



OmniScan SX

Ultrasonic Flaw Detector

User's Manual

DMTA-20043-01EN [U8778624] — Rev. F
August 2019

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. Use the product as instructed. Keep this instruction manual in a safe, accessible location.

Olympus Scientific Solutions Americas, 48 Woerd Avenue, Waltham, MA 02453, USA

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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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List of Abbreviations

DC	direct current
EFUP	environment-friendly use period
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
LCD	liquid crystal display
NDT	nondestructive testing
PA	phased array
RH	relative humidity
SDHC	secure digital high capacity
TFT	thin film transistor
USDOT	US Department of Transportation
UT	ultrasonic testing
WEEE	waste electrical and electronic equipment

Labels and Symbols

Safety-related labels and symbols are attached to the instrument at the locations shown in Figure i-1 on page 1. If any or all of the labels or symbols are missing or illegible, please contact Olympus.

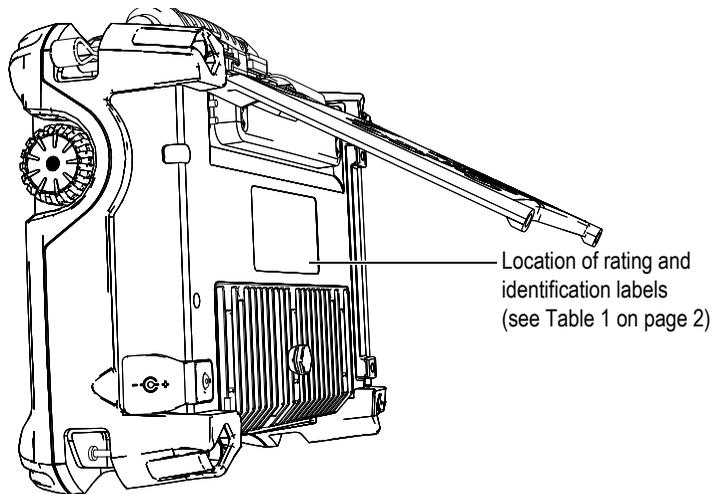


Figure i-1 Labels location

Table 1 Content of the rating label

Content	
	<p>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. Contact your Olympus representative for more information.</p>
	<p>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.</p>
	<p>The WEEE symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.</p>

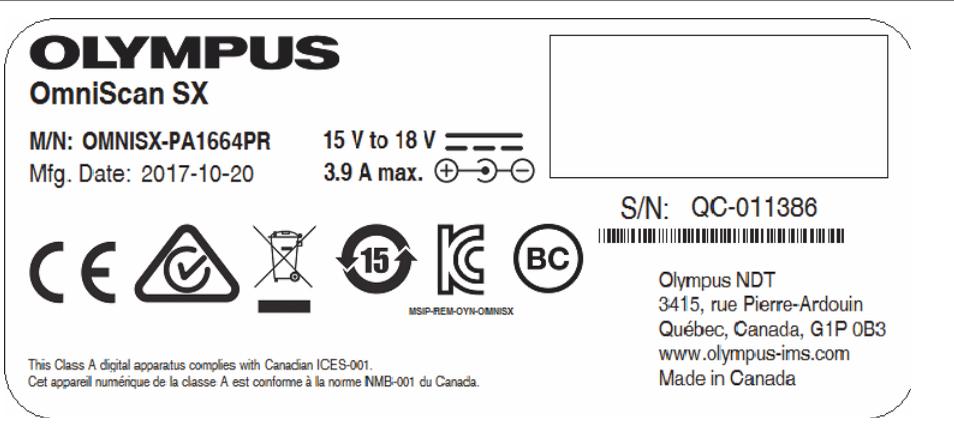


Table 1 Content of the rating label (continued)

	<p>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 OmniScan SX has been determined to be 15 years.</p> <p>Note: The Environment-Friendly Use Period (EFUP) is not meant to be interpreted as the period assuring functionality and product performance.</p>
	<p>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 home.</p> <p>The MSIP code for the OmniScan SX is the following: MSIP-REM-OYN-OMNISX.</p>
	<p>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.</p>
	<p>The direct current symbol.</p>
	<p>The DC adaptor polarity symbol.</p>
<p>M/N</p>	<p>Model number</p>
<p>Mfg. Date</p>	<p>Manufacturing date</p>
<p>S/N</p>	<p>Serial number</p>



CAUTION

The membrane vent (see Figure i-2 on page 4) is used to counterbalance the internal and external pressures and to maintain the instrument watertightness. Do not puncture the membrane vent. When the membrane vent is punctured, the instrument fails to comply with the IP66 rating.

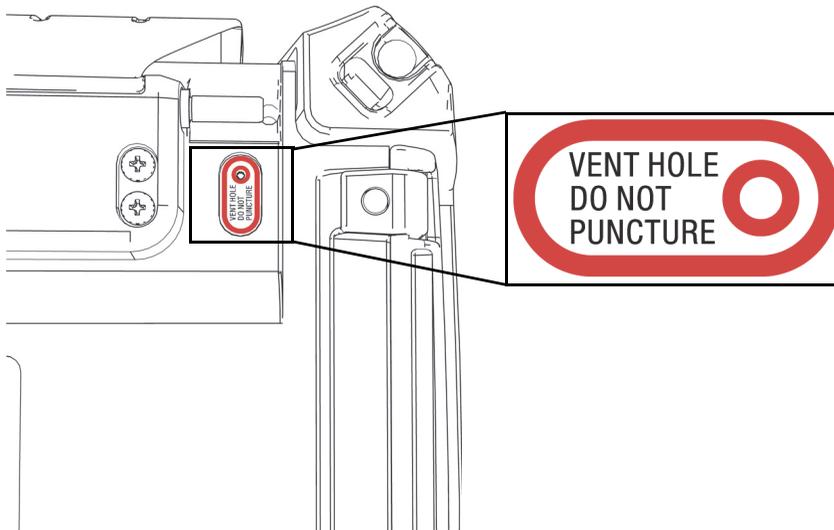


Figure i-2 Membrane vent location

**CAUTION**

- To reduce the risk of electric shock, avoid touching the inner conductor of the probe connectors. Up to 340 V can be present on the inner conductor of the ultrasonic testing (UT) connectors, and up to 115 V can be present on the phased array (PA) connector. The warning symbol near the PA and UT connectors signals this electric shock risk (see Figure i-3 on page 5).
 - Reinforced insulation must be provided for the probes connected to the OmniScan SX instrument.
-

**CAUTION**

To avoid the risk of equipment malfunction or damage, use only compatible Olympus probes.

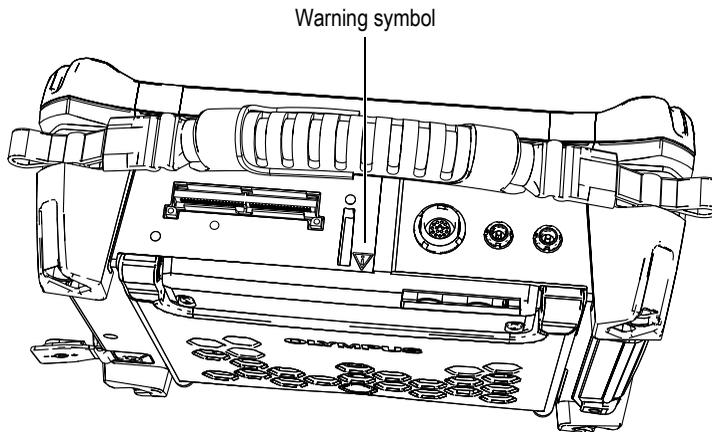


Figure i-3 Warning symbol on top of the OmniScan SX



WARNING

The warning symbol on the battery compartment door (see Figure i-4 on page 6) signals that to avoid the risk of injuries or equipment damage, precautions must be taken concerning the battery. See “Warnings on Battery Use” on page 47.

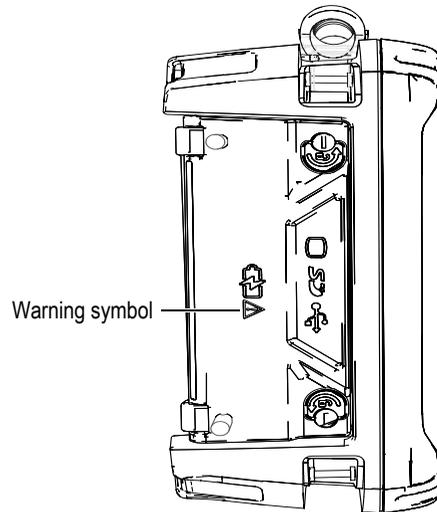


Figure i-4 Warning symbol on battery compartment door

Important Information — Please Read Before Use

Intended Use

The OmniScan SX is designed to perform nondestructive inspections on industrial and commercial materials.



WARNING

Do not use the OmniScan SX 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. Use the product as instructed.

Keep this instruction manual in a safe, accessible location.

