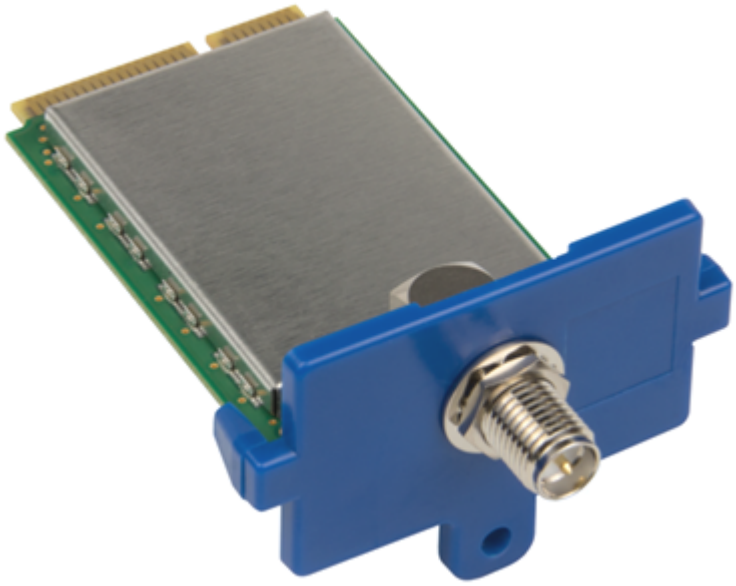
MTAC-LORA-H Topics

Introduction

The MTAC-LORA-H accessory card provides long range RF support using Semtech’s LoRa radio technology. The Conduit gateway uses this accessory card to connect MultiTech's MultiConnect® DOT Series products to the cloud.



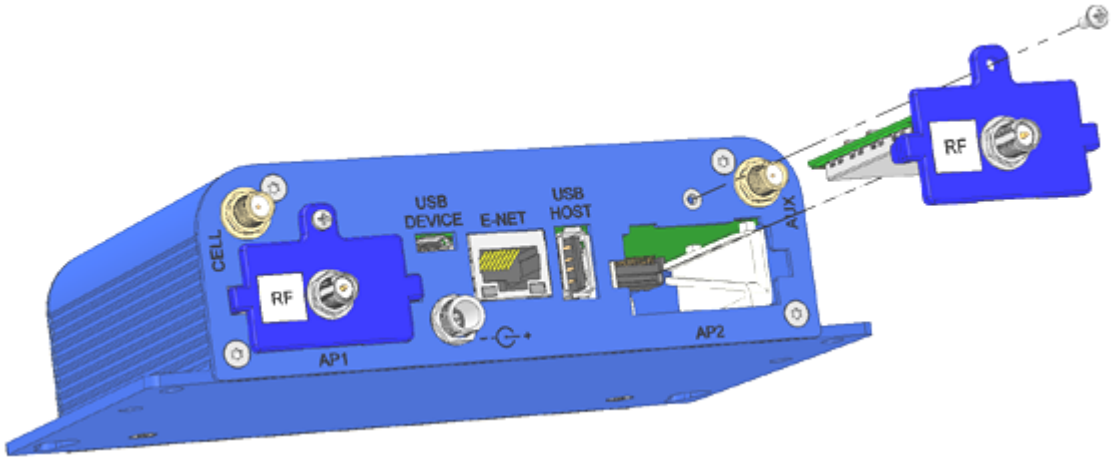
Installing the Accessory Card

You need:

- Phillips screwdriver
- MTAC-LORA-H card with accompanying small screw

To install the MTAC-LORA-H accessory card:

1. Disconnect power to the Conduit, if it is connected.
2. At the back of the Conduit housing, locate the opening where you want the MTAC-LORA-H card to be installed. You can install the card in the AP1 opening or the AP2 opening.



3. Slide the card into the opening. You should feel the card connector seat in the internal connector.
4. Use a small Phillips screwdriver to attach the card bracket to the housing with the screw provided.

Operating Instructions

The Conduit that the MTAC-LORA-H will be installed software that allows the user to configure and run the MTAC-LORA-H.

