Datasheet

IMPINJ® SPEEDWAY® READER

OVERVIEW, SOFTWARE TOOLS, ACCESSORIES, AND SPECIFICATIONS

Version 2.5

www.impinj.com

TABLE OF CONTENTS

1 Overview 1
1.1 Key Benefits 1
2 Specifications 1
2.1 Operation 1
2.2 UHF RFID Specifications 1
2.3 Software Tools 3
3 Hardware Accessories 4
4 regulatory information 6
5 Maintenance and Support 6
6 Notices 6

1 OVERVIEW

Speedway readers, the #1 selling fixed RAIN RFID readers in the world, speed time to market with superior performance and flexibility supported by the most powerful suite of software and deployment tools; streamlining installation, application development and enterprise adoption.

1.1 Key Benefits

Optimal RAIN RFID Performance

Speedway Readers maintain high read rates regardless of RF noise or interference as the readers leverage built-in automation features to ensure peak performance.

Versitle and Customizable

Speedway readers are supported by a suite of hardware accessories and antennas that deliver deployment flexibility streamlining installation and expansion

Powerful Application Development Tools

Choose from the most powerful comprehensive suite of development libraries and software for purpose built faster application development

Enterprise-Class Reliability

Industry-best enterprise-class reliability for trouble-free operation and long life

2 SPECIFICATIONS

2.1 Operation

Impinj Speedway fixed readers deliver item visibility with the performance, quality, and reliability necessary for robust solutions. Impinj gateways, reader chips, and readers enable bidirectional, wireless communications between applications and everyday items. With numerous form and deployment options, Impinj RAIN RFID connectivity devices offer flexible implementation to meet your unique needs.

2.2 UHF RFID Specifications

PRODUCT DETAILS	SPEEDWAY R420	SPEEDWAY R220	SPEEDWAY R120
Operating Frequencies *Refer to country-specific regulations for channel allocation within the band	FCC: 902-928 MHz EU1: 865-868 MHz EU2: 915-921 MHz GX1: 902-928 MHz GX2: 902-925 MHz GX3: 920-926 MHz JP2: 916-921 MHz	FCC: 902-928 MHz EU1: 865-868 MHz GX1: 902-928 MHz GX2: 902-925 MHz	FCC: 902-928 MHz EU1: 865-868 MHz GX2: 902-925 MHz

Transmit Power (dBm max conducted) *Refer to regulations for country-specific limitations	FCC, GX1, GX2, GX3: 32.5 AC/31.5 PoE EU1: 31.5 AC/30.0 PoE EU2: 33.0 AC/33.0 PoE+ JP2: 30.0 AC/30.0 PoE	FCC, GX1, GX2: 32.5 AC/31.5 PoE EU1: 31.5 AC/30.0 PoE	FCC, GX2 with antenna hub: 32.5 AC/31.5 PoE EU1 with antenna hub: 31.5 AC/30.0 PoE FCC, GX2 without antenna hub: 30.0 AC/30.0 PoE EU1 without antenna hub: 30.0 AC0.0 PoE
Antenna Ports	4	2	1(enabled)
Maximum Read Rate	1100 tags/s	200 tags/s	200 tags/s
Reduced Power Option (FCC region only)	YES	NO	NO
Gen2 Reader Modes	10	5	5
Antenna Hub Support	YES	NO	YES
Read Zones (maximum)	32 (with 4 hubs)	2	8 (with Port Pack)
Regulatory Certifications	www.impinj.com/supported_regions		
Power Sources	AC-DC power supply: all models IEEE 802.3af PoE: all models except EU2 IEEE 802.3at PoE+: EU2 model	AC-DC power supply: all models IEEE 802.3af PoE: all models	AC-DC power supply: all models IEEE 802.3af PoE: all models
Air Interface Protocol	GS1/EPCglobal UHF Gen2 (ISO 18000-6C) or RAIN RFID		
Receive Sensitivity (maximum)	-84 dBm		
Return Loss (minimum)	10dB		
Antenna Impedance	50 ohm		
Network Connectivity	10/100BASE-T Ethernet		
USB Ports	1 device, 1 host		
Management Console Port (RS-232)	RJ-45		
GPIO Serial Port	YES		
Factory Reset Button	YES		
Operating Temperature	-4F to +122F (-20C to 50C)		
Storage Temperature	-4°F to 140°F (-20°C to 60°C)		

Humidity	5% to 95% non-condensing
Environmental Sealing	IEC IP52
Environmental Air Handling Space	NEC section 300-22(a)
Shock and Vibration	MIL-STD-810G
Dimensions (H x W x D)	7.5 x 6.9 x 1.2 in (19 x 17.5 x 3 cm)
Weight	1.5 lb (0.7 kg)
RoHS Compliant	YES
Reliability	Enterprise Grade
Network Protocols	SSH, HTTP, HTTPS, NTP, DHCP, SFTP, mDNS
Networking Stack	IPv4, IPv6
Management	SNMPv1, v2, v3
Security	802.1x (Port Security), TLS 1.2 for Secure LLRP
Host Interface	LLRP with Impinj Extensions
Custom Application Partition	YES
Management Console Port	RS-232 using a standard Cisco-style management cable (DB-9 to RJ-45)
Development Libraries	Octane SDK (.NET and Java), LTK (C, C++, .NET, Java), ETK (C, C++)
Software supported (Impinj)	ItemTest, ItemSense, Speedway Connect
IP Address Configuration	DHCP, Static, or Link Local Addressing (LLA) with Multicast DNS (mDNS)

2.3 Software Tools

Our software is built to simplify testing and deployment of Item Intelligence solutions.

