

OSI-S interface and OMM-S receiver



Compliance information for these products is available by scanning the QR code or visiting www.renishaw.com/mtpdoc.



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Before you begin

Warranty

Unless you and Renishaw have agreed and signed a separate written agreement, the equipment and/or software are sold subject to the Renishaw Standard Terms and Conditions supplied with such equipment and/or software, or available on request from your local Renishaw office.

Renishaw warrants its equipment and software for a limited period (as set out in the Standard Terms and Conditions), provided that they are installed and used exactly as defined in associated Renishaw documentation. You should consult these Standard Terms and Conditions to find out the full details of your warranty.

Equipment and/or software purchased by you from a third-party supplier is subject to separate terms and conditions supplied with such equipment and/or software. You should contact your third-party supplier for details.

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-S window or otherwise obstruct the window.

Patents

Features of the OMM-S and OSI-S, and other similar Renishaw products, are the subject of one or more of the following patents and/or patent applications:

CN 100461049	JP 5244786
CN 101166953	JP 5274775
CN 101432592	JP 5658863
CN 101622513	JP 5905189
CN 103822603	JP 6058109
EP 1877732	JP 6058110
EP 2016370	TW I424164
EP 2115387	US 6810597
EP 2267563	US 7866056
EP 2447665	US 7885777
IN 307869	US 7900367
	US 7970488

OSI-S and OMM-S software notices

These OSI-S and OMM-S products include embedded software (firmware) to which the following notices apply:

US government notice

NOTICE TO UNITED STATES GOVERNMENT CONTRACT AND PRIME CONTRACT CUSTOMERS

This software is commercial computer software that has been developed by Renishaw exclusively at private expense. Notwithstanding any other lease or licence agreement that may pertain to, or accompany the delivery of, this computer software, the rights of the United States Government and/or its prime contractors regarding its use, reproduction and disclosure are as set forth in the terms of the contract or subcontract between Renishaw and the United States Government, civilian federal agency or prime contractor respectively. Please consult the applicable contract or subcontract and the software licence incorporated therein, if applicable, to determine your exact rights regarding use, reproduction and/or disclosure.

Renishaw software EULA

Renishaw software is licensed in accordance with the Renishaw licence at:
www.renishaw.com/legal/softwareterms

Intended use

The OSI-S and OMM-S are, respectively, the interface and receiver designed for use on machine tools in conjunction with the OSP60 probe.

Safety

Information to the user

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

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.

If the probe system fails, 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 UK, 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 (for example, power transformers, servo drives);
- 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 (for example, motor power supply cables), or be near high-speed data lines;
- cable lengths should always be kept to a minimum.

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

These products contain LEDs that emit both visible and invisible light.

OSI-S and OMM-S are ranked Risk Group: Exempt (safe by design).

These products were 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-S and OMM-S basics

Introduction

The OSI-S interface and OMM-S receiver are, respectively, the machine interface and optical receiver for use with the high-speed on-machine contact scanning system for CNC machine tools, an innovative high-speed analogue scanning system that offers a new concept in part measurement on machine tools.

The OSI-S manages data communications between the components of the system and the machine tool. Typically, it is mounted in the controller cabinet so that it is close to the machine I/O, from which it receives signals to synchronise its operation with the running NC code. It is connected via Ethernet to the controller's PC front end (or external data processor) to stream the probe deflection data.

The OMM-S, which is powered directly by the OSI-S, is designed to be mounted in the machine environment and provide line-of-sight communication with the OSP60 probe. When the OSP60 probe is scanning, the stylus position data is continuously streamed to the OMM-S. The data stream is decoded by the OSI-S interface, where it is buffered until requested by the scanning software.

A second OMM-S can be connected to the OSI-S to extend range, for example: in applications with exceptionally long spindle travel; in applications with rotating heads; or on large machines where line-of-sight is difficult to maintain with a single receiver.

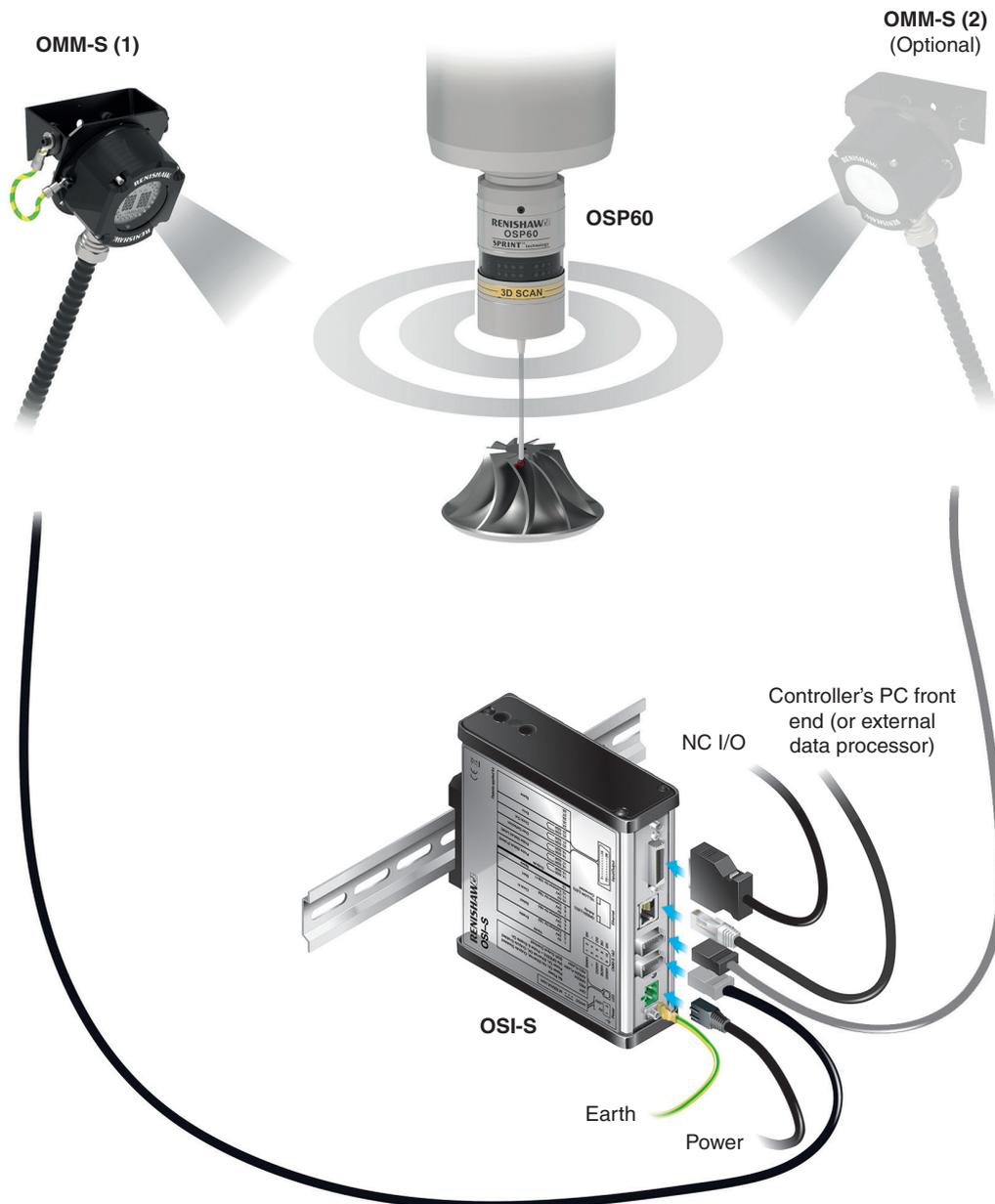
The OMM-S can operate in one of four transmission power levels that can be set within the scanning software. The power level of the OMM-S need only be adjusted when it is likely that conflict could occur from systems on adjacent machines.

Both the OMM-S and OSI-S use front panel LEDs to provide a visual indication of their current status.

All user-configuration settings of the OSI-S and OMM-S, including optical transmission power and I/O polarity, are adjusted using the scanning software. No physical switches or adjustments are required.

