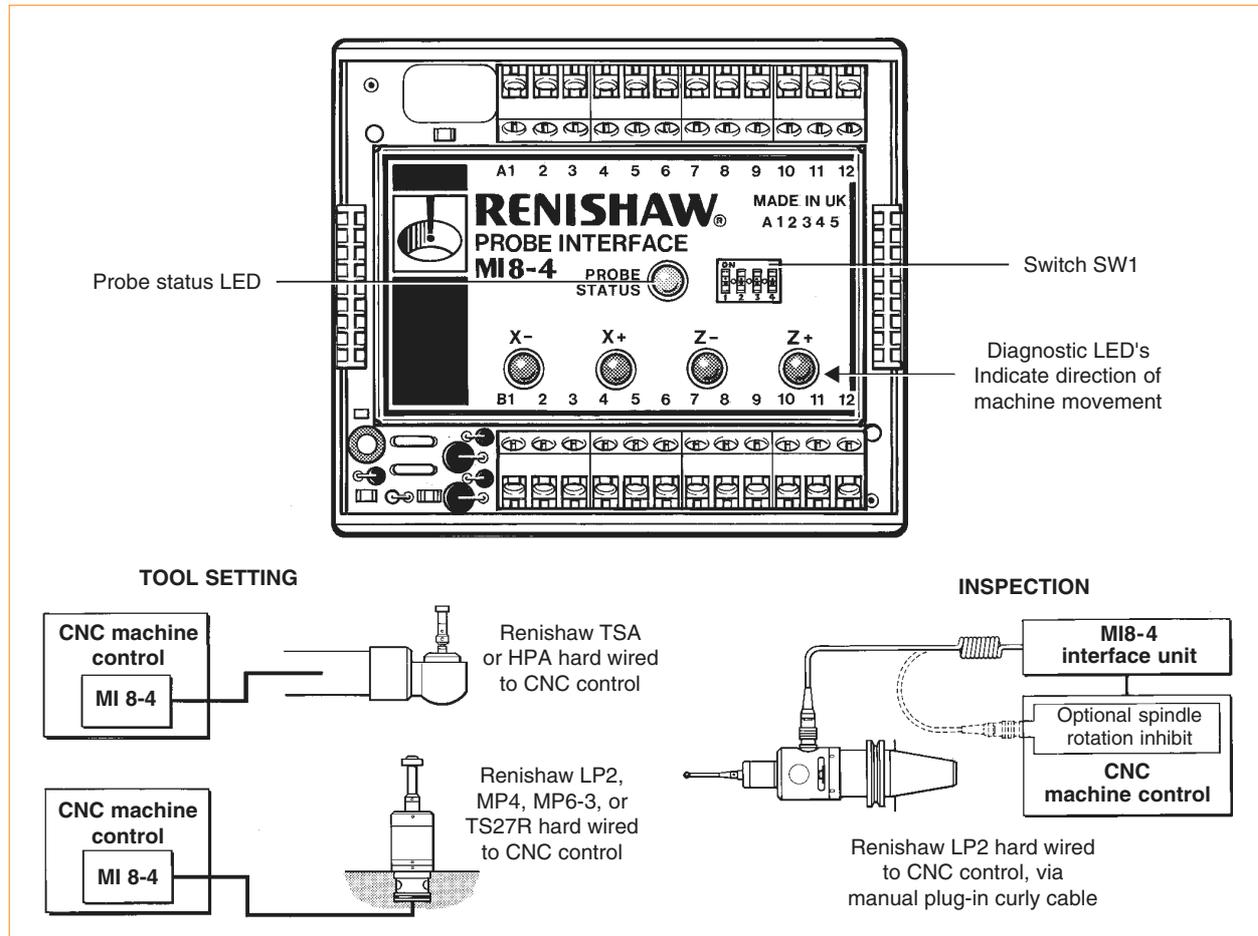


MI 8-4 interface unit



The MI 8-4 interface processes the probe signal from a hard wired probe and converts it into the correct format to connect into a controller's probe input.

The MI 8-4 can also be connected into the 4 wire Fanuc automatic measurement input (XAE, ZAE). Four signals are required from the control to determine which of the four outputs should transmit the probe signal.

