MULTITECH®

LoRaWAN™

MultiTech xDot®
Long Range LoRaWAN® Certified Module

MultiTech xDot® is a low-power, LoRaWAN® 1.0.4 Certified module designed to enable long-range, low-bandwidth communication for the Internet of Things (IoT) devices. With its ultra-low power consumption, the xDot is perfect for use in a wide range of IoT applications, including smart cities, agriculture, environmental monitoring, and industrial automation.

Featuring the latest in LoRaWAN technology, the xDot is capable of reaching more than 22 miles/ 35 km line-of-sight, making it ideal for remote and hard-to-reach locations, and provides excellent building penetration. Its low power consumption extends sensor and device battery life up to 10 years, making it the most reliable and cost-effective choice for long-term deployments. The xDot easily integrates into existing systems via serial UART AT Commands or you can build your own custom application using MultiTech ARM® Mbed OS libraries.

Cybersecurity is critical to any IoT systems and MultiTech works continuously to ensure its devices are secure. The xDot safeguards IoT devices against the possibility of cyberattacks by following the AES-128 standard via symmetric cryptography and secret keys.

Both the xDot Essential and Advanced models share identical pins, enabling a straightforward and flexible substitution without the need for costly hardware upgrades or complex software development. The Advanced model provides additional features for more functionality including additional I/O's, 8 Mb flash FOTA memory, trace and UFL antennas, and allows for custom applications.
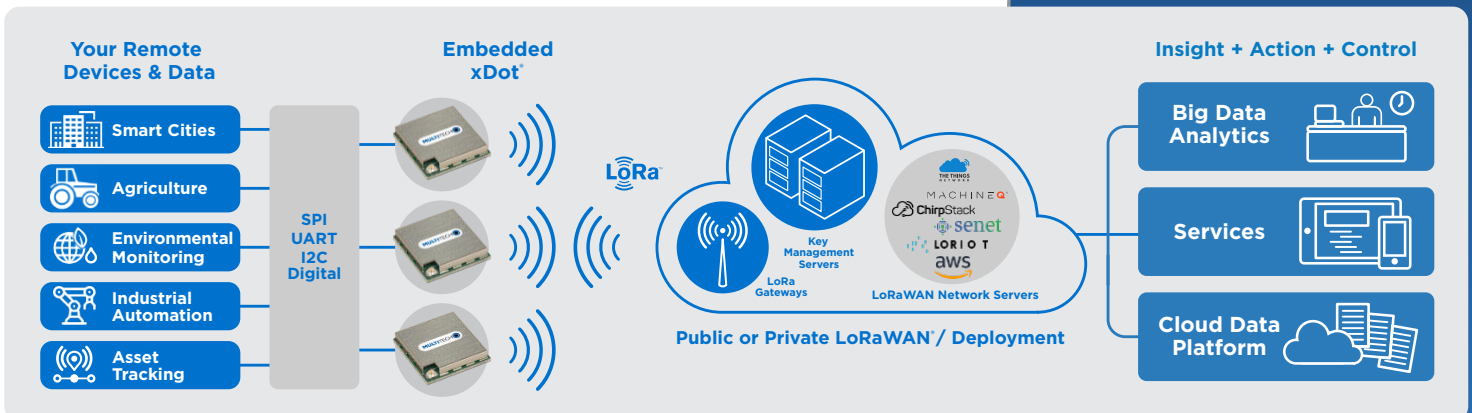
MultiTech's proven reliability, established through rigorous testing and time-to-market, provide a global solution for Enterprises around the world. Whether you're looking to deploy a large-scale IoT network or simply need a reliable way to monitor a few remote devices, the MultiTech xDot is the ideal connected solution optimized for both performance and value.

BENEFITS
- High Reliability and Global Scalability
- Meets AES-128 standard via symmetric cryptography and secret keys
- Ultra-low power consumption with Sleep Current = 1.0uA
- LoRaWAN Certification (US915, AS923, AU915, EU868, IN865, KR920, RU864)

FEATURES
- Ease of integration
- Protected and Isolated LoRaWAN stack resulting in a reliable and certifiable LoRaWAN solution.
- Software updates over UART and over-the-air for the Advanced version
  - LoRaWAN 1.0.4 Certified Product
  - End-to-end AES-128 encryption
  - Over-the-Air Activation (OTAA) or Activation by Personalization (ABP)
- Certified for use in Australia, Canada, Europe, India, Japan, Korea, New Zealand, United Kingdom, Russia, United States
- Check with MultiTech for the latest country-specific support

Your Remote Devices & Data
- Smart Cities
- Agriculture
- Environmental Monitoring
- Industrial Automation
- Asset Tracking

