Cisco FM3500 Endo

Ultra-Reliable Wireless Backhaul
for moving vehicles
(formerly Fluidmesh)

Contents

The Cisco FM3500 Endo is part of the Cisco Ultra-Reliable Wireless Backhaul portfolio. It is a high-performance radio transceiver, designed for fast, reliable backhaul of mission-critical video, voice and data.

The Cisco FM3500 Endo is used to create point-to-point, point-to-multipoint, mesh and mobility networks with a throughput of up to 500 Mbps. It is specially suitable for wayside-to-vehicle communication in industries where reliable, stable, low-latency communications are essential for safe operations and optimal productivity.

The FM3500 Endo can be exploited as a wayside radio in any vertical market that features or depends on mobility applications.

Reduce the cost of network ownership by selecting the amount of throughput you need

Limit the cost of network ownership with FluidThrottle by selecting only the amount of throughput required. More throughput can be easily achieved by upgrading the system with software plug-ins when the traffic requirements increase. FluidThrottle makes Cisco FM cost-effective and future-ready.

Prodigy 2.0 for reliable mission-critical applications

Our Multiprotocol Label Switching (MPLS)-based transmission protocol is built to overcome the limits of standard wireless protocols and to deliver an infrastructure with a higher level of reliability. At the base of our innovative transmission protocol is a traffic optimization algorithm that allows every Cisco FM radio to assign a specific level of priority and reliability to every packet transmitted. The result is a better, more reliable, multiservice wireless infrastructure.

Web interface configures, monitors, and troubleshoots the wireless network

The Cisco FM3500 Endo includes the FMQuadro web interface, which allows you to configure, monitor, and troubleshoot the wireless network in real time, without any additional software.

Your investment is protected

Your investment is safe when business needs change. With FluidMAX, you don't have to replace your radios when you change the network's architecture from point-to-point to point-to-multipoint or mesh. The Cisco FM3500 Endo can operate in CSMA.

Works with FLUIDITY, our unique mobility solution

The Cisco FM3500 Endo supports FLUIDITY, the ultimate broadband connectivity solution for high-speed vehicles. Providing up to 500 Mbps of usable throughput to vehicles traveling up to 225 mph/360 kmh is now a reality.

There is no handoff time with FLUIDITY: thanks to the seamless "make before break" handoff, it maintains persistent network sessions and streams for any type of traffic.

Easy installation

The Cisco FM3500 Endo has a small form factor to minimize the impact of the installation.

To facilitate installation it has an easy NPT-1 thread for conduit. The screws, located at the bottom, are self-retaining. The visible LEDs help you understand the LAN activity and the strength of your signal. The PoE injector enables easy setup.

Quick peek

Rugged die-cast aluminum housing

Specific for harsh environments and long-lasting performances

FluidThrottle

Select only the throughput you need

Prodigy 2.0

MPLS transmission protocol with intelligent QoS

FMQuadro

Web-based interface to easily configure, monitor, and troubleshoot the network

FluidMAX

Change the network's architecture, not the radios

FLUIDITY

Connectivity solution for high-speed vehicles and trains

Multiple frequencies

4.9 GHz and 5.1 to 5.8 GHz

Ethernet port

802.3at PoE Gigabit

Easy installation

NPT-1 threaded cable gland for conduit direct mounting

Table 1.   Product specifications

System		
Chipset	CPU	880 MHz 1004Kc MIPS network processor
	RF	MIMO 2x2
Interface		2x 10/100/1000 Tx-RJ45 1x Reset button for factory default
LEDs		1x Power 1x Ethernet 1 1x Ethernet 2 4x RSSI

Radio	
Communication protocol	Prodigy 2.0
Operating frequencies[*]	5150 to 5350 / 5470 to 5850 MHz 4940 to 4990 MHz Thailand restricted to 5750-5850 MHz only
Data rate	6/9/12/18/24/36/48/54 Mbps 30/60/90/120/180/240/300 Mbps 65/140/195/260/390/520/585/650/780/866.6 Mbps
Modulation	OFDM (BPSK, QPSK,16QAM,64QAM, 256QAM)
Channel width	5/10/20/40/80 MHz
Coaxial connectors	2x Cu-Sn-Zn-plated RP-SMA female compliant with ASTM B117
Output power	Up to 30 dBm[**]

Physical

Weight	25 oz (700 g)
Dimensions (in)	9.1 (H) x 5.2 (W) x 2.18 (d)
Dimensions (mm)	230.5 (H) x 132.4 (W) x 60.5 (D)