APPLICATIONS

1. Hard wired tool setting probe for CNC lathes and machining centres.
2. Hard wired inspection probe for CNC machining centres.

FEATURES

The bi-colour probe status LED is off when the MI 8-4 power is off. It is green when the probe stylus is seated, or the interface is inhibited. It changes to red when the stylus is deflected on contact with a surface (probe triggered).

The four green diagnostic LEDs indicate in which axis the machine is moving. e.g. During an X- move the X- LED will illuminate.

SPECIFICATION

Supply voltage	15 to 30 V DC maximum
Supply voltage (with ripple)	16.5 to 28.5 V with 3 V peak to peak ripple.
Load current	The MI 8-4 presents a load of up to 80 mA maximum. (Each XAE/ZAE output connection will add to the supply current).
Supply protection	250 mA (FF) anti-surge fuse (FS1).
Probe Input	Normally closed, open for trigger.

Wiring connections

WIRING - MI 8-4 to CNC CONTROL

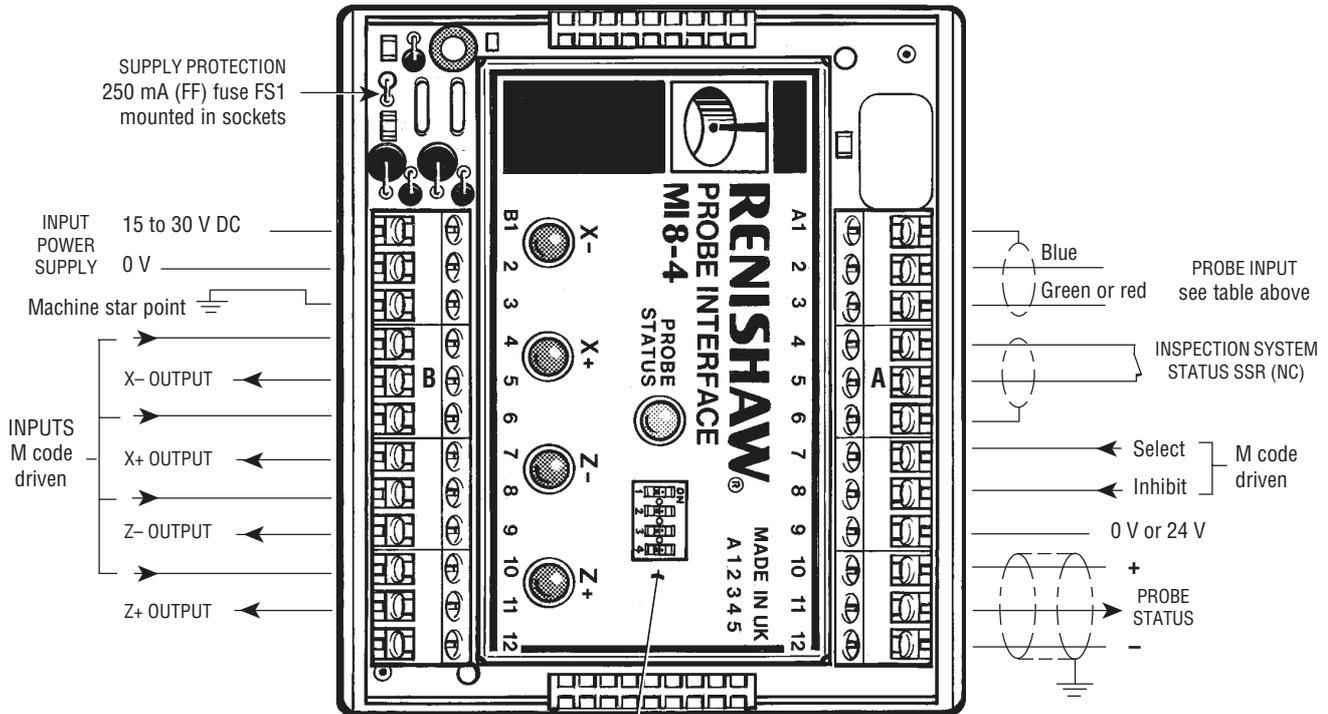
Use single wires.
Each wire Ø2,5 mm sq. (Ø0.10 in sq.) maximum.
Maximum permitted length 3 m (9.8 ft).

