Installation guide
H-5492-8504-02-B

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OSI with OMM-2 multiple optical probe interface system

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Before you begin

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CNC machines

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

Care of the system components

Keep system components clean and treat with care. Do not apply labels to the front of the OMM-2 or otherwise obstruct the window.

Patents

None applicable.

Intended use

The OSI with OMM-2 acts as a separate machine interface and optical transceiver, which converts signals from the optical probe into voltage-free solid state relay (SSR) and driven outputs for transmission to the CNC machine controller.

Safety

Information to the user

In all applications involving the use of machine tools or CMMs, eye protection is recommended.

The OMM-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 the equipment installer

All Renishaw equipment is designed to comply with the relevant EU 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 0 V/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;
- the dc supply to this equipment must be derived from a source which is approved to BS EN IEC 62368-1.

Equipment operation

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Optical safety

This product contains LEDs that emit both visible and invisible light.

OMM-2 is ranked Risk Group: Exempt (safe by design).

The product was evaluated and classified using the following standard:

BS EN 62471:2008 The photobiological safety of lamps and lamp systems.

Renishaw recommends that you do not stare at or look directly into any LED device, irrespective of its risk classification.

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OSI with OMM-2 system basics

Introduction

CNC machine tools using Renishaw spindle probes with optical signal transmission for workpiece inspection, or tool setters with optical signal transmission, require an interface system to convert the signals from the probe into voltage-free solid state relay (SSR) outputs for transmission to the CNC machine controller.

Typically installed within the CNC machine controller's cabinet and located away from sources of interference such as transformers and motor controls, the OSI can draw its power from the machine's nominal 12 Vdc to 30 Vdc supply.

The OSI has an input voltage range of 12 Vdc to 30 Vdc. The supply is protected by a 1.1 A self-resetting fuse (its nominal current, when connected to an inspection probe, is either 400 mA max. @ 12 V or 200 mA max. @ 24 V with tandem OMM-2). To reset the fuse, remove the power then identify and rectify the cause of the fault.

The OSI can be used with either a single OMM-2 or a tandem OMM-2 configuration, housed within the machining environment. The OMM-2 transmits control signals to the spindle probe, or tool setter, and receives probe data signals for onward transmission to the OSI and CNC controller. Power is supplied from the OSI. Visual indication of system status is provided via the LEDs located on the OMM-2.

The OSI with OMM-2 system operates using a 'modulated' optical transmission mode and is compatible with machine probes that also operate in 'modulated' mode.

The OSI with OMM-2 system is user-configurable for operation in either single probe mode or multiple probe mode. In multiple probe mode the system is capable of operating three compatible probes sequentially.

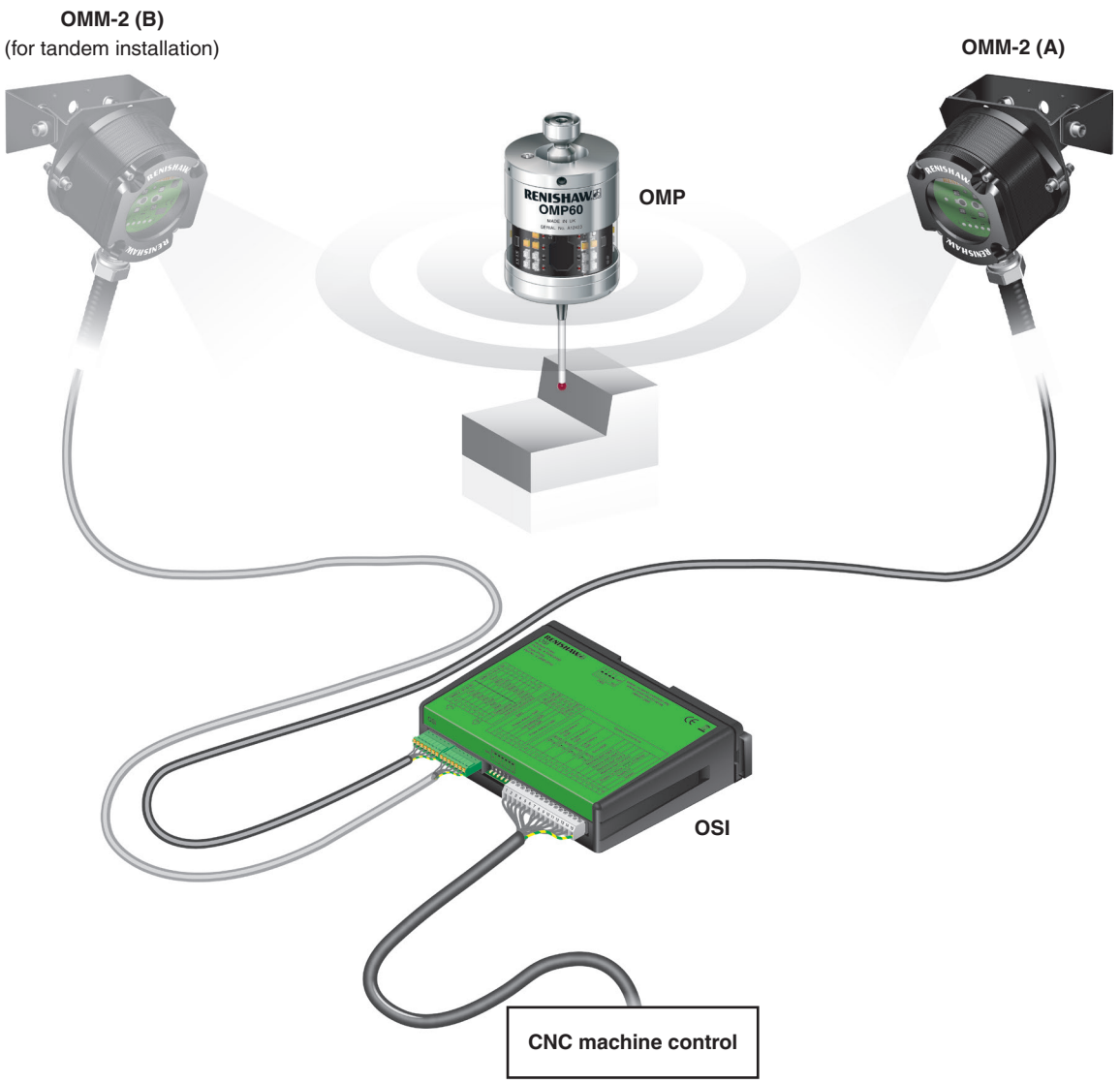
OSI with OMM-2 system used in single probe mode

The system can be used with any Renishaw optical machine probe (OMP) or optical lathe probe (OLP) system. The following descriptions use OMP60 as an example.

In single probe mode, the system will interface a single Renishaw machine probe with the machine controller. It is possible for either a single OMM-2 or tandem OMM-2 to be connected to the OSI. The selected configuration will depend on the machine application.

When the OMM-2 is used in tandem, both receivers will simultaneously provide an indication of probe status. Tandem OMM-2 allow for uninterrupted probe communication in applications with exceptionally long spindle movement, or in applications where line-of-sight issues become apparent when only a single receiver is used. Obstruction to the line-of-sight between the OMM-2 and the probe can be caused by the machine's swinging head or by the workpiece.

The illustration below shows a typical OSI with OMM-2 system used in single probe mode. Alternatively, the system can be used to interface a single optical tool setter (OTS) instead of the OMP shown.



A typical OSI with OMM-2 system used in single probe mode

OSI with OMM-2 system used in multiple probe mode

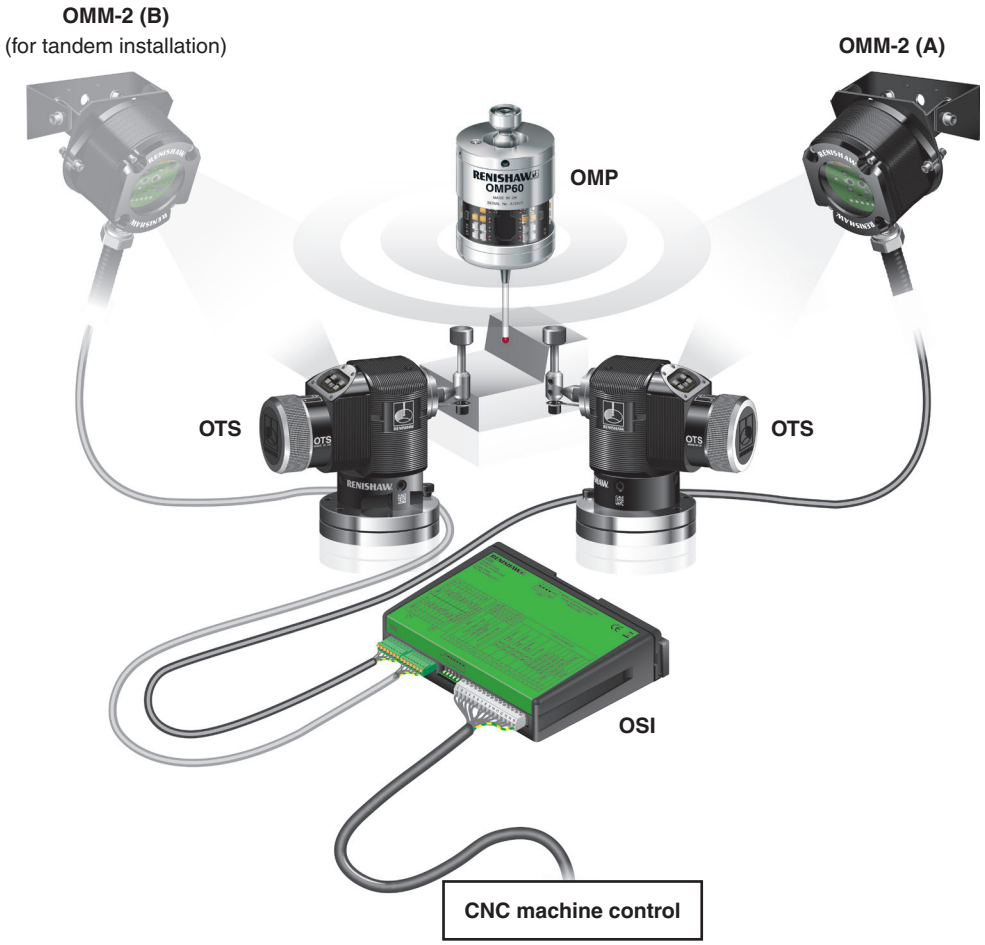
In multiple probe mode, the system will sequentially interface up to three separate Renishaw optical machine probes with the machine controller. It is possible to have either a single OMM-2 or a tandem OMM-2 configuration to best suit the application.

Application of the system in multiple probe mode is suited to many machine applications. Typical examples are as follows:

1 × OMP with 2 × OTS (illustrated below).
This arrangement is suitable for a machine application that has a partitioned machining area with an OTS and OMM-2 positioned in each area. An OMP in the spindle is used in both areas, communicating with the OMM-2 located in the specific machining area. The OMP is assigned as Probe 1 and 2 × OTS assigned as Probe 2 and Probe 3.

2 × OMP with 1 × OTS
This arrangement is suitable for a machine application that requires two different stylus configurations. For this configuration to be compatible, it is necessary that one of the OMPs has Probe 2 functionality. The 2 × OMP are assigned as Probe 1 and Probe 2 and the OTS is assigned as Probe 3.

3 × OTS
This arrangement is suitable for a pallet-loaded machine application with an OTS installed on each of three pallets, each communicating with an OMM-2 in the machine. The 3 × OTS are assigned as Probe 1, Probe 2 and Probe 3.

