



HST-X04

Manual Weld TOFD Scanner

User's Manual

DMTA020-01EN — Rev. E
September 2022

This instruction manual contains essential information on how to use this Evident product safely and effectively. Before using this product, thoroughly review this instruction manual. Use the product as instructed. Keep this instruction manual in a safe, accessible location.

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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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Important Information — Please Read Before Use

Intended Use

The HST+X04 is designed to perform nondestructive inspections on industrial and commercial materials.



WARNING

Do not use the HST+X04 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 product safely and effectively. Before using this product, thoroughly review this instruction manual. Use the product as instructed. Keep this instruction manual in a safe, accessible location.

IMPORTANT

Some of the details of components illustrated in this manual may differ from the components installed on your device. However, the operating principles remain the same.

Device Compatibility

Only use this device with the approved ancillary equipment provided by Evident. Equipment provided by Evident and approved for use with this device is described later in this manual.



CAUTION

Always use equipment and accessories that meet Evident specifications. Using incompatible equipment could cause equipment malfunction and/or damage, or human injury.

Repair and Modification

This device does not contain any user-serviceable parts. Opening the device might void the warranty.



CAUTION

In order to prevent human injury and/or equipment damage, do not disassemble, modify, or attempt to repair the device.

Safety Symbols

The following safety symbols might appear on the device 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 or material damage.



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 device:



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, will 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, may 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 note signal words could appear in the documentation of the device:

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.

Safety

Before turning on the device, verify that the correct safety precautions have been taken (see the following warnings). In addition, note the external markings on the device, which are described under “Safety Symbols.”

Warnings



WARNING

General Warnings

- Carefully read the instructions contained in this instruction manual prior to turning on the device.
- 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 device 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 device.
- Service instructions, when applicable, are for trained service personnel. To avoid the risk of electric shock, do not perform any work on the device unless qualified to do so. For any problem or question regarding this device, contact Evident or an authorized Evident representative.
- Do not touch the connectors directly by hand. Otherwise, a malfunction or electric shock may result.
- Do not allow metallic or foreign objects to enter the device through connectors or any other openings. Otherwise, a malfunction or electric shock may result.

**WARNING****Electrical Warning**

The device must only be connected to a power source corresponding to the type indicated on the rating label.

**CAUTION**

If a non-approved power supply cord not dedicated to Evident products is used, Evident will not be able to ensure the electrical safety of the equipment.

Battery Precautions**CAUTION**

- Before disposing of a battery, check your local laws, rules, and regulations, and follow them accordingly.

- Transportation of lithium-ion batteries is regulated by the United Nations under the United Nations Recommendations on the Transport of Dangerous Goods. It is expected that governments, intergovernmental organizations, and other international organizations shall conform to the principles laid down in these regulations, thus contributing to worldwide harmonization in this field. These international organizations include the International Civil Aviation organization (ICAO), the International Air Transport Association (IATA), the International Maritime Organization (IMO), the US Department of Transportation (USDOT), Transport Canada (TC), and others. Please contact the transporter and confirm current regulations before transportation of lithium-ion batteries.
- For California (USA) only:
The device may contain a CR battery. The CR battery contains perchlorate material, and special handling may be required. Refer to <http://www.dtsc.ca.gov/hazardouswaste/perchlorate>.
- Do not open, crush, or perforate batteries; doing so could cause injury.
- Do not incinerate batteries. Keep batteries away from fire and other sources of extreme heat. Exposing batteries to extreme heat (over 80 °C) could result in an explosion or personal injury.
- Do not drop, hit, or otherwise abuse a battery, as doing so could expose the cell contents, which are corrosive and explosive.
- Do not short-circuit the battery terminals. A short circuit could cause injury and severe damage to a battery making it unusable.
- Do not expose a battery to moisture or rain; doing so could cause an electric shock.
- Only use an external charger approved by Evident to charge the batteries.
- Only use batteries supplied by Evident.
- Do not store batteries that have less than 40 % remaining charge. Recharge batteries to between 40 % and 80 % capacity before storing them.
- During storage, keep the battery charge between 40 % and 80 %.
- Do not leave batteries in the HST+X04 unit during device storage.

Regulations for Shipping Products with Lithium-Ion Batteries

IMPORTANT

When shipping a Li-ion battery or batteries, be sure to follow all local transportation regulations.

