Installation and user's guide
H-1000-5180-01-A

RENISHAW
apply innovation™

NDI AUTOsense touch trigger module

Renishaw part no: H-1000-5180-01-A

Issued: 11 2008

NDI AUTOsense touch trigger module

installation and user's guide

CE

Care of equipment

Renishaw probes and associated systems are precision tools used for obtaining precise measurements and must therefore be treated with care.

CAUTION: The product should not be included in general rubbish.

Changes to equipment

Renishaw reserves the right to improve, change or modify its hardware or software without incurring any obligations to make changes to Renishaw equipment previously sold.

Warranty

Renishaw plc warrants its equipment provided that it is installed exactly as defined in associated Renishaw documentation.

Prior consent must be obtained from Renishaw if non-Renishaw equipment (e.g. interfaces and/or cabling) is to be used or substituted for Renishaw equipment. Failure to comply with this will invalidate the Renishaw warranty.

Claims under warranty must be made from authorised service centres only, which may be advised by the supplier or distributor.

Patents

Aspects of the NDI AUTOsense touch trigger module system have patents applied for.

CAUTION: The NDI AUTOsense touch trigger module will only work with genuine AUTOsense module styli. When switching on the module ensure a genuine stylus is fitted and that the stylus is not in contact with any surface until the module status LED turns green.

EC DECLARATION OF CONFORMITY

Renishaw plc declare that the product:

Name(s):	MSP3
Description:	NDI AUTOsense touch trigger module
Part no.:	A-3053-2300

has been manufactured in conformity with the following standards:

BS EN 61326-1:2006	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements Immunity to Table 2 - industrial locations. Emission to Class A - industrial locations.

and that it complies with the requirements of the following directive:

2004/108/EC	Electromagnetic compatibility

The above information is summarised from the full EC Declaration of Conformity. A copy is available from Renishaw on request.

Contents

1 Introduction

This installation and user's guide is for the NDI AUTOsense touch trigger module (see figure 1):

The AUTOsense module is a dual function stylus holder that enables touch trigger probing for both single-point and scanning. The AUTOsense module is only compatible with supported NDI hand-held probes.

Figure 1 - NDI AUTOsense touch trigger module

2 Product description

2.1 The AUTOsense touch trigger module kit

The standard AUTOsense module kit (Renishaw part no. A-3053-4200) comprises the following components (see figure 2):

• NDI AUTOsense module	A-3053-2300
• Ø 4 mm (0.16 in) x 30 mm (1.18 in) stylus	A-5004-1188
• Ø 6 mm (0.24 in) x 60 mm (2.36 in) stylus	A-5004-1189
• Two M4 stylus tools (boxed)	A-3053-2196
• Cleaning kit	A-1085-0016
• System installation and user's guide CD	H-1000-5181
• Kit box	A-1015-8550

2.1.1 The AUTOsense module

The module body incorporates a kinematic connector that attaches to the stylus assembly mount on supported NDI hand-held probes.

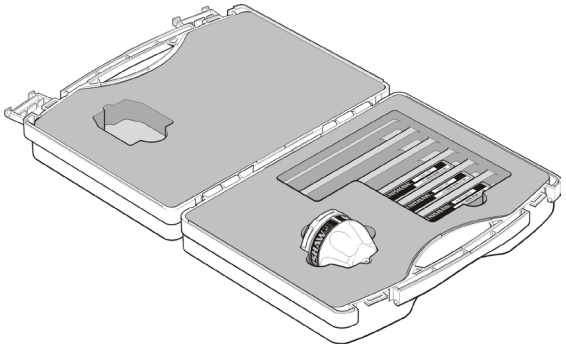

Figure 2 - The NDI AUTOsense touch trigger module boxed kit

3 Product installation

Before using the NDI AUTOsense system assemble a supported stylus to the module, connect the stylus assembly to the probe and qualify it. Once qualified the AUTOsense stylus assembly can be attached to and removed from the probe with no additional calibration.