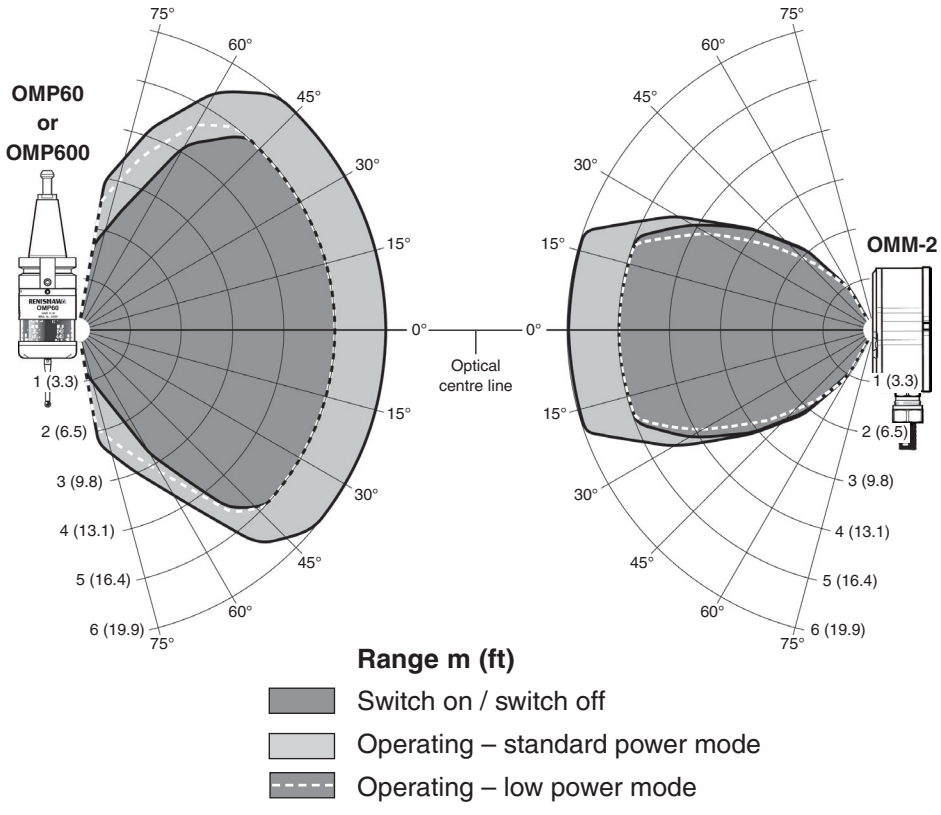


A typical OSI with OMM-2 system used in multiple probe mode

System performance with OMP60 or OMP600

The probe and OMM-2 may deviate from the optical centre line, provided opposing light cones always overlap, with transmitters and receivers in the other's field of view (eye-to-eye).

In multiple probe mode applications, OMP60 or OMP600 may be configured as Probe 1, Probe 2 or Probe 3.

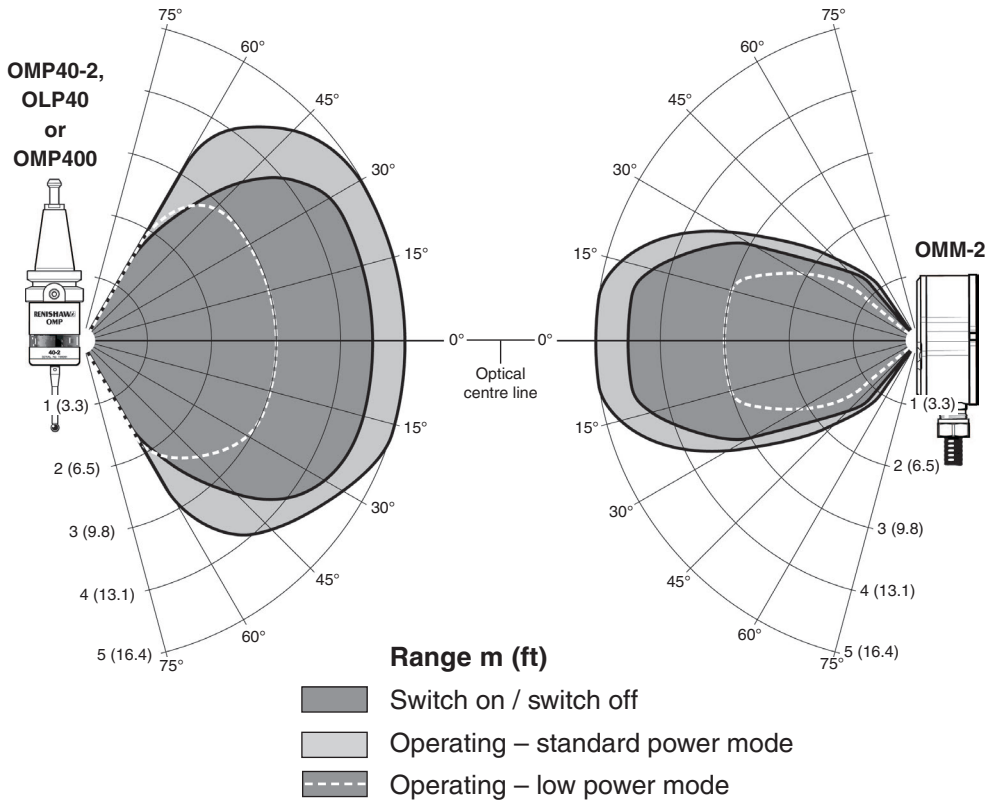


Typical plot at 20 °C (68 °F)
360° transmission around
probe axis in metres (feet)

System performance with OMP40-2, OLP40 or OMP400

The probe and OMM-2 may deviate from the optical centre line, provided opposing light cones always overlap, with transmitters and receivers in the other's field of view (eye-to-eye).

In multiple probe mode applications, OMP40-2 or OLP40 may be configured as Probe 1, Probe 2 or Probe 3. OMP400 may be configured as Probe 1 or Probe 2.



Typical plot at 20 °C (68 °F)
360° transmission around
probe axis in metres (feet)

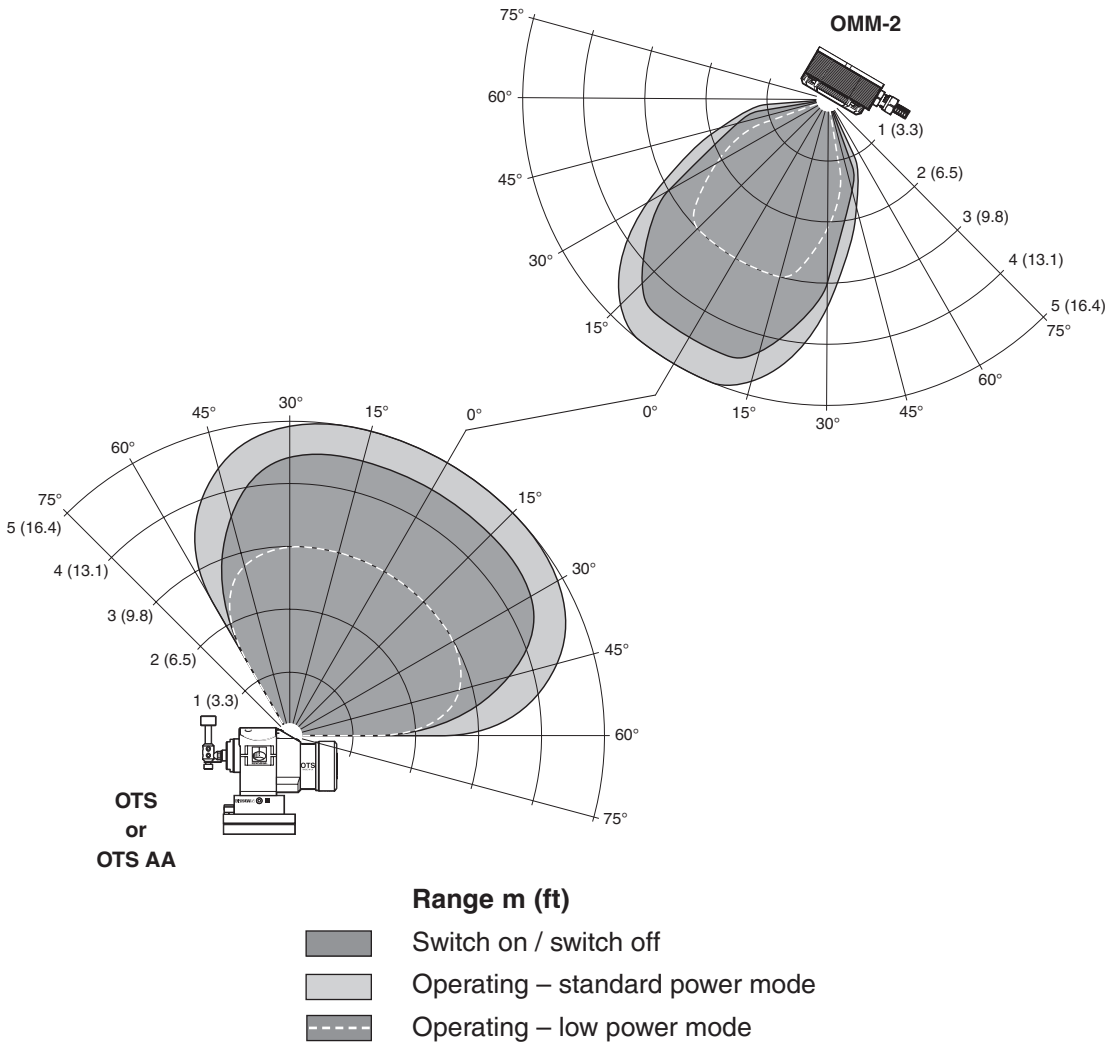
System performance with OTS or OTS AA

The probe system should be positioned so that the signal transmission is maintained when the OTS or OTS AA is positioned below the machine spindle.

The OTS or OTS AA and OMM-2 may deviate from the optical centre line, provided opposing light cones always overlap, with transmitters and receivers in the other's field of view (eye-to-eye).

In multiple probe mode applications, OTS or OTS AA may be configured as Probe 1, Probe 2 or Probe 3.

Typical plot at 20° C (68° F)
Transmission around probe axis
in metres (feet)



OSI inputs

There are three inputs:

- Probe 1 start
- Probe 2 start
- Probe 3 start

Switch SW2 can be configured to accept either a pulsed output or a level output from the machine controller.

Probe 1 start

Level	8 V to 30 V (4 mA @ 15 V, 7 mA @ 24 V) When the input is active, the probe is switched on.
Pulsed	8 V to 30 V (4 mA @ 15 V, 7 mA @ 24 V) The probe toggles between switched on and off. The minimum pulse width is 10 ms.

Probe 2 start and probe 3 start

Level	12 V to 30 V (10 mA @ 24 V) When the input is active, the probe is switched on.
Pulsed	12 V to 30 V (10 mA @ 24 V) The probe toggles between switched on and off. The minimum pulse width is 10 ms.

The OSI uses level and pulsed machine inputs to define the active probe. When the respective input is active, the probe is switched on.

If all inputs are simultaneously active, the system will default to error.

OSI outputs

There are four outputs:

- Probe status 1 (SSR)
- Probe status 2 (SSR)
- Error (SSR)
- Low battery (SSR)

All outputs can be inverted by using switch SW1, (see “Switch SW1 output configuration” on page 2.11).

Probe status 1, Probe status 2, Error, Low battery (SSR):

- ‘On’ resistance = 50 Ω max.
- Load voltage = 40 V max.
- Load current = 100 mA max.

Switching times (with 10 mA load)

- Open to closed = 100 µs max.
- Closed to open = 25 µs max.

Both probe status outputs indicate the status of the selected probe (only one probe can be selected at a time). They are both individually configurable.

The OMM-2 LEDs will start flashing red when an output overload has occurred. Probe status output will be triggered (SSR open). If this occurs, turn off the power supply and remove the source of the problem. Turning on the power supply will reset the OSI.