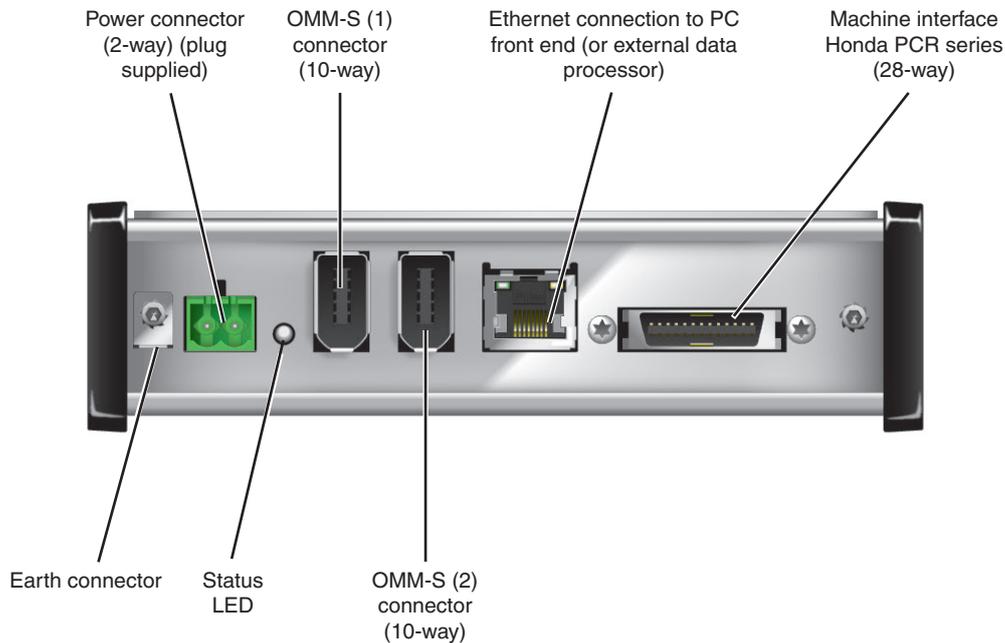
The OSI-S and OMM-S are only compatible with the OSP60 probe, due to the sophisticated nature of the optical transmission protocol.

OSI-S and OMM-S system



IMPORTANT: Ensure the OMM-S and OSI-S have low impedance earth connections to the machine chassis, using all indicated star washers to cut through paint and oxide layers. Failure to ensure a low impedance earth connection on both OMM-S and OSI-S will result in reduced operating range.

OSI-S components

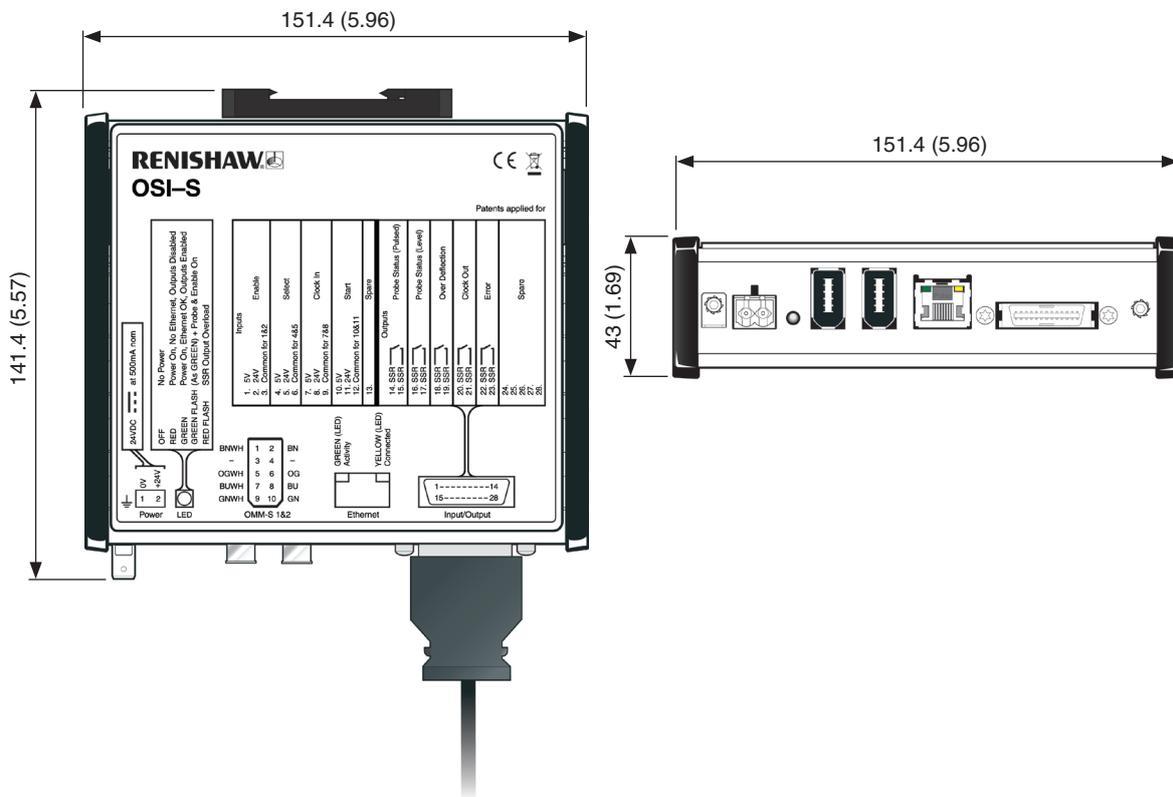


The OSI-S is an interface that decodes signals received by the OMM-S and controls the operation of the OSP60 probe. It communicates with the scanning software via Ethernet, and the machine tool NC controller via I/O signals.

Status LED	
Off	No power.
Red	Power on, no Ethernet connection, outputs disabled.
Green	Power on, Ethernet connected, outputs enabled.
Flashing green	Power on, Ethernet connected, outputs enabled, Probe on and Enable on.
Flashing red	Solid state relay (SSR) output overload.

NOTE: The status LED will start flashing red when an output overload has occurred. All outputs will be switched off. If this occurs, turn off the power and remove the source of the problem. Turning off the power will reset the OSI-S.

OSI-S dimensions



Dimensions mm (in)

OSI-S specification

Principal application	The OSI-S processes signals from the OMM-S and transmits them to the CNC machine controller.	
Dimensions	Width	151.4 mm (5.96 in)
	Height	43.0 mm (1.69 in)
	Depth	141.4 mm (5.57 in)
	Installation depth	190.7 mm (7.51 in)
Supply voltage	18 Vdc to 30 Vdc	
Supply current	Nominal current 400 mA @ 18 V (when powering one OMM-S) or 500 mA @ 24 V (when powering two OMM-S optical receivers). Minimum current 300 mA @ 30 V (when powering one OMM-S). Maximum current 650 mA @ 18 V (when powering two OMM-S optical receivers). The dc supply to this equipment must be derived from a source which is approved to BS EN IEC 62368-1.	
Output signal	Voltage-free solid state relay (SSR) output, configurable normally open or normally closed. 'On' resistance = 50 Ω maximum. Load voltage = 50 V maximum. Load current = 60 mA maximum. When the OSI-S is powered down, the solid state relays are open regardless of configuration.	
Mounting	Unit is provided with a DIN rail mount as standard. An optional bracket kit is available for panel mounting – see Section 6 , "Parts list".	
Input/output protection	The input is protected by a 1.85 A self-resetting fuse. To reset the fuse, remove power, then identify and rectify the fault.	
Environment	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)

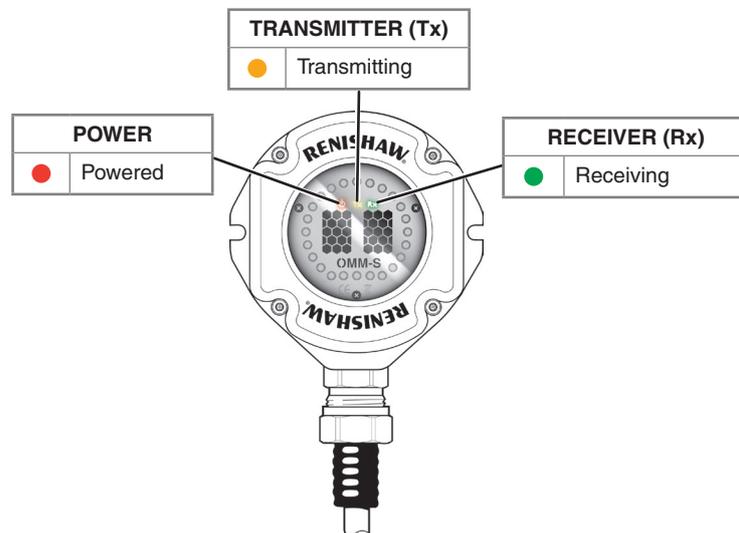
OMM-S components

The OMM-S is an optical receiver that transmits control signals to the OSP60 probe and receives probe data signals for onward transmission to the OSI-S and machine tool NC controller.

