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EN 50155 Wi-Fi 7 Access Point

Ibex-1520 series

- **Next-Gen Wireless Technology**
  - Dual-band Wi-Fi 7 (802.11be), concurrent 2.4 GHz & 5 GHz operation
  - Multi-Link Operation (MLO) for higher throughput
  - Supports up to 512 clients per radio, 2x2 MU-MIMO, 4096-QAM modulation
  - Bluetooth
- **Designed for Onboard Rail Usage**
  - Certified for onboard rail: EN 50155 (electrical safety), EN 45545-2 (fire protection)
  - Compact metal housing with M12 connectors
  - IP66 protection, -40°C to +70°C operating range
  - Built to withstand vibration, humidity, and electromagnetic interference
- **Advanced Security & Safety Features**
  - Cybersecurity: WPA2/WPA3, 802.1X with RadSec, persistent security logs
  - OpenRoaming certified & Passpoint 2.0 ready
  - High isolation, surge protection, GORE-TEX® membrane for condensation prevention
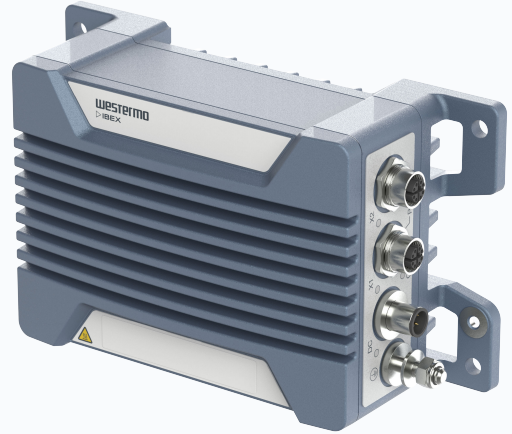
CE   FC Part 15   EN 45545-2 Fire Protection   EN 50155 On Board Rail

Product Overview

The Ibex-1520 is a concurrent dual-band 802.11be Wi-Fi 7 access point for onboard rail and stationary applications. It supports 2x2 MU-MIMO, Multi-Link Operation (MLO) with bandwidth support up to 320 MHz, and features 4K-QAM modulation. The device delivers reliable, efficient, high-speed data transfers, airtime fairness, band steering, client and multi-AP steering. This enables optimized use for passenger hotspot applications, remote maintenance access, data offloading, or integration into a Train Control and Management System (TCMS) network.

Rugged Design for Rail Environments

The Ibex family is engineered to withstand the tough environment onboard trains, including constant vibration, extreme temperatures, humidity, and demanding electromagnetic conditions. A GORE-TEX® membrane prevents internal condensation. High level isolation between all interfaces allows direct connectivity to vehicle auxiliary power and protects against overvoltage and surges. IP66 protection prevents ingress of water and dust, even at the quick connect QMA connectors. The compact form factor and very high MTBF enable easy integration in space-restricted installations and contribute to a low lifecycle cost.

Compliance and Security

The Ibex-1520 undergoes rigorous type testing at independent laboratories to ensure compliance with a broad range of standards, including EN 50155. Powered by IbexOS, it incorporates advanced cybersecurity features and receives regular cybersecurity updates.

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Specifications - Ibex-1520 series