- For Conduit AEP (MTCDT-xx-210A) models, information on configuring LoRa is available at http://www.multitech.net/developer/software/lora/getting-started-with-lora-conduit-aep/.
- For Conduit mLinux (MTCDT-x-210L) models, information on configuring LoRa is available at http://www.multitech.net/developer/software/lora/getting-started-with-lora-conduit-mlinux/.

Hardware Specifications

The following are the hardware specifications for the accessory card.

Category	Description
Physical Description	
Weight	TBD
Dimensions	3.650" x 1.375" (92 mm x 34.925 mm)
Power Requirements	
Operating Voltage	5 VDC and 3.3 VDC +/- 10%
Environment	
Operating Environment	-30° to +70° C [1] when operated in a Conduit gateway device (MTCDT).
Storage Environment	-40° to +85° C
Relative Humidity	20% to 90% non-condensing
Certifications and Compliance	
EMC Compliance	EN 301 489-03 V1.6.1:2013
	EN 300 220-2 V2.4.1:2012
	RSS-210:2010
	RSS-247:2015
	FCC 15.247:2015
	FCC 15.109:2015
	FCC 15.109(g):2015
	FCC 15.107:2015
	ICES-003:2012
	EN 61000-3-3:2013
	EN 61000-3-2:2006 (Amended by A1:2009 and A2:2009)
	EN 55022: 2010
Safety Compliance	UL 60950-1 2nd ED
	cUL 60950-1 2nd ED
	UL 201
	IEC 60950-1 2nd Ed. Am.1 and Am.2

