Quick Start Guide - Managed Service & Rental

i-MO 520 Series *Bonding Router*

Quick Start Guide

Managed Service & Rental

for the i-MO 520 Series Appliance

OptiBond™

Advanced Bandwidth Technologies

Content

i-MO 520 Appliance Identification Guide

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

1 x i-MO Appliance

2 x External Aerials

2 x External Aerial Brackets

Optional - 1 x WiFi Antenna

Optional - 2 x SIM Cards

1 x Mains Cable

1 x Rack Mount Kit

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.

Rack-Mounting Requirements (Optional)

Ensure that the equipment rack into which the chassis is installed is evenly and securely supported, to avoid the hazardous condition that could result from uneven mechanical loading.

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 rear ventilation grille.

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 F 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 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.

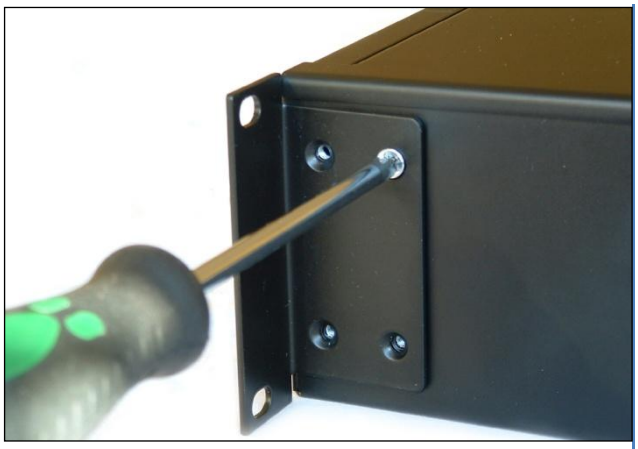
Hardware Installation Guide

The i-MO appliance is supplied fully configured and ready to use. This guide describes how to connect and get started with the device.

1) Installing the Rack mount kit (optional)

This stage is only required if you plan to mount the appliance in a communications rack. The rack mount kit includes 2 brackets and 8 screws.

The brackets are symmetrical and can be installed on either side. See pictures below.

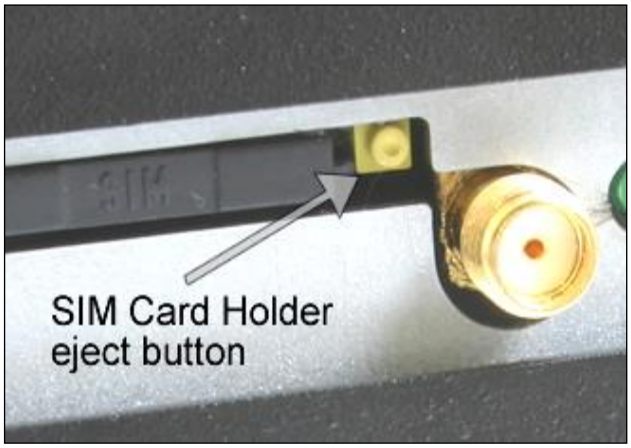


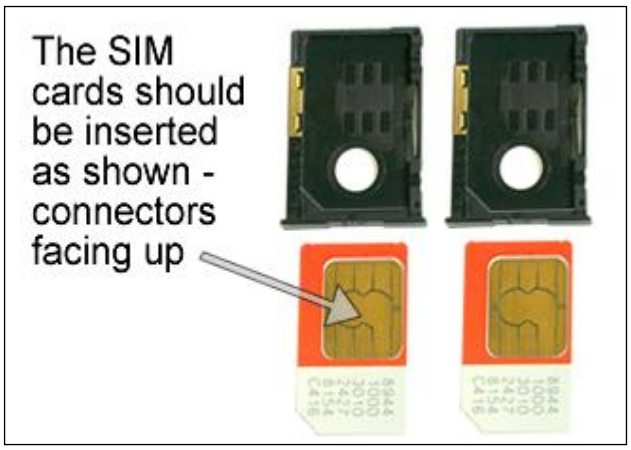
2) Attach WiFi antenna (optional)

The i-MO appliance can be supplied with an optional WiFi interface. If the WiFi interface is required install the antenna as shown below.

