

## STARMAX 2100 SERIES

### 802.16-2004 WiMAX SUBSCRIBER STATION

EION Wireless' 2100 Series Subscriber Stations (SS) are fully compliant with the 802.16-2004 standards. They are matched to the frequencies and WiMAX enhanced features supported by the StarMAX Base Station (BS) system. When deployed in networks based on the StarMAX BS, they provide optimal performance in line-of-sight (LOS), near-line-of-sight (NrLOS) and non-line-of-sight (NLOS) applications.



Use of intelligent antenna systems and advanced WiMAX features is what allows the StarMAX SS to offer market-leading performance. The variants available, the StarMAX 2120, 2160 cover indoor, and outdoor deployments respectively.

#### STANDARDS COMPLIANT FOR INVESTMENT PROTECTION

All StarMAX SS are fully compliant with IEEE 802.16-2004 specifications. This assures network operators of compatibility with any WiMAX certified BS, protecting their infrastructure investments.

#### ENHANCED FEATURES FOR SUPERIOR COVERAGE AND THROUGHPUT

The StarMAX SS implement several enhanced modes of WiMAX for performance differentiation. These include:

- Uplink Subchannelization for link budget gains of up to 12 dB
- Space Time Coding (STC) receive diversity gains—combined with Maximum Ratio Combining (MRC) receive diversity on Base Station—for typically 3 to 8 dB of added gain in uplink and downlink.
- Payload Header Suppression (PHS) for increasing IP payload throughput
- Subscriber Stations performing over 20 Mbit/s IP data throughput (accumulated UL+DL)
- RF and data parameters logging for statistics
- Alignment tool consisting of Best Location Finder and Best Direction Finder
- Several modes of IP address assignment to the SS and CPE

#### KEY FEATURES

- Nomadic mobility and handover
- Subchannelization
- STC antenna diversity
- Triple Play QoS
- 20+ Mbit/s data throughput
- Provisioning via OSS
- Remote software upgrade
- 2.5 / 3.3 / 3.5 GHz, TDD, H-FDD
- Alignment tool "TSAT" with acoustic indicator
- Different modes of IP address assignment

#### TARGET APPLICATIONS

- Wireless Broadband Internet Access
- VoIP
- VLAN service

#### TARGET MARKETS

- Enterprise/Small Office
- Retail/Residential DSL Alternative
- Urban, Suburban and Rural

#### DEPLOYMENT MODES

- Fixed/Portable
- Non Line of Sight (NLOS)
- Near Line of Sight (NrLOS)
- Line of Sight (LOS)

## SUBSCRIBER STATION FEATURES

The EION Wireless StarMAX 2100 series has a host of features that helps it address different market segments.

### SELF INSTALLATION CAPABILITY – ‘NO TRUCK ROLL’

The subscriber station is self-activated by a process that consists of automatic scanning and selection of frequency, WiMAX initial ranging and WiMAX certificate X.509-based authentication.

### BEST LOCATION/DIRECTION FINDER – SIMPLE, RELIABLE INSTALLATIONS

The StarMAX 2100 series contains a comprehensive suite of tools optimizing the subscriber station physical positioning process for best data performance as well as best bandwidth resource usage.

### ANTENNA DIVERSITY – BETTER NLOS COVERAGE

STC/MRC antenna diversity at the base station improves the uplink and downlink link budget with about 2 to 8 dB. valuable in enhancing the link budget in NLOS conditions.

### SUBCHANNELIZATION – BETTER UPLINK PERFORMANCE

Uplink Subchannelization for link budget gains of up to 12 dB are applied to enable better coverage and higher spectral efficiency in the operator’s network.

### NAT – INTEGRATING APPLICATION FLEXIBILITY

Eliminates the need for external equipment and makes the StarMAX 2100 series more valuable to your customers. 1:N operation and N:N static operations are supported and every subscriber station can be placed in one of these modes.