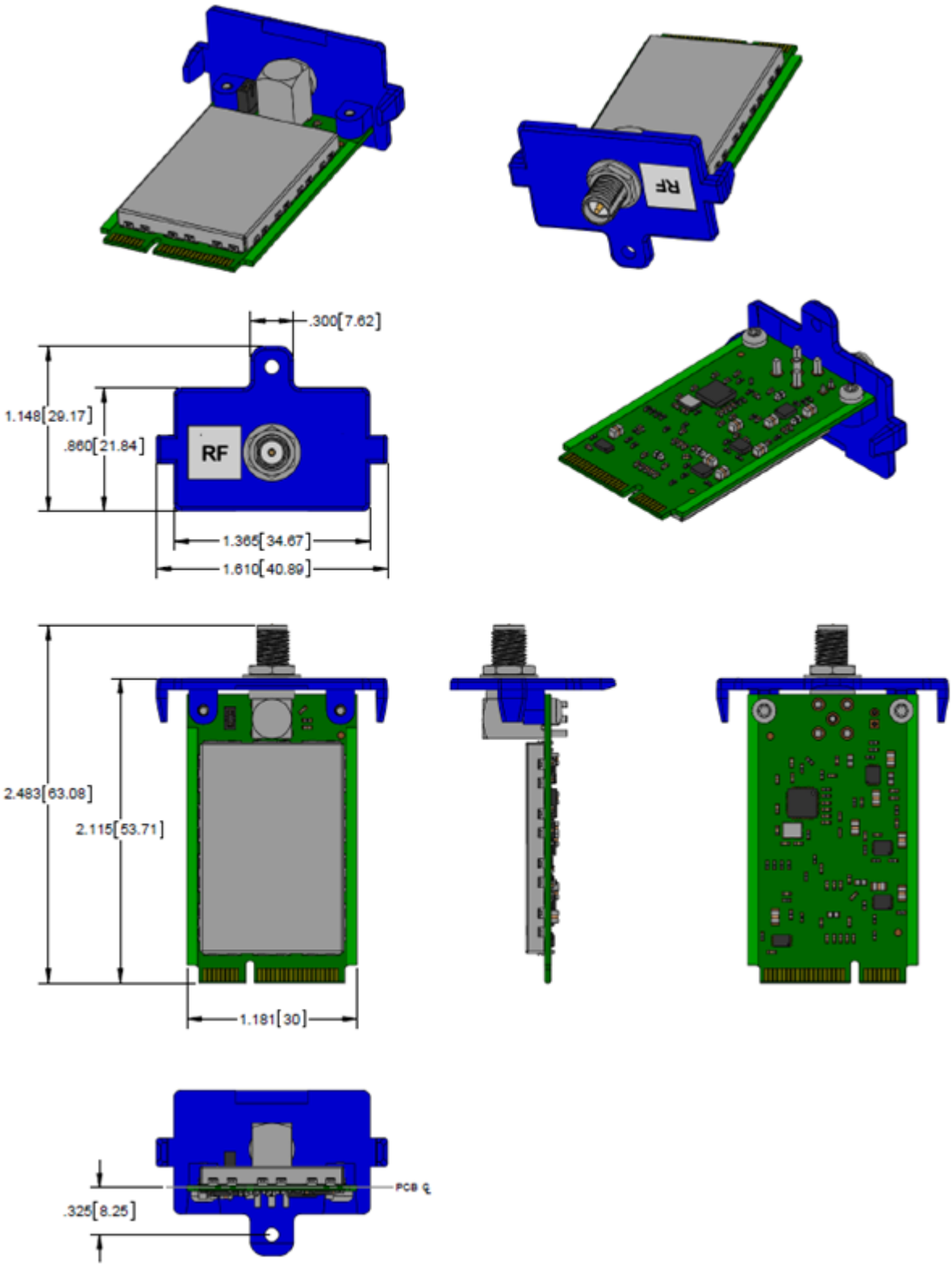
MTAC-LORA-H Power Draw

Note:

- The following power draw values were measured with the MTAC-LoRa-H card installed in a MultiConnect Conduit with H5 cellular modem (MTCDT-H5).
- Transmit power accuracy is +/- 2 dB.

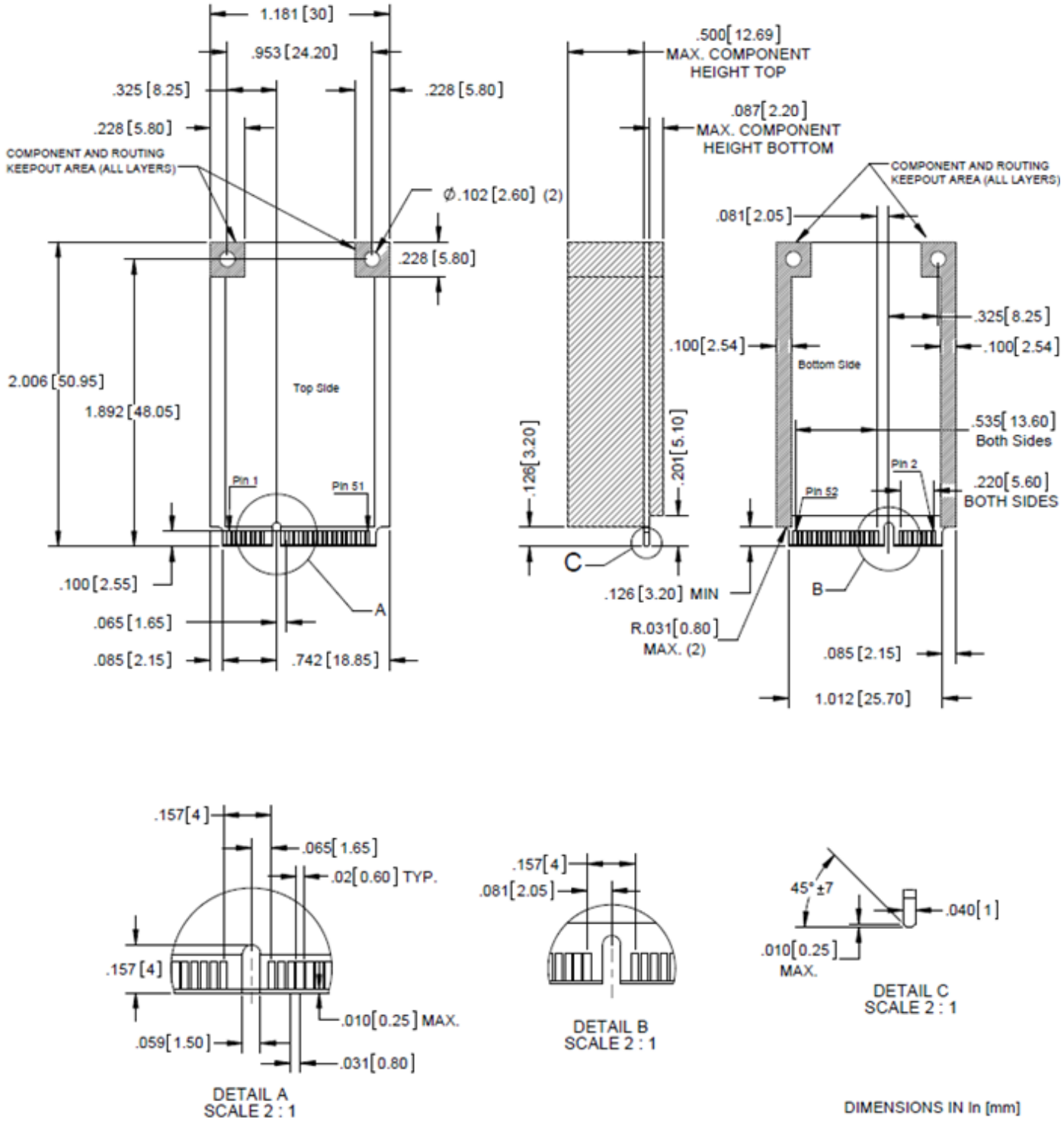
Voltage	Radio Protocol	Cellular Call Box Connection, No Data	Average Measured Current at Max Power	Average TX Pulse Amplitude Current for GSM850or Peak Current for HSDPA	Total Inrush Charge in MilliCoulombs
9.0 Volts	GSM 850 MHz	747 mA	1.01 Amps	1.75 Amps	6.06 mC
	HSDPA	748 mA	1.19 Amps	1.3 Amps	6.06 mC
12.0 Volts	GSM 850 MHz	561 mA	767 mA	1.34 mA	5.21 mC
	HSDPA	563 mA	872 mA	964 mA	5.21 mC
24.0 Volts	GSM 850 MHz	301 mA	393 mA	667 mA	4.15 mC
	HSDPA	302 mA	440 mA	524 mA	4.15 mC