**WARNING**

Damaged batteries cannot be shipped through normal routes — DO NOT ship damaged batteries to Evident. Contact your local Evident representative or material disposal professionals.

Equipment Disposal

Before disposing of the HST+X04, check your local laws, rules, and regulations, and follow them accordingly.

BC (Battery Charger - California, USA Community)



The BC marking indicates that this product has been tested and complies with the Appliance Efficiency Regulations as stated in the California Code of Regulations Title 20, Sections 1601 through 1608 for Battery Charger Systems. The internal battery charger within this device has been tested and certified pursuant to the California Energy Commission's (CEC) requirements; this device is listed on the online CEC's (T20) database.

CE (European Community)



This device complies with the requirements of directive 2014/30/EU concerning electromagnetic compatibility, directive 2014/35/EU concerning low voltage, and directive 2015/863 which amends 2011/65/EU concerning restriction of hazardous substances (RoHS). The CE marking is a declaration that this product conforms to all the applicable directives of the European Community.

UKCA (United Kingdom)



This device complies with the requirements of the Electromagnetic Compatibility Regulations 2016, the Electrical Equipment (Safety) Regulations 2016, and the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012. The UKCA marking indicates compliance with the above regulations.

RCM (Australia)



The regulatory compliance mark (RCM) label indicates that the product complies with all applicable standards, and has been registered with the Australian Communications and Media Authority (ACMA) for placement on the Australian market.

WEEE Directive



In accordance with European Directive 2012/19/EU 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 Evident distributor for return and/or collection systems available in your country.



China RoHS

China RoHS is the term used by industry generally to describe legislation implemented by the Ministry of Information Industry (MII) in the People's Republic of China for the control of pollution by electronic information products (EIP).



The China RoHS mark indicates the product's Environment-Friendly Use Period (EFUP). The EFUP is defined as the number of years for which listed controlled substances will not leak or chemically deteriorate while in the product. The EFUP for the HST+X04 has been determined to be 15 years.

Note: The Environment-Friendly Use Period (EFUP) is not meant to be interpreted as the period assuring functionality and product performance.



电器电子产品有害
物质限制使用
标志

本标志是根据“电器电子产品有害物质限制使用管理办法”以及“电子电气产品有害物质限制使用标识要求”的规定，适用于在中国销售的电器电子产品上的电器电子产品有害物质使用限制标志。

（注意）电器电子产品有害物质限制使用标志内的数字为在正常的使用条件下有害物质等不泄漏的期限，不是保证产品功能性能的期间。

产品中有害物质的名称及含量

部件名称		有害物质					
		铅及其化合物 (Pb)	汞及其化合物 (Hg)	镉及其化合物 (Cd)	六价铬及其化合物 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
主体	机构部件	×	○	○	○	○	○
	光学部件	×	○	○	○	○	○
	电气部件	×	○	○	○	○	○

产品中有害物质的名称及含量

部件名称	有害物质					
	铅及其化合物 (Pb)	汞及其化合物 (Hg)	镉及其化合物 (Cd)	六价铬及其化合物 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
附件	×	○	○	○	○	○
本表格依据 SJ/T 11364 的规定编制。 ○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T26572 规定的限量要求以下。 ×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T26572 规定的限量要求。						

Korea Communications Commission (KCC)



Seller and user shall be noticed that this equipment is suitable for electromagnetic equipment for office work (class A) and it can be used outside the home. This device complies with the EMC requirements of Korea.

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

EMC Directive Compliance

This equipment generates and uses radio-frequency energy and, if not installed and used properly (that is, in strict accordance with the manufacturer's instructions), may cause interference. The HST+X04 has been tested and found to comply with the limits for an industrial device in accordance with the specifications of the EMC directive.

FCC (USA) Compliance

NOTE

This product 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 product is operated in a

commercial environment. This product generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this product 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.

IMPORTANT

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the product.

FCC Supplier's Declaration of Conformity

Hereby declares that the product,

Product name: HST+X04

Model: HST-X04-MR/HST-X04-CW

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107 and Section 15.109.

Supplementary information:

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.

Responsible party name:

EVIDENT CANADA

Address:

3415, Rue Pierre-Ardouin Québec (QC) G1P 0B3 Canada

Phone number:

+1 781-419-3900

ICES-001 (Canada) Compliance

This Class A digital apparatus complies with Canadian ICES-001.