The OMM-S is for exclusive use with the OSP60 probe.

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

- power LED;
- transmitter (Tx) LED;
- receiver (Rx) LED.



Power LED (red)

This LED will be lit when the OMM-S is plugged in to the OSI-S and power is supplied to the OSI-S.

Do not remove the OMM-S connector from the OSI-S before first removing the power.

Transmitter (Tx) LED (yellow) and receiver (Rx) LED (green)

Both of these LEDs will light up when the probe is switched on. The probe and the receiver are continuously communicating to each other and simultaneously transmitting and receiving.

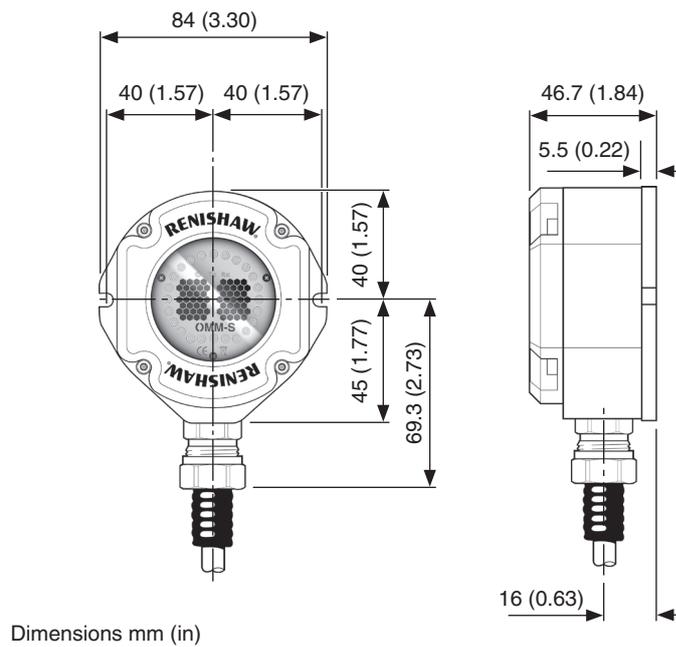
These two LEDs will light up as long as there is valid communication occurring. As soon as the communication is interrupted, both LEDs will switch off.

At the start of a probing cycle, both of these LEDs will flash briefly when a probe switch-on command is executed. Use this feature to help determine which part of the system is at fault if a 'probe switch-on' error occurs, for example, if only the Tx LED flashes then the probe is at fault.

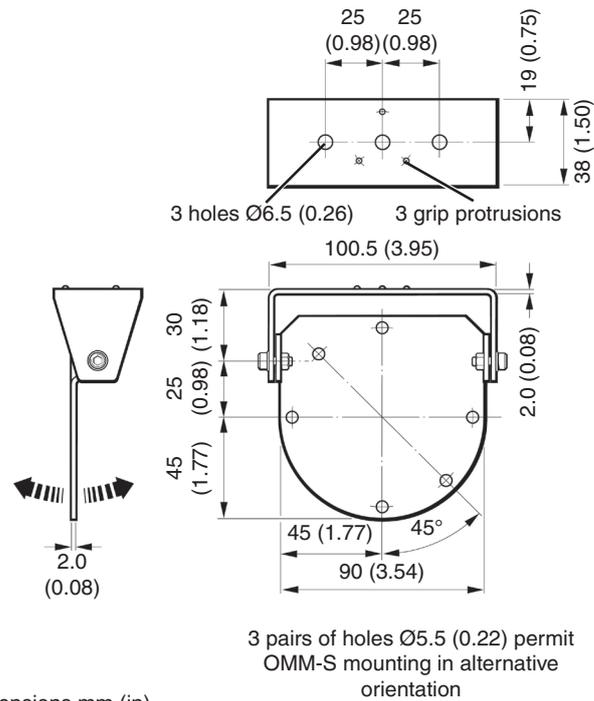
In a tandem OMM-S installation, the LEDs on both receivers will display the same state regardless of which one is receiving the strongest signal.

NOTE: If the Tx and Rx LEDs flash together, the OMM-S is in an overload state: remove the power from the OSI-S (by powering down the machine or removing the power connector) and reapply to reset from this condition.

OMM-S dimensions



Optional mounting bracket dimensions



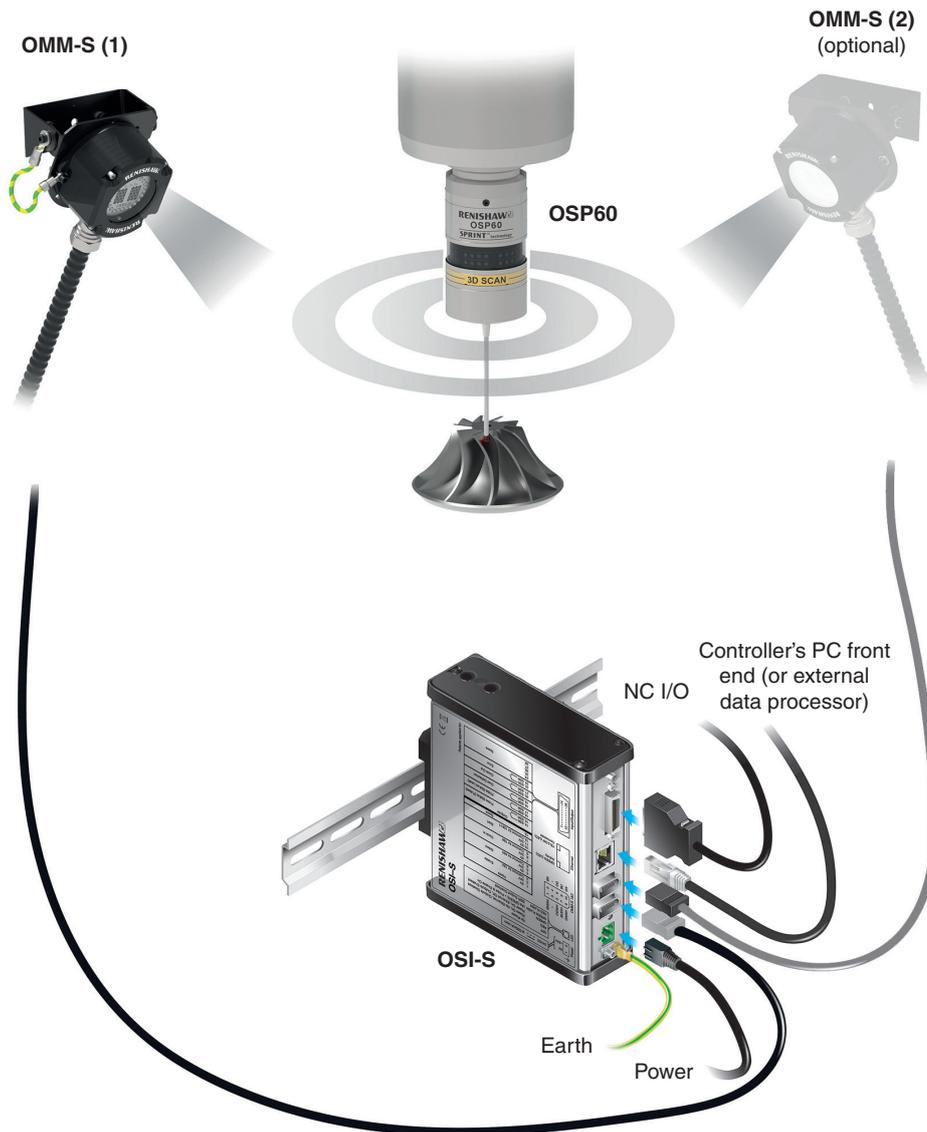
OMM-S specification

Principal application	The OMM-S transmits control signals and receives data from the OSP60 probe for onward transmission to the OSI-S interface and machine tool NC controller.	
Transmission type	Infrared optical transmission.	
Compatible probe	OSP60	
Power supply	The OMM-S is powered by the OSI-S.	
Cable	The OMM-S standard cable is 15 m (49 ft) long. Cable specification: Ø6.1 mm, 8-core, twisted pair, screened cable, each core 7 × 0.146 mm. Maximum cable length 30 m (98 ft).	
Mounting	A mounting bracket is available allowing directional setting.	
Weight	OMM-S including 15 m (49 ft) of cable	1000 g (35 oz)
Environment	IP rating	IPX8, 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)

System installation

Installing the OSI-S and OMM-S

Typical installation



IMPORTANT: Ensure the OMM-S and OSI-S have low impedance earth connections to the machine chassis, using all indicated star washers to cut through paint and oxide layers. Failure to ensure a low impedance earth connection on both OMM-S and OSI-S will result in reduced operating range.