SPI UART I2C Digital

Embedded xDot®

LoRa™

LoRa Gateways

Key Management Servers

THE THINGS NETWORK
MACHINEQ®
ChirpStack
senet
LORIOT
aws

LoRaWAN Network Servers

Public or Private LoRaWAN®/ Deployment

Insight + Action + Control
- Big Data Analytics
- Services
- Cloud Data Platform

multitech.com/xdot

SPECIFICATIONS

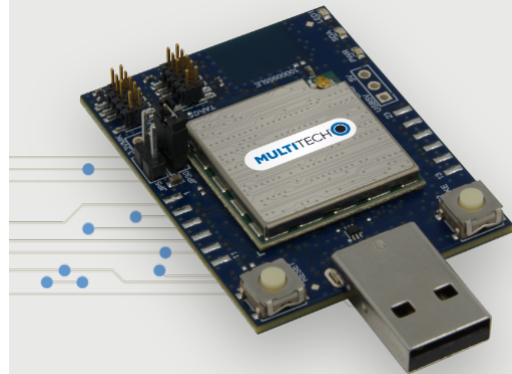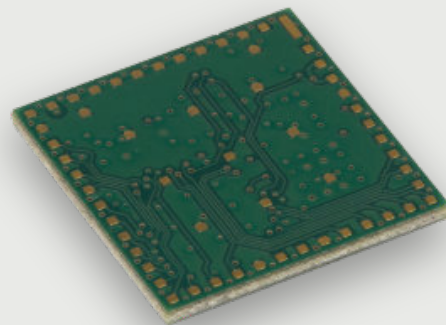| Models	xDot Essential	xDot Advanced
	MTXDOT-NA1-B15 **MTXDOT-WW1-B15**	**MTXDOT-NA1-B10** **MTXDOT-WW1-B10**
Region/Country	-NA1 = Canada, United States -WW = Canada, United States, Asia Pacific, Australia, Europe, India, Japan, Korea, United Kingdom, Russia	
LoRaWAN	LoRaWAN 1.0.4 Activation OTAA/ABP Class A, B, C LoRa Point-to-Point	
LoRa Radio	SX1262 sub-GHz RF Transceiver	
LoRa Radio Frequency Plan	-NA1 = US915 -WW = US915, AS923-1/2/3/4, AU915, EU868, IN865, KR920, RU864	
Channel Configurability	Up to 16-channels (regionally dependent)	
Listen-Before-Talk (LBT) Enabled	Yes	
Host Interface	1x Low Power UART	
Module Package/Physical Dimensions	Surface Mount, 47-pin LGA / 23.6 mm X 23.6 mm x 3.51 (.93″ x .93″ x 0.14″)	
Packaging	Tape and Reel	Tape and Reel
Performance		
Processor	ARM® Cortex-M4	
Clock Speed	100 MHz internal clock speed	
Operating System	ARM Mbed OS	
Application	AT Command	AT Command or Custom using MultiTech Mbed OS Libraries
System Memory	160KB SRAM	
Flash Memory	384 KB	
FOTA Memory	Passthrough Mode Using AT Commands (Requires External Flash)	8 Mb Flash
Bootloader	UART	
Input/Output	UART, Wake, Reset, Status PINs	19 Digital I/O 2 UART, I2C, SPI, Wake, Reset
Security	AES 128 LoRaWAN Compliance Standard	
Power		
Supply Voltage	2.4 to 3.57V	
Maximum Transmitter Power Output (TPO)	21 dBm / Limited by LoRaWAN Regional Specification	
Maximum Receive Sensitivity	-148 dBm	
Deep Sleep Current	Deep Sleep = 1.0 uA	
Maximum Effective Isotropic Radiated Power (EiRP)	36 dBm @ 915 Mhz / 16 dBm @ 868 MHz	
Antenna Options		
Configuration	Trace Antenna	UFL and Trace Antenna
Environmental		
Operating Temperature	-40° C to +85° C (-40° F to +185° F)	
Storage Temperature	-40° C to +85° C (-40° F to +185° F)	
Relative Humidity	20% to 90% RH noncondensing	
Moisture Level	MSL 1	
ESD	ANSI/ESD S20.20-1999	
Certifications		
EMC Compliance	**Australia and New Zealand:** CISPR 22 / **Canada:** ICES-003 / **Europe and United Kingdom**: EN 55022 Class B, EN 55024, CISPR 22:2008 **Japan:** TELEC, Radio/Telecom Biz Act, Giteki / **Korea:** National Radio Research Agency Notice 2018-29 / **United States:** FCC Part 15 Class B	
Radio Compliance	**Australia and New Zealand:** 4268:2012 + a1:2013, MPE Standard 2014 **Europe and United Kingdom:** EN 300 220-1 V4.1:2012, EN 301 489-03 V1.6.1:2013 **Japan:** Radio/Telecom Biz Act, Giteki **Korea:** Ministry of Science and ICT Notice 2018-90 **United States:** FCC 15.247:2015, FCC 15.107:2015, FCC 15.109:2015	
Safety	**Australia and New Zealand:** 62368.1 **Canada:** cUL 60950-1 2nd Edition, cUL 62368-1 2nd Edition **Europe and United Kingdom:** IEC 60950-1 2nd Edition **Japan and Korea:** IEC 62368-1:2014 **United States:** UL 60950-1 2nd Edition, UL62368-1 2nd Edition	
ROHS	**Europe and United Kingdom:** EN IEC 63000:2018	

