

# OMP40-2 optical machine probe



© 2009 Renishaw plc. All rights reserved.

This document may not be copied or reproduced in whole or in part, or transferred to any other media or language, by any means, without the prior written permission of Renishaw plc.

The publication of material within this document does not imply freedom from the patent rights of Renishaw plc.

Renishaw part no: H-4071-8504-03-A

Issued: February 2009

# Contents

## Contents

### 1.0 Before you begin

Disclaimer .....	1.1
Trademarks .....	1.1
Warranty .....	1.1
Changes to equipment .....	1.1
CNC machines .....	1.1
Care of the probe .....	1.1
Patents .....	1.2
EC declaration of conformity .....	1.3
FCC declaration (USA).....	1.3
Safety .....	1.4

### 2.0 OMP40-2 basics

Introduction.....	2.1
Optical transmission method .....	2.1
Trigger Logic™ .....	2.2
Modes of operation.....	2.3
Configurable settings.....	2.4
OMP40-2 dimensions.....	2.5
OMP40-2 specification .....	2.6
Principal application .....	2.6
Overall dimensions.....	2.6
Weight .....	2.6
Operating .....	2.6
Batteries .....	2.7
Environment .....	2.7

### 3.0 System installation

Installing the OMP40-2 with an OMI-2/OMI-2T/OMI-2H/OMI .....	3.1
Performance envelope with an OMI-2/OMI-2T/OMI-2H .....	3.2
Performance envelope with an OMI .....	3.3
Installing the OMP40-2 with an OMM and MI12 .....	3.4
Performance envelope with an OMM .....	3.5
Preparing the OMP40-2 for use .....	3.6
Fitting the stylus .....	3.6
Installing the batteries .....	3.7
Mounting the probe on a shank.....	3.8
Stylus on-centre adjustment.....	3.9
Calibrating the OMP40-2.....	3.10

### 4.0 Trigger Logic™

Reviewing the current probe settings .....	4.1
Probe settings record table .....	4.2
Changing the probe settings .....	4.3
Operating mode .....	4.4

### 5.0 Maintenance

Maintenance .....	5.1
Cleaning the probe .....	5.1
Changing the batteries .....	5.2
Battery types .....	5.3

### 6.0 Fault finding

Fault finding.....	6.1
--------------------	-----

### 7.0 Parts list

Parts list .....	7.1
------------------	-----

# Before you begin

## Disclaimer

RENISHAW HAS MADE CONSIDERABLE EFFORTS TO ENSURE THE CONTENT OF THIS DOCUMENT IS CORRECT AT THE DATE OF PUBLICATION BUT MAKES NO WARRANTIES OR REPRESENTATIONS REGARDING THE CONTENT. RENISHAW EXCLUDES LIABILITY, HOWSOEVER ARISING, FOR ANY INACCURACIES IN THIS DOCUMENT.

## Trademarks

**RENISHAW®** and the probe emblem used in the RENISHAW logo are registered trademarks of Renishaw plc in the UK and other countries.

**apply innovation™** and Trigger Logic™ are trademarks of Renishaw plc.

All other brand names and product names used in this document are trade names, service marks, trademarks, or registered trademarks of their respective owners.

## Warranty

Equipment requiring attention under warranty must be returned to your equipment supplier. No claims will be considered where Renishaw equipment has been misused, or where repairs or adjustments have been attempted by unauthorised persons. Prior consent must be obtained in instances where Renishaw equipment is to be substituted or omitted. Failure to comply with this requirement will invalidate the warranty.

## Changes to equipment

Renishaw reserves the right to change equipment specifications without notice.

## CNC machines

CNC machine tools must always be operated by fully trained personnel in accordance with the manufacturer's instructions.

## Care of the probe

Keep system components clean and treat the probe as a precision tool.

## Patents

Features of the OMP40-2 probe, and other similar Renishaw probes, are the subject of one or more of the following patents and/or patent applications:

EP	0390342	JP	2945709
EP	0695926	JP	2994401
EP	0974208	JP	3967592
EP	1130557	JP	2003-526170
EP	1185838	JP	2004-522961
EP	1373995	JP	2004-530234
EP	1397637	JP	2005-502035
EP	1425550	JP	2006-313567
EP	1477767		
EP	1477768	US	5040931
EP	1503524 B	US	5150529
EP	1701234	US	5669151
EP	1734426	US	6776344 B2
EP	1804020	US	6839563 B1
		US	6860026 B2
		US	6941671 B2
		US	6472981 B2
		US	7145468 B2



## EC DECLARATION OF CONFORMITY

Renishaw plc declares that the product:-

Name	OMP40-2
Description	Optical machine probe

has been manufactured in conformity with the following standards:-

BS EN 61326-1:2006	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements Immunity to Table 2 - industrial locations. Emissions to Class A - industrial locations.
BS EN 60825-12:2004	Safety of laser products - Part 12: Safety of free space optical communication systems used for transmission of information

and that it complies with the requirements of the following directives: -

2004/108/EC	Electromagnetic compatibility
2006/95/EC	Low voltage

The above information is summarised from the full EC Declaration of Conformity. A copy is available from Renishaw on request.

## FCC DECLARATION (USA)

### FCC Section 15.19

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device may accept any interference received, including interference that may cause undesired operation.

### FCC Section 15.105

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

### FCC Section 15.21

The user is cautioned that any changes or modifications not expressly approved by Renishaw plc, or authorised representative could void the user's authority to operate the equipment.

## Safety

### Information to the user

Handle and dispose of batteries in accordance with the manufacturer's recommendations. Use only the recommended batteries. Do not allow the battery terminals to contact other metallic objects.

Take care not to short the battery contacts as this may be a fire hazard. Ensure that the contact strips are located securely.

The OMP40-2 has a glass window, handle with care if broken, to avoid injury.

### Information to the machine supplier/installer

It is the machine supplier's responsibility to ensure that the user is made aware of any hazards involved in operation, including those mentioned in Renishaw product literature, and to ensure that adequate guards and safety interlocks are provided.

Under certain circumstances, the probe signal may falsely indicate a probe seated condition. Do not rely on probe signals to halt the movement of the machine.

### Information to equipment installer

All Renishaw equipment is designed to comply with the relevant EEC and FCC regulatory requirements. It is the responsibility of the equipment installer to ensure that the following guidelines are adhered to, in order for the product to function in accordance with these regulations:

- any interface **MUST** be installed in a position away from any potential sources of electrical noise, i.e. power transformers, servo drives etc;
- all 0V/ground connections should be connected to the machine 'star point' (the 'star point' is a single point return for all equipment ground and screen cables). This is very important and failure to adhere to this can cause a potential difference between grounds;
- all screens must be connected as outlined in the user instructions;
- cables must not be routed alongside high current sources, i.e. motor power supply cables etc, or be near high speed data lines;
- cable lengths should always be kept to a minimum.

# OMP40-2 basics

## Introduction

Welcome to the OMP40-2 job set-up and inspection probe, an upgrade of the multiple award winning OMP40. At only 40 mm diameter, this compact probe sets industry standards for functionality, reliability and robustness in the harshest of machine tool environments.

The OMP40-2 is ideal for small to medium machining centres including the growing range of HSK machines.

- The OMP40 uses legacy transmission only, whereas the OMP40-2 can use either modulated or legacy transmission modes.
- full compatibility with Renishaw's industry proven optical transmission systems.
- 360° optical 'switch-on' facility allows probe to be switched off in any position.

## Optical transmission method

The OMP40-2 can be operated in either **modulated** or **legacy** mode.

### Modulated mode

Certain forms of light interference can cause false triggers or mimic a start signal and falsely activate the probe. These effects are much reduced when modulated transmission is selected.

When set to modulated mode, the probe will only function with one of the following modulated receivers: OMI-2T, OMI-2 OMI-2H or OMI-2C.

