airPoint XO™ Series
Wireless Access Points

Quick Install Guide

Professional Installation

airPoint XO and airPoint XO2 require installation by professional installer.

Steps:

- Choose the antenna from the antennas certified with airPoint XO / airPoint XO2
- The RF cable should be of 1 meter length, LMR 400 cable with N male connectors at both ends.
- Set the power output of airPoint XO / airPoint XO2 using the procedure shown in "Configuring airPoint XO" / " Configuring airPoint XO2 ". The RF output power can be adjusted to a maximum of +17dBm.
- Keep safe distance of 32 centimeters away from the antenna.
- Professional installation is required for all antennae.

RF Safety Precaution

  airPoint XO , airPoint XO2 gives out electromagnetic Radiation through the antenna . . It is harmful to be in contact with the antenna or to be in close proximity when the airPoint XO or airPointXO2 when it is powered ON . The safe distance is 45 centimeters from the antenna . The indication for RF radiation is the lighting up of Blue LED on the device .

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1. airPoint XO™ Series

The smartBridges airPoint XO™ products are LongRange™, IEEE
802.11b compliant Access Point devices for deployment of Wireless Wide
Area Networks (WWANs). The airPoint XO™ products deal with four key
areas that are of vital importance in any WWAN network: Subscriber
Bandwidth Management, Advanced Networking Capabilities, Remote
Infrastructure Management and, Carrier-Class Reliability.

Currently there are 2 models in the airPoint XO™ series

1. airPoint XO™ - Outdoor wireless
    access point with Bandwidth
    Management

2. airPoint XO^2™ - Dual radio outdoor
    wireless access point with Bandwidth
   Management

With a suitable external Directional antenna
the airPoint XO™ series can provide range of up to 32 Kilometers. All the
access points in this series provide data rates up to 11Mbps making it one
of the fastest Wireless Access Point family in the market. Encryption
capability of 64 bits or 128 bits provides network security.

The airPoint XO™ series can be used as an access point, client bridge,
wireless bridge and wireless repeater to provide various networking
functions. The dual radio XO^2™ can be configured to work in Full
Repeater mode, Dual Access Point mode, Cell Extender mode and High
Reliability Access Point mode. Designed to tolerate extreme weather
conditions, the airPoint XO™ series provides a two-layered protection,
through the IEEE 802.3af compliant, PoE Outdoor™ (Power over
Ethernet) accessory for regulatory compliant installations. The radios are
supported by multiple Network Processing Elements to handle heavy
network loads. These devices can be remotely configured, monitored
upgraded, reset and even power cycled, thus allowing ease of
maintenance. Numerous applications like broadband connectivity to far
flung neighborhood homes, wireless networking of PC's in a campus,
wireless networking across waterways, roads, valleys and rough terrain
are possible. The home PC gets connected to the Internet through the

airBridge series (Client devices) and the airPoint XO™ series (access points) wirelessly.

