

## MI 8 interface unit



© 1995 Renishaw. All rights reserved.

Renishaw® is a registered trademark of Renishaw plc.

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

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

Renishaw part no: H-2000-5015-05-N

Issued: 03.2003

## **Disclaimer**

Considerable effort has been made to ensure that the contents of this document are free from inaccuracies and omissions. However, Renishaw makes no warranties with respect to the contents of this document and specifically disclaims any implied warranties. Renishaw reserves the right to make changes to this document and to the product described herein without obligation to notify any person of such changes.

## **Trademarks**

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

**Installation and user's guide**  
**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 harmful 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.

**D****ACHTUNG****Informationen für den Benutzer**

Durchgebrannte Sicherungen müssen mit gleichwertigen ersetzt werden. Beziehen Sie sich bitte auf die SICHERHEITSHINWEISE in der Produktdokumentation.

Vor Wartungsarbeiten muss die Stromversorgung getrennt werden.

Beziehen Sie sich auf die Wartungsanleitungen des Lieferanten.

**Informationen für den Maschinenlieferanten**

Es obliegt dem Maschinenlieferanten, den Anwender über alle Gefahren, die sich aus dem Betrieb der Ausrüstung, einschließlich der, die in der Renishaw Produktdokumentation erwähnt sind, zu unterrichten und zu versichern, dass ausreichende Sicherheitsvorrichtungen und Verriegelungen eingebaut sind.

Unter gewissen Umständen könnte das Messtaster Fehlsignale melden (Ausgelenkt). Verlassen sie sich nicht auf das Messtastersignal um die Maschine zu stoppen.

**DK****ADVARSLER****Oplysninger til brugeren**

Udskift sikringer, der er sprunget, med nye komponenter af samme type. Se i afsnittet SIKKERHED (SAFETY) i produktdokumentationen.

Afbryd strømforsyningen, før der foretages vedligeholdelse.

Se maskinleverandørens brugervejledning.

**Oplysninger til maskinleverandøren**

Det er maskinleverandørens ansvar at sikre, at brugeren er bekendt med eventuelle risici i forbindelse med driften, herunder de risici, som er nævnt i Renishaws produktdokumentation, og at sikre, at der er tilstrækkelig afskærmning og sikkerhedsblokeringer.

Under visse omstændigheder kan probesignalet ved en fejl angive, at proben står stille. Stol ikke på, at probesignaler stopper maskinens bevægelse.

## E

**ADVERTANCIAS****Información para el usuario**

Sustituir los fusibles fundidos con componentes nuevos del mismo tipo. Remitirse a la sección titulada SEGURIDAD (SAFETY) en la documentación sobre el producto.

Quitar la corriente antes de emprender cualquier operación de mantenimiento.

Remitirse a las instrucciones de manejo del proveedor de la máquina.

**Información para el proveedor de la máquina**

Corresponde al proveedor de la máquina asegurar que el usuario esté consciente de cualquier peligro que implica el manejo de la máquina, incluyendo los que se mencionan en

la documentación sobre los productos Renishaw y le corresponde también asegurarse de proporcionar dispositivos de protección y dispositivos de bloqueo de seguridad adecuados.

Bajo determinadas circunstancias la señal de la sonda puede indicar erróneamente que la sonda está asentada. No fiarse de las señales de la sonda para parar el movimiento de la máquina.

## F

**AVERTISSEMENTS****Informations à l'attention de l'utilisateur**

Remplacer les fusibles grillés par des composants neufs du même type. Consulter la section SECURITE de votre documentation.

Mettre la machine hors tension avant d'entreprendre toute opération de maintenance.

Consulter le mode d'emploi du fournisseur de la machine.

**Informations à l'attention du fournisseur de la machine**

Il incombe au fournisseur de la machine d'assurer que l'utilisateur prenne connaissance des dangers d'exploitation, y compris ceux décrits dans la documentation du produit Renishaw, et d'assurer que des protections et verrouillages de sûreté adéquats soient prévus.

Dans certains cas, il est possible que le signal issu du capteur indique à tort que celui-ci est hors matière. Ne pas se fier aux signaux du capteur qui ne garantissent pas toujours l'arrêt de la machine.

## FIN TURVALLISUUS

### **Käyttäjälle tarkoitettuja tietoja**

Korvaa palaneet sulakkeet samantyyppisillä uusilla sulakkeilla. Lue tuoteselosteen TURVALLISUUTTA (SAFETY) koskeva osa.

Kytke virta pois päältä ennen huoltotoimenpiteitä.