Screened cable is recommended for probe status when driving a TTL input. Also for all MI 8-4 to CNC control connections where cable lengths of 3 to 10m (9.8 to 32.8 ft) are used and interference may be encountered.

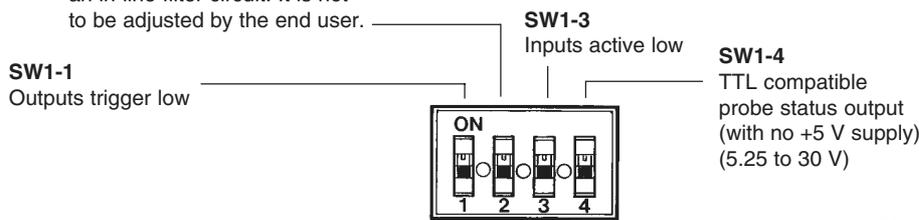
WIRING - PROBE to MI 8-4

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

Terminal No.	Wire colour	LP2 RP2 MP6-3	MP4 TS20 TS27R
A2	Blue	●	●
A3	Green	●	●
A3	Red		●



SW1-2 should be in the off position. This switch activates an in-line filter circuit. It is not to be adjusted by the end user.



PIN	DESCRIPTION
B1	POWER SUPPLY 24 V
B2	POWER SUPPLY 0 V
B3	MACHINE STAR POINT
B4	SELX- INPUT
B5	X- OUTPUT
B6	SELX+ INPUT
B7	X+ OUTPUT
B8	SELZ- INPUT
B9	Z- OUTPUT
B10	SELZ+ INPUT
B11	Z+ OUTPUT
B12	SCREEN

SW1-1 Outputs trigger high
SW1-3 Inputs active high

PIN	DESCRIPTION
A1	SCREEN
A2	PROBE INPUT +
A3	PROBE INPUT -
A4	INSPECTION SYSTEM INPUT +
A5	INSPECTION SYSTEM INPUT -
A6	SCREEN
A7	INSPECTION SELECT
A8	INHIBIT
A9	INPUT RESISTORS COMMON
A10	OUTPUT SUPPLY +
A11	PROBE STATUS OUTPUT
A12	OUTPUT SUPPLY -

TWO PROBE OPERATION

Toolsetting and inspection

The MI 8-4 has a facility for connecting an output from a different Renishaw probe system (i.e. inspection) and then selecting which probe input (toolsetter or inspection) is routed out through the outputs.

The selection of probe is controlled by a machine control input to the MI 8-4 (M Code).

When the inspection select input is active the inspection system input is routed through to the outputs. When inactive the probe input (toolsetter) is routed through the outputs.

The inspection system input can be driven by a normally closed relay (open for trigger) or a totem-pole output (high for triggered).

INHIBIT, INSPECTION SELECT and MACHINE AXIS MOVING INPUTS

These inputs are open collector transistor (OCT), totem-pole, and relay compatible.

They can be configured as active low or active high. Also, they can be terminated by pull-up or pull-down resistors.

With the input resistors common (A9) connected to 0 V all inputs have 2k4 pull-down resistors. With it connected to 24 V, all inputs have 2k4 pull up resistors.

Switch **SW1-3** controls the polarity of the input signals.

SW1-3 OFF = Inputs active high.
SW1-3 ON = Inputs active low.

V in low = 4.0 V max.
V in high = 11.0 V min.

If the inputs are not to be used then SW1-3 should be in the default state of OFF and the input resistors common (A9) should be connected to 0 V.

This makes all inputs inactive.

PROBE STATUS XAE/ZAE OUTPUTS

Switch **SW1-1** controls the polarity of all the output signals.

SW1-1 OFF Output triggered = High.
SW1-1 ON Output triggered = Low.

Probe status output

This is an isolated totem-pole output which requires a three wire connection: signal, power and ground. It works over a 4.75 to 30 V supply range and will source and sink up to 20 mA.

Output voltage high

(V supply minus 3.5 V max) at 20 mA.
(V supply minus 2.8 V max) at 10 mA.

Output voltage low

0.6 V max at 20 mA.
0.4 V max at 10 mA.

Supply current

10 mA max at 30 V.