Modulated transmission is capable of providing two different coded start signals. This allows the use of two probes with one interface. Twin probe installations require an OMI-2T interface.

### Legacy mode

When set to legacy mode, the probe will only function with an OMI or OMM/MI12.

## Trigger Logic™

All OMP40-2 settings are configured using the Trigger Logic™ technique.

Trigger Logic™ (see Section 4 - **Trigger Logic™**) is a method that allows the user to view and select all available mode settings in order to customise a probe to suit a specific application. Trigger Logic™ is activated by battery insertion and uses a sequence of stylus deflection (triggering) to systematically lead the user through the available choices to allow selection of the required mode options.

Current probe settings can be reviewed by simply removing the batteries for a minimum of 5 seconds, and then replacing them to activate the Trigger Logic™ review sequence.

## Modes of operation

The OMP40-2 can be in one of three modes:

**Standby mode:** where the probe is awaiting a switch-on signal:

**Operational mode:** where the probe has been activated:

**Configuration mode:** where Trigger Logic™ may be used to configure probe settings.

**NOTE:**

A visual indication of currently selected probe settings is provided on battery insertion, by the three multi-colour LEDs located within the probe window (see **Section 4 - Trigger Logic™**).

Probe switch-on	Probe switch-off
<p><b>Optical switch-on</b>                      (When commanded by an M code or machine output).</p>	<p><b>Optical off</b>                      (When commanded by an M code or machine output).                      A timer automatically switches the probe off after 90 minutes from the last trigger if not turned off by an M code or machine output.</p> <p><b>Note:</b>                      This method is required when operating a twin probe system with an OMI-2T.                      After being switched on, the OMP40-2 must be on for 1 second minimum before being switched off.</p> <p><b>Timer off (time out)</b>                      Time out will occur (12, 33 or 134 seconds) after the last probe trigger or reset.</p>
<p><b>Optical switch-on</b>                      (When commanded by Auto start).</p>	<p><b>Timer off (time out)</b>                      Time out will occur (12, 33 or 134 seconds) after the last probe trigger or reset.</p>

**NOTE:**

Ensure that the probe does not remain active in the tool changer when optical on/time out option is selected by observing the LEDs.

## Configurable settings

See pages 4.1/4.3

### Optical switch-off

See table page 2.3

### Enhanced trigger filter

Probes subjected to high levels of vibration or shock loads may output signals without having contacted any surface. The Enhanced trigger filter improves the probes resistance to these effects.

When the filter is enabled, a constant 10 ms delay is introduced to the probe output.

The OMP40-2 is factory set to trigger filter off.

---

#### NOTE:

It may be necessary to reduce the probe approach speed to allow for the increased stylus overtravel during the extended time delay.

---

## Transmission method/probe identification

### Legacy start filter off/on

If false start problems are experienced in Legacy mode, activate the Legacy start filter on option. This introduces a 1 second delay to the probe switch on time and improves the probes resistance to false starts caused by light interference.

### Modulated Probe 1/Probe 2

To operate a twin probe system, one probe needs to be set to Probe 1 start and the other set to Probe 2 start, these settings are user configurable.

In a twin probe system such as a spindle probe and an optical tool setting probe, the spindle

probe would be set to Probe 1 start and the tool setter would be set to Probe 2 start.

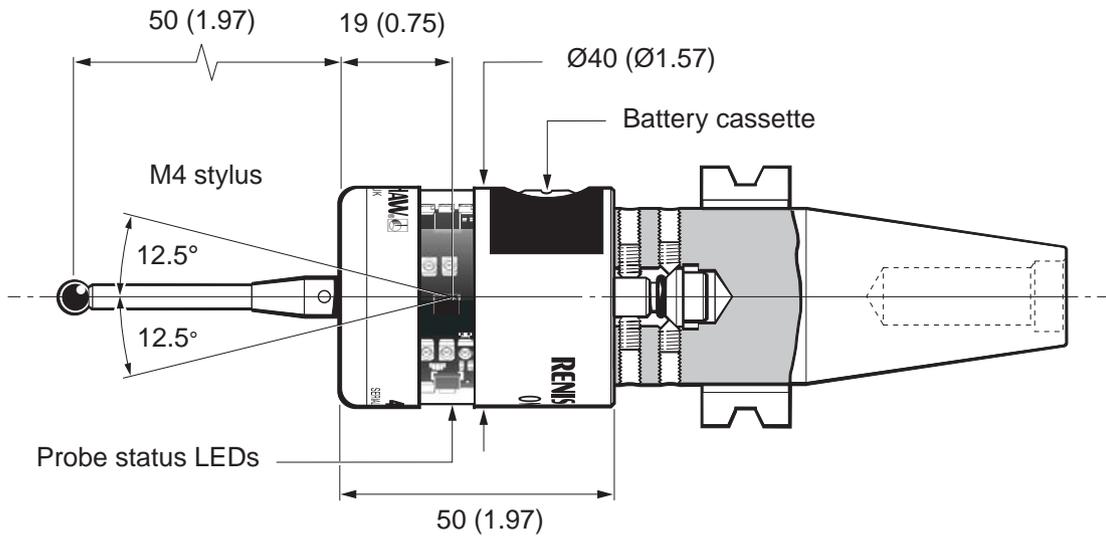
For most applications the spindle probe should be set to Probe 1 start. However where the application uses two spindle probes the secondary spindle probe is set to Probe 2.

### Optical power

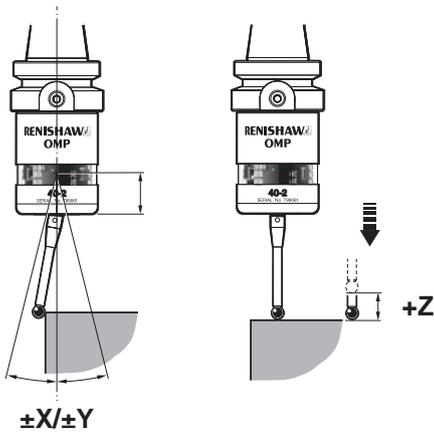
Where the separation between the OMP40-2 and the receiver is small (no more than 2 metres), the low optical power setting may be selected, see pages 3.2/3.3/3.5 and 4.3. This setting will reduce the optical transmission range and extend battery life.

The OMP40-2 is factory set to standard Optical power.

## OMP40-2 dimensions



dimension given in mm (in)



Stylus overtravel limits

Stylus length	$\pm X/\pm Y$	$+Z$
50 (1.97)	12 (0.47)	6 (0.24)
100 (3.94)	22 (0.87)	6 (0.24)

## OMP40-2 specification

**Principal application:** Workpiece measurement and job set-up on small to medium machining centres

**Overall dimensions:**

Length	50 mm (1.97 in)
Diameter	40 mm (1.57 in)

**Weight:**

	<b>with batteries</b>	<b>without batteries</b>
	260 g (9.17 oz)	240 g (8.46 oz)

### Operating:

**Signal transmission type:** 360° infra-red optical transmission (modulated or legacy)

**Switch-on method:** Optical on or Auto Start

**Switch-off method:** Optical off or Timer

**Operating range:** Up to 5 m (16.4 ft)

**Receiver/interface:** OMI-2T, OMI-2, OMI-2H, OMI-2C, OMI or OMM/MI12

**Sense directions:** Omni-directional  $\pm X$ ,  $\pm Y$ ,  $+Z$

**Uni-directional repeatability:** 1.0  $\mu\text{m}$  (0.00004 in) 2 sigma ( $2\sigma$ ) \*

### Stylus trigger force (factory set):

low force direction	<b>XY plane</b>	<b>+Z direction</b>
	0.5 N, 50 gf (1.76 ozf) §	5.85 N, 585 gf (20.63 ozf) §

high force direction	<b>XY plane</b>	<b>+Z direction</b>
	0.9 N, 90 gf (3.17 ozf) §	5.85 N, 585 gf (20.63 ozf) §

<b>Stylus overtravel:</b>	<b>XY plane</b>	<b>+Z direction</b>
	$\pm 12.5^\circ$	6 mm (0.24 in)

\* Probe performance specification is for a test velocity of 480 mm/min (1.57 ft/min) using a 50 mm (1.97 in) straight stylus.