Katso koneen toimittajan käyttöohjeita.

### **Tietoja koneen toimittajalle**

Koneen toimittajan vastuulla on, että käyttäjä on saanut tiedon mahdollisista käyttöön liittyvistä vaaroista, mukaan lukien Renishaw'n tuoteselosteessa mainitut vaarat. Konetoimittajan tulee myös varmistaa, että suojukset ja turvalukitukset ovat riittävät.

Tietyissä olosuhteissa anturilta tuleva signaali saattaa osoittaa virheellisesti, että anturi on paikallaan. Älä luota anturin signaaleihin koneen liikkeen pysäyttämiseksi.

## GR ΠΡΟΕΙΔΟΠΟΙΗΣΕΙΣ

Πληροφορίες για τους χρήστες  
Αντικαταστήστε τις καμένες ασφάλειες με νέες ασφάλειες του ίδιου τύπου. Ανατρέξτε στο κεφάλαιο SAFETY (ΑΣΦΑΛΕΙΑ) στο σχετικό εγχειρίδιο προϊόντος.

Αποσυνδέστε το μηχάνημα από το ηλεκτρικό ρεύμα προτού επιχειρήσετε τυχόν εργασίες συντήρησης.

Ανατρέξτε στις οδηγίες λειτουργίας του προμηθευτή του μηχανήματος.

Πληροφορίες για τους προμηθευτές των μηχανημάτων

Αποτελεί ευθύνη του προμηθευτή του μηχανήματος να εξασφαλίσει ότι ο χρήστης είναι ενήμερος ενδεχόμενων κινδύνων που συνεπάγεται η λειτουργία, συμπεριλαμβανομένων όσων αναφέρονται στο έντυπο συνοδευτικό υλικό των προϊόντων της Renishaw. Είναι επίσης ευθύνη του να εξασφαλίσει ότι υπάρχουν τα απαιτούμενα προστατευτικά καλύμματα και μανδάλωσις ασφάλειας.

Σε ορισμένες περιπτώσεις το σήμα ανιχνευτή μπορεί να δείξει λανθασμένα ότι ο ανιχνευτής έχει τοποθετηθεί. Μη βασίζεστε στα σήματα ανιχνευτή για να διακόψετε την κίνηση του μηχανήματος.

## I SICUREZZA

### **Informazioni per l'utente**

Per essere in condizioni di sicurezza continuativa è indispensabile che il fusibile sia sostituito con un componente del tipo corretto e di uguale valore nominale. Consultare la sezione SICUREZZA nella documentazione dello specifico prodotto.

Prima di effettuare qualsiasi intervento di manutenzione, isolare dall'alimentazione di rete.

Consultare le istruzioni d'uso del fabbricante della macchina.

### **Informazioni per il fabbricante della macchina**

Il fornitore della macchina ha la responsabilità di avvertire l'utente dei pericoli inerenti al funzionamento della stessa, compresi quelli riportati nelle istruzioni della Renishaw, e di fornire ripari di sicurezza e interruttori di esclusione adeguati.

È possibile che in certe situazioni venga erroneamente prodotto un segnale che indica che la sonda è in posizione. Non fare affidamento sugli impulsi trasmessi dalla sonda per arrestare la macchina.

## NL WAARSCHUWINGEN

### **Informatie voor de Gebruiker**

Doorgeslagen zekeringen met nieuwe componenten van hetzelfde type vervangen. U wordt verwezen naar het hoofdstuk VEILIGHEID (SAFETY) in de produktendocumentatie.

Voordat u enig onderhoud verricht dient u de stroom uit te schakelen.

Raadpleeg de bedieningsinstructies van de machineleverancier.

### **Informatie voor de Machineleverancier**

De leverancier van de machine is ervoor verantwoordelijk dat de gebruiker op de hoogte wordt gesteld van de risico's die verbonden zijn aan bediening, waaronder de risico's die vermeld worden in de produktendocumentatie van Renishaw. De leverancier dient er tevens voor te zorgen dat de machine is voorzien van voldoende beveiligingen en veiligheidsgrenselinrichtingen.

Onder bepaalde omstandigheden kan het tastersignaal een onjuiste tastertoestand aangeven. Vertrouw niet op de tastersignalen voor het stoppen van de machinebeweging.



## P AVISOS

### **Informações para o Utilizador**

Substituir fusíveis danificados por novos componentes do mesmo tipo. Consultar a seção SEGURANÇA (SAFETY) na documentação do produto.produto.

