Installation and user's guide
H-2000-5015-05-N

RENISHAW
apply innovation

MI 8 interface unit

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MI 8 interface unit

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 harmfull interference.
2. This device must 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.

FCC Section 15.27

The user is also cautioned that any peripheral device installed with this equipment such as a computer, must be connected with a high-quality shielded cable to insure compliance with FCC limits.

GB

WARNINGS

Information for the user

Replace blown fuses with new components of the same type. Refer to the SAFETY section of the relevant product documentation.

Remove power before performing any maintenance operations.

Refer to the machine supplier's operating instructions.

Information for the machine supplier

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 documentation, 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 stop machine movement.

Installation and users guide - English

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WARRANTY

Equipment requiring attention under warranty must be returned to your supplier.
No claims will be considered where Renishaw equipment has been misused, or repairs or adjustments have been attempted by unauthorised persons.

CHANGES TO EQUIPMENT

Renishaw reserves the right to change specifications without notice.

CNC MACHINE

CNC machine tools must always be operated by competent persons in accordance with manufacturers instructions.

MI 8 MAINTENANCE

No maintenance or cleaning is required.

ENVIRONMENT

Temperature

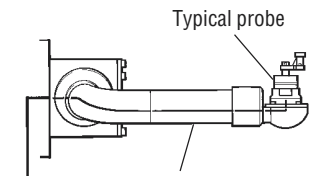
The MI 8 is specified for storage over –10° to 70° C (14 to 158° F) and operation over 5° to 50° C (41° to 122° F) ambient temperature range.

MI 8 INTERFACE UNIT

CNC machine tools using a Renishaw probe system for tool setting or workpiece set-up and inspection, require an interface unit, to convert probe signals into an acceptable form for the CNC machine control. The MI 8 interface unit is for probe systems using hard wired signal transmission.

TOOL SETTING
Lathe

Hard wired transmission

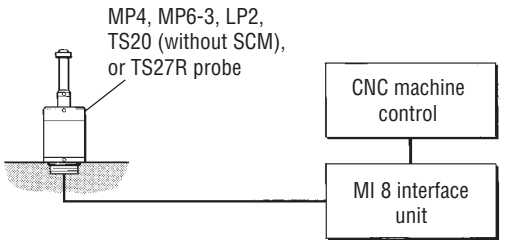


WARNING

The MI 8 interface must NOT be used with an in-line signal conditioning module (SCM) supplied with Renishaw high precision arms (HPA) and some TS20 probes.

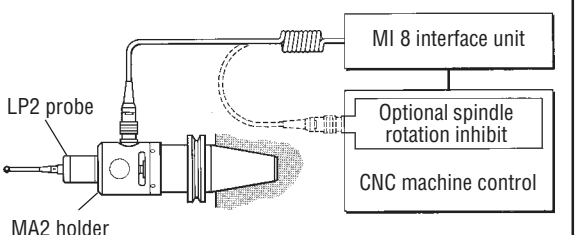
TOOL SETTING
Machining centre

Hard wired transmission

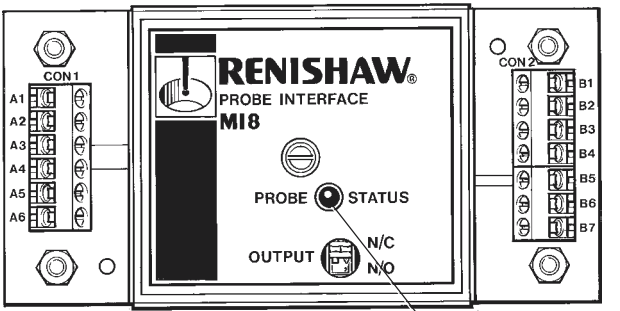


WORKPIECE SET-UP AND INSPECTION
Machining centre

Hard wired transmission
Flexible cable with manual connection



MI 8 FUNCTION



The MI 8 interface processes signals from Renishaw hard wired probes and converts them into voltage free solid state relay (SSR) output, for transmission to the CNC machine control, which stores work offsets and responds to probe inputs.

The probe status LED (light emitting diode) is lit when the probe stylus is seated (at rest), or the interface is inhibited.

When the probe stylus deflects on contact with a tool or workpiece, the MI 8 output relays change state, and the LED switches off. The LED is also off when MI 8 power is off.

