

*Model 3701*

# Line Probe

## User Manual



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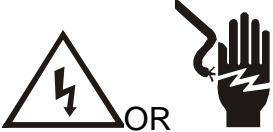


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## Safety Symbol Definitions

This product and related documentation must be reviewed for familiarization with safety markings and instructions prior to operation of the product.

Safety Symbol	Definition
	<p><b>REFER TO MANUAL</b>—When the product is marked with this symbol refer to the instruction manual for additional information. If the instruction manual has been misplaced, go to <a href="http://www.ets-lindgren.com">www.ets-lindgren.com</a> for downloadable files or contact ETS-Lindgren customer service.</p>
	<p><b>HIGH VOLTAGE</b>—Indicates the presence of hazardous voltage. Unsafe practice could result in several personal injury or death.</p>
	<p><b>PROTECTIVE EARTH GROUND (SAFETY GROUND)</b>—Indicates protective earth terminal. Uninterruptible safety earth ground from the main power source to the product input wiring terminals, power cord or supplied power cord set shall be provided.</p>
	<p><b>WARNING</b>—Denotes a hazard. Failure to follow instruction could result in severe personal injury and/or property damage. Text that follows the symbol will provide proper procedures.</p>

## General Safety Considerations

Safety Symbol	Definition
	<p><b>BEFORE POWER IS APPLIED TO THIS INSTRUMENT, GROUND IT PROPERLY</b> through the protective conductor of the AC power cable to a power source provided with protective earth contact. Any interruption of the protective (grounding) conductor, inside or outside of the instrument, or disconnection of the protective earth terminal could result in personal injury.</p>
	<p><b>BEFORE SERVICING: CONTACT ETS-LINDGREN (+1.512.531.6400)</b>—Servicing or modifying the unit without ETS-Lindgren authorization may void your warranty. If an attempt to service the unit must be made, disconnect all electrical power prior to beginning. Voltages exist at many points within the instrument that could, if contacted, cause personal injury. Only trained service personnel should perform adjustments and/or service procedures upon this instrument. <i>Capacitors inside this instrument may still be charged even when the instrument is disconnected from the power source.</i></p>
	<p><b>ONLY QUALIFIED PERSONNEL</b> should operate or service this equipment.</p>

## 1.0 Introduction

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The ETS-Lindgren Model 3701 Line Probe is a wire clamp-on device that attaches to the AC power mains providing primary power to the equipment under test. When it is not practical to use a Line Impedance Stabilization Network (LISN), the Model 3701 Line Probe can measure conducted emissions, and may be used to block the power mains frequency while allowing the higher frequencies (9 kHz to 30 MHz) present on the line to be measured. The Line Probe can also measure the presence of conducted signals on the power mains within a facility.

The Model 3701 Line Probe presents a nominal resistance of 1500 ohms to all voltages on the line. The Line Probe also attenuates noise voltage, so a correction factor must be added to the EMI receiver readings to obtain the proper emission levels on the line.

The Model 3701 Line Probe is built in accordance with FCC Rules and Regulations Volume II, Part 15, Paragraph 8.4, Appendix A. The design and construction is also in accordance with various international regulatory compliance standards.

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## 2.0 Receiving Your Order

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### 2.1 Unpacking and Acceptance

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**Step 1.** Upon delivery of your order, inspect the shipping container(s) for evidence of damage. Record any damage on the delivery receipt before signing it. In case of concealed damage or loss, retain the packing materials for inspection by the carrier.

**Step 2.** Remove the product from its shipping container(s). Save the container(s) and any protective packing materials for future use.

**Step 3.** Check all materials against the packing list to verify that the equipment you received matches what was ordered. If you find any discrepancies, note them and call ETS-Lindgren Customer Service for further instructions.

Ensure that you are satisfied with the contents and condition of your order prior to placing the product into service.

### 2.2 Return Procedures

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To return a system or system component:

**Step 1.** Contact ETS-Lindgren Customer Service to obtain an SRO, Service Request Order.

**Step 2.** Briefly describe the problem in writing. Give details regarding the observed symptom(s) or error codes, and whether the problem is constant or intermittent in nature. Please include the date(s), the service representative you spoke with, and the nature of the conversation. Include the serial number of the item being returned.