Installing the OSI-S

The OSI-S is typically installed in the controller cabinet at the rear of the machine tool. It can be DIN rail mounted or it can be fastened to a panel, using optional brackets and screws.

The OSI-S requires an I/O connection to the NC from a Honda PCR series (28-way) connector (not supplied). A pre-wired connector with 1.5 m (4.5 ft) of cable is available as a spare from Renishaw (part number A-5465-1600).

This I/O connection ensures synchronisation of time-critical signals within the running NC program.

Other signals that are not time-critical are transmitted directly to the scanning software via an Ethernet link to the controller's PC front end (or external data processor).

The Ethernet cable should be a CAT 7 specification screened cable with a maximum length of 30 m (98 ft). It should be connected to the controller's PC front end (or external data processor), using a dedicated connection, not connected through a network hub. Connection through a hub can cause critical data drop-out.

CAUTIONS:

Power supply voltage

Check to ensure the power supply does not exceed 30 V between: the power input (pin 1) and the earth wire (green/yellow); the power input (pin 2) and earth wire (green/yellow); or the power inputs (pins 1 and 2), as this could result in permanent damage to the OSI-S and/or the user power supply.

The power supply 0 V should be terminated at the machine "star point". If a negative supply is used (for example, +ve terminal is at 0 V and -ve terminal is at a negative supply voltage), the negative line must be fused, rated at 1 A.

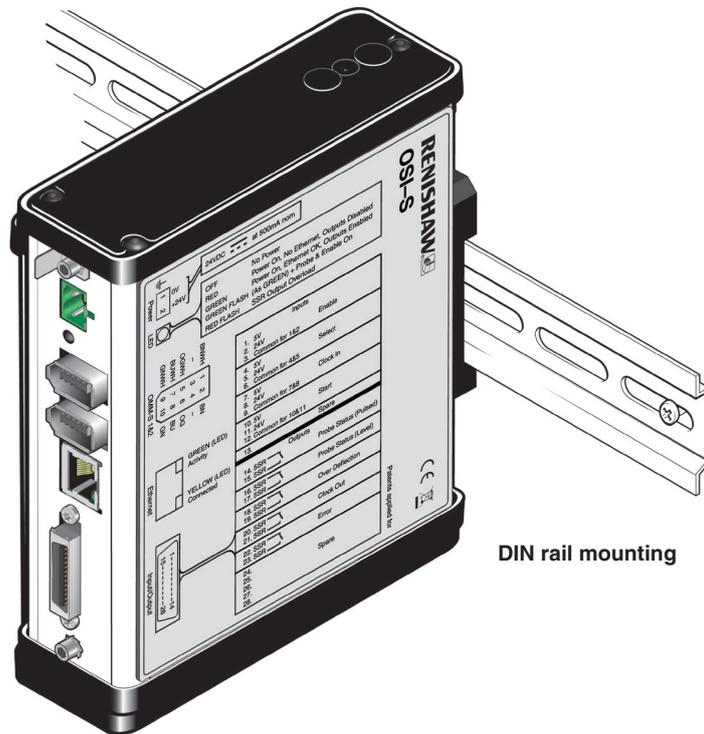
The use of in-line fuses at the machine cabinet is recommended to provide protection for the OSI-S and cable.

Output

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

IMPORTANT: Ensure the OMM-S and OSI-S have low impedance earth connections to the machine chassis, using all indicated star washers to cut through paint and oxide layers. Failure to ensure a low impedance earth connection on both OMM-S and OSI-S will result in reduced operating range. A low impedance braided earth cable is recommended.

Mounting the OSI-S



NOTE: To remove the OSI-S from a DIN rail, lift the case then rotate the bottom away from the rail.

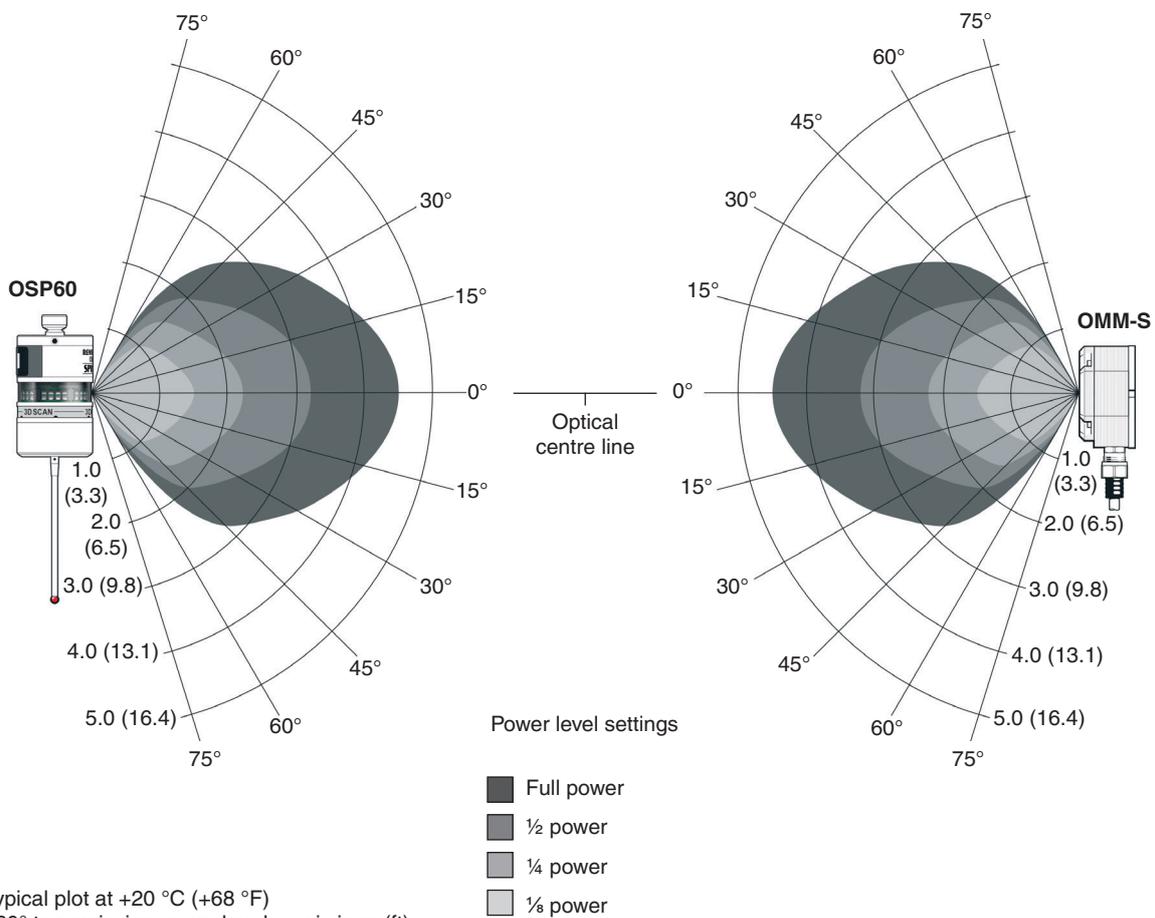
System performance with the OSP60 probe

The OSP60 probe and OMM-S receiver may deviate from the optical centre line, provided that opposing light cones always overlap, with transmitters and receivers in the other's field of view (line-of-sight).

