

i-MO 225 5G *Bonding Router*

Hardware Installation Guide

for the i-MO 225 5G Appliance

OptiBond™

Advanced Bandwidth
Technologies



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I-MO Appliance Identification Guide

The following diagram shows the basic and optional i-MO 225 Series hardware components.



1 x Mains
AC Adaptor



1 x UK
Mains Cable



1 x EU
Mains Cable



1 x i-MO
225 Unit

Optional Extras:



Up to 4 x Aerial
Type MIMO



Up to 8 x Aerial
5 m Extension



Up to 4 x Aerial
Type FIN



Up to 2x
SIM cards

General Safety Guidelines for EMS Hardware Equipment

The following guidelines help ensure your safety and protect the hardware equipment from damage. The list of guidelines might not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

- Perform only the procedures explicitly described in this documentation. Make sure that only authorized service personnel perform other system services.
- Keep the area around the chassis clear and free from dust before, during, and after installation.
- Keep tools away from areas where people could trip over them while walking.
- Wear safety glasses if you are working under any conditions that could be hazardous to your eyes.
- Do not perform any actions that create a potential hazard to people or make the equipment unsafe.
- Never install or manipulate wiring during electrical storms.
- Never install electrical jacks in wet locations unless the jacks are specifically designed for wet environments.
- Operate the hardware equipment only when the chassis is properly grounded.
- Do not open or remove chassis covers or sheet metal parts unless instructions are provided in this documentation. Such an action could cause severe electrical shock.
- Do not push or force any objects through any opening in the chassis frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the chassis or onto any hardware component. Such an action could cause electrical shock or damage the hardware equipment.
- Do not use the device where inflammables or explosives are stored, for example, in a fuel station, oil depot, or chemical plant. Otherwise, explosions or fires may occur.
- Use only the accessories supplied or authorized by the device manufacturer. Otherwise, the performance of the device may get affected, the warranty for the device or the laws and regulations related to telecommunications terminals may become null and void, or an injury may occur.
- Do not use the power adapter if its cable is damaged. Otherwise, electric shocks or fires may occur.
- Do not use the antennas if the connectors, cables, or antennas are damaged. Otherwise, radio frequency interference or electric shock may occur.

Installation Safety Guidelines and Warnings

Read the installation instructions before you connect the hardware equipment to a power source.

Operating Temperature Warning

To prevent the hardware equipment from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 40°C. To prevent airflow restriction, allow at least 2 inches of clearance around the device.

Do not expose to direct sunlight.

Do not place containers of liquids on the device or allow the device to come in contact with liquids.

Do not place near or on a source of heat.

Product Disposal Warning

Disposal of this product must be handled according to all national laws and regulations.

See [Appendix C](#) for details.

General Electrical Safety Warnings for EMS Hardware Equipment

Radio Frequency Interference

You can reduce or eliminate the emission of radio frequency interference (RFI) from your site wiring by using twisted-pair network cabling with a good distribution of grounding conductors. If you must exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable.

Electromagnetic Compatibility

If your site is susceptible to problems with electromagnetic compatibility (EMC), particularly from lightning or radio transmitters, you might want to seek expert advice. Strong sources of electromagnetic interference (EMI) can destroy the signal drivers and receivers in the router and conduct power surges over the lines into the equipment, resulting in an electrical hazard. It is particularly important to provide a properly grounded and shielded environment and to use electrical surge-suppression devices.