Desligar a alimentação de energia antes de efetuar qualquer operação de manutenção.

Consultar as instruções de funcionamento do fabricante da máquina.

### **Informações para o Fornecedor da Máquina**

É responsabilidade do fabricante da máquina assegurar que o usuário esteja consciente de quaisquer perigos envolvidos na operação, incluindo os mencionados na documentação dos produtos Renishaw e assegurar que são fornecidas proteções e bloqueios de segurança adequados.

Em determinadas circunstâncias, o sinal do apalpador pode indicar incorretamente uma condição de toque. Não confie nos sinais do apalpador para parar o movimento da máquina.

## SW VARNING

### **Information för användaren**

Byt ut smälta säkringar med nya av samma typ. Se avsnittet SÄKERHET (SAFETY) i produktdokumentationen.

Koppla bort strömmen innan underhåll utförs.

Se maskintillverkarens bruksanvisning.

### **Information för maskinleverantören**

Maskinleverantören ansvarar för att användaren informeras om de risker som drift innebär, inklusive de som nämns i Renishaws produktdokumentation, samt att tillräckligt goda skydd och säkerhetsförelagningar tillhandahålls.

Under vissa omständigheter kan sondens signal falskt ange att en sond är monterad. Lita ej på sondersignaler för att stoppa maskinens rörelse.

# Installation and users guide - English

## Contents

MI 8 interface unit	...	...	1-1
MI 8 function	...	...	1-2
MI 8 specification	...	...	1-3
MI 8 wiring connections	...	...	1-4
LP2 hard wired inspection system			1-6
MI 8 output signal	...	...	1-7
Parts list	...	...	1-7

## 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.

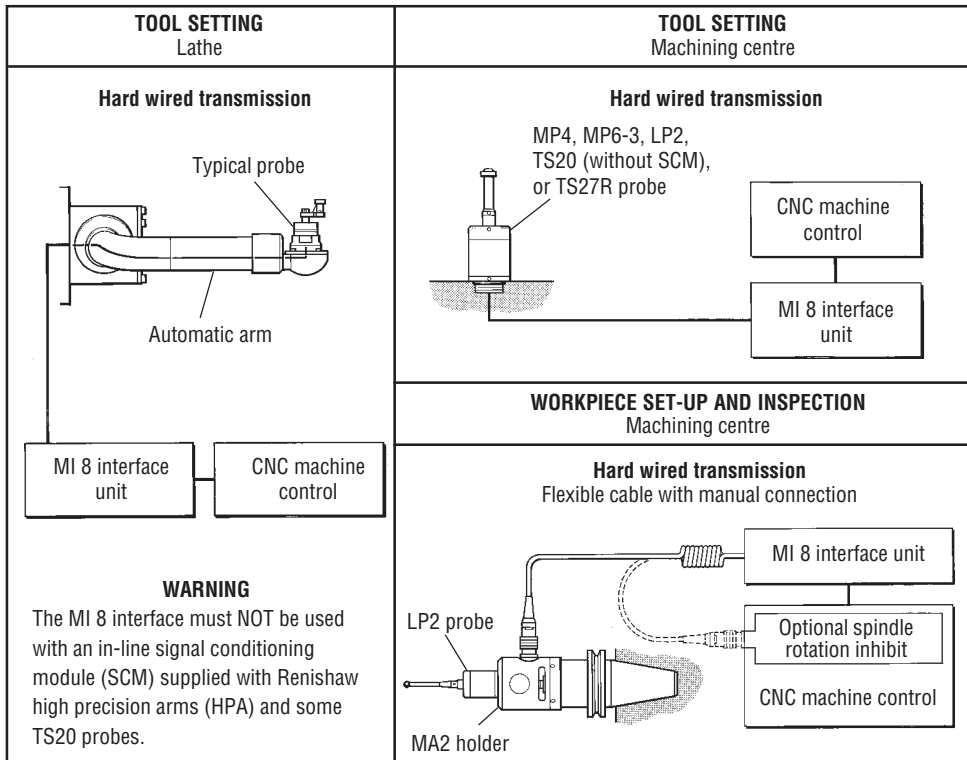
## ENVIRONMENT

### Temperature

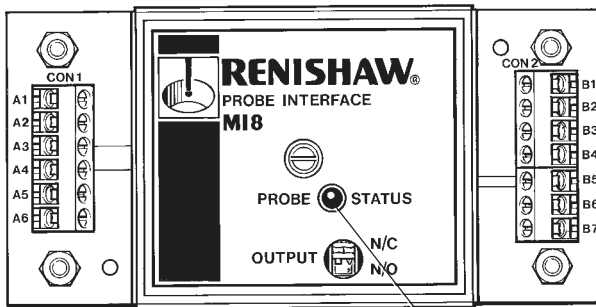
The MI 8 is specified for storage over  $-10^{\circ}$  to  $70^{\circ}$  C (14 to  $158^{\circ}$  F) and operation over  $5^{\circ}$  to  $50^{\circ}$  C ( $41^{\circ}$  to  $122^{\circ}$  F) ambient temperature range.

