Octane SNMP

version 7.6

http://www.impinj.com

Contents

1   Introduction

1.1   Purpose

This document describes the Simple Network Management Protocol (SNMP) capabilities of Impinj Octane software version 7.6.

1.2   Scope

This document defines Impinj Octane SNMP. It provides a summary level description for system architects to validate and understand the standard SNMP features supported by Octane SNMP. This document provides an overview of unique Impinj Octane SNMP behaviors, which deliver added capabilities along with detailed information, for developers planning to support Impinj Speedway Readers and xArray/xSpan Gateways via SNMP.

This document covers Impinj Octane 7.6 software releases and the Impinj Speedway and xArray/xSpan Gateway product families.

1.3   References

Table 1.1 References

Document	Version
EPCglobal: Reader Management (RM)	1.01
EPCglobal: Reader Management Artifacts	1.0.1
Impinj Speedway Installation and Operations Guide	7.6
Impinj xArray/xSpan Installation and Operations Guide	7.6

1.4   Terms

Reader- In this document, the term "Reader" is used to describe both the Speedway Reader and the xArray/xSpan Gateways.

SNMP–Simple Network Management Protocol

EPCglobal RM– EPCglobal Reader Management Protocol

RO–Read Only

RW–Read Write

RZ–Reports as Zero

AFN–Accessible For Notify

MR–Modifiable via RShell

RShell–Reader's Command Line shell

MIB –Management Information Base

1.5   Overview

This document defines Octane SNMP. The summary provides interface and support descriptions for MIB-II, as well as management support and considerations for use. This document provides the information in the following sections:

- Section 2 describes the Octane SNMP interface.
- Section 3 describes Octane MIB-II support.
- Section 4 describes EPCglobal Reader Management support.
- Section 5 describes important considerations for using EPCglobal RM with Octane.

Octane SNMP implements the EPCglobal Reader Management Standard 1.0.1. This interface provides a standard way to collect statistical data and events from RFID readers. For a complete description of EPCglobal RM, see the EPCglobal Reader Management document referred to in Table 1.1.

2 Octane SNMP connections

Any SNMP manager device can connect and retrieve statistics via Octane SNMP. Octane SNMP supports SNMP V1, V2c, and V3 authentication. For information about the SNMP interface that uses RShell, see the *Impinj RShell Reference Manual*. The SNMP service is available via UDP port 161 and 162 by default (these ports may be changed via RShell). Octane SNMP supports IPv6 connections for read operations but any traps sent from the reader are V2c compliant.

3   Octane MIB-II SNMP Capabilities

Octane supports MIB-II at OID .1.3.6.1.2.1 and includes the capabilities that are listed in Table 3.1.

Table 3.1 MIB-II Supported Nodes

Object	Node	Octane Support	Notes
system	1	Yes	
interfaces	2	Yes	
at	3	Yes	Address Translation MIB
ip	4	Yes	Internet Protocol MIB
icmp	5	Yes	Internet Control Message Protocol MIB
tcp	6	Yes	Transmission Control Protocol MIB
udp	7	Yes	User Datagram Protocol MIB
egp	8	**No**	Exterior Gateway Protocol MIB
cmot	9	**No**	Common Management information services and protocol Over TCP/IP MIB
transmission	10	**No**	
snmp	11	Yes	

4 Octane RM SNMP Capabilities

This section describes the capabilities of Octane SNMP. It includes a description of the parameters implemented with the EPCglobal RM MIB, and any parameter support limitations.

Octane SNMP implements the EPCglobal RM MIB version **200703080000Z**. A copy of the MIB definition file is available in the *EPCglobal: Reader Management Artifacts* document referred to in Table 1.1. Note that the specifications include both SNMP and XML bindings. Octane 7.6 supports the SNMP binding of RM 1.0.1. The RM MIB, titled **epcgReaderMIB**, is rooted in the MIB OID tree at node .1.3.6.1.4.1.22695.1.1.

Table 4.1 describes the objects supported by Octane. The **Octane Support** column reports whether the Reader will return a value when the OID is queried. See the **Notes** column for any special data meanings. For example, for several objects, Octane will always report zero.