Application Diagram for airPoint XO™

airPoint XO Access Point with Bandwidth Management
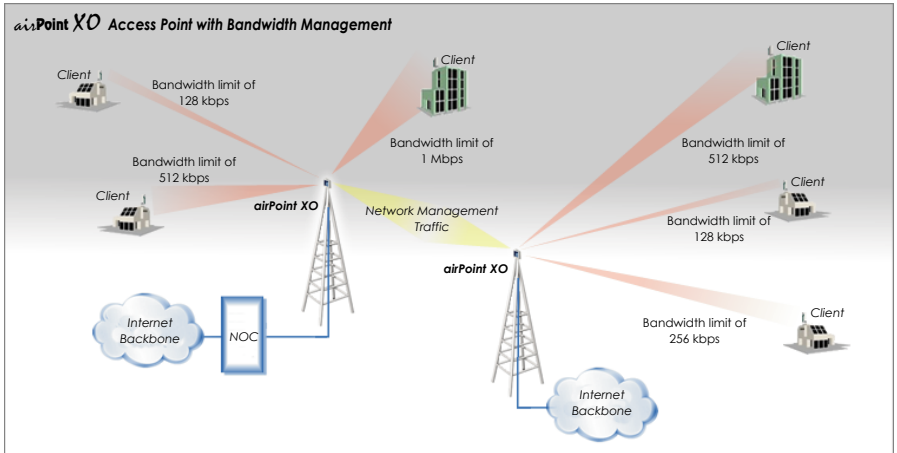
Application Diagram for airPoint XO^2™
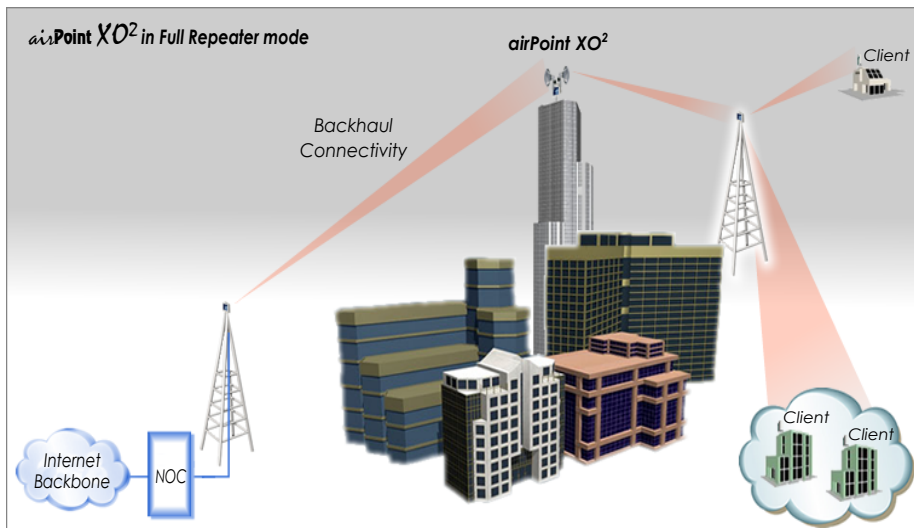
2. Package Contents

- airPoint XO™ or XO²™ Unit

- Power over Ethernet (PoE) Outdoor™, with 48 V power adapter and Wall Plate Unit (standard accessories provided with airPoint XO™ series)

- Grounding Tag

- Pole Mounting Kit : U Bracket, Nuts, Washers

- Wall Mounting Kit : Wall plugs , Screws

- airPoint XO™ Setup Software and User Manual CD

- Quick Install Guide

3.   Hardware Installation

For airPoint XO™ and airPoint XO^2™

- Connect an outdoor rated shielded Ethernet CAT 5 / 5e cable to the RJ45 connector of the airPoint XO™ (Located   inside   the weather proof connector) to the ETH OUT of PoE Outdoor™ (Refer to the PoE Outdoor™ user guide for detailed instructions)

- Connect the ETH IN RJ45 connector of the PoE Outdoor™ to the ETH Out of the Wall Plate Unit with proper CAT 5 / 5e cable .

- Connect the ETH in of the Wall plate to the LAN port of the PC or network through CAT 5 / 5e cable

- Connect the DC output (RJ 11 Plug) of the AC adapter to the PWR in of the Wall plate unit

- Confirm that the AC input to the AC adaptor is 110V AC (+/-5%), 60Hz in US and 240V AC (+/-5%), 50 HZ in EU. Make sure the AC input is clean of any surges or spikes. It is recommended to use a use a Spike and a surge suppressor, buster or a UPS to make sure that the power supply is clean. The UPS or buster should be of the correct voltage and current rating. Make sure that the AC supply has a proper Ground available to the surge suppressor, spike protector or UPS.

- Use only smartBridges Power over Ethernet Outdoor™ with a 48V AC adaptor.

- The specification for smartBridges AC adaptor :

Current Ratings	570 mA @ 48V
Type of Plug	RJ 11 4p4c
Plug Polarity	Pins 1, 2 Positive Pins 3, 4 Negative
AC Input	90 ~ 267 V AC 40 ~ 60 Hz

- Connect the AC Adapter to the mains outlet.

- Verify that the PWR , ETH and RF LEDs are ON .

- airPoint XO™ with its Factory Default Settings will serve the nearby wireless clients