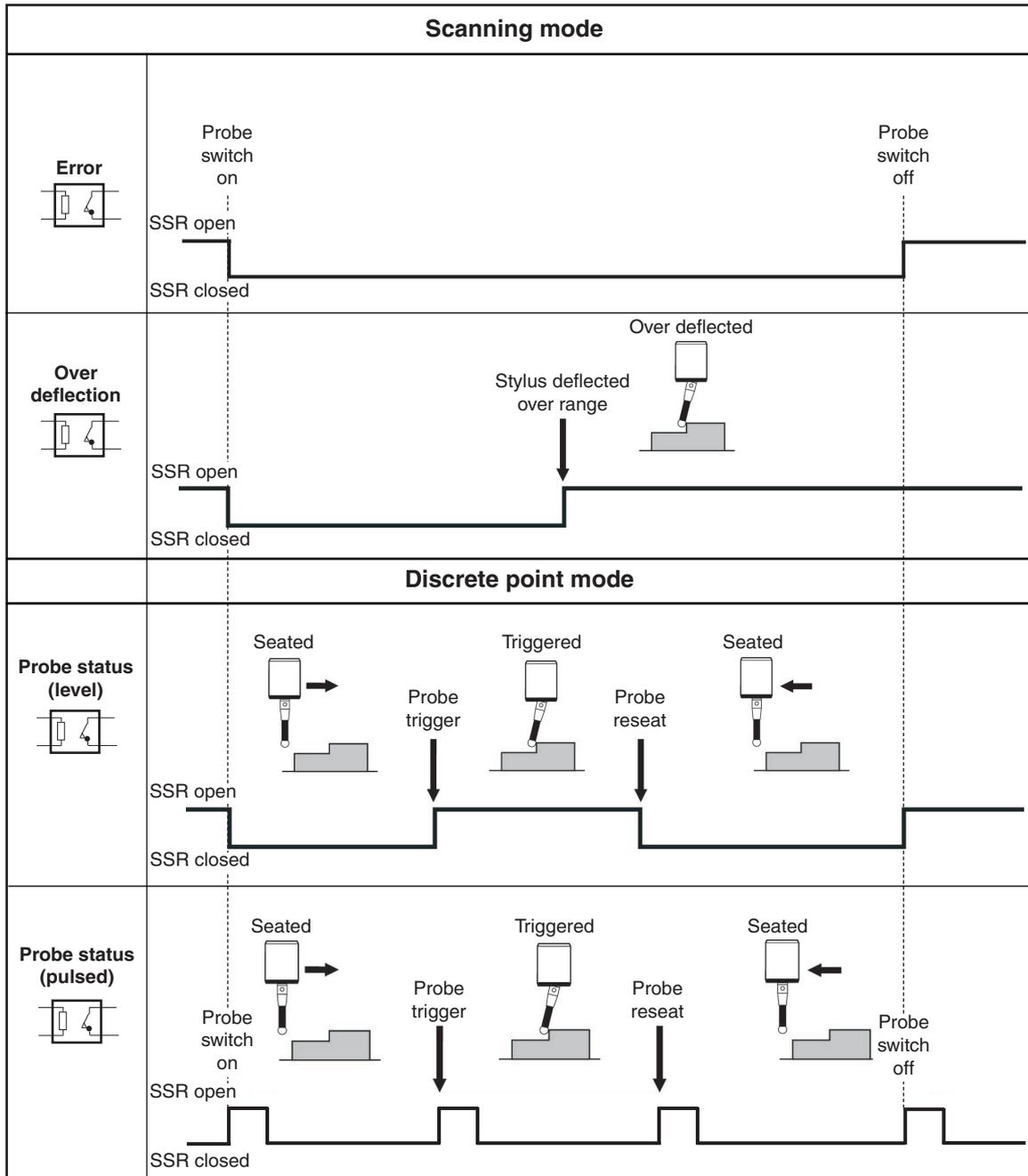
Power levels for the OSP60 probe and OMM-S receiver can be independently adjusted. These adjustments are made during configuration of the scanning software. It is recommended that the OMM-S is set to full power mode (default setting) and the OSP60 is set to automatic power level.

The receiver power level can be reduced to prevent interference with adjacent systems.

Performance envelope when using the OSP60 with the OMM-S



OSI-S output waveforms



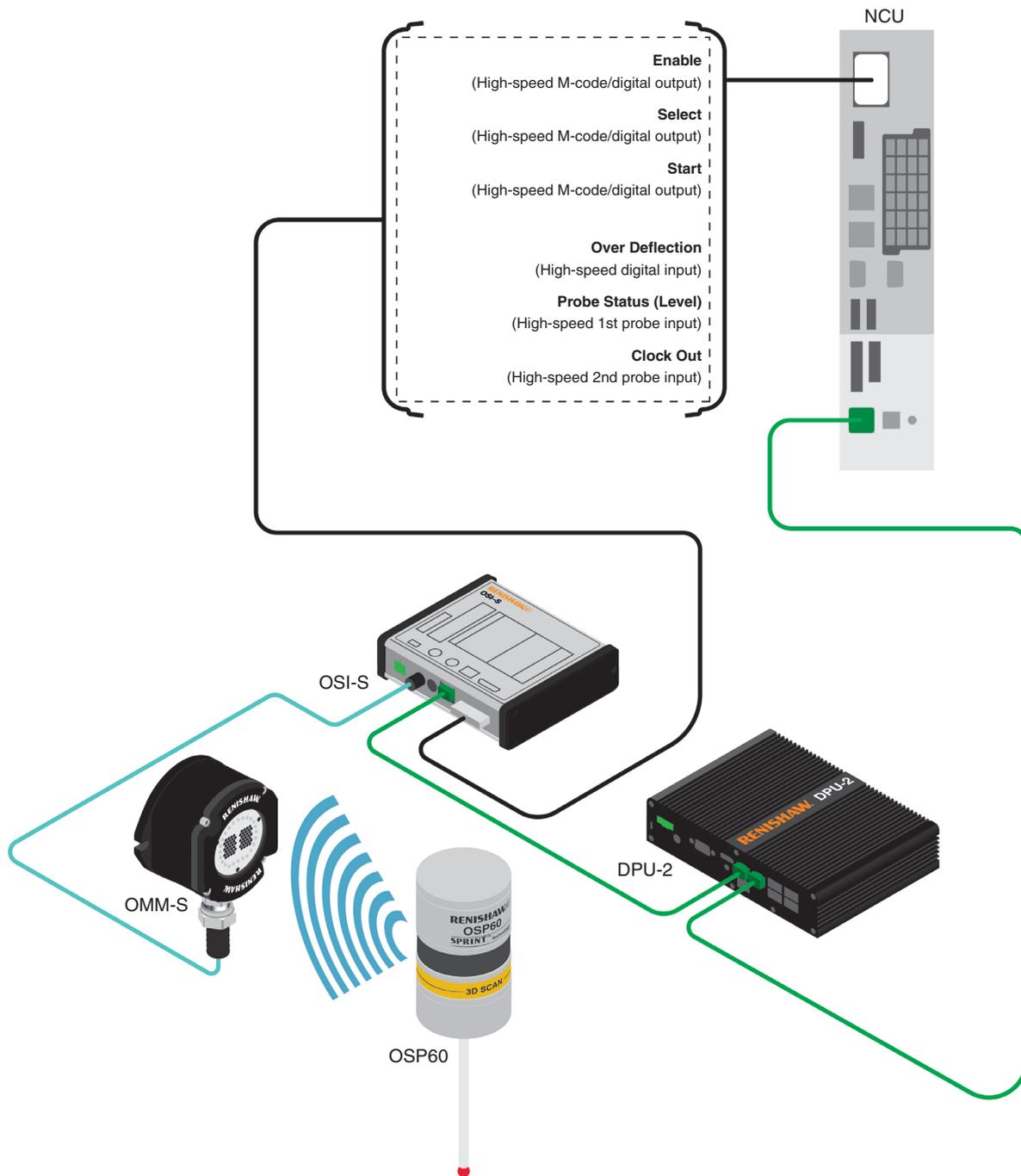
NOTES:

It is recommended that the input polarity is set so that, when power is removed from the OSI-S, the probe and over-deflection inputs change state to stop the machine and indicate a fault.

The polarity of each of these signals can be set in the scanning software.

"Probe switch on" means the probe is ready for use. This is a short time after the M_START signal is activated.

