



HST-Lite Scanner User's Manual

DMTA-20045-01EN — Revision A

October 2012

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This document was prepared with particular attention to usage to ensure the accuracy of the information contained therein, and corresponds to the version of the product manufactured prior to the date appearing on the title page. There could, however, be some differences between the manual and the product if the product was modified thereafter.

The information contained in this document is subject to change without notice.

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Table of Contents

Labels and Symbols	1
Important Information — Please Read Before Use	3
Intended Use	3
Instruction Manual	3
Instrument Compatibility	4
Safety Symbols	4
Safety Signal Words	5
Note Signal Words	6
Warnings	6
WEEE Directive	7
Warranty Information	7
Technical Support	8
1. HST-Lite Scanner	9
1.1 Positioning the Frame Bar	10
1.2 Installing a Probe and a Wedge in a Probe Holder	11
1.3 Setting the Distance Between Beam Exit Points	13
1.4 Positioning the Wheel Encoder	16
1.5 Installing Tubing and Cables	16
1.6 Installing the Cable Sheath	19
1.7 Scanner Wheels	22
1.8 Installing a Preamplifier	24
1.9 Offset Probe Configuration	26
2. Parts and Accessories	29
2.1 Standard Accessories	29
2.2 Optional Accessories	30

3. Specifications	31
List of Figures	33
List of Tables	35
Index	37

Labels and Symbols

Marking of the HST-Lite Scanner is shown in Figure i-1 on page 1. If the marking is illegible, please contact Olympus.

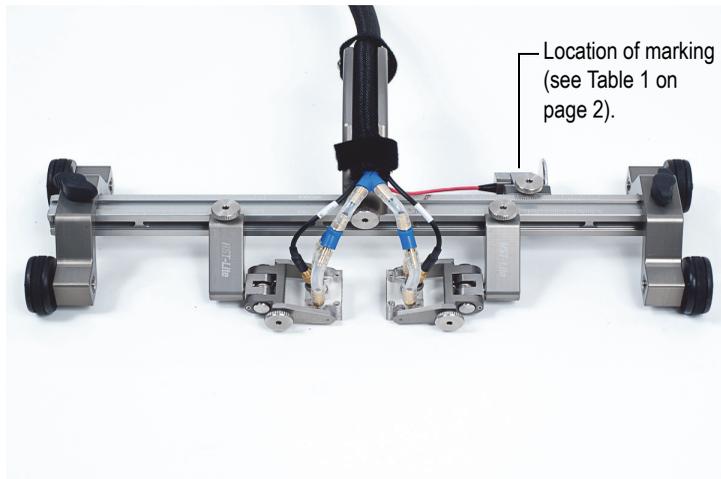


Figure i-1 Marking location

Table 1 Content of the marking

Marking:	
Contains:	
S/N	The serial number.
	The CE marking is a declaration that this product conforms to all the applicable directives of the European Community. See the <i>Declaration of Conformity</i> for details.
	The WEEE symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.

Important Information — Please Read Before Use

Intended Use

The HST-Lite Scanner is designed to perform nondestructive inspections on industrial and commercial materials.



CAUTION

Do not use the HST-Lite Scanner for any purpose other than its intended use. It must never be used to inspect or examine human or animal body parts.

Instruction Manual

This instruction manual contains essential information on how to use this Olympus product safely and effectively. Before using this product, thoroughly review this instruction manual, and use the product as instructed.

Keep this instruction manual in a safe, accessible location.

Instrument Compatibility

The HST-Lite Scanner is compatible with the ancillary Olympus equipment listed in Table 2 on page 4. For a list of other compatible parts and accessories, refer to chapter 2 on page 29.



CAUTION

Using incompatible equipment could cause malfunction and/or equipment damage.

Table 2 Ancillary equipment

Equipment	Description
OmniScan MX	Phased array instrument
TomoScan FOCUS LT	Phased array instrument (using the optional C1-DE15F-BXM-0.30M [U8767107] encoder adaptor)
OmniScan MXU	OmniScan software
OmniScan MX2	Phased array instrument (using the adaptor OMNI-A2-ADP20 [U8775201] supplied with the instrument)
TOFD wedges	ST1 and ST2 type

Safety Symbols

The following safety symbols might appear on the instrument and in the instruction manual:



General warning symbol:

This symbol is used to alert the user to potential hazards. All safety messages that follow this symbol shall be obeyed to avoid possible harm.



High voltage warning symbol:

This symbol is used to alert the user to potential electric shock hazards greater than 1000 volts. All safety messages that follow this symbol shall be obeyed to avoid possible harm.

Safety Signal Words

The following safety symbols might appear in the documentation of the instrument:



DANGER

The DANGER signal word indicates an imminently hazardous situation. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in death or serious personal injury. Do not proceed beyond a DANGER signal word until the indicated conditions are fully understood and met.



WARNING

The WARNING signal word indicates a potentially hazardous situation. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in death or serious personal injury. Do not proceed beyond a WARNING signal word until the indicated conditions are fully understood and met.



CAUTION

The CAUTION signal word indicates a potentially hazardous situation. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in minor or moderate personal injury, material damage, particularly to the product, destruction of part or all of the product, or loss of data. Do not proceed beyond a CAUTION signal word until the indicated conditions are fully understood and met.

Note Signal Words

The following safety symbols could appear in the documentation of the instrument:

IMPORTANT

The IMPORTANT signal word calls attention to a note that provides important information, or information essential to the completion of a task.

NOTE

The NOTE signal word calls attention to an operating procedure, practice, or the like, which requires special attention. A note also denotes related parenthetical information that is useful, but not imperative.