3) Install SIM cards

If SIM cards have been supplied to you with the i-MO unit, then they will already be installed. If you need to insert or replace SIM cards then these need to be installed in the SIM card holders on the rear of the appliance as illustrated below.





- Note – please ensure you replace the SIM Card holders carefully in their slots and ensure that they are fully pressed in.

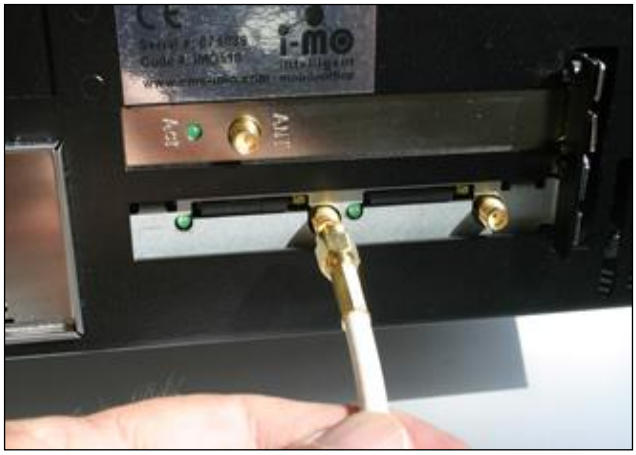
4) Attach network cables (optional)

The i-MO appliance can be supplied with an optional 8 Port Network Hub. If the Network interface is required install Network cables as shown below.

5) Attach Antennas and Cables

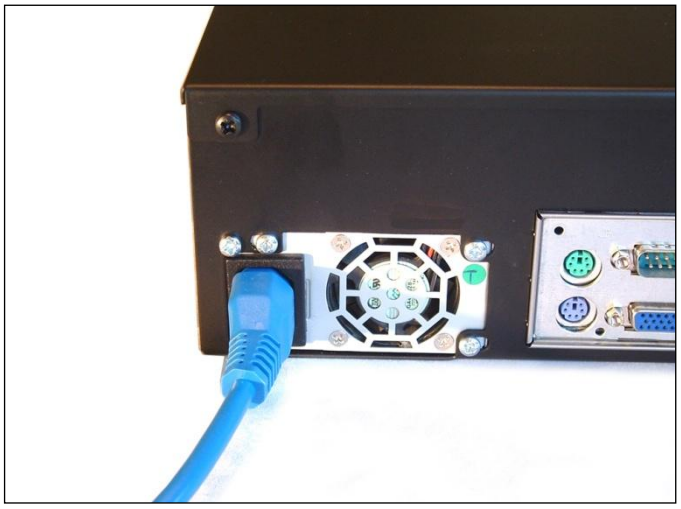
The antennas should be mounted externally and as high as possible. The antennas should be spaced about 1 metre apart.

The connector on each aerial cable should be attached to the aerial sockets as shown below.



6) Power Cable

The appliance is powered by a standard 200~240V supply.