Instrument Compatibility

Refer to “Compatibility Tables” on page 71 to confirm that the OmniScan SX is compatible with the auxiliary equipment being used.



CAUTION

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

Repair and Modification

The OmniScan SX does not contain any user-serviceable parts. Opening the instrument might void the warranty.



CAUTION

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

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 or material damage.



Shock hazard caution symbol

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

Safety Signal Words

The following safety signal words 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 that 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 that 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 a procedure, practice, or the like that 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 instrument:

IMPORTANT

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

NOTE

The NOTE signal word calls attention to an operating procedure, practice, or the like, that 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 that provides hints on how to effectively use the capabilities of the product.

Safety

This instrument is an instrument of Class 1 and installation category II. Before turning on the instrument, verify that the correct safety precautions have been taken (see the following warnings). In addition, note the external markings on the instrument, which are described under “Safety Symbols”.

Warnings



WARNING

General Warnings

- Carefully read the instructions contained in this instruction manual prior to turning on 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.

- Service instructions, when applicable, are for trained service personnel. To avoid the risk of electric shock, do not perform any work on the instrument unless qualified to do so. For any problem or question regarding this instrument, contact Olympus or an authorized Olympus 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 Warnings**

- Before turning on the instrument, you must connect the protective earth terminal of the instrument to the protective conductor (mains) of the power cord. The mains plug shall only be inserted into a socket outlet provided with a protective earth contact. Never negate the protective action by using an extension cord (power cable) without a protective conductor (grounding).
- Only use fuses with the required rated current, voltage, and specified type (normal-blow, slow-blow, quick-acting, etc.). Do not use repaired fuses or short-circuited fuse holders. Doing so could cause electric shock or create a fire hazard.
- If there is any possibility that the ground protection could be impaired, you must make the instrument inoperative and secure it against any unintended operation.
- The instrument 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 Olympus products is used, Olympus 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), and others. Please contact the transporter and confirm current regulations before transportation of lithium-ion batteries.
- 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 [176 °F]) 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 the OmniScan SX unit or an external charger approved by Olympus to charge the batteries.
- Only use batteries supplied by Olympus.
- 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 OmniScan SX unit during instrument storage.

Equipment Disposal

Before disposing of the OmniScan SX, check your local laws, rules, and regulations, and follow them accordingly.

CE (European Community)



This device complies with the requirements of both directive 2014/30/EU concerning electromagnetic compatibility and directive 2014/35/EU concerning low voltage. The CE marking indicates compliance with the above directives.

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 Olympus 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 OmniScan SX 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.

“中国 RoHS”是一个工业术语，一般用于描述中华人民共和国信息工业部（MII）针对控制电子信息产品（EIP）的污染所实行的法令。



电气电子产品
有害物质
限制使用标识

中国 RoHS 标识是根据“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气电子产品上的电气电子产品有害物质限制使用标识。

注意：电气电子产品有害物质限制使用标识内的数字为在正常的使用条件下有害物质不会泄漏的年限，不是保证产品功能性的年限。

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	×	○	○	○	○	○
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)

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 OmniScan SX has been tested and found to comply with the limits for an industrial device in accordance with the specifications of the EMC directive.

IMPORTANT

To maintain OmniScan SX compliance with the emissions requirements of the EMC directive, the following conditions must be met:

- All cables used to connect the equipment must have an overall shielding to ensure electromagnetic compatibility and optimal performance.
 - Ferrite clamp filters must be attached to the cables connected to the OmniScan SX. For details, see "Ferrite clamp filters" on page 47.
-

FCC (USA) Compliance

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.

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

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, might 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.

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

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 Scientific Solutions Americas Inc. 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>.

Introduction

Olympus is a long-standing leader in NDT (nondestructive testing) test platforms, with thousands of OmniScan units in use throughout the world. With the OmniScan SX, the user benefits from a lighter, smaller, and more portable solution that meets requirements for single group fully encoded phased array inspection.

NOTE

Refer to the *OmniScan MXU Software User's Manual* for information on software functions.

NOTE

The illustrations used in this manual were prepared with the instrument version available at the time of publication, and may differ slightly in appearance from the version of the OmniScan SX instrument that you are using.

1. Package Content

Models

The OmniScan SX is available in two different models:

OMNISX-PA1664PR

Portable 16:64PR phased array acquisition unit (including one UT conventional channel)

OMNISX-UT

Portable one-channel conventional UT acquisition unit

Accessories

The OmniScan SX comes standard with the following accessories:

- Cable ferrite clamp — Internal diameter of 4.8 mm
- Cable ferrite clamp — Internal diameter of 6.6 mm
- Cable ferrite clamp — Internal diameter of 9.0 mm
- 16-GB USB Flash drive
- 16-GB SDHC card
- Anti-glare screen protectors (2)
- Stylus
- Li-ion battery
- DC power adaptor
- Power cord (model varies according to country)
- Transport case

- USB Flash drive, which contains:
 - MXU software
 - *OmniScan SX Getting Started Guide*
 - *OmniScan SX User's Manual*
 - *OmniScan MXU Software User's Manual*

NOTE

For a list of accessories and part numbers, see “Compatibility Tables” on page 71.

2. Overview of the OmniScan SX

The front panel of the OmniScan SX (see Figure 2-1 on page 23) contains all the main controls and indicators, which are explained further in the following sections.

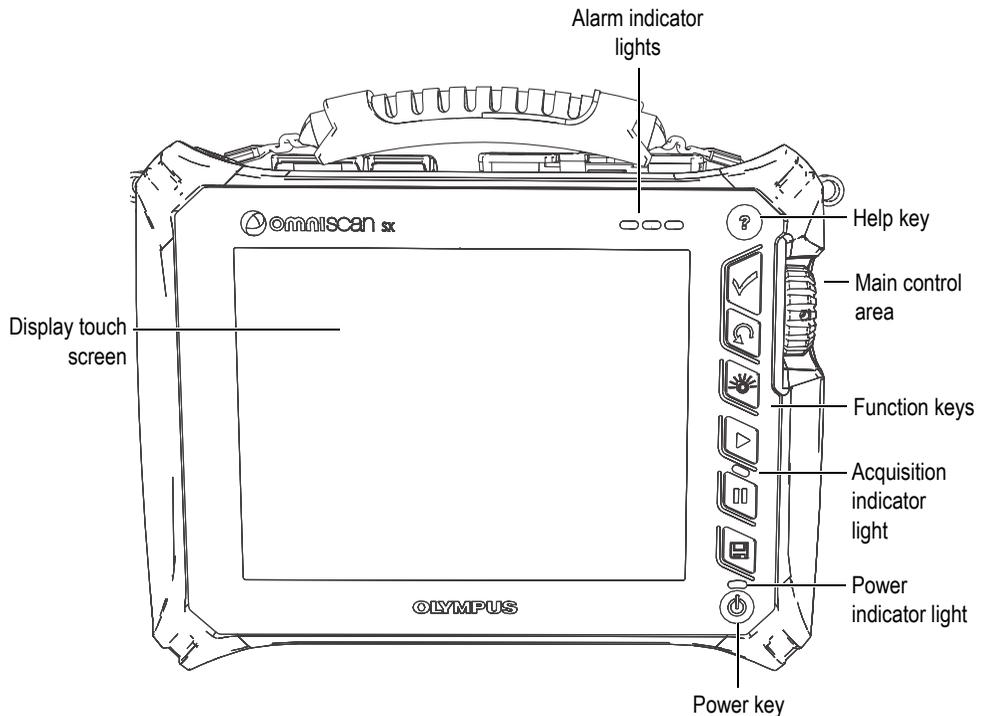


Figure 2-1 Front panel controls of the OmniScan SX

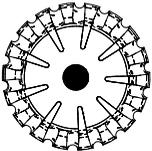
2.1 Display Touch Screen

The display touch screen acts as a pointing device. To click an interface element, touch the screen surface lightly with your finger. Refer to the *OmniScan MXU Software User's Manual* for advanced operating instructions for the touch screen.

2.2 Main Control Area

The main control area is shown in Figure 2-1 on page 23. You can control the OmniScan SX completely from this area if you wish. The main control area contains three elements, which are described in Table 2 on page 24.

Table 2 Main control area

Element	Name	Description
	Scroll knob	Used to navigate through selections without the need for a keyboard, mouse, or touch screen. Turning the scroll knob in a clockwise direction shifts a selection to the left (horizontal list) or upward (vertical list). For more information about using the scroll knob with the OmniScan software, refer to the <i>OmniScan MXU Software User's Manual</i> .
	Accept key	Used to confirm a selection.
	Cancel key	Used to cancel the current selection, or to go back one level in the menu hierarchy.

2.3 Power Key

The Power key (see Figure 2-1 on page 23) is used to start or shut down the OmniScan SX, but also to enable or disable the sleep mode.

2.4 Help Key

The Help key (see Figure 2-1 on page 23) is located on the upper-right side of the OmniScan SX front panel. Pressing this key displays the online help for the currently selected function.