§ Factory set using 50 mm (1.97 in) straight stylus.

## OMP40-2 specification

### Batteries:

- Battery type:** ½ AA Lithium Thionyl Chloride (3.6 V) x 2
- Battery reserve life:** Approximately 1 week after a low battery warning is first given
- Low battery indication:** Blue flashing LED in conjunction with normal red or green probe status LED
- Dead battery indication:** Constant or flashing red

### Typical battery life

MODULATED optical transmission mode				
Standby life	5% usage (72 minutes/day)		Continuous use	
	Standard power mode	Low power mode	Standard power mode	Low power mode
250 days	85 days	120 days	140 hours	230 hours
LEGACY optical transmission mode				
Standby life	5% usage (72 minutes/day)		Continuous use	
	Standard power mode	Low power mode	Standard power mode	Low power mode
250 days	115 days	170 days	170 hours	270 hours

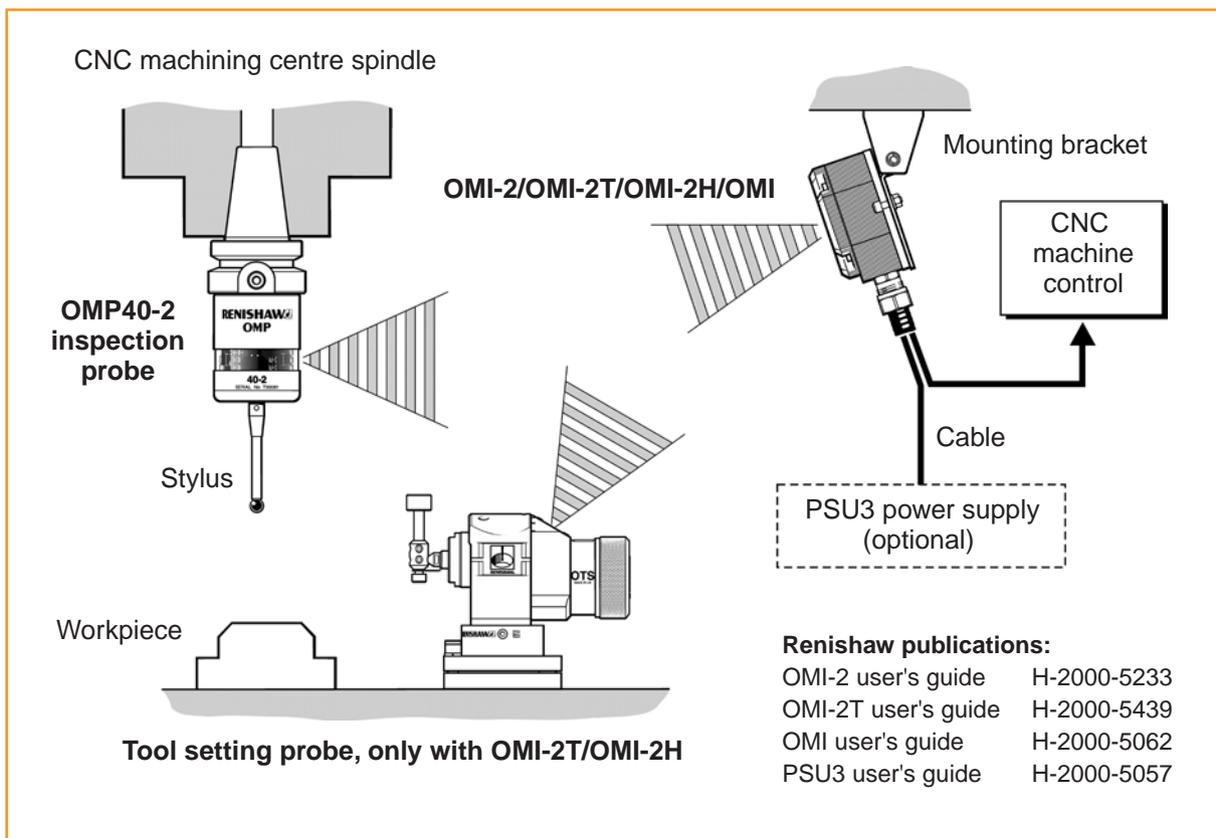
### Environment:

- IP rating:** IPX8
- Operating temperature:** 5 °C to 50 °C (41 °F to 122 °F)
- Storage temperature:** -10 °C to 70 °C (14 °F to 158 °F)

This page left intentionally blank

# System installation

## Installing the OMP40-2 with an OMI-2/OMI-2T/OMI-2H/OMI



### Probe and optical receiver

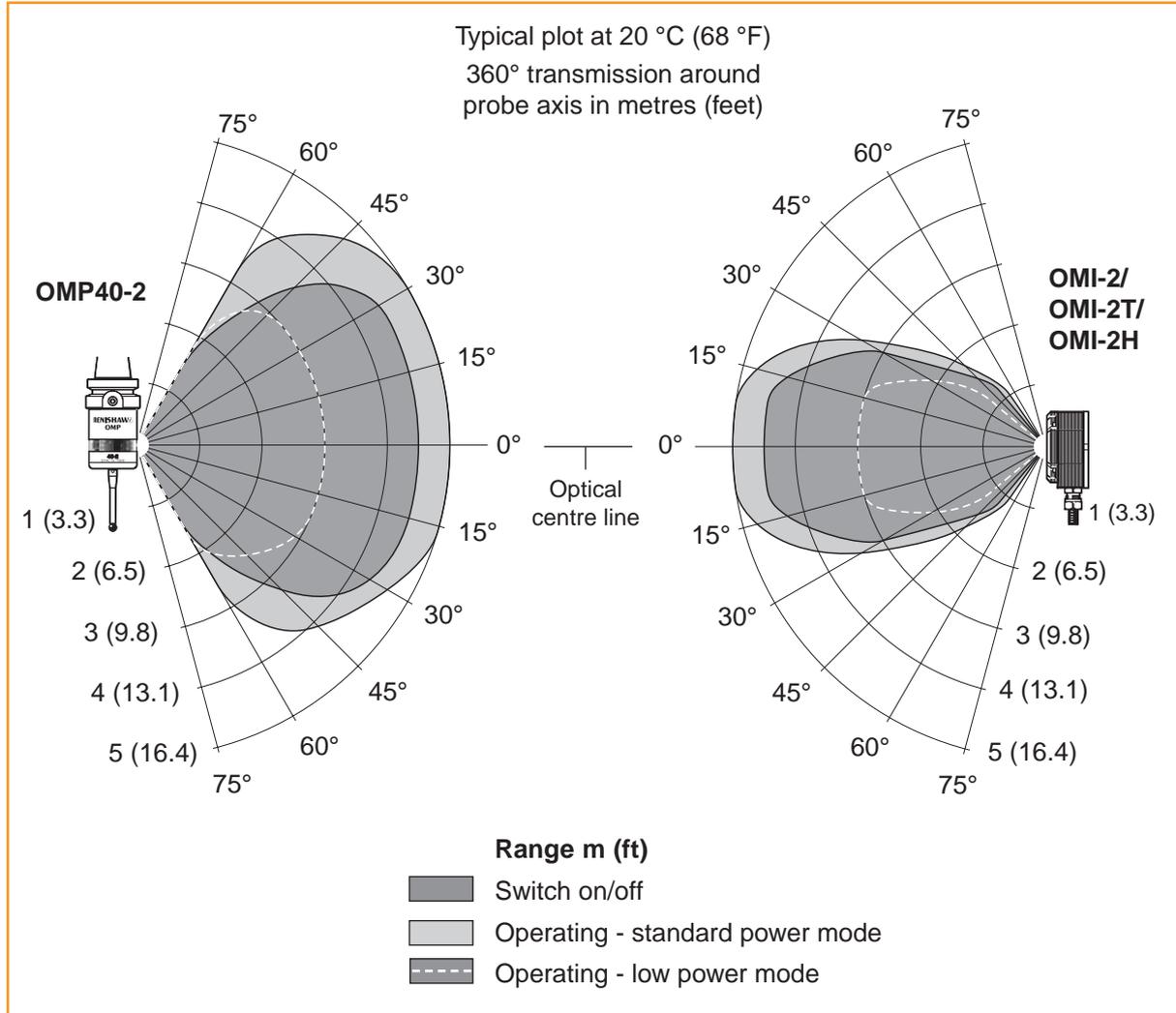
The probe and receiver must be in the other's field of view, and within the performance envelope shown (pages 3.2/3.3). The OMP40-2 performance envelope is based on the receiver being at 0°, and vice-versa.