4. Installing the airPoint XO™ Series
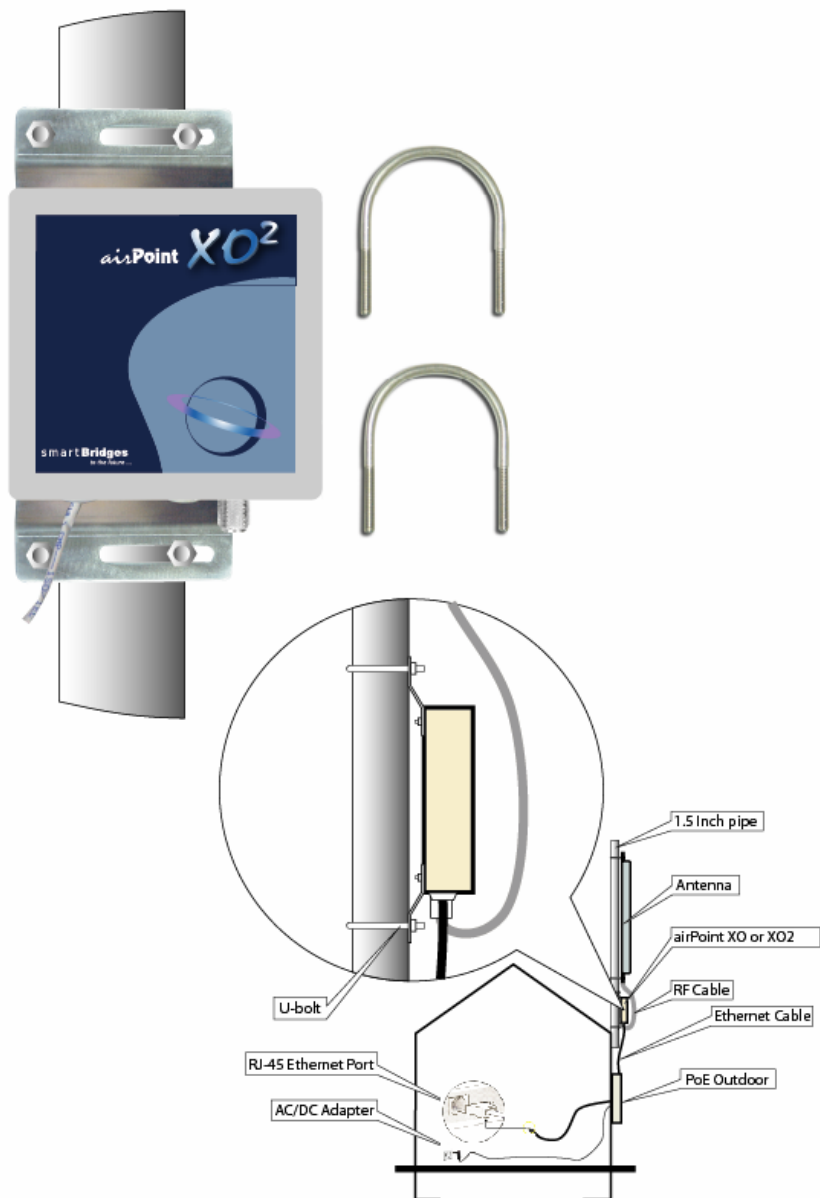
Grounding :

- Crimp an AWG # 10 grounding wire to the Tag provided.

- Place this Tag on the grounding Stud at the bottom side of the aP XO™ .

- Fasten it with the M6 nut tightly to the grounding Stud .

- Connect the other end of the earth wire to the Power Ground on the premises .

Note : Grounding has to be done before mounting the aPXO™ on the wall or pole .

4.1 Pole Mounting

Select the most appropriate place on the roof which will provide a direct view to the Access Point. Secure a 1.5 inch steel pipe vertically and insure that it cannot come off with wind force. Attach the bracket of the airPoint XO™ or XO^2™ unit with the 2pcs of U bolts to the pipe. Make sure to tighten both top and bottom mounting plates to the pipe with U bolts, nuts and spring washers. Tighten the nuts so that the bracket does not rotate on the pipe. The mounting should be such that the antenna socket, LED's, Ethernet cable outlet face downward.

Note:

1.   Do not mount the unit upside down with RF connectors facing up.

2.   There are no user adjustable parts inside and it is recommended that the unit is used in the same way it is shipped.

3.   Make sure that the unit is mechanically well secured to the mounting tower, pole, mast or wall.

4.   Radio communications requires Radio Line of Sight (RLOS) or Visual Line of Sight. Therefore, it is essential that the antennas connected to the airPoint XO™ or XO^2™ and the Access Point Clients, are in line of sight without any obstruction.

4.2   Mounting the Antenna

Antenna should be mounted on the same pipe as the airPoint XO™ or XO^2™ and positioned above it. The height of the antenna and direction should be in the direction of the Client devices. The antenna socket of the airPoint XO™ or XO^2™ and the antenna input have to be connected by an RG 8 N Male to N Male cable.

