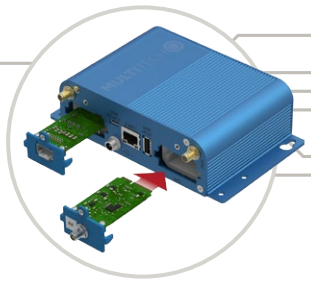
MULTITECH®
CREATE • CONNECT • COMMUNICATE

MultiConnect® Conduit™ AS923 for Japan

Programmable Gateway for the Internet of Things



LoRa Alliance™

MultiConnect® Conduit™ is the industry's most configurable, manageable, and scalable cellular communications gateway for industrial IoT applications and now supports the AS923 channel plan. Designed specifically to operate in the Japanese market, this Conduit supports Listen Before Talk transmission to ensure regulatory conformance as well as optimum communications performance. Network engineers can remotely configure and optimize their Conduit performance through DeviceHQ®, the world's first IoT Application Store and Device Management platform.

The Conduit features GNSS and two accessory card slots that enable users to plug in MultiConnect® mCard™ accessory cards supporting their preferred wired or wireless interface to connect a wide range of assets locally to the gateway.

Available options include a LoRaWAN™ mCard capable of supporting thousands of MultiConnect® xDot™ long range RF modules connected to remote sensors or appliances. Both IBM's Node-RED, a graphical, drag-and-drop interface and mLinux™ Open Embedded/Yocto opens the complex world of IoT application development to a wider user group to monitor and control their assets. Quick-to-deploy and easy to customize and manage, the Conduit communications gateway realizes your IoT application.

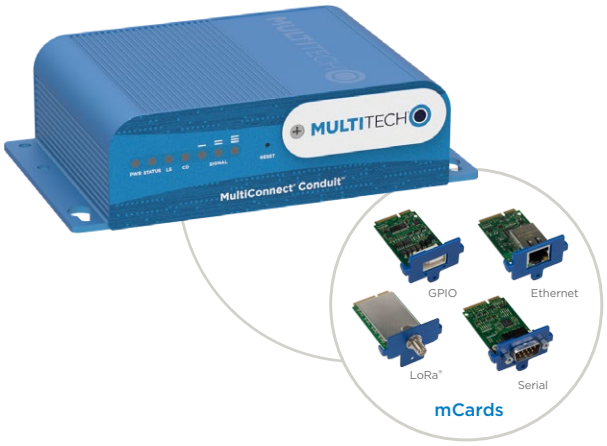
GATEWAY BENEFITS

- Incredible asset management range with LoRa® – up to 10 miles/15 km line of sight, 1-3 miles/ 2 km thru buildings*
- GNSS module for LoRaWAN packet time-stamping
- Backhaul options include 4G-LTE Cat 1 cellular or Ethernet for cost effective global deployment
- Quick-to-deploy, manage and scale differentiated services using the DeviceHQ IoT Application Store

* Represents ideal network configuration and equipment set up. Results vary depending on payload amount, transmission frequency, spreading factor used, as well as terrain, RF interference and obstruction type (e.g., metal, cement, etc.)

LORA FEATURES

- Certified for Japanese AS923 MHz ISM band
- Listen Before Talk for advanced collision prevention
- 1 PPS interface to facilitate LoRa packet time-stamping
- ISM band scanning for optimum LoRa performance



3 Steps to Deploying your IoT Application

1. Select Wide Area Network — 4G-LTE Cat 1, Ethernet
2. Select Local Connection — Ethernet, Serial, GPIO, LoRaWAN™
3. Select Development Platform — Node-RED, mLinux™

www.multitech.com/conduit

HIGHLIGHTS

Application Development Tailored to You

MultiConnect Conduit provides both the IBM Node-RED graphical, drag-and-drop interface and mLinux development environments, offering IT professionals, integrators and developers alike, programming choice and capability to utilize the distributed intelligence capabilities of 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; providing hundreds of open source packages and extensive language support.

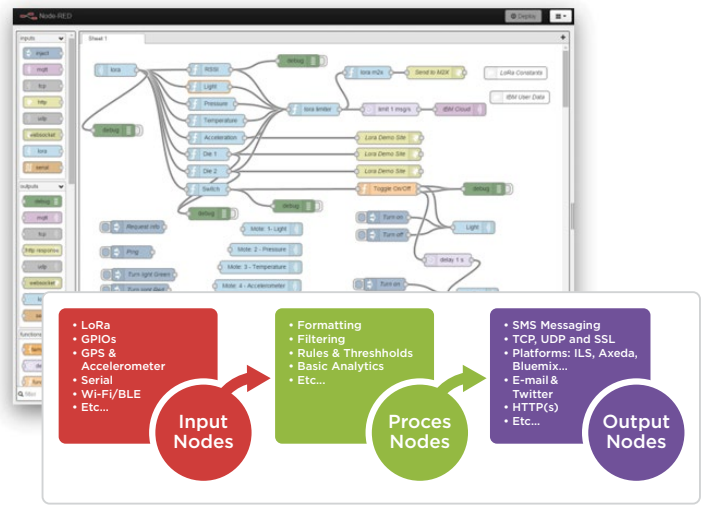
This development path is recommended for those wanting to port existing applications, who have strong language preferences, or who need complete firmware control.