Natural reflective surfaces within the machine may increase the signal transmission range.

Coolant residue accumulating on the OMP40-2 or OMI-2T/OMI-2/OMI-2H/OMI windows may reduce the signal transmission range. Wipe clean as often as is necessary to maintain unrestricted transmission.

Operation in temperatures of 0 °C to 5 °C or 50 °C to 60 °C (32 °F to 41 °F or 122 °F to 140 °F) will result in some reduction in range.

## Performance envelope with an OMI-2/OMI-2T/OMI-2H (modulated transmission)



### Optical power setting

If two machines are operating in close proximity to each other, take care to ensure that signals transmitted from a probe on one machine are not received by the receiver on the other machine, and vice versa.

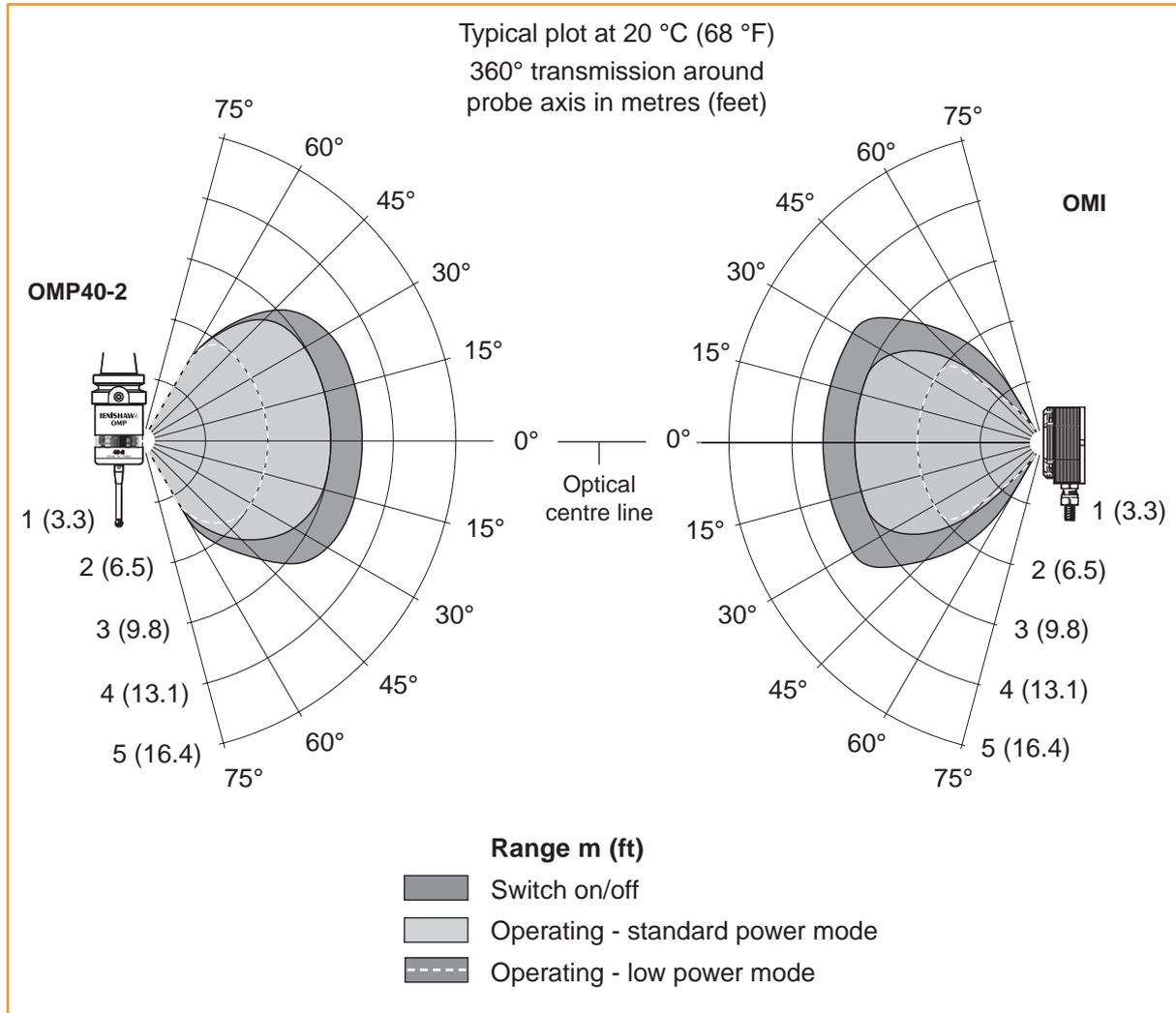
When this is the case, it is recommended that the low optical power setting on probes is used, and that the low range setting is used on the receiver.

### Receiver position

To assist finding the optimum position for the installation, signal condition is displayed on the OMI-2/OMI-2T/OMI-2H receiver.

Please refer to the receiver User's Guide.

## Performance envelope with an OMI (legacy transmission)



### Optical power setting

If two machines are operating in close proximity to each other, take care to ensure that signals transmitted from a probe on one machine are not received by the receiver on the other machine, and vice versa.

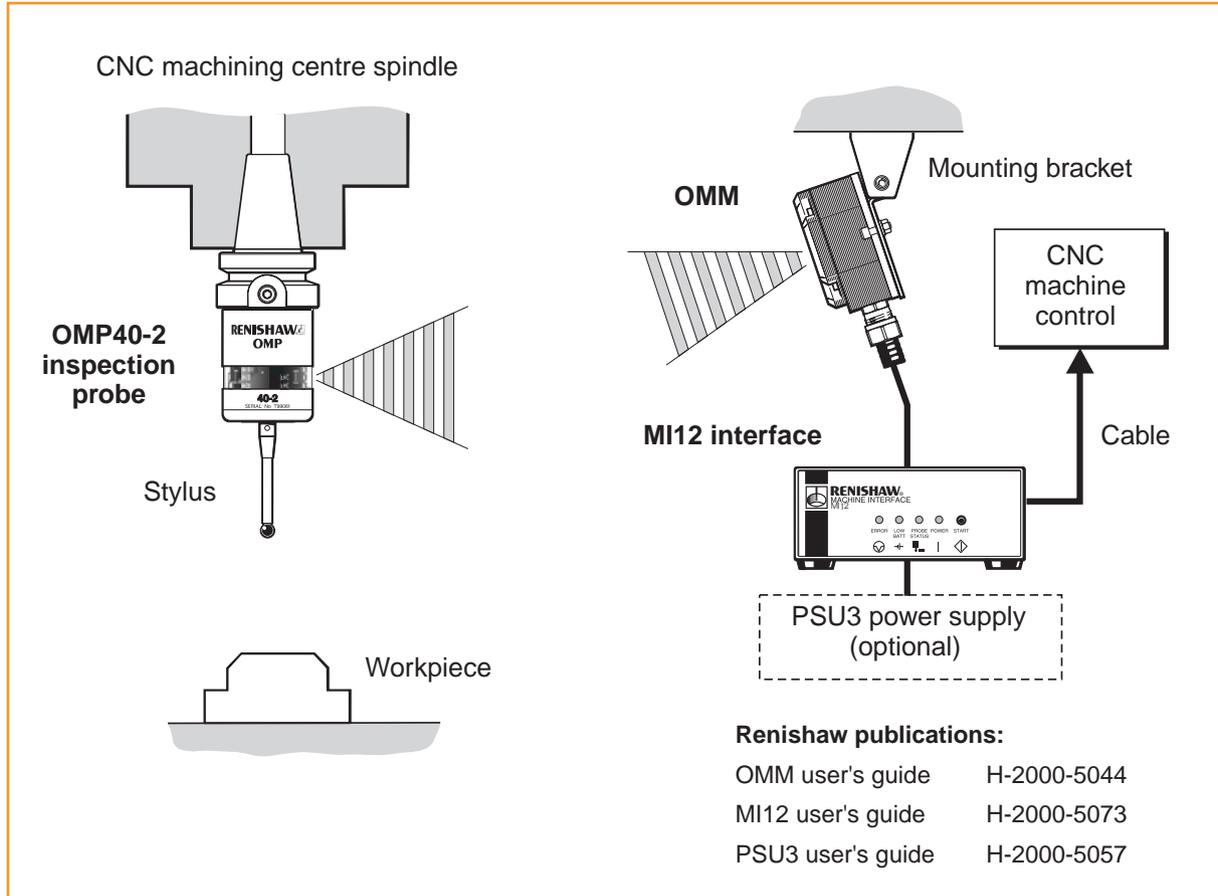
When this is the case, it is recommended that the low optical power setting on probes is used, and that the low range setting is used on the receiver.