### CENTRAL PROVISIONING – BETTER CUSTOMER MANAGEMENT

ProVision controls user authorization, IP network access, service grants and enables/restricts basic mobility according to SLAs.

### MANAGEABILITY FROM CENTRAL MANAGEMENT SYSTEM – BETTER SERVICE MANAGEMENT

Numerous service agents running on StarMAX subscriber stations enable total control of the units from the NMS/PS.

### PERFORMANCE MONITORING – EASIER CUSTOMER AND NETWORK TROUBLESHOOTING

On StarMAX subscriber stations Radio and Traffic measurements are collected and buffered in its local memory. Statistical data is periodically pooled by the central management system, stored in a relational database and prepared for online analysis and reporting.

### ROAMING MANAGEMENT – ENSURING SLAS IN NOMADIC & MOBILE NETWORKS

EION Wireless’ roaming management addresses the need to ensure SLAs to enterprise customers while offering nomadic and mobility services to residential customers—without roaming users to impact the SLAs of enterprise customers.

### ENHANCED SECURITY - SUBSCRIBER STATION PROTECTION AND SECURITY

All subscriber stations support WiMAX certificate-based authorization – X.509 certificates, DES and ADS data encryption.

### USER INTERFACE – SIMPLIFIED SUPPORT

Each StarMAX 2100 drives a browser-based user interface to access parameters and tools to verify installation, connectivity and operating features. It allows for remote support and eases on-site support.

### REMOTE SOFTWARE UPGRADEABILITY – EASY NETWORK OPERATION AND MAINTENANCE

The subscriber stations can be upgraded for new features and configuration profiles remotely. Software corruption or failures are automatically reverted and/or can be remotely handled.



## WIMAX INDOOR SUBSCRIBER STATION WITH INTEGRATED HIGH-GAIN ANTENNA

### STARMAX 2120

- Compact design with integrated high gain directional antenna
- Quick and easy installation
- Non line of Sight (NLOS), indoor coverage

The EION Wireless StarMAX 2120 SS is intended for indoor deployment. It consists of a slim indoor unit with an integrated directional antenna that delivers 15 dBi of gain. It comes with a plastic stand that has an adjustable tilting mechanism. The unit has LED indicators to show the effective signal strength.

Typical users of StarMAX 2120 are residential customers and small offices. It is deployed easily without any mechanical tools. The modem is optimized for best cost–performance ratio with a small form factor.

- Better penetration even with indoor SS: High antenna gain; High transmit power
- Anywhere placement of indoor SS: Built-in intelligent antenna; 4-sector switched adaptive antenna system
- Better link performance: STC/MRC Diversity counters fading and gives additional gain of 2-8 dB in uplink
- Better coverage: UL subchannelization adds up to 12 dBm to uplink link budget and is significant to ensure modem network entry under difficult RF conditions.
- Ease of SS installation: Automatically scans frequency spectrum and connects to the WiMAX network; retains previous settings for time optimized scan.
- Ease of provisioning: Service profile for each subscriber station is configured remotely upon establishing network connection
- In-built basic mobility – enabling subscriber stations to operate at multiple locations or on the move by keeping IP sessions up during intentional or unintentional hand-over between base stations
- Data performance optimized and multi path agnostic system by means of enhanced PHY features

## WIMAX OUTDOOR SUBSCRIBER STATION WITH INTEGRATED HIGH-GAIN ANTENNA

### STARMAX 2160

- 16 dBi outdoor antenna
- Hardened, weather-proof construction
- Roof-top mounting
- Ideal for:

Enterprise / SOHO Customers

Residential / Retail Customers

Urban, Suburban and Rural Applications

The StarMAX 2160 is an outdoor SS in a weatherproof enclosure consisting of the modem and a 16dBi antenna in one unit. It is typically used in fringe and suburban/rural locations where LOS operation is required or in NrLOS/NLOS cases where its outdoor antenna is capable of enabling service in difficult access locations.

