



**Juniper Networks
G-series CMTS**

**SNMP and Enterprise MIB
Specification**

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G-series CMTS SNMP and Enterprise MIB Specification

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The Chassis Control Module and its corresponding G10 CMTS software perform encryption that is subject to U.S. Customs and Export regulations and shall not be exported, sold or transferred to a country outside the USA and Canada without an appropriate export license from the U.S. Government. The specific Regulations governing exports of encryption products are set forth in the Export Administration Regulations, 15 C.F.R. (Code of Federal Regulations), Parts 730-774.

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About This Manual

This section describes important information about the design of this document.

Purpose

The purpose of the *G-series CMTS SNMP and Enterprise MIB Specification* is to specify the simple network management protocol (SNMP) support, and the standard and enterprise management information base (MIB) support provided by the G10 and G1 Cable Modem Termination Systems (CMTS).

With respect to the SNMP and MIB requirements specified by the *Data Over Cable Service Interface Specifications* (DOCSIS), this particular revision of the *G-series CMTS SNMP and Enterprise MIB Specification* specifies those requirements as defined by DOCSIS version 1.1.

The intended audience for this information is for network management application developers and network operators of a G-series CMTS.

Organization

This document is organized as follows:

- Chapter 1, “Introduction” – Provides a general overview of network management with respect to a CMTS. This chapter also specifies the SNMP-related support provided by the CMTS.
- Chapter 2, “Standard MIB Specification” – Specifies the standard MIBs supported by the CMTS as required by DOCSIS 1.1.
- Chapter 3, “Enterprise MIB Specification” – Specifies the enterprise MIBs supported by the CMTS.

Document Conventions

The following document conventions are used in this manual:

Table 1: Document Conventions

General Conventions	<i>Italic font</i>	Denotes a) emphasis, b) first use of a new term, or c) a document title.
	Screen Name font	Denotes a) the on-screen name of a window, dialog box or field, or b) keys on a keyboard.
Software Conventions	Computer font	Font denotes code or messages displayed on-screen.
	Computer Bold font	Font denotes literal commands and parameters that you enter exactly as shown.
	<Computer Italic> font	Font denotes parameter values that require a user-defined input. The value strings are enclosed in angle brackets < ... > .
	[parameter]	Square brackets denote optional parameters.
	{parameter}	Braces denote required parameters.
		Vertical bars separate parameters in a group from which you must choose only one.

Notes, Cautions, and Warnings



A note indicates information that might be helpful in a particular situation, or information that might otherwise be overlooked.



A caution indicates a situation that requires careful attention. Failure to observe a cautionary note could result in injury or discomfort to yourself, or serious damage to the product.



A warning is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

G-series CMTS Document Set

- *G10 CMTS Installation and Operation*
- *G1 CMTS Installation and Operation*
- *G10 CMTS Functional Description*
- *G1 CMTS Functional Description*
- *G-series CMTS CLI Reference*
- *G-series CMTS SNMP and Enterprise MIB Specification*





Part 1

Overview and Component Descriptions

- Introduction on page 3
- Standard MIB Specification on page 7
- Enterprise MIB Specification on page 11





Chapter 1

Introduction

Management Architecture Overview

The primary management of the CMTS is performed using SNMP in conjunction with the command line interface (CLI). Though the initial configuration of the CMTS is performed primarily through the CLI, SNMP can also be used to perform some of the steps required for configuration. The CLI can also be used to manage the CMTS. See the *G-series CMTS CLI Reference* manual for more details regarding the G-series CMTS CLI.

Key components of the SNMP model of a managed network consist of one or more managed SNMP entities, one or more SNMP managers, a messaging protocol, and a transport stack to allow messaging to occur between the managed entity and the manager.

A managed SNMP entity must contain an SNMP agent that provides access to the management information and its properties contained in its management information base (MIB). The management information can include configuration parameters, various statistics, and state variables that reflect the status of the managed entity. Each DOCSIS Module and Chassis Control Module contains a set of management information that must be accessible by an SNMP manager. Within the CMTS, the Chassis Control Module runs an SNMP agent that provides SNMP and CLI access to all the modules within the CMTS. In addition, the MIB can define events—a trap, an inform, or a notification—that represent specific conditions in the managed entity. The SNMP agent generates event reports to an SNMP manager or a Trap Manager that reflect these conditions.