Cet appareil numérique de la classe A est conforme à la norme NMB-001 du Canada.

Warranty Information

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

The Evident 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 Evident for assistance with the damage claim and equipment replacement, if necessary.

This instruction manual explains the proper operation of your Evident 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, Evident 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.

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

Technical Support

Evident 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 on the Evident Scientific Web site.

1. Setting Up and Operating the HST-X04 Scanner

The HST-X04 scanner is a versatile pipe and plate scanner, which can be used to inspect welds using TOFD or pulse-echo techniques.

1.1 Description

The HST-X04 scanner is composed of two probe holders mounted on a bar. A mini-encoder is installed on one of the probe holders (see Figure 1-1 on page 19).

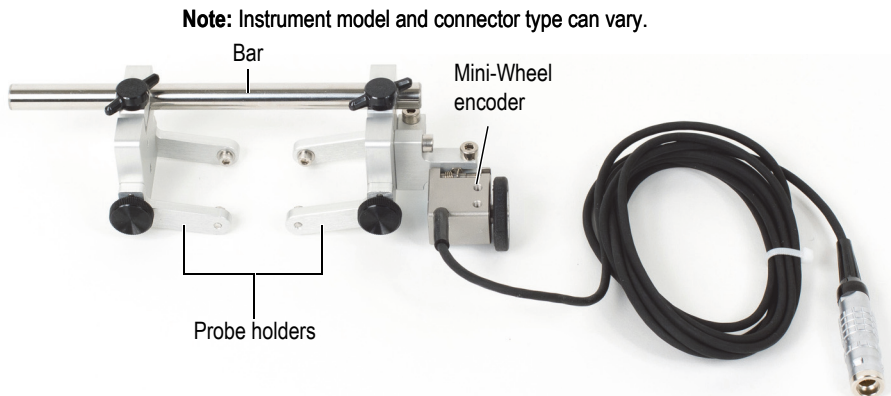


Figure 1-1 The HST-X04 scanner

1.2 Assembling the Scanner

This section presents the assembly procedures for the HST-X04 scanner, which include installing a probe and wedge in a probe holder, installing and adjusting a probe holder, and installing the Mini-Wheel encoder.

1.2.1 Installing a Probe and Wedge in a Probe Holder

To install a probe and wedge in a probe holder

1. On the side of the fork, unscrew the wing screw enough so that you can pull the fork arm away from the probe holder (see Figure 1-2 on page 20).

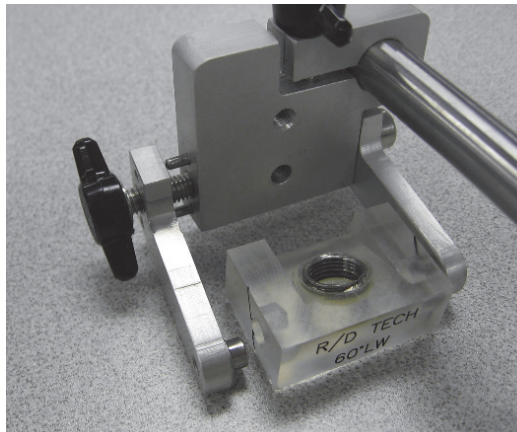


Figure 1-2 Pulling the fork arm away from the probe holder

2. Install the probe and wedge between the two fork arms and push the fork arm in order to place the arm guiding pin into the wedge side hole.

NOTE

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

3. Screw the wing screw until it holds the fork arm tight against the holder.
-

1.2.2 Installing a Probe Holder

To install a probe holder

1. On top of the holder, unscrew the wing screw enough to loosen the bar socket (see Figure 1-3 on page 21).

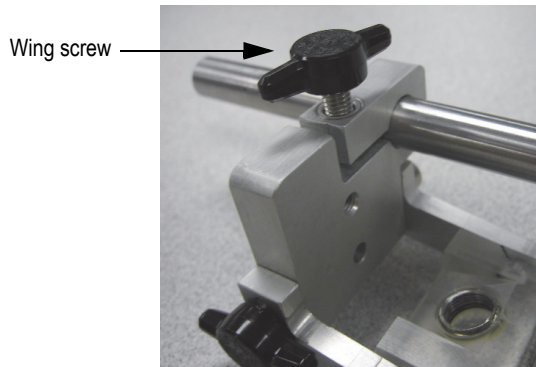


Figure 1-3 Loosening the bar socket

2. Move the probe holder on the bar to the desired position and screw the wing screw tight enough to hold the probe holder in place.