**Step 3.** Package the system or component carefully. If possible, use the original packing materials to return a system or system component to ETS-Lindgren at the following address:

**ETS-Lindgren**  
Attn. Service Department  
301 Arrow Point Drive  
Cedar Park, TX, USA 78613  
Phone: +1.512.531.6400

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### 3.0 Maintenance

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**To prevent electrical shock, do not remove covers. Disconnect all electrical power before servicing.**



**Only a qualified service technician should repair the Model 3701 Line Probe. Damage resulting from unauthorized servicing may void your warranty.**

The Model 3701 Line Probe contains no internal user-serviceable parts. Refer all servicing to qualified personnel. The Line Probe must be serviced at the factory address on the serial number label that is located on the Line Probe. To return the Line Probe for recalibration or service, use the original packaging or comparable materials.

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## 4.0 Operation

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To connect to the line under test:

1. Remove power from the line under test.
2. Pull the plastic safety shroud back to expose the conductive hook.
3. Place the hook around an exposed portion of the power mains conductor and release the plastic shroud. The spring-loaded shroud will clamp the contact point.
4. Connect a type BNC cable to the coaxial connector on the end of the Model 3701 Line Probe.
5. Apply power to the power mains.
6. Connect the opposite end of the BNC cable to the input on the EMI receiver or spectrum analyzer.

### **WARNING**

**To avoid electrical shock, do not make contact with the power mains conductor when power is applied through the conductor. When attaching the Model 3701 Line Probe, always remove power.**

Each Model 3701 Line Probe is individually characterized. A graph of the Line Probe insertion loss characteristics is provided on a separate data sheet shipped with your Line Probe.

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## 5.0 Specifications

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### 5.1 Electrical Specifications

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<b>Frequency range:</b>	9 kHz – 30 MHz
<b>Maximum AC voltage:</b>	250 VAC line-to-ground
<b>Input connector:</b>	Conductive hook with spring-loaded plastic shroud
<b>Output connector:</b>	Type BNC receptacle

### 5.2 Physical Specifications

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<b>Length:</b>	8.5 in 216 mm
<b>Diameter:</b>	1.5 in 38 mm
<b>Weight:</b>	5.8 oz 164.4 g

### 5.3 Environmental Specifications

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<b>Installation:</b>	Indoor use only
<b>Altitude:</b>	15,000 ft maximum 4,572 m maximum

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## 6.0 Warranty Policy for Standard EMCO Brand Products

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### 6.1 Scope and Duration of Warranties

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Seller warrants to Buyer that the Standard EMCO Brand Products Excluding 5211 & 5220 be (1) free from defects in material, manufacturing workmanship, and title, and (2) conform to the Seller's applicable product descriptions and specifications, if any, contained in or attached to Seller's quotation. If no product descriptions or specifications are contained in or attached to the quotation, Seller's applicable product descriptions and specifications in effect on the date of shipment shall apply. The criteria for all testing shall be Seller's applicable product specifications utilizing factory-specified calibration and test procedures and instruments.

All product warranties, except the warranty of title, and all remedies for warranty failures are limited in time as shown in the following table.

Product Warranted	Duration of Warranty Period
Standard EMCO Brand Products Excluding 5211 & 5220	2 Years

Any product or part furnished to Buyer during the warranty period to correct a warranty failure shall be warranted to the extent of the unexpired term of the warranty applicable to the repaired or replaced product.

The warranty period shall commence on the date the product is delivered to Buyer; however, if Seller assembles the product, or provides technical direction of such assembly, the warranty period for such product shall commence on the date the assembly of the product is complete. Notwithstanding the foregoing, in the event that the assembly is delayed for a total of thirty (30) days or more from the date of delivery for any reason or reasons for which Seller is not responsible, the warranty period for such product may, at Seller's options, commence on the thirtieth (30th) day from the date such product is delivered to Buyer. Buyer shall promptly inspect all products upon delivery. No claims for shortages will be allowed unless shortages are reported to Seller in writing within ten (10) days after delivery. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery (or assembly if the products are to be assembled by Seller) or, in the case of alleged breach of warranty, within the applicable warranty period.