SOFTWARE	DESCRIPTION
Application Development	• ItemSense • Speedway Connect • Octane Software Development Kit (SDK) • Octane Embedded Tool Kit (ETK) • EPCglobal Low Level Reader Protocol (LLRP) Tool Kit (LTK)

Gateway Management	• Impinj Web Management UI • Impinj Rshell Management Console using serial management console port or SSH • SNMPv2 MIBII • EPCglobal Reader Management v1.0.1 • Syslog
Site Management	• ItemSense
Performance Optimization	• ItemTest

3 HARDWARE ACCESSORIES

Speedway Readers are supported by a suite of hardware accessories and antennas that deliver deployment flexibility streamlining installation and expansion

HARDWARE	DESCRIPTION
Speedway Antenna Hub	The Impinj Speedway Antenna Hub provides a low cost opportunity to create a large, contiguous RAIN RFID read zone. Connect up to 32 antennas to a single Speedway R420.
GPIO Adapter for Antenna Hub	The GPIO Adapter and cable for Antenna Hub provides control of up to 4 Antenna Hubs. Each hub supports up to 8 antennas for a maximum of 32 antennas per Speedway R420 (4 hubs/R420 x 8 antennas/hub).
GPIO Box	The GPIO Box interfaces with the reader via a supplied HD15 cable, and separates each input and output signal to easy-access screw terminals. The GPIO box connects to peripherals to facilitate reader control and indicate status.
Speedway R120 Port Pack	The Speedway R120 Port Pack enables up to 8 antennas for the Speedway R120 and includes one Speedway antenna hub and one GPIO Adapter.
AC Power Supply (without AC power cord)	For readers and gateways and GPIO box, the universal power supply and specific regional power cord are optional, depending on whether or not the Power over Ethernet (PoE) option is used. If the PoE option is not used, you must order a universal power supply and specific regional power cord.
Slim Outdoor Antenna by Times7	The Slim Outdoor antenna by Times-7 is a thin, powerful, long-read range RAIN RFID antenna rated for permanent outdoor and industrial use. SMA female side connector (Requires accessory cable to connect to reader's RP-TNC connector)

Compact Outdoor Antenna by Times7	The Compact Outdoor antenna by Times-7 is rated for outdoor and industrial use and designed for a wide range of RAIN RFID applications requiring a long-read range and compact size. SMA female side connector (Requires accessory cable to connect to reader's RP-TNC connector)
Matchbox Antenna	The Impinj Matchbox antenna is a very small RAIN RFID antenna suited for embedded applications needing strong performance in a tight read zone. Requires 1 SMA to R-TNC cable (not included)
Brickyard Antenna	The Brickyard antenna by CSL has a one meter read zone designed for point-of-sale terminals enabling quick and easy item identification. Integrated 2.4 m pigtail R-TNC cable
Guardwall Antenna	The Impinj Guardwall RAIN RFID antenna, deployed in pairs, provides a tightly controlled read zone designed to integrate into conveyor systems. Includes 2 x SMA to R-TNC (2 m) cables
Mini-Gurardrail Antenna	The Impinj Mini-Guardrail antenna has a short-read zone and fits easily into small enclosures. The small form factor and mounting holes support a multitude of use cases. Requires 1 SMA to R-TNC cable (not included)
Threshold Antenna	The Impinj Threshold RAIN RFID antenna provides wide zone coverage ideal for a road race course or other boundary or threshold crossings. Includes 1 SMA to R-TNC (2 m)
Far-Field Antenna by Laird	The Far-Field circularly polarized panel antenna by Laird is ideal for applications where tags need to be read at a longer distance away, typically more than 1.5 feet. Common far field applications include pallet tracking, real-time inventory management, asset management, conveyor systems, and supply chain visibility. Features an integrated 2.4 m pigtail cable. Both left hand (LHP) and right hand (RHP) circularly polarized versions are available. For multi-reader portal applications where antennas face each other opposite polarizations are recommended.
Reader Antenna RF Cables	For connecting antennas to Speedway readers, the Guardwall, Mini-Guardwall, and Matchbox antennas. The lossless LL400 flex cables minimize system Tx/Rx power.

4 REGULATORY INFORMATION

For a list of the regions and geographies that the Speedway Readers supports, go to www.impinj.com/supported_regions

5 MAINTENANCE AND SUPPORT

All readers and gateways are covered by a Limited Hardware Warranty.

Extended warranty adds 1, 2, or 3 years of warranty benefits to the initial limited hardware warranty for an Impinj reader or gateway. For example, if a you purchase a 3-year extended warranty when purchasing a new Impinj reader or gateway, you receive 4 years of warranty benefits (1-year Initial Limited Hardware Warranty + 3-year extension). An extended warranty must be purchased at least 90-days prior to the expiration of an existing initial limited hardware or extended warranty. Product warranty options

6 NOTICES

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