The mLinux Distribution Includes:

- Operating System: Linux 3.12.70 Kernel, Yocto 2.2
- Language Support: Python, C/C++, Node js, JavaScript; Package upgrade support for Java, Ruby, Perl, Mono C#
- Packages: SQLite (Database), Ligttpd (Web Server), BusyBox (Core Utilities)
- Documentation and instructions on how to program mLinux Conduits can be found on our developer site at www.multitech.net

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 M2M 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.

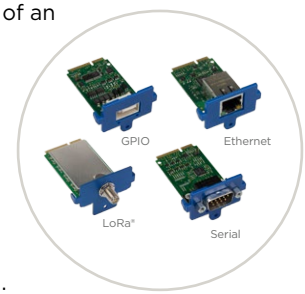
Benefits

- "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

ACCESSORIES

MultiConnect Conduit Accessories – From the Gateway to the Endpoint

MultiConnect Conduit is the center of an integrated IoT platform and comes with the following options:



MultiConnect mCard

MultiConnect mCards provide the flexibility needed to manage diverse infrastructures, supporting a wide range of interfaces and communication protocols including:

- Multi-Function Serial, GPIO, Ethernet
- LoRa LPWAN

MultiConnect xDot – Connecting the "Things"

MultiConnect xDots are inexpensive RF radio modules able to connect low data-rate M2M devices to the internet through the Conduit IoT gateway using the LoRa Alliance LoRaWAN specification, a long-range, Low-Power Wireless Access Network (LPWAN) technology.

xDots bring intelligence, reduced cost and complexity to the very edge of the network by running the Arm® Mbed™ OS on a low power Arm Cortex®-M3 processor. With support for multiple interfaces, just about any "Thing" can now be cost effectively connected to the Conduit and choice of cloud data provider.

SPECIFICATIONS

Model	MTCDT-LDC3	MTCDT-LSB3
Performance (Cellular Optional)	Category 1 LTE 3GPP Release 13 (10 Mbps peak downlink/5 Mbps peak uplink)	
	NTT Docomo	Softbank
	Diversity	
Frequency Bands (MHz)	4G No Fallback / B1 (2100)/B19 (850)/B21 (1500)	4G No Fallback / B1(2100)/B8(900)
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	
Radio Frequency	LoRa – a proprietary Digital Spread Spectrum technique / 8-Channel Gateway / 2 x 8-Channel Optional	
Software	AEP and mLinux Open source embedded Linux distro based on the Yocto Project Tool chain for creating custom images LoRa network server & packet forwarder Ethernet, Wi-Fi or cellular Cellular PPP, DHCP client & server Firewall configuration via iptables MTAC-GPIO, MTAC-MFSER RS-232 or RS-485, MTAC-ETH and MTAC-LORA Full root console access via SSH and serial debug port Out of the box support for C, C++, Python, Node.js, Javascript Package upgrade support for Java, Perl, Ruby, Mono C# 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	AEP Only Seamless integration with DeviceHQ, MultiTech's device management platform Cellular Connection Management Enhanced closed source embedded Linux platform Dynamic DNS Secure firewall with NAT and port forwarding Node-RED integration with Built-in application development for: MTAC-GPIO, MTAC-MFSER and MTAC-LORA, Custom Static Routing Open VPN Graphical web interface for configuration and management Remote Access Configuration backup & restore Easy firmware upgrade through graphical web interface System and network statistics
GNSS/GPS	• 72-channel u-blox M8 engine • GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS • 3 Concurrent GNSS • Standard Precision GNSS	
Antennas	LoRa Omni-directional radiation pattern for 360° / 3 dBi gain / Vertical polarization / Weight: 25.6 grams / 1/8 wavelength dipole configuration / Dimensions: 195 ± 2 x 13mm / Frequency Range: 868-928 MHz / Reverse SMA Male connector Cellular Wideband LTE, 4G, 3G & GSM / 1 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 Magnet mount / Input Voltage: 3.0V±0.3V / Power Consumption: 15mA Typical (+25°C±5°C) 20mA Max (-40°C≈+85°C) / Cable: 1.5DS-QEHV (TA) 5m:Black / Gain: 90°: 3.0dBi MIN 20° -5.0dBi MIN / Polarization: RHCP / Output Connector: SMA-SP-1.5DQEHV / Weight: 25g w/o cable / Frequency Range: 1.575.42±1.023 MHz / Dimensions: 34±0.5mm x 37.4±0.5mm x 12.95±0.5 mm not including black 5m cable	
MTAC LoRa mCard	Listen Before Talk support / SPI interface / LoRaWAN 1.0, 1.0.1 & 1.0.2 support Dimensions – 50.59 mm x 30 mm / 902-928 MHz ISM Band – AS923 MHz compliant	
LoRa Channel Plan Support	Japan 920 – 928 MHz	
LoRaWAN Protocol Support	LoRaWAN 1.0, 1.0.1 and 1.02 supported / LoRaWAN 1.1 Support Q1, 2019	
Storage	Micro SD – 32 GB max size storage	
Input Voltage	Conduit / 9V to 32VDC	
	AC Supply / 01006640L, MJSW0901700N-5448 / Input current: 0.6A Max / Input voltage: 90V - 264V / Input frequency: 47-63Hz	
Connectors		
Ethernet	1 RJ-45 Ethernet 10/100 port	
USB	2 USB Ports: USB Host (Type-A), USB Device (Micro-B)	
Serial	1 Debug Serial: USB Micro-B	
Cellular (Optional)	Female SMA, 2dBi detachable cellular antennas (Qty 2)	
SIM	Standard Mini SIM/USIM (2FF)	
Physical Description		
Dimensions (L x W x H)	6.35" x 4.23" x 1.69" (161.3 mm x 107.4 mm x 42.8 mm)	
Weight	1.01 lbs (16.2 oz) with two accessory cards installed	
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	Japan: TELEC, Radio/Telecom Biz Act, GITEKI	
Radio Compliance	Japan Giteki, Radio/Telecom Biz Act	
Safety	UL 60950-1 2nd Ed., cUL 60950-1 2nd Ed., IEC 60950-1 2nd Ed	
Network Approvals	NTT Docomo, Softbank	
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	

