

MultiConnect[®] Conduit[™] IP67 Base Station

16-channel v2.1 Geolocation Reference
Design; optional 64-channel upgrade



The **MultiConnect[®] Conduit[™] IP67 Base Station** is a ruggedized IoT gateway solution, specifically designed for outdoor LoRa[®] public or private network deployments. The product can operate in two modes: standard and geolocation. The standard product operates as a 16-channel, full duplex gateway, supporting both packet-forwarder and built-in network server modes. The geolocation product is based on the Semtech v2.1 reference design, which uses the LoRaWAN[™] protocol to perform Time Difference of Arrival (TDoA) calculations to deliver end-node location information in conjunction with a v2.1 LoRa Network Server. This technology provides asset location information that enables a variety of use cases, services and business models that GPS limitations cannot support.

The upgradeable FPGA on the LoRa processor allows customers to deploy in standard operation today for existing LoRaWAN network needs and remotely upgrade to geolocation operation as business needs change. There is no need to send a technician to site to change mode of operation. It can support thousands of LoRaWAN certified end nodes natively, including the MultiConnect[®] mDot[™] and xDot[™], without the need for additional hardware or software upgrades to the end nodes.

BENEFITS

- Full duplex communication reduces time and costs of operational management of LoRa end devices
- Increased timing accuracy and Enhanced Security – all geolocation packets are fine timestamped and AES encrypted
- Existing LoRaWAN compliant end nodes can utilize geolocation without extra hardware or software costs
- GPS-free geolocation reduces complexity of locating LoRaWAN end devices

FEATURES

- Semtech v2.1 design is Geolocation enabled by partnering with a v2.1 LoRa Network Server
- Operates as a 16-channel gateway in standard or geolocation operation; 64-channel upgrade option for both
- Certified for Europe 868 MHz and North American 915 MHz ISM bands
- Standard operation supports 1PPS packet timestamp; geolocation operation supports finer packet timestamp

IP67 BASE STATION POWERED BY CONDUIT - HIGHLIGHTS

Geolocation Applications

There are many IoT use cases that require information on the location of a physical asset, but traditionally have been hampered by technology that either requires additional hardware (e.g., GPS module) and/or has limited capability (e.g., cannot work indoors in wide area applications). With Semtech's v2.1 geolocation solution, new business cases and services in key verticals such as agriculture, health care, logistics, and construction can benefit from location services previously too expensive or impossible to meet utilizing GPS. Whether one wants to locate animals, assets or provide new services cost efficiently, LoRaWAN geolocation is positioned to enable a myriad of use cases that benefit society.

Geolocation with v2.1 LoRa Network Servers

The MultiConnect IP67 Conduit v2.1 base station requires a LoRa Network Server that is capable of processing v2.1 packets. v2.1 packets are not backwards compatible with v1.5 or earlier LoRa Network Servers. Therefore, in order to use geolocation with this new product, a customer must have access to a v2.1 capable LoRa Network Server. Check with your public LoRa operator of choice to see if they have an agreement with Semtech, as MultiTech is compatible with most operators around the world.

Comprehensive Service and Support

The MultiTech commitment to service means we provide a two year product warranty and service that includes free standard technical support, 24 hour website, and FTP support.

MULTICONNECT CONDUIT HIGHLIGHTS

Application Development Tailored to You

MultiConnect Conduit gateways provide both the IBM Node-RED graphical, drag-and-drop interface and mLinux development environments, offering IT professionals, integrators and developers alike, programming choice to utilize the Conduit to provide analytics on incoming data and provide more actionable outgoing data.

For the Advanced Developer – Open mLinux Development Environment

With a completely open Linux development environment, our mLinux distribution is based on the Open Embedded/Yocto project. This development path is recommended for those wanting to port existing applications, who have strong language preferences, or who need complete firmware control.