Example connection diagram – Productivity+™ Scanning Suite



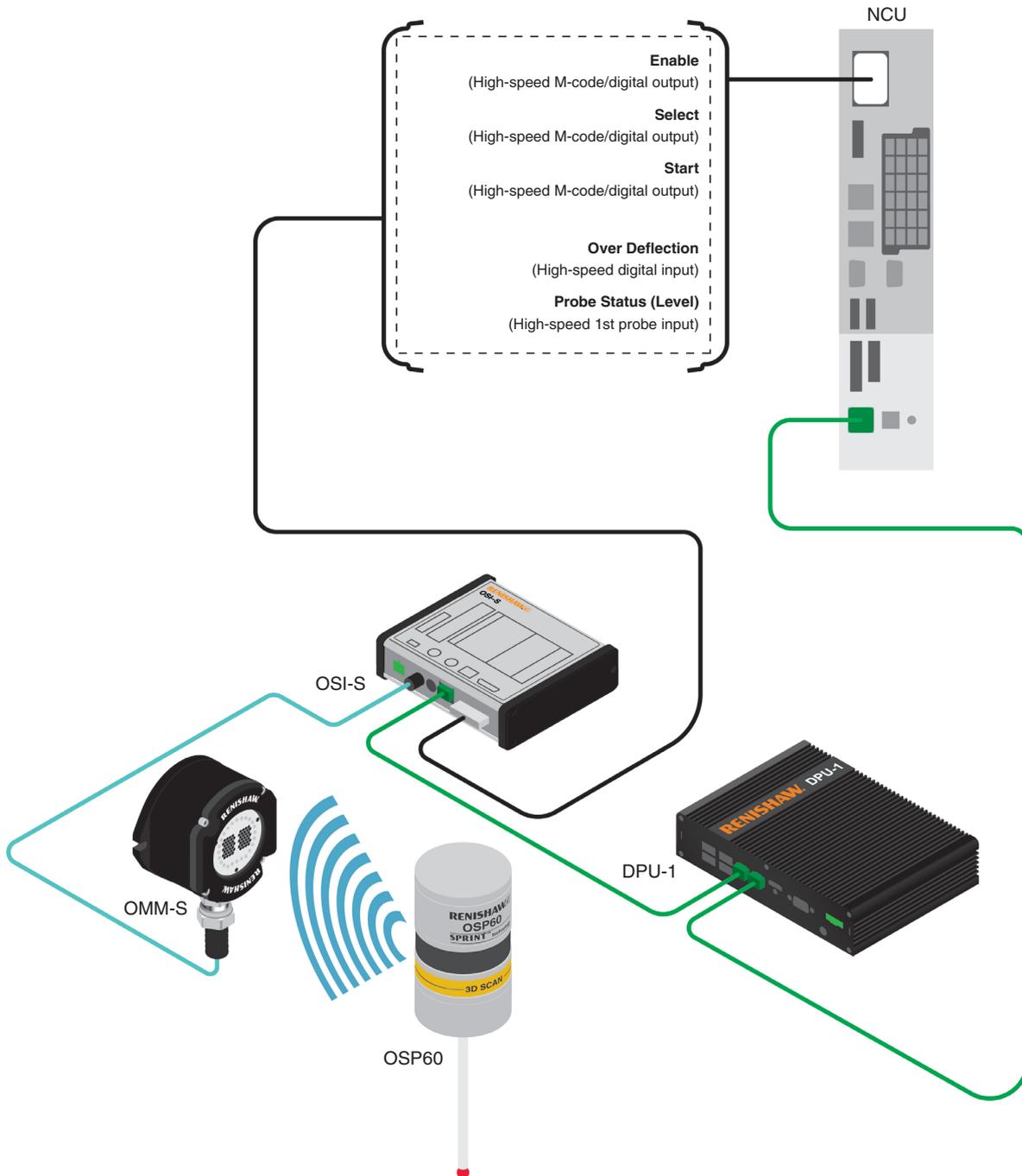
NOTES:

It is advised that only relays of a solid state type are used. Mechanical relays can cause input spikes and variable delays which cause false signals.

When the OSI-S is powered down, the solid state relays are open, regardless of configuration.

For controller specific information, see the applicable controller requirements document.

Example connection diagram – SupaScan

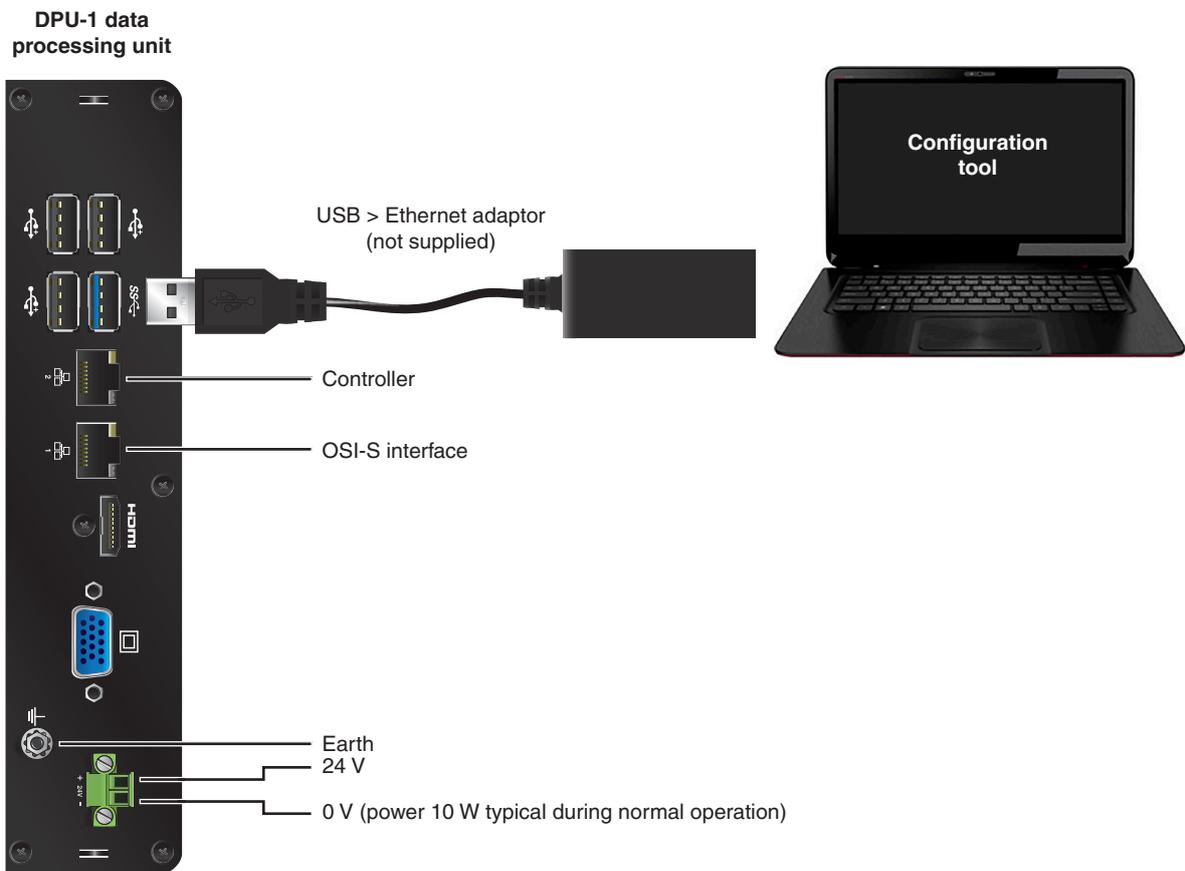


NOTES:

When the OSI-S is powered down, the solid state relays will always be in an open state, regardless of how they are set within the SupaScan Configuration Tool.

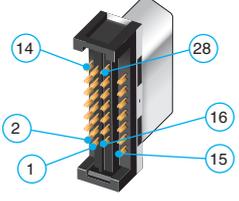
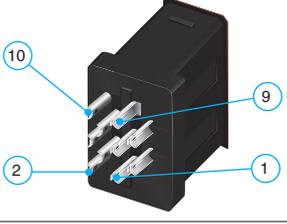
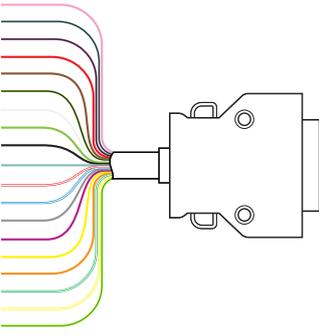
For controller specific information, see the applicable controller requirements document.

SupaScan system connectivity



NOTE: For a list of USB to Ethernet adaptors known to be compatible with the SupaScan system, see the *SupaScan* installation and configuration guide (Renishaw part no. H-5465-8528).

Cables and connectors

Connector	Part number and description
	<p>P-CN30-0015 – OSI-S PCR 28-way I/O connector</p> <p>Provided as part of A-5465-1600</p>
	<p>P-CN30-0016 – OSI-S PCR 28-way I/O connector backshell</p> <p>Provided as part of A-5465-1600</p>
	<p>P-CN58-0035 – OMM-S 10-way connector</p> <p>Provided as part of A-5465-2050</p>
	<p>P-CX35-0031 – OMM-S 10-way connector backshell</p> <p>Provided as part of A-5465-2050</p>
	<p>A-5465-1600 – OSI-S wiring kit</p>

Pin	Wire colour	Signal name
1		
2	Pink	Enable
3	Turquoise/Black	Enable
4		
5	Violet/Black	Select
6	Red	Select
7		
8	Brown	Clock In
9	Green/Black	Clock In
10		
11	White	Start
12	Green	Start
13		

Pin	Wire colour	Signal name
14	Black	Probe Status (Pulsed)
15	Turquoise	Probe Status (Pulsed)
16	White/Red	Probe Status (Level)
17	White/Blue	Probe Status (Level)
18	Grey	Over Deflection
19	Violet	Over Deflection
20	Yellow	Clock Out
21	Orange	Clock Out
22	White/Green	Error
23	White/Yellow	Error
24		
25		
26		
27		
28		
Backshell	Green/Yellow	Earth

Installing the OMM-S

OMM-S application

A single or tandem OMM-S configuration can be connected to the OSI-S. Each OMM-S is connected to the interface using the supplied connector. When a tandem OMM-S configuration is used, there will be a simultaneous indication of system status on both receivers. It is not important which of the two OMM-S connections are used on the OSI-S.