Mechanical Drawing

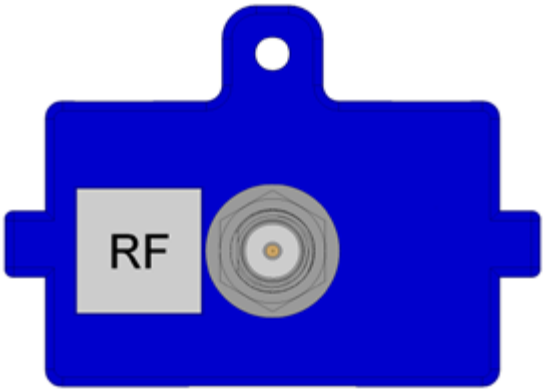


Electromechanical Specifications

The following information applies to all accessory cards. Refer to your card's mechanical drawing for card specific details.



Antenna Connector



FCC Antenna Requirements

The antenna used for transmitting must be installed to provide a separation distance of at least 25 cm from all persons and must not transmit simultaneously with any other antenna transmitters.

Antenna for 915 MHz Models

For 915 MHz models, this device is approved with the following antenna or for alternate antennas meeting the given specifications.

Manufacturer:	Laird Technologies
Description:	OMNI, GF, 902-928 MHz
Model Number:	FG9026

Antenna Specifications

Category	Description
Frequency Range	900-928 MHz
Dimensions	65 inches
VSWR	2
Gain	8 dBi
Radiation	Omni-directional
Polarization	Vertical

Antenna for 868 MHz Models

For 868 MHz models, this device is approved with the following antenna or for alternate antennas meeting the given specifications.

Manufacturer:	L-com Global Connectivity
Description:	OMNI for 800 MHz/900 MHz ISM band
Model Number:	HGV-906U

Antenna Specifications

Category	Description
Frequency Range	824-960 MHz
Dimensions	23.6 inches (600 mm), 2.4 lbs. (1.1 Kg)
VSWR	< 1.5:1 average
Gain	6 dBi
Radiation	Omni-directional
Polarization	Vertical
Vertical Beam Width	30 degrees
Horizontal Beam Width	360 degrees
Impedance	50 Ohm
Maximum Input Power	100 Watts

Getting Started With LoRa

Prerequisites:

- Perform the Getting Started with Conduit AEP Models procedure. Do not create a Node-Red flow until you have installed and configured the LoRa card with the values listed below.
- Ensure that you have installed the correct LoRa card for your operation. For North America, you need the MTAC-LORA-915 or MTAC-LORA-H 915. For Europe, you need the MTAC-LORA-868 or MTAC-LORA-H 868.
- Attach the LoRa antenna to the MTAC-LORA card.
- Ensure that you have version 1.0.25 or later of the firmware installed in the Conduit.
- On the left sidebar of the Web Management interface (GUI), go to **Setup > LoRa Network Server** to display the LoRa Network Server Configuration panel.