CAUTIONS:

Power supply voltage

Do not exceed 30 V between the following:

- the 0 V and the screen wire;
- the 12 V to 30 V supply wire and screen wire;
- the 12 V to 30 V supply wire and 0 V wires.

This could result in permanent damage to the OSI, OMM-2 and/or the power supply.

The use of in-line fuses at the machine cabinet end is recommended to provide protection for the OSI, OMM-2 and cable.

Screen connection

A good connection must be made to the machine ground (‘star point’).

Output

Ensure the output from the OSI does not exceed the specified current ratings.

OSI components

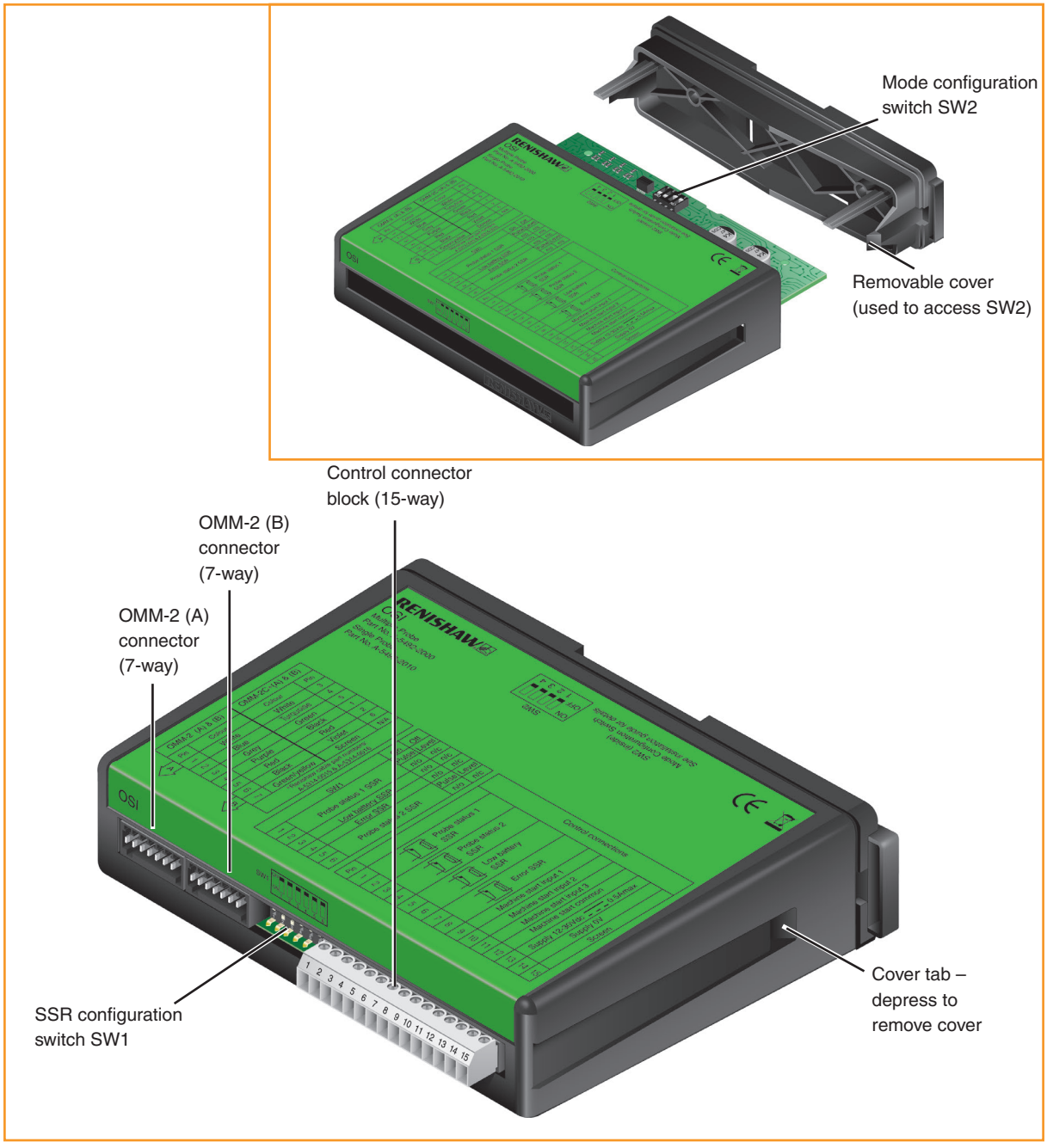
The following components are housed within the front face of the OSI (as shown in the figure below):

- OMM-2 (A) connector (7-way);
- OMM-2 (B) connector (7-way);
- Control connector block (15-way);
- SSR configuration switch SW1.

The following component is housed within the body of the OSI:

- Mode configuration switch SW2.

Both SW1 and SW2 only need to be accessed during installation.



OMM-2 (A) connector (7-way)

This is a seven-pin connector and is designed to connect to the Renishaw OMM-2.

OMM-2 (B) connector (7-way)

This is a seven-pin connector and is designed to connect to the Renishaw OMM-2.

Control connector block (15-way)

This is a 15-pin connector block and is designed to connect the OSI to the CNC machine control and appropriate power supply as follows:

Pins 1 and 2 are used to connect the ‘Probe status 1 SSR’ function.

Pins 3 and 4 are used to connect the ‘Probe status 2 SSR’ function.

Pins 5 and 6 are used to connect the ‘Low battery SSR’ function.

Pins 7 and 8 are used to connect the ‘Error SSR’ function.

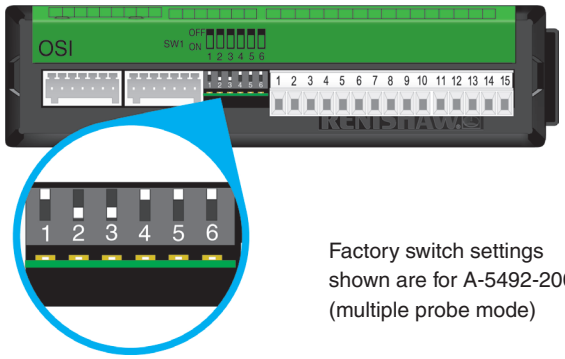
Pins 9 to 12 are used to supply a start signal to the probe:

- pin 9 is used to transmit a ‘Machine start input 1’ signal;
- pin 10 is used to transmit a ‘Machine start input 2’ signal;
- pin 11 is used to transmit a ‘Machine start input 3’ signal;
- pin 12 is used as ‘Machine start common’.

Pins 13 to 15 are used to supply power and screen earth to the interface.

Switch SW1 output configuration

Switch SW1 enables the user to configure the probe system SSR outputs.



Factory switch settings shown are for A-5492-2000 (multiple probe mode)

Pin	SW1	ON	OFF
1	Probe status 1 SSR	Pulse	Level
2		Normally open	Normally closed
3	Low battery SSR	Normally open	Normally closed
4	Error SSR	Normally open	Normally closed
5	Probe status 2 SSR	Pulse	Level
6		Normally open	Normally closed

CAUTION: Take electrostatic discharge (ESD) precautions when handling the PCB.

Switch SW2 output configuration

Switch SW2 enables the user to configure the OSI to be used in either single probe mode or multiple probe mode.

Factory switch settings shown are for A-5492-2000 (multiple probe mode)

Mode	Switch settings				
	POLE				Visual representation
	1	2	3	4	
Single probe mode, Auto Start off, pulsed machine M-code (factory setting for A-5492-2010).	ON	OFF	OFF	OFF	
Single probe mode, Auto Start off, level machine M-code.	ON	OFF	OFF	ON	
Single probe mode, Auto Start on.	ON	ON	OFF	OFF	
Multiple probe mode, two machine M-codes, short time delay of 10 ms.	OFF	ON	OFF	OFF	
Multiple probe mode, two machine M-codes, medium time delay of 50 ms.	OFF	ON	ON	OFF	
Multiple probe mode, two machine M-codes, long time delay of 100 ms.	OFF	ON	OFF	ON	
Multiple probe mode, three machine M-codes, level start (factory setting for A-5492-2000).	OFF	OFF	ON	ON	
Multiple probe mode, three machine M-codes, common start, pulsed machine output.	OFF	OFF	OFF	OFF	
Multiple probe mode, three machine M-codes, common start, level machine output.	OFF	OFF	OFF	ON	

OSI input mode configurations

Single probe mode

Single probe mode enables one Renishaw probe to be operated. The probe should be configured as Probe 1.

Single probe mode provides the option for Auto Start to be selected. With Auto Start on, the system will send a start signal once every second if the probe is off and does not require a CNC machine output.

Auto Start should only be used when no output from the machine controller is available. If Auto Start is selected, care should be taken to ensure system signals are not being received from probing systems on other machines.

If Auto Start is off, the interface will respond to an output from the machine controller. Switch SW2 can be configured to accept either a pulsed output or a level output.

In pulsed mode the interface will react to a pulse width of 10 ms minimum from a leading edge signal.

In level mode, the probe will be off when the level is low, and on when the level is high.

Multiple probe mode

Multiple probe mode enables two or three Renishaw probes to be operated. This can be achieved by using either two or three outputs from the machine controller.

If two machine outputs (for three probes) are used, a coded switch-on technique is used to switch on / switch off the selected probe. When using this technique, it is necessary for the two machine outputs to be sent in short succession by the controller. To allow for a delay between the machine outputs, three user-selectable options are provided:

- a short time delay of 10 ms;
- a medium time delay of 50 ms;
- a long time delay of 100 ms.

If three machine outputs are used, the following start configurations are available which provide flexibility for interface integration.

Dedicated start (level mode)

In dedicated start, a machine start input is required per probe that is configured for optical switch-on.

Machine start inputs			Probe selected
P1	P2	P3	
			None
✱			Probe 1 on
	✱		Probe 2 on
		✱	Probe 3 on

✱ Machine start input active. Any attempt to switch on more than one probe simultaneously will result in an error condition.

Common start (level mode)

In common start (level mode), machine start inputs P2 and P3 are used to select the probe, and machine start input P1 is used to start the selected probe. All inputs are level.

Machine start inputs P1, P2 and P3			Probe selected
Probe start	Probe selection inputs		
P1	P2	P3	
✱			Probe 1
✱	✱		Probe 2
✱		✱	Probe 3

✱ Machine start input active.
When P1 is off, all probes are off.
When P1 is active, the selected probe will be on.

NOTE: Any change to the probe selection inputs P2 and P3 whilst the probe is operating will result in an error condition.

Common start (pulsed mode)

In common start (pulsed mode), machine start inputs P2 and P3 are level inputs used to select the probe. Machine start input P1 is a pulsed input used to start the selected probe.

Machine start inputs P1, P2 and P3			Probe selected
Probe start	Probe selection inputs⇳		
P1	P2⇳	P3⇳	
⎍			Probe 1
⎍	✱		Probe 2
⎍		✱	Probe 3

⎍ Machine start input pulsed, so the selected probe will change state.

⇳ Probe selection inputs are level signals.

✱ Machine start input active.

NOTES:

OMP600, OMP60, OMP40-2, OLP40 or OTS can be configured as Probe 1, Probe 2 or Probe 3. OMP400 can be configured as Probe 1 or Probe 2.

For more information, see your probe installation guide or contact your local Renishaw office.

Switch-on / switch-off method

Single probe mode

In pulsed or level mode, the following switch-on / switch-off methods may be used.

- Optical on / optical off

- Optical on / time off
- Spin on / spin off
- Spin on / timer off
- Shank switch on / shank switch off

For Auto Start, only the following switch-on / switch-off method may be used.

- Optical on / time off.

Multiple probe mode

In multiple probe mode, only the following switch-on / switch-off method may be used.