Unless otherwise noted, all objects are read-only (RO). Writeable objects are shown as **read-write (RW)**. The objects that can be modified via Octane RShell are shown as **RShell (MR)**.

Each table in the subsections below describes a single object in the epcgReaderMIB. Each description includes a list of supported sub-elements and any relevant notes.

4.1 epcgReaderMIB (.1.3.6.1.4.1.22695.1.1)

The Base OID for the epcgReaderMIB are shown in Table 4.1.

Table 4.1 epcgReaderMIB

Object	Node	Octane Support	Notes
epcgReaderNotifs	.0	No	Section 4.2
epcgReaderObjects	.1	Yes	Section 4.3
epcgReaderConformance	.2	No	N/A

4.2 epcgReaderNotifs (.1.3.6.1.4.1.22695.1.1.0)

Table 4.2 lists the notifications (traps) that are defined by the EPCG MIB. Note that none of these notifications are currently supported by Octane SNMP. For a list of the SNMP notifications supported by Octane SNMP, please refer to the "Impinj RShell Reference Manual" for details.

Table 4.2 epcgReaderNotifs

Object	Node	Octane Support

Object	Node	Octane Support
epcgReaderDeviceOperationState	.1	No
epcgRdrDevMemoryState	.2	No
epcgReadPointOperationState	.3	No
epcgReaderAntennaReadFailure	.4	No
epcgReaderAntennaWriteFailure	.5	No
epcgReaderAntennaKillFailure	.6	No
epcgReaderAntennaEraseFailure	.7	No
epcgReaderAntennaLockFailure	.8	No
epcgReaderIoPortOperationState	.9	No
epcgReaderSourceOperationState	.10	No
epcgReaderNotificationChanOperState	.11	No

4.3 epcgReaderObjects (.1.3.6.1.4.1.22695.1.1.1)

Table 4.3 describes the main RFID objects in the RM MIB.

Table 4.3 epcgReaderObjects

Object	Node	Octane Support	Notes
epcgReaderDevice	.1	Yes	Section 4.4
epcgReadPoints	.2	Yes	Section 4.9
epcgAntennaReadPoints	.3	Yes	Section 4.10
epcgIoPorts	.4	Yes	Section 4.11
epcgSources	.5	Yes	Section 4.12
epcgNotificationChannels	.6	Yes	Section 4.15
epcgTriggers	.7	**No**	N/A

4.4 epcgReaderDevice (.1.3.6.1.4.1.22695.1.1.1.1)

Table 4.4 describes the main Reader device objects in the RM MIB.

Table 4.4 epcgReaderDevice

Object	Node	Octane Support	Notes
epcgReaderDeviceInformation	.1	Yes	Section 4.5

Object	Node	Octane Support	Notes
epcgGlobalCountersTable	.2	Yes	Section 4.6
epcgReaderDeviceOperation	.3	Yes	Section 4.7
epcgReaderDeviceMemory	.4	No	N/A
epcgReaderServerTable	.5	Yes	Section 4.8

4.5   epcgReaderDeviceInformation (.1.3.6.1.4.1.22695.1.1.1.1.1)

Table 4.5 provides basic RFID Reader device information.

Table 4.5 epcgReaderDeviceInformation

Object	Node	Octane Support	Notes
epcgRdrDevDescription	.1.0	Yes	Reports the same value as mib-2.system.sysDescr
epcgRdrDevRole	.2.0	Yes	MR
epcgRdrDevEpc	.3.0	Yes	RO
epcgRdrDevSerialNumber	.4.0	Yes	RO
epcgRdrDevTimeUtc	.5.0	Yes	RO
epcgRdrDevCurrentSource	.6.0	Yes	RO
epcgRdrDevReboot	.7.0	Yes	RW
epcgRdrDevResetStatistics	.8.0	Yes	RW
epcgRdrDevReset-Timestamp	.9.0	Yes	RO
epcgRdrDevNormalize-PowerLevel	.10.0	Yes	RO
epcgRdrDevNormalize-NoiseLevel	.11.0	Yes	RO

4.6   epcgGlobalCountersTable (.1.3.6.1.4.1.22695.1.1.1.1.2)

Table 4.6 shows global counters that report statistics that were collected on the device across all antennas since the last statistics reset.