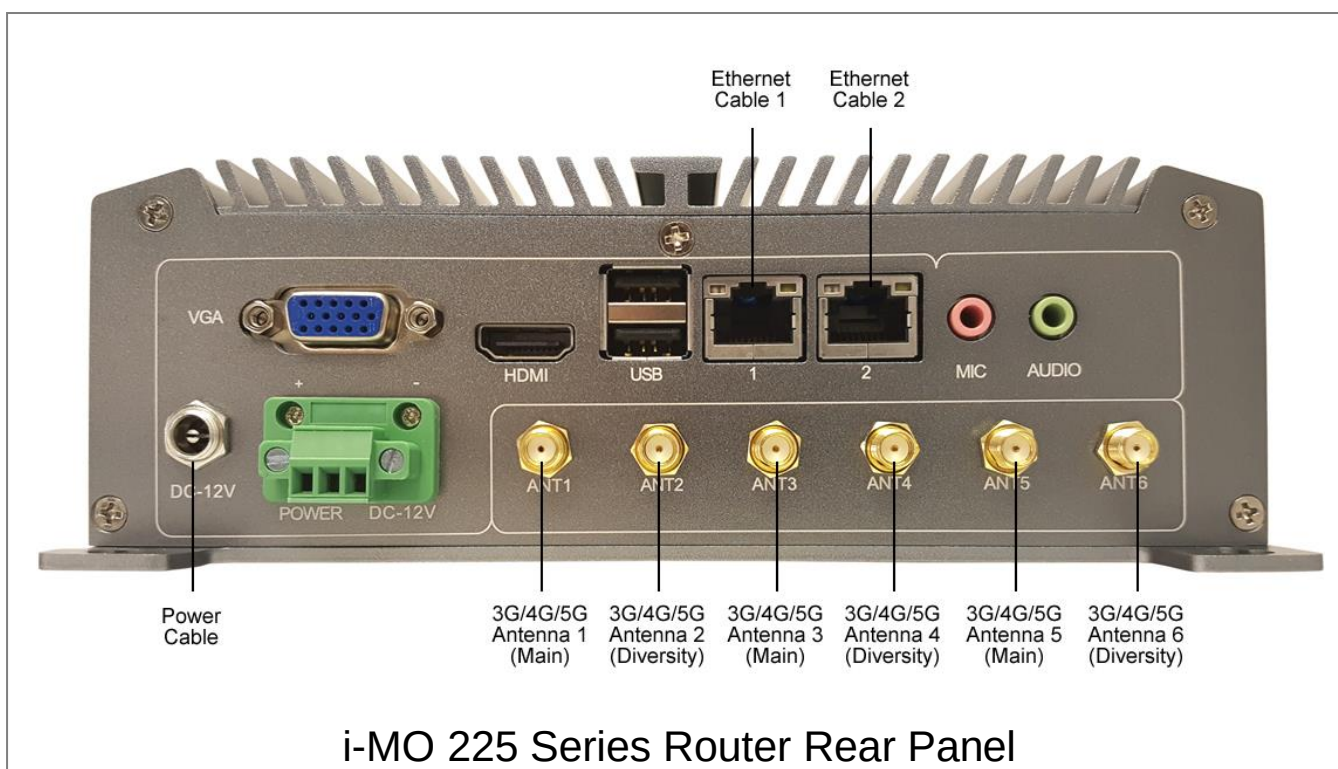
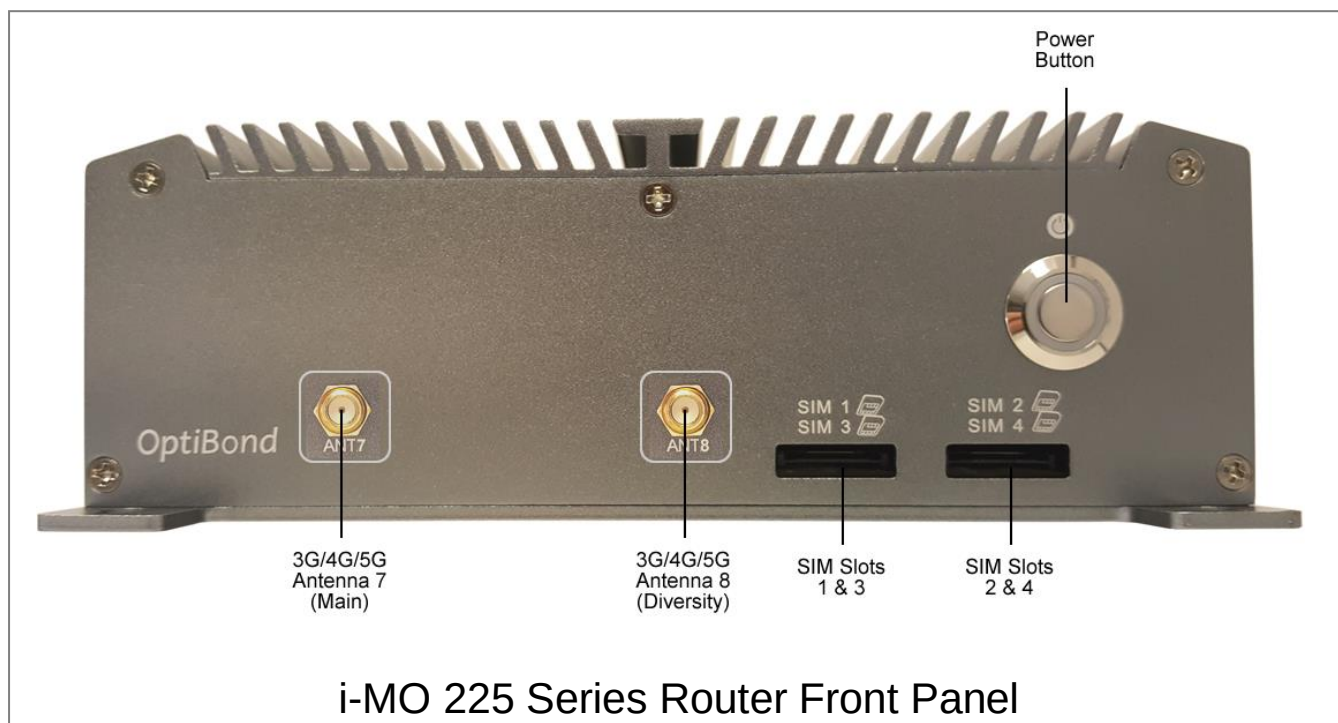
AC Power Electrical Safety Guidelines