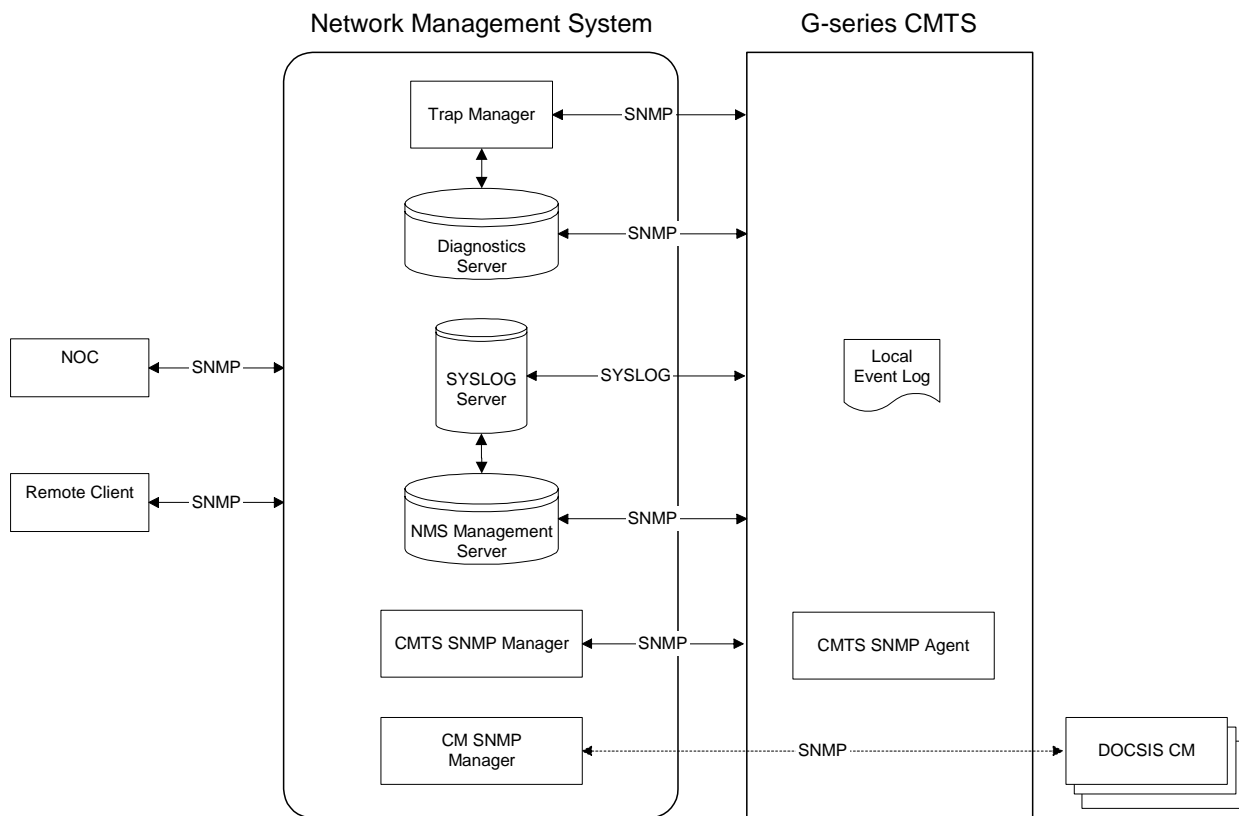
An SNMP manager has access to the MIBs of its managed entities. Depending on the definition of the objects in each MIB, the manager can retrieve and modify the objects as part of its management role. Also, an SNMP manager receives events from SNMP agents and takes the appropriate action, depending on the type of event that has occurred. Figure 1 on page 4 provides a high-level view of the SNMP management architecture of the CMTS.

A network management system (NMS) is comprised of servers and managers that use SNMP for multiple purposes:

- The NMS Management Server and the CMTS SNMP manager use the SNMP protocol for message exchange with the SNMP agent that resides on the CMTS.
- The diagnostics server in the NMS uses SNMP to poll various statistics defined in the standard and enterprise MIBs, such as media access control (MAC) variables (HCS errors, CRC errors, collisions for requests), and physical (PHY) variables (signal-to-noise ratios, sync loss, power levels). These statistics can then be used to detect, diagnose, and potentially correct CMTS or HFC problems. The diagnostics server can also be configured to generate traps or notifications to the trap manager.