Table 4.6 epcgGlobalCountersTable

Object	Node	Octane Support	Notes
antennaTagsIdentified	.1.2.1	Yes	RO

Object	Node	Octane Support	Notes
antennaTagsNotIdentified	.1.2.2	Yes	RO - RZ
antennaMemoryRead- Operations	.1.2.18	Yes	RO
antennaMemoryReadFailures	.1.2.3	Yes	RO
antennaWriteOperations	.1.2.4	Yes	RO
antennaWriteFailures	.1.2.5	Yes	RO
antennaKillOperations	.1.2.6	Yes	RO
antennaKillFailures	.1.2.7	Yes	RO
antennaEraseOperations	.1.2.8	Yes	RO - RZ
antennaEraseFailures	.1.2.19	Yes	RO - RZ
antennaLockOperations	.1.2.9	Yes	RO
antennaLockFailures	.1.2.10	Yes	RO
sourceUnknownToGlimpsed	.1.2.11	Yes	RO - RZ
sourceGlimpsedToUnknown	.1.2.12	Yes	RO - RZ
sourceGlimpsedToObserved	.1.2.13	Yes	RO - RZ
sourceObservedToLost	.1.2.14	Yes	RO - RZ
sourceLostToGlimpsed	.1.2.15	Yes	RO - RZ
sourceLostToUnknown	.1.2.16	Yes	RO - RZ
triggerMatches	.1.2.17	Yes	RO - RZ

4.7   epcgReaderDeviceOperation (.1.3.6.1.4.1.22695.1.1.1.1.3)

Table 4.7 shows the status of current device operations for the Reader.

Table 4.7 epcgReaderDeviceOperation

Object	Node	Octane Support	Notes
epcgRdrDevOperStatus	.1.0	Yes	RO - unknown (1), up (3), down (4)
epcgRdrDevOperStatusPrior	.2.0	No	AFN
epcgRdrDevOperStateEnable	.3.0	Yes	RO – Always false
epcgRdrDevOperNotifFrom-State	.4.0	Yes	RO - Always up (3), down (4)
epcgRdrDevOperNotifToState	.5.0	Yes	RO - Always up (3), down (4)
epcgRdrDevOperNotifState-Level	.6.0	Yes	RO – Always error

Object	Node	Octane Support	Notes
epcgRdrDevOperStateSupress-Interval	.7.0	Yes	RO
epcgRdrDevOperState-Suppressions	.8.0	Yes	RO

4.8 epcgReaderServerTable (.1.3.6.1.4.1.22695.1.1.1.1.5)

Table 4.8 shows the DHCP, DNS, and NTP server information in Octane SNMP.

Table 4.8 epcgReaderServerTable

Object	Node	Octane Support	Notes
epcgReaderServerAddressType	.1.3	Yes	RO
epcgReaderServerAddress	.1.4	Yes	RO
epcgReaderServerRowStatus	.1.5	Yes	RO

4.9 epcgReadPointTable (.1.3.6.1.4.1.22695.1.1.1.2.1)

Table 4.9 shows the status of current read point operations for the Reader.

Table 4.9 epcgReadPointTable

Object	Node	Octane Support	Notes
epcgReadPointName	.1.2	Yes	RO
epcgReadPointDescription	.1.3	Yes	RO
epcgReadPointAdminStatus	.1.4	Yes	RO – Always up (3)
epcgReadPointOperStatus	.1.5	Yes	RO – Unkown (1) until first use
epcgReadPointOperState-NotifyEnable	.1.6	Yes	RO – Always false
epcgReadPointOperNotify-FromState	.1.7	Yes	RO – Always up (3), down (4)
epcgReadPointOperNotify-ToState	.1.8	Yes	RO – Always up (3), down (4)

Object	Node	Octane Support	Notes
epcgReadPointOperNotify-StateLevel	.1.9	Yes	RO – Always error
epcgReadPointOperStatus- Prior	.1.10	No	AFN
epcgReadPointOperState-SuppressInterval	.1.11	Yes	RO - RZ
epcgReadPointOperState-Suppressions	.1.12	Yes	RO - RZ

4.10   epcgAntennaReadPoints(.1.3.6.1.4.1.22695.1.1.1.3)

Table 4.10 shows RFID operation reports and per-antenna read point statistics.