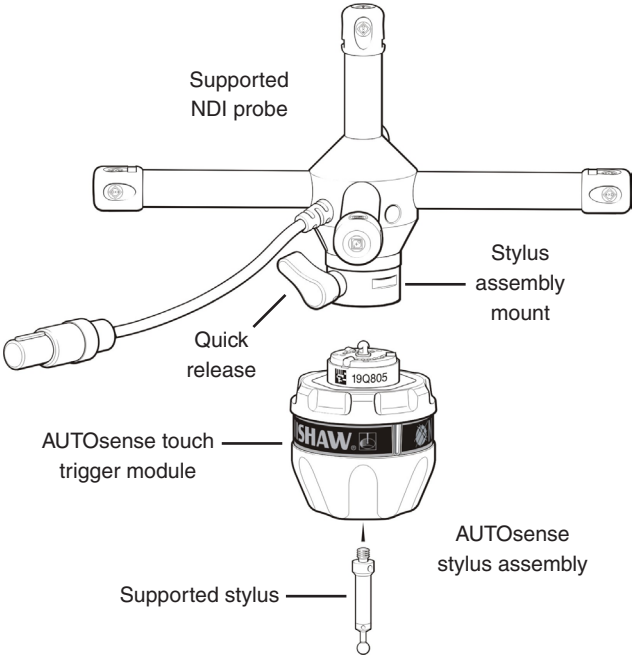

Figure 3 - The NDI AUTOsense system components

3.1 Creating and connecting an AUTOsense stylus assembly

1. Screw/thread a stylus into the AUTOsense module by hand.
2. Hold the AUTOsense module in one hand and insert a stylus tool through the eyehole of the supported stylus.
3. Tighten the supported stylus to a maximum tightening torque of 2 Nm - 17.7 ibf.in.

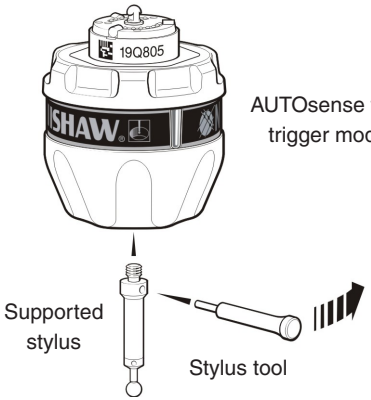

Figure 4 - Stylus fitting

4. Connect the AUTOsense stylus assembly to the stylus assembly mount so the alignment marks line up.

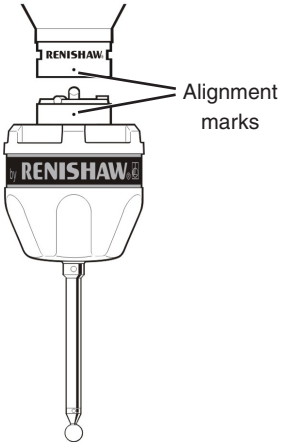

Figure 5 - NDI AUTOsense module alignment

5. Tighten the connection by turning the quick release lever until it stops.

6. Perform a stylus calibration as described in the *'OPTOTRAK PROseries User Documentation'*.

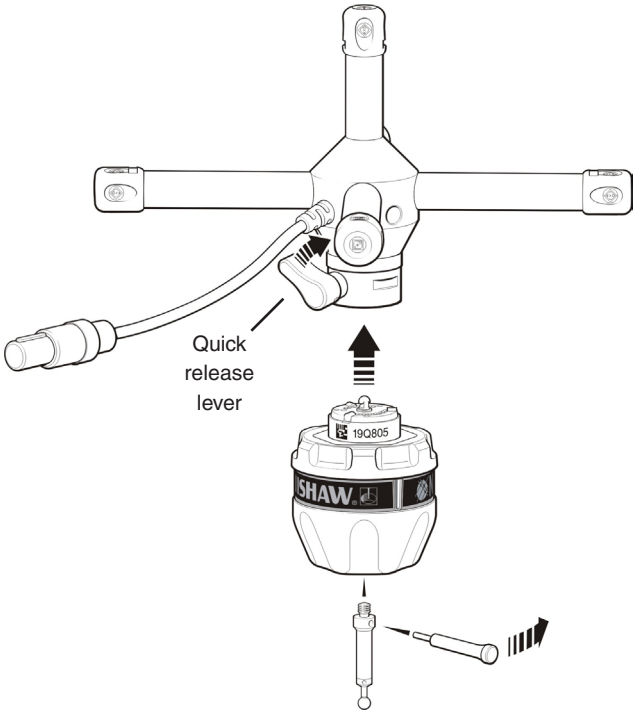

Figure 6 - NDI AUTOsense module fitting

4 Product operation

4.1 Operational modes

The various modes of the NDI AUTOsense module are indicated by the two status LED's on the side of the module:

Solid Blue	Module is in sleep mode. If the probe is not used for a period of time the module is switched into sleep mode. The software will automatically wake the probe.
Flashing Blue	Module is auto-zeroing which may take 8 seconds to find optimum sensitivity for the stylus connected.
Solid Green	Module has auto-zeroed successfully and is ready to measure. Green also indicates the module is not in contact with a surface.
Solid Red	Module auto-zeroed successfully and is in measuring mode contacting the surface. Position data signals are being generated.
Flashing Red	Module failed to auto-zero and will NOT take data points. Check that a stylus is present and that the stylus is correctly tightened.