### Receiver position

To assist finding the optimum position for the installation, signal condition is displayed on the OMI receiver.

Please refer to the receiver User's Guide.

## Installing the OMP40-2 with an OMM and MI12



### Probe and optical receiver

The probe and receiver must be in the other's field of view, and within the performance envelope shown (page 3.5). The OMP40-2 performance envelope is based on the receiver being at 0°, and vice-versa.

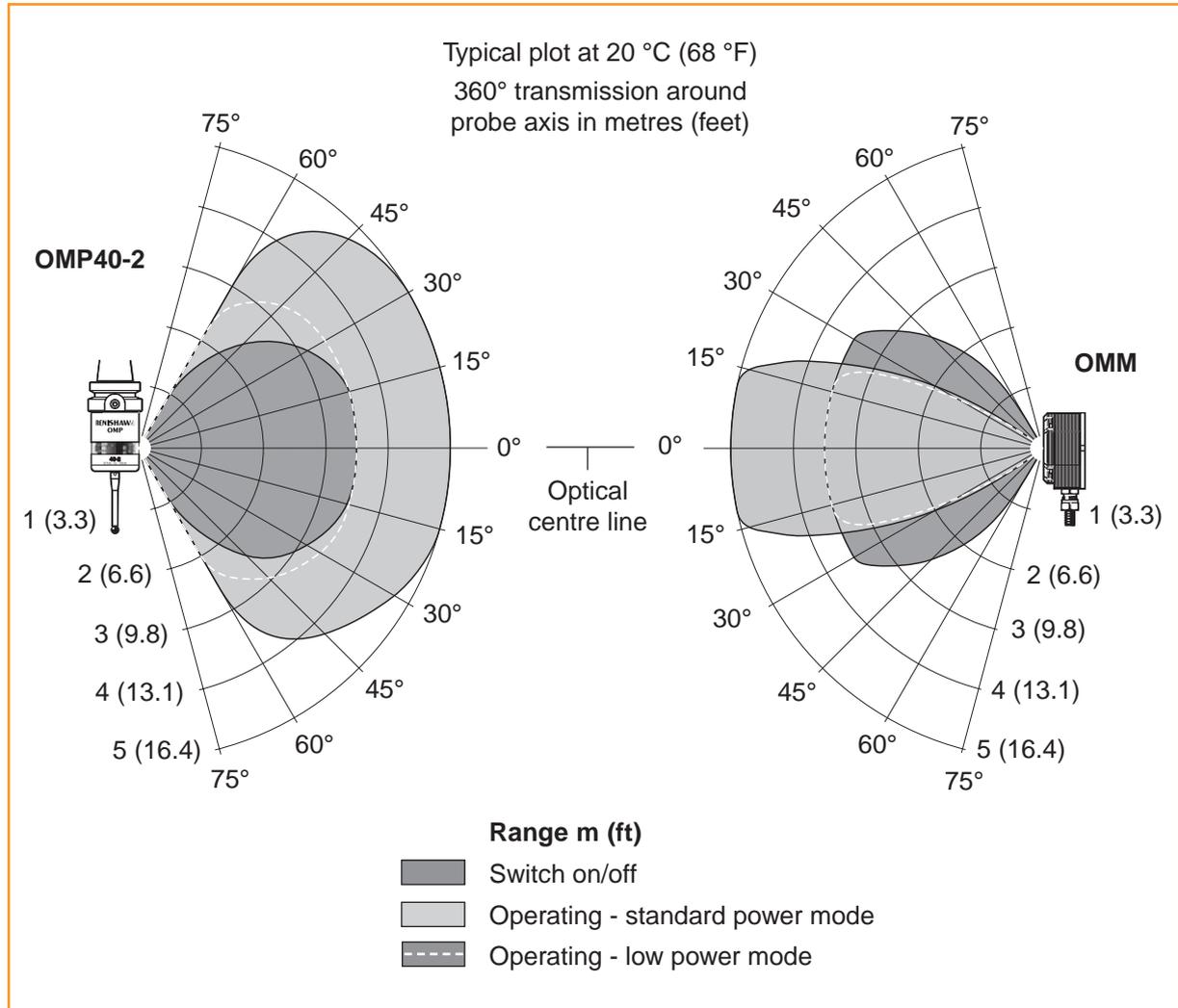
Natural reflective surfaces within the machine may increase the signal transmission range.

Coolant residue accumulating on the OMP40-2 or OMM windows may reduce the signal transmission range. Wipe clean as often as is necessary to maintain unrestricted transmission.

Operation in temperatures of 0 °C to 5 °C or 50 °C to 60 °C (32 °F to 41 °F or 122 °F to 140 °F) will result in some reduction in range.

On large machine tools, it is possible to provide greater reception coverage by mounting two OMMs connected to a single MI12 interface.

## Performance envelope with an OMM (legacy transmission)



### Optical power setting

If two machines are operating in close proximity to each other, take care to ensure that signals transmitted from a probe on one machine are not received by the receiver on the other machine, and vice versa.

When this is the case, it is recommended that the low optical power setting on probes is used, and that the low range setting is used on the receiver.

# Preparing the OMP40-2 for use

## Fitting the stylus



## Installing the batteries

1



### NOTES:

See **Section 5 - Maintenance** for list of suitable battery types.

When inserting batteries, check that the battery polarity is correct.

If dead batteries are inadvertently inserted into the probe then the LEDs will remain a constant red, see page 4.4.

Do not allow coolant or debris to enter the battery compartment.

After inserting the batteries the LEDs will display the current probe settings (for details see **Section 4 - Trigger Logic™**).

2



3



4



Mounting the probe on a shank



## Stylus on-centre adjustment

### NOTES:

If a probe and shank assembly is dropped, it must be rechecked for correct on-centre adjustment.

Do not hit or tap the probe to achieve on-centre adjustment.