- SNMP is used between the NMS and the network operations center (NOC) allowing remote management of the NMS and the CMTS. Remote clients on the network can also use SNMP to access those elements of the managed network for which privilege has been granted.
- There is a SYSLOG in the NMS and a local event log in the CMTS that contain the same log of events, which are defined within MIBs. The CMTS uses the SYSLOG mechanism (as opposed to SNMP) to send SYSLOG events to the SYSLOG Server. The local event log is CLI and SNMP accessible.
- The NMS contains the SNMP manager for the DOCSIS cable modems (CMs). NMS management of the CMs is transparent to the CMTS since the SNMP messages, or protocol data units, are encapsulated as the payload within DOCSIS MAC frames.

Figure 1: CMTS Management Architecture



CMTS SNMP Support

As required by DOCSIS 1.1, the CMTS supports SNMPv1, SNMPv2c, and SNMPv3.

Table 2 provides a list of the SNMP- and SMI-related IETF RFCs that are supported by the CMTS.

Table 2: CMTS SNMP-Related IETF RFCs Supported

Name	RFC Number	RFC Title
—	RFC 1157	A Simple Network Management Protocol
—	RFC 1212	Concise MIB Definitions
—	RFC 1215	A Convention for Defining Traps For Use With the SNMP
—	RFC 1901	Introduction to Community-based SNMPv2
—	RFC 1902	Structure of Management Information for Version 2 of the Simple Network Management Protocol (SNMPv2)
—	RFC 1903	Textual Conventions for Version 2 of the Simple Network Management Protocol (SNMPv2)
—	RFC 1904	Conformance Statements for Version 2 of the Simple Network Management Protocol (SNMPv2)
SNMPv2-PDU	RFC 1905	Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)
SNMPv2-TM	RFC 1906	Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)
SNMPv2-MIB	RFC 1907	Management Information Base for Version 2 of the Simple Network Management Protocol (SNMPv2)
—	RFC 1908	Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Framework
—	RFC 2570	Introduction to Version 3 of the Internet-standard Network Management
SNMP-FRAMEWORK-MIB	RFC 2571	An Architecture for Describing SNMP Management Frameworks
SNMP-MPD-MIB	RFC 2572	Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
SNMP-NOTIFICATION-MIB	RFC 2573	SNMP Applications
SNMP-TARGET-MIB		
SNMP-USER-BASED-SM-MIB	RFC 2574	The User-Based Security Model for Version 3 of the Simple Network Management Protocol (SNMPv3)
SNMP-VIEW-BASED-ACM-MIB	RFC 2575	View-based Access Control Model for the Simple Network Management Protocol (SNMP)
SNMP-COMMUNITY-MIB	RFC 2576	Coexistence between Version 1, Version 2, and Version 3 of the Internet-Standard and Network Management Framework
SNMPv2-SMI	RFC 2578	Structure of Management Information Version 2 (SMIv2)
SNMPv2-TC	RFC 2579	Textual Conventions for SMIv2
SNMPv2-CONF	RFC 2580	Conformance Statements for SMIv2
INET-ADDRESS-MIB	RFC 2851	Textual Conventions for Internet Network Addresses

CMTS MIB Categories

A G-series CMTS supports two general categories of MIBs—standard and enterprise. Some standard MIBs must be supported as required by DOCSIS 1.1. However, a G-series CMTS supports additional standard MIBs. The standard MIBs supported are listed in Chapter 2. The enterprise MIBs are defined in Chapter 3.



Chapter 2

Standard MIB Specification

The standard MIBs supported by the CMTS are a combination of those MIBs required by DOCSIS 1.1, along with additional MIBs specific to a G-series CMTS. The following sections in this chapter simply provide a list of the MIBs supported by a G-series CMTS and do not provide details regarding the management information contained therein. For details regarding a specific MIB, the reader is encouraged to read that particular MIB.

CMTS Standard MIB Support

Table 3 provides a list of the standard MIBs and the corresponding IETF RFCs that are supported by the CMTS.