The three wires are protected against short circuit by current limiting circuitry.

TTL COMPATIBILITY

The probe status output is TTL compatible with a 5V \pm 5% supply voltage. If this supply voltage is not available then another voltage in the 4.75 V to 30 V range can be used with **SW1-4** ON.

V out high = 2.5 V min at 2.5 mA.
V out low = 0.4 V max at 10 mA.

With **SW1-4** ON, the probe status output will be TTL compatible, irrespective of the supply voltage.

Supply current with **SW1-4** ON,

22 mA max at 30 V.
15 mA max at 10 V.

FANUC 'AUTOMATIC LENGTH MEASUREMENT'

The four 'machine axis moving' inputs (B4, B6, B8, B10) to the MI 8-4 are open collector transistor (OCT), totem-pole and relay compatible.

The four outputs (B5, B7, B9, B11) are totem-pole outputs supplied by the 15 to 30 V power supply (B1, B2) to the MI 8-4.

Output voltage high

(V supply minus 4.0 V max) at 20 mA.
(V supply minus 3.4 V max) at 10 mA.

Output voltage low

1.5 V max at 20 mA.
1.0 V max at 10 mA.

The outputs are protected against short circuit by current limiting circuitry.

Installation

dimensions mm (in)

INSTALLATION

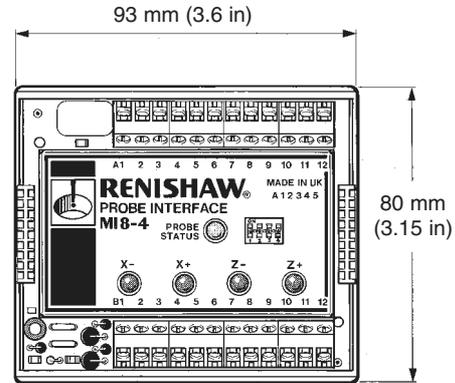
Ideally install the interface in the CNC machine control cabinet.

Take care to avoid potential sources of interference, such as three phase transformers and motor controllers.

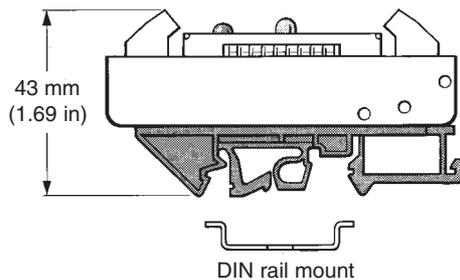
MOUNTING

Two forms of mounting are supplied.

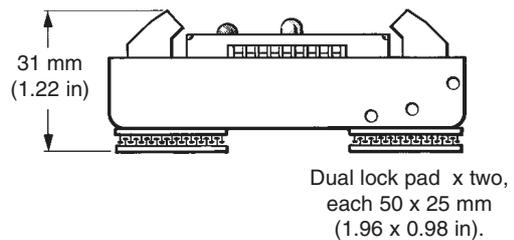
1. DIN rail mounted, compatible with all DIN EN carrier rails.
2. Dual lock self adhesive fixing allows the MI 8-4 to be attached to any flat surface.



DIN RAIL MOUNTING



DUAL LOCK PAD MOUNTING



POWER SUPPLY

The MI 8-4 can draw its supply from the CNC machine 24 V nominal DC supply.

Alternatively a Renishaw PSU3 power supply unit supplies power when a 24 V supply is not available from the machine control.

ENVIRONMENT

Storage temperature -10° to 70° C (14° to 158° F)

Operating temperature 0° to 50° C (32° to 122° F)

WARNING

The MI 8-4 interface must NOT be used with an in-line signal conditioning module (SCM) supplied with Renishaw high precision arms (HPA) and some TS20 probes.

Parts List - Please quote the Part No. when ordering equipment

Type	Part No.	Description
MI 8-4	A-2157-0001	MI 8-4 interface unit supplied with DIN rail mount and dual lock pads.
Fuse	P-FS20-1A25	250 mA (FF) anti-surge fuse.
PSU3	—	See Data Sheet H-2000-2200 PSU3 power supply unit.

For worldwide contact details please visit our website at www.renishaw.com