TIP

The TIP signal word calls attention to a type of note that helps you apply the techniques and procedures described in the manual to your specific needs, or provides hints on how to effectively use the capabilities of the product.

Warnings



General Warnings

- Carefully read the instructions contained in this instruction manual prior to using the instrument.
- Keep this instruction manual in a safe place for further reference.
- Follow the installation and operation procedures.
- It is imperative to respect the safety warnings on the instrument and in this instruction manual.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment could be impaired.
- Do not install substitute parts or perform any unauthorized modification to the instrument.

WEEE Directive



In accordance with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE), this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately. Refer to your local Olympus distributor for return and/or collection systems available in your country.

Warranty Information

Olympus guarantees your Olympus product to be free from defects in materials and workmanship for a specific period, and in accordance with conditions specified in the *Olympus NDT Terms and Conditions* available at <http://www.olympus-ims.com/en/terms/>.

The Olympus warranty only covers equipment that has been used in a proper manner, as described in this instruction manual, and that has not been subjected to excessive abuse, attempted unauthorized repair, or modification.

Inspect materials thoroughly on receipt for evidence of external or internal damage that might have occurred during shipment. Immediately notify the carrier making the delivery of any damage, because the carrier is normally liable for damage during shipment. Retain packing materials, waybills, and other shipping documentation needed in order to file a damage claim. After notifying the carrier, contact Olympus for assistance with the damage claim and equipment replacement, if necessary.

This instruction manual explains the proper operation of your Olympus product. The information contained herein is intended solely as a teaching aid, and shall not be used in any particular application without independent testing and/or verification by the operator or the supervisor. Such independent verification of procedures becomes increasingly important as the criticality of the application increases. For this reason, Olympus makes no warranty, expressed or implied, that the techniques, examples, or procedures described herein are consistent with industry standards, nor that they meet the requirements of any particular application.

Olympus reserves the right to modify any product without incurring the responsibility for modifying previously manufactured products.

Technical Support

Olympus is firmly committed to providing the highest level of customer service and product support. If you experience any difficulties when using our product, or if it fails to operate as described in the documentation, first consult the user's manual, and then, if you are still in need of assistance, contact our After-Sales Service. To locate the nearest service center, visit the Service Centers page at: <http://www.olympus-ims.com>.

1. HST-Lite Scanner

The HST-Lite Scanner is a versatile pipe and plate scanner, which can be used to inspect welds using TOFD and pulse-echo techniques.

The HST-Lite Scanner is composed of the following items (see Figure 1-1 on page 9):

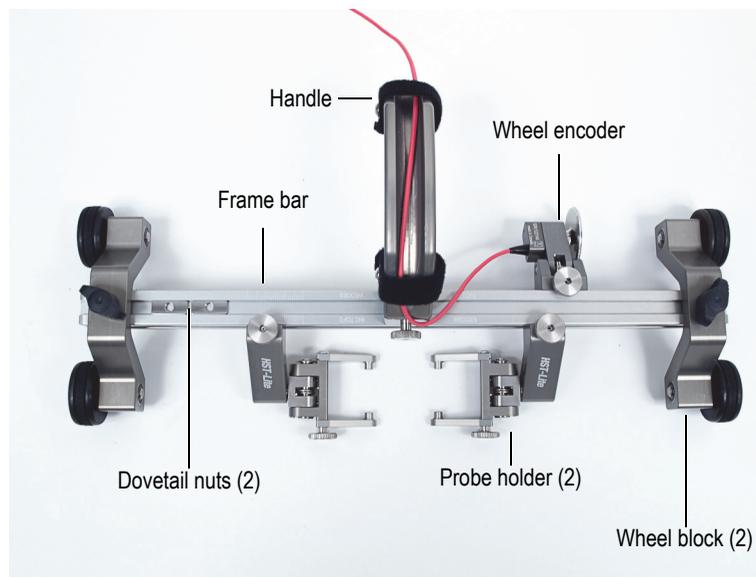


Figure 1-1 The HST-Lite Scanner components

1.1 Positioning the Frame Bar

The frame bar must be positioned differently according to the wedge model used:

- Stainless steel wedges (IHS)
- Rexolite wedges (IHC)

The engraving corresponding to the wedge model used must be facing upward. If it is not the case, perform the following procedure.

To position the frame bar

1. Loosen the wheel block, the probe holder, the handle, and the wheel encoder thumbscrews, and then remove all the components from the frame bar (see Figure 1-2 on page 10).

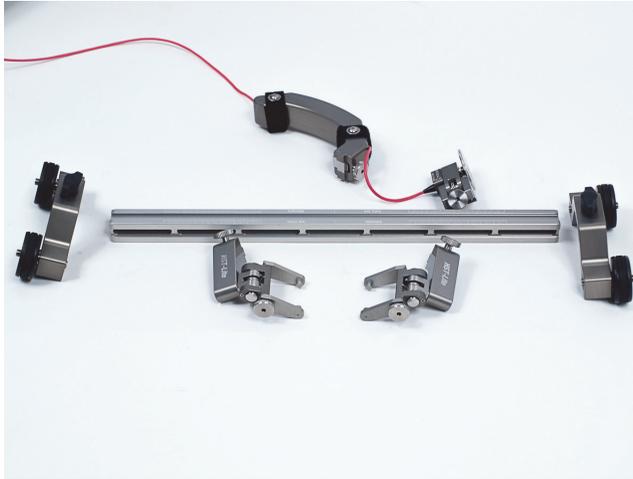


Figure 1-2 Disassembled scanner

2. Position the frame bar so the engraving corresponding to the wedge model used (IHS TOFD WEDGES or IHC TOFD WEDGES) is facing upward (see Figure 1-3 on page 11).