Table 3: CMTS Standard MIBs Supported

MIB Name	RFC	Description
—	RFC 1155	Structure and Identification of Management Information for TCP/IP-based Internets
—	RFC 1213	Management Information Base for Network Management of TCP/IP-based internets: MIB-II
BRIDGE-MIB	RFC 1493	Definitions of Managed Objects for Bridges
IP-MIB	RFC 2011	SNMPv2 Management Information Base for the Internet Protocol using SMIPv2
TCP-MIB	RFC 2012	SNMPv2 Management Information Base for the Transmission Control Protocol using SMIPv2
UDP-MIB	RFC 2013	SNMPv2 Management Information Base for the User Datagram Protocol using SMIPv2
IF-MIB	RFC 2233	The Interfaces Group MIB using SMIPv2
ETHERLIKE-MIB	RFC 2665	Ethernet Interface MIB
DOCS-CABLE-DEVICE-MIB	RFC 2669	DOCSIS Cable Device MIB
DOCS-IF-MIB	RFC 2670	Radio Frequency (RF) Interface MIB
ENTITY-MIB	RFC 2737	Entity MIB (Version 2)
DOCS-BPI-MIB	RFC 3083	Baseline Privacy Interface MIB
DOCS-BPI2-MIB	—	Management Information Base for DOCSIS Cable Modems and Cable Modem Termination Systems for Baseline Privacy Plus
DOCS-QOS-MIB	—	Data Over Cable System Quality of Service Management Information Base
DOCS-SUBMGT-MIB	—	Management Information Base for DOCSIS Cable Modem Termination Systems for Subscriber Management
DOCS-IF-EXT-MIB	—	Extension Module to RFC2670 DOCS-IF-MIB
DOCS-CABLE-DEVICE-TRAP-MIB	—	Extension of the CABLE DEVICE MIB Defined in RFC2669

Support of Optional MIB Objects

In some cases, support for certain objects (OBJECT-TYPE or OBJECT-GROUP) within a MIB is considered optional as defined by the DOCSIS and OSSI specifications. This section identifies, by MIB, those optional objects that are supported by the CMTS. If an object is listed as supported, all underlying objects are also supported. The omission of an optional object in the following sections implies that the object is not supported by the CMTS.

If a MIB is not explicitly addressed in this section, none of the optional objects within that MIB are supported in the CMTS.



Note

In general, a G-series CMTS does not support those objects classified by the DOCSIS specifications as *Deprecated* or *Obsolete*. In the exceptional case where a deprecated or obsolete object is supported, Juniper Networks reserves the right to remove such support in a future release without prior notice.

SNMP-COMMUNITY-MIB Object Support

The SNMP-COMMUNITY-MIB (“Coexistence between Version 1, Version 2, and Version 3 of the Internet-Standard and Network Management Framework”) objects that are considered optional by DOCSIS 1.1, but are supported by the CMTS, are as follows:

- snmpTrapAddress
- snmpTrapCommunity

IF-MIB Object Support

The IF-MIB (“The Interfaces Group MIB using SMIV2”) objects that are considered optional by DOCSIS 1.1, but are supported by the CMTS, are as follows:

- ifXTable
 - ifHCInOctets
 - ifHCInUcastPkts
 - ifHCInMulticastPkts
 - ifHCInBroadcastPkts
 - ifHCOctets
 - ifHCOUcastPkts
 - ifHCOmulticastPkts
 - ifHCOBroadcastPkts
- ifStackLastChange

- ifRcvAddressTable
- ifTestTable

DOCS-CABLE-DEVICE-MIB Object Support

The DOCS-CABLE-DEVICE-MIB (“DOCSIS Cable Device MIB”) objects that are considered optional by DOCSIS 1.1, but are supported by the CMTS, are as follows:

- docsDevBaseGroup
- docsDevNmAccessTable
- docsDevSoftwareGroup
- docsDevFilterGroup
- docsDevFilterLLCTable

DOCS-IF-MIB Object Support

The DOCS-IF-MIB (“Radio Frequency Interface MIB”) objects that are considered optional by DOCSIS 1.1, but are supported by the CMTS, are as follows:

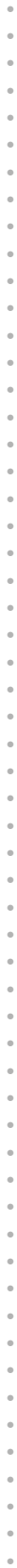
- docsIfQosProfileTable

The docsIfQosProfileTable object is supported, though entries in this table cannot be created by the NMS. Entries are created by the CMTS as a result of gleaning QoS parameters from registration requests sent by CMs.

DOCS-QOS-MIB Object Support

The DOCS-QOS-MIB (“IETF Proposed Standard RFC-version of Qos MIB”) objects that are considered optional by DOCSIS 1.1, but are supported by the CMTS, are as follows:

- docsQosServiceClassPolicyTable
- docsQosPHSTable



Chapter 3

Enterprise MIB Specification

A G-series CMTS provides support for the following enterprise MIBs:

- PBC-ENT-MIB—this is the top-level MIB which defines the root structure for all Juniper Networks CMTS enterprise MIBs
- PBC-GENERIC-MIB—defines system and chassis management capabilities that are common to all Juniper Networks' CMTS product offerings
- PBC-CMTS-MIB—defines management objects common to all Juniper Networks' CMTS product offerings
- PBC-KODIAK-M-G10-MIB—defines management features specific only to the CMTS

These MIBs define extensions to the standard MIBs, and provide the support for managing the proprietary features and functions of the CMTS.