As the probe moves clear of the contact surface, the LED lights up, indicating that the probe stylus has reseated, and the probe is available for the next contact in the probing routine.

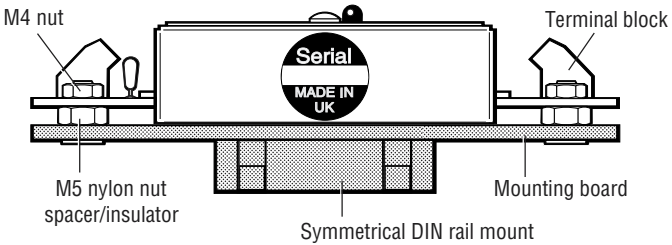
Probe status LED
Lit when probe is at rest. Unlit indicates probe stylus is deflected or power is off.

Remote LED (not supplied by Renishaw)
If the MI 8 is installed where it not be easily seen, outputs are provided for a remote LED, to be positioned near the machine operator. Nominal current is 10 mA. Connection is made between terminals B3 and B4 (see wiring diagram page 1-4).

MI 8 SPECIFICATION

Ideally install the interface in the CNC machine control cabinet. Take care to avoid potential sources of interference, such as three phase transformers and motor controllers.

The MI 8 should be located on studded supports or adhesive feet - see page 1-5. Alternatively, a variant of the MI 8 can be DIN rail mounted.- shown opposite



Power supply

The MI 8 can draw its power from the CNC machine's 24 V nominal d.c. supply. Its input voltage range is 15 to 30 V d.c. maximum and it presents a load of up to 50 mA. Alternatively, it can be powered from a Renishaw PSU3 power supply unit.

Probe input

Normally closed, open for trigger.

Inhibit/enable function - two probes

When a machine uses two probes, the CNC controller must be able to control which probe is used. e.g. Hard wired tool setting probe using an MI 8 interface or inspection probe with optical transmission and MI 12 interface.
The MI 8 contains a remote inhibit input which allows the CNC controller to inhibit it while the inspection probe is in use.

Simultaneous - two probes
Tool setting and inspection probe operation

When one probe is inhibited, it is held in a 'probe at rest' state so that the other probe output will not be masked. This can be automatically controlled by an M code (miscellaneous function) from the CNC machine's control.

Inhibit input

Shorting together terminals B1 and B2 (less than 100 Ohms) will force the output into the seated state, irrespective of actual probe status. Breaking contact between terminals B1 and B2 (more than 50 K Ohms) will remove the inhibit function.

MI 8 output

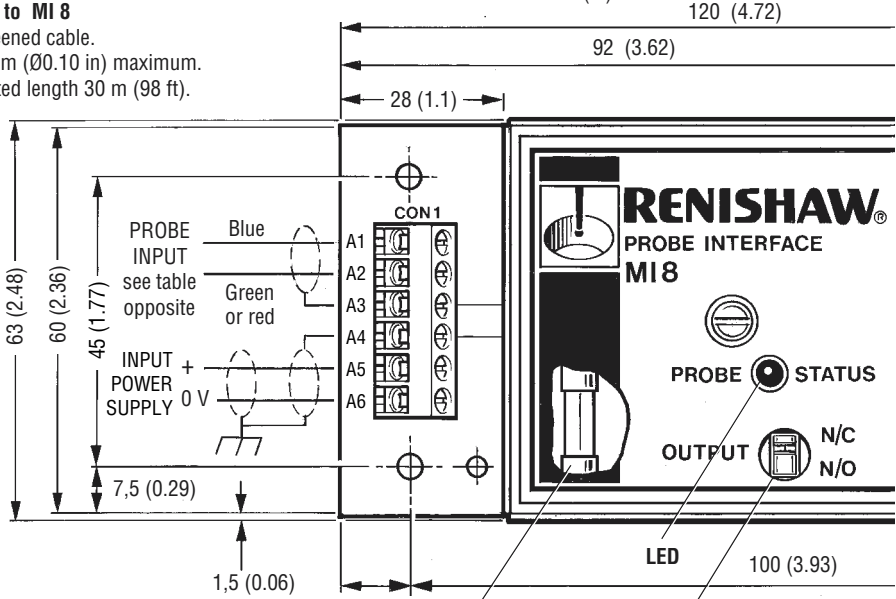
Voltage free - solid state relay (SSR)
Normally open (N/O) or normally closed (N/C), selected by switch SW1. Maximum current 50 mA peak.
Maximum voltage ±50 V peak

MI 8 CONNECTIONS dimensions mm (in)

WIRING - PROBE to MI 8

Use two core screened cable.
Each core Ø2,5 mm (Ø0.10 in) maximum.
Maximum permitted length 30 m (98 ft).