The i-MO 225 Series appliance requires an AC supply of 100-240Volts, 50/60Hz and can draw a current of up to 2 Amps.

i-MO routers are shipped with a three-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. Do not circumvent this safety feature. Equipment grounding should comply with local and national electrical codes. The power cord serves as the main disconnecting device. The socket outlet must be near the router and be easily accessible.

Hardware Installation Guide

The i-MO appliance is supplied un-configured unless otherwise agreed with your supplier. Please confirm the specification of the unit with your supplier as not all features are supported on every unit. This guide describes how to connect and get started with the device. Electronic copies of this guide can be found by clicking this link: [i-MO Documentation](#) or by entering this URL: <http://tinyurl.com/lt297hl>



1) How to attach the 3G/4G/5G antennas

The i-MO 225 Series 5G Router appliance is normally supplied with a minimum of 4 of 3G/4G/5G aerials. A variety of options are available. The aerials should be mounted external to any building or cabin and as high as possible. The aerials should be spaced 1 metre apart.

When using dual lead 'MIMO' aerials, the leads may be marked 'Main' & 'Diversity'. Where this is the case, connect the lead marked 'MAIN' to 'ANT 1', 'ANT 3', 'ANT 5' & 'ANT 7' and the leads marked 'Diversity' to 'ANT 2', 'ANT 4', 'ANT 6' & 'ANT 8'. If unmarked simply connect Aerial 1 to ANT 1 & 2, 2 to ANT 3 & 4, 3 to ANT 5 & 6 & 4 to ANT 7 & 8.

Note: Connectors should be 'touch' tight only. DO NOT over-tighten!



2) How to attach network cables (optional)

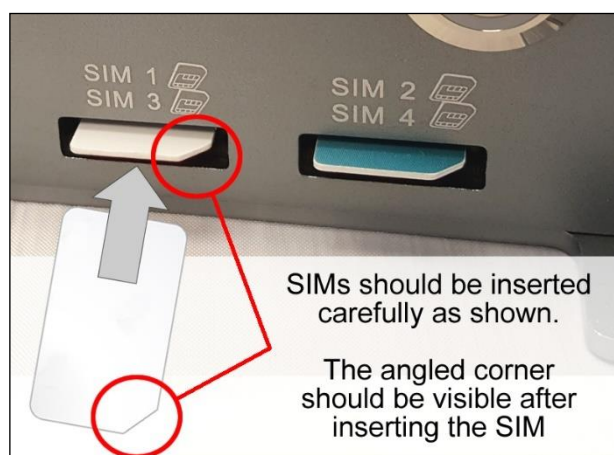
The i-MO appliance provides two Ethernet ports at the rear. One of these can be configured as a WAN port. Network cables (not provided) can be connected as shown below. The default configuration is both ports configured for LAN usage (2 port network hub).



3) How to install SIM cards (optional if not already fitted)

The appliance supports 2 SIMs which are installed in the SIM card slots on the front of the appliance as illustrated below.