The following table shows the configuration values you need to enter for the fields listed.

Field	MTAC-LORA-915 (NA)	MTAC-LORA-868 (EU)
Enabled	Checked	Checked
Frequency Band	915	868
Frequency Sub Band	1 to 8	NA
Additional Channels Frequency	NA	Default: 869.5 Ranges: [863.5 to 867.5] and [869.1 to 869.5]
Tx Power	Maximum transmission power in dBm (-6 to 26)	
Name	Name of your LoRa network (string, 8-character minimum)	
Passphrase	Security passphrase for your LoRa network (string, 8-character minimum)	

Click **Submit** at the bottom right of the page. (No need to restart the device.)

47 CFR Part 15 Regulation Class B Devices

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 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.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Notice

Per FCC 15.19(a)(3) and (a)(4) 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.

Industry Canada Class B Notice

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Reglement Canadien sur le matériel brouilleur.

This device complies with Industry Canada license-exempt RSS standard(s). The operation is permitted for the following two conditions:

1. the device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

EMC, Safety, and R&TTE Directive Compliance

CE

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 2014/30/EU on the approximation of the laws of Member States relating to electromagnetic compatibility;
and
Council Directive 2014/35/EU on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;
and
Council Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment;
and
Council Directive 1999/5/EC on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

Information on HS/TS Substances According to Chinese Standards

In accordance with China's Administrative Measures on the Control of Pollution Caused by Electronic Information Products (EIP) # 39, also known as China RoHS, the following information is provided regarding the names and concentration levels of Toxic Substances (TS) or Hazardous Substances (HS) which may be contained in Multi-Tech Systems Inc. products relative to the EIP standards set by China's Ministry of Information Industry (MII).

Hazardous/Toxic Substance/Elements

Name of the Component	Lead (PB)	Mercury (Hg)	Cadmium (CD)	Hexavalent Chromium (CR6+)	Polybrominated Biphenyl (PBB)	Polybrominated Diphenyl Ether (PBDE)
Printed Circuit Boards	O	O	O	O	O	O
Resistors	X	O	O	O	O	O
Capacitors	X	O	O	O	O	O
Ferrite Beads	O	O	O	O	O	O
Relays/Opticals	O	O	O	O	O	O
ICs	O	O	O	O	O	O
Diodes/ Transistors	O	O	O	O	O	O
Oscillators and Crystals	X	O	O	O	O	O
Regulator	O	O	O	O	O	O
Voltage Sensor	O	O	O	O	O	O
Transformer	O	O	O	O	O	O
Speaker	O	O	O	O	O	O
Connectors	O	O	O	O	O	O
LEDs	O	O	O	O	O	O
Screws, Nuts, and other Hardware	X	O	O	O	O	O
AC-DC Power Supplies	O	O	O	O	O	O
Software /Documentation CDs	O	O	O	O	O	O
Booklets and Paperwork	O	O	O	O	O	O
Chassis	O	O	O	O	O	O

X Represents that the concentration of such hazardous/toxic substance in all the units of homogeneous material of such component is higher than the SJ/Txxx-2006 Requirements for Concentration Limits.
O Represents that no such substances are used or that the concentration is within the aforementioned limits.