2.5 Indicator Lights

There are three types of indicator lights on the OmniScan SX front panel: power, acquisition, and alarm. Each indicator light is described below.

2.5.1 Power Indicator Light

The power indicator light is located above the Power key. The color of this light identifies the power status of the OmniScan SX (see Table 3 on page 25).

Table 3 Power indicator light statuses

Indicator light	Status
Off	The OmniScan SX is turned off.
Flashing orange	The OmniScan SX is turned off. Battery is charging.
Orange	The OmniScan SX is turned off. Battery charging is complete.
Green	<ul style="list-style-type: none"> The OmniScan SX is turned on. The OmniScan SX is turned on and battery is charging.
Flashing green/orange	The OmniScan SX is in sleep mode. The battery is charging.

Table 3 Power indicator light statuses (continued)

Indicator light	Status
Flashing green	<ul style="list-style-type: none"> The OmniScan SX is in sleep mode. The OmniScan SX is in sleep mode and battery charging is complete.
Flashing red	A critical factor (excessive temperature, very weak battery, etc.) requires immediate attention.

2.5.2 Acquisition Indicator Light

The acquisition indicator light is located below the Play key (). The color of this light indicates the operating mode of the OmniScan SX (see Table 4 on page 26).

Table 4 Acquisition indicator light statuses

Off	Inspection mode
Orange	Analysis mode

2.5.3 Alarm Indicator Lights

There are three alarm indicator lights located on the upper right corner of the OmniScan SX. These lights only flash one color (red) and indicate the trigger status of their respective alarms (set within the software).

NOTE

For more details about the alarm indicator lights, refer to the *OmniScan MXU Software User's Manual*.

2.6 Left Side Panel

The left side panel of the OmniScan SX (see Figure 2-2 on page 27) contains various input and output ports.

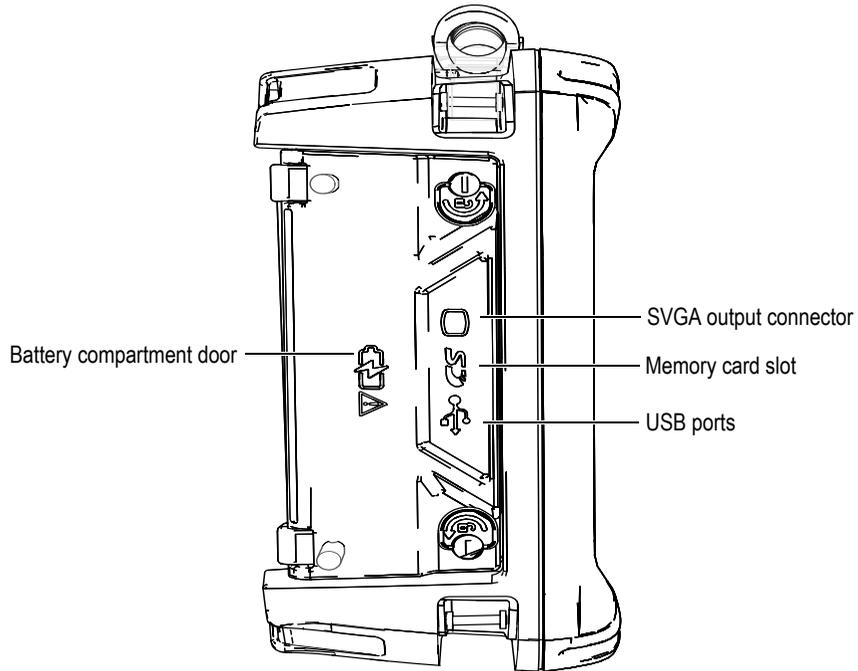


Figure 2-2 Left side panel of the OmniScan SX

Battery compartment door

This door provides access to the battery compartment. Battery replacement is covered in “Battery Removal and Installation” on page 43.

SVGA output

An external VGA or SVGA monitor that mirrors the OmniScan SX display may be connected to this DB-15 port.

Memory card slot

Slot for inserting the Secure Digital High Capacity (SDHC) memory card. (Lexar brand memory cards are recommended for optimal results.)

USB ports (2)

The USB ports (see Figure 2-2 on page 27) accommodate USB peripherals such as external keyboards, mice, storage devices, or printers.

2.7 Right Side Panel

The right side panel of the OmniScan SX (see Figure 2-3 on page 28) contains the DC power adaptor plug.

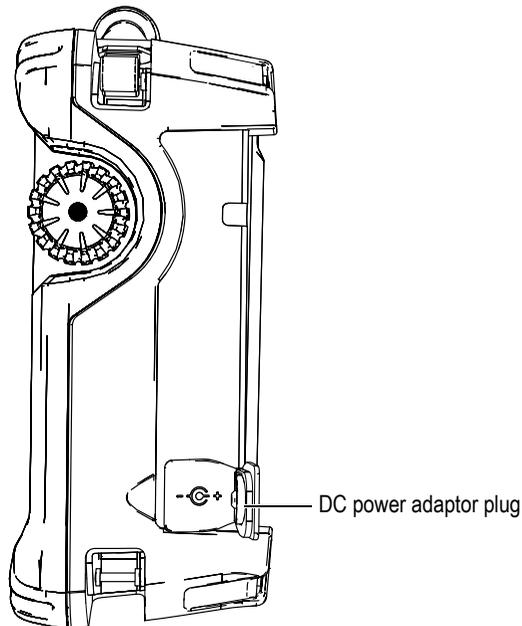


Figure 2-3 Right side panel of the OmniScan SX

DC power adaptor plug

Used to connect an external DC power adaptor to the OmniScan SX.

2.8 Top Panel



CAUTION

- To reduce the risk of electric shock, avoid touching the inner conductor of the probe connectors. Up to 340 V can be present on the inner conductor of the UT connectors, and up to 115 V can be present on the PA connector. The warning symbol near the PA and UT connectors signals this electric shock risk.
 - Reinforced insulation must be provided for the probes connected to the OmniScan SX instrument.
-



CAUTION

To avoid the risk of equipment malfunction or damage, use only compatible Olympus probes.

There are four connectors located on the top panel of the OmniScan SX (see Figure 2-4 on page 30).

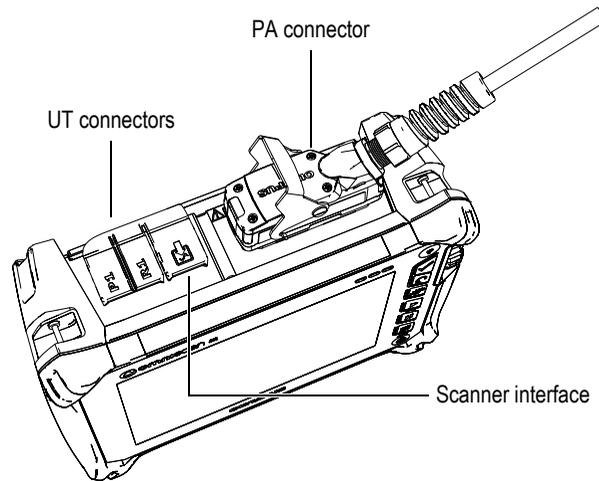


Figure 2-4 Top panel of the OmniScan SX (OmniSX-PA1664PR shown)

P1 (UT connector)

LEMO connector used for the transmission of ultrasonic signals when using the pitch-catch inspection technique.

R1 (UT connector)

LEMO connector used for the reception of ultrasonic signals when using the pitch-catch inspection technique.

Scanner interface

Used to connect a scanner device equipped with an encoder.

PA connector

Used to connect a phased array probe.

The compatible probe connectors are presented in Figure 2-5 on page 31.

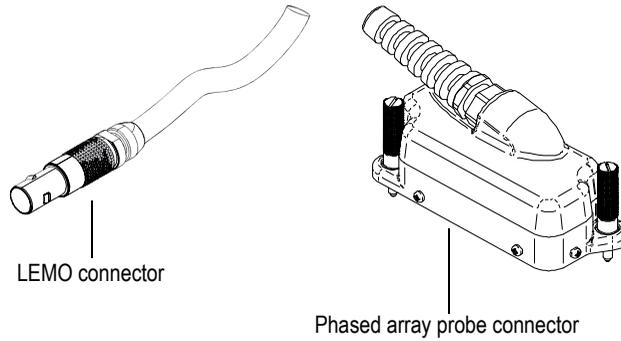


Figure 2-5 LEMO and phased array probe connectors

2.9 Rear Panel

The rear panel consists of the heat sink and the support stand (see Figure 2-6 on page 32).