Note:

1.   Use a low loss coaxial cable, such as LMR400 (times microwave), with not more than a 2 meter length connecting the device to the antenna.

2.   Use good quality N (male) connectors on the coaxial cable from sources such an Amphenol.

3. Seal the RF connectors both at the antenna and the SB device side from the natural elements using weatherproofing tape provided. Do not skimp or skip on this.

4. Choose the antenna of the correct gain and radiating angle to meet the requirements for the system setup. Avoid using channels which are already in use. Use the IEEE 802.11b recommended non-overlapping channels: 1, 6 & 11 only or any other non-overlapping channel combo. The antenna polarity (vertical / horizontal) should be consistent for all the stations in the network.

5. It is illegal to use an amplifier with this device.

For more details, follow the mounting instructions provided by the antenna manufacturer.

4.3   Cabling

The airPoint XO™ and XO^2™ provides a weatherproof RJ45 female connector for outdoor use. Use an outdoor rated, shielded, Ethernet CAT5 cable, such as OSP category 5 (BBDN) cable from Superior Essex. Route the cable to the outdoor devices, away from any strong electromagnetic radiation sources, such as, radio or TV transmitters, power line transformers or any other strong Electromagnetic Interference or Transmission source. Preferably, the Ethernet cable has to be routed through a pipe to the tower on which the unit is mounted.

Note:

1. Make sure not to use an unnecessarily long Ethernet cable.

2. Make sure the weather proof connector is correctly used as per the instructions enclosed with it. The cable entry gland nuts of the weather proof connector should be tightened so that no water seepage takes place. Do not strain the weather proof connector. Make sure to crimp the shield of the cable to the metallic shield of the RJ45 connector.

3.   Suitable cable ties should be used to hold the cable rigidly along its path. Make sure that the cable does not pull or cause strain on the weather proof connector on the airPoint XO™ devices.

4.   Do not make sharp bends. Provide bending radius of minimum 2 inches (50mm).

Refer to the cable and connector installation instructions placed inside the weatherproof connector for more detailed information.

4.4   LEDs Status

1.   Power   : Green

2.   Ethernet (Link, Activity)   : Amber, Amber Blinking

3.   BW Controller (Link, Activity) : Blue, Blue Blinking

4.   RF (Link, Activity)   : Blue, Blue Blinking

4.5   Protection

The product has reliable surge suppression capability. RJ45 data lines are clamped to 7.5V and the Transient Voltage Suppressor (TVS) provides protection against High Voltage transients. Grounding is achieved through the grounding stud at the back. The Gas Discharge Tube (GDT) is also provided to handle large surges. The airPoint XO™ devices, used along with the PoE Outdoor™, are extremely robust outdoor devices for WISPs. The airPoint XO™ series complies with CE and FCC standards for wireless installations.

The airPoint XO™ products are housed in a NEMA 4X weatherproof casing which is built to perform reliably under all climatic conditions, withstanding temperatures anywhere between -40°C and +60°C (-40°F to 140°F).

Multi-feature security, 128-bit WEP encryption and a built-in RADIUS client for authentication offer high security across the network. The airPoint XO™ has a special Timer Function to set time for next radio reset and a built-in temperature sensor.

5. Software and Device Configuration

Please refer to the online help in the enclosed simpleMonitor software CD for the device configuration.

6. Service and Support

This User Manual provides comprehensive information on Installation and Configuration of airPoint XO™ series. If, however, you still have problems or need further support, you can visit our website at:

http://www.smartbridges.com

or send your queries to **support@smartbridges.com**

Please register **airPoint XO^{TM}** on our product registration page.