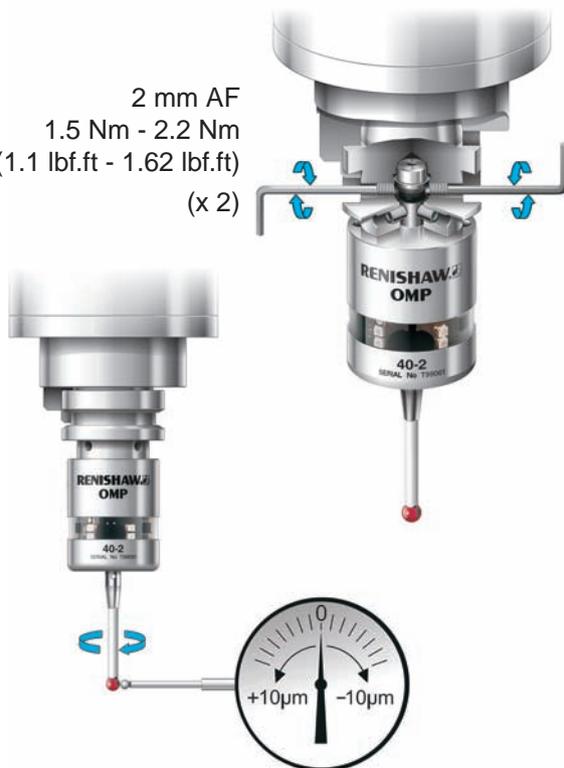
1

2 mm AF  
 0.5 Nm - 1.5 Nm  
 (0.37 lbf.ft - 1.1 lbf.ft)  
 (x 4)



2

2 mm AF  
 1.5 Nm - 2.2 Nm  
 (1.1 lbf.ft - 1.62 lbf.ft)  
 (x 2)



3

2 mm AF  
 1.5 Nm - 2.2 Nm  
 (1.1 lbf.ft - 1.62 lbf.ft)  
 (x4)



## Calibrating the OMP40-2

### Why calibrate a probe?

A spindle probe is just one component of the measurement system which communicates with the machine tool. Each part of the system can introduce a constant difference between the position that the stylus touches, and the position that is reported to the machine. If the probe is not calibrated, this difference will appear as an inaccuracy in the measurement. Calibration of the probe allows the probing software to compensate for this difference.

During normal use, the difference between the touch position and the reported position does not change but it is important that the probe is calibrated in the following circumstances:

- when a probe system is to be used for the first time;
- when a new stylus is fitted to the probe;
- when it is suspected that the stylus has become distorted or that the probe has crashed;
- at regular intervals to compensate for mechanical changes of your machine tool;
- if repeatability of relocation of the probe shank is poor. In this case, the probe may need to be recalibrated each time it is selected.

It is good practice to set the tip of the stylus on-centre, because this reduces the effect of any variation in spindle and tool orientation (see page 3.9). A small amount of run-out is acceptable, and can be compensated for as part of the normal calibration process.

Three different operations are to be used when calibrating a probe. They are:

- calibrating in either a bored hole or on a turned diameter of known position;

- calibrating either in a ring gauge or on a datum sphere;
- calibrating the probe length.

### Calibrating in a bored hole or on a turned diameter

Calibrating a probe, either in a bored hole or on a turned diameter of known size, automatically stores values for the offset of the stylus ball to the spindle centre-line. The stored values are then used automatically in the measuring cycles. Measured values are compensated by these values so that they are relative to the true spindle centre-line.

### Calibrating in a ring gauge or on a datum sphere

Calibrating a probe either in a ring gauge or on a datum sphere with a known diameter automatically stores one or more value for the radius of the stylus ball. The stored values are then used automatically by the measuring cycles to give the true size of the feature. The values are also used to give true positions of single surface features.

---

#### NOTE:

The stored radii values are based on the true electronic trigger points. These values are different from the physical sizes.

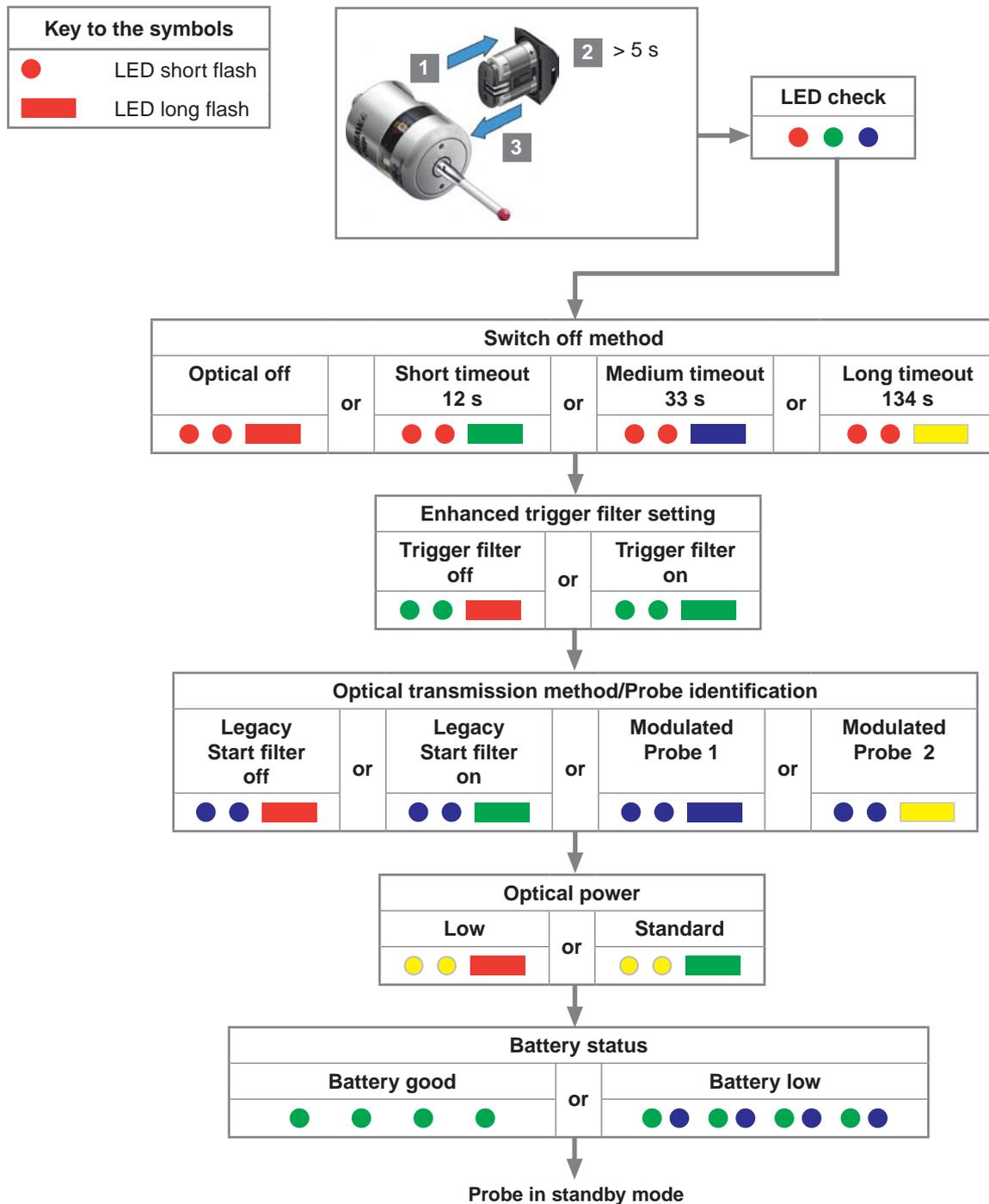
---

### Calibrating the probe length

Calibrating a probe on a known reference surface determines the length of the probe, based on the electronic trigger point. The stored value for length is different from the physical length of the probe assembly. Additionally, the operation can automatically compensate for machine and fixture height errors by adjusting the probe length value that is stored.

# Trigger Logic™

## Reviewing the current probe settings



## Probe settings record table

This page is provided to note your probe's settings.