- Optical on / optical off.

Start-up times

For information on probe start-up times, see “Multiple probe mode timing diagrams” on page 2.16.

The switch-off time is 0 seconds.

When changing from one selected probe to another, allow 1 second between the cancelling of one machine start input (machine output) and the raising of the other start input.

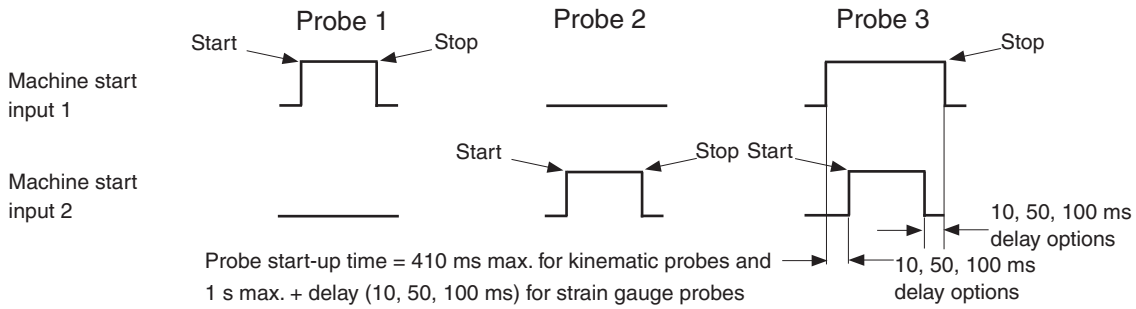
Synchronisation recovery

Under abnormal operating situations, when used in multiple probe mode, the system may lose synchronisation between the receiver and the probes. An internal synchronisation recovery will be initiated when the next machine input is received.

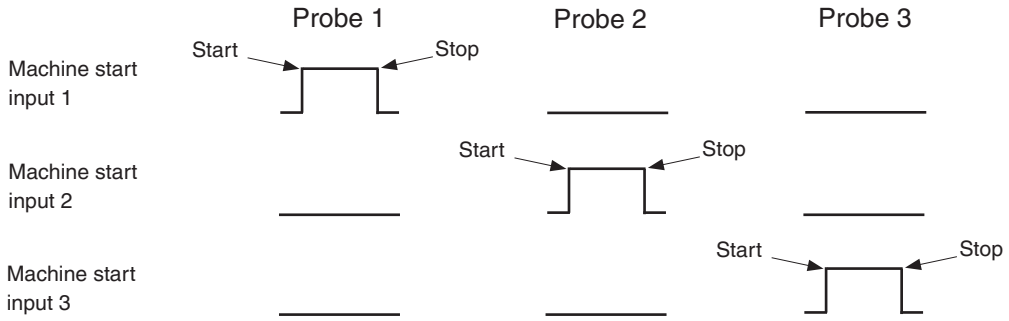
The maximum time for system recovery from an abnormal operating situation is 7.5 seconds. Such a time delay could cause a machine alarm if controllers require ready signals within a time of less than 5.5 seconds.

Multiple probe mode timing diagrams

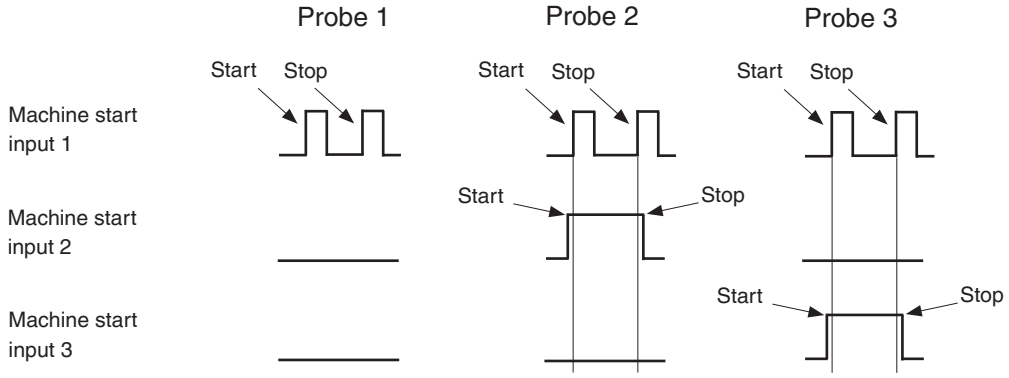
Two machine outputs (for three probes)



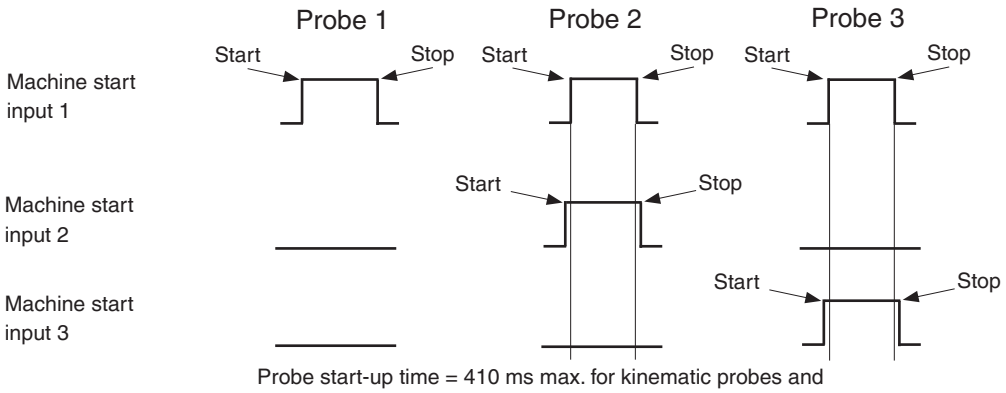
Three machine outputs (dedicated start)



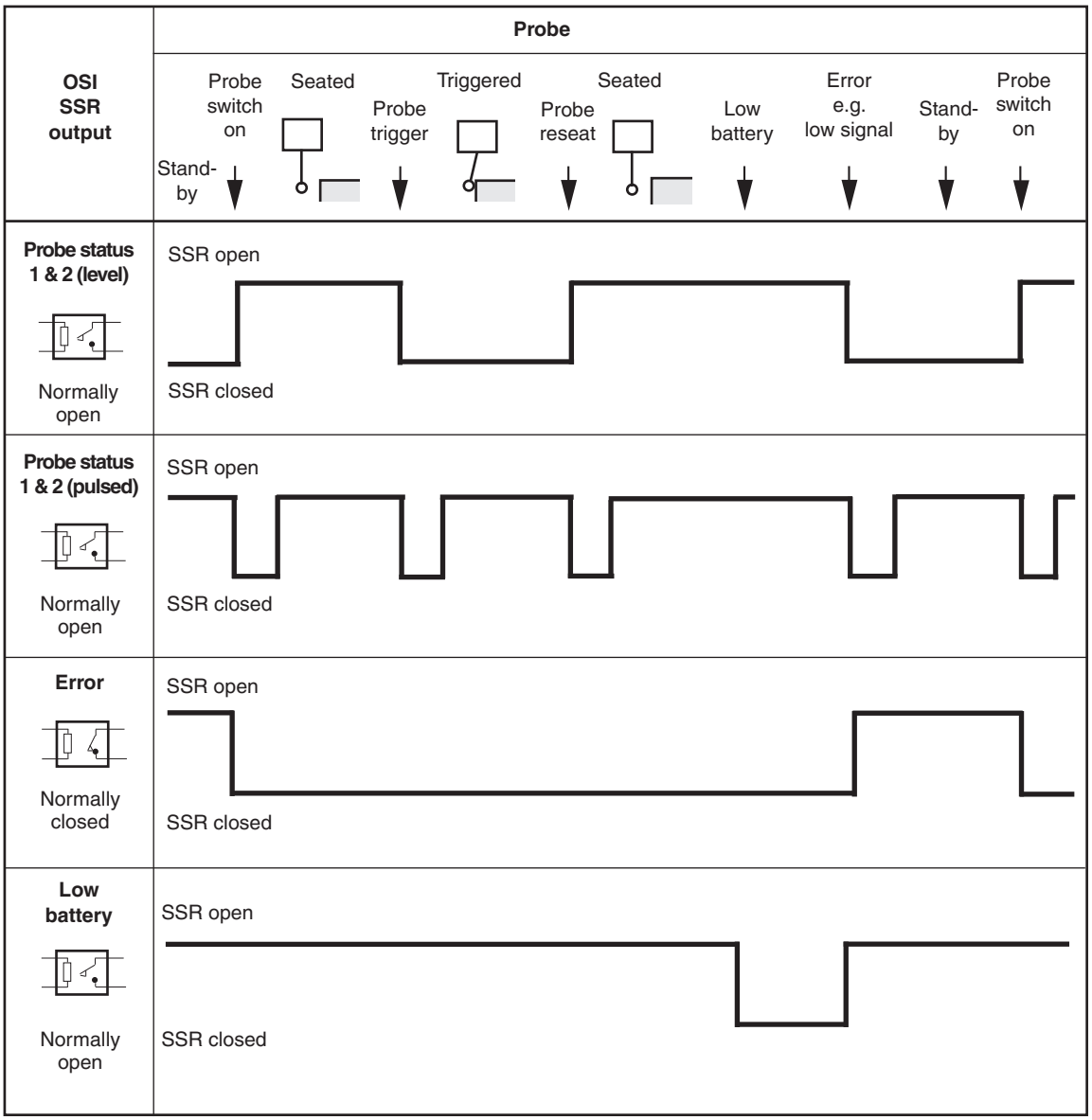
Three machine outputs (common start / pulsed mode)



Three machine outputs (common start / level mode)



OSI output waveforms

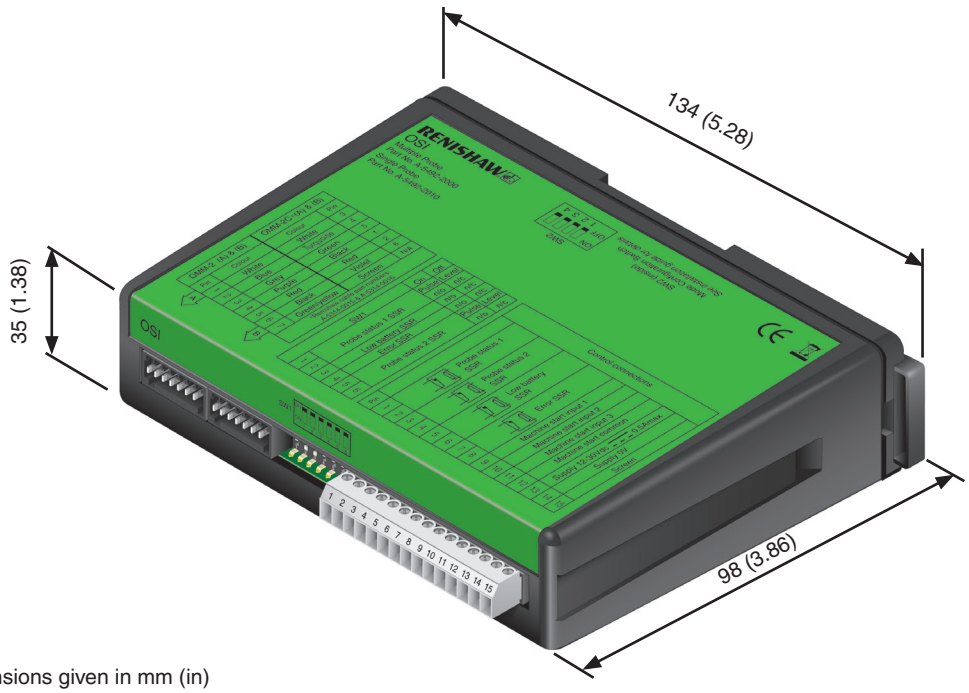


Signal delays

Transmission delay From probe trigger to output change of state = 2.5 ms max.