- **Note:** Please ensure you insert the SIM cards 'face' down with the angled corner towards you on the right. There are 2 slots for each SIM card bay. Carefully insert the cards in slot 1 & 2 ONLY and ensure that they are pressed in as illustrated below.
- **Note:** Slots for SIM 3 and SIM 4 are reserved for future upgrade use.



4) How to attach the power cable

The appliance is powered by an AC Adapter power supply. Do **NOT** connect the power supply to the mains yet. Please insert the power cable as shown below. Now connect power supply to mains.

Note: We recommend the use of UPS units where power regulation cannot be guaranteed (e.g. use of a generator)



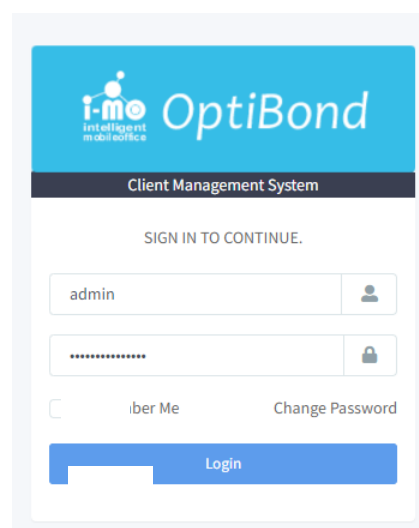
5) How to switch the power On or Off

The power button at the front of the unit is used to turn the appliance on (boot) or off (shutdown). As soon as the button is pressed it will illuminate to show that the appliance is powering up. Press the button again to start the power off sequence.

Note: Do **NOT** hold the power button in unless specifically instructed to do so by a support engineer.

6) First-time Login Instructions

1. Start your web browser on a machine connected to the i-MO's LAN.
2. Enter the following address in the browser's address bar: `http://192.168.0.1`
This is the default IP Address of the i-MO Router.
3. Enter the default login credentials as follows:
USERNAME: `emsadmin`
PASSWORD: `1hov2pNZaX`
- 3A. If the login attempt fails and you can see the "Emergency Login" button, click it instead, and use the credentials provided in 3. above.
4. After a successful login, the dashboard of the i-MO will be displayed. This dashboard will display the current status of the two modems, including the SIMs they are using and their current data usage. You will also find SIM status information and a readout of connected machines on the LAN.
5. For security purposes, we recommend changing the password to a unique one after a successful login. The new password must have a maximum character limit of 150 characters, containing only letters, digits, and the following symbols `@./+/-/_`
6. With the above steps, you have successfully logged in to the i-MO Router and accessed the Management UI.



Appendix A - 3G / 4G / 5G Radio Component

Up to four 3G / 4G / 5G radio components may be attached to the i-MO to provide a 3G / 4G / 5G signal.

	External MIMO Aerial	External FIN Aerial
		
Supplied Cable	2 x 5 Metre Cable	2 x 5 Metre Cable
Mounting Type	Bracket Mount	Magnetic Mount
Frequency Range	1710-2700/3300-3800 (MHz)	700-5900 (MHz)
Input Impedence	50 (Ohms)	50 (Ohms)
Half-power angle	H 78° ±2/ E68° ±2	N/A
V.S.W.R.	≤ 2.5	≤ 1.5
Gain	5.5 (dBi)	2 (dBi)
Max Input Power	100 (W)	100 (W)
Front to Back Ratio	≥ 2 dB	N/A
Polarization Type	Vertical & Horizontal	Vertical
Connection Type	2 x SMA-M	1 x SMA-M
Working Temperature	-30°C to +65°C	-40°C to +80°C
Pole Diameter	35-50mm Diameter	N/A
Size	200 x 220 x 230 mm	167 x 82 mm
Rated Wind Velocity	31.5 m/s	31.5 m/s

External Installation (where optional external aerials have been supplied)

Safety

Installation of this antenna near power lines is dangerous. For your safety, follow these instructions.

Select your installation site with safety, as well as performance in mind. Remember: electric power lines and phone lines look alike. For your safety, assume that any overhead line can kill you.

When installing your antenna, remember:

- Do not use a metal ladder.
- Do not work on a wet or windy day.
- Do dress properly—shoes with rubber soles and heels, rubber gloves, long sleeved shirt or jacket.

If any part of the antenna system should come in contact with a power line, don't touch it or try to remove it yourself. Call your local power company. They will remove it safely. If an accident should occur with the power lines call for qualified emergency help immediately.