Table 4.10 epcgAntennaReadPointTable

Object	Node	Octane Support	Notes
epcgAntRdPntTagsIdentified	.1.1.1	Yes	RO
epcgAntRdPntTagsNotIdentified	.1.1.2	Yes	RO - RZ
epcgAntRdPntMemoryRead-Operations	.1.1.25	Yes	RO
epcgAntRdPntMemoryRead- Failures	.1.1.3	Yes	RO
epcgAntRdPntReadFailure-NotifEnable	.1.1.4	Yes	RO – Always false
epcgAntRdPntReadFailure-NotifLevel	.1.1.5	Yes	RO – Always error
epcgAntRdPntReadFailure-SuppressInterval	.1.1.26	Yes	RO - RZ
epcgAntRdPntReadFailure-Suppressions	.1.1.27	Yes	RO - RZ
epcgAntRdPntWriteOperations	.1.1.6	Yes	RO
epcgAntRdPntWriteFailures	.1.1.7	Yes	RO
epcgAntRdPntWriteFailures-NotifEnable	.1.1.8	Yes	RO – Always false
epcgAntRdPntWriteFailures-NotifLevel	.1.1.9	Yes	RO – Always error
epcgAntRdPntWriteFailure-SuppressInterval	.1.1.28	Yes	RO - RZ
epcgAntRdPntWriteFailure-Suppressions	.1.1.29	Yes	RO - RZ

Object	Node	Octane Support	Notes
epcgAntRdPntKillOperations	.1.1.10	Yes	RO
epcgAntRdPntKillFailures	.1.1.11	Yes	RO
epcgAntRdPntKillFailures-NotifEnable	.1.1.12	Yes	RO – Always false
epcgAntRdPntKillFailures-NotifLevel	.1.1.13	Yes	RO – Always error
epcgAntRdPntKillFailure-SuppressInterval	.1.1.30	Yes	RO - RZ
epcgAntRdPntKillFailure-Suppressions	.1.1.31	Yes	RO - RZ
epcgAntRdPntEraseOperations	.1.1.14	Yes	RO - RZ
epcgAntRdPntEraseFailures	.1.1.15	Yes	RO - RZ
epcgAntRdPntEraseFailures-NotifEnable	.1.1.16	Yes	RO – Always false
epcgAntRdPntEraseFailures-NotifLevel	.1.1.17	Yes	RO – Always error
epcgAntRdPntEraseFailure-SuppressInterval	.1.1.32	Yes	RO - RZ
epcgAntRdPntEraseFailure-Suppressions	.1.1.33	Yes	RO - RZ
epcgAntRdPntLockOperations	.1.1.18	Yes	RO
epcgAntRdPntLockFailures	.1.1.19	Yes	RO
epcgAntRdPntLockFailures-NotifEnable	.1.1.20	Yes	RO – Always false
epcgAntRdPntLockFailures-NotifLevel	.1.1.21	Yes	RO – Always error
epcgAntRdPntLockFailure-SuppressInterval	.1.1.34	Yes	RO - RZ
epcgAntRdPntLockFailure-Suppressions	.1.1.35	Yes	RO - RZ
epcgAntRdPntPowerLevel	.1.1.22	Yes	RO
epcgAntRdPntNoiseLevel	.1.1.23	Yes	RO - RZ
epcgAntRdPntTimeEnergized	.1.1.24	Yes	RO

4.11   epcgIoPorts (.1.3.6.1.4.1.22695.1.1.1.4)

Table 4.11 shows the IOPort information and status.