Environmental

IP rating	IP 66
Enclosure	Die-cast metal aluminum
Mounting	Pole mounting kit and DIN rail mounting included
Operating temperature	-40° to 75°C -40° to 167°F
Operating humidity	5% to 95% noncondensing

Regulatory compliance

Approvals	FCC Part 15.B, FCC Part 15.C
	FCC Part 15.E, NII/RSS-210 Annex 9, FCC Part 90y, OET 65 MPE/ RSS102, EN893+DFS, EN301189-1 EN5502224
	EN 62311, En 60950, IC RS2010, CE, UL, ROHS

Security

VPN / L2TP	Yes
Full compatibility with AES, 3DES, RSA, HTTPS, SSL	Yes
AES link-level encryption	Yes

Network

Protocols	UTP, TCP, IP, RTP, RTCP, RTSP, HTTP, HTTPS, ICMP, ARP
Web-based interface	Yes
Multicast support	Yes
UPnP support	Yes
SNMP support	Yes

Network	
802.1Q VLAN support	Yes

Electrical	
Power input	48 VDC active 802.3at PoE+ 48 VDC passive PoE output***
Max power consumption	20W

Warranty	
2 years	Limited on parts and labor

* Some frequencies may require minimum order volumes or special licenses.

***PoE injector and PoE converters available upon request.

Plug-Ins and Licenses

FM3500E (Endo)

- Endo radios come pre-configured with PtP or PtMP throughput support up to 15Mbps
- Can be upgraded once purchased between PtP, PtMP, and Fluidity Licensing as detailed below:

		Cisco FM3500 Endo: Plugin and License Summary		
Type of Plugin or License	Part Numbers	Description	Cisco PIDs	
Hardware P/N	FM3500E-HW	Cisco FM3500 Endo, single-radio 2x2 MIMO wireless router operating at 4.9-5.8 GHz. Up to 15 Mbit/s Ethernet Throughput. Two (2) RJ45 Ports. Two (2) RP-SMA antenna ports. Requires external antenna and cables. **Does not include Fluidcare support plan.**	FLMESH-HW-3500-1-1NA	NAM/LAM/Taiwan
			FLMESH-HW-3500-1	Rest of the World

		Cisco FM3500 Endo: Plugin and License Summary	
Type of Plugin or License	**Part Numbers**	**Description**	**Cisco PIDs**
Point-to-Multipoint (PtMP)	FM3500-30	Enable Ethernet throughput up to 30 Mbit/s in FM3500 for fix backhaul.	L–FLMESH-3500-23
	FM3500-60	Enable Ethernet throughput up to 60 Mbit/s in FM3500 for fix backhaul.	L–FLMESH-3500-24
	FM3500-200	Enable Ethernet throughput up to 200 Mbit/s in FM3500 for fix backhaul.	L–FLMESH-3500-22
	FM3500-UN	Enable Ethernet throughput UNLIMITED (up to 500 Mbit/s in FM3500 for fix backhaul.	L–FLMESH-3500-20
Point-to-Point (PtP)	FM3500-PTP-UN	Enable Ethernet throughput UNLIMITED (up to 500 Mbit/s in FM3500 for Point to Point ONLY	L–FLMESH-3500-21
Fluidity Licensing: Mobile	FM3500-FLU-MOB-5	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 5 Mbit/sec in FM3500	L–FLMESH-3500-7
	FM3500-FLU-MOB-10	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 10 Mbit/sec in FM3500	L–FLMESH-3500-1
	FM3500-FLU-MOB-15	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 15 Mbit/sec in FM3500	L–FLMESH-3500-2
	FM3500-FLU-MOB-20	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 20 Mbit/sec in FM3500	L–FLMESH-3500-4
	FM3500-FLU-MOB-30	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 30 Mbit/sec in FM3500	L–FLMESH-3500-6
	FM3500-FLU-MOB-60	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 60 Mbit/sec in FM3500	L–FLMESH-3500-8
	FM3500-FLU-MOB-150	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 150 Mbit/sec in FM3500	L–FLMESH-3500-3
	FM3500-FLU-MOB-250	Enable FLUIDITY Fast-roaming Mobile-Unit Mode up to 250 Mbit/sec in FM3500	L–FLMESH-3500-5
	FM3500-FLU-MOB-UN	Enable FLUIDITY Fast-roaming Mobile-Unit Mode UNLIMITED (up to 500 Mbit/sec) in FM3500	L–FLMESH-3500-9