The mLinux Distribution Includes:

- Operating System: Linux 3.12.70 Kernel, Yocto 2.2
- Language Support: Java, Ruby, Perl, Python, C/C++, PHP, C# and JavaScript
- Packages: SQLite (Database), Lighttpd (Web Server), BusyBox (Core Utilities)

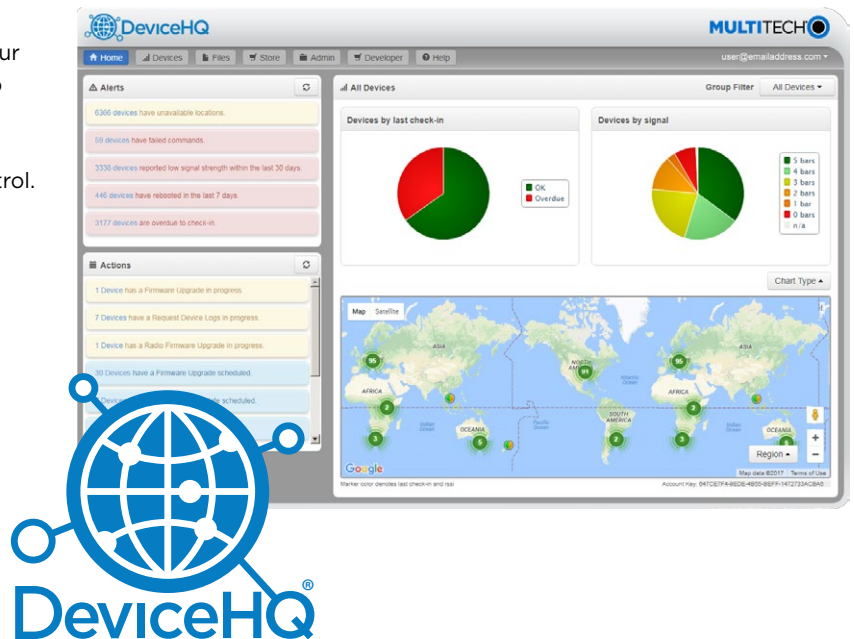
Fast and Intuitive Programming with Node.js and Node-RED Technologies

Applications can be simply created and deployed by the click of a button based upon IBM's Node-RED visual development tool. Incredibly user-friendly, Node-RED is an intuitive graphical programming tool ideal for rapid prototyping, designed for IT professionals to optimize and scale the edge behavior of their IoT network.

Easily Deploy and Manage Assets Via DeviceHQ®

MultiTech DeviceHQ is the industry's first IoT online application store to enable customers to easily deploy and scale applications to their connected devices. Drag-and-drop tools easily allow customers to create and manage applications for in-field assets. The DeviceHQ application store gives your business the power to innovate operations management and create value-added services.

Note: Node-red and DeviceHQ are not yet supported in the v2.1 geolocation Conduit. Support for these features is targeted for September 2018