Table 4.11 epcgIoPortTable

Object	Node	Octane Support	Notes
epcgIoPortName	.1.1.2	Yes	RO
epcgIoPortAdminStatus	.1.1.3	Yes	RO – Always Up (3)
epcgIoPortOperStatus	.1.1.4	Yes	RO – Always Up (3)
epcgIoPortOperStatus-NotifEnable	.1.1.5	Yes	RO – Always false
epcgIoPortOperStatus-NotifLevel	.1.1.6	Yes	RO – Always error
epcgIoPortOperStatus-NotifFromState	.1.1.7	Yes	RO – Always unknown (1), other, up (3), down (4)
epcgIoPortOperStatus-NotifToState	.1.1.8	Yes	RO – Always unknown (1), other, up (3), down (4)
epcgIoPortDescription	.1.1.9	Yes	RO
epcgIoPortOperStatus-Prior	.1.1.10	**No**	AFN
epcgIoPortOperState-SuppressInterval	.1.1.11	Yes	RO - RZ
epcgIoPortOperState-Suppressions	.1.1.12	Yes	RO - RZ

4.12 epcgSources (.1.3.6.1.4.1.22695.1.1.1.5)

Table 4.12 shows the sources, read points, and notification channel tables.

Table 4.12 epcgSources

Object	Node	Octane Support	Notes
epcgSourceTable	.1	Yes	Section 4.13
epcgRdPntSrcTable	.3	Yes	Section 4.14
epcgNotifChanSrcTable	.4	No	Not Accessible

4.13 epcgSourceTable (.1.3.6.1.4.1.22695.1.1.1.5.1)

Table 4.13 shows source operational status and statistics.

Table 4.13 epcgSourceTable

Object	Node	Octane Support	Notes
epcgSrcName	.2	Yes	RO
epcgSrcReadCyclesPer-Trigger	.3	Yes	RO - RZ
epcgSrcReadDutyCycle	.4	Yes	RO - RZ
epcgSrcReadTimeout	.5	Yes	RO - RZ
epcgSrcGlimpsed-Timeout	.6	Yes	RO - RZ
epcgSrcObserved-Threshold	.7	Yes	RO - RZ
epcgSrcObserved-Timeout	.8	Yes	RO - RZ
epcgSrcLostTimeout	.9	Yes	RO - RZ
epcgSrcUnknownTo-GlimpsedTrans	.10	Yes	RO - RZ
epcgSrcGlimpsedTo-UnknownTrans	.11	Yes	RO - RZ
epcgSrcGlimpsedTo-ObservedTrans	.12	Yes	RO - RZ
epcgSrcObservedTo-LostTrans	.13	Yes	RO - RZ
epcgSrcLostTo-GlimpsedTrans	.14	Yes	RO - RZ
epcgSrcLostTo-UnknownTrans	.15	Yes	RO - RZ
epcgSrcAdminStatus	.16	Yes	RO – Always Up (3)
epcgSrcOperStatus	.17	Yes	RO – Up (3) if RFID process is running (see Section 5.2)
epcgSrcOperStatus-NotifEnable	.18	Yes	RO – Always false
epcgSrcOperStatus-NotifFromState	.19	Yes	RO – Always up (3), down (4)
epcgSrcOperStatus-NotifToState	.20	Yes	RO – Always up (3), down (4)
epcgSrcOperStatus-NotifyLevel	.21	Yes	RO – Always error
epcgSrcSupports-WriteOperations	.22	Yes	RO – Always true

Object	Node	Octane Support	Notes
epcgSrcOperStatus-Prior	.23	Yes	AFN
epcgSrcOperState-SuppressInterval	.24	Yes	RO – RZ
epcgSrcOperState-Suppressions	.25	Yes	RO – RZ

4.14   epcgRdPntSourceTable (.1.3.6.1.4.1.22695.1.1.1.5.3)

Table 4.14 provides the read point to source association. A single source represents all Octane-based products.

Table 4.14 epcgRdPntSourceTable

Object	Node	Octane Support	Notes
epcgRdPntSrcRowStatus	.1.1	Yes	RO – Always active

4.15   epcgNotificationChannels (.1.3.6.1.4.1.22695.1.1.1.6)

Table 4.15 shows the RFID control and notification channels status reports.