Figure 1-3 Engraving on the frame bar

3. Reassemble the scanner.

1.2 Installing a Probe and a Wedge in a Probe Holder

To install a probe and a wedge in a probe holder



CAUTION

Before installing a new probe into a probe holder, make sure that there is enough couplant between the probe face and the wedge.

1. Apply couplant on the probe face (see Figure 1-4 on page 12).



Figure 1-4 Applying couplant on probe face

2. Install the probe on the wedge.
3. Loosen the yoke thumbscrew (see Figure 1-5 on page 12).

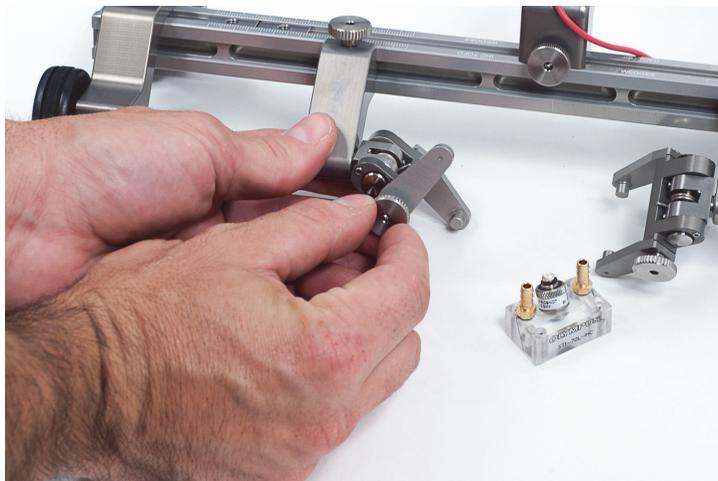


Figure 1-5 Loosening yoke thumbscrew

4. Install the probe and wedge assembly between the two yoke arms (see Figure 1-6 on page 13).

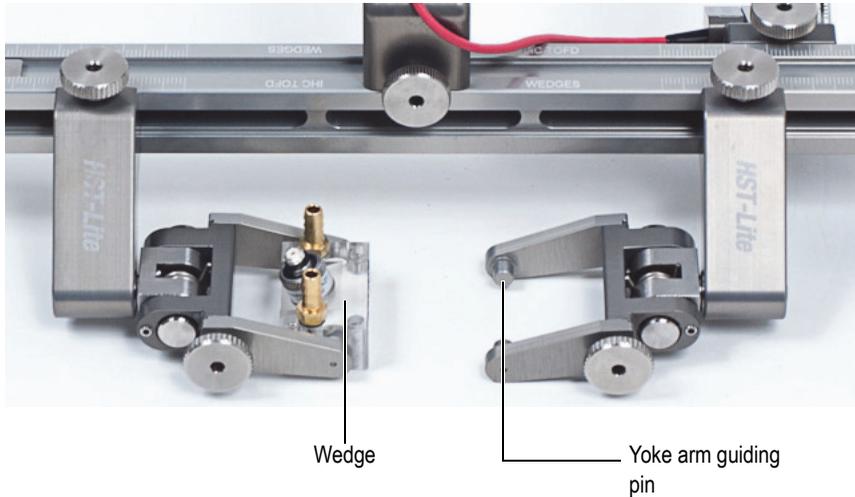


Figure 1-6 Wedge installed

5. Push the yoke arm in order to place the yoke arm guiding pin into the wedge side hole (see Figure 1-6 on page 13).
6. Tighten the thumbscrew until it holds the yoke arm tight against the holder.
7. Repeat the procedure to install the other wedge.

1.3 Setting the Distance Between Beam Exit Points

To set the distance between beam exit points

1. According to the scan plan, determine the distance between the beam exit points (for example, 40 mm).
2. Divide the distance value by two (for example, 20 mm).
3. Position the probe holders so their indicators point to the half value (for example, 20 mm) on the left- and right-hand side frame rulers (see Figure 1-7 on page 14 and Figure 1-8 on page 15).



Figure 1-7 Probe holder indicator

NOTE

A millimeter appears as the distance between two short lines. The distance between two long lines is 5 mm.

4. To make sure that the distance between beam exit points is properly set:
 - ◆ When using Rexolite wedges, measure the distance between the dots engraved on yoke arms (see Figure 1-8 on page 15).
 - OR
 - When using stainless steel wedges, measure the distance between the vertical lines engraved on wedges (see Figure 1-9 on page 15).

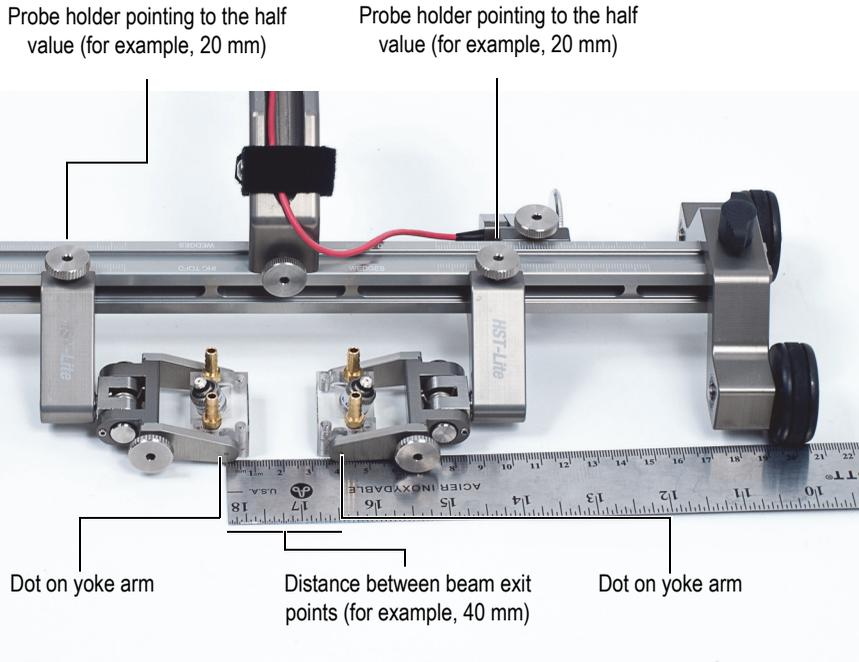


Figure 1-8 Distance between beam exit points (Rexolite wedges shown)