Information on HS/TS Substances According to Chinese Standards (in Chinese)

依照中国标准的有毒有害物质信息

根据中华人民共和国信息产业部 (MII) 制定的电子信息产品 (EIP) 标准－中华人民共和国《电子信息产品污染控制管理办法》（第 39 号），也称作中国 RoHS, 下表列出了 Multi-Tech Systems, Inc. 产品中可能含有的有毒物质 (TS) 或有害物质 (HS) 的名称及含量水平方面的信息。

有害/有毒物质/元素

成分名称	铅 (PB)	汞 (Hg)	镉 (CD)	六价铬 (CR6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板	O	O	O	O	O	O
电阻器	X	O	O	O	O	O
电容器	X	O	O	O	O	O
铁氧体磁环	O	O	O	O	O	O
继电器/光学部件	O	O	O	O	O	O
ICs	O	O	O	O	O	O
二极管/晶体管	O	O	O	O	O	O
振荡器和晶振	X	O	O	O	O	O
调节器	O	O	O	O	O	O
电压传感器	O	O	O	O	O	O
变压器	O	O	O	O	O	O
扬声器	O	O	O	O	O	O
连接器	O	O	O	O	O	O
LEDs	O	O	O	O	O	O
螺丝、螺母以及其它五金件	X	O	O	O	O	O
交流-直流电源	O	O	O	O	O	O
软件/文档 CD	O	O	O	O	O	O
手册和纸页	O	O	O	O	O	O
底盘	O	O	O	O	O	O

X 表示所有使用类似材料的设备中有害/有毒物质的含量水平高于 SJ/Txxx-2006 限量要求。
O 表示不含该物质或者该物质的含量水平在上述限量要求之内。

REACH Statement

Registration of Substances

After careful review of the legislation and specifically the definition of an “article” as defined in EC Regulation 1907/2006, Title II, Chapter 1, Article 7.1(a)(b), it is our current view that Multi-Tech Systems, Inc. products would be considered as “articles.” In light of the definition in § 7.1(b) which requires registration of an article only if it contains a regulated substance that “is intended to be released under normal or reasonably foreseeable conditions of use,” our analysis is that Multi-Tech Systems, Inc. products constitute nonregisterable articles for their intended and anticipated use.

Substances of Very High Concern (SVHC)

Per the candidate list of Substances of Very High Concern (SVHC) published October 28, 2008 we have reviewed these substances and certify the Multi-Tech Systems, Inc. products are compliant per the EU “REACH” requirements of less than 0.1% (w/w) for each substance. If new SVHC candidates are published by the European Chemicals Agency, and relevant substances have been confirmed, that exceeds greater than 0.1% (w/w), Multi-Tech Systems, Inc. will provide updated compliance status.

Multi-Tech Systems, Inc. also declares it has been duly diligent in ensuring that the products supplied are compliant through a formalized process which includes collection and validation of materials declarations and selective materials analysis where appropriate. This data is controlled as part of a formal quality system and will be made available upon request.

Restriction of the Use of Hazardous Substances (RoHS)

Multi-Tech Systems, Inc.

Certificate of Compliance

2011/65/EU

Multi-Tech Systems, Inc. confirms that its embedded products comply with the chemical concentration limitations set forth in the directive 2011/65/EU of the European Parliament (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment - RoHS).

These MultiTech products do not contain the following banned chemicals[1]:

- Lead, [Pb] < 1000 PPM
- Mercury, [Hg] < 1000 PPM
- Hexavalent Chromium, [Cr+6] < 1000 PPM
- Cadmium, [Cd] < 100 PPM
- Polybrominated Biphenyl, [PBB] < 1000 PPM
- Polybrominated Diphenyl Ether, [PBDE] < 1000 PPM

Environmental considerations:

- Moisture Sensitivity Level (MSL) =1
- Maximum Soldering temperature = 260C (in SMT reflow oven)

[1]Lead usage in some components is exempted by the following RoHS annex, therefore higher lead concentration would be found in some modules (>1000 PPM);

- Resistors containing lead in a glass or ceramic matrix compound.

Waste Electrical and Electronic Equipment Statement

Note: This statement may be used in documentation for your final product applications.

WEEE Directive

The WEEE Directive places an obligation on EU-based manufacturers, distributors, retailers, and importers to take-back electronics products at the end of their useful life. A sister directive, ROHS (Restriction of Hazardous Substances) complements the WEEE Directive by banning the presence of specific hazardous substances in the products at the design phase. The WEEE Directive covers all MultiTech products imported into the EU as of August 13, 2005. EU-based manufacturers, distributors, retailers and importers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

July, 2005