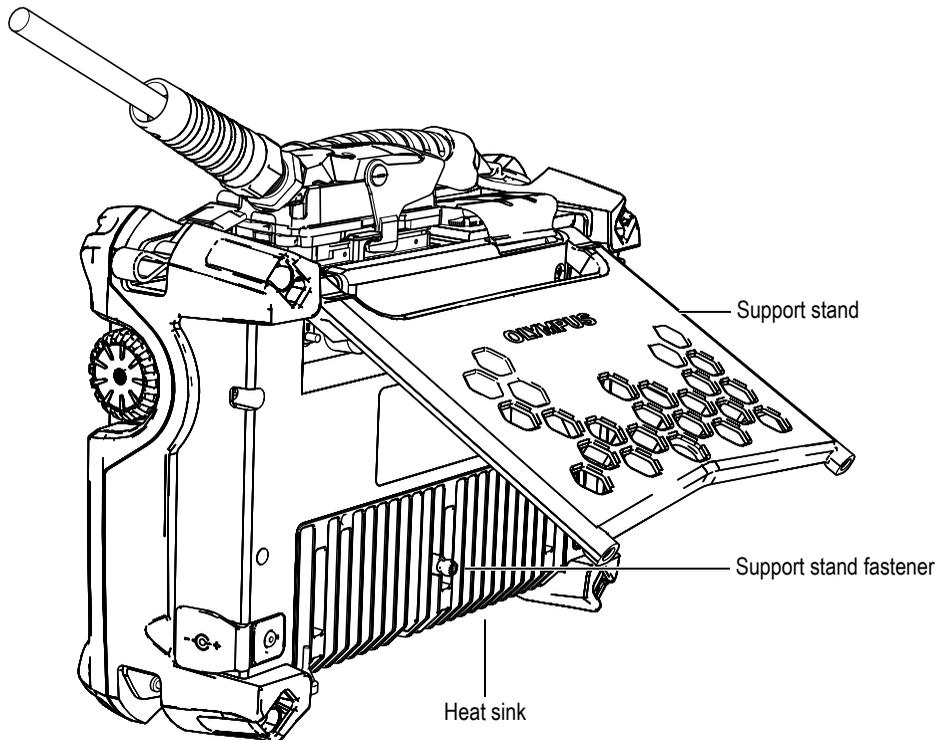


Figure 2-6 Rear panel of the OmniScan SX



CAUTION

- To prevent the instrument from falling over when propped up on a desktop or similar flat surface, you must make sure the support stand is open to its full extent.
 - In order to prevent injury, do not place your fingers between the rear panel and the instrument's support stand (when unfolded).
 - Injury can result when support stand is folded in stored position.
 - Do not use the support stand as a handle. Using the support stand as a handle could cause equipment damage or injury.
-

The rear panel is equipped with two fastening holes that can be used for attaching accessories or for instrument mounting purposes (see Figure 2-7 on page 33 and Figure 2-8 on page 34).

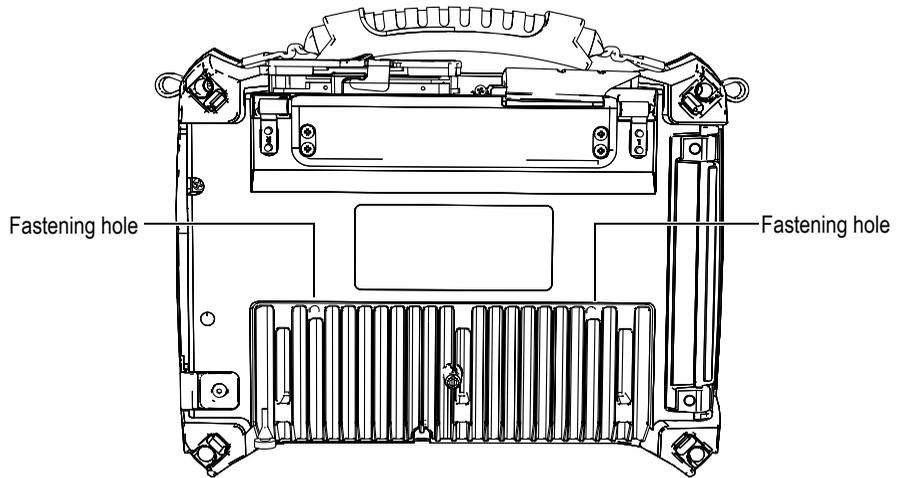


Figure 2-7 Fastening holes

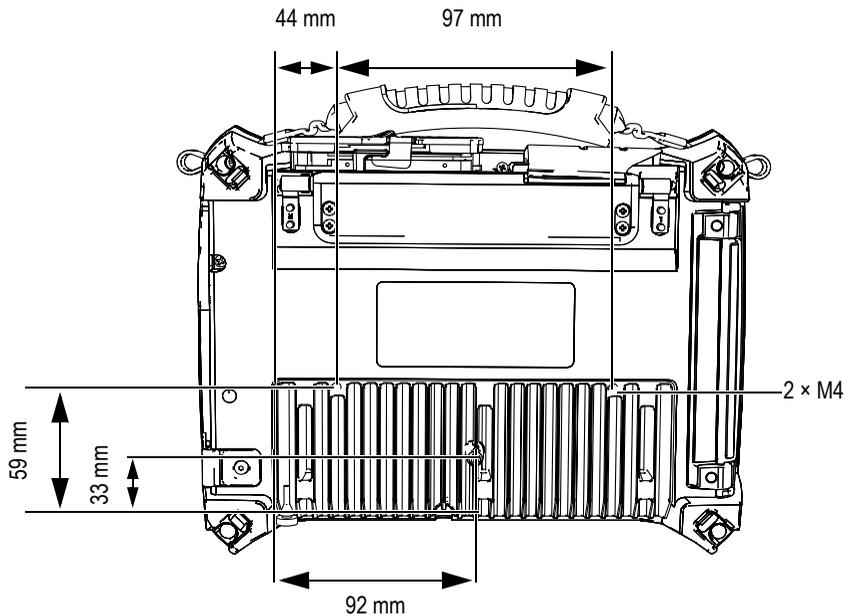


Figure 2-8 Fastening hole location and specifications



CAUTION

To prevent equipment damage, apply the following instructions when attaching accessories to the OmniScan SX or when mounting the OmniScan SX to any surface.

- Use M4 × 0.7 mm screws with a nominal penetration length (into the instrument) of 8 mm.
- Make sure that air can circulate freely between the OmniScan SX's heat sink and the accessory or mounting surface.
- When mounting the OmniScan SX to any surface:
 - Always use the two fastening holes.
 - Make sure that there is at least a 12 mm diameter surface contact area (see Figure 2-9 on page 35) between the OmniScan SX and the supporting surface.

- Only attach accessories weighing 3.4 kg (the weight of the OmniScan SX) or less.

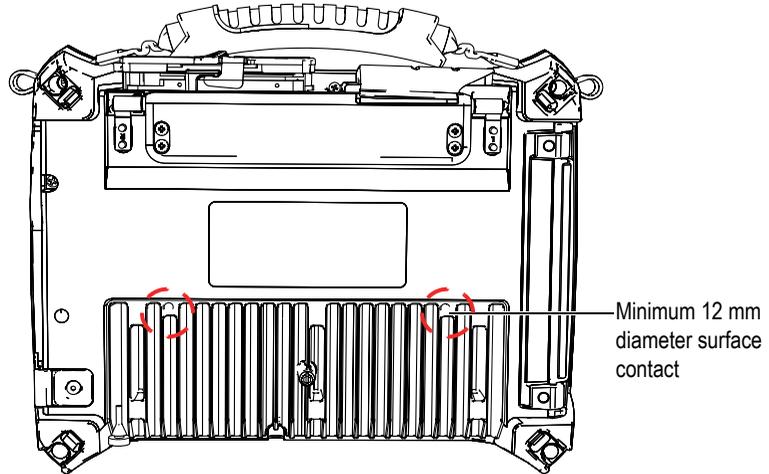


Figure 2-9 Surface contact requirements

3. Basic Operation

This chapter describes the basic principles and procedures involved in operating the OmniScan SX instrument.

3.1 Turning On and Off the OmniScan SX

This section explains how to turn on and off the OmniScan SX.

To turn on the OmniScan SX

- ◆ Press the Power key for one second.
The system starts up and performs a memory check.

NOTE

If the system encounters a problem during the start-up phase, the power indicator light will indicate the nature of the problem using a color code (for details, see “Power Indicator Light” in “Indicator Lights” on page 25).

To turn off the OmniScan SX

1. Quickly press the Power key.
The “Select a command” message appears (see Figure 3-1 on page 38).

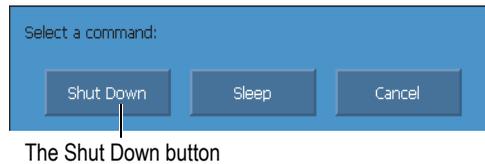


Figure 3-1 The Shut Down button

2. Select **Shut Down** (see Figure 3-3 on page 39).

A message asking you if you want to save your setup appears (see Figure 3-2 on page 38).

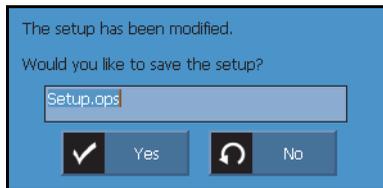


Figure 3-2 Saving the setup

3. To save your setup, select **Yes**.

NOTE

You can also turn off the OmniScan SX by pressing and holding the Power key for ten seconds. However, your setup will **NOT** be saved.