## 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.



## 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 resealed, 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.

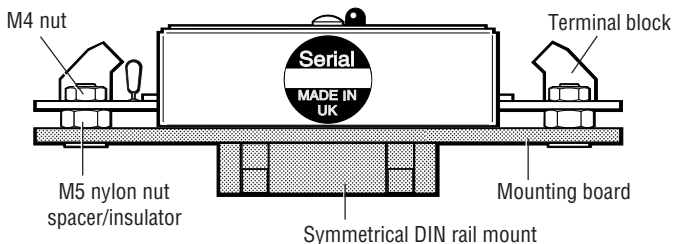
#### Remote LED (not supplied by Renishaw)

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  $\pm 50$  V peak

## MI 8 CONNECTIONS

dimensions mm (in)

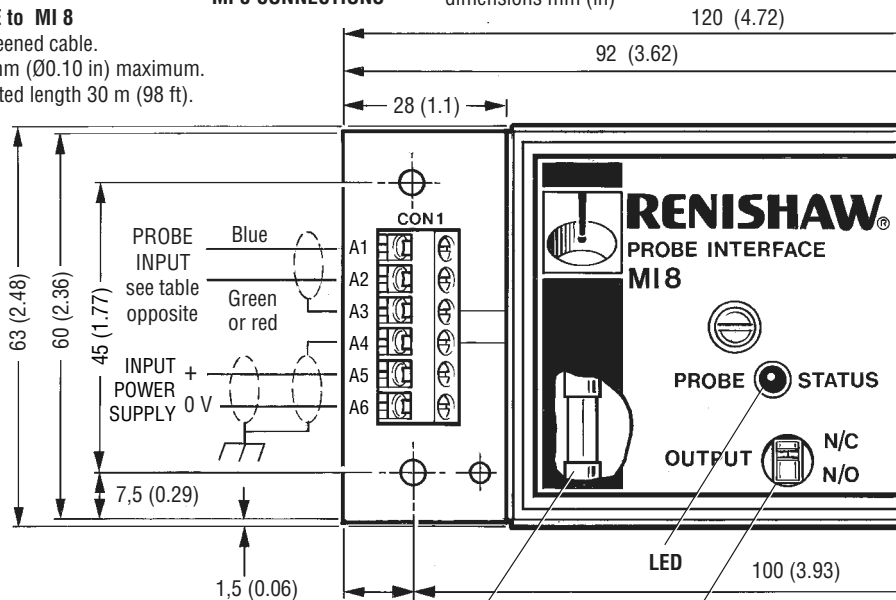
## WIRING - PROBE to MI 8

Use two core screened cable.

Each core  $\varnothing 2,5$  mm ( $\varnothing 0.10$  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

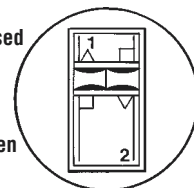
**WARNING**

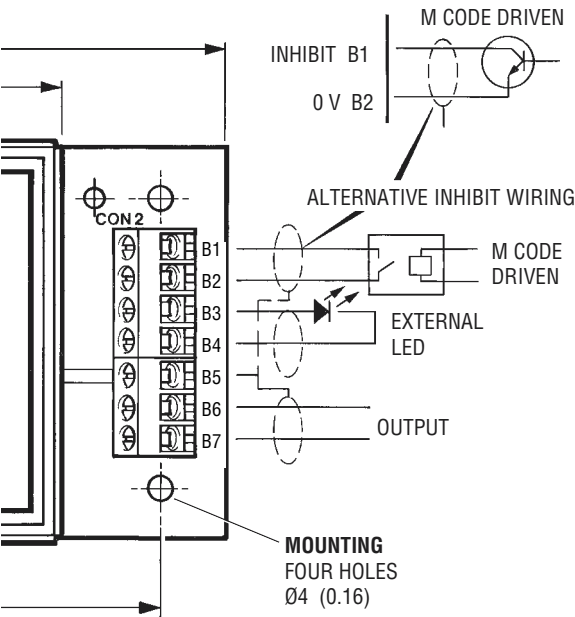
For safe operation it is essential to fit a fuse of the correct rating