Dimensional drawing
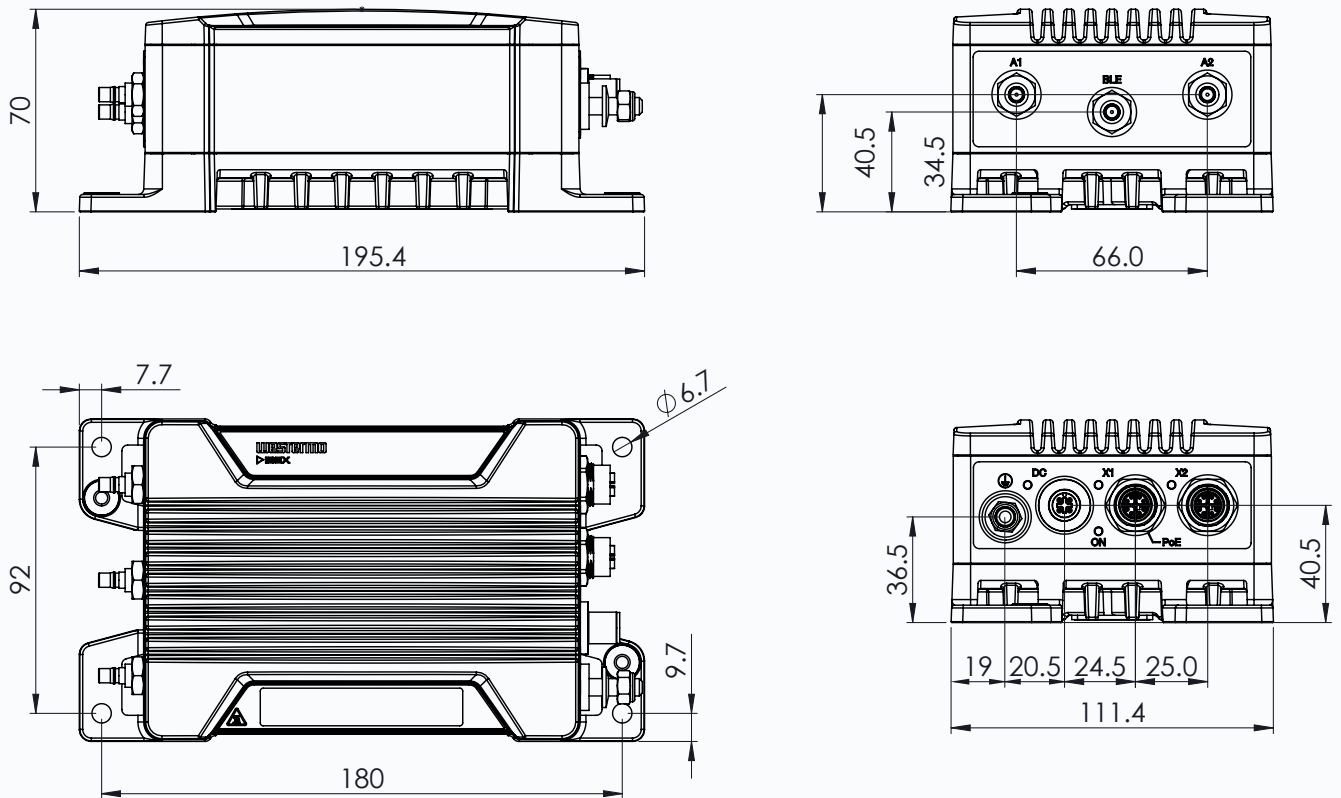
Technical data

Dimensions (W x H x D)	195 x 70 x 111 mm (7.68 x 2.76 x 4.37 inches)
Housing	Full metal
Weight	1.45 kg without antennas
Operating temperature	-40 to +70°C (-40 to +158°F)
Ingress protection	IP66
MTBF	400,000 hours
	500,000 hours (PoE only)
Rated voltage[a.]	24 to 110 VDC or PoE IEEE 802.3 Class 4
Rated power	14 W
Average Power	7 W (idle), 12 W (load)
PoE	PoE Class 4 (IEEE 802.3at type 1 and 2 PD)

[a.]DC power supply not included in "PoE only" product variants

Interface

RF antenna	2 x QMA compatible antenna connector for Wi-Fi 7 2.4 GHz and 5 GHz (combiner)
Bluetooth	1 x QMA compatible antenna connector
Ethernet	2 x 10/100/1000/2.5G Base-T with M12 X-coded connectors

Wireless	
Operating modes	Access Point, Client, Bridge
Interfaces	Dual-Band Concurrent 2x2 MU-MIMO (total 4 Spatial Streams)
Standards supported	IEEE 802.11g, 802.11a, 802.11n, 802.11ac, 802.11ax, 802.11be
Modulation	Up to 4096-QAM
Frequency range	2.400 to 2.4835 GHz (2x2 MU-MIMO) 5.150 to 5.350 GHz, 5.470 to 5.725 GHz, 5.725 to 5.875 GHz (2x2 MU-MIMO)
Data rates supported	2.4 GHz: Up to 802.11be 40 MHz 2SS BW EHT13: 688 MBit/s 5 GHz: Up to 802.11be 80 MHz 2SS BW EHT13: 1441 MBit/s
RF transmit power 2.4 GHz[a]	Max. conducted transmit power: 25 dBm, per port: 22 dBm
RF transmit power 5 GHz[a]	Max. conducted transmit power: 25 dBm, per port: 22 dBm
Receiver sensitivity per radio[b]	20 MHz: -94 dBm (EHT0), -68 dBm (EHT9), -63 dBm (EHT11), -58 dBm (EHT13) 40 MHz: -91 dBm (EHT0), -65 dBm (EHT9), -61 dBm (EHT11), -56 dBm (EHT13) 80 MHz: -88 dBm (EHT0), -63 dBm (EHT9), -58 dBm (EHT11), -53 dBm (EHT13)