7) Power Switch

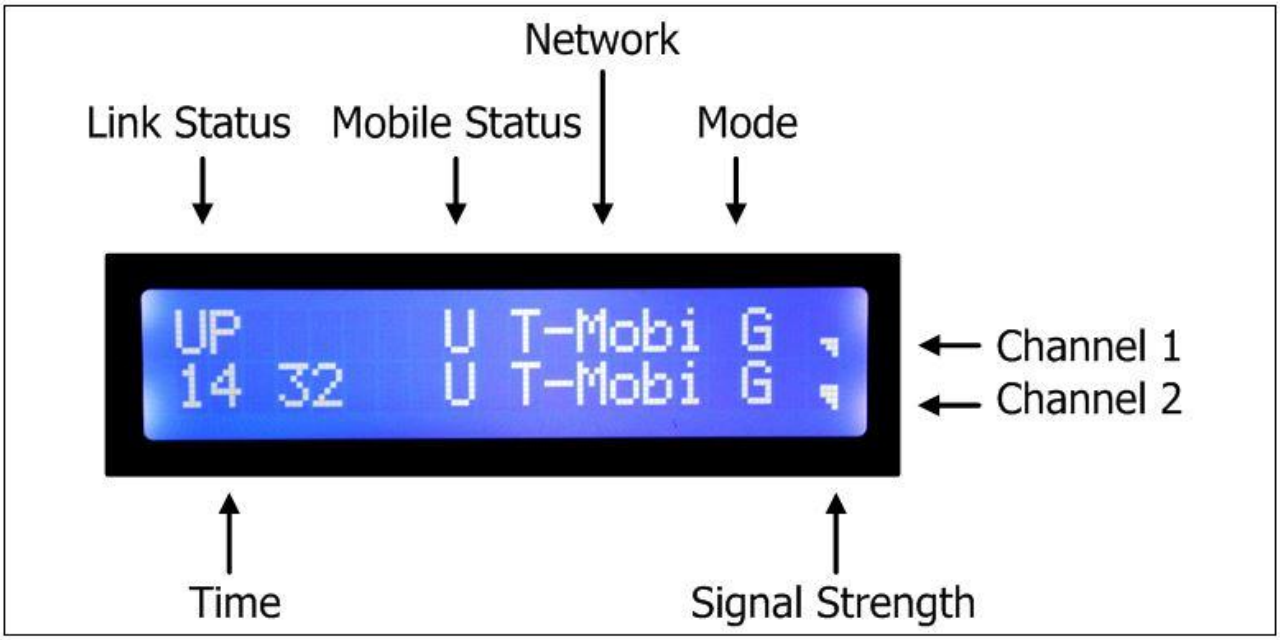
The power switch is used to turn the appliance on or off. As soon as the button is pressed the button will illuminate to show that the appliance is powered up.

Press the button again to start the power off sequence. The message on the status display will change and when the power off sequence has completed the light in the button will extinguish.

8) Status display

The LCD display shows the status of the two mobile connections plus the overall status of the link.

Link Status	This shows the overall status of the link which can either be UP or DOWN. When the link is DOWN the appliance is not able to send or receive data. Just to the right of the link status the letters T and R will flash when the appliance is Transmitting or Receiving data.
Mobile Status	This shows the status of each mobile channel. The letter U will be displayed when the link is UP and D is displayed when the link is DOWN. The status will also flash T and R when the channel is transmitting or receiving data.
Network	This shows the name of the network the appliance is using.
Mode	The appliance currently supports five network protocols: GPRS, EDGE, 3G, HSDPA and 4G. The letter G is displayed for the GPRS and EDGE modes and the digit 3 is displayed for the 3G and HSDPA modes and 4 for 4G mode.
Signal Strength	This shows the strength of the signal being received from the mobile network.



Appendix A - Optional WiFi Radio Component

Warnings

When using the device, ensure that the antenna of the device is at least 1 cm away from all persons.

Do not use the device where using wireless devices is prohibited or may cause interference or danger.

Do not operate the WiFi device in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the WiFi device MUST BE POWERED OFF. It can transmit signals that could interfere with this equipment.

Do not operate the WiFi device in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, the WiFi device MUST BE POWERED OFF. When operating, it can transmit signals that could interfere with various on-board systems.

Regulatory Notices

The design of the WiFi device complies with U.S. Federal Communications Commission (FCC) guidelines respecting safety levels of radio frequency (RF) exposure for mobile devices, which in turn are consistent with the following safety standards previously set by U.S. and international standards bodies:

- ANSI / IEEE C95.1-1999, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz
- National Council on Radiation Protection and Measurements (NCRP) Report 86, 1986, Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields
- International Commission on Non-Ionising Radiation Protection (ICNIRP) 1998, Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)

FCC ID: N7N-MHS802

RF Exposure - This device has been tested for compliance with FCC RF exposure limits in a portable configuration. At least 1.0 cm of separation distance between the WiFi Antenna and the user's body must be maintained at all times. This device must not be used with any other antenna or transmitter that has not been approved to operate in conjunction with this device.