NOTE: Whilst the module is auto-zeroing ensure the stylus does NOT come into contact with any surface.

Always recalibrate the module and stylus if the stylus has been removed.

4.2 Operation

NOTE: When the stylus has been replaced or changed, the auto zeroing will take up to 8 seconds.

NDI AUTOsense module auto zero results in flashing red:

- Ensure that the stylus mounting threads on the stylus and the AUTOsense module are clean
- Ensure the stylus ball and shank are entirely free of contacts during the auto-zeroing process
- You must only use NDI AUTOsense module styli

NOTE: While flashing red, the module will not sense surfaces.

4.3 Accuracy of measurement

Operator variability when measuring with the NDI AUTOsense module can be significantly reduced by careful selection of the measuring mode and stylus configuration for the job in hand. Following these simple rules will result in successful data collection.

Use scanning mode only when:

- The part is rigid – for example an engine block.

Always use point measurement mode when:

- The part is not rigid (sheet metal or plastic components).

Whilst measuring :

- Do not touch the stylus tip or stylus shank with any part of the body as this can issue false triggers.
- Only touch the surface being measured with the stylus tip.
- Use consistent amount of force between the stylus tip and part.
- Use consistent amount of force when calibrating and when measuring.
- Use the minimum amount of force required to trigger the probe when measuring.

4.4 Calibration

Perform a stylus calibration as described in the *'OPTOTRAK PROseries User Documentation'*.

5 Technical data

5.1 Measuring performance

NOTE: The following data is derived from high accuracy test rig with a Ø 6 mm (0.24 in) x 30 mm (1.18 in) stylus measurements and may not represent the performance achievable on a probe.

5.1.1 Technical specification

Product compatibility	The NDI AUTOsense module is suitable for use with supported NDI hand-held probes.	
Dimensions		
Diameter	51 mm (2.01 in)	
Length	62.85 mm (2.47 in)	
Probe mount	Renishaw autojoint	
Stylus mount	Thread M4 x 0.7 mm	
Sensing directions	6-way	(±X, ±Y, ±Z)
Sealing	IP30	
Repeatability	1 µm 2 σ (0.0000394 in)	
Trigger force	0.02 - 0.04 Nm (2 - 4 gf)	
Pre-travel	4.5 µm (0.000177 in)	
Pre-travel variation	1 µm (0.0000349 in)	
Weight	161 g (5.68 oz)	

6 Applications guide

6.1 Stylus selection

The NDI AUTOsense module comes supplied with two matching styli which are specially designed for the highest accuracy and sensitivity. The stylus design is carefully matched to the module contact sensing system. Third party styli should not be used.

NOTE: Choosing the best stylus for a given application is an important factor in achieving optimum probe performance.

When selecting a stylus, it is important that the stylus length is kept to the minimum required to access all features to be measured.

It is also important to ensure that the stylus ball diameter chosen is as large as is practical. This not only ensures that the stylus will be as stiff as possible, but also reduces the stylus susceptibility to surface form and surface finish.

6.1.1 The list of available styli

Part number	Ball Ø mm (in)	Length mm (in)	ELW* mm (in)
A-5004-1188	4 (0.16)	30 (1.18)	6.5 (0.26)
A-5004-1189	6 (0.24)	60 (2.36)	55.5 (2.19)
A-5004-0291	3 (0.12)	30 (1.18)	6.5 (0.25)
A-5004-0293	6 (0.24)	30 (1.18)	25.4 (1.0)

* Effective working length.

6.1.2 Recommended stylus limits

Owing to the modular construction of the NDI AUTOsense module, it is recommended that the limits shown in figure 7 are applied when selecting styli to be used.

- No star or cranked styli

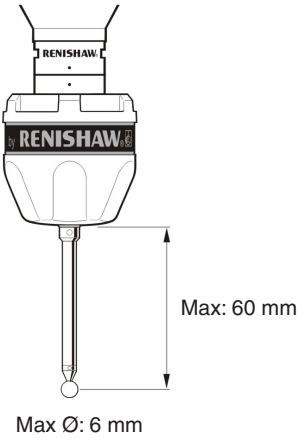

Figure 7 - Recommended stylus limits

7 Product maintenance

NOTE: Maintenance of the NDI AUTOsense module is restricted to the periodic cleaning of the stylus M4 mating faces and the three rollers and three sets of balls. To aid cleaning of these couplings, each NDI AUTOsense module is supplied with a Renishaw cleaning kit.

Each Renishaw cleaning kit contains a specialised material to effectively remove contamination from location faces.

Styli that are not attached to the probe should be stored in their transport boxes, to prevent contamination and damage.

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
www.renishaw.com

RENISHAW
apply innovation™

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

H-1000-5180-01