1.2.3 Installing an Encoder

The Mini-Wheel encoder (see Figure 1-4 on page 22) can be installed two different ways according to the scanning direction needed.



Figure 1-4 The Mini-Wheel encoder and cable

When the probes are perpendicular to the weld and the scanning direction is parallel to the weld, the Mini-Wheel encoder is installed on the outside of the encoder holder (see Figure 1-5 on page 22).

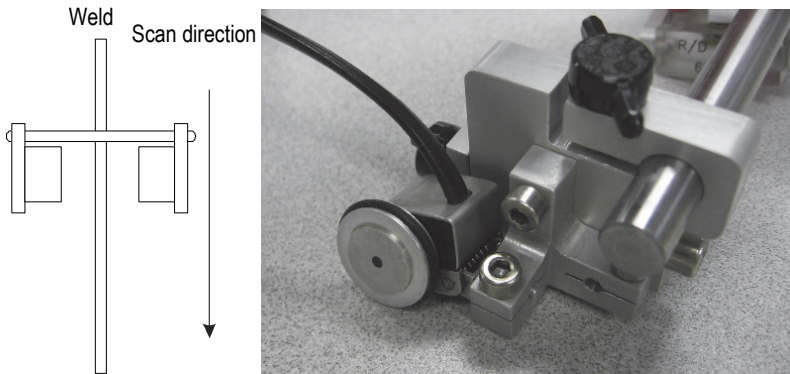


Figure 1-5 The Mini-Wheel encoder installed on the outside of the encoder holder

When the probes are parallel to the weld and the scanning direction is parallel to the weld or when the probes are perpendicular to the weld and the scanning direction is also perpendicular to the weld, the Mini-Wheel encoder is installed on the inside of the encoder holder (see Figure 1-6 on page 23).

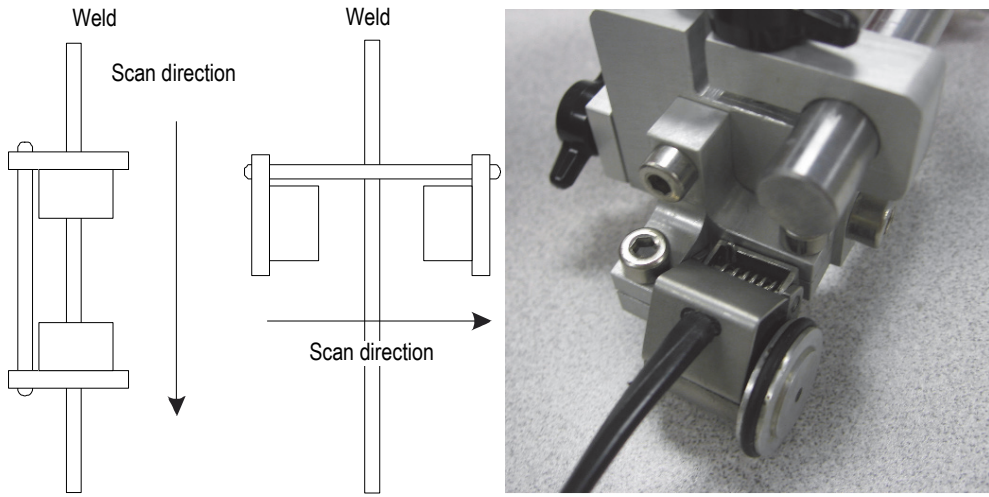


Figure 1-6 The Mini-Wheel encoder installed on the inside of the encoder holder

To install an encoder

1. Use the hexagonal key to loosen the screw securing the Mini-Wheel encoder pin into the encoder holder (see Figure 1-7 on page 23).