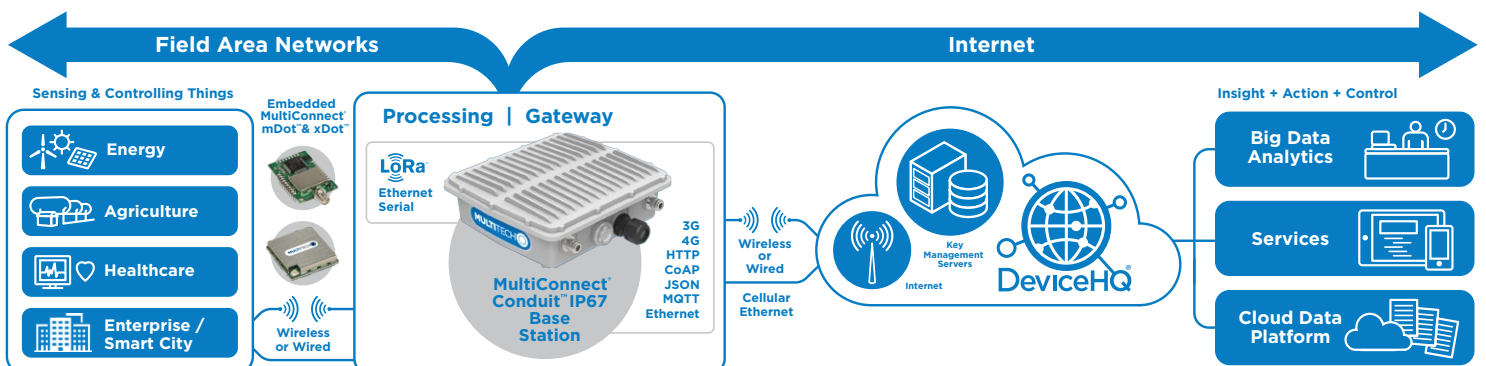
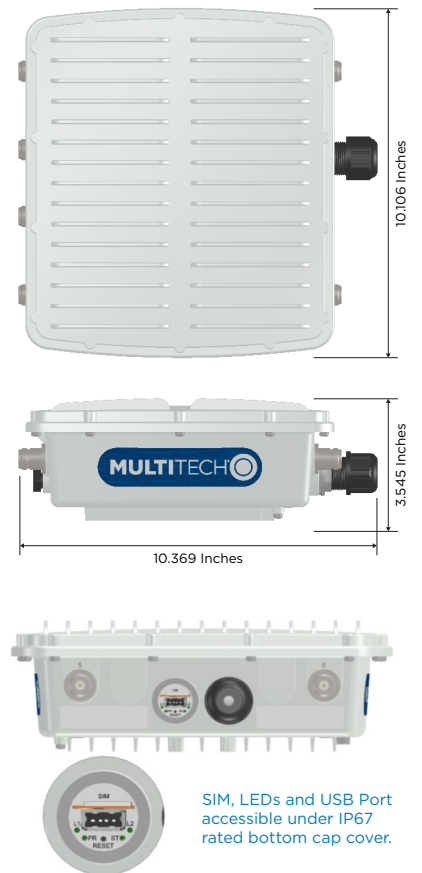


Benefits

- “Low Touch” asset deployment reduces costs, complexity and time
- Reduce truck-rolls using remote performance management and asset updates
- Easily scales to your network needs
- Browse and download a wide variety of custom applications tailored to your business needs