Probe type	Core colours
LP2 RP2 MP6-3	Blue and Green
MP4 TS20 TS27R	Blue and Red

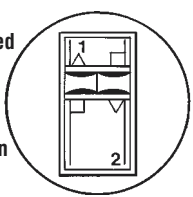


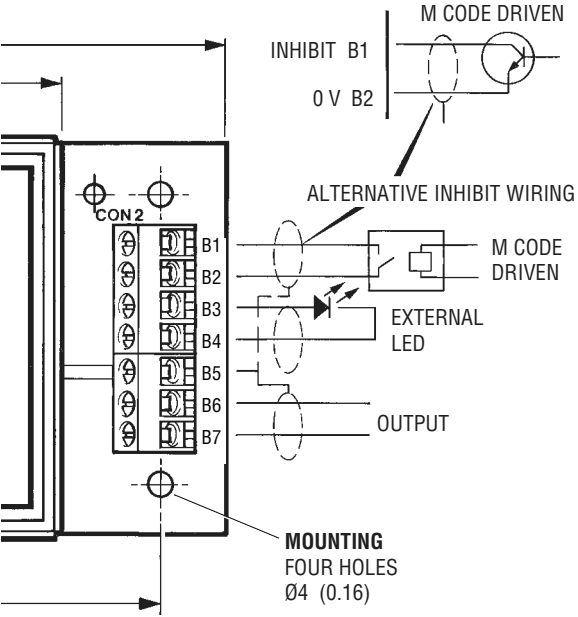
PIN	DESCRIPTION	COMMENTS
A1	PROBE INPUT	
A2	PROBE INPUT	
A3	SUPPLY SCREEN	Connect to cable screen
A4	SUPPLY SCREEN	Connect to machine earth
A5	SUPPLY	Positive +15 to 30 V d.c.
A6	SUPPLY	0 V

Supply protection
80 mA (T) FUSE FS1
Remove cover to access fuse

WARNING
For safe operation it is essential to fit a fuse of the correct rating

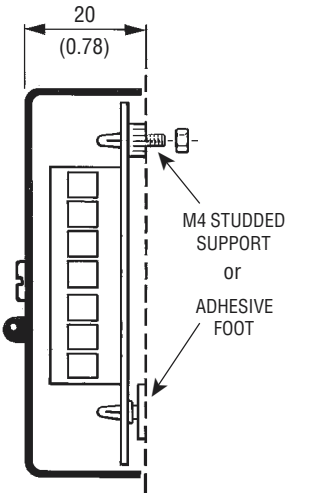
SWITCH SW1





WIRING - MI 8 to CNC CONTROL

Use two core screened cable.
Each core Ø2,5 mm (Ø0.10 in) maximum.



PIN	DESCRIPTION	COMMENTS
B1	INHIBIT	Inhibit function (active low)
B2	INHIBIT 0V	
B3	EXTERNAL LED	+ ve
B4	EXTERNAL LED	– ve
B5	SCREEN	For cable screens
B6	OUTPUT	SSR voltage free
B7	OUTPUT	

SAFETY

Only qualified persons should adjust switches or replace fuses.
Ensure the machine tool is in a safe state, and power is removed from the MI 8, before removing the cover and making the following changes.