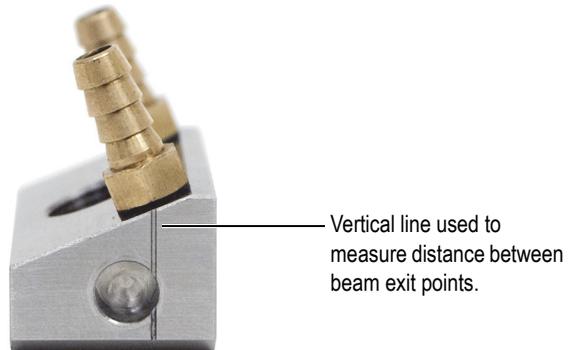


Figure 1-9 Vertical lines engraved on stainless steel wedges

1.4 Positioning the Wheel Encoder

To position the wheel encoder

1. Loosen the wheel encoder thumbscrew (see Figure 1-10 on page 16).
2. Slide the wheel encoder to the desired position (see Figure 1-10 on page 16).
3. Tighten the wheel encoder thumbscrew.

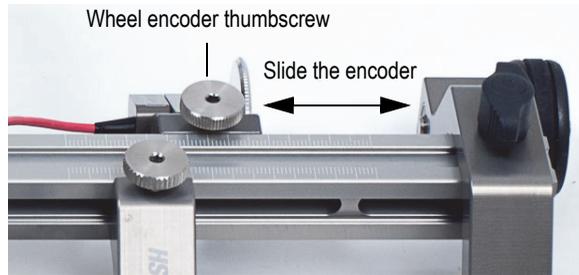


Figure 1-10 Positioning the wheel encoder

1.5 Installing Tubing and Cables

To install tubing and cables

1. If you plan to use the offset probe configuration, assemble the HST-Lite Scanner according to section 1.9 on page 26.
2. If required, install the preamplifier (see section 1.8 on page 24).
3. Connect the probe cables to the probes.
4. Cut four pieces of transparent tube. They should measure about 3.8 cm (1.5 in.) long.
5. Install the four transparent tubes on the wedges (see Figure 1-11 on page 17).
6. Install a Y-fitting on each pair of transparent tubes (see Figure 1-11 on page 17).

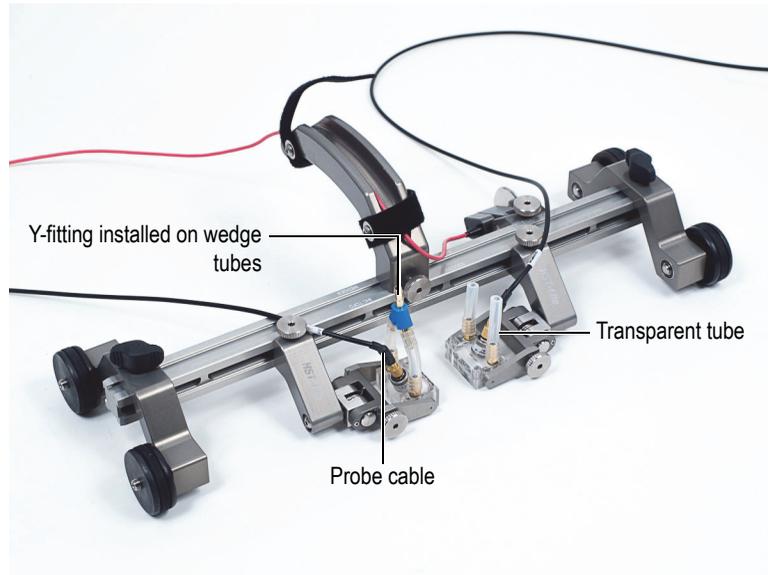


Figure 1-11 Transparent tubes installed on the wedges

7. Insert a Y-fitting in the blue irrigation tube (see Figure 1-12 on page 17).



Figure 1-12 Y-fitting inserted in the irrigation tube

8. Install the irrigation tube in the scanner handle, and then temporarily secure the irrigation tube using the hook and loop strips (see Figure 1-13 on page 18).

NOTE

Make sure the Y-fitting of the irrigation tube is outside the handle (see Figure 1-13 on page 18).

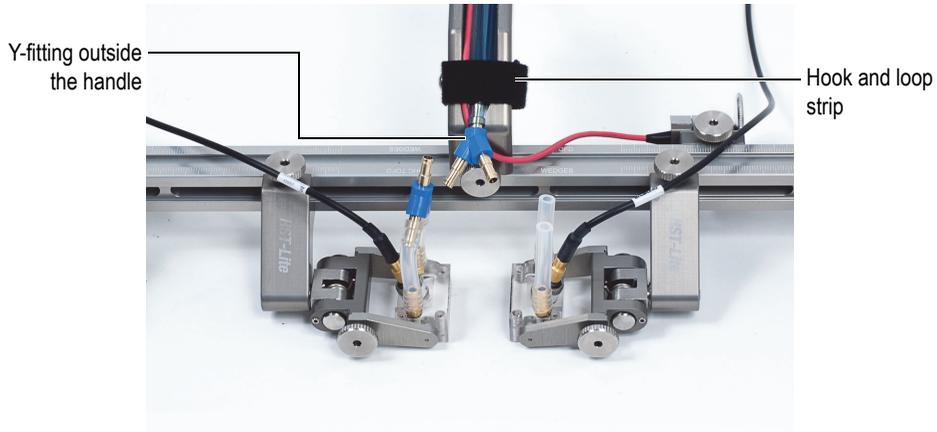


Figure 1-13 Securing the irrigation tube

9. Link the wedges to the irrigation tube using pieces of transparent tubes cut to the required length (see Figure 1-14 on page 19).