7. Frequently Asked Questions

How does the airPoint XO™ differs from some other available products?
The airPoint XO™ is designed to provide Bandwidth Management function from the Access Point box, which houses the radio, rather than the commonly used method of managing bandwidth from the NOC.
Why is this a better way of handling Bandwidth Management?
Doing bandwidth control at the Point of Service (at individual access points) (A) obviates the need to bring back all the backhaul from multiple access points in the WISP network to the central NOC and process it there. This frees up valuable network resources. (B) Distributing the bandwidth management function also ensures that incidental bandwidth throttling failure at NOC does not cripple bandwidth management across the entire network.
Does one have to buy additional software to use Bandwidth Management with airPoint XO™ series?
No. WISPs no longer need to buy additional software to do bandwidth management; this now comes built-in with airPoint XO™ products.
If an airPoint XO^2™ is used at the NOC, will the receiving radio have to be an airPoint XO™ to be able to use all XO™ series features or would an airPoint Pro Outdoor™ be sufficient? If yes, what would be a typical scenario?
The airPoint XO^2™ is built to work with all standard client devices and the airPoint Pro Outdoor™. For instance, an airPoint XO™ can provide bandwidth limiting to airPoint Outdoor™ access point, deployed further down the network tree.
Can minimum and maximum bandwidth be set?
Yes. Bandwidth can be throttled in steps of 64Kbps, till a maximum of 5 Mbps, to suit the WISP's requirement. The airPoint XO™ series allows upstream as well as downstream bandwidth control. The service provider can set up different categories based on bandwidth purchased. Users can be grouped by profiles, based on allowed bandwidth limits. This allows customer segmentation and optimal pricing possibilities.
Can radius authentication be done using usernames and passwords (not on IP or MAC address)?
Yes. The airPoint XO™ series supports RADIUS based authentication. This is based on MAC address. Support for authentication based on IP address will soon follow.

Is bandwidth throttling based on radius profiles possible?

Dynamic RADIUS based control is supported for large networks. Bandwidth control can be implemented using static IP lists for small networks.

In airPoint XO^2™, does each radio have independent WEP key, ESSID, and channel. Is it possible to set it differently?

Yes. Each radio parameter can be set differently. This significantly enhances the flexibility of configurations that the airPoint XO^2™ can provide.

What is built-in temperature sensor used for?

The built-in temperature sensor helps to monitor the device temperature, at any point of time. This is extremely useful in maintenance/ management and troubleshooting when required.

Can different speed limits be set for upstream and downstream connectivity?

Yes. Asymmetrical bandwidth control is possible with the airPoint XO™ series.

Is multi-mode functionality supported?

Yes. The airPoint XO™ series supports multi-mode functionality. The aP XO™ can be configured as an access point, wireless bridge, client-bridge or repeater. The aPXO^2™ can be configured as a twin access point, access point- backhaul, full-repeater or access point-standby.

Does the airPoint XO™ Series lock the radios at different speeds or does it throttle the speed via IP?

Bandwidth control is done using the MAC address. A static table can be used in the unit (similar to MAC authentication table) or an external RADIUS can be used as well to authenticate as well as provide the rate control information for each client.

How is the radio protected with grounding?

Grounding studs are provided on the back of the radio case as well as on the PoE Outdoor, which is supplied with the product.

Can the existing airPoint Pro Outdoor be upgraded to airPoint XO™?

No. The existing airPoint PRO Outdoor is essentially different from the airPoint XO™. The latter uses a 48V power supply and supports bandwidth management. Hence, the airPoint Pro Outdoor cannot be upgraded to an airPoint XO™.

Appendix A – Specifications

Model No	SB5100 (airPoint XO^2™) ; SB5200 (airPoint XO™)
Network Standard	IEEE 802.11b
Data Rates Supported	Can be adjusted in steps of 64Kbps, up to max throughput
Frequency Band	2400 to 2483.5Mhz
Wireless Medium	Direct Sequence Spread Spectrum (DSSS)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	DSSS with CCK / DQPSK / DBPSK
Operating Channels	11 FCC, 13 ETSI, 14 Japan, 4 France, Other countries 3 non-overlapping channels
Non-overlapping Channels	3
Receive Sensitivity	-92dBm at 1Mbps / -83dBm at 11 Mbps
Number of Outputs(radio)	2 (airPoint XO^2™) ; 1 (airPoint XO™)
Transmitter Output Power (Device/Radio)	+17 dBm max at the N-Connector, adjustable to 11.5dBm min using software control "Dial a Power"
Range	Up to 34 km (21miles) with proper antenna
Antenna Connector, Impedance	N (Female) Bulkhead Mount, 50 ohms
Compliance	Europe: ETSI 300-328, CE Marked
Under Certification	USA: FCC 47 CFR Part 15C, Section 15.247 - FCC Certification- ID: PWG SPEEDTRAP
SNMP Compliance	MIB I and MIB II
Management	SNMP ver 1 (MIB, Traps); TFTP (FW download), simpleNMS
Encryption Key Length	64-bit & 128-bit WEP
Remote Configuration Support	simpleMonitor, simpleDeploy, simpleNMS*
Dimension (W x D x H)	180 mm x 180 mm x 60 mm (7.08 inches x 7.08 inches x 2.36 inches)
Unit Weight	aPXO^2 ~ 1.2 Kg (2.6 lbs); aPXO ~ 1Kg (2.23lbs)
Shipping Weight	aPXO^2 ~ 2.0 Kg (4.4 lbs); aPXO ~ 1.85Kg (4.08lbs)