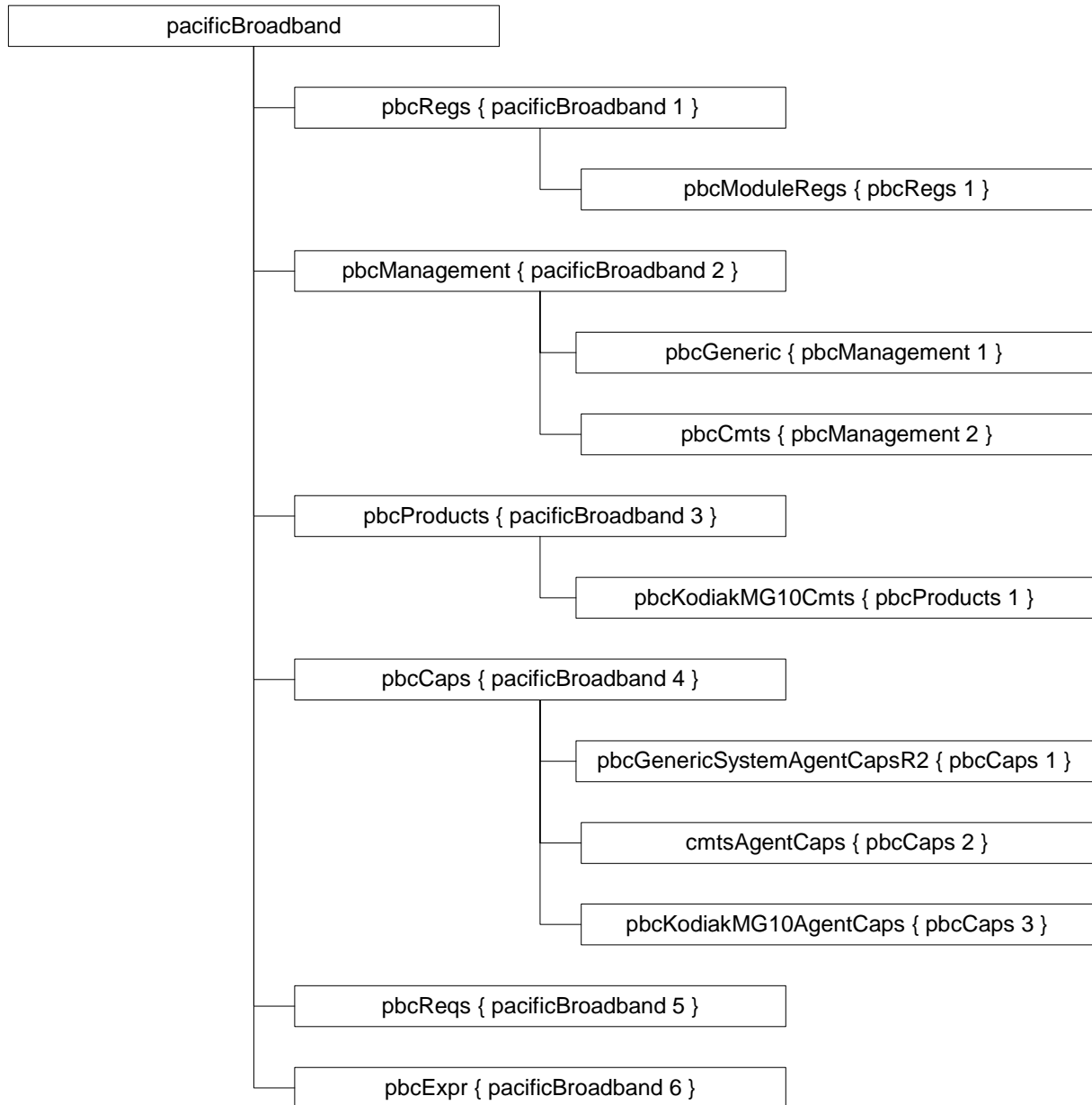
Module `pacificBroadband`

The top level of the PBC-ENT-MIB tree is the `pacificBroadband` module which resides under enterprise at { `enterprise 5987` }. The complete path to the `pacificBroadband` module from the root of the Object Identifier (OID) tree is as follows:

```
{ iso org dod internet mgmt private enterprise pacificBroadband }
```

This path is equivalent to OID value { `1 3 6 1 4 1 5987` }. Figure 2 on page 12 illustrates the hierarchy of the `pacificBroadband` module and the next two levels beneath it. For the hierarchy, object, and event details below the second level, see the listing of the entire enterprise MIBs in “MIB Module PBC-ENT-MIB” on page 17 through “MIB Module PBC-KODIAK-M-G10-MIB” on page 30.

