 V and +19.5 V.

MM-0360 is capable of measuring down to 0 RPM* when used with measurement system capable of DC coupling of the CCLD power supply such as in the Brüel & Kjær LAN-XI family of data acquisition hardware (bp2215.pdf) or Hand-held Vibration Analyzer Type 2250-H (bp2183.pdf)†.

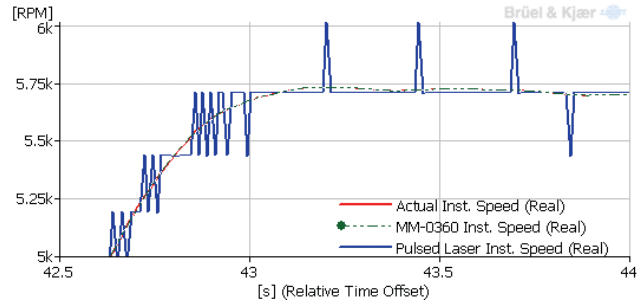
It is possible to use MM-0360 with a standard DeltaTron or ICP® CCLD supply. The low RPM limit of the system will no longer be 0 RPM, but instead will be the high-pass frequency of the CCLD power supply. Bias voltage and signal amplitude are almost completely unaffected by RPM and distance to the object, and are also independent of CCLD current between 4 and 20 mA.

A small LED on the probe body flashes when reflected light pulses are received, giving a positive indication of correct orientation relative to the moving object. Alternatively, the test button can be pressed momentarily to produce a pulse to confirm

connection to a measurement channel and allow trigger setup when the test object is either unavailable or not rotating.

Jitter-free Measurement

MM-0360 uses a continuous wave laser. A tacho probe based on a continuous wave laser avoids the phase jitter from tacho probes based on pulsed lasers and provides the precise rotational speed and phase information needed for order tracking, phase or balancing applications. It also minimises the size needed for the reflective target.



Specifications – CCLD Laser Tacho Probe MM-0360

PERFORMANCE

RPM range: 0* – 300000

Operating Range: 1.5 (0.6) to > 70 cm (27") and > 30° from centre line

Laser Spot: < Ø5 mm at 70 cm distance

ELECTRICAL

Current Requirements: CCLD, 3 to 20 mA

Voltage Requirements: CCLD, ≥ 20 V

DC Bias Output: +18.0 V to +19.5 V for CCLD current ≥ 4 mA (individually measured and stored in TEDS)

Signal Output: $-0.8 V_p \pm 0.2 V$ re DC bias output. Rise and Fall time < 500 ns

Output Connector: SMB

Protection: Max. Continuous Input Voltage: -5 V to +30 V current limited†

* Measurement down 0 RPM requires DC coupling of the CCLD power supply and that the retroreflective target is small relative to the shaft circumference, ≤ 15°

† Current limit at transducer: 20 mA up to +20 V; 13 mA up to +30 V to guarantee input power < 400 mW.

‡ Type 2250 requires units with serial number 2630266 or above

Laser: Class 3R. Visible 660 – 690 nm, CW, P [optical] < 2 mW. Complies with EN/IEC 60825-1: 2007

Activity LED: Flashes when pulses are received or lights up if the test button is activated

Test Button: When activated, the output level drops 0.8 V and the activity LED is lit. This corresponds to the active signal level

TEDS: TEDS template with probe identification and specifications for power requirements, trigger level, signal level and polarity

Isolation: Housing is separated from signal ground by a 1 kΩ resistor to avoid the effect of ground loops in multichannel systems

MECHANICAL

Mounting: ¼"–20 UNC (camera tripod), 10–32 UNF and M4 on the flat side of the probe; M22–1 thread with flange on the front

Front Protection Glass: Acrylic with hard-coated and antireflective surface

Weight: 50 g (2 oz.)

Dimensions: Ø22.5 × 91 mm (Ø0.87 × 3.6")

ENVIRONMENTAL

Enclosure: IP 64, dust tight and protected against splashing water

Temperature Range:

Operating: -10 to +50°C (14 to 122°F)

Storage: -20 to +80°C (-4 to +176°F)

EMC

EN 61000-6-2: Immunity for industrial environments

EN 61000-6-3: Emission for residential environments

CE Compliance with EMC Directive and Low Voltage Directive of the EU
Compliance with the EMC requirements of Australia and New Zealand



Ordering Information

MM-0360 includes the following accessories

- QS-0056-001: Retro-reflective Tape, 4 m
- KE-0345: Box for MM-0360 and tape

OPTIONAL ACCESSORIES

KE-1019: Soft Case

Mounting

UA-0801 Lightweight Tripod

TRADEMARKS

ICP is a registered trademark of PCB Group Inc.

UA-1251 Lightweight Tripod, compact type

UA-0642 Mounting Magnet with integrated 10–32 stud

Cables

AO-0564-D-xxx SMB Right-angle Connector to BNC Cable

AO-0587-D-xxx SMB Straight Connector to BNC Cable

AO-0726-D-xxx SMB Straight Connector to 2250 cable

WA-1705 SMB to 10–32 female adaptor

xxx = length in dm (e.g., -D-010 is 1 m long)

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HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark
Telephone: +45 7741 2000 · Fax: +45 4580 1405 · www.bksv.com · info@bksv.com

Local representatives and service organisations worldwide

Brüel & Kjær