Tandem OMM-S receivers 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-S receivers, it is necessary that they are located in the machine in positions where the operating envelopes of each OMM-S overlap each other. 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-S receivers may be used in applications with a partitioned machining environment where an OMM-S is located in each area. In this instance, the operating envelopes do not need to overlap.

Power supply

Power for the OMM-S is supplied from the OSI-S interface.

OMM-S cable

Cable termination to connector

It is critical that the shield around the OMM-S cable is in contact with the cable clamp of the metal connector shell.

Earthing the OMM-S

An earth strap is provided in the kit to ensure a good earth connection between the OMM-S body and the machine. It is critical that the star washers provided are used to break through the anodised coating of the OMM-S body and that paint is removed from the machine as necessary. Test for continuity between the OMM-S body and machine with a multimeter.

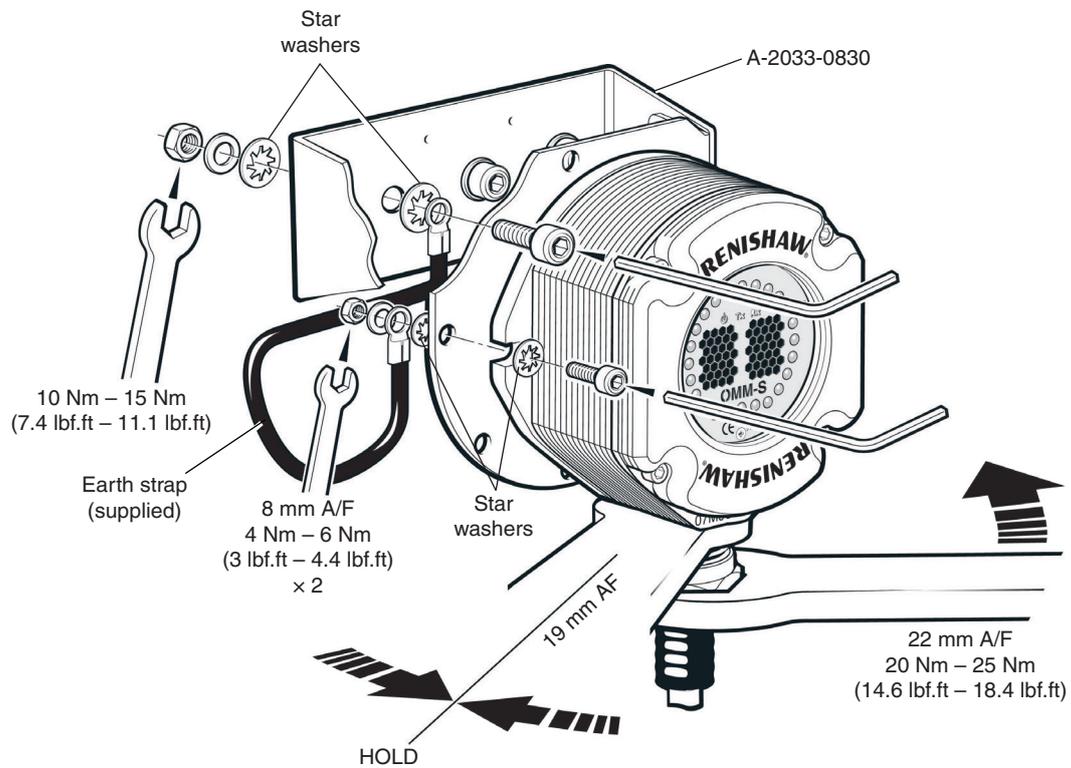
Standard cable variants

The OMM-S standard polyurethane cable is 15 m (49 ft). Contact Renishaw for other cable lengths if required. However, note that the maximum permissible length of cable that can be used is 30 m (98 ft).

Cable specification

Ø6.1 mm, 8-core, twisted pair, screened cable, each core 7 × 0.146 mm.

Mounting the OMM-S



IMPORTANT:

Ensure OMM-S body is earthed to machine.

It is critical that the star washers provided are used to break through the anodised coating of the OMM-S body and that paint is removed from the machine as necessary to provide a good earth connection between the OMM-S body and machine.

Cable sealing

Coolant and dirt are prevented from entering the OMM-S by the cable sealing gland. The OMM-S 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 from Renishaw (see **Section 6**, “Parts list”).

CAUTIONS:

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-S.

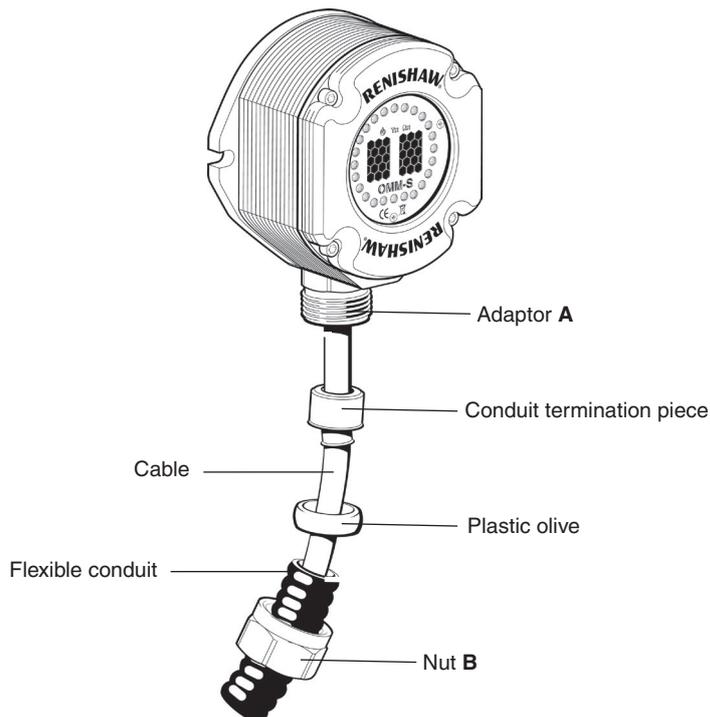
Failure of the product due to inadequate cable protection will invalidate the warranty.

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 an M16 thread.

1. Slide nut **B** and the plastic olive onto the conduit.
2. Screw the conduit termination piece into the end of the conduit.
3. Fit the conduit to adaptor **A** and tighten nut **B** to 20 Nm – 25 Nm (14.6 lbf.ft – 18.4 lbf.ft).



Maintenance

OSI-S maintenance

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

A good connection is required between the OSI-S earth tag and machine ground (“star point”). Periodically check that all connections are tight and remove any dirt or corrosion from the earth contact points.

CAUTION: Always remove power from the OSI-S (by powering down the machine or removing the power connector) before modifying any connections. Failure to do this could result in damage to the OSI-S and/or OMM-S.

OMM-S maintenance

No routine maintenance is required. Periodically ensure the window is clean by wiping it with a clean cloth.

A good connection is critical between the OMM-S body and machine via the earth strap provided. Periodically check that all connections are tight and remove any dirt or corrosion from the earth strap contact points. If necessary, test for continuity between the OMM-S body and machine with a multimeter.

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

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 performed on a regular basis to maintain optimum transmission.

WARNING: The OMM-S has a glass window. Handle with care if broken to avoid injury.

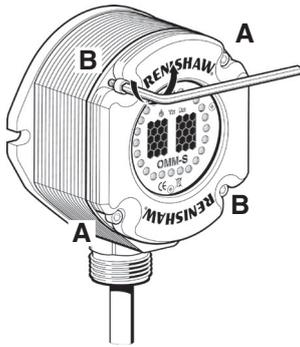


Removing the OMM-S window

It is not necessary to remove the OMM-S from the machine when installing replacement parts.