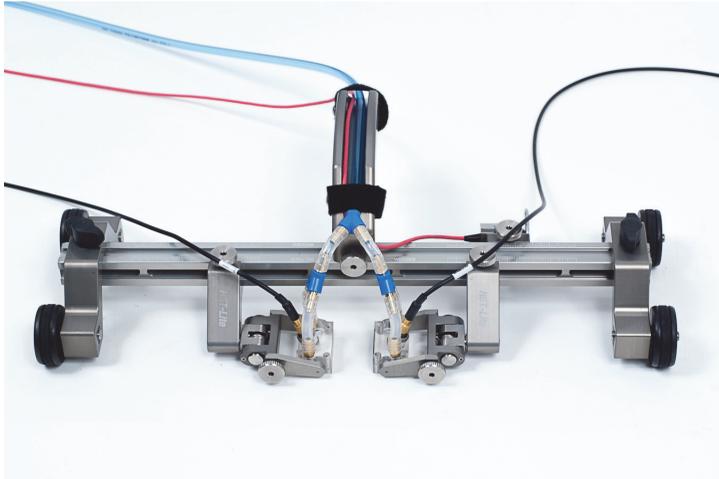


Figure 1-14 Irrigation tube linked to the wedges

1.6 Installing the Cable Sheath

To install the cable sheath

1. Unfasten the handle hook and loop strips.
2. Bundle up the probe cables, wheel encoder cable, irrigation tube, and preamplifier cables (if installed).
3. Install the draw-in tool on the cable and tube bundle. The pointed end of the draw-in tool should point away from the scanner (see Figure 1-15 on page 20).

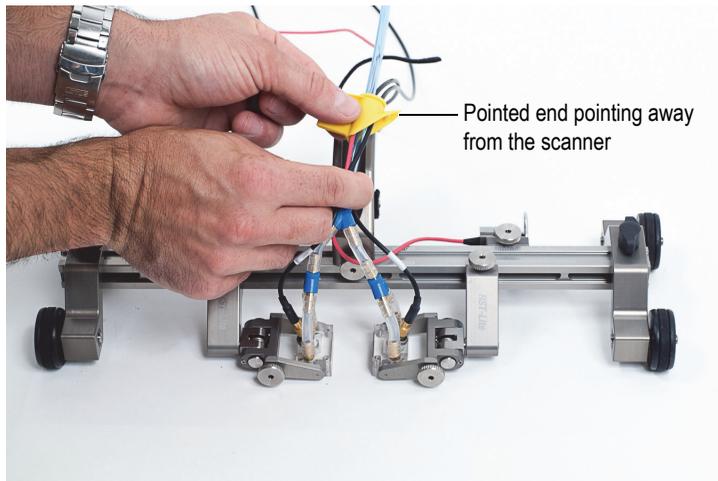


Figure 1-15 Draw-in tool installed on cable and tube bundle

4. Install the cable sheath over the draw-in tool, and then slide the tool to install the cable sheath (see Figure 1-16 on page 20).

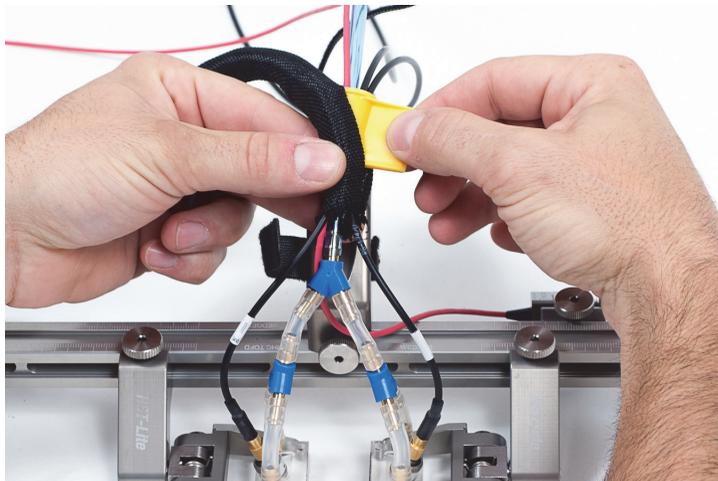


Figure 1-16 Cable sheath installed on the draw-in tool

TIP

To prevent the draw-in tool from slipping out of the cable sheath, place your fingers under the tool and the sheathing (see Figure 1-17 on page 21).



Figure 1-17 Fingers placed under the draw-in tool

5. Position the cable and tube bundle in the scanner handle, and then fasten the hook and loop strips (see Figure 1-18 on page 22).