3.2 Sleep Mode

The OmniScan SX can be put into sleep mode when not in use to conserve power.

To use the sleep mode

1. With the OmniScan SX turned on, quickly press the Power key.

The “Select a command” message appears (see Figure 3-3 on page 39).

2. Select **Sleep**.

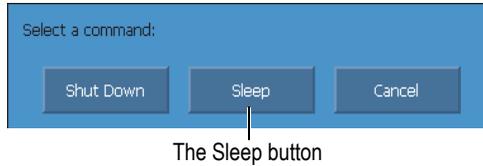


Figure 3-3 Sleep mode selection

3. To disable the sleep mode, quickly press the Power key.
The OmniScan SX returns to its previous state (inspection or analysis mode).

3.3 Automatic Start-Up Mode

The OmniScan SX has an automatic start-up mode: auto-boot. Use the auto-boot mode to remotely start the OmniScan SX unit. When this mode is enabled, you do not need to press the Power key to start the OmniScan SX. The OmniScan SX starts up automatically when connected to a DC power adaptor. This mode is disabled by default.

To activate the auto-boot

1. Turn off the OmniScan SX unit, remove the batteries, and then disconnect the DC power adaptor.
2. Press and hold the Power key.
3. Connect the OmniScan SX to a DC power adaptor.
4. Wait for the power indicator light to blink two times, and then release the Power key.
5. To deactivate the auto-boot, repeat steps 1 to 4.

3.4 Power Supply Management

The OmniScan SX is a portable instrument that can draw power from either a lithium-ion battery or a DC power adaptor.

3.4.1 DC Power Adaptor

You can operate the OmniScan SX on AC power using the DC power adaptor (P/N: OMNI-A-AC [U8767093]). The OMNI-A-AC has a universal AC power input, which operates with any line voltage from 100 VAC to 120 VAC or from 200 VAC to 240 VAC, and at 50 Hz to 60 Hz line frequency.



WARNING

To avoid the risk of injuries and/or equipment damage, only use the DC power adaptor indoors.

To use AC power

1. Connect the AC power cord to the DC power adaptor (P/N: OMNI-A-AC [U8767093]) and to an appropriate power outlet.
-



CAUTION

- Use only the AC power cord supplied with the OmniScan SX. Do not use this AC power cord with other products.
 - The OmniScan SX must only be connected to a power source corresponding to the type indicated on the rating plate. Therefore, use only the DC power adaptor that is delivered with the OmniScan SX.
-
2. On the right-hand side of the OmniScan SX, lift the rubber seal covering the DC adaptor connector plug (see Figure 3-4 on page 41).

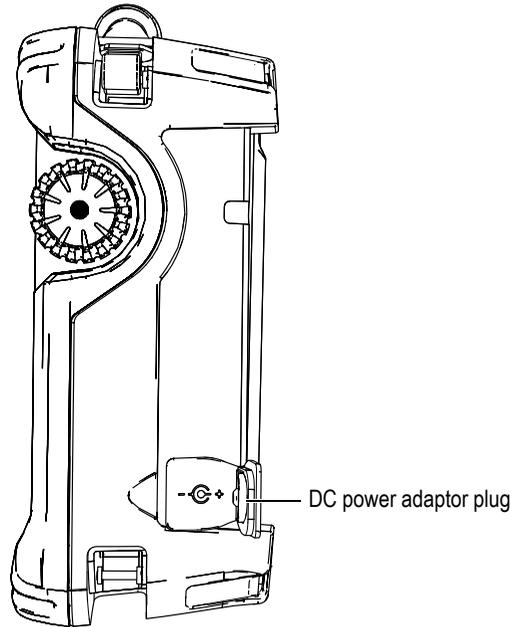


Figure 3-4 The OmniScan SX DC power adaptor plug

3. Connect the DC power adaptor to the OmniScan SX DC power adaptor plug (see Figure 3-4 on page 41).
4. Press the power key to start the OmniScan SX.

3.4.2 Lithium-Ion Battery

The OmniScan SX holds one lithium-ion battery (P/N: OMNI-A-BATT [U8760010]). The lithium-ion battery can be inserted and removed without needing to shut down the OmniScan SX, provided that there is another valid power source available (DC power adaptor).

The OmniScan SX also includes a lithium coin battery that does not need to be removed or replaced by the user. The coin battery keeps the instrument clock and masterboard configuration running.

**CAUTION**

To avoid the risk of injuries and/or equipment damage, replace the battery only with an Olympus battery (P/N: OMNI-A-BATT [U8760010]).

3.4.2.1 Battery Status Indicators

The battery status indicators located on the upper left corner of the display screen use one of the following two methods to indicate the amount of power remaining in each battery (see Figure 3-5 on page 42):

- The remaining operation time is displayed on the battery status indicator. The OmniScan SX must be operated for approximately 15 minutes before it is able to accurately display this information.
- The charge indicator (bar) on the battery status indicator shows the approximate amount of remaining power in the battery.

If you attempt to start the OmniScan SX using a battery with an insufficient charge, the power indicator light will flash red for approximately three seconds. To operate the OmniScan SX, replace the battery or plug in the DC power adaptor.



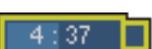
Figure 3-5 Battery charge status

3.4.2.2 Battery Discharge

The battery status indicator displays the amount of time needed to discharge the battery.

The OmniScan SX software informs the user of the remaining power status. The battery status indicator variations are described in Table 5 on page 43.

Table 5 Battery status indicator variations

Indicator	Outline	Fill	Meaning
	Dotted	N/A	There is no battery in the compartment.
	Blue	Blue	The battery is functioning properly.
	Blue	Orange	The battery is too hot for use.
	Yellow (blinking)	Blue	The battery is charging.
	Orange	Blue	The battery is too hot to be charged, or the internal system temperature is too high to enable charging (over 60 °C [140 °F]).
	Red (blinking)	Blue	The battery charge is critically low (less than 10 %). A beeping noise is emitted.
	N/A	Yellow	The OmniScan SX is being powered externally through the DC adaptor.

3.4.2.3 Battery Removal and Installation

To remove or install a battery

1. On the left side panel, turn the two quarter-turn latches to open the battery compartment door.
2. Pull the tab to remove the battery (see Figure 3-6 on page 44).

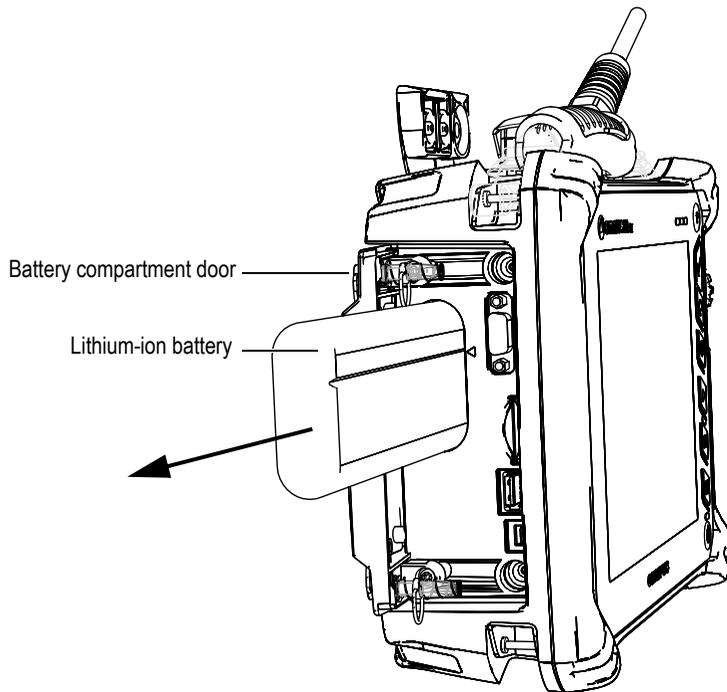


Figure 3-6 Removing a lithium-ion battery

3. Insert a new battery. Make sure that the groove on the battery is aligned with the small edge inside the battery compartment.
4. Close the battery compartment door.

The battery is recharged inside the OmniScan SX when it is connected to a DC power adaptor. Connecting an adaptor automatically starts the recharging process. The battery can also be recharged using an optional external charger.

3.4.2.4 Battery Charging

To charge the OmniScan SX battery

- ◆ Connect the OmniScan SX to a proper DC power adaptor.
Battery charging is performed as follows:
 - When the OmniScan SX is turned off:

When the OmniScan SX is connected to a proper DC power source and is turned off, it will automatically recharge the battery.

The power indicator light flashes orange to indicate that the battery is currently being recharged. When the charge is complete, the power indicator light emits a steady orange light. The battery can take up to 3 hours to fully charge from a completely discharged state (less than 5 % remaining charge).