✓ tick

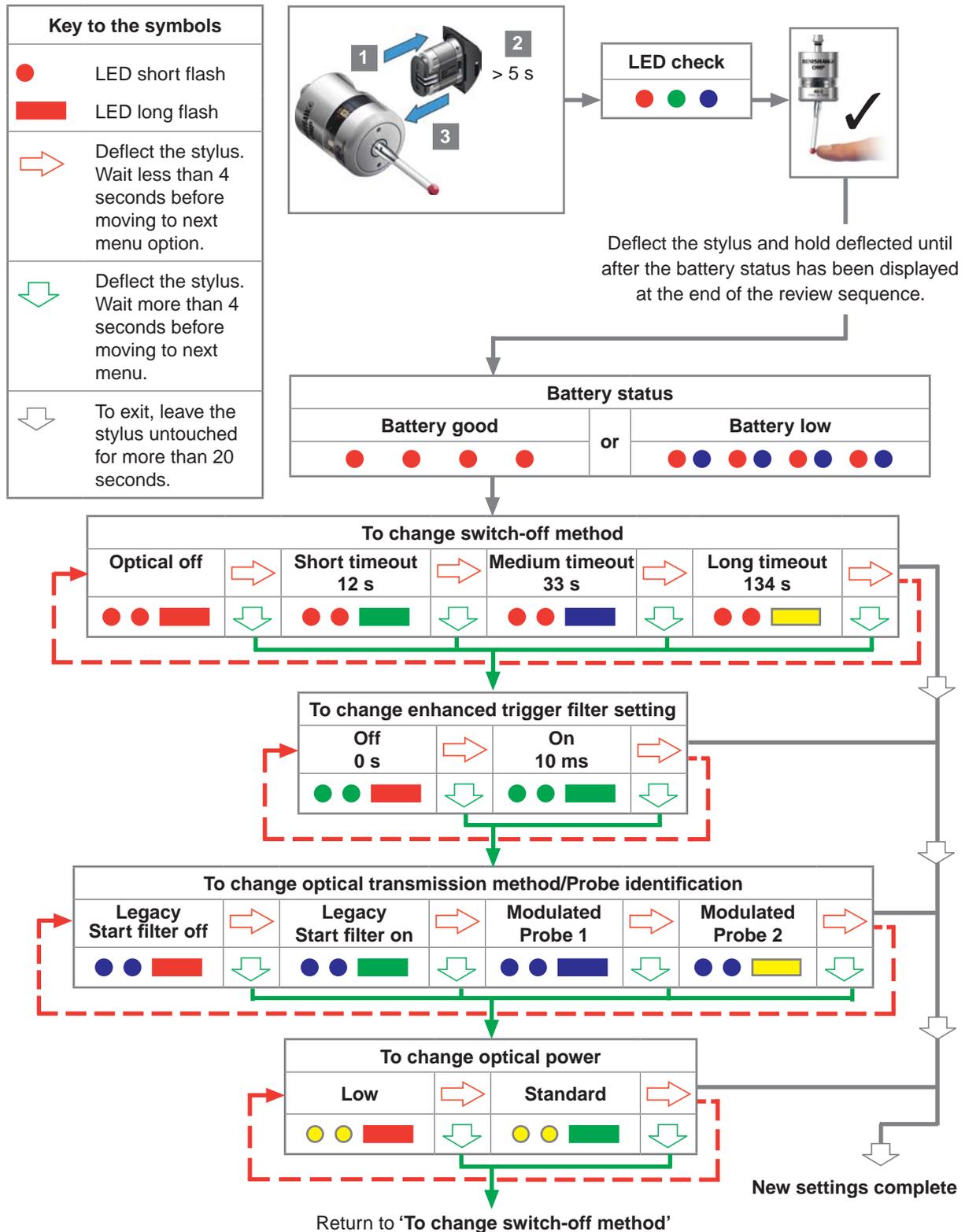
<b>Switch-on method</b>	Optical switch-on or Auto Start		
<b>Switch-off method</b>	Optical off		
	Short time out (12 sec)		
	Medium time out (33 sec)		
	Long time out (134 sec)		
<b>Enhanced trigger filter setting</b>	Trigger filter off		
	Trigger filter on		
<b>Optical transmission method</b>	Legacy start filter off		
	Legacy start filter on		
	Modulated probe 1		
	Modulated probe 2		
<b>Optical power setting</b>	Low optical power		
	Standard optical power		

OMP40-2 serial no .....

## Changing the probe settings

Insert batteries or, if already installed, remove for 5 seconds and replace. Following the LED check, immediately deflect the stylus and hold deflected until five red flashes have been observed (if the battery power is low then each of the five red

flashes will be followed by a blue flash). Keep the stylus deflected until the 'switch on method' setting is displayed, then release the stylus. The probe is now in configuration mode and Trigger Logic™ is activated.



## Operating mode



## Probe status LEDs

LED colour	Probe status	Graphic hint
Flashing green	Probe seated in operating mode	● ● ●
Flashing red	Probe triggered in operating mode	● ● ●
Flashing green and blue	Probe seated in operating mode - low battery	● ● ● ● ● ●
Flashing red and blue	Probe triggered in operating mode - low battery	● ● ● ● ● ●
Constant red	Battery dead	▬
Flashing red or red and green or red, green and blue	Unsuitable batteries	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

### NOTES:

Due to the nature of Lithium Thionyl Chloride batteries, if a 'low battery' LED sequence is ignored or overlooked, then it is possible for the following sequence of events to occur:

1. When the probe is active, the batteries discharge until battery power becomes too low for the probe to operate correctly.
2. The probe stops functioning, but then re-activates as the batteries recharge sufficiently to provide the probe with power.
3. The probe begins to run through the LED review sequence (page 4.1).
4. Again, the batteries discharge and the probe ceases to function.
5. Again, the batteries recharge sufficiently to provide the probe with power and the sequence repeats itself.

# Maintenance

## Maintenance

You may undertake the maintenance routines described in these instructions.

Further dismantling and repair of Renishaw equipment is a highly specialised operation, which must be carried out at authorised Renishaw Service Centres.

Equipment requiring repair, overhaul or attention under warranty should be returned to your supplier.

## Cleaning the probe

Wipe the window of the probe with a clean cloth to remove machining residue. This should be done on a regular basis to maintain optimum transmission.



**CAUTION:** The OMP40-2 has a glass window, handle with care if broken to avoid injury

## Changing the batteries

1



2



### ⚠ CAUTIONS:

Do not leave exhausted batteries in probe.

When changing batteries, do not allow coolant or debris to enter the battery compartment.

When changing batteries, check that the battery polarity is correct.

Take care to avoid damaging the battery cassette gasket.

Only use specified batteries (page 5.3).

### ⚠ CAUTIONS:

Please dispose of exhausted batteries in accordance with local regulations.

Never dispose of batteries in a fire.

### NOTES:

After removing the old batteries, wait more than 5 seconds before inserting the new batteries.

Do not mix new and used batteries or battery types, as this will result in reduced life and damage to the batteries.

Always ensure that the cassette gasket and mating surfaces are clean and free from dirt before reassembly.

If dead batteries are inadvertently inserted into the probe, the LEDs will remain a constant red.