WARNING (EMI) - United States FCC Information - This equipment has been tested and found to comply with the limits for a Class B computing device peripheral, pursuant to Parts 15 and 27 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Any changes or modifications not expressly approved by EMS Ltd could void the user's authority to operate the equipment.

This device complies with Parts 15 and 27 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Certification Information (SAR)

Your wireless device is a radio transmitter and receiver. It is designed not to exceed the limits for exposure to radio waves recommended by international guidelines.

These guidelines are developed by the independent scientific organization International Commission on Non-ionizing Radiation Protection (ICNIRP) and include safety margins designed to assure the protection of all persons, regardless of age and health.

The guidelines use a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit for wireless devices is 2.0 watts/kilogram (W/kg) and the highest SAR value for this device when tested complies with this limit.
Important safety information regarding radio frequency (RF) radiation exposure is as follows:

To ensure compliance with RF exposure guidelines, the device must be used with a minimum of 2.5cm distance from the body. Failure to observe these instructions could result in your RF exposure exceeding the relevant guideline limits.

Technical Data

- 2412 ~ 2472, 2484 MHz (subject to local regulations)
- Modulation Technology OFDM and DSSS
- Modulation Techniques 64QAM, 16QAM, QPSK, BPSK, CCK, DQPSK, DBPSK
- Data Rates 54, 48, 36, 18,12, 9, 11, 6, 5.5, 2, and 1 Mbps, auto fallback
- Peak Output Power Targeted at 14dBm @54Mbps, 18dBm @11Mbps
- Minimum Receive Sensitivity Targeted at -70dBm @54Mbps; -80dBm@11Mbps
- Antenna External antenna with the gain of 2dBi, L type

Safety Regulation and Operating Environment

- FCC Part 15 (USA) DGT (Taiwan)
- EMC certification
- CE (Europe)
- Temperature Range Operating: 0 ~ 40 degree C,
- Storage: -20 ~ 65 degree C

Appendix B - 3G & 4G Radio Component

Two 3G or 4G radio components may be attached to the i-MO to provide a 3G or 4G signal.

External Aerial Type B	External Aerial Type C
	
Technical Data **GSM/UMTS Specifications** **Frequency ranges:** • **GSM 850 / 900 MHz 824 - 960 MHz** • **GSM 1800 MHz 1710 - 1990 MHz** • **UMTS 2,1 GHz 1900 - 2170 GHz** **Gain 5 dBi** **Polarization vertical** **Rod Length 290mm** **Power maximum: 20 W** **Cable length 2500 mm** **Cable type RG 174** **Connector SMA male** **VSWR: <= 1.5**	***Technical Data*** GSM/UMTS Specifications Frequency ranges: • GSM 850 / 900 MHz 824 - 960 MHz • GSM 1800 MHz 1710 - 1990 MHz • UMTS 2,1 GHz 1900 - 2170 GHz Gain 2.2 dBi Polarization vertical Rod Length 240mm Power maximum: 10 W Cable length 5000 mm Cable type RG 58 Connector SMA male VSWR: 1.5

External Installation

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 Bracket Kit

The antenna is provided with a mounting kit. This kit allows you to mount the antenna on the side of a building.

2 x External Aerial Brackets

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.

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.

Connecting the External Antennas to the i-MO

The connector on each 3G or 4G aerial cable should be attached to the aerial sockets by means of the screw threads as shown below.

Appendix F - 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 corn/certification. You are recommended to visit the Web site regularly for up-to-date information.

Appendix G - 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 MERCHANTABLE QUALITY, 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.