Choosing a Mounting Location

The location of the antenna is important. Objects such as metal columns, walls, etc. will reduce efficiency. Best performance is achieved when antennas are mounted at the same height and in a direct line of sight with no obstructions. If this is not possible and reception is poor, you should try different mounting positions to optimize reception.

The antenna is designed to create an omni-directional broadcast pattern. To achieve this pattern, the antenna should be mounted clear of any obstructions to the sides of the radiating element. If the mounting location is on the side of a building or tower, the antenna pattern will be degraded on the building or tower side.

Before attempting to install your antenna, think where you can best place the antenna for safety and performance. Install your antenna at about 8 to 10 feet above the ground and away from all power lines and obstructions.

Mounting the Antennas

The antennas should be mounted externally and as high as possible but ensure they are clear of any power lines. The antennas should be spaced about 1 metre apart. The antenna is vertically polarized. Since the antenna has vertical gain, it is very important to mount the antenna in a vertical (not leaning) position for optimal performance.

Appendix C - Disposal and Recycling Information

This device (and any included batteries) should not be disposed of as normal household garbage. Do not dispose of your device or batteries as unsorted municipal waste. The device (and any batteries) should be handed over to a certified collection point for recycling or proper disposal at the end of their life.

For more detailed information about the recycling of the device or batteries, contact your local city office, the household waste disposal service, or the retail store where you purchased this device.

WEEE EU Directive

The disposal of this device is subject to the Waste from Electrical and Electronic Equipment (WEEE) directive of the European Union. The reason for separating WEEE and batteries from other waste is to minimize the potential environmental impacts on human health of any hazardous substances that may be present.

If in any doubt, please view detailed WEEE information on the following web page from the Environment Agency's web site:

<http://www.environment-agency.gov.uk/business/topics/waste/32084.aspx>

Reduction of Hazardous Substances

This device is compliant with the EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation (Regulation No 1907/2006/EC of the European Parliament and of the Council) and the EU Restriction of Hazardous Substances (RoHS) Directive (Directive 2002/95/EC of the European Parliament and of the Council). For more information about the REACH compliance of the device, visit the Web site www.ems-uk.com/certification. You are recommended to visit the Web site regularly for up-to-date information.

Appendix D - Warranty Information

EMS's Limited Warranty Statement (1-Year Warranty)

Thank you for purchasing the enclosed i-MO Appliance. The product is provided with a one year limited warranty commencing from the date of purchase.

One-Year Limited Warranty

THIS PRODUCT IS PROVIDED TO YOU UNDER THE FOLLOWING TERMS AND CONDITIONS THAT CONTAIN LIMITATIONS ON WARRANTIES AND LIABILITIES AND YOUR REMEDIES. BY USING THIS PRODUCT YOU AGREE TO THE TERMS AND CONDITIONS BELOW.

The original end-user purchaser of the enclosed i-MO Appliance (the "Product") from EMS Ltd (the "Vendor") or one of its authorized Partners, is offered with a non-transferable, limited warranty that: (a) the Product will be of good quality and free from defects in design, materials, workmanship, and manufacture under normal use and service; (b) all materials, parts, components, and other items incorporated in the Product will be new; and (c) the Product will be compliant with, and perform in accordance with, its specifications, for a period that expires one year from the original purchase date of the Product (the "Warranty Period").

During the Warranty Period, if Vendor determines that a Product is defective under a proper warranty claim, then Vendor will, at its sole discretion, either (a) pay parts and labour charges for the repair of the Product, or (b) replace the Product with a new or rebuilt unit (which unit may use refurbished parts of similar quality and functionality), provided that the defective Product is returned to a Vendor-authorized service centre for the Product, transportation charges prepaid, and is accompanied by written proof of purchase in the form of a bill of sale or receipted invoice indicating that the Product was purchased by you and is within the Warranty Period. After the Warranty Period, you are responsible for paying all parts, labour, and shipping charges. The warranty described above shall apply to all repaired or replaced Product for a period of 90 days from the date of return to you, or the balance of the Warranty Period, whichever is greater.