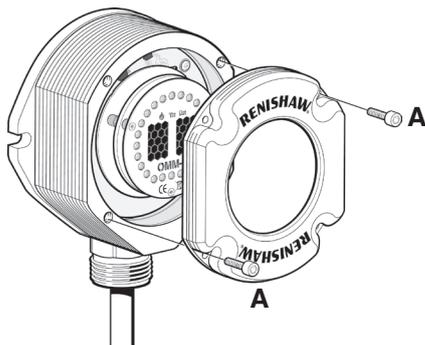
The window may be removed and replaced as described below.

To remove the OMM-S window



CAUTION: The window must not be removed by twisting or rotating.

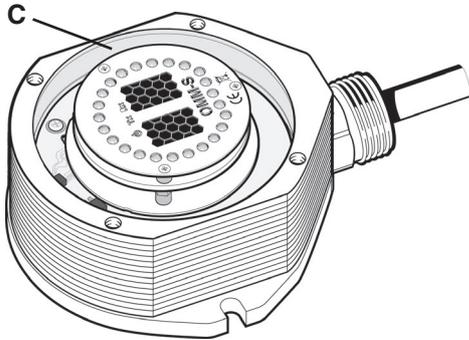
1. Clean the OMM-S to ensure no debris enters the unit.
2. Remove the four cover screws using a 2.5 mm A/F hexagon key. Two screws are short and two are long. Two of the cover holes are threaded **A** and two are plain **B**.
3. The window fits tightly on the OMM-S body and is removed using the two long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



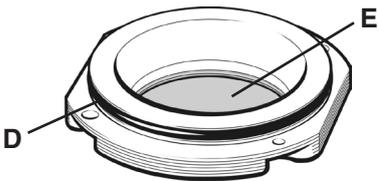
Tighten each screw, a few turns at a time, to pull the window up evenly. When it is clear of the body, remove the window and screws completely.

Fitting the OMM-S window

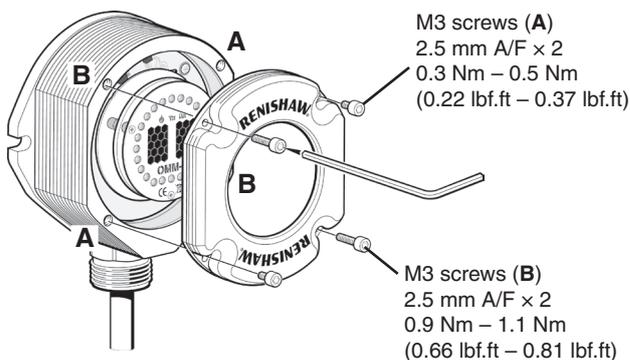
1. Before fitting the window, check for any damage to the screws or for any scratch marks which could prevent sealing.
2. Ensure the O-ring seating **C** in the OMM-S body is clean.



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-S 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 compression of air trapped inside the body.

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Fault-finding

NOTE: Where the following fault-finding information refers to the OSP60 probe, refer to the *OSP60 optical scanning probe* installation guide (Renishaw part no. H-5465-8504) for further information.

Symptom	Cause	Action
OSP60 probe fails to switch on.	Dead probe batteries.	If the OSP60 probe LEDs are constant red, flash red three times, or fail to light when the batteries are inserted, replace with fresh batteries.
	Transmission obstructed.	Clean the windows of the OSP60 probe and the OMM-S. Ensure the OSP60 and OMM-S have line-of-sight by removing any obstructions, or by repositioning the OMM-S.
	OSP60 probe is out of range.	Reposition the OMM-S to ensure the OSP60 probe and the OMM-S are always in each other's operational envelope. Increase the optical power setting in the scanning software.
	Optical interference blocking start signal.	Remove sources of interference or reposition the OMM-S such that interfering light does not shine directly into the OMM-S window.
	OSP60 probe address is wrong.	See if the OSP60 probe LEDs flash green once when the OMM-S start signal is sent; if so, then the probe has a different address to the OMM-S. Change the probe address setting in the Productivity+™ Scanning Suite software. The default probe address is 7.

Symptom	Cause	Action
OSP60 probe fails to switch on (continued).	Rx and Tx LEDs are flashing.	The OMM-S is in an overload state; remove the power from the OSI-S interface, correct the fault and then reapply power.
	Installation fault / configuration fault.	See if the Rx and Tx LEDs flash when the start command is sent. If they don't there could be a fault with either the start signal wiring or the definition of the probe start command in the .RenMF file.
Scanning software reports a high number of communication errors during measurement.	Optical interference is blocking transmissions.	Remove sources of interference or reposition the OMM-S so that interfering light does not shine directly into the OMM-S window.
	OSP60 probe is on edge of range.	Reposition the OMM-S to ensure the OSP60 probe and the OMM-S are always in each other's operational envelope. Increase the optical power setting in the scanning software.
	OMM-S and/or OSI-S is not well grounded.	Ensure the OMM-S and/or OSI-S body has a good connection to the machine earth.
	Poor earth connection.	Check earth connection of the OMM-S and OSI-S.
Scanning software reports no communication link with the interface.	OSI-S status LED is flashing red.	The OSI-S is in an overload state; remove the power from the OSI-S interface and reapply to recover.
	Ethernet socket LEDs are not flashing.	Check that the cable is connected to a valid Ethernet port.
		Check that the cable is a crossover-type cable or has a crossover unit.
Scanning software reports data dropouts during measurement.	Data is not reliably getting from the OSI-S to the scanning software.	Ensure the Ethernet link to the scanning software is dedicated and does not pass through an Ethernet hub.

Symptom	Cause	Action
OSP60 probe stops in mid-cycle.	The OSP60 probe stylus has been deflected outside its maximum range.	Check the part for any deviation outside of normal limits which could cause the stylus to overdeflect.
	Dead probe batteries.	OSP60 probe LEDs will show a constant red. Replace with fresh batteries.
	Transmission obstructed.	Clean the windows of the OSP60 probe and the OMM-S. Ensure the OSP60 and OMM-S have line-of-sight by removing any obstructions, or by repositioning the OMM-S.
	OSP60 probe is on edge of range.	Reposition the OMM-S to ensure the OSP60 probe and the OMM-S are always in each other's operational envelope.
	Optical interference is blocking transmissions.	Remove sources of interference or reposition the OMM-S so that interfering light does not shine directly into the OMM-S window.

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Parts list

Type	Part number	Description
OSI-S kit	A-5465-2030	OSI-S interface kit and support card.
OMM-S kit	A-5465-2050	OMM-S with 15 m (49 ft) cable, toolkit and support card.
Mounting bracket	A-2033-0830	Receiver mounting bracket comprising: mounting plate, 2 × M4 × 8 mm long screws, 2 × M4 washers and mounting bracket toolkit.
Conduit kit	A-4113-0306	Conduit kit with 1 m (3.28 ft) of polyurethane conduit and bulkhead connector (M16 thread).
Window replacement kit	A-5191-0019	Window replacement kit comprising: window assembly with O-ring; stainless steel screws (2 × M3 × 14 mm long; 2 × M3 × 5 mm long); 2.5 mm hexagon wrench.
Tool kit (for use with OMM-S)	A-5191-0016	Tool kit comprising: 2.5 mm hexagon wrench, 4 mm hexagon wrench, 2 × M5 × 16 mm long screws, 2 × M5 washers and 2 × M5 nuts.
Cable	A-5465-0414	OMM-S 15 m (49 ft) cable assembly.
OSI-S terminal block	P-CN01-0019	2-way terminal block.
OSI-S connector	P-CN30-0015	PCR 28-way I/O connector.
OSI-S connector shell	P-CN30-0016	PCR 28-way I/O connector shell.
OMM-S connector	P-CN58-0035	10-way connector.
OMM-S connector shell	P-CX35-0031	10-way connector shell.
OMM-S wiring kit	A-5465-1650	Prepared Honda PCR series (10-way) connector and in-line Phoenix solder-free connector.
OSI-S wiring kit	A-5465-1600	Prepared Honda PCR series (28-way) connector for connection to machine I/O.
OSI-S bracket kit	A-5465-1601	OSI-S bracket kit (for optional panel mounting). Includes 2 × M5 × 10 mm long screws.
OMM-S earth strap kit	A-5465-1603	Earth strap and star washers to ground OMM-S to machine.
Publications. These can be downloaded from our website at www.renishaw.com .		
OSP60 installation guide	H-5465-8504	Installation guide: for set-up of the OSP60 optical scanning probe.
OSI-S and OMM-S installation guide	H-5465-8540	Installation guide: for set-up of the OSI-S interface and OMM-S receiver.

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