- When the OmniScan SX is running:

When the OmniScan SX is running and connected to a proper DC power source, it will automatically recharge the battery. The indicator for the battery is green.

Because the OmniScan SX is running, less power is available from the DC source to recharge the battery. As such, it could take a minimum of 8 hours to charge a completely discharged battery. For more information about battery charge status, see Table 5 on page 43.

- When the OmniScan SX is in sleep mode:

When the OmniScan SX is in sleep mode and connected to a proper DC power source, it will automatically recharge the battery. The indicator for the battery flashes green and orange. When the charge is complete, the power indicator light flashes green.

3.4.2.5 Maximizing the Performance of Lithium-Ion Batteries

This section describes lithium-ion battery care and maintenance.

Storage instructions for rechargeable batteries

1. Before recharging, drain the battery by running the OmniScan SX on battery power until it shuts down, or until you get a low-battery warning. Do not leave the battery dormant for long periods of time. Olympus recommends using the battery at least once every two to three weeks. If a battery has not been used for a long period of time, perform the “New battery procedure” on page 46.

If you do not plan to use the OmniScan SX on battery power within three or more weeks, charge the battery to between 40 % and 80 % capacity (three or four bars on the battery charge indicator), and then remove and store the battery in a clean, cool, and dry place.

NOTE

Even when the OmniScan SX is turned off and unplugged, it draws a small amount of power from the battery, which could completely discharge the battery in about 3 months at room temperature (25 °C [77 °F]).

2. Because lithium-ion batteries self-discharge over time, remember to check the remaining charge of any stored batteries approximately once a month to ensure that they have 40 % to 80 % remaining capacity, and recharge any that do not. Failure to do so may render a battery permanently unusable if it falls below a critical level (less than 1 %).
3. After an extended period of storage, the batteries should be recharged before use.

New battery procedure

1. Anytime you acquire a new rechargeable battery, use it four to eight times consecutively in the OmniScan SX, and ensure that you completely discharge and recharge it after each use. Doing so will enable it to reach maximum capacity, providing maximum run time.
2. It is good practice to completely discharge and recharge the battery after the first 10 to 15 periods of normal use (or after two to three weeks) in order to drain the battery, thus maintaining good run time and maximizing battery life.
3. Frequently switching from external DC power to battery power and vice versa may result in shorter battery life, because the charge/discharge cycles are limited (approximately 300 cycles). Please note that even a partial discharge and recharge of the battery accounts for one cycle.
4. To maximize battery life, before charging, always run the OmniScan SX on battery power until it shuts down, or until you get a low-battery warning. Recharge the battery with the OmniScan SX in turned-off mode for a shorter recharge time, or with the external charger if provided.

3.4.2.6 Used Battery Disposal

Although lithium-ion batteries do not contain any environmentally hazardous components such as lead or cadmium, the batteries should be disposed of in accordance with local regulations. Batteries should be disposed of in a discharged state to avoid heat generation, and if applicable, in accordance with the European Directive on Waste Electrical and Electronic Equipment (WEEE). Refer to your local Olympus distributor for return and/or collection systems available in your country.

3.4.2.7 Warnings on Battery Use

Carefully read and observe the following warnings on battery use.



WARNING

- 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 [176°F]) 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 the OmniScan SX or an external charger approved by Olympus to charge the battery.
 - Do not recharge a battery unless the indicators light up when the capacity check button on the battery is pressed. Doing so could be dangerous.
 - 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 charged to between 40 % and 80 %.
 - Do not leave the battery in the OmniScan SX during instrument storage.
-

3.5 Peripheral Connection

This section explains the peripherals that can be used with the OmniScan SX.

Ferrite clamp filters

Before using the OmniScan SX, attach the ferrite clamp filters (supplied with the OmniScan SX) to the peripheral cables that will be connected to the OmniScan SX unit. The optional peripherals are as follows:

- Olympus UT probes
- Olympus PA probe
- Devices connected to the VGA out connector
- USB devices connected with a USB cable (printers, etc.)
- Scanner interface

If the ferrite clamp filters are not attached, the OmniScan SX unit may fail to comply with the international and European electromagnetic emission specifications.

To attach the clamp filters

IMPORTANT

- Make sure that the cable is not clamped in between the pawls of the ferrite clamp filter.
- Attach the ferrite clamp filters as closely as possible to the cable ends. The ferrite clamp filters are not effective unless they are immediately adjacent to the cable end connected to the OmniScan SX.
- Use the ferrite clamp filter with the corresponding cable diameter. The filter must not slip easily or be difficult to clip onto the cable.
- Make sure that the two ferrite clamp-filter parts are closed tight until the clamp clicks.

-
1. Attach the ferrite clamp filter on the cable of the Olympus UT probes, in close proximity to the connector for the OmniScan SX.
 2. Attach the ferrite clamp filter on the cable of the Olympus PA probe, in close proximity to the connector for the OmniScan SX.
 3. Attach the ferrite clamp filter to the VGA cable, in close proximity to the connector for the OmniScan SX.
 4. Attach the ferrite clamp filter to the USB cable, in close proximity to the connector for the OmniScan SX.
 5. Attach the ferrite clamp filter to the scanner interface cable, in close proximity to the connector (LEMO) for the OmniScan SX.

Figure 3-7 on page 49 and Figure 3-8 on page 49 show the applicable connection for various cables on the OmniScan SX, and the locations where the ferrite clamp filters must be attached.

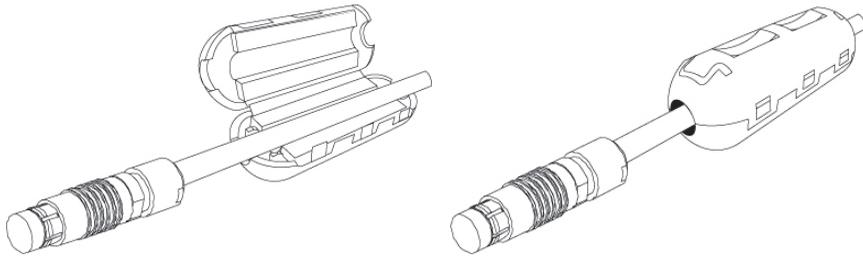


Figure 3-7 Attaching a ferrite clamp filter to a cable (example shown with the scanner interface cable)

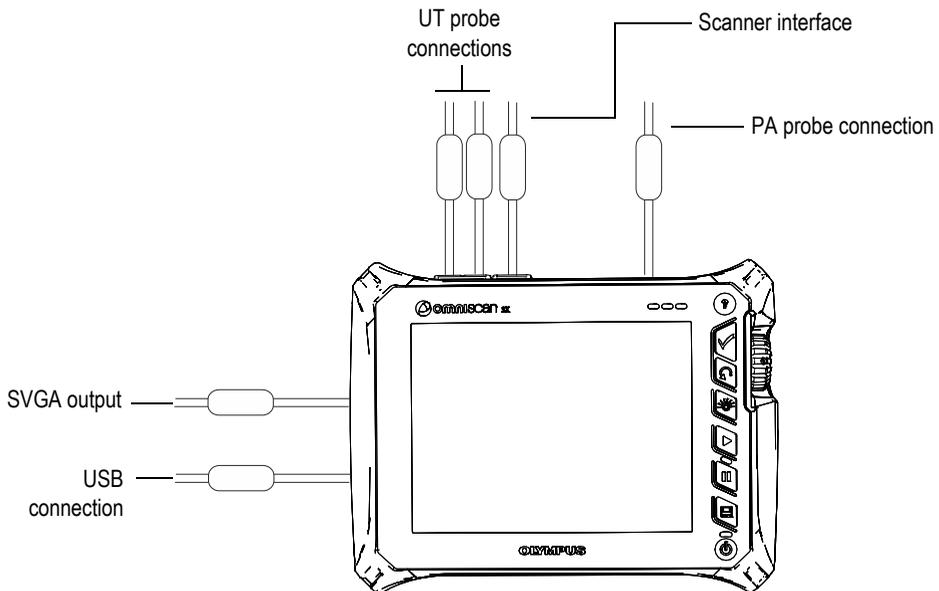


Figure 3-8 OmniScan SX connection diagram – ferrite clamp filters

3.6 OmniScan SX Software Installation

The OmniScan SX software installation is designed to be as trouble-free as possible. The software is stored on an SDHC card.

During upgrades to new versions, a message appears on the screen to inform you that the upgrade is taking place. However, no action is required on your part.

Refer to the Olympus website for software updates and all related, applicable procedures.

4. Maintenance

This chapter describes the basic maintenance that must be performed on the OmniScan SX unit by operators. The maintenance operations explained below enable you to keep your instrument in good physical and working condition. By virtue of its design, the OmniScan SX only requires minimal maintenance. The chapter covers preventative maintenance and instrument cleaning.

4.1 Preventative Maintenance

The OmniScan SX does not have many moving parts, and therefore only requires minimal preventative maintenance. Simply perform regular inspections to keep the OmniScan SX in proper working order.

