

Model 4825/2

Line Impedance Stabilization Network (LISN)

User Manual



ETS-Lindgren L.P. reserves the right to make changes to any product described herein in order to improve function, design, or for any other reason. Nothing contained herein shall constitute ETS-Lindgren L.P. assuming any liability whatsoever arising out of the application or use of any product or circuit described herein. ETS-Lindgren L.P. does not convey any license under its patent rights or the rights of others.

© Copyright 1999–2010 by ETS-Lindgren L.P. All Rights Reserved. No part of this document may be copied by any means without written permission from ETS-Lindgren L.P.

Trademarks used in this document: The *ETS-Lindgren* logo is a trademark of ETS-Lindgren L.P.

Revision Record | MANUAL 4825/2 LISN | Part #399241, Rev. C


Revision	Description	Date
A	Initial Release	April, 1999
B	Rebrand	June, 2010
C	Updated <i>Physical Specifications</i> ; updated <i>Installation</i>	July, 2010

Table of Contents

Notes, Cautions, and Warnings	v
1.0 Introduction	7
ETS-Lindgren Product Information Bulletin	7
2.0 Maintenance	9
Service Procedures	9
3.0 Specifications	11
Electrical Specifications	11
Physical Specifications	12
4.0 Installation	13
Equipment Under Test	17
Spectrum Analyzer / Receiver	18
5.0 Data	19
6.0 Schematic	21
Appendix A: Warranty	23
Appendix B: EC Declaration of Conformity	25

This page intentionally left blank.

Notes, Cautions, and Warnings

	Note: Denotes helpful information intended to provide tips for better use of the product.
CAUTION	Caution: Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.
WARNING	Warning: Denotes a hazard. Failure to follow instructions could result in SEVERE personal injury and/or property damage. Included text gives proper procedures.



See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

This page intentionally left blank.

1.0 Introduction

The **ETS-Lindgren Model 4825/2 Line Impedance Stabilization Network (LISN)** is a two-channel low pass filter network designed to isolate the Equipment Under Test from an external power source while steering any radio frequency signals from the power line to a 50-ohm port.



Model 4825/2 Front View

The conducted emissions measurements may be made in accordance with regulatory compliance standards.

ETS-Lindgren Product Information Bulletin

See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Warranty information
- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS-Lindgren calibration service
- ETS-Lindgren contact information

This page intentionally left blank.

2.0 Maintenance

WARNING



Only trained service personnel should perform adjustments and/or service procedures.

Inside the Model 4825/2 are LETHAL voltages with which you could come into contact. Capacitors inside the unit may still be CHARGED even when the unit is disconnected from power.

CAUTION

Before performing any maintenance, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



Maintenance of the Model 4825/2 is limited to external components such as cables or connectors.

Clean the exterior of the cabinet using a damp cloth and mild cleaner. Always unplug the unit before cleaning.

To prevent electrical shock, do not remove cover.

If you have any questions concerning maintenance, contact ETS-Lindgren Customer Service.

Service Procedures

For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

This page intentionally left blank.

3.0 Specifications

Electrical Specifications

Frequency Range:	9 kHz–30 MHz (VDE 0876 specified curve \pm 20%)
Network Inductance:	50 μ H / 250 μ H
Network Impedance:	50 Ω
Current Rating	
4825/2NM:	20 Amperes
4825/2BR:	13 Amperes
4825/2SH:	16 Amperes
4825/2AS:	15 Amperes
Maximum AC Voltage	
4825/2NM:	125 VAC 60 Hz
4825/2BR:	250 VAC 50 Hz
4825/2SH:	250 VAC 50 Hz
4825/2AS:	250 VAC 50 Hz
Input Connectors:	IEC-309 Type 3-wire Inlet 32 Amperes Single Phase (mating connector provided)

Output Connectors	
4825/2NM:	NEMA 5-20R
4825/2BR:	BS 1363
4825/2SH:	CEE 7
4825/2AS:	AS 3112
Monitor Port:	BNC 1 per line
Environmental	
Installation:	Indoor use only
Altitude:	15000 ft (4572 m) max
Temperature:	0°C to 40°C (32°F to 104°F)
Relative Humidity:	80% up to 31°C (87.8°F) decreasing linearly to 50% at 40°C (104°F)

Physical Specifications

Height:	127 mm (5.0 in)
Width:	440 mm (17.3 in)
Depth:	381 mm (15.0 in)
Weight:	9 kg (20 lb)

4.0 Installation

CAUTION

Before connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

CAUTION

Overcurrent protection is provided in the Model 4825/2. The rating of the integral 2-pole circuit breaker is 250 VAC 50/60 Hz at 25 amperes. If overcurrent protection at a lower rating is required by the Equipment Under Test, the unit must be connected to a power mains which has appropriately rated mains protection installed.



