



## SMARTMESH® IA-510

# LM2650

Industrial

**PRODUCT DESCRIPTION** > Optimized for small networks, the SmartMesh® IA-510 LM2650 network manager integrates Dust Networks' robust Intelligent Networking Platform and industry-leading low-power radio technology to provide a self-forming, self-healing SmartMesh IA-510 network with unmatched network reliability, ultra low-power consumption, and ease of use. The LM2650 supports up to 32 SmartMesh IA-510 motes (DN2510 or M2510), creating a self-configuring, reliable wireless mesh network.

The LM2650's Intelligent Networking Platform uses sophisticated network management algorithms to enable the deployment of low-power wireless sensor networks that deliver proven performance in the face of harsh RF and environmental conditions, offering years of uninterrupted operation.

The LM2650 embedded network manager is highly flexible and can operate on battery, solar power, or line power. Additionally, the manager offers a comprehensive set of serial APIs to deliver a rich and flexible development environment. The APIs also provide full visibility and control over network configuration, security administration, network status, and performance statistics.

**ABOUT SMARTMESH IA-510** > Dust Networks' SmartMesh® IA-510 is an industry-leading wireless networking solution designed for critical monitoring and control applications. SmartMesh IA-510 serves a wide range of applications from renewable energy generation, such as solar monitoring, to factory machine health monitoring and data center energy management. The SmartMesh IA-510 system delivers dynamic network optimization and intelligent routing to achieve unsurpassed levels of wireless network scalability, system-wide reliability and low latency, coupled with industrial-class security. Additionally, ultra low-power operation permits even greater deployment flexibility for wire-free applications.

### KEY FEATURES

#### ULTRA LOW-POWER OPERATION

- ▣ Low power manager enables battery or solar powered operation

#### INTELLIGENT NETWORKING PLATFORM

- ▣ Dynamic network optimization maintains network health and enables greater than 99.99% network reliability even in the most challenging environments
- ▣ Intelligent routing lowers latency, reduces network power consumption, and eliminates in-network packet collisions
- ▣ Performance profiles enable users to configure network operation based on power, latency, and throughput

#### FAST AND LOW RISK INTEGRATION

- ▣ Comprehensive set of APIs delivers a rich and flexible development environment
- ▣ Fully integrated RF capabilities—simply add an antenna

#### ROBUST SECURITY MANAGEMENT

- ▣ Industry-proven security meets standards for critical infrastructure
- ▣ 128-bit AES encryption ensures secure data transmission
- ▣ Access control lists ensure that only authorized devices can join a network
- ▣ Dynamic encryption key distribution eliminates manual intervention

## NORMAL OPERATING CONDITIONS

PARAMETER	MIN	TYP	MAX	UNITS	COMMENTS
Operational supply voltage range	3.0	3.3	3.6	V	
Operating temperature range	-40		85	°C	
Operating relative humidity	10		95	%RH	Non-condensing

## DETAILED RADIO SPECIFICATIONS

PARAMETER	MIN	TYP	MAX	UNITS	COMMENTS
Operating frequency	2.4000		2.4835	GHz	
Number of channels		15			
Channel separation		5		MHz	
Occupied channel bandwidth		2.7		MHz	At -20 dBc
Modulation					IEEE 802.15.4 direct sequence spread spectrum (DSSS)
Raw data rate		250		kbps	
Receiver sensitivity		-90		dBm	At 1% PER, $V_{DD} = 3\text{ V}$ , $25^\circ\text{ C}$
Output power, EIRP PA enabled PA disabled		10 0		dBm dBm	$25^\circ\text{ C}$ , assumes +2 dBi antenna
Range* PA enabled: Indoor Outdoor PA disabled: Indoor Outdoor		100 300 25 200		m m m m	

\* Actual performance varies depending on the specific installation environment.

## DATA PORTS

PORT	SPECIFICATIONS
Serial 1	115 kbps, 8-bits, no parity, 1 stop bit, LVTTTL voltage levels, TX, RX, RTS, CTS, GND
Serial 2	115 kbps, 8-bits, no parity, 1 stop bit, LVTTTL voltage levels, TX, RX, GND

## COMPREHENSIVE API

- Provides full control of mesh network, for network configuration, security administration, network status and performance statistics
- Serial-API—packet-based interface ideal for resource-constrained systems
- Embedded command line interface for debugging and field troubleshooting

## INNOVATIVE RADIO TECHNOLOGY

- IEEE 802.15.4-compliant radio
- Integrated access point seamlessly bridges wireless network to wireline infrastructure
- Network-wide sub-millisecond time synchronization
- Direct Sequence Spread Spectrum (DSSS)
- Time-synchronized channel hopping operation

## GLOBAL MARKET SOLUTION

- IEEE 802.15.4-certified radio operates on 2.4 GHz global license-free band providing customers with a single product for world-wide use
- Modular 2.4GHz band RF certifications for FCC, IC and CE dramatically reduce cost and complexity of wireless device certification

## FULL DEVELOPMENT SUPPORT

- Development Kit:
  - Rich library of app notes
  - Reference designs
  - Sample code
  - Software debug utilities
- OEM support for RF functional test commands

