



# SMARTMESH® IA-510

# PM2511

WirelessHART®

**PRODUCT DESCRIPTION** > The WirelessHART® compliant PM2511 embedded network manager combines Dust Networks' robust, Intelligent Networking Platform and industry-leading low power radio technology in an easy-to-integrate embedded subsystem. A central part of the SmartMesh® IA-510 system, the PM2511 provides industrial automation vendors with a complete embedded wireless sensor networking solution for WirelessHART applications that assures multi-vendor interoperability and offers forward compatibility.

The PM2511 is tailored for use in line powered WirelessHART gateways and controllers, and enables the development of wireless sensor networks that deliver proven performance and scalability. Sophisticated network management algorithms deliver dynamic network optimization and intelligent routing to achieve carrier class reliability, lower latency, and deterministic power management. Additionally, the embedded network manager offers a comprehensive API to deliver rich and flexible functionality without complex coding. This API also provides full visibility and control over network configuration, security administration, network status and performance statistics.

The network-ready embedded manager enables industrial automation vendors to integrate advanced wireless sensor networking intelligence into monitoring and control solutions with low risk and rapid time-to-market.

**ABOUT SMARTMESH IA-510** > Dust Networks' SmartMesh® IA-510 is the first WirelessHART-compatible system in the SmartMesh IA-500™ family of products. The SmartMesh IA-510 system offers industrial automation vendors an industry-leading standards-based system that delivers flexible, secure solutions. The SmartMesh IA-510 system's Intelligent Networking Platform delivers dynamic network optimization and intelligent routing to achieve the carrier class data reliability, lower latency and deterministic power management required for the industrial automation market. The SmartMesh IA-510 system consists of the PM2511 embedded network manager and two mote form factors: the DN2510 Mote-on-Chip™ and the M2510 RF-certified mote module. SmartMesh IA-510 systems are easy for industrial automation vendors to integrate and simple for end users to deploy.

## KEY FEATURES

### WIRELESSHART COMPLIANCE

- ☒ Interoperable with WirelessHART field devices

### INTELLIGENT NETWORK MANAGEMENT

- ☒ Dynamic network optimization—maintains network health and provides deterministic power management
- ☒ Intelligent routing—lowers latency, reduces network power consumption and eliminates in-network collisions
- ☒ Enables >99.99% network reliability even in the most challenging industrial environments

### BANDWIDTH FLEXIBILITY

- ☒ Variable bandwidth—assign different levels of bandwidth to satisfy unique throughput and latency requirements
- ☒ Flexibly addresses the range of latency and throughput needs of industrial automation applications, such as request/response, fast file transfer, and alerting

### FAST AND LOW RISK INTEGRATION

- ☒ Comprehensive APIs deliver rich and flexible functionality without complex coding
- ☒ Fully integrated and certified RF capabilities—simply add an antenna

### GLOBAL MARKET SOLUTION

- ☒ IEEE 802.15.4-certified radio operates on 2.4 GHz global license-free band
- ☒ Configurable radio output—meets RF emission limits for different regions with a single product
- ☒ Modular RF certifications for FCC, IC, and CE

## NORMAL OPERATING CONDITIONS

PARAMETER	MIN	TYP	MAX	UNITS	COMMENTS
Operational supply voltage range	4.0	5.0	5.5	V	
Operating temperature range	-40		85	°C	
Operating relative humidity	10		90	%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, 25° C
Output power, EIRP					25° C, +2 dBi antenna
PA enabled		10		dBm	
PA disabled		0		dBm	
Range*					
PA enabled:					
Indoor		100		m	
Outdoor		300		m	
PA disabled:					
Indoor		25		m	
Outdoor		200		m	

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

## DATA PORTS

PORT	SPECIFICATIONS
Ethernet	IEEE 802.3 standard 10/100Base-T MAC/PHY
Serial	115kbps, 8bits, no parity, 1 stop bit, LVTTTL voltage levels, TX, RX, RTS, CTS, GND

### INNOVATIVE RADIO TECHNOLOGY

- IEEE 802.15.4-compliant radio
- 80% less receiver current than comparable radios on the market
- Direct Sequence Spread Spectrum (DSSS), frequency-hopping operation for interference rejection

### ROBUST SECURITY

- AES 128-bit encryption
- Dynamically updated multi-level encryption key scheme
- Access control lists enable users to administer network permissions

### COMPREHENSIVE API

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

### FULL DEVELOPMENT SUPPORT SUITE

- Development Kit available—rich library of app notes, reference designs, sample code, software debug utilities
- OEM support—SW version management, RF functional test commands