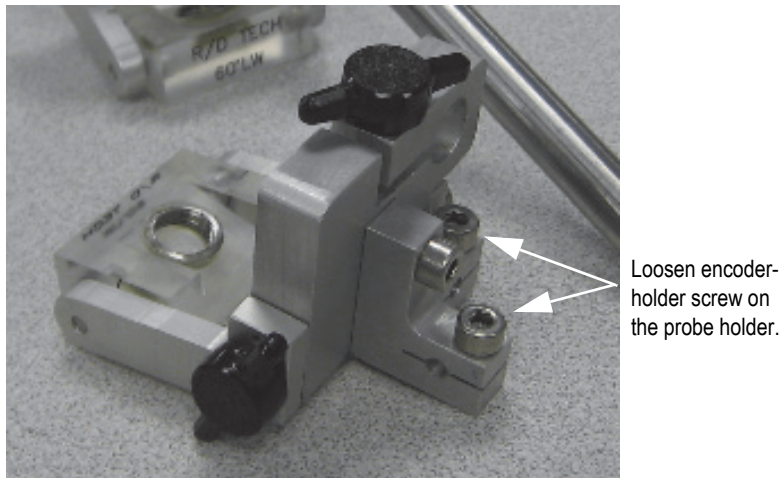


Figure 1-7 The two encoder holder screws

2. Slide the Mini-Wheel encoder pin into the encoder holder and secure it with the hexagonal head screw.

1.3 Operating the Scanner

The HST-X04 scanner is designed for manual use, and is straightforward to operate.

After you have setup the HST-X04 scanner for the size of pipe or plate you wish to inspect (see “Assembling the Scanner” on page 20), use the following procedure to operate the scanner.

To operate the scanner

1. Hold the scanner above the inspection surface, and then align the scanner so that the inspection area is centered between the probes.

NOTE

Depending on the type of probe or transducer used, some fine-tuning can be required to adjust the distance between probes. Also, some situations may require the surface being inspected to be off-centered between the probes (see “Installing a Probe Holder” on page 21).



CAUTION

All carbide wear pins should be flush with the wedge surface.

2. Next, push or pull the scanner in the desired inspection direction.

2. Probes and Wedges

This chapter presents a list of probes and wedges that can be used with the HST-X04 scanner and describes the parts that are included in the scanner kit.

2.1 Probes

Table 1 on page 25 describes the probes used for inspections made with the HST-X04 scanner.

Table 1 Miniature screw-in TOFD transducers

Frequency	Nominal element size		Transducer part numbers	Case type	Case thread pitch
	MHz	mm			
2.25	6	0.25	C542-XX ^a	ST1	3/8 - 32
	9.5	0.375	C566-XX ^a	ST2	11/16 - 24
	12	0.5	C540-XX ^a	ST2	11/16 - 24
5.0	3	0.125	C567-XX ^a	ST1	3/8 - 32
	6	0.25	C543-XX ^a	ST1	3/8 - 32
	9.5	0.375	C568-XX ^a	ST2	11/16 - 24
	12	0.5	C541-XX ^a	ST2	11/16 - 24

Table 1 Miniature screw-in TOFD transducers (continued)

Frequency	Nominal element size		Transducer part numbers	Case type	Case thread pitch
	MHz	mm			
10	3	0.125	C563-XX ^a	ST1	3/8 - 32
	6	0.25	C544-XX ^a	ST1	3/8 - 32
15	3	0.125	C564-XX ^a	ST1	3/8 - 32

- a. The XX part of the transducer part number indicates that two types of connectors are available: SM (Microdot connectors) or SL (LEMO 00 connectors)

2.2 Wedges

Table 2 on page 26 describes the wedges used for inspections made with the HST-X04 scanner.

Table 2 Miniature TOFD screw-in wedges

ST1 wedge type	ST2 wedge type	Refracted longitudinal angle (°)
ST1-45L ^a	ST2-45L ^a	45
ST1-45L-IHC ^b	ST2-45L-IHC ^b	45
ST1-45L-IHS ^c	—	45

Table 2 Miniature TOFD screw-in wedges (continued)

ST1 wedge type	ST2 wedge type	Refracted longitudinal angle (°)
ST1-60L ^a	ST2-60L ^a	60
ST1-60L-IHC ^b	ST2-60L-IHC ^b	60
ST1-60L-IHS ^c	—	60
ST1-70L ^a	ST2-70L ^a	70
ST1-70L-IHC ^b	ST2-70L-IHC ^b	70
ST1-70L-IHS ^c	—	70

- a. Comes standard with scanner holes.
- b. IHC: Irrigation, scanner holes, and carbides.
- c. IHS: Irrigation, scanner holes, and stainless steel frame.

NOTE

The HST-X04 scanner can also be fitted with SPE wedges. However, probes with a LEMO connector cannot be used in combination with SPE wedges, due to mechanical interference.