IP67 BASE STATION SPECIFICATIONS

Model	MTCDD-Lxx		
Performance (Cellular Optional)	4G-LTE Category 3 3GPP Release 9 (100 Mbps peak downlink/50 Mbps peak uplink)		
	AT&T/T-Mobile	Europe	Verizon
	with HSPA+ 21/GPRS fallback	with HSPA+ 42/GPRS fallback	(No fall back)
Frequency Bands (MHz)	4G: 700(B17)/850(B5)/ AWS1700(B4)/1900(B2) 3G: 850(B5)/1900(B2) 2G: 850/1900	4G: 800(B2)/ 1800(B3)/2600(B7) 3G: 850(B5)/900(B8)/2100(B1) 2G: 900/1800	4G: 700(B13)/AWS1700(B4)
Processor & Memory	ARM9 processor with 32-Bit ARM & 16-Bit Thumb instruction sets / 400 MHz / 16K Data Cache / 256 MB Flash Memory / 16K Instruction Cache / 128X16M DDR RAM		
Packet Data	Up to 100 Mbps downlink, Up to 50 Mbps uplink		
LoRa Radio and Channel Capacity	LoRa - a Digital Spread Spectrum technique 16 Channel gateway / 64 Channel targeted Q4, 2018		
mLinux Software	<div>Linux 3.12.70</div> <div>• Open source embedded Linux distro based on the Yocto Project - 2.2</div> <div>• Tool chain for creating custom images</div> <div>• Packet forwarder</div> <div>• WAN connection via Ethernet or cellular</div> <div>• Cellular PPP, DHCP client & server</div> <div>• Firewall configuration via iptables</div> <div>• Full root console access via SSH and serial debug port</div> <div>• Out of the box support for C, C#, C++, Perl, Python, Javascript, Node.js, Ruby</div> <div>• Five configurable LEDs</div> <div>• opkg package manager with limited package feed</div> <div>• Basic router functionality built-in with Linux</div> <div>• Software configurable USB device port</div> <div>• Lighttpd web server</div> <div>• GNSS</div>		
GNSS/GPS Module - when not using geolocation	72-channel u-blox NEO/LEA-M8T module / Concurrent reception of GPS/QZSS, GLONASS, Galileo, BeiDou / Survey-in and single satellite timing / Time pulse frequency: 0.25 Hz...10 MHz / Time pulse accuracy: Clear sky ≤ 20 ns / Indoor ≤ 500 ns		
Antennas	LoRa Omni-directional radiation pattern for 360° / 3 dBi gain / Vertical polarization / Weight: 231 grams / Nominal Impedance: 50 Ω / Dimensions: 388.5mm x 36.9mm / Frequency Range: 806-960 MHz / N Male connector		
	Cellular Wideband LTE, 4G / 3 dBi gain / Groundplane independent / Linear polarization / Locks in three positions for flexibility / Dimensions: 171 x 18mm (max) / Frequency Range: 690-960/1710-2700MHz / SMA-Male connector		
	GNSS/GPS Operation Voltage: 3.0 - 5.0V / Polarization: RHCP / Power Consumption: 8+/-3mA (@3.0+/-0.1V) / Temperature: -40°C to +85°C / Gain: 90°: 2.4 dBic @ 1575 MHz; 2.85 dBic @ 1602 MHz / Connector: N-Plug / Frequency Range: 1575 - 1615 MHz / Dimensions: 55 (Dia.) mm x 64 (W) / Noise Figure: 2.0 dB typ.		
LoRaWAN Communication	Certified Channel Support Europe 868 MHz North America 915 MHz	Radio Frequency Support AS923 MHz, AU 915 MHz, IN 865 MHz, KR 920 MHz	
LoRaWAN Protocol Support	LoRaWAN 1.0, 1.0.1 and 1.0.2 supported / LoRaWAN 1.1 Targeted Q4 2018 / Listen Before Talk support		
PoE	802.3at Type 2: PoE device with power rating 60W or greater Input power: Power over Ethernet 37-57 Volts DC		
Connectors			
Ethernet and PoE	1 RJ-45 Ethernet 10/100 port; RJ-45 for PoE		
USB	1 USB Ports: USB Host (Type-A)		
Cellular (Optional)	Female SMA, 2dBi detachable cellular antennas (Qty 2)		
Antenna	"N" type		
SIM	Micro-SIM Holder (3FF)		
Physical Description			
Dimensions (LxWxH)	10.315" x 3.582" x 10.118" (262 mm x 91 mm x 257 mm)		
Weight	2.56 kg (5.65 lbs)		
Chassis Type	Metal		
Environmental			
Operating Temperature	-30° to +75° C		
Storage Temperature	-40° to +85° C		
Relative Humidity	20% to 90%, non-condensing		
Certifications			
EMC Compliance	US: FCC Part 15 Class B, EU: EN 55022 Class B, EN 55024, Canada: ICES-003		
Radio Compliance	FCC 15.247, IC RSS-210, EU EN 300 220		
Safety	UL / cUL 60950-1 2nd Ed., UL / cUL 60950-22, IEC 60950-1 2nd Ed. + A2, IEC 60950-22, RoHS compliant		
Network Approvals	AT&T/T-Mobile, Verizon		
Quality	MIL-STD-810G: High Temp, Low Temp, Random Vibration. SAE J1455: Transit Drop & Handling Drop, Random Vibration, Swept-Sine Vibration. IEC68-2-1: Cold Temp. IEC68-2-2: Dry Heat		