Figure 2: Hierarchy of Module *pacificBroadband*



The objects one level beneath the *pacificBroadband* module, along with their OIDs, are presented in Table 4, which is followed by brief explanations of each of these objects.

Table 4: Objects Beneath Module *pacificBroadband*

Objects	OID
<i>pbcReqs</i>	{ <i>pacificBroadband</i> 1 }
<i>pbcManagement</i>	{ <i>pacificBroadband</i> 2 }
<i>pbcProducts</i>	{ <i>pacificBroadband</i> 3 }
<i>pbcCaps</i>	{ <i>pacificBroadband</i> 4 }
<i>pbcReqs</i>	{ <i>pacificBroadband</i> 5 }
<i>pbcExpr</i>	{ <i>pacificBroadband</i> 6 }

- ***pbcReqs***—represents the sub-tree for PBC registrations
- ***pbcManagement***—represents assorted common management MIBs
- ***pbcProducts***—represents the sub-tree for product-specific object and event definitions
- ***pbcCaps***—represents the sub-tree for agent profiles (defined with the AGENT-CAPABILITIES construct)
- ***pbcReqs***—represents the sub-tree for management application requirements (defined with MODULE-COMPLIANCE construct)
- ***pbcExpr***—represents the sub-tree for experimental definitions

Sections “Objects Beneath Object *pbcReqs*” through “Objects Beneath Object *pbcCaps*” on page 14 itemize and describe the objects that reside beneath the objects listed in Table 4 (the *pbcReqs* and *pbcExpr* objects do not have any objects directly beneath them).

Objects Beneath Object *pbcReqs*

The only object that resides directly beneath the *pbcReqs* object is the *pbcModuleReqs* object which represents the sub-tree used to register the values assigned to modules with the MODULE-IDENTITY construct.

Objects Beneath Object *pbManagement*

The objects immediately beneath the *pbManagement* object, along with their OIDs, are presented in Table 5, which is followed by brief explanations of each of these objects.

Table 5: Objects Beneath Module *pbManagement*

Objects	OID
<i>pbGeneric</i>	{ <i>pacificBroadband pbManagement 1</i> }
<i>pbCmts</i>	{ <i>pacificBroadband pbManagement 2</i> }

- ***pbGeneric***—the root node for all Juniper Networks management objects which are common to chassis-type systems
- ***pbCmts***—the root node for management objects which are common to all Juniper Networks CMTS products and which are not defined by standard RFCs

Objects Beneath Object *pbProducts*

The only object that resides directly beneath the *pbProducts* object is the *pbKodiakMG10Cmts* object. There are currently no management objects specific only to the G10 CMTS or G1 CMTS models.

Objects Beneath Object *pbCaps*

The objects immediately beneath the *pbCaps* object, along with their OIDs, are presented in Table 6, which is followed by brief explanations of each of these objects.

Table 6: Objects Beneath Module *pbCaps*

Objects	OID
<i>pbGenericSystemAgentCapsR2</i>	{ <i>pacificBroadband pbCaps 1</i> }
<i>cmtsAgentCaps</i>	{ <i>pacificBroadband pbCaps 2</i> }
<i>pbKodiakMG10AgentCaps</i>	{ <i>pacificBroadband pbCaps 3</i> }

- ***pbGenericSystemAgentCapsR2***—defines the agent capabilities which are common to all Juniper Networks system/chassis products
- ***CmtsAgentCaps***—defines the baseline agent capabilities for Juniper Networks CMTS SNMP agents
- ***pbKodiakMG10AgentCaps***—defines agent capabilities specific to the CMTS

Tables in Enterprise MIBs

Table 7 summarizes the tables that are defined in the enterprise MIB modules, along with the table indices, the table Object ID, and the MIB that defines them. See the MIBs in the following sections for table descriptions and contents.