The customer equipment connects directly via an Ethernet cable to the StarMAX 2160. Power is supplied to the SS via the same Ethernet cable using power-over-Ethernet.

- NMS management to monitor customer usage statistics and various RF parameters
- Advanced security features include X.509-base authentication, traffic encryption
- Antenna alignment software for easy modem installation for best location and antenna direction
- Enhanced security with Implementation of X.509, Provider locking, traffic encryption,
- Service availability:
  - Group VLAN and multiple VLAN, support for flexible services deployment
  - Sector locking to ensure uninterrupted consistence performance
  - Availability of multiple classifiers or traffic classification
  - Support for NAT in 1: N and N: N modes

DATASHEET

STARMAX 2100 16D SERIES

GENERAL	STARMAX 2120	STARMAX 2160
RF PHY	OFDM	
Frequency Bands	2.50-2.69 GHz, 3.30-3.40 GHz, 3.41-3.60GHz	
Channel Size	3 / 3.5 / 6 / 7 MHz - S/W configurable; Bandwidth configurable in 250kHz steps; (from 1.5 to 14 MHz on request)	
Duplex Method	TDD	
<b>WIMAX</b>		
WiMAX Specification	IEEE 802.16-2004	
Adaptive Modulations Supported	64QAM 3/4, 64QAM 2/3, 16QAM 3/4, 16QAM 1/2, QPSK 3/4, QPSK 1/2, BPSK 1/2	
Tx Power Maximum (typical)	+20 dBm / +24 dBm	
Rx Sensitivity (typical)	-99 dBm @ (BPSK, 3MHz)	
Uplink Subchannelization Support	Yes	
Enhanced WiMAX Features	Best Scanner Channel algorithm, enhanced adaptive modulation algorithm	
STC Support	Yes	
Gain with BS Antenna Diversity (typical)	Between 3 dB and 8 dB	
<b>ANTENNA</b>		
Antenna (3.3 & 3.5 GHz / 2.5 GHz) (typical)	15 dBi / 12 dBi gain Integrated directional antenna	16 dBi / 14 dBi
<b>SERVICES AND PROVISIONING</b>		
Service Flows	Up to 8 service flows per Subscriber Station for data, voice and video	
QoS Priorities	Up to 16 classifiers per Subscriber Station	
QoS Types, Classes of Service	BE, nrt-PS, rt-PS, UGS	
Access Control Lists	Yes (enabled by Provisioning)	
Data Rate Control	Minimum data rate, Data Rate Limiting (enabled by Provisioning)	
Portability and Mobility	Yes, (enabled by Provisioning)	
Security	Data: DES, AES, 3DES; Authentication: X.509 certificate	
<b>NETWORKING</b>		
IP Protocols	IPv4, (Different modes of IP address assignment)	
Bridging/Routing (Subscriber Station)	VLAN aware Bridging, Separate NAT to 1:N and N:N	
Packet handling	802.1Q VLAN	
<b>MANAGEMENT</b>		
Management Protocol	SNMP, Telnet CLI	
Software Upgrade	Yes, "over the air", "fail-safe" software upgradeable	
NMS Remote Management and Provisioning	Yes	
<b>CONFIGURATION MANAGEMENT</b>		
Graphical User Interface	HTML	
<b>MECHANICAL/ELECTRICAL</b>		
User Interface	10/100 Base-T on RJ-45,	10/100 Base-T on RJ-45
Power Consumption (typical/maximum)	7W / 11.5W	
Dimensions (height-width-depth)	30mm x 190mm x 200mm	
	1.2 in x 7.5 in x 7.9 in	
Weight (typical)	0.70 kg (1.5 lb)	2.4 kg (5.3 lb)
Temperature	0°C to +55°C (32°F to 131°F)	
Humidity	10% - 90% (non condensing)	
Regulatory Compliances	CE, RoHS/WEEE	



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