MULTICONNECT CONDUIT SOFTWARE SPECIFICATIONS

mLinux

Open source embedded Linux distro based on the Yocto Project

Tool chain for creating custom images

Packet forwarder

WAN connection via Ethernet or cellular

Cellular PPP, DHCP client & server

Firewall configuration via iptables

Full root console access via SSH and serial debug port

Out of the box support for C, C#, C++, Java, Perl, Python, Javascript, Node.js, Ruby
opkg package manager with limited package feed

Basic router functionality built-in with Linux

Five configurable LEDs

Software configurable USB device port

Lighttpd web server

GNSS

WHAT'S INCLUDED WITH YOUR IP67 BASE STATION KIT?

MultiConnect Conduit IP67 Base Station

The IP67 Base Station includes the following:

- 1 - IP67-rated metal chassis
- 1 - mounting bracket
- 1 - Grounding screw
- 1 - LoRa antenna
- 2 - Cellular antenna's
- 1 - GNSS antenna
- 1 - Installation guide for setting up IP67 chassis and inserting SIM card

Mounting Options
(Optional accessories shown)



ORDERING INFORMATION - MULTICONNECT® CONDUIT™ IP67 BASE STATION

Model	Description	Region
MTCDTIP-LEU1-270L-868	LTE Cat 3 Conduit IP67 Geolocation Base Station, GNSS w/Accessories	Europe
MTCDTIP-LAT1-270L-915	LTE Cat 3 Conduit IP67 Geolocation Base Station, GNSS w/Accessories (AT&T)	US/Canada
MTCDTIP-LVW2-270L-915	LTE Cat 3 Conduit IP67 Geolocation Base Station, GNSS w/Accessories (Verizon)	US
With Wi-Fi/BT/BLE Support		
MTCDTIP-LEU1-275L-868	LTE Cat 3 Conduit IP67 Geolocation Base Station, GNSS w/Wi-Fi/BT and Accessories	Europe
MTCDTIP-LAT1-275L-915	LTE Cat 3 Conduit IP67 Geolocation Base Station, GNSS w/Wi-Fi/BT and Accessories (AT&T)	US/Canada
MTCDTIP-LVW2-275L-915	LTE Cat 3 Conduit IP67 Geolocation Base Station, GNSS w/Wi-Fi/BT and Accessories (Verizon)	US

Go to www.multitech.com for detailed product model numbers and additional accessories.

SERVICES & WARRANTY

MultiTech's comprehensive Support Services programs offer a full array of options to suit your specific needs. These services are aimed at protecting your investment, extending the life of your solution or product, and reducing total cost of ownership. Our seasoned technical experts, with an average tenure of more than 10 years, can walk you through smooth installations, troubleshoot issues and help you with configurations.

INSTALLATION SUPPORT

MultiTech's Installation Support Service delivers priority service with the ability to work one-on-one with an experienced MultiTech technical support engineer, to guide you through the installation process for our products.

TECHNICAL SUPPORT SERVICES

At MultiTech, we're committed to providing you personalized attention and quality service while providing you a quick response to your product support needs. We have several options of support for you to choose from.

For additional information on Support Services as well as other service offerings, please contact your MultiTech representative or visit www.multitech.com/support.go

World Headquarters

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112 U.S.A.
Tel: 763-785-3500
Toll-Free: 800-328-9717
Email: sales@multitech.com
www.multitech.com

EMEA Headquarters

Multi-Tech Systems (EMEA)
Strata House
264-270 Bath Road
Harlington UB3 5JJ
United Kingdom
Tel: +(44) 118 959 7774
Email: sales@multitech.co.uk
www.multitech.co.uk



Produced in the U.S. of U.S. and non-U.S. components. Features and specifications are subject to change without notice.

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