4.2 Instrument Cleaning

The OmniScan SX external surfaces may be cleaned as needed. This section provides the appropriate procedure for cleaning the instrument.

4.2.1 Casing Cleaning

To clean the casing

1. Make sure that the instrument is turned off, and that the power cord is disconnected.
2. Disconnect all cables and connectors, and make sure that all external ports on the OmniScan SX have been covered with their rubber protectors.
3. Place the cap on the scanner interface connector.

4. Make sure that the battery compartment door is closed correctly.
5. To restore the instrument's original finish, clean the casing with a soft cloth.
6. To remove persistent stains, use a damp cloth with a mild, soapy solution. Do not use abrasive products or powerful solvents, which could damage the finish.
7. Once the connector protectors are removed, make sure the connectors are dry before connecting anything to them. If they are wet, dry them with a soft, dry cloth, or let them air dry.

4.2.2 Screen and Screen Protector Cleaning

Never use abrasive products or powerful solvents to clean the OmniScan SX touch screen and screen protector. Clean the touch screen and screen protector using a damp cloth moistened with a standard, evaporating glass cleaner. If necessary, remove any paper-towel residue with a soft-bristle brush.

4.3 Replacing the Touch-Screen Protector

This section explains how to replace the touch-screen protector.

To replace the touch-screen protector

1. Remove any dust or dirt on the touch screen (dust and dirt cause bubbles to appear on the protective film). See "Screen and Screen Protector Cleaning" on page 52.
2. Simply remove the label marked No. 1, and peel away the protective film on the back.

NOTE

Avoid touching the back of the screen protector after the protective film on the back is peeled away. Doing so will leave a trace of your finger prints.

3. Align the protector into the correct position on the screen, and slowly install the screen protector.
4. Remove the label marked No. 2, and peel away the film on the front. Provided that there is no dust trapped underneath, all small bubbles will dissipate within 48 hours.

TIP

Dust particles can be blown away prior to installation using a can of compressed air.

5. Troubleshooting

This chapter will help you resolve minor problems that could occur during operation of your OmniScan SX unit. This troubleshooting guide has been prepared based on the assumption that the instrument has not been modified, and that all cables and connectors used are those provided and documented by Olympus.

5.1 Start-Up Problems

The OmniScan SX does not start.

Possible solutions

- Check that the DC power adaptor is connected to both the OmniScan SX and a power outlet with the proper voltage. Use only the adaptor supplied with the OmniScan SX.
- Make sure that the battery is charged to at least 10 % capacity and correctly inserted into the battery compartment.
- Press and hold the Power key for three seconds or longer.

5.2 Battery Charging Problems

The battery does not charge when placed in the OmniScan SX.

Possible solutions

- Make sure that the battery model used in the OmniScan SX is compatible with the model suggested by Olympus. An incompatible battery may be able to power the unit, but the recharge protocol may not recognize it.

- Make sure that the DC power adaptor is connected correctly.
- Charge the battery using an external charger. The battery charges much quicker when the OmniScan SX is not in use. However, the battery will charge very slowly, if at all, if the power consumption is too high.
- Shut down the OmniScan SX and wait for it to cool. Battery charging is disabled when the battery temperature or the system's internal temperature is too high. This status will be indicated on the battery status indicator (see Table 5 on page 43 for battery status indicator descriptions).

5.3 Battery Life Problems

The battery charge does not last as long as it used to.

Possible solutions

- Drain the battery completely before recharging it to extend its life.
- Recondition the battery once a month using an external battery charger. Although the OmniScan SX lithium-ion battery does not suffer from the "memory effect" commonly affecting other battery types, it should be reconditioned for optimum efficiency (for details, see "Maximizing the Performance of Lithium-Ion Batteries" on page 45).
- Verify your current configuration. There may be an option or combination of options that are causing the battery to drain too quickly. Such options could include the brightness, voltage level, and acquisition rate.

6. Specifications

This chapter covers the OmniScan SX unit specifications (see Table 6 on page 57 to Table 11 on page 62).

Table 6 OmniScan SX general specifications

Housing	
Size	267 mm × 208 mm × 94 mm (10.5 in. × 8.1 in. × 3.7 in.)
Weight	3.4 kg (7.5 lb) [with battery inside]
Environmental conditions	
Operating temperature	−10 °C to 45 °C (14 °F to 113 °F)
Storage temperature	−20 °C to 60 °C [−4 °F to 140 °F] (with battery inside) −20 °C to 70 °C [−4 °F to 158 °F] (with no battery inside)
Relative humidity (RH)	Max. 70 % RH at 45 °C (113 °F) noncondensing
Altitude	Up to 2000 m
Outdoor use	To be used with the battery only
IP rating	Designed to meet requirements of IP66
Pollution level	2
Installation category	II
Battery	
Battery model	OMNI-A-BATT (U8760010)
Battery type	Smart lithium-ion battery
Number of batteries	1

Table 6 OmniScan SX general specifications (continued)

Battery storage temperature	-20 °C to 60 °C (-4 °F to 140 °F) at 80 % relative humidity
Battery charge time	3 hours using the internal charger or an optional battery charger
Battery life	Minimum 6 hours under normal operating conditions
Size	Approximately 214 mm × 58.7 mm × 21.9 mm (8.4 in. × 2.3 in. × 0.9 in.)
External DC Supply	
DC-IN voltage	15 VDC to 18 VDC (min. 50 W)
Connector	Circular, 2.5 mm pin diameter, center-positive
Suggested model	OMNI-A-AC (U8767093)
Display	
Display size (diagonal)	213 mm (8.4 in.)
Resolution	800 × 600 pixels
Number of colors	16 million
Type	TFT LCD
Viewing angles	Horizontal: -80° to 80° Vertical: -60° to 80°
Data storage	
Storage devices	SDHC card or most standard USB storage devices
Maximum data file size	300 MB
I/O ports	
USB port	2 USB ports compliant with USB 2.0 specifications
Video output	Video out (SVGA)
I/O lines	
Encoder	2-axis encoder line (quadrature or clock/direction)
Digital input	4 digital inputs TTL, 5 V
Digital output	3 digital outputs TTL, 5 V, 15 mA maximum per output

Table 6 OmniScan SX general specifications (continued)

Remote communication	Remote communication RS-232: One serial port using 3-wire RS-232
Acquisition on/off switch	Through configuration of a digital input
Power output line	5 V nominal, 500 mA (short-circuit protected)
Pace input	5 V, TTL pace input

Table 7 OmniScan SX alarms

Alarms	
Number of alarm zones	3
Conditions	Any logical combination of gates

**CAUTION**

- To reduce the risk of electric shock, avoid touching the inner conductor of the probe connectors. Up to 340 V can be present on the inner conductor of the UT connectors, and up to 115 V can be present on the PA connector. The warning symbol near the probe connectors signals this electric shock risk.
- Reinforced insulation must be provided for the probes connected to the OmniScan SX instrument.

**CAUTION**

To avoid the risk of equipment malfunction or damage, use only compatible Olympus probes.

Table 8 on page 60 and Table 9 on page 60 detail the acoustic specifications of the pulser, receiver, and beam formation, for both UT and PA modes.

Table 8 Acoustic specifications – UT channel using UT connector

Pulser	
Voltage	95 V, 175 V, and 340 V
Pulse width	Adjustable from 30 ns to 1000 ns; resolution of 2.5 ns
Fall time	< 10 ns
Pulse shape	Negative square pulse
Output impedance	< 30 Ω
Receiver	
Gain range	0 dB to 120 dB maximum input signal 34.5 Vp-p (full-screen height)
Input impedance	60 Ω in pulse-echo mode 50 Ω in pulse-receive mode
System bandwidth	0.25 MHz to 28 MHz (-3 dB)

NOTE

When the UT channel is used in pulse-echo mode, pulses occur on both the P1 and R1 connectors. When pulse-echo mode is selected, Olympus recommends using only the P1 connector to connect the probe.

Table 9 Acoustic specifications – PA channel

Pulser	
Voltage	40 V, 80 V, and 115 V
Pulse width	Adjustable from 30 ns to 500 ns; resolution of 2.5 ns
Fall time	< 10 ns
Pulse shape	Negative square pulse
Output impedance	35 Ω (pulse-echo mode); 30 Ω (pitch-catch mode)
Receiver	
Gain range	0 dB to 80 dB maximum input signal 550 mVp-p (full-screen height)

Table 9 Acoustic specifications – PA channel (continued)

Input impedance	60 Ω (pulse-echo mode); 150 Ω (pitch-catch mode)
System bandwidth	0.6 MHz to 18 MHz (-3 dB)
Beam formation	
Scan type	Sectorial and linear
Aperture	OMNISX-PA1664PR = 16 elements OMNISX-UT = N/A
Number of focal laws	256
Delay range transmission	0 μ s to 10 μ s in 2.5 ns increments
Delay range reception	0 μ s to 6.4 μ s in 2.5 ns increments

Table 10 on page 61 lists the acquisition specifications for frequency, data display, and synchronization.