NOTE: Pulsed outputs are 40 ms ±1 ms duration

OSI dimensions



Dimensions given in mm (in)

OSI specification

Principal application	The OSI processes signals from RENGAGE™ or standard probes via single or tandem OMM-2s and converts them into machine outputs, which are then transmitted to the CNC controller. The system allows up to three probes to be used with one interface.	
Transmission type	Infrared optical transmission (modulated)	
Probes per system	Up to three	
Supply voltage	12 Vdc to 30 Vdc	
Supply current	200 mA max. @ 24 V with tandem OMM-2	
Configurable M-code input	Pulsed or level	
Output signals	**Probe Status 1, Probe Status 2, Low Battery, Error** Voltage-free solid-state relay (SSR) outputs, configurable as normally open or normally closed.	
Input/output protection	Supply protected by a 1.1 A resettable fuse. Outputs protected by overcurrent protection circuit.	
Environment (as defined in BS EN IEC 61010-1:2010)	IP rating	IP20, BS EN 60529:1992+A2:2013
	Storage temperature	–10 °C to +70 °C (+14 °F to +158 °F)
	Operating temperature	+5 °C to +55 °C (+41 °F to +131 °F)

Maintenance

No routine maintenance is required. Remove dust from external surfaces with a dry cloth.

CAUTIONS:

Power supply voltage

Do not exceed 30 V between the following:

- the black wire and the screen wire (green/yellow);
- the red wire and screen wire (green/yellow);
- the red and black wires (power supply).

This could result in permanent damage to the OSI and/or the customer power supply.

The use of in-line fuses at the machine cabinet is recommended to provide protection for the OSI and cable.

Screen connection

A good connection should be made to the machine ground (‘star point’).

Output

Ensure that outputs from the OSI do not exceed specified current ratings.

OMM-2 components

The OMM-2 is an optical receiver that transmits control signals to the probe and receives probe data signals for onward transmission to the OSI and CNC controller.

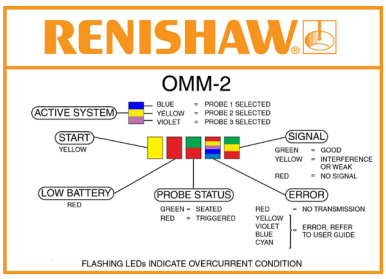
The OMM-2, when connected to the OSI, operates using 'modulated' transmission and is compatible with all machine probes operating in 'modulated' mode.

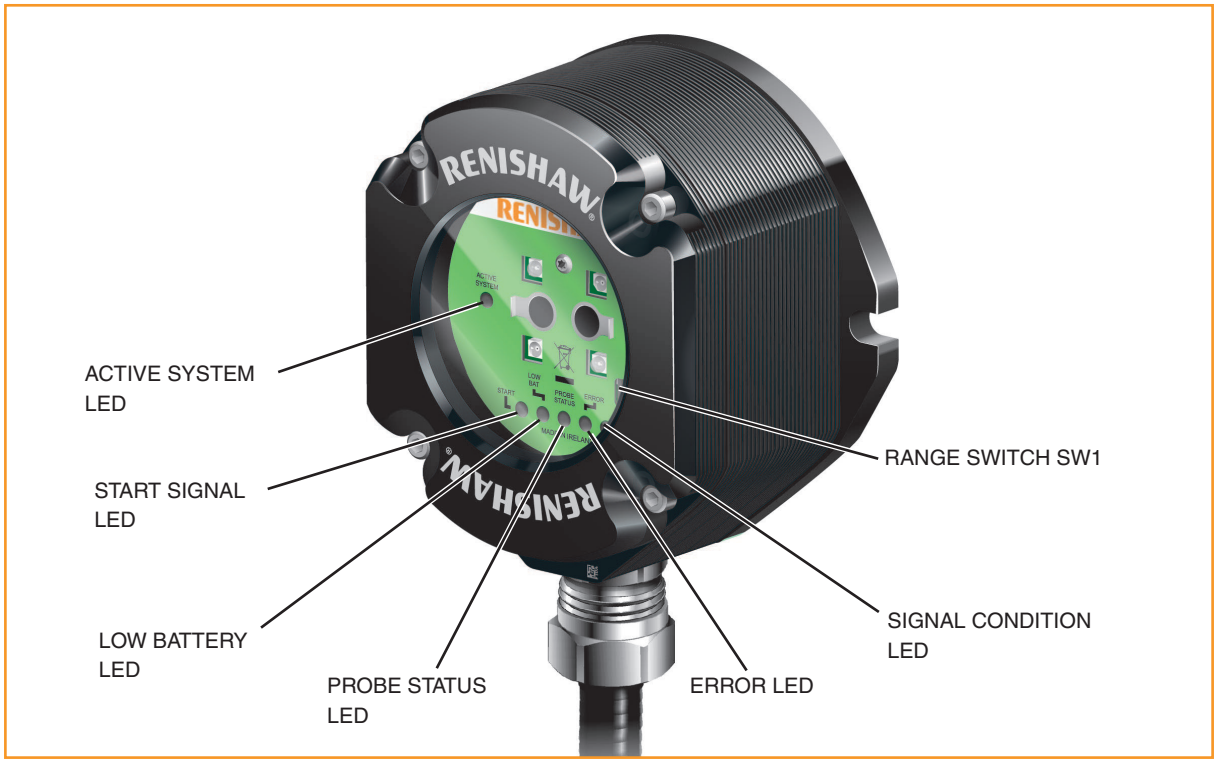
The following components are housed within the front window of the OMM-2 (as shown in the figure below):

- START SIGNAL LED;
- LOW BATTERY LED;
- PROBE STATUS LED;
- ERROR LED;
- SIGNAL CONDITION LED;
- ACTIVE SYSTEM LED;
- RANGE SWITCH SW1.

Magnetic label

A summary of OMM-2 LED activity is provided on a magnetic label. The label may be placed on any machine flat metal surface.





START SIGNAL LED (yellow)

This LED will flash once when a machine controller start signal is commanded.

LOW BATTERY LED (red)

This LED is lit when the activated probe battery voltage falls below a set level. It is recommended that the probe battery is replaced as soon as is practicable after the LED is lit.

PROBE STATUS LED (green, red)

This bi-colour LED is lit when the OMM-2 is powered.

Green – Probe is seated.

Red – Probe is in standby, or triggered, or an error has occurred.

The change of colour of this LED will coincide with the OSI probe status output changing state.

ERROR LED (red, blue, yellow, violet, cyan)

This multicolour LED indicates a transmission error condition, such as optical beam obstructed / probe out of optical range / probe switched off (standby) / battery dead.

Red – Signal from probe has either failed or stopped.

Blue – A second modulated signal has been received.

Yellow – Interference or a weak probe signal has been received.

Violet – Interference or a weak probe signal has caused the trigger instant to be delayed.

Cyan – Invalid start signal.

NOTE: In single probe mode, the blue, yellow or violet error condition resulting from the loss of a good probe signal will persist until the machine start is activated or 1 hour has elapsed. In multiple probe mode the indication will persist until the active system input (Probe 1, Probe 2 or Probe 3) is deactivated.

SIGNAL CONDITION LED (red, yellow, green)

This tri-colour LED is lit when the OMM-2 is powered and indicates as follows.

Red – There is no signal from the probe.

Yellow – Signal received from the probe is too weak or interference is present.

Green – The condition of the signal received from the probe is good.

ACTIVE SYSTEM LED (blue, yellow, violet)

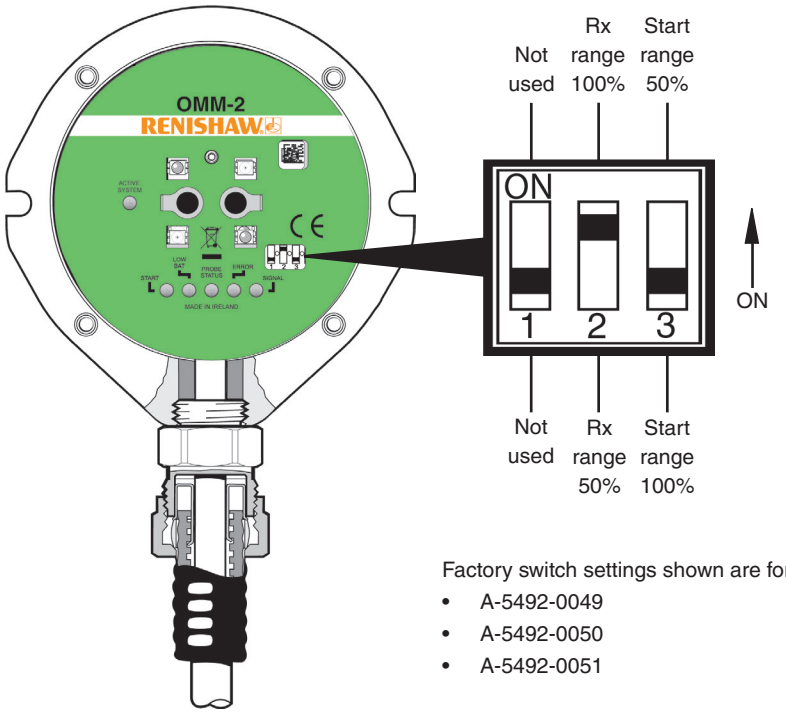
In single probe mode the LED will be constantly lit blue to show that the input is active.

In multiple probe mode the LED will be constantly lit blue to denote Probe 1 is active, yellow to denote Probe 2 is active or violet to denote Probe 3 is active.

If any ambiguous start information is received, the ACTIVE SYSTEM LED will flash repeatedly (blue – yellow – violet – cyan) in sequence until the start input is cleared.

Range switch (SW1)

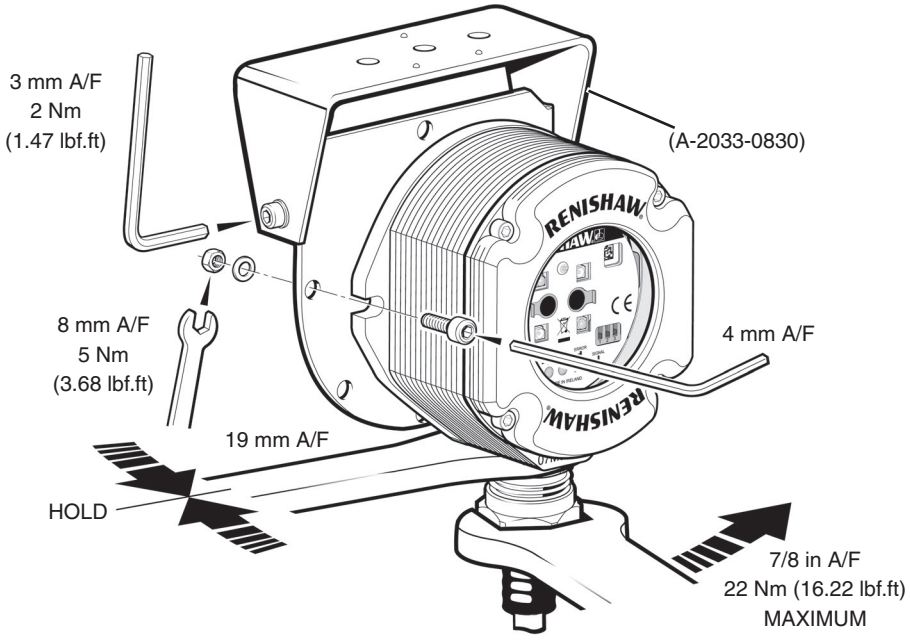
Switch SW1 is user-configurable and can be accessed by removing the window from the front of the OMM-2 (see “Removing the OMM-2 window” on page 4.2).