Operating Temperature	-40 deg C to +60 deg C (-40 F to +140 F)
Relative Humidity	Operating: 0 to 70% (non-condensing) Storage: 10 to 90% (non-condensation)
Mounting	Pole or wall mount via 2 pc U-Bolts & clamps (supplied)
Power Consumption	400 mA @ 48V (airPoint XO^2™); 300 mA @ 48V (airPoint XO™)
LEDs	Power, Ethernet, BW Controller, Activity, RF
Power Supply	48V Input , through PoE Outdoor (IEEE 802.3af compliant)
LAN Interface	10/100BaseT Ethernet Auto MDX cross-over- 1 foot outdoor rated CAT5 cable connected to the device and terminated into a weather-proof connector

Appendix B – Warranty, License and Copyrights

Warranty Information

smartBridges warrants product to be free of defects, and agrees to repair or replace the product that proves defective. airPoint XO™ is warranted for one year from date of purchase. This warranty does not cover accidents, misuse, neglect, unauthorized product modification, or acts of nature.

Please visit customer support area of smartBridges web site for making warranty claims. smartBridges may elect to exchange the product or refund the full purchase price of the unit.

Except as expressly provided above, smartBridges makes no warranties or conditions, express, implied, or statutory, including without limitation, the implied warranties of merchantability and fitness for a particular purpose or infringement of any patent, copyright or other intellectual property right. smartBridges shall not be liable for damage to other property caused by any defects in this product, damages based upon inconvenience, loss of use of the product, loss of time or data, commercial loss, or any other damages, whether special, incidental, consequential, or otherwise, whether under theory of contract, tort (including negligence), indemnity, product liability, or otherwise. smartBridges products are not intended for use in medical, life saving, or life sustaining applications. In no event shall smartBridges' liability exceed the normal purchase price for this product.

Software License

No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document. The setup software is licensed for use with the airPoint-PRO Wireless Access Point only. The software may be copied only for backup purpose.

Copyright & Trademarks

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Appendix C -Declaration of Conformity and Regulatory Information

DECLARATION OF CONFORMITY TO FCC REGULATIONS, Part 15
FCC ID - PWG SPEEDTRAP

smartBridges declares that the equipment described in this document is within the requirements of the Code of Federal Regulations - Title 47 Part 15, Subpart B, Class B for a digital device. This declaration is based upon the compliance of the airBridge Wireless Ethernet Client to the above standards. smartBridges has determined that airBridge has been shown to comply with the applicable technical standards if no unauthorized changes are made to the equipment and if the equipment is properly maintained and operated. These units are identical to the units tested and found acceptable with the applicable standards. Records maintained by smartBridges continue to reflect that the units being produced under this Declaration of Conformity, within the variation that can be expected due to quantity production and tested on a statistical basis, continue to comply with the applicable technical standards.

FCC Rules and Regulations - Part 15

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 and, 2. This device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 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 and, if not installed and used in accordance with the instructions, 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 the 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.

Changes or modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

In order to maintain compliance with FCC regulations, standard network cables must be used with this equipment. Operation with non-approved equipment or non-standard cables is likely to result in interference to radio and TV reception. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

CANADIAN DEPARTMENT OF COMMUNICATION, INDUSTRY CANADA STATEMENT

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Commu-nications du Canada.

EUROPEAN COMMUNITY CE MARK, DECLARATION OF CONFORMITY

smartBridges Pte. Ltd. declares that the equipment described in this document is in conformance with the requirements of the European Council Directives - 73/23/EEC, Low Voltage Directive with Amendment 93/68/EEC and 89/336/EEC, EMC Directive with Amendments 92/31/EEC and 93/68/EEC. This declaration is based upon compliance of the product to the following standards: EN 55022 (CISPR 22B), RF Emissions Control and EN 50082-1 (IEC 801-2, 3, 4) Immunity to Electromagnetic Disturbance.

SAFETY NOTICE

This product is intended for use with UL 1950/EN60950/IEC950 (or other NRTL) listed ITE computer that contains operator-accessible Ethernet ports. This being an electromagnetic radiating device we recommend keeping the equipment at least 32 cm away from the human body. Radiating levels are within safety limits set by FCC

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