Hardware Overview & Pin Layout
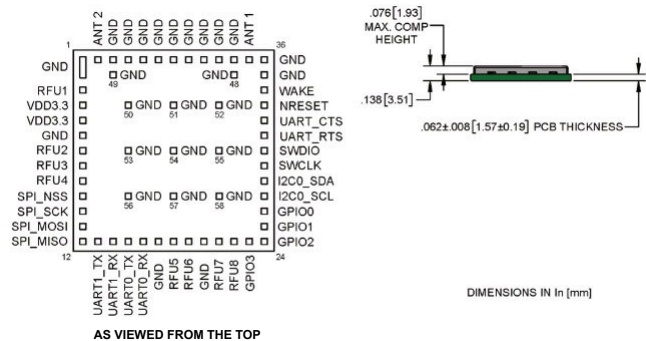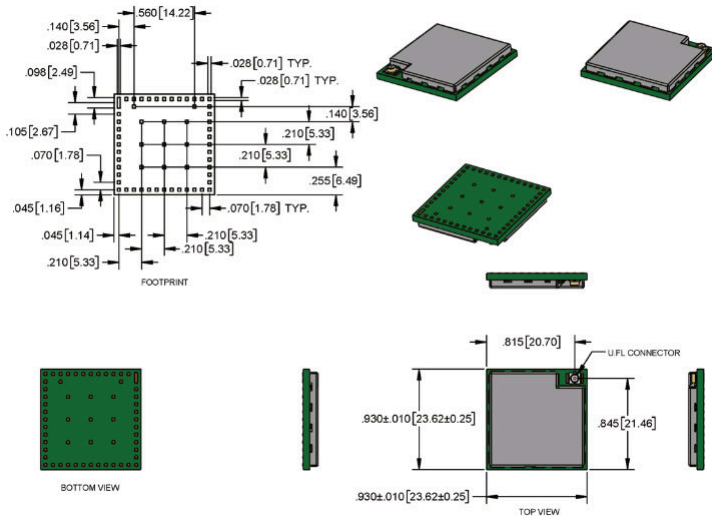
DEVELOPER KIT

The MultiTech xDot (MTMDK-XDOT) Developer Kit is a USB dongle engineered to simplify application development. Its portability facilitates easy laptop integration, enabling developers to effortlessly run AT commands or design custom Mbed-based applications.

This kit includes a development board with an xDot, an integrated LoRa antenna and Quick Start Guide.

HIGHLIGHTS

Applications
- Smart cities
- Smart meters
- Supply chain and logistics
- Building automation
- Agricultural sensors
- Retail store sensors
- Asset tracking
- Street lights
- Parking sensors
- Environmental sensors
- Healthcare
- Safety and security sensors
- Remote control applications

Operating Modes
- Developer friendly Arm Mbed libraries provides customization capabilityfor specific applications
- Comprehensive AT command instruction set

xDot LGA
Family Footprint

EDGE INTELLIGENCE

The MultiTech xDot® is Arm® Mbed™ compatible meaning applications can be written and compiled quickly online using developer friendly libraries, downloaded and hosted within the xDot. Decision making and control is distributed to the edge, enabling data to be more actionable without the heavy lift required to optimize RF performance, implement complex IoT middleware and security protocols needed to deploy a low touch install. In addition, xDots come from the factory with AT command firmware preloaded. This means you can use the xDot as an AT command driven LoRa modem. No custom software development for the xDot is needed when operating in this mode.

ORDERING INFORMATION

MultiTech xDot® Essential Models

Model	Description	Region
MTXDOT-NA1-B15-TR-250	xDot Essential with Trace Antenna and Tape and Reel Packaging. (250 quantity)	US/Canada
MTXDOT-WW1-B15-TR-250	xDot Essential with Trace Antenna and Tape and Reel Packaging. (250 quantity)	Global

MultiTech xDot® Advanced Models

Model	Description	Region
MTXDOT-NA1-B10-TR-250	xDot Advanced with UFL and Trace Antenna and Tape and Reel Packaging. (250 quantity)	US/Canada
MTXDOT-WW1-B10-TR-250	xDot Advanced with UFL and Trace Antenna and Tape and Reel Packaging. (250 quantity)	Global

MultiTech xDot® Essential Developer Kits

Model	Description	Region
MTMDK-XDOT-NA1-B14	xDot Essential Developer Kit (3 Pk) (US915)	US/Canada
MTMDK-XDOT-WW1-B14	xDot Essential Developer Kit (3 Pk) (US915, AS923-1/2/3/4, AU915, EU868, IN865, KR920, RU864)	Global

MultiTech xDot® Advanced Developer Kits

Model	Description	Region
MTMDK-XDOT-NA1-B10	xDot Advanced Developer Kit (3 Pk) (US915)	US/Canada
MTMDK-XDOT-WW1-B10	xDot Advanced Developer Kit (3 Pk) (US915, AS923-1/2/3/4, AU915, EU868, IN865, KR920, RU864)	Global

MultiTech xDot® Accessories

Model	Description	Region
AN868-915A-1HRA	868-915 MHz RP-SMA Antenna, 8″ (3.0dBi)	Global
CARSMA-UFL	Reverse SMA-to-UFL Coax RF Cable, 6″	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.

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

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