Table 7: Tables Within Enterprise MIBs

Table	Indices	OID	MIB
pbCmtsIfDownstreamChannelTable	ifIndex	1.3.6.1.4.1.5987.2.2.1.2.2	PBC-CMTS-MIB
pbCmtsIfUpstreamChannelTable	ifIndex	1.3.6.1.4.1.5987.2.2.1.3.2	
pbCardIfIndexTable	ifIndex	1.3.6.1.4.1.5987.2.1.1.9	PBC-GENERIC-MIB
pbCardTable	pbCardIfCardIndex	1.3.6.1.4.1.5987.2.1.1.11	
pbCardPortTable	pbCardIfCardIndex pbCardIfPortIndex	1.3.6.1.4.1.5987.2.1.1.12	
pbPortIfTable	pbCardIfPortIndex pbPortIfIndex	1.3.6.1.4.1.5987.2.1.1.13s	
systemEnvMonAmbientTemperatureTable	pbCardIfCardIndex	1.3.6.1.4.1.5987.3.1.1.1.3.4	PBC-KODIAK-M-G10-MIB
systemEnvMonFanTrayStatusTable	systemEnvMonFanStatusIndex	1.3.6.1.4.1.5987.3.1.1.1.6	
systemEnvMonFanStatusTable	systemEnvMonFanTrayStatusIndex systemEnvMonFanStatusIndex	1.3.6.1.4.1.5987.3.1.1.1.8	

Notifications in Enterprise MIBs

Table 8 summarizes the notifications that are defined in the enterprise MIB modules, along with the MIB that defines them, their descriptions, the MIB variables that are returned, and the Object ID of each notification.

Table 8: Notifications Within Enterprise MIBs

Notification	MIB / Description / Objects Returned / OID
pbCmtsEnvMonNotification	PBC-CMTS-MIB
	Notifications generated by environmental monitoring.
	docsDevEvLevel docsDevEvId docsDevEvText
	1.3.6.1.4.1.5987.2.2.3.3.1
pbCmtsChassisNotification	PBC-CMTS-MIB
	Chassis-related notifications.
	docsDevEvLevel docsDevEvId docsDevEvText
	1.3.6.1.4.1.5987.2.2.3.3.2

Notification	MIB / Description / Objects Returned / OID
pbcCmtsSoftwareNotification	PBC-CMITS-MIB
	Notifications from the software management system.
	docsDevEvLevel docsDevEvId docsDevEvText
	1.3.6.1.4.1.5987.2.2.3.3.3
pbcCmtsAccessNotification	PBC-CMITS-MIB
	Access-related notifications.
	docsDevEvLevel docsDevEvId docsDevEvText
	1.3.6.1.4.1.5987.2.2.3.3.4
pbcCmtsConfigNotification	PBC-CMITS-MIB
	Notifications related to configuration changes.
	docsDevEvLevel docsDevEvId docsDevEvText
	1.3.6.1.4.1.5987.2.2.3.3.5
pbcCmtsDataPathNotification	PBC-CMITS-MIB
	Notifications related to datapath events.
	docsDevEvLevel docsDevEvId docsDevEvText
	1.3.6.1.4.1.5987.2.2.3.3.6
pbcCmtsRFInterfaceNotification	PBC-CMITS-MIB
	Notifications related to RF interface events.
	docsDevEvLevel docsDevEvId docsDevEvText
	1.3.6.1.4.1.5987.2.2.3.3.7

MIB Module PBC-ENT-MIB

The PBC-ENT-MIB that follows has been formatted to enhance readability. It was parsed from the actual PBC-ENT-MIB file that is written in compliance with Structure of Management Information, Version 2.



Note

Some portions of the enterprise MIBs presented in section “MIB Module PBC-ENT-MIB” on page 17 through section “MIB Module PBC-KODIAK-M-G10-MIB” on page 30 (for example, AGENT-CAPABILITIES) are not represented as they are not relevant to a discussion of private MIB objects. For the complete representation of the enterprise MIBs, see the MIB files provided.

Last Updated: 200106072341Z

Organization: Pacific Broadband Communications, Inc.

Contact: Contact: Customer Support Group

Purpose: This module defines the enterprise managed object space for products from Pacific Broadband Communications, Inc.

Postal: Pacific Broadband Communications, Inc

3103 North First Street

San Jose, CA USA 95134

PHONE: +1 408.468.6200

EMAIL: support@pbc.com

WEB: <http://www.pacificbroadband.com>

(C)opyright 2001, Pacific Broadband Communications, Inc.

Imported Definitions

Definition	Source
enterprises	RFC1155-SMI
MODULE-IDENTITY	SNMPv2-SMI
OBJECT-IDENTITY	SNMPv2-SMI

MIB Module PBC-GENERIC-MIB

The PBC-GENERIC-MIB that follows has been formatted to enhance readability. It was parsed from the actual PBC-GENERIC-MIB file that is written in compliance with the Structure of Management Information, Version 2.