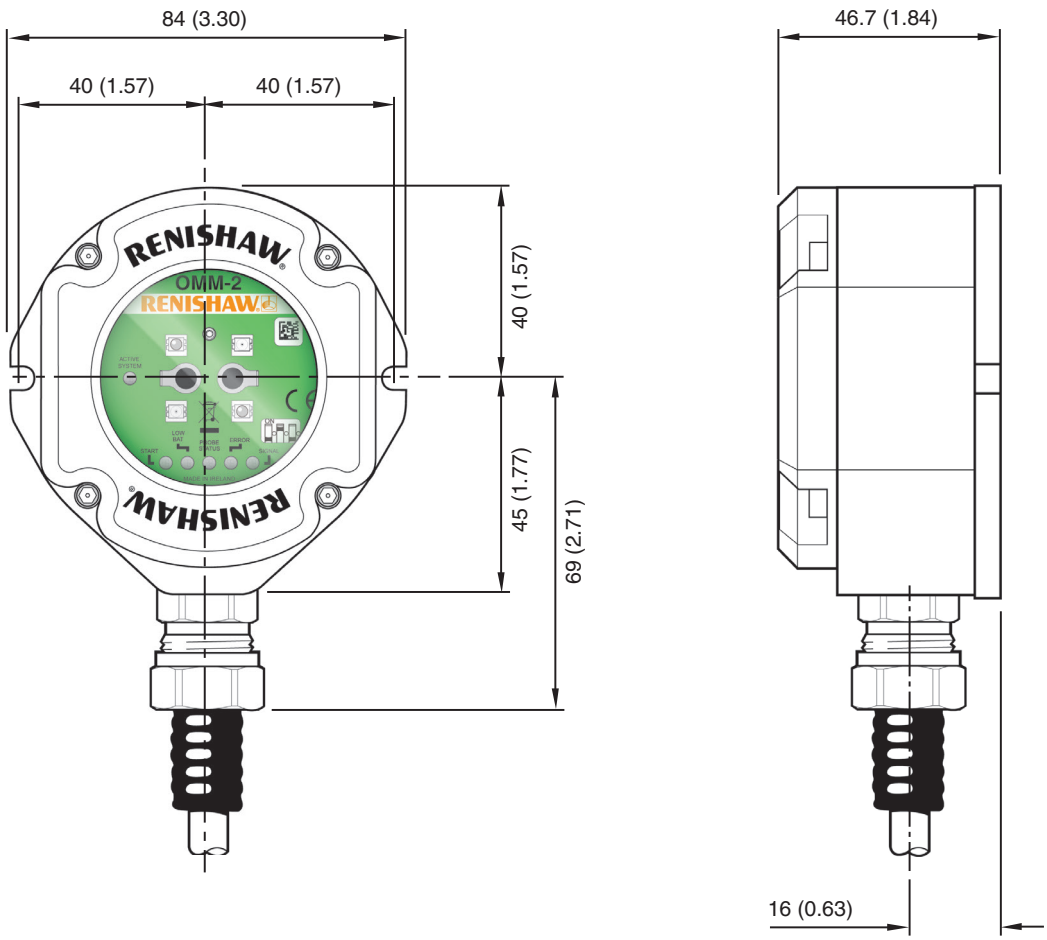
Factory switch settings shown are for:

- A-5492-0049
- A-5492-0050
- A-5492-0051

OMM-2 screw torque values



OMM-2 dimensions



Dimensions given in mm (in)

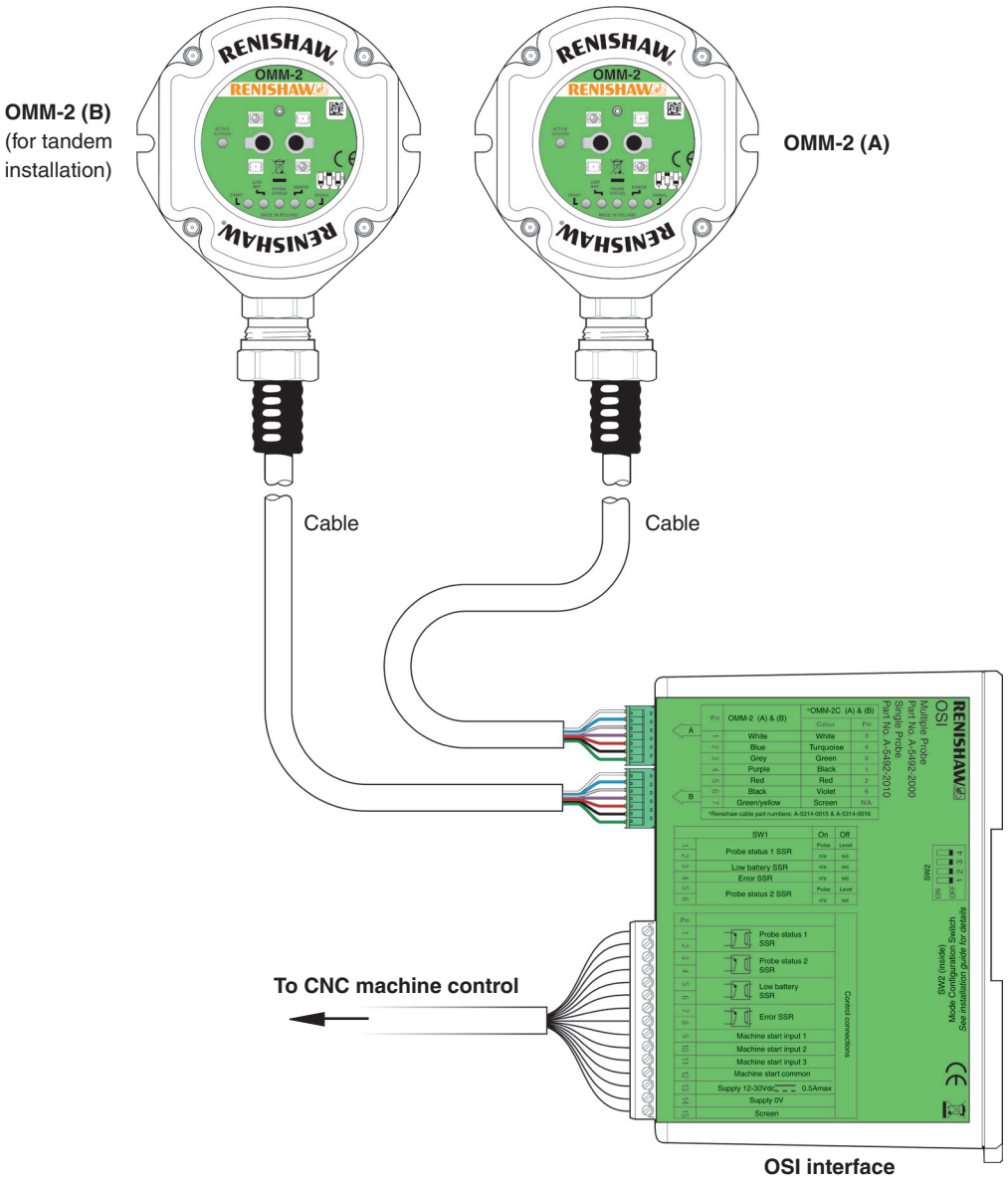
OMM-2 specification

Principal application	The OMM-2 transmits control signals to the probe and receives probe data signals for onward transmission to the OSI and CNC control.	
Transmission type	Infrared optical transmission (modulated)	
Probes per system	Up to three	
Operating range	Up to 6 m (19.7 ft)	
Weight	OMM-2 including 8 m (26 ft) of cable	700 g (25 oz)
	OMM-2 including 15 m (49 ft) of cable	1000 g (35 oz)
	OMM-2 including 25 m (82 ft) of cable	1500 g (53 oz)
Cable	The OMM-2 standard cables are 8 m (26 ft), 15 m (49 ft) and 25 m (82 ft) long. Cable specification: Ø5.8 mm (0.23 in), 6-core screened cable, each core 18 × 0.1 mm	
Mounting	A mounting bracket is available allowing directional setting.	
Diagnostic LEDs	Start, low battery, probe status, error, active system and signal condition.	
Environment	IP rating	IPX8, BS EN 60529:1992+A2:2013
	IK rating	IK03, BS EN 62262:2002+A1:2021 (for glass window)
	Storage temperature	–25 °C to +75 °C (–13 °F to +167 °F)
	Operating temperature	+5 °C to +55 °C (+41 °F to +131 °F)

System installation

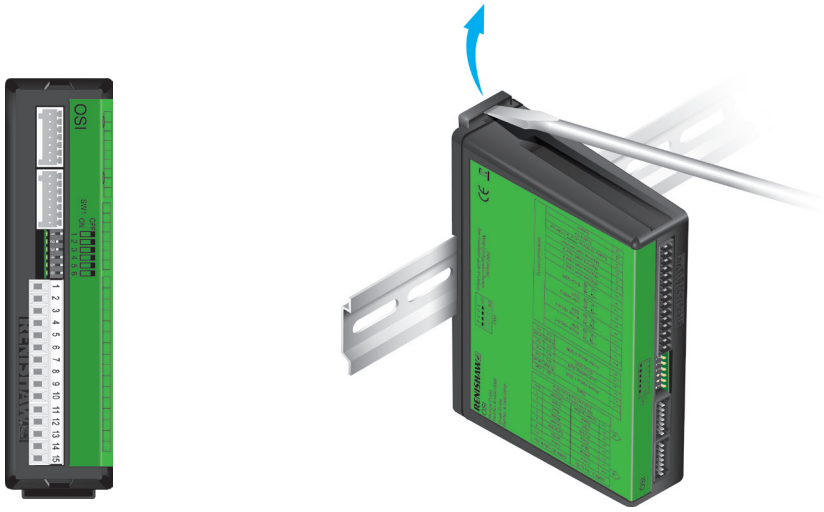
Installing the OSI

Typical OSI installation

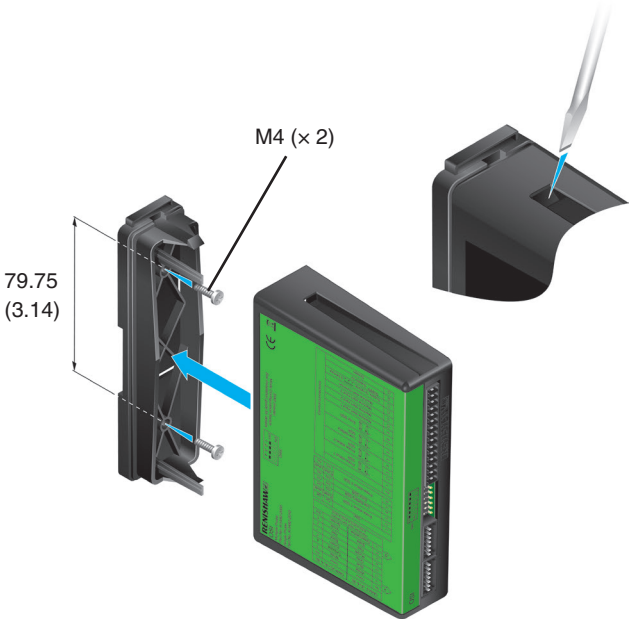


Mounting the OSI to a DIN rail

NOTE: Lift spring end plate to attach OSI to DIN rail.