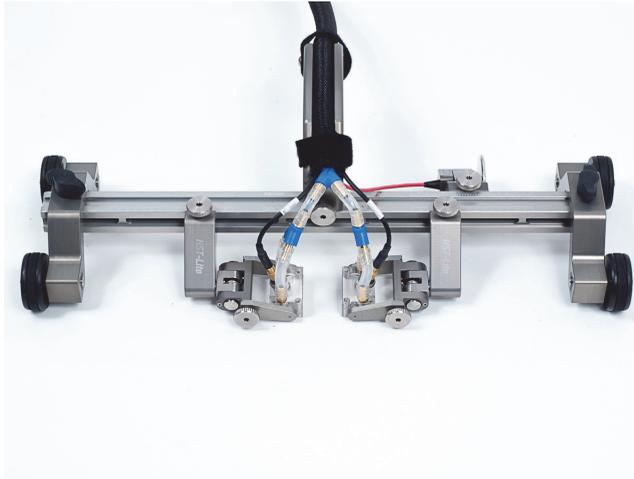


Figure 1-18 Cable and tube bundle in the scanner handle

1.7 Scanner Wheels

The HST-Lite Scanner is equipped with four wheels. Two additional wheels can be installed for offset configuration. For more details about offset configuration, see section 1.9 on page 26.

To replace a scanner wheel

1. Block the wheel shaft using the hexagonal key (see Figure 1-19 on page 23).



Figure 1-19 Blocking the wheel shaft

2. Unscrew the wheel manually, and then remove the wheel (see Figure 1-20 on page 23).

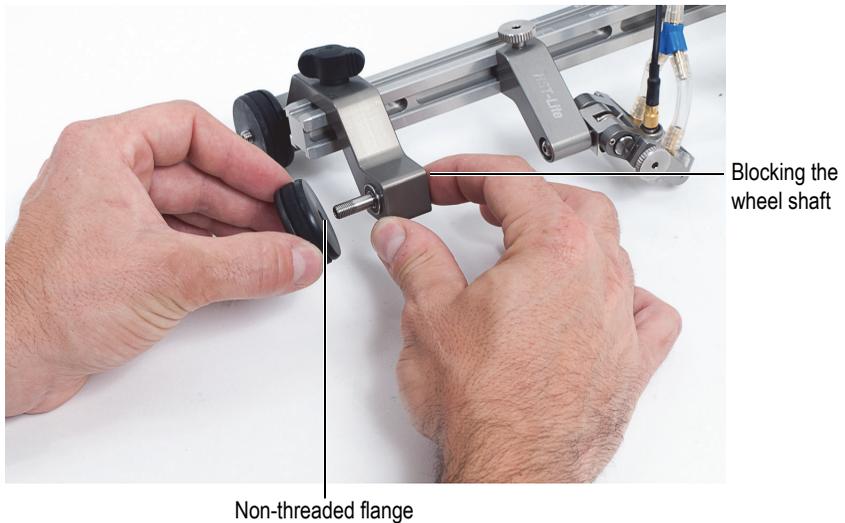


Figure 1-20 Installing a replacement wheel



CAUTION

When installing a replacement wheel, make sure that the non-threaded flange faces the wheel block. If the wheel is not installed properly, the wheel threads will be damaged.

3. Block the wheel shaft with your fingers, and then manually screw on the replacement wheel.
4. Hold the wheel shaft in place using the hexagonal key, and then slightly tighten the wheel.

1.8 Installing a Preampfier

Perform the following procedure to install the optional preampfier (P/N: 5682-KIT02 [U8779091]).

To install a preampfier

1. Remove one of the wheel blocks.
2. Remove both dovetail nuts from the frame bar, and then insert them in the back channel (see Figure 1-21 on page 24).

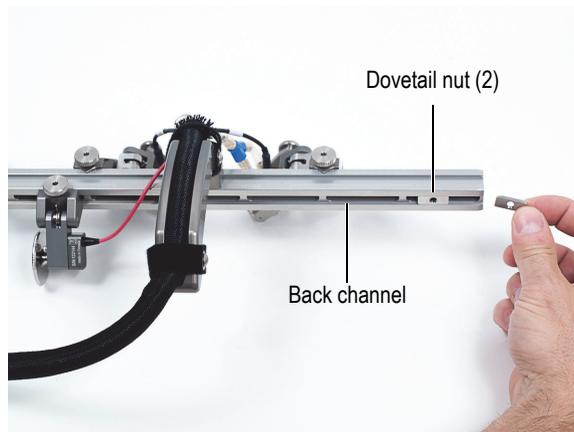


Figure 1-21 Inserting dovetail nuts in the frame bar back channel

3. Reinstall the wheel block.
4. Insert a lock washer on each preamplifier bracket thumbscrew (see Figure 1-22 on page 25).

**CAUTION**

To prevent thread damage, do not overtighten the preamplifier bracket thumbscrews.

5. Secure the preamplifier bracket to the dovetail nuts using the thumbscrews (see Figure 1-22 on page 25).

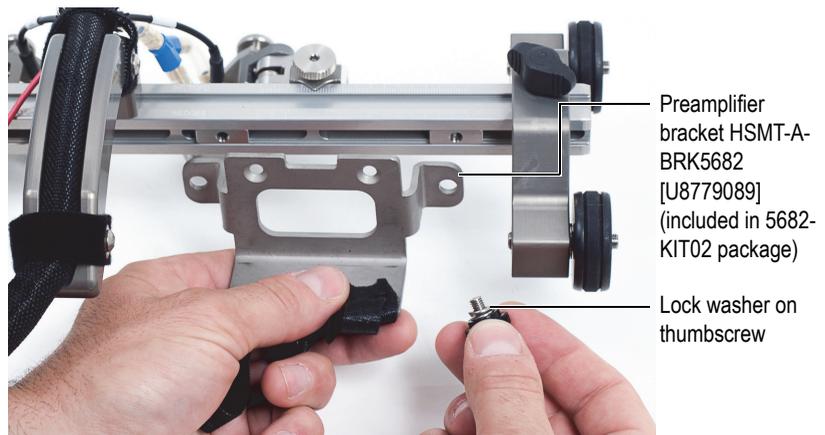


Figure 1-22 Securing the preamplifier bracket

6. Install the preamplifier in the bracket, and then secure the preamplifier using the hook and loop strips (see Figure 1-23 on page 26).