### Battery type

**½ AA Lithium Thionyl Chloride (3.6 V) x 2**



**Ecocel:** EB1426  
**Saft:** LS 14250C,  
 LS 14250  
**Tadiran:** SL-750  
**Xeno:** XL-050F



**Dubilier:** SB-AA02  
**Maxell:** ER3S  
**Sanyo:** CR 14250SE  
**Tadiran:** SL-350, SL-550  
 TL-4902 TL-5902,  
 TL-2150, TL-5101  
**Varta:** CR 1/2 AA

This page left intentionally blank

# Fault finding

Symptom	Cause	Action
<b>Probe fails to power up (no LEDs illuminated, or fails to indicate current probe settings)</b>	Dead batteries	Change batteries
	Wrong batteries	Change batteries
	Batteries inserted incorrectly	Check battery insertion
	Batteries removed for too short a time and probe has not reset	Remove batteries for a minimum of 5 seconds
<b>Probe fails to switch-on</b>	Wrong transmission mode selected	Reconfigure transmission mode
	Dead batteries	Change batteries
	Wrong batteries	Change batteries
	Batteries inserted incorrectly	Check battery insertion
	Optical/magnetic interference	Check for interfering lights or motors Consider removing interfering source
	Transmission beam obstructed	Check that OMP40-2 and receiver windows are clean, and remove any obstruction
	Probe out of range/not aligned with receiver	Check alignment and if receiver fixing is secure
	No receiver start signal	Check start signal by reviewing receiver start LED Refer to relevant user's guide

Symptom	Cause	Action
<b>Machine stops unexpectedly during a probing cycle</b>	Optical communication obstructed	Check interface/receiver and remove obstruction
	Interface/receiver/machine fault	Refer to interface/receiver/machine user's guide
	Dead batteries	Change batteries
	False probe trigger	Enable enhanced trigger filter
	Probe unable to find target surface	Check that part is correctly positioned and that stylus has not broken
	Adjacent probe	Reconfigure to low power mode and reduce range of receiver
<b>Probe crashes</b>	Length offset incorrect	Review offsets
	Controller wired to respond to tool setter instead of inspection probe	Review installation wiring

Symptom	Cause	Action
<b>Poor probe repeatability and/or accuracy</b>	Debris on part or stylus	Clean part and stylus
	Poor tool change repeatability	Re-datum probe after each tool change
	Loose probe mounting on shank or loose stylus	Check and tighten as appropriate
	Excessive machine vibration	Enable enhanced trigger filter Eliminate vibrations
	Calibration out of date and/or incorrect offsets	Review probing software
	Calibration and probing speeds not the same	Review probing software
	Calibration feature has moved	Correct position
	Measurement occurs as stylus leaves surface	Review probing software
	Measurement occurs within the machine's acceleration and deceleration zone	Review probing software, probe filter settings and stylus trigger force
	Probing speed too high or too slow	Perform simple repeatability trials at various speeds
Temperature variation causes machine and workpiece movement	Minimise temperature changes	
Machine tool faulty	Perform health checks on machine tool	
<b>Probe fails to switch-off</b>	Optical/magnetic interference	Check for interfering lights or motors Consider removing the interfering source Check position of receiver Increase receiver signal start range Ensure window is clean
	Probe out of range	Review performance envelopes

Symptom	Cause	Action
<b>Probe fails to switch-off (where optical off is required)</b>	Wrong switch-off mode selected	Reconfigure to optical off mode
	Optical/magnetic interference	Check for interfering lights or motors  Consider removing the interfering source
	Probe is inadvertently switched-on by the receiver when using autostart	Check position of receiver Reduce receiver signal strength
	Probe out of range	Review performance envelopes
	Probe is regularly falsely switched-on by light interference	Enable optical transmission legacy mode (start filter on), or consider upgrading to modulated system.
	Transmission beam obstructed	Check that the probe and receiver windows are clean, and remove any obstruction.
<b>Probe fails to switch-off (where time out is required)</b>	Wrong switch-off mode is selected	Reconfigure to time out mode
	Probe placed in carousel when in time out mode. Timer can be reset by carousel activity	Ensure that carbon fibre stylus is being used  Enable enhanced trigger filter  Shorten timeout setting  Consider use of optical on/ optical off setting
<b>Probe goes into Trigger Logic™ set up mode and cannot be reset</b>	Probe was triggered when batteries were inserted	Do not touch the stylus during battery insertion

# Parts list

Type	Part number	Description
OMP40-2	A-4071-0001	OMP40-2 probe with batteries, tool kit and Quick-start guide. Optical on, set to: optical off/trigger filter off/legacy transmission, start filter off/standard power.
OMP40-2	A-4071-0002	OMP40-2 probe with batteries, tool kit and Quick-start guide. Optical on, set to: time off 134 sec/trigger filter off/legacy transmission, start filter off/standard power.
OMP40-2	A-4071-2001	OMP40-2 probe with batteries, tool kit and Quick-start guide. Optical on, set to: optical off/trigger filter off/Probe 1 start, modulated transmission/standard power.
OMP40-2	A-4071-2002	OMP40-2 probe with batteries, tool kit and Quick-start guide. Optical on, set to: time off 134 sec trigger filter off/Probe 1 start, modulated transmission/standard power.
OMP40-2LS	A-4071-3001	OMP40-2LS probe with batteries, tool kit and Quick-start guide. Optical on, set to: optical off/trigger filter off/Probe 1 start, modulated transmission/standard power.
Stylus	A-5000-3709	PS3-1C ceramic stylus 50 mm long with Ø6 mm ball.
Batteries	P-BT03-0007	1/2 AA Lithium thionyl chloride (LTC) batteries (pack of two).
Battery cassette	A-4071-1166	OMP40-2 battery cassette kit.
Seal	A-4038-0301	Seal for OMP40-2 battery cassette.
Tool kit	A-4071-0060	Probe tool kit comprising: Ø1.98 mm stylus tool, 2.0 mm AF hexagon key and shank grub screws (x6).
Stylus tool	M-5000-3707	Tool for tightening/releasing styli.
Shank adaptor assembly	A-4071-0031	Shank adaptor assembly for mounting to OMP60, RMP60, MP700 type shanks.

Type	Part number	Description
OMI-2	A-5191-0049	OMI-2 complete with cable 8 m (26.25 ft) long.
OMI-2	A-5191-0050	OMI-2 complete with cable 15 m (49 ft) long.
OMI-2T	A-5439-0049	OMI-2T complete with cable 8 m (26.25 ft) long.
OMI-2T	A-5439-0050	OMI-2T complete with cable 15 m (49 ft) long.
OMI	A-2115-0001	OMI complete with cable 8 m (26.25 ft) long.
OMM	A-2033-0576	OMM complete with cable 25 m (82 ft) long.
Mounting bracket	A-2033-0830	OMI-2/OMI-2T/OMI-2H/OMI/OMM mounting bracket with fixing screws, washers and nuts.
MI12	A-2075-0142	MI12 interface unit.
PSU3	A-2019-0018	PSU3 power supply unit 85-264 V input.
<p><b>Publications.</b> These can be downloaded from our web site at <a href="http://www.renishaw.com">www.renishaw.com</a></p>		
OMP40-2	A-4071-8500	Quick-start guide for rapid set-up of the OMP40-2 probe, includes CD with OMP40-2 publications.
OMP40-2LS	H-4071-8505	Addendum OMP40-2LS performance envelope.
Styli	H-1000-3200	Catalogue Styli and accessories.
OMI-2	H-2000-5233	Installation and user's guide Optical machine interface.
OMI-2T	H-5439-8502	Installation and user's guide Twin probe system optical machine interface.
OMI	H-2000-5062	Installation and user's guide Optical machine interface.
OMM	H-2000-5044	Installation and user's guide Optical machine module.
MI12	H-2000-5073	Installation and user's guide MI12 interface unit.
PSU3	H-2000-5057	Installation and user's guide PSU3 power supply unit.
Software features	H-2000-2289	Data sheet Probe software for machine tools - illustrated features.
Software list	H-2000-2298	Data sheet Probe software for machine tools - list of programs.



**Renishaw plc**  
New Mills, Wotton-under-Edge,  
Gloucestershire, GL12 8JR  
United Kingdom

**T** +44 (0)1453 524524  
**F** +44 (0)1453 524901  
**E** uk@renishaw.com  
[www.renishaw.com](http://www.renishaw.com)

**RENISHAW**   
**apply innovation™**

**For worldwide contact details,  
please visit our main website at  
[www.renishaw.com/contact](http://www.renishaw.com/contact)**



H - 4071 - 8504 - 03