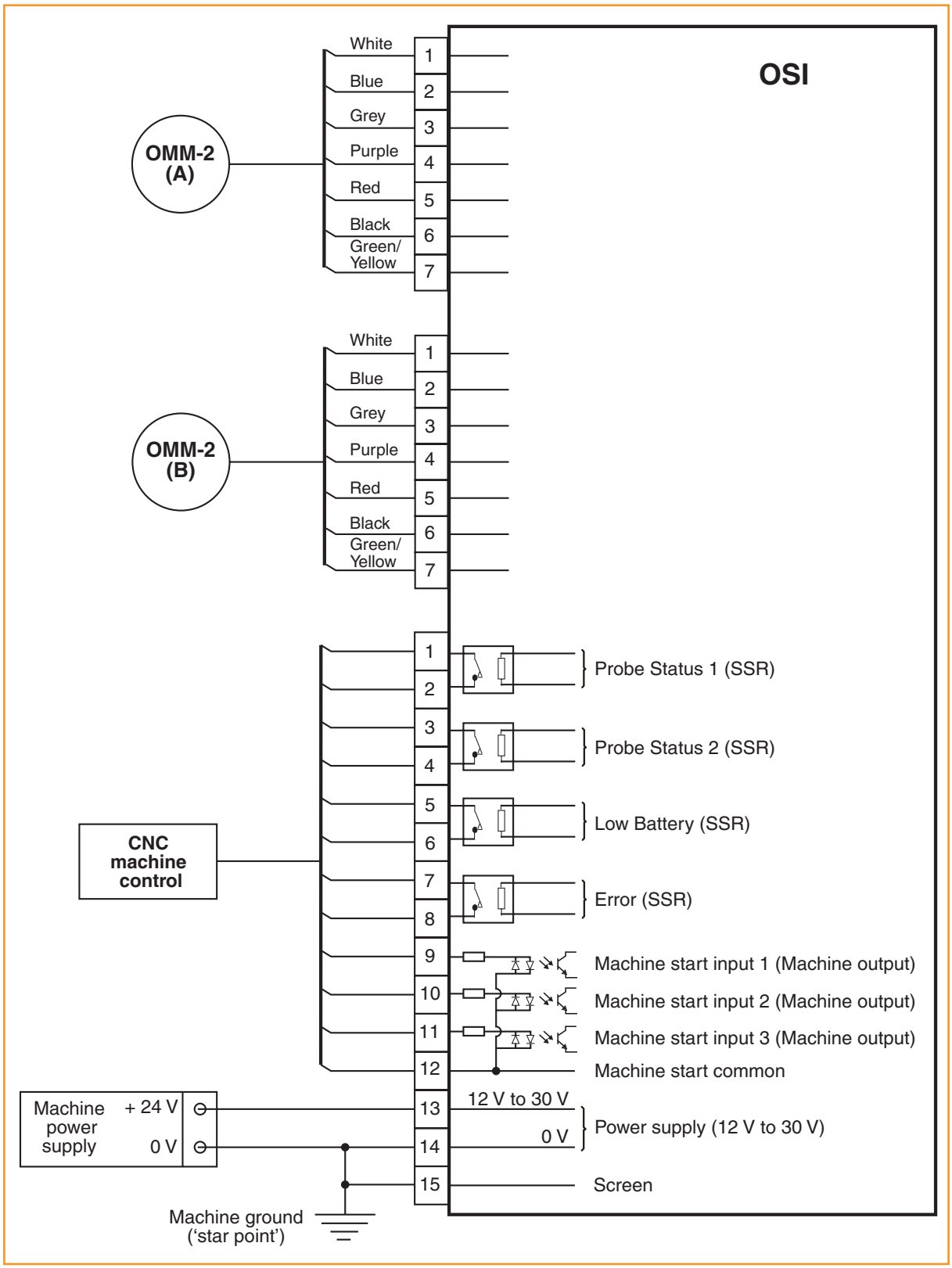
Standard DIN rail mounting



Alternative mounting

Dimensions given in mm (in)

Wiring diagram (with output groupings shown)



CAUTIONS:

The power supply 0 V should be terminated at the machine ground ('star point'). If a negative supply is used, then the negative output must be fused.

The dc supply to this equipment must be derived from a source which is approved to BS EN IEC 62368-1.

Installing the OMM-2

OMM-2 application

A single or tandem OMM-2 configuration can be connected to the OSI. Each OMM-2 is connected to the OSI by a 7-way connector block. When a tandem OMM-2 configuration is used, there will be a simultaneous indication of system status on both receivers.

Tandem OMM-2 can be used to extend the range of the probe. This may simply be required for large machines or to overcome line-of-sight issues caused by the machine or workpiece. When installing tandem OMM-2, they must be located in the machine in positions where the operating envelopes of each OMM-2 overlap. This is to ensure that there is no loss of communication with the probe as it passes out of range from one receiver and into the range of the other. Alternatively, tandem OMM-2 may be used in applications with a partitioned machining environment where an OMM-2 is located in each area. In this instance the operating envelopes do not need to overlap.

Power supply

Power for the OMM-2 is supplied from the OSI.

OMM-2 cable

Cable termination

If the cable is shortened, suitable ferrules should be crimped onto each cable wire for a more positive connection at the terminal box.

Standard cable variants

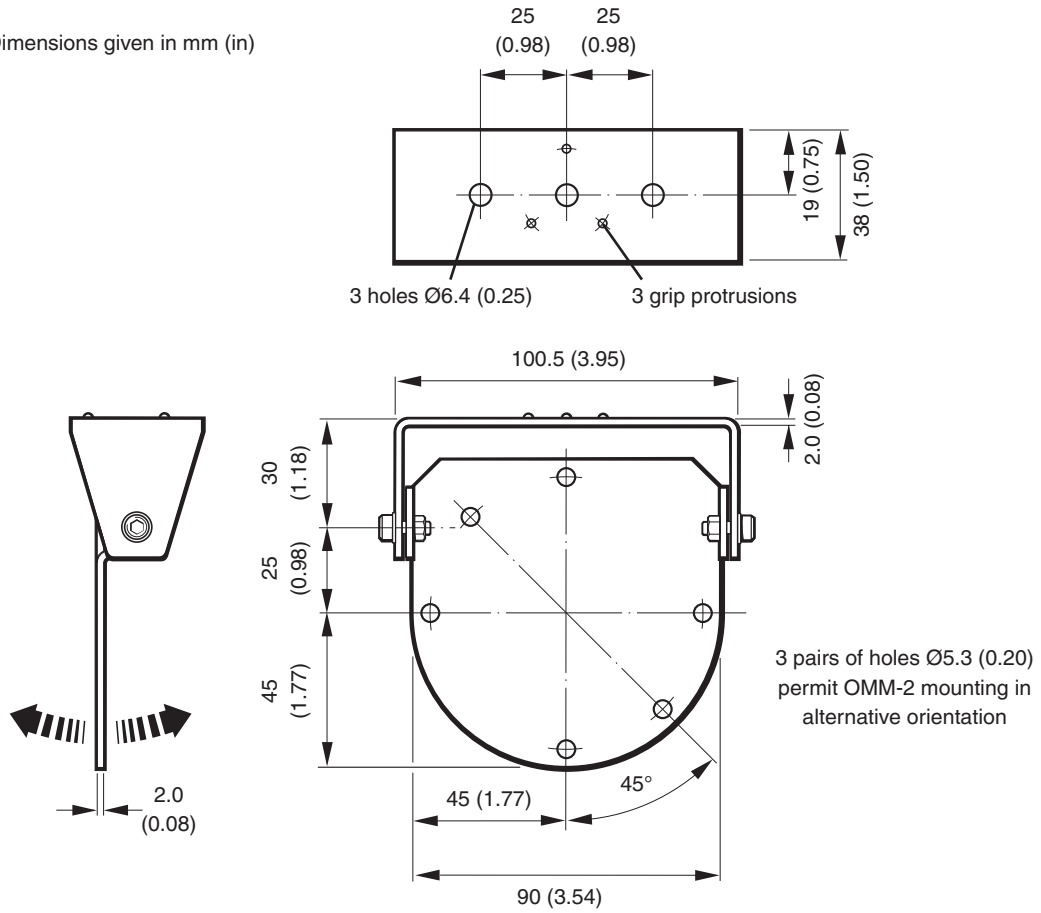
The OMM-2 standard polyurethane cables are supplied in 8 m (26 ft), 15 m (49 ft) and 25 m (82 ft) lengths. Please contact Renishaw for other cable lengths if required. However, please note that the maximum permissible length of cable that can be used is 50 m (164 ft).

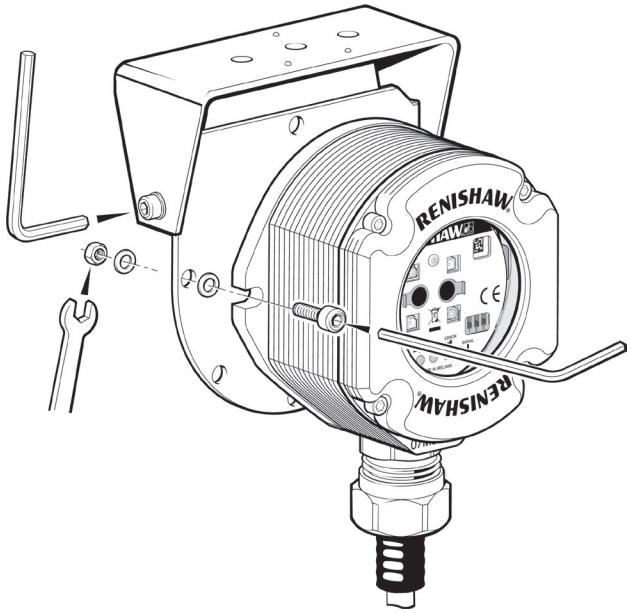
Cable specification

Ø5.8 mm (0.23 in) 6 core, screened cable, each core consisting of 18 × 0.1 mm wires.

Installing the OMM-2 to the mounting bracket (optional)

Dimensions given in mm (in)





NOTE: Install OMM-2 with cable exiting from lower side for good coolant run-off.

Cable sealing

Coolant and dirt are prevented from entering the OMM-2 by the cable sealing gland. The OMM-2 cable can be protected against physical damage by fitting flexible conduit if required.

Recommended flexible conduit is Anamet™ Sealtite HFX (5/16 in) polyurethane. A conduit kit is available (see section 6, “Parts list”).

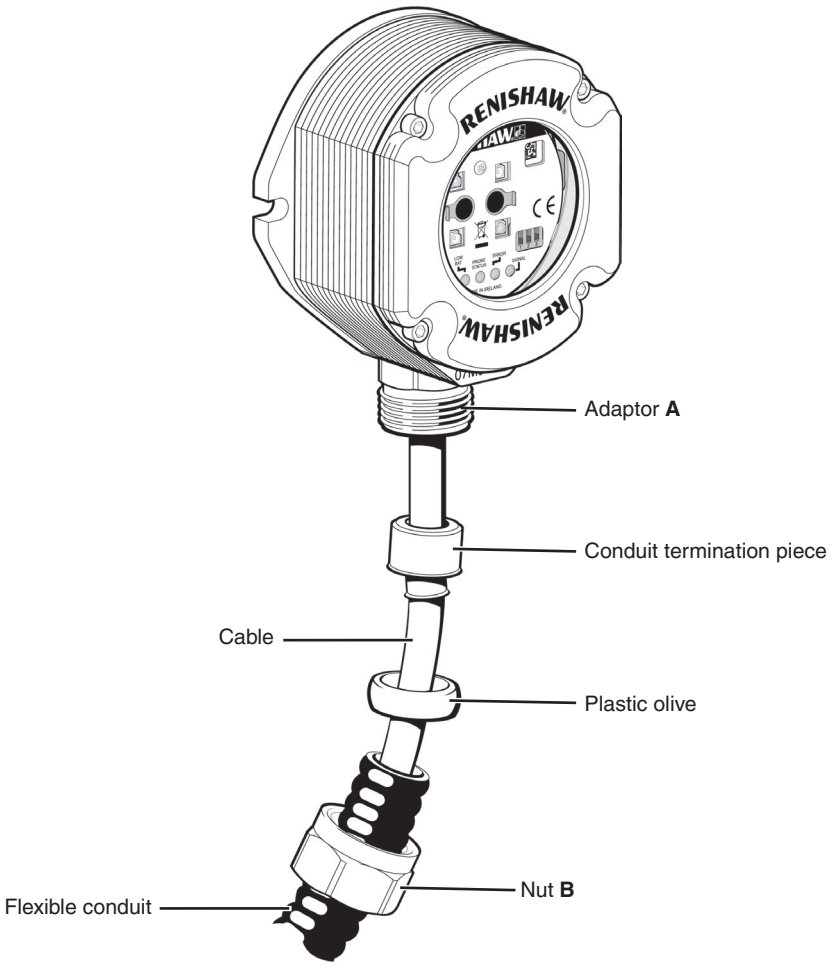
CAUTION: Failure to adequately protect the cable can result in system failure due to either cable damage or coolant ingress through the cable cores into the OMM-2. Failure of the product due to inadequate cable protection will invalidate the warranty.