1. Wiring cable to terminal block.
2. Changing fuse FS1.
3. Switching switch SW1.

LP2 HARD WIRED INSPECTION SYSTEM

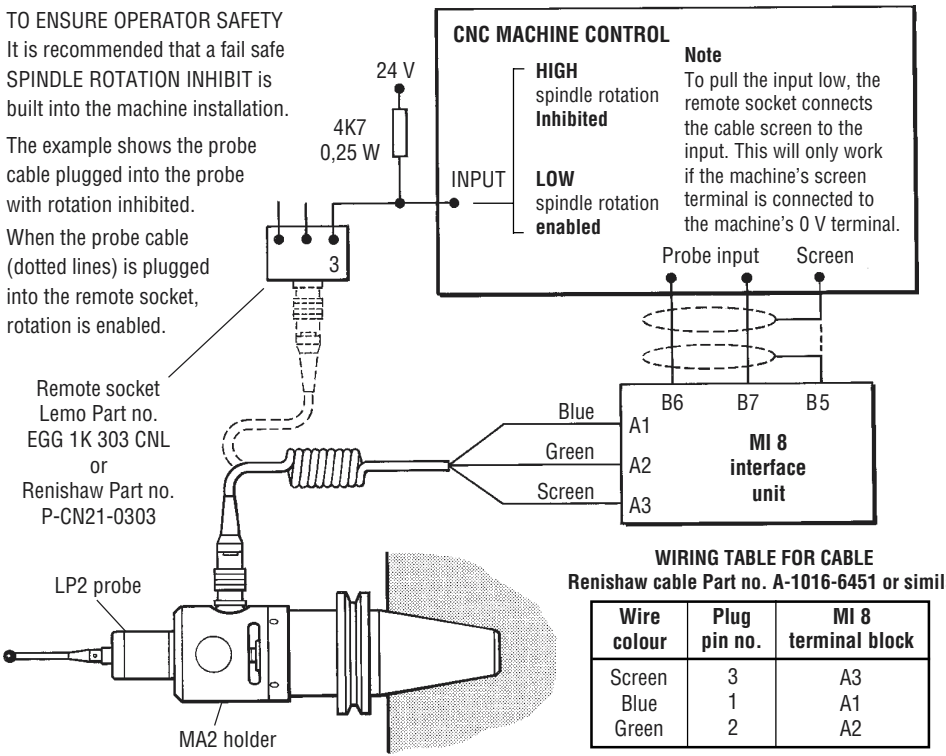
SAFETY

The probe should **not** be rotated (spun) by the machine's spindle with the cable connected. If this is allowed, then serious injury could occur to persons nearby due to flying cable or entanglement.

TO ENSURE OPERATOR SAFETY
It is recommended that a fail safe SPINDLE ROTATION INHIBIT is built into the machine installation.

The example shows the probe cable plugged into the probe with rotation inhibited.

When the probe cable (dotted lines) is plugged into the remote socket, rotation is enabled.



WIRING TABLE FOR CABLE
Renishaw cable Part no. A-1016-6451 or similar

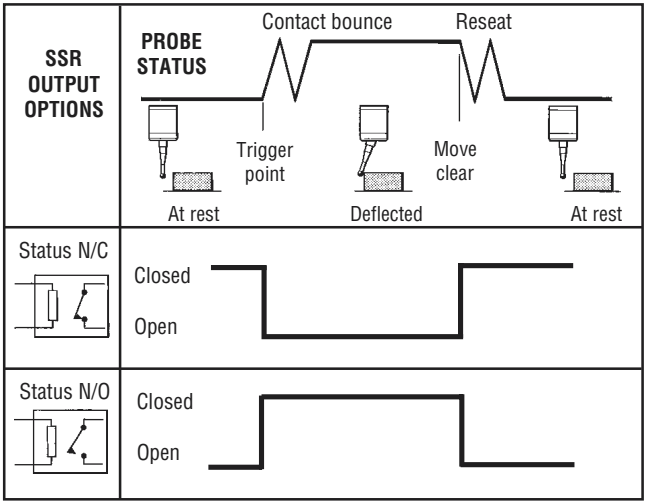
Wire colour	Plug pin no.	MI 8 terminal block
Screen	3	A3
Blue	1	A1
Green	2	A2

MI 8 OUTPUT SIGNAL

The output signal from the interface must be compatible with the machine's control.

Solid state relay (SSR)
Normally closed (N/C).
or
Normally open (N/O).
(Teledyne 640-1 or equivalent).
Maximum current ±40 mA peak.
Maximum voltage ±50 V peak.

Note:
Change of state debounce time is 20 mS ± 5 mS.
Debounce time is the time delay after the MI 8 has responded to a probe trigger, before it can be used again.



PARTS LIST - Please quote the Part no. when ordering equipment

Type	Part no.	Description
MI 8	A-2037-0010	MI 8 interface unit complete with four M4 studded supports, nuts and four adhesive feet.
MI 8/DIN	A-2037-0020	MI 8 interface for DIN rail mounting.
Fuse	P-FS01-0080	80 mA (T) anti-surge fuse. One spare fuse is supplied with kit A-2037-0010 and kit A-2037-0020.

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