The Model 4825/2 is provided with a protective earthing connection integral to the power inlet and input power cord assembly. The mains plug should only be connected to a mains source which utilizes a protective earth conductor. Due to the high leakage current to ground inherent in this type of equipment, it is necessary to install a supplemental protective earthing wire from the protective earth terminal on the rear panel to an appropriate earthing point on the power mains. This earthing point should be determined by an electrician authorized to perform such work by appropriate code or law. Any interruption of the protective conductor inside or outside of the unit is likely to make the Model 4825/2 dangerous. Intentional interruption is prohibited. The supplemental ground wire is supplied with the unit.

CAUTION

The Model 4825/2 is provided with resistors to help bleed off high voltage transients, but it is advisable to connect the input and output connectors to their proper power lines and loads before connecting the monitor port to the measurement instrumentation; otherwise, power surges or transients can damage the test instrumentation mixers or attenuators.

The Model 4825/2 Line Impedance Stabilization Network (LISN) is designed for use in Installation Category II and Pollution Degree II per IEC-1010 and IEC-664. When installing in a cabinet, make sure that the convection around the product is not restricted. The ambient temperature outside the cabinet must be less than the maximum operating temperature of the Model 4825/2 by 4°C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

Model 4825/2 Front View



Model 4825/2 Back View



The Model 4825/2 is nominally designed for a 25-ampere current capacity. For safe operation, you must follow the maximum current rating of the output receptacle on the mains power adapter. See *Specifications* on page 11 or the back panel of the Model 4825/2 for the applicable current rating.

Maximum line-to-line voltage must not exceed the voltage rating of the power connectors provided on the input and output of the unit. See *Specifications* on page 11 for the applicable maximum value.

The input power connection to the line side of the Model 4825/2 is made through the IEC-309 pin and sleeve type power inlet on the back panel. This three-wire power inlet is rated at 125/250 VAC 60 Hz in North America. Additionally, the power inlet is certified by VDE for operation at 220-240 VAC 50 Hz. Power to the Model 4825/2 is routed directly from the power inlet to an internally-wired 25 ampere circuit breaker. This circuit breaker provides a means to remove power in case of emergency.

An IEC-309 cable mount connector is provided with the Model 4825/2. This connector is a three-wire receptacle rated at 32 amperes. The cordage required to connect the power mains to the unit must meet certain regulatory requirements for electrical safety. A harmonized metric cordage size of 3 x 4.00 mm² is recommended for international applications. A wire size of 8 AWG is recommended for installation in North America. The installation wiring of the Model 4825/2 should be accomplished by an electrician authorized to do such work by appropriate code or law. The following color codes should be observed:

North America	International
125 VAC	250 VAC
Line – Black	Line – Brown
Neutral – White	Neutral – Blue
Ground – Green or Green/Yellow	Earth – Green/Yellow

The ground pin of the IEC-309 inlet is connected to chassis ground. Prior to powering the Model 4825/2, the earth connection from the power mains must be connected to this ground pin. Additionally, the brass lug terminal on the front panel should be bonded to the ground plane of the conducted emissions test setup. The brass ground stud should not be considered a protective earthing terminal. The earth line does not provide high frequency isolation and should not carry any voltage above earth potential.

Prior to energizing the Model 4825/2, connect the power adapter to the front panel by slipping the three pins on the adapter into the three socket receptacles on the front panel. Use the four captive screws to attach the adapter to the front panel. Although the main chassis is rated for 25 amperes, you must follow the maximum rating of the selected power adapter. See the list of adapters and power ratings in *Specifications* on page 11 and on the back panel of the unit. The receptacle provided in the power adapter is determined by the model specified. Following are the standard output receptacle types:

- NEMA (Type 5-15R)



- Schuko (Type CEE 7)



- British Standard (BS 1363)



- Australian (AS 3112)



The safety ground isolation choke selector switch located on the front panel switches the 1.6 mH earth line choke in and out of the safety ground circuit. The ground choke is designed and manufactured with sufficient current capacity to conduct the maximum current rating of the Model 4825/2 and at no time is the safety ground of the unit compromised. When the earth line choke selection switch is in the IN position, the earth line choke avoids a double RF ground connection (safety ground and measurement ground) in the conducted emissions test setup.

An artificial hand connection is provided on the front panel. In conformance to EN55014 and BS800, the artificial hand is used to test handheld equipments which are provided without earth connections.

Equipment Under Test

- The Equipment Under Test (EUT) is connected to the Model 4825/2 through the power adapter located on the front panel.
- The red and black socket receptacles on the front panel provide connection to the two power lines; the green socket receptacle provides connection to the earth line.
- A radio frequency bonding stud on the front panel is identified by the equipotentiality symbol. In normal operation this bonding stud should be connected to the ground plane of the conducted emissions test setup using a grounding strap or braid. This grounding stud should not be considered a protective earth bonding point.



Spectrum Analyzer / Receiver

- Use the BNC connectors on the front panel to connect the spectrum analyzer or EMI receiver.
- The monitor port which is not being monitored should be terminated into a coaxial 50-ohm terminator.



Connect the input and output terminals to their proper mains connections and EUT connections before connecting the monitor port to the measurement instrumentation; otherwise, power surges may damage the test instrumentation mixers or attenuators.