Table 10 Acquisition specifications

Frequency	
Effective digitizing frequency	Up to 100 MHz
A-scan (acquisition mode)	Up to 6000 A-scans per second (512-point, 8-bit A-scan)
Maximum pulsing rate	Up to 6 kHz (C-scan)
Depth in material	59.8 meters in steel (longitudinal wave), 10 ms with compression 0.49 meter in steel (longitudinal wave), 81.9 μ s without compression
Display	
Refresh rate	A-scan: 60 Hz; S-scan: 60 Hz
Envelope (echo-dynamic mode)	Yes: Volume-corrected S-scan (30 Hz)
Synchronization	
On internal clock	1 Hz to 6 kHz
External pace	Yes
On encoder	On two axes: from 1 to 65536 steps

Table 11 on page 62 details the data specifications of processing, TCG, and storage.

Table 11 Data specifications

Processing	
Number of data points	Up to 8192
Real-time averaging	PA: 2, 4, 8, 16 UT: 2, 4, 8, 16, 32, 64
Rectification	RF, full wave, half wave+, half wave-
Filtering	PA channel: 3 low-pass, 3 band-pass, and 5 high-pass filters UT channel: 3 low-pass, 6 band-pass, and 3 high-pass filters (8 low-pass filters when configured in TOFD)
Video filtering	Smoothing (adjusted to the probe frequency range)
Programmable TCG	
Number of points	16: One TCG (time-corrected gain) curve per focal law
Range	PA: 40 dB per step of 0.1 dB UT: 100 dB per step of 0.1 dB
Maximum slope	40 dB/10 ns
Storage	
A-scan recording	6000 A-scans per second (512-point, 8-bit A-scan)
C-scan recording	I, A, B, up to 6 kHz
Maximum file size	Limited to available internal flash memory: 300 MB

7. Connector References



WARNING

Always use equipment and accessories that meet Olympus specifications. Using incompatible equipment can result in a malfunction, equipment damage, or injury.

This chapter provides a technical description of the OmniScan SX unit connectors and adaptor.

The following information is provided for each of the connectors: a brief description, the manufacturer's number, the number of the corresponding cable connector, an illustration, and a table with the signal pinout for the connector.

The following OmniScan SX connectors comply with their respective standards:

- Scanner interface connector
- SDHC (memory card slot)
- Circular DC power jack, 2.5 mm pin diameter, 15 VDC to 18 VDC (see Figure 7-1 on page 63).



Figure 7-1 Circular DC power jack polarity

- USB
- VGA
- R1

- P1
- PA

7.1 Scanner Interface Connector

Description

LEMO, 16-pin female circular connector

Manufacturer, number

LEMO, EEG.1K.316.CLL

Suggested cable connector

LEMO, FGG.1K.316.CLAC65Z



Figure 7-2 The scanner interface LEMO connector (pin side)

Table 12 Pinout for the scanner interface LEMO connector

Pin	I/O	Signal	Description	Current	Level
1	N/A	N/A	N/A	N/A	N/A
2	Out	+5 V	External power supply.	500 mA	N/A

Table 12 Pinout for the scanner interface LEMO connector (continued)

Pin	I/O	Signal	Description	Current	Level
3	In	DIN1	<p>Digital input 1.</p> <p>Programmable input. Can be configured for different functionalities. By default, this input is disabled. Refer to the <i>OmniScan MXU Software User's Manual</i> ("Configuring the Digital Input") for information on programming this input.</p> <p>To activate the input, you must use a high-level signal with a minimum signal length of 50 ms.</p>	N/A	TTL
4	In	DIN2	<p>Digital input 2.</p> <p>Programmable input. Can be configured for different functionalities. By default, this input is disabled. Refer to the <i>OmniScan MXU Software User's Manual</i> ("Configuring the Digital Input") for information on programming this input.</p> <p>To activate the input, you must use a high-level signal with a minimum signal length of 50 ms.</p>	N/A	TTL

Table 12 Pinout for the scanner interface LEMO connector (continued)

Pin	I/O	Signal	Description	Current	Level
5	In	DIN3	Digital input 3. Programmable input. Can be configured for different functionalities. By default, this input is disabled. Refer to the <i>OmniScan MXU Software User's Manual</i> ("Configuring the Digital Input") for information on programming this input. To activate the input, you must use a high-level signal with a minimum signal length of 50 ms.	N/A	TTL
6	In	DIN4	Digital input 4. Programmable input. Can be configured for different functionalities. By default, this input is disabled. Refer to the <i>OmniScan MXU Software User's Manual</i> ("Configuring the Digital Input") for information on programming this input. To activate the input, you must use a high-level signal with a minimum signal length of 50 ms.	N/A	TTL
7	Out	DOUT1/ PaceOut	Digital out 1/pace output.	±15 mA	TTL
8	Out	DOUT2	Digital output 2	±15 mA	TTL

Table 12 Pinout for the scanner interface LEMO connector (continued)

Pin	I/O	Signal	Description	Current	Level
9	In	PhA axis 1	Encoder 1: phase A/clock/up/ down.	N/A	TTL
10	In	PhB axis 1	Encoder 1: phase B/direction/ N.U./N.U. ^a	N/A	TTL
11	In	PhB axis 2	Encoder 2: phase B/direction/ N.U./N.U.	N/A	TTL
12	In	PhA axis 2	Encoder 2: phase A/clock/up/ down.	N/A	TTL
13	Out	DOUT3	Digital output 3	±25 mA	TTL
14	In	RRx	Rx	N/A	RS-232
15	Out	RTx	Tx	N/A	RS-232
16	–	Gnd	Ground	N/A	N/A

a. N.U. = Not used

7.2 Scanner Interface Adaptor

The scanner interface adaptor cable, which is used to connect scanners equipped with a DE-15 connector to the new LEMO scanner interface, is an optional accessory.

Description

LEMO connector

Manufacturer, number

LEMO, FGG.1K.316.CLA.C65Z



Figure 7-3 The scanner interface adaptor LEMO connector (weld side)

Description

DE-15 connector

Manufacturer, number

Amphenol, 17EHD-015-SAA-000

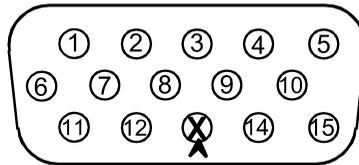


Figure 7-4 The scanner interface adaptor DE-15 connector (weld side)

Table 13 Scanner interface adaptor pinout [DE-15 to LEMO]

LEMO	Signal	DE-15
1	Analog In	4
2	+5 V	3
3	DIN1	1
4	DIN2	2
5	DIN3	5

Table 13 Scanner interface adaptor pinout [DE-15 to LEMO] (continued)

LEMO	Signal	DE-15
6	N.U. ^a	
7	DOUT1	6
8	DOUT2	14
9	PHA-1	9
10	PHB-1	10
11	PHB-2	12
12	PHA-2	11
13	Connector keying (index)	13 (removed)
14	RX	7
15	TX	8
16	GND	15
Casing	Shield	Casing

a. N.U. = Not used

Appendix: Compatibility Tables



WARNING

Always use equipment and accessories that meet Olympus specifications. Using incompatible equipment can result in a malfunction, equipment damage, or injury.

This appendix presents the software and accessories that are compatible with the OmniScan SX (see Table 14 on page 71 and Table 15 on page 72).

IMPORTANT

The software versions mentioned in Table 14 on page 71 were the versions available at the time of the publication. Subsequent qualified versions will also be compatible.

Table 14 OmniScan SX software compatibility

Model	Acquisition	Analysis
UT	MXU 4.1	OmniPC 4.1 TomoView 2.10R5
PA	MXU 4.1	OmniPC 4.1 TomoView 2.10R5

Table 15 Accessory compatibility

Accessory	Part number	U8 number
OmniScan SX battery	OMNI-A-BATT	U8760010
External battery charger	OMNI-A-CHRG	U8767077
Transport case	OMNIX-A-SHCASE	U8779748
OmniScan SX accessory kit (battery, battery charger, keyboard, optical mouse, and backstrap)	OMNIX-A-ACC1	U8779749
Kit of 5 anti-glare protection films for the touch screen	OMNIX-A-SCREENPROTEC	U8779745
Stylus kit	OMNI-A2-STYLUS	U8780317
16-GB SD card	OMNI-A2-SDCard	U8780306
Encoder adaptor (DE-15 to LEMO)	OMNI-A2-ADP20	U8775201
DC power adaptor	OMNI-A-AC	U8767093
Mini USB drive	OMNI-A2-USBDrive	U8780307
USB keyboard (virtually indestructible)	OMNI-A-KEYB	U8780085
HP small, portable battery-operated, color ink jet, USB printer	OMNI-A-PRINTBATT	U8780086
USB optical mouse	OMNI-A-OMSE	U8780087
OmniScan backstrap	OMNI-A-BST	U8780089
Flash and SD card reader	OMNI-A-CFR	U8780092

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