### 6.2 Warranty Exclusions

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Except as set forth in any applicable patent indemnity, the foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, express, implied, or statutory. EXCEPT AS EXPRESSLY STATED ABOVE, SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, BY STATUTE OR

OTHERWISE, WHETHER OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR USE OR OTHERWISE ON THE PRODUCTS, OR ON ANY PARTS OR LABOR FURNISHED DURING THE SALE, DELIVERY OR SERVICING OF THE PRODUCTS. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

Warranty coverage does not include any defect or performance deficiency (including failure to conform to product descriptions or specifications) which results, in whole or in part, from (1) negligent storage or handling of the product by Buyer, its employees, agents, or contractors, (2) failure of Buyer to prepare the site or provide an operating environmental condition in compliance with any applicable instructions or recommendations of Seller, (3) absence of any product, component, or accessory recommended by Seller but omitted at Buyer's direction, (4) any design, specification, or instruction furnished by Buyer, its employees, agents or contractors, (5) any alteration of the product by persons other than Seller, (6) combining Seller's product with any product furnished by others, (7) combining incompatible products of Seller, (8) interference with the radio frequency fields due to conditions or causes outside the product as furnished by Seller, (9) improper or extraordinary use of the product, or failure to comply with any applicable instructions or recommendations of Seller, or (10) acts of God, acts of civil or military authority, fires, floods, strikes or other labor disturbances, war, riot, or any other causes beyond the reasonable control of Seller. This warranty does not cover (1) contact fingers or replacements unless loss is caused by a defect in material or manufacturing workmanship within the scope of this warranty (2) items designed to be consumable and (3) removal and reconstruction of walls, partitions, ceilings and other facility costs arising from repair or replacement of the product or parts thereof by Seller under the warranty. Seller does not warranty products of others which are not included in Seller's published price lists for shielding products and systems supplies and accessories.

### **6.3 Buyer's Remedies**

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If Seller determines that any product fails to meet any warranty during the applicable warranty period, Seller shall correct any such failure by either, at its option, repairing, adjusting, or replacing without charge to Buyer any defective or nonconforming product, or part or parts of the product. Seller shall have the option to furnish either new or exchange replacement parts or assemblies.

Warranty service during the applicable warranty period will be performed without charge to Buyer within the contiguous 48 United States during Seller's normal business hours. After the warranty period, service will be performed at Seller's prevailing service rates. Subject to the availability of personnel, after-hours service is available upon request at an additional charge. For service outside the contiguous 48 United States, travel and per diem expenses, when required, shall be the responsibility of the Buyer, or End User, whichever is applicable.

The remedies set forth herein are conditioned upon Buyer promptly notifying Seller within the applicable warranty period of any defect or nonconformance and making the product available for correction.

The preceding paragraphs set forth Buyer's exclusive remedies and Seller's sole liability for claims based on failure of the products to meet any warranty, whether the claim is in contract, warranty, tort (including negligence and strict liability) or otherwise, and however instituted, and, upon the expiration of the applicable warranty period, all such liability shall terminate. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING OUT OF, OR AS A RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, ASSEMBLING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT DESPITE ANY NEGLIGENCE ON BEHALF OF THE SELLER. IN NO EVENT SHALL SELLER'S LIABILITIES UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCT IN RESPECT OF WHICH DAMAGES ARE CLAIMED. This agreement shall be construed in accordance with laws of the State of Illinois. In the event that any provision hereof shall violate any applicable statute, ordinance, or rule of law, such provision shall be ineffective to the extent of such violation without invalidating any other provision hereof.

Any controversy or claim arising out of or relating to the sale, delivery, nondelivery, servicing, assembling, use or loss of use of the products or any part thereof or for any charges or expenses in connection therewith shall be settled in Austin, Texas by arbitration in accordance with the Rules of the American Arbitration Association, and judgment upon the award rendered by the Arbitrator may be entered in either the Federal District Court for the Western District of Texas or the State District Court in Austin, Texas, all of the parties hereto consenting to personal jurisdiction of the venue of such court and hereby waive the right to demand a jury trial under any of these actions.