[a] Depending on the regulatory limitations and selected antennas

[b] Typical, all antenna chains connected, temperature 25° C

Bluetooth	
Standard	BLE 5.2, low power
RF transmit power	Max. EIRP 8.3 dBm

Features	
Security	Wi-Fi Security Open, WPA2-Personal (CCMP), WPA2-Enterprise, WPA3-Personal (SAE/OWE), WPA3-Enterprise (Suite-B), WPA2/3-Hybrid-Mode (SAE+PSK), 802.11w, 802.1X, Security Log (persistent)
Networking	Fixed fallback IP, IP Aliases, MAC override, 802.1Q VLAN support, Interface Port Protection, Routing Static/Policy/Multicast, Multi WAN support, CARP, DHCP Server/Client/Relay, DNS Server/Client, NTP Server/Client, RSTP, Firewall Filter/Mangle (L2 stateless/L3 stateful), IP Masquerading (NAT/NAPT), Port Forwarding (DNAT/SNAT), Stateless NAT (1-1 NAT)
Wireless	Up to 8 SSID assignments per radio, up to 512 client connections per radio, SSID Hide, AP Client Isolation, 802.11e (WME/WMM), 802.11r, 4addr, QoS (L2/L3 mapping), Access Control (ACL), Automated Channel Selection (ACS), static/dynamic VLAN per SSID, BSSID override, Multi-link Operation (MLO), Passpoint, OpenRoaming
VPN	SSL Server/Client, IPsec, OpenVPN Client, Wireguard, GRE/GRETAP, VXLAN
Discovery	LLDP, SSDP, mDNS
Client management	ATF (Air Time Fairness), Client Steering and Load Balancing between 2.4 GHz and 5 GHz, Multi-AP Client Steering, 802.11k, 802.11v
Monitoring	Built-in monitoring sensors and diagnostics, SNMP notifications (TRAP/INFO), Syslog, CLI
Management	SNMP v2c/v3 with USM authentication and encryption support, HTTP/HTTPS web interface and WebAPI with user authentication (local or LDAP), CLI (SSH and Telnet), Certificate Management (SCEP), Dual Firmware Primary/Backup
SNMP MIB Support	MIB-2, RFC1213, HOST-RESOURCES, BRIDGE, ETHERLIKE, IF-MIB, LLDP-MIB, UCD-SNMP-MIB, WESTERMO-SW6-MIB, WESTERMO-SW6-BRIDGE-MIB, WESTERMO-SW6-FIREWALL-MIB, WESTERMO-SW6-ICL-MIB, WESTERMO-SW6-NWM-MIB, WESTERMO-SW6-PWN-MIB

Approvals and Standards

Climate	• EN 50155, class OT4 Railway applications - Electronic equipment used on rolling stock
EMC	• EN 50155, Railway applications - Electronic equipment used on rolling stock • EN 50121-3-2, Railway applications – Electromagnetic compatibility, Part 3-2: Rolling stock – Apparatus • ETSI EN 301 489-1, Electromagnetic compatibility (EMC) and Radio spectrum Matters (ERM) for radio equipment and services - Part 1: Common technical requirements • ETSI EN 301 489-17, Electromagnetic compatibility (EMC) and Radio spectrum Matters (ERM) for radio equipment - Part 17: Specific conditions for Broadband Data Transmission Systems
Mechanical (Shock and vibration)	• EN 61373, category 1, class B
Insulation (Coordination and test)	• EN 50155, Railway applications - Electronic equipment used on rolling stock
Radio communication	• ETSI EN 300 328, Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using wide band modulation techniques • ETSI EN 301 893, 5 GHz RLAN • ETSI EN 300 440, 5.8 GHz, Short Range Devices • IEEE802.11, Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications
Safety	• EN/IEC 62368-1, Safety requirements for audio/video, information and communication technology equipment • EN 45545-2, Fire protection on railway vehicles

Ordering information

Art. no.	Model	Description
3628-15201	Ibex-1520-T2G2.5 EU	Dual EN 50155 Wi-Fi 7 Access Point, 24...110 VDC, PoE PD
3628-15202	Ibex-1520-T2G2.5 NA	Dual EN 50155 Wi-Fi 7 Access Point, 24...110 VDC, PoE PD
3628-15211	Ibex-1520-T2G2.5-PoE EU	Dual EN 50155 Wi-Fi 7 Access Point, PoE PD
3628-15212	Ibex-1520-T2G2.5-PoE NA	Dual EN 50155 Wi-Fi 7 Access Point, PoE PD
3623-0799	Factory Reset Plug X-code	Accessory

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