Cisco FM3500 Endo: Plugin and License Summary			
Type of Plugin or License	**Part Numbers**	**Description**	**Cisco PIDs**
Fluidity Licensing: Trackside	FM3500-FLU-TRK-15	Enable FLUIDITY Fast-roaming Infrastructure Mode up to 15 Mbit/sec in FM3500	L-FLMESH-3500-25
	FM3500-FLU-TRK-20	Enable FLUIDITY Fast-roaming Infrastructure Mode up to 20 Mbit/sec in FM3500	L-FLMESH-3500-11
	FM3500-FLU-TRK-30	Enable FLUIDITY Fast-roaming Infrastructure Mode up to 30 Mbit/sec in FM3500	L-FLMESH-3500-13
	FM3500-FLU-TRK-60	Enable FLUIDITY Fast-roaming Infrastructure Mode up to 60 Mbit/sec in FM3500	L-FLMESH-3500-14
	FM3500-FLU-TRK-150	Enable FLUIDITY Fast-roaming Infrastructure Mode up to 150 Mbit/sec in FM3500	L-FLMESH-3500-10
	FM3500-FLU-TRK-250	Enable FLUIDITY Fast-roaming Infrastructure Mode up to 250 Mbit/sec in FM3500	L-FLMESH-3500-12
	FM3500-FLU-TRK-UN	Enable FLUIDITY Fast-roaming Infrastructure Mode UNLIMITED (up to 500 Mbit/sec) in FM3500	L-FLMESH-3500-15

General Licenses

Cisco FM3500 Endo: Plugin and License Summary			
Type of Plugin or License	**Cisco FM Part Numbers**	**Description**	**Cisco PIDs**
Software Network Plugins	FM-TITAN	TITAN Plug-in. Enables Fast Failover in case of networm, radio or power failure on a single Cisco FM product. All Cisco FM devices in a network mush have a plugin-in to operate.	L-FLMESH-TITAN-1
	FM-AES	AES Plug in. Enables One plug-in is required for each hardware device where encryption is desired. ECN 5D002 (Export Licensed Required to be exported in certain countries; no license required to be sold in North America and in the European Union).	L-FLMESH-TITAN-1
	FM-FIPS140-2	FIPS 140-2 plugin. Enables FIPS 140-2 validated cryplograpic module (NIST certificate #1747) on a Cisco FM product. One plug-in is required for each hardware device where encryption is desired.	L-FLMESH-FIPS140-2

| Type of Plugin or License | Cisco FM Part Numbers | Cisco FM3500 Endo: Plugin and License Summary | |
		Description	Cisco PIDs
	FM-PROFINET	PROFINET Plug-in. Enables support to Layer 2 ethertype 0x8892 on one Cisco FM product. It requires also QoS support and the VLAN plug-in. All Cisco FM hardware devices in a network must have these plug-ins to operate.	L-FLMESH-PROFINET
	FM-VLAN	VLAN Plug-in. Enables port-based and MAC address-based VLANs on a single Cisco FM product. All Cisco FM hardware devices in a network must have a plug-in for VLAN to operate.	L-FLMESH-VLAN-1
	FM-QNET	QNET Plug-in. Enables support to Layer 2 ethertype 0x8204 on one Cisco FM product. All Cisco FM hardware devices in a network must a plug-ins to operate.	L-FLMESH-QNET
	FM-CANBUS	CANBUS Plug-in. Enables CANBUS Support on Cisco FM radios. All Cisco FM devices in a network must have these plugin-ins to operate.	L-FLMESH-CANBUS

Product sustainability

Information about Cisco's Environmental, Social and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability reporting.

Table 2.   Cisco environmental sustainability information

Sustainability Topic			Reference
General	Information on product-material-content laws and regulations		Materials
	Sustainability Inquiries		Contact: csr_inquiries@cisco.com
	Countries and Regions Supported		Table: Regulatory compliance
Power	Power (Including Pluggable)		Table : Electrical
Material	Product packaging weight and materials		Contact: environment@cisco.com
	Weight		Table: Physical
Recycled Content	Pre-consumer	0.51%	Contact: csr_inquiries@cisco.com
	Post-consumer	2.52%	

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

Document history

New or Revised Topic	Described In	Date
Typos and missing captions fixed	[Table 1. Product Specifications](#)	5/17/2022
New supported Region (Taiwan) for -NA PID version	[Table 1](#)	5/17/2022