Table 4.15 epcgNotificationChannels

Object	Node	Octane Support	Notes
epcgNotifChanName	.1.1.2	Yes	RO
epcgNotifChanAddressType	.1.1.3	Yes	RO – Always ipv4
epcgNotifChanAddress	.1.1.4	Yes	RO
epcgNotifChanLastAttempt	.1.1.5	Yes	RO
epcgNotifChanLastSuccess	.1.1.6	Yes	RO
epcgNotifChanAdminStatus	.1.1.7	Yes	RW, MR
epcgNotifChanOperStatus	.1.1.8	Yes	RO
epcgNotifChanOperNotifEnable	.1.1.9	Yes	RO – Always false
epcgNotifChanOperNotifLevel	.1.1.10	Yes	RO – Always error
epcgNotifChanOperNotif-FromState	.1.1.11	Yes	RO – Always up (3), down (4)
epcgNotifChanOperNotif- ToState	.1.1.12	Yes	RO – Always up (3), down (4)

Object	Node	Octane Support	Notes
epcgNotifChanOperStatus- Prior	.1.1.13	No	AFN
epcgNotifChanOperState-SuppressInterval	.1.1.14	Yes	RO – RZ
epcgNotifChanOperState-Suppressions	.1.1.15	Yes	RO – RZ

5   Octane SNMP Usage Notes

This section describes the unique characteristics of Octane SNMP.

5.1   Notification Channels

Octane supports two different notification channels, as shown in Table 5.1. Only a single notification channel can be operationally active or "up" at any one time. An administratively disabled notification channel cannot be activated. Note that in Octane 7.6, administratively disabling a notification channel does not affect the operational status. If a channel is operationally "up", administratively disabling it will not disable the channel or take it "down".

Table 5.1 Notification Channels

Notification Channel Name	Description	Operational Status	Administrative Status
LLRP Client	A client (remote) initiates LLRP connection (includes on-Reader applications that connect through LLRP).	Reports as operationally enabled (up) when a remote application connects to the Reader via LLRP.	Client-initiated LLRP connections are allowed only when this notification channel is administratively enabled (up).
LLRP Reader	A Reader initiates LLRP connection.	Reports as operationally up when a remote application connects to the Reader via LLRP.	Reader initiated LLRP connections are allowed only when this notification channel is administratively enabled (up).

5.2   Sources

A Reader contains a single static source. Octane SNMP always reports zero because no source statistics are supported via LLRP. The administrative status of the source always reports **enabled** if the internal RFID software device processes are running properly and ready for application input. An operational failure indicates an internal hardware or software fault of the device.

5.3   ReadPoints

A Reader contains a single static read point/antenna read point for each antenna. Each read point is always administratively enabled. The antenna displays operationally enabled when the antenna successfully completes its previous inventory attempt. If the antenna malfunctions, or becomes disconnected, it is marked as operationally disabled.

Note: If the antenna is not used by the application, it remains operationally unknown.

6 Impinj Root Registration MIB

The Impinj Root Registration MIB, IMPINJ-ROOT-REG-MIB.mib, defines the set of object IDs for various Impinj products, as referenced by SNMPv2-MIB::sysObjectID. For example, an Impinj Speedway R420 Reader for FCC region advertises its sysObjectID as SNMPv2-SMI::enterprises.25882.2.1.2.2.1000.

The Octane 7.6 documentation bundle contains the latest version of the IMPINJ-ROOT-REG-MIB.txt.file. It is available on the Impinj support portal located at support.impinj.com.

In addition, the IMPINJ-R680_MIB.mib and IMPINJ-R660_MIB.mib files are available in the documentation bundle, which defines object IDs that are specific to the xArray/xSpan Gateways.

7   Revision History

Date	Revision	Comments
08/27/2009	4.2	Initial release
03/18/2010	4.4	Added reference to Impinj Root Registration MIB
10/28/2010	4.6	Re-released for Octane 4.6, no changes
4/25/2011	4.8	Removed Octane 3.X, document now covers Octane 4.X on Speedway products only
4/30/2012	4.1	Updated version numbers and copyright dates , no changes
12/16/2014	5.2	Added 5.X and xArray support
06/02/2015 06/02/2015	5.4 5.4	Updated for Octane 5.4 release Updated for Octane 5.4 release
10/12/2015	5.6	Updated for Octane 5.6 release
12/21/2015	5.6.2	Updated for Octane 5.6.2 release
10/10/2016	5.8.0	Updated for Octane 5.8.0 - no changes

8   Notices

These products may be covered by one or more U.S. patents. See http://www.impinj.com/patents for details.

For more information, contact support@impinj.com