3. Maintenance

This chapter deals with the basic maintenance that an operator can apply to the HST-X04 scanner. The maintenance operations explained as follows help keep the product in good physical and working condition. Due to its design, the HST-X04 scanner requires only a minimum of maintenance. This chapter covers preventive maintenance and unit cleaning.

3.1 Preventive Maintenance

The HST-X04 does not require preventive maintenance. Only a regular inspection of the product is recommended to ensure that the HST-X04 scanner functions correctly.

3.2 Unit Cleaning

The HST-X04 scanner external surfaces can be cleaned when needed. This section provides the procedure for the appropriate cleaning of the product.

To clean the unit

1. Disconnect and remove all cables, probes, and wedges.
2. To bring the instrument back to its original finish, clean the housing with a soft cloth.
3. To remove persistent stains, use a damp cloth with a soft, soapy solution. Do not use abrasive products or powerful solvents that could damage the finish.

4. Spare Parts

The spare parts for the HST-X04 scanner are shown in Figure 4-1 on page 31 and the part and accessories list is provided in Table 3 on page 32.

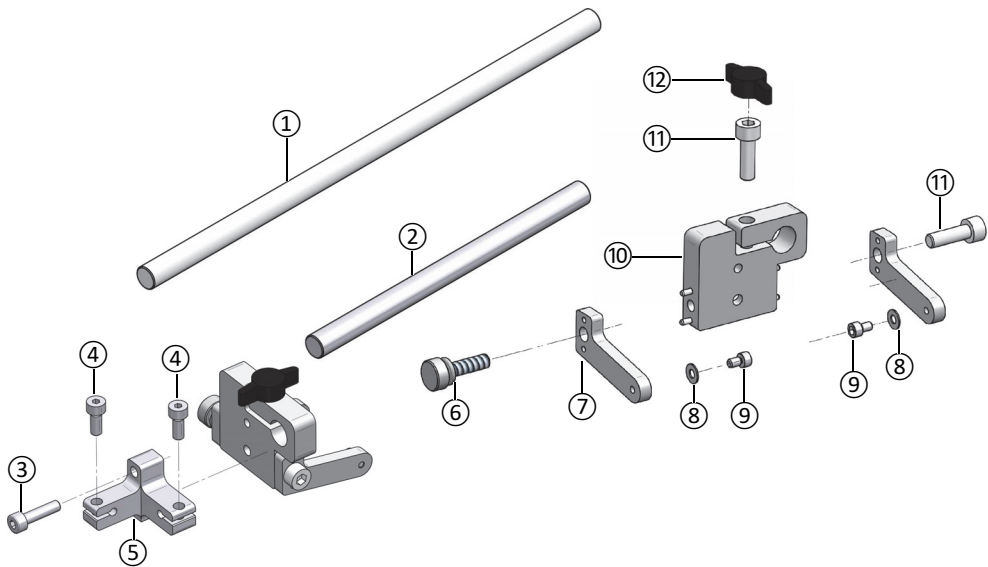


Figure 4-1 Exploded view

Table 3 HST-X04 scanner spare part and accessories list

Drawing number	Qty ^a	Part number	Description
1	1	U8775213	Round stainless steel shaft, 10 mm OD × 250 mm long
2	1	Q8300909	Precision shaft, 10 mm OD × 150 mm long
3	1	U8902445	M4 × 16 mm hexagonal stainless steel screw
4	2	U8770529	M4 × 10 mm hexagonal stainless steel screw
5	1	Q8300907	Encoder support
6	2	Q8300908	M5 × 16 mm knurled stainless steel thumbscrew
7	4	Q8300630	TOFD yoke arm
8	4	U8906889	M3 × 0.5 mm stainless steel flat washer
9	4	U8779451	Modified screw 28LA0032
10	2	Q8300906	Sliding probe holder
11	4	U8900318	M5 × 16 mm hexagonal stainless steel screw
12	2	U8900342	M5 butterfly head screw
—	1	U8775085	HST-X04 TOFD hand scanner frame and probe holders only Does not include: encoder, wedges, probes, cables, or transport case
—	1	U8775295	OmniScan Mini-Wheel encoder, 2.5 m cable, waterproof with LEMO connector Includes bracket kit.
—	2	U8435028	10 MHz (3 mm element diameter) CentraScan composite TOFD probes
—	2	U8435020	5 MHz (6 mm element diameter) CentraScan composite TOFD probes
—	2	U8710004	ST1-60L-IHC wedge
—	2	U8710002	ST1-45L-IHC wedge
—	2	U8710006	ST1-70L-IHC wedge
—	2	U8800388	LEMO to U-DOT 2.5 m cable
—	2	—	Two sizes of hexagonal keys
—	2	U8767012	LEMO 00 female to BNC male adaptor