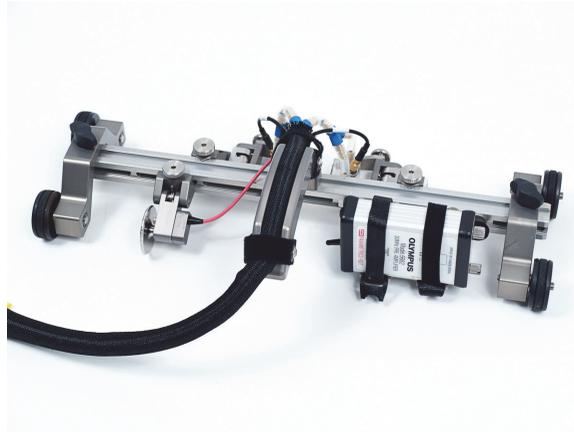


Figure 1-23 Preamplifier installed

1.9 Offset Probe Configuration

When an obstacle prevents you from placing the weld to be inspected between the wheels, we suggest you use the offset configuration.

To configure the scanner for offset inspection

1. Install the scanner components as shown in Figure 1-24 on page 27.

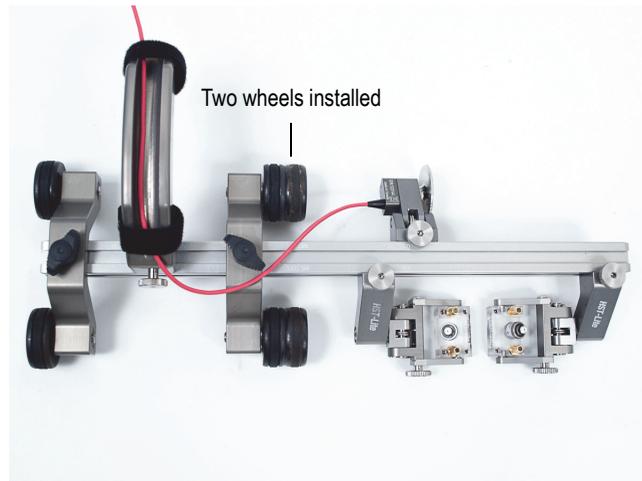


Figure 1-24 Offset configuration

2. Adjust the distance between beam exit points according to step 4 on page 14.



CAUTION

To prevent the scanner from falling off during the inspection, you must add two magnetic wheels to the inner wheel block. Additional magnetic wheels are sold separately.



CAUTION

When installing an additional wheel on a shaft, make sure that the threaded flange of the second wheel faces the wheel block.

3. Install the additional wheels (see Figure 1-25 on page 28):



Figure 1-25 Installing an additional wheel

- a)* Block the wheel shaft with your fingers, and then manually screw on the wheel. The wheel threaded flange must face the wheel block.
- b)* Hold the shaft in place using the hexagonal key, and then slightly tighten the wheel.
- c)* Repeat the step for the other wheel.

2. Parts and Accessories

This chapter describes the accessories delivered with the HST-Lite Scanner and presents a list of spare parts that can be used with the scanner.

2.1 Standard Accessories

The HST-Lite Scanner comes standard with:

- Frame bar with handle.
- Four magnetic wheels.
- OmniScan-compatible, waterproof, spring-loaded wheel encoder with 5 m cable.
- Two spring-loaded arms (SLA) with TOFD-P/E yokes (31.75 mm wide and 5 mm diameter buttons).
- Irrigation tubing and accessories.
- Cable sheath.
- Carrying case.

NOTE

Probes, wedges, and cables are not included with the basic HST-Lite Scanner.

2.2 Optional Accessories

Table 3 HST-Lite Scanner optional accessories

Description	Part number
5682 remote preamplifier kit	5682-KIT02 (U8779091)
Couplant-feed unit	WTR-SPRAYER-8L (U8775001)
TomoScan FOCUS LT encoder cable adaptor	C1-DE15F-BXM-0.30M (U8767107)
Plastic wheel	CHAINSCAN-A-PWHEEL (U8775189)
Magnetic wheel	CHAINSCAN-A-MWHEEL (U8779383)
Replacement encoder	HST-Lite-SP-ENC (U8775277)
Extra handle	HST-Lite-A-Handle (U8775278)
Extra pair of spring loaded probe holders for TOFD inspection compatible with HST-Lite Scanner. Yokes are 31.75 mm wide and 23.5 mm long with 5 mm buttons.	HST-Lite-A-PH-TOFD (U8775279)
Irrigation tubes and fittings for HST-Lite Scanner. Same content as in the basic HST-Lite Scanner package.	HST-Lite-SP-IRRIGATION (U8775281)

3. Specifications

This chapter presents the general specifications for the HST-Lite Scanner.