Normally closed (N/C)



Normally open (N/O)



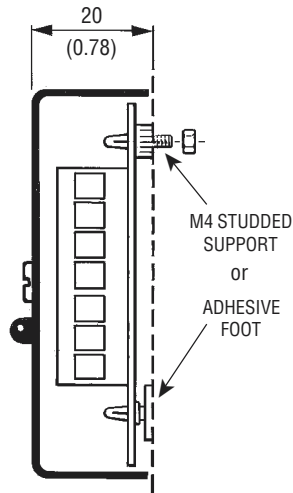


PIN	DESCRIPTION	COMMENTS
B1	INHIBIT	Inhibit function (active low)
B2	INHIBIT 0V	
B3	EXTERNAL LED	+ ve
B4	EXTERNAL LED	- ve
B5	SCREEN	For cable screens
B6	OUTPUT	SSR voltage free
B7	OUTPUT	

### WIRING - MI 8 to CNC CONTROL

Use two core screened cable.

Each core  $\varnothing 2,5$  mm ( $\varnothing 0.10$  in) maximum.



### 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

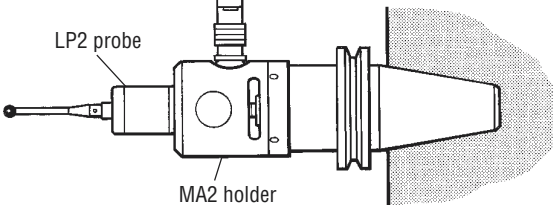
The probe should **not** be rotated (spun) by the machine's spindle with the cable connected. If this is allowed, then serious injury could occur to persons nearby due to flying cable or entanglement.

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.

Remote socket  
Lemo Part no.  
EGG 1K 303 CNL  
or  
Renishaw Part no.  
P-CN21-0303



### CNC MACHINE CONTROL

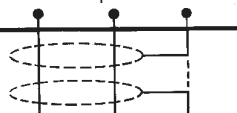
**HIGH**  
spindle rotation  
**Inhibited**

**LOW**  
spindle rotation  
**enabled**

#### Note

To pull the input low, the remote socket connects the cable screen to the input. This will only work if the machine's screen terminal is connected to the machine's 0 V terminal.

Probe input    Screen



Blue

Green

Screen

B6

B7

B5

**MI 8  
interface  
unit**

### 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).

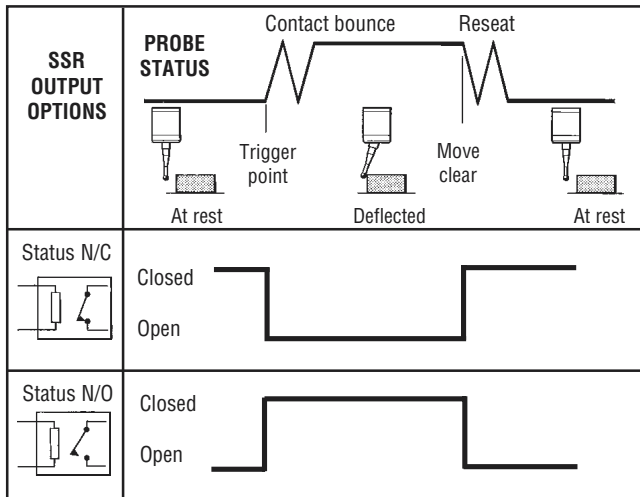
or

Normally open (N/O).

(Teledyne 640-1 or equivalent).  
Maximum current  $\pm 40$  mA peak.  
Maximum voltage  $\pm 50$  V peak.

### Note:

Change of state debounce time is 20 mS  $\pm$  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

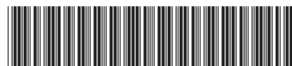
Type	Part no.	Description
MI 8	A-2037-0010	MI 8 interface unit complete with four M4 studded supports, nuts and four adhesive feet.
MI 8/DIN Fuse	A-2037-0020 P-FS01-0080	MI 8 interface for DIN rail mounting. 80 mA (T) anti-surge fuse. One spare fuse is supplied with kit A-2037-0010 and kit A-2037-0020.

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

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

**RENISHAW**   
apply innovation

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



\* H - 2 0 0 0 - 5 0 1 5 - 0 5 - N \*