Fitting flexible conduit

CAUTION: When tightening or loosening nut **B** onto the conduit, ensure that torque is only applied between **A** and **B**.

NOTE: Conduit bulkhead fittings require a clearance hole for a M16 thread.

1. Slide nut **B** and plastic olive onto the conduit.
2. Screw conduit termination piece into the end of the conduit.
3. Fit the conduit to adaptor **A** and tighten nut **B** to 22.00 Nm (16.22 lbf.ft).



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 interface

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

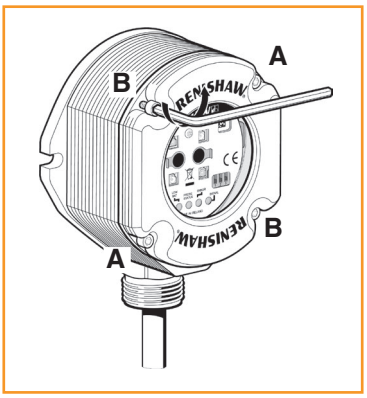
CAUTION: The OMM-2 has a glass window, handle with care if broken to avoid injury.

Removing the OMM-2 window

It is not necessary to remove the OMM-2 from the machine when adjusting the range switch SW1 or installing replacement parts.

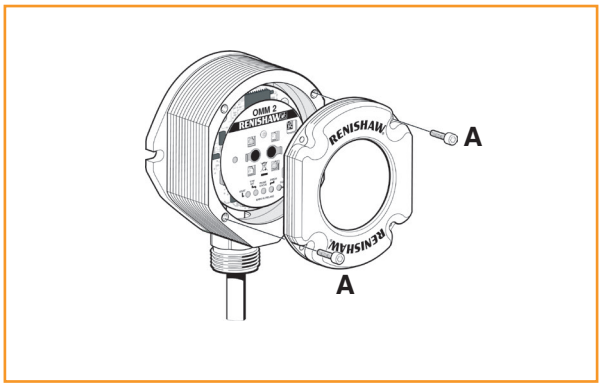
The window may be removed and replaced as described below to change the switch settings.

To remove the OMM-2 window



CAUTION: DO NOT remove the window by twisting or rotating.

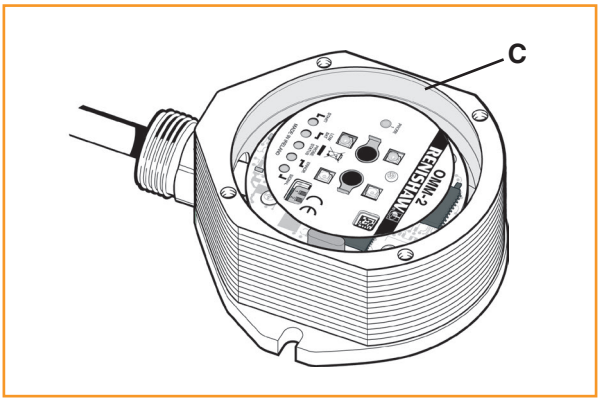
1. Clean the OMM-2 to ensure no debris enters the unit.
2. Remove the four cover screws, using a 2.5 mm A/F hexagon key. Two screws are short and two are long. Two of the cover holes are threaded **A**, and two are plain **B**.
3. The window fits tightly on the OMM-2 body, and is removed using the two long screws, which are inserted into the threaded holes **A**.



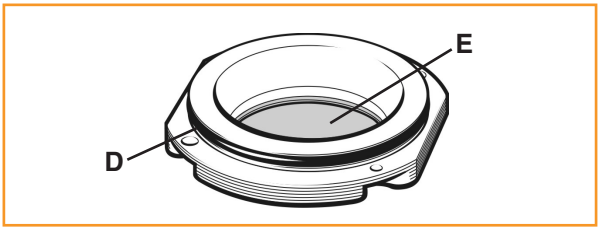
Tighten each screw a few turns at a time to pull the window up evenly. When it is clear of the body, remove the window and screws completely.

Fitting the OMM-2 window

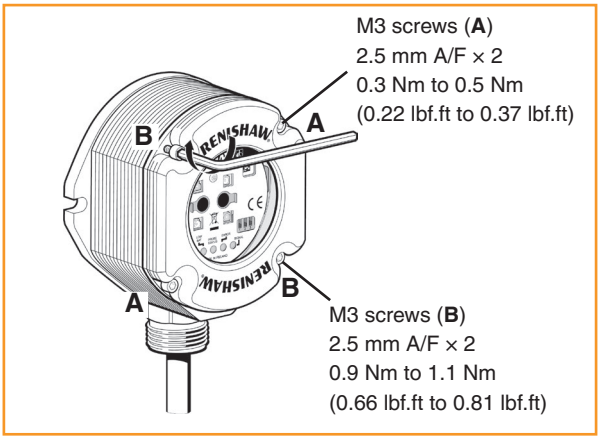
1. Before fitting the window, check for any damage to screws or scratch marks which could prevent sealing.
2. Ensure the O-ring seating **C** in the OMM-2 body is clean.
3. Ensure that the O-ring **D** and window **E** are clean.



4. Insert the two short screws into window holes **A** and tighten.



5. Place the window, complete with the O-ring, onto the OMM-2 body.



NOTE: The O-ring should be lightly lubricated with grease.

6. Insert the long screws into holes **B** and tighten each screw a few turns at a time to pull the window down evenly. There may be some resistance due to some compression of air trapped inside the body.

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Fault-finding

Symptom	Cause	Action
Probe fails to switch on or switch off.	Installation / CNC program fault.	Correct the M-code and/or wiring from machine to OSI and from OSI to OMM-2 and/or CNC program.
	OMM-2 ERROR LED is lit and cyan due to ambiguous start information being received.	Correct the M-codes in the CNC program when more than one is used. To reset the error, deactivate all active machine start inputs. Select 50 ms or 100 ms delay.
	The probe is out of start range.	Change the CNC program to bring the probe within the start range of the receiver.
	The transmission beam is obstructed.	Clean the receiver window and remove any obstructions.
	Incompatible probe / probe transmission setting.	Ensure the probe switch-on / switch-off method is set to optical on / optical off. Change the probe or probe setting to modulated with the appropriate start code.
	Incorrect Machine Start setting.	Reconfigure the Machine Start setting switch SW2.
	Dead probe batteries.	Replace the probe batteries.
	Optical interference is blocking the start signal.	Remove the source of interference and ensure that interfering light does not shine onto the receiver window or probe window.

Symptom	Cause	Action
Probe 2 or Probe 3 fails to switch on.	OSI in single probe mode.	Change OSI to multiple probe mode.
	A time delay exists between machine inputs from the controller.	Increase selected time delay.
The probe stops in mid-cycle. **or** **An unexpected error occurs during a probing cycle.** **or** **An unexpected trigger occurs during the probing cycle.**	The transmission beam is obstructed.	Remove the obstruction.
	Optical interference.	Remove the source of interference and ensure that interfering light does not shine into the receiver window.
	Intermittent wiring fault.	Correct the wiring.
	The probe has moved outside the reception range.	Change the CNC program to bring the probe within the reception range of the receiver.
	The probe has not been triggered for more than 90 minutes.	Restart the probe and ensure that the probe is not idle for 90 minutes.
The probe switches on, but the OMM-2 ERROR LED is lit red, blue, yellow or violet.	Interfering light source is shining directly into the receiver window.	Remove the source of interference and ensure that the interfering light does not shine into the receiver window.
	The probe has moved outside the reception range.	Change the CNC program to bring the probe within the reception range of the receiver.
	A signal is being received from a probe on an adjacent machine tool.	Change the adjacent probe to low power mode.
	Installation / CNC program fault.	Check wiring and CNC program.

Symptom	Cause	Action
The probe indicates low battery condition, but the machine controller does not.	Installation / CNC program fault. Machine may not have the facility integrated.	Correct low battery SSR wiring and/or CNC program.
The machine controller does not respond to the probe being triggered or seated.	Probe is not switched on.	Attempt to switch it on.
	Probe is out of range.	Change the CNC program to bring the probe within reception range.
	Installation / CNC program fault.	Correct the M-code and/or wiring from machine to OSI and from OSI to OMM-2 and/or CNC program.
	A signal is being received from a probe on an adjacent machine tool.	Change the adjacent probe to low power mode.
Probe triggers but the OMM-2 does not respond.	The OMP400 or OMP600 has the 3 second switch-on delay selected.	Reconfigure the OMP400 or OMP600 to the standard switch-on delay.
	The probe is out of range.	Review the performance envelopes.
	The transmission beam is obstructed.	Check that the probe and receiver windows are clean, and remove any obstruction.
	The probe is set to legacy transmission.	Reconfigure to modulated transmission.

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Parts list

Item	Part number	Description
OSI interface	A-5492-2000	OSI (multiple probe mode) with DIN rail mounting, terminal block and product support card.
OSI interface	A-5492-2010	OSI (single probe mode) with DIN rail mounting, terminal block and product support card.
OMM-2	A-5492-0049	OMM-2 with 8 m (26 ft) cable, tools and product support card.
OMM-2	A-5492-0050	OMM-2 with 15 m (49 ft) cable, tools and product support card.
OMM-2	A-5492-0051	OMM-2 with 25 m (82 ft) cable, tools and product support card.
Mounting bracket	A-2033-0830	Mounting bracket.
Conduit	A-4113-0306	Conduit kit with 1 m (3.28 ft) of polyurethane conduit and bulkhead connector (M16 thread).
Window replacement	A-5191-0019	Window replacement kit comprising: window assembly with O-ring, 2 × stainless steel M3 × 14 mm long screws, 2 × stainless steel M3 × 5 mm long screws and 2.5 mm hexagon wrench.
Tools	A-5191-0300	Tool kit comprising: 2.5 mm hexagon wrench, 4 mm hexagon wrench, 14 × ferrules, 2 × M5 screws, 2 × M5 washers and 2 × M5 nuts.
OSI terminal block (15-way)	P-CN25-0009	15-way socket terminal for OSI.
OMM-2 terminal block (7-way)	P-CA79-0021	7-way socket terminal for OMM-2.

Item	Part number	Description
Publications. These can be downloaded from our website at **www.renishaw.com**.		
OSI with OMM-2C	H-5991-8504	Installation guide: for the set up of the OSI with OMM-2C.
OMP40-2	H-4071-8504	Installation guide: for the set up of the OMP40-2.
OLP40	H-5625-8504	Installation guide: for the set up of the OLP40.
OMP400	H-5069-8504	Installation guide: for the set up of the OMP400.
OMP60	H-4038-8505	Installation guide: for the set up of the OMP60.
OMP600	H-5180-8504	Installation guide: for the set up of the OMP600.
OTS	H-5401-8504	Installation guide: for the set up of the OTS.

NOTE: The serial number of each OMM-2 unit is found at the bottom of the housing.

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