- Removal of a terminator and connection to the BNC receptacle will not generate power surges.
- When the power is to be disconnected, remove the coaxial connection to the measurement instrumentation first to avoid possible damage.

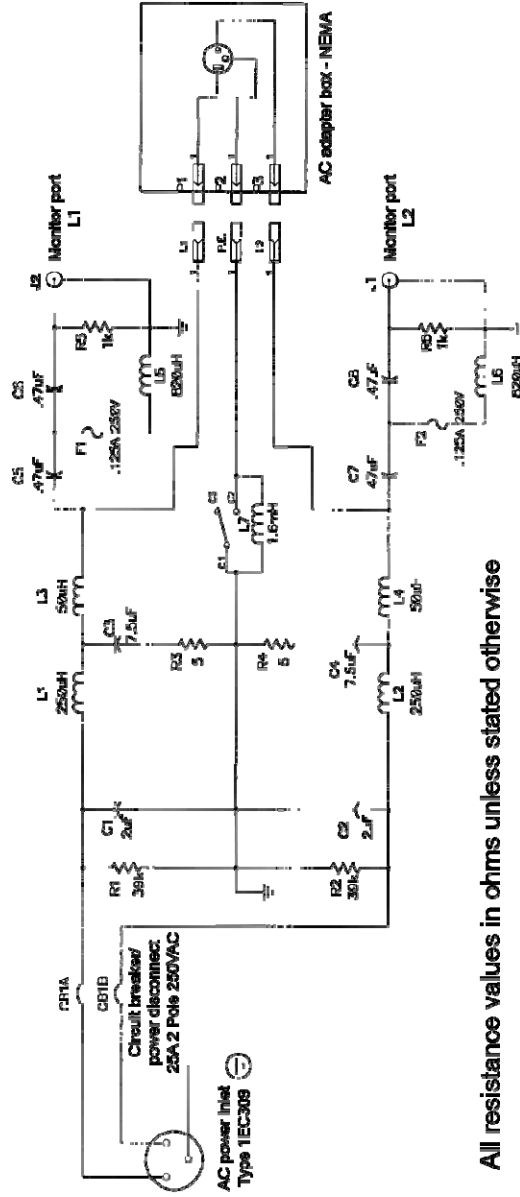
5.0 Data

Characterizations for each measurement port of the Model 4825/2 Line Impedance Stabilization Network (LISN) are included with the unit. The graphs provide individual plots of both impedance and insertion loss data. Impedance is plotted in a semi-log format where frequency is displayed on the horizontal from 9 kHz to 30 MHz. The vertical has a range of 0 ohms to 100 ohms and represents the measured impedance of the unit. The insertion loss is also plotted with frequency on the horizontal from 9 kHz to 30 MHz. The vertical of the graph has a range of -9 dB to 1 dB and represents the measured insertion loss of the Model 4825/2.

A *Certificate of Calibration Conformance* is provided with each Model 4825/2.

This page intentionally left blank.

6.0 Schematic



All resistance values in ohms unless stated otherwise

This page intentionally left blank.

Appendix A: Warranty



See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your Model 4825/2 Line Impedance Stabilization Network (LISN).

DURATION OF WARRANTIES FOR MODEL 4825/2

All product warranties, except the warranty of title, and all remedies for warranty failures are limited to two years.

Product Warranted	Duration of Warranty Period
Model 4825/2 Line Impedance Stabilization Network (LISN)	2 Years

This page intentionally left blank.

Appendix B: EC Declaration of Conformity



EUROPEAN COMMUNITY DECLARATION OF CONFORMITY

The EC Declaration of Conformity is the method by which EMC Test Systems, L.P. declares that the equipment listed on this document complies with the EMC directive.

Factory:

EMC Test Systems, L.P.
P.O. Box 80589
Austin, Texas USA
78708-0589

Issued by:

EMC Test Systems, L.P.
P.O. Box 80589
Austin, Texas USA
78708-0589

The products manufactured under the EMCO product name and listed below are eligible to bear the EC Mark:

Model 4825/2SH Line Impedance Stabilization Network
Model 4825/2BR Line Impedance Stabilization Network
Model 4825/2NM Line Impedance Stabilization Network
Model 4825/2AS Line Impedance Stabilization Network


Applicable Requirements:

Standard	Criteria
IEC1010	Safety requirements for electrical equipment for measurement, control and laboratory use
EN55022	Passive device. EMC testing is not required.

Authorized Signatories


Bruce Butler, General Manager


Charles Garrison, Quality Assurance


James C. Psencik, Engineering Mgr.

Date of Declaration

The authorizing signature on the EC Declaration of Conformity document authorizes EMC Test Systems, L.P. to affix the CE mark to the indicated product. CE marks placed on these products will be distinct and visible. Other marks or inscriptions liable to be confused with the CE mark will not be affixed to these products. EMC Test Systems, L.P. has ensured that appropriate documentation shall remain available on premises for inspection and validation purposes for a period of no less than 10 years.