Table 3 HST-X04 scanner spare part and accessories list (continued)

Drawing number	Qty^a	Part number	Description
—	1	DMTA020-01EN	<i>HST-X04—Manual Weld TOFD Scanner: User's Manual</i>

- a. This number represents the typical quantity initially included with your scanner package.

5. Specifications

This chapter presents the general and operating specifications for the HST-X04 scanner (see Table 4 on page 35 and Table 5 on page 35).

5.1 General and Environment Specifications

Table 4 General specifications

Parameter	Value
Length	175 mm (6.9 in.) with the 150 mm bar and the Mini-Wheel encoder installed on the inside of the encoder holder. 275 mm (10.8 in.) with the 250 mm bar and the Mini-Wheel encoder installed on the inside of the encoder holder.
Width	60 mm (2.4 in.) with the Mini-Wheel encoder installed on the outside of the encoder holder.
Height	50 mm (2 in.)
Voltage	5 V
Current	25 mA maximum
Frequency	0–1.5 kHz (maximum displacement velocity of 100 mm/s [4 in./s])

Table 5 Operating environment specifications

Parameter	Value
Operating temperature	–10 °C to 55 °C (14 °F to 131 °F)
Storage temperature	–30 °C to 60 °C (–22 °F to 140 °F)
Relative humidity (RH)	Max. 85 % RH noncondensing

Table 5 Operating environment specifications (continued)

Parameter	Value
Wet location	Yes
Altitude	Up to 2000 m
Outdoor use	Yes
Pollution level	1
IP rating	Waterproof (designed to meet IP67)

5.2 Connector Reference

HST-X04 scanners sold after July 2013 come standard with the LEMO connector, which is compatible with OmniScan MX2 and SX instruments. For use with a different instrument, an optional adaptor is required (see Table 6 on page 36).

Table 6 Required encoder cable adaptor

Scanner Connector	Instrument		
	OmniScan MX	OmniScan MX2, SX, and FOCUS PX	TomoScan FOCUS LT
LEMO (from July 2013 onward)	P/N: U8780329	—	P/N: U8769010
DE15 (prior to July 2013)	—	P/N: U8775201	P/N: U8767107

Figure 5-1 on page 37 contains the pinout for the LEMO connector used on the OmniScan MX2 model.

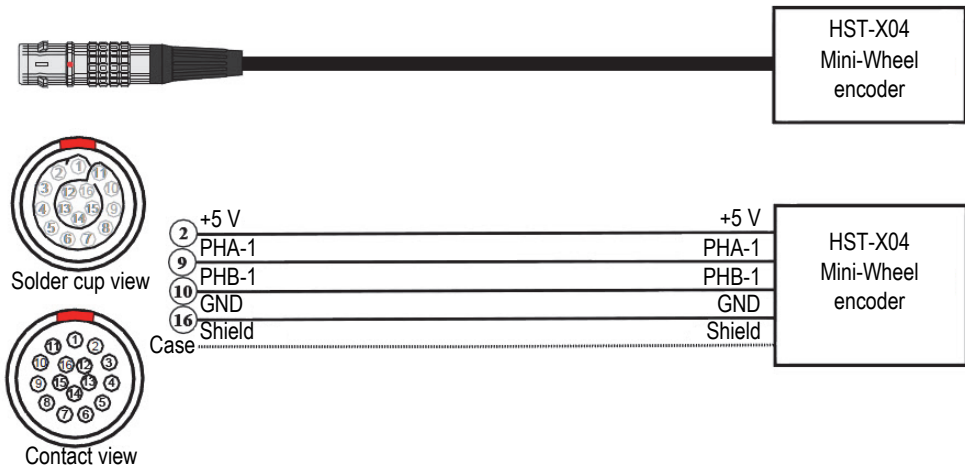


Figure 5-1 LEMO connector pinout diagram

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