This limited warranty does not cover and is void with respect to: (a) Products which have been improperly installed, repaired, maintained, or modified; (b) Products which have been subjected to misuse (including using the Products with hardware which is electrically or mechanically incompatible with the Products), abuse, accident, physical damage, abnormal operation, improper handling or storage, neglect, exposure to fire, water, or excessive moisture or dampness, or extreme changes in climate or temperature; (c) Products which have been opened, repaired, modified, or altered by anyone other than Vendor or a Vendor-authorized service centre; (d) Products which have been damaged due to fire, flood, acts of God, or other acts which are not Vendor's fault and which the Product is not specified to tolerate; (e) cosmetic damage; (f) Products which have been operated outside of published maximum ratings; (g) cost of installation, removal, or re-installation of the Product; (h) signal reception problems (unless caused by a defect in material(s) or workmanship); or (i) Products on which warranty stickers or serial numbers have been removed, altered, or rendered illegible. This limited warranty is not transferable to any third party including, but not limited to, any subsequent purchaser or owner of the Products. Any transfer or resale of any of the Products will automatically terminate Vendor's warranty coverage of such Products. This limited warranty does not cover customer education, instruction, installation, set-up adjustments, or signal reception problems.

REPAIR OR REPLACEMENT, AS PROVIDED FOR UNDER THIS LIMITED WARRANTY, IS YOUR SOLE AND EXCLUSIVE REMEDY FOR BREACH OF THIS LIMITED WARRANTY. TO THE EXTENT PERMITTED BY APPLICABLE LAW, NEITHER VENDOR NOR THE ORIGINAL OWNER OF THE PRODUCT MAKE ANY OTHER REPRESENTATIONS, WARRANTIES, OR CONDITIONS OF ANY KIND, EXPRESS OR IMPLIED OR STATUTORY, WITH RESPECT TO THE PRODUCT INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.

This warranty gives you specific rights and you may also have other rights, which vary from jurisdiction to jurisdiction. Some jurisdictions do not allow the exclusion of implied warranties and conditions and do not permit the exclusion or limitation of certain damages. Therefore, the foregoing exclusions may not apply to you.

THE ENTIRE RISK AS TO THE RESULTS AND PERFORMANCE OF THIS PRODUCT IS ASSUMED BY YOU. NEITHER THE ORIGINAL OWNER OF THE PRODUCT NOR THE VENDOR NOR VENDOR'S DISTRIBUTORS, RESELLERS, SUPPLIERS, AGENTS, OFFICERS, AND DIRECTORS SHALL HAVE ANY LIABILITY TO YOU OR TO ANY OTHER PERSON OR ENTITY FOR ANY DAMAGES HOWSOEVER CAUSED INCLUDING, BUT NOT LIMITED TO, DIRECT, INDIRECT, INCIDENTAL, SPECIAL, GENERAL, CONSEQUENTIAL, PUNITIVE, OR EXEMPLARY DAMAGES WHATSOEVER INCLUDING, BUT NOT LIMITED TO, LOSS OF REVENUE OR PROFIT, DAMAGES TO PROPERTY OR PERSONS, LOST OR DAMAGED DATA, OR OTHER COMMERCIAL OR ECONOMIC LOSS, EVEN IF ANY SUCH AFOREMENTIONED PERSON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR THEY ARE FORESEEABLE, OR FOR CLAIMS BY ANY THIRD PARTY. MAXIMUM AGGREGATE LIABILITY OF THE AFOREMENTIONED PERSONS SHALL NOT EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT. THE LIMITATIONS IN THIS SECTION SHALL APPLY WHETHER OR NOT THE ALLEGED BREACH, DEFAULT, NONPERFORMANCE, OR FAILURE IS A BREACH OF FUNDAMENTAL CONDITION OR TERM, OR A FUNDAMENTAL BREACH.

If any provision or term of these terms and conditions is determined to be invalid or unenforceable, the invalidity or un-enforceability of that provision or term will not affect the validity or enforceability of the remaining provisions and terms or the validity or enforceability of that provision or term in any other jurisdiction.

THIS LIMITED WARRANTY IS NOT AN ALTERNATIVE TO THE PURCHASE OF AN ANNUAL MAINTENANCE AGREEMENT. For further details of Annual Maintenance Agreement Terms & Conditions please refer to the separate Maintenance Agreement documentation provided by EMS Ltd or Authorised Partner.

Obtaining Technical Assistance

EMS Ltd provides www.ems-imo.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using this Web Site. Registered users (requires a valid Annual Maintenance Agreement) have complete access to the technical support resources on the www.ems-imo.com Web Site.