* UL Listed @ 40° C, limited by AC power supply. UL Recognized @ 70° C when used with the fused DC power cable, part number FPC-532-DC.

Installation in outdoor locations or ambient temperature above 40° C or 70° C has not been evaluated by UL. UL Certification does not apply or extend to use in outdoor applications.

Optional power must be UL Listed ITE power supply marked LPS or Class 2 rated 12VDC, 5A. Certification does not apply or extend to voltages outside certified range, and has not been evaluated by UL for operating voltages beyond tested range.

Documentation and instructions on how to program mLinux Conduits can be found on our developer site at www.multitech.net

ORDERING INFORMATION

LTE Models

Model	Description	Region
MTCDT-LDC3-246A-JP	LTE Cat 1 Application Enablement Gateway GNSS w/JP Accessory Kit (NTT Docomo)	Japan
MTCDT-LDC3-246A-923-JP	LTE Cat 1 Application Enablement Gateway GNSS w/JP Accessory Kit & MTAC LoRa mCard (NTT Docomo)	Japan
MTCDT-LSB3-246A-JP	LTE Cat 1 Application Enablement Gateway GNSS w/JP Accessory Kit (Softbank)	Japan
MTCDT-LSB3-246A-923-JP	LTE Cat 1 Application Enablement Gateway GNSS w/JP Accessory Kit & MTAC LoRa mCard (Softbank)	Japan

Non-cellular Models

Model	Description	Region
MTCDT-246A-923-JP	Ethernet Application Enablement Gateway w/MTAC LoRa mCard, GNSS, w/JP Accessory Kit	Japan

RECOMMENDED ACCESSORIES

MultiConnect mCard

Model	Description	Region
MTAC-LORA-H-923-JP	923 MHz LoRa Accessory Card, with Listen Before Talk (Antenna Sold Separately)	Japan
MTAC-GPIO	GPIO Accessory Card, GPIO Cable Sold Separately	Global
MTAC-MFSER-DTE	Multi-Function Serial Accessory Card – DTE Interface	Global
MTAC-MFSER-DCE	Multi-Function Serial Accessory Card – DCE Interface	Global

MultiConnect xDot

Model	Description	Region
MTXDOT-JP1-A00-100	AS923 MHz LoRa Module w/ LBT UFL/TRC (100 Pk)	Japan
MTXDOT-JP1-A00-1	AS923 MHz LoRa Module w/ LBT UFL/TRC (1 Pk)	Japan

MultiConnect mDot

Model	Description	Region
MTDOT-923-JP1-X1P-SMA-1	AS923 MHz XBee LoRa SMA w/Programming Header w/ LBT (1 Pk)	Japan

Developer Kit, Antennas and Accessories

Model	Description	Region
MTMDK-XDOT-JP1-A00	MultiConnect xDot Micro Developer Kit-includes AS923 MHz xDot	Japan
AN868-915A-xHRA	868-915 MHz RP-SMA Antenna, 8" (3.0dBi) (1, 10, & 50 packs)	Global
CARSMA-UFL	Reverse SMA-to-UFL Coax RF Cable, 6"	Global
CA-MTAC-GPIO	GPIO Cable for MTAC-GPIO (2.5 ft)	Global
CA9-9-D	DE9M-DE9F Serial Cable (6 ft)	Global
CA-USB-A-MICRO-B-3	USB Cable Type A to Type B Micro (3ft)	Global

Go to www.multitech.com for detailed product model numbers.
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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

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