Table 4 HST-Lite Scanner specifications

Length in scan axis (mm)	Width (mm)	Height (mm)	Weight (kg)	Encoder resolution (steps/mm)
125	385	100 ^a	1.3	9

a. 67 mm without handle

List of Figures

Figure i-1	Marking location	1
Figure 1-1	The HST-Lite Scanner components	9
Figure 1-2	Disassembled scanner	10
Figure 1-3	Engraving on the frame bar	11
Figure 1-4	Applying couplant on probe face	12
Figure 1-5	Loosening yoke thumbscrew	12
Figure 1-6	Wedge installed	13
Figure 1-7	Probe holder indicator	14
Figure 1-8	Distance between beam exit points (Rexolite wedges shown)	15
Figure 1-9	Vertical lines engraved on stainless steel wedges	15
Figure 1-10	Positioning the wheel encoder	16
Figure 1-11	Transparent tubes installed on the wedges	17
Figure 1-12	Y-fitting inserted in the irrigation tube	17
Figure 1-13	Securing the irrigation tube	18
Figure 1-14	Irrigation tube linked to the wedges	19
Figure 1-15	Draw-in tool installed on cable and tube bundle	20
Figure 1-16	Cable sheath installed on the draw-in tool	20
Figure 1-17	Fingers placed under the draw-in tool	21
Figure 1-18	Cable and tube bundle in the scanner handle	22
Figure 1-19	Blocking the wheel shaft	23
Figure 1-20	Installing a replacement wheel	23
Figure 1-21	Inserting dovetail nuts in the frame bar back channel	24
Figure 1-22	Securing the preamplifier bracket	25
Figure 1-23	Preamplifier installed	26
Figure 1-24	Offset configuration	27
Figure 1-25	Installing an additional wheel	28

List of Tables

Table 1	Content of the marking	2
Table 2	Ancillary equipment	4
Table 3	HST-Lite Scanner optional accessories	30
Table 4	HST-Lite Scanner specifications	31

Index

A

- accessories 29
 - optional accessories 30
 - standard accessories 29
- additional wheels 27
- ancillary equipment *See* compatibility, scanner
- arm, yoke 13, 29

B

- bar, frame 9, 29
 - engraving 11
 - positioning 10
 - rulers 13
- beam exit points 15
 - distance 13
 - Rexolite wedges 14
 - stainless steel wedges 14
- block, wheel 9
- blue tube *See* irrigation tube
- bracket, preamplifier 25

C

- cable
 - installation 16
 - probe 17
 - sheath 19, 29
- carrying case 29
- caution notes
 - additional wheel installation 27
 - couplant on probe 11
 - incompatible equipment 4
 - wheel replacement 24
- CE marking 2

- compatibility, scanner 4
 - OmniScan MX 4
 - OmniScan MX2 4
 - OmniScan MXU 4
 - TOFD wedges 4
 - TomoScan FOCUS LT 4
- components, scanner *See* scanner components
- conduit *See* sheath, cable
- configuration, offset probe 26, 27
- couplant 11, 12

D

- danger note, scanner intended use 3
- distance, beam exit points 13, 15
- dovetail nuts 9, 24
- draw-in tool 19, 20
 - pointed end 20

E

- encoder, wheel 9, 29
 - positioning 16

F

- fittings, Y- 17, 18
- frame bar 9, 29
 - engraving 11
 - positioning 10
 - rulers 13

G

- guiding pin, yoke arm 13

H

- handle 9

hexagonal key 22
holder, probe 9
hook and loop strips 18
HST-Lite Scanner *See* scanner

I

IHC 10
IHS 10
installing
 additional wheels 27
 cable sheath 19
 preamplifier 24
 probe in probe holder 11
 tubing and cables 16
instruction manual 3
instrument *See* scanner
intended use, scanner 3
irrigation tube 17, 29

K

key, hexagonal 22

L

lock washers 25

M

magnetic wheels *See* wheels
manual, instruction 3
marking
 content 2
 location 1

N

note signal words 6
notes
 irrigation tube Y-fitting 18
 probes and wedges not included 29
 ruler reading 14
nuts, dovetail 9, 24

O

offset probe configuration 26, 27
Olympus technical support 8
optional accessories 30

P

parts 29

points, beam exit 15
 distance 13
 Rexolite wedges 14
 stainless steel wedges 14
positioning
 frame bar 10
 wheel encoder 16
preamplifier 26
 bracket 25
 dovetail nuts 9, 24
 installation 24
probe
 cable 17
 holder 9
 installation 11
 offset configuration 26, 27

R

removing a wheel 23
replacing scanner wheels 22
rulers 13

S

safety
 signal words 5
 symbols 4
scanner
 compatibility 4
 OmniScan MX 4
 OmniScan MX2 4
 OmniScan MXU 4
 TOFD wedges 4
 TomoScan FOCUS LT 4
 components 9
 dovetail nuts 9, 24
 frame bar 9, 29
 handle 9
 probe holder 9
 wheel block 9
 wheel encoder 9, 29
 description 9
 intended use 3
 marking
 content 2
 location 1
 serial number 2

- specifications 31
- wheels 22
 - removal 23
 - replacement 22
 - shaft 23
- serial number 2
- setting distance between beam exit points 13
- sheath, cable 19, 29
- signal words
 - note 6
 - safety 5
- specifications 31
- standard accessories 29
- strips, hook and loop 18
- support information 8
- symbols
 - CE 2
 - WEEE 2
- T**
- technical support 8
- thumbscrews
 - lock washers 25
 - preamplifier bracket 25
 - yoke 12
- tip, draw-in tool usage 21
- tools
 - draw-in tool 19, 20
 - pointed end 20
 - hexagonal key 22
- transparent tubes 17, 18, 19
- tubing
 - installation 16
 - irrigation tube 17, 29

- transparent tubes 17, 18, 19

U

- use, scanner intended 3

V

- velcro *See* hook and loop strips

W

- warnings, general 6
- warranty information 7
- washers, lock 25
- waste electrical and electronic equipment (WEEE) 7
- wedges
 - Rexolite (IHC) 10
 - stainless steel (IHS) 10
- WEEE directive 2, 7
- wheel block 9
- wheel encoder 9, 29
 - positioning 16
- wheels 22, 29
 - additional wheel installation 27
 - removal 23
 - replacement 22
 - shaft 23

Y

- yellow tool *See* draw-in tool
- Y-fittings 17, 18
- yoke
 - arm 13, 29
 - guiding pin 13
 - thumbscrew 12