Imported Definitions

Last Updated: 200106211620Z

Organization: Pacific Broadband Communications

Contact: Contact: Customer Support Group

Purpose: This module defines management objects which are common to all PBC chassis/system products.

Imported Definitions

Definition	Source
ifIndex	IF-MIB
InterfaceIndex	IF-MIB
pbModuleRegs	PBC-ENT-MIB
pbManagement	PBC-ENT-MIB
pbCaps	PBC-ENT-MIB
OBJECT-GROUP	SNMPv2-CONF
AGENT-CAPABILITIES	SNMPv2-CONF
MODULE-COMPLIANCE	SNMPv2-CONF
TimeTicks	SNMPv2-SMI
Unsigned32	SNMPv2-SMI
OBJECT-TYPE	SNMPv2-SMI
MODULE-IDENTITY	SNMPv2-SMI
DisplayString	SNMPv2-TC
DateAndTime	SNMPv2-TC
TEXTUAL-CONVENTION	SNMPv2-TC

OBJECT IDENTIFIERS

Identifier	Registration
pbGeneric	1.3.6.1.4.1.5987.2.1
pbChassis	1.3.6.1.4.1.5987.2.1.1
pbGenericConformance	1.3.6.1.4.1.5987.2.1.2
pbGenericGroups	1.3.6.1.4.1.5987.2.1.2.1
pbGenericCompliance	1.3.6.1.4.1.5987.2.1.2.2

Textual Conventions

Name: PortType
Syntax: Enumerated

pbCChassis

Name	Syntax	Access	Registration
pbCChassisEntityIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.1
pbCChassisOperStatus	Enumerated	read-only	1.3.6.1.4.1.5987.2.1.1.2
pbCChassisSlots	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.3
pbCContactInfo	Octet String	read-only	1.3.6.1.4.1.5987.2.1.1.4
pbCHostName	Octet String	read-write	1.3.6.1.4.1.5987.2.1.1.5
pbCDomainName	Octet String	read-write	1.3.6.1.4.1.5987.2.1.1.6
pbCDateTimeOfLastChange	Octet String	read-only	1.3.6.1.4.1.5987.2.1.1.7
pbCCardIfIndexTableNumEntries	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.8

Table: pbCCardIfIndexTable

For each ifIndex currently exposed by the system, this table will provide an association to the physical and logical objects which are related to it.

PbCCardIfIndexEntry

Name	Syntax	Access	Registration
pbCCardIfCardIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.9.1.1
pbCCardIfPortNumber	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.9.1.2
pbCCardIfPortType	Enumerated	read-only	1.3.6.1.4.1.5987.2.1.1.9.1.3
pbCCardIfSlotNumber	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.9.1.4
pbCCardIfPortIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.9.1.5

pbCChassis

Name	Syntax	Access	Registration
pbCCardTableNumEntries	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.10

Table: pbcCardTable

Chassis card table.

PbcCardEntry

Name	Syntax	Access	Registration
pbcCardSlotNumber	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.11.1.1
pbcCardEntityIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.11.1.2
pbcCardAdminStatus	Enumerated	read-write	1.3.6.1.4.1.5987.2.1.1.11.1.3
pbcCardOperStatus	Enumerated	read-only	1.3.6.1.4.1.5987.2.1.1.11.1.4
pbcCardUpTime	Timeticks	read-only	1.3.6.1.4.1.5987.2.1.1.11.1.5
pbcCardnvRAMSize	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.11.1.6
pbcCardNumPorts	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.11.1.7

Table: pbcCardPortTable

Describes the ports on a particular card and their current status.

PbcCardPortEntry

Name	Syntax	Access	Registration
pbcCardPortStatus	Enumerated	read-only	1.3.6.1.4.1.5987.2.1.1.12.1.1
pbcCardPortEntityIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.2.1.1.12.1.2

Table: pbcPortIfTable

Lists the interfaces (ifIndex values) associated with a specific port.

PbcPortIfEntry

Name	Syntax	Access	Registration
pbcPortIfIndex	Integer Range	read-only	1.3.6.1.4.1.5987.2.1.1.13.1.1

PBC-GENERIC-MIB Object Details

pbCChassisEntityIndex

Registration: 1.3.6.1.4.1.5987.2.1.1.1
Access: read-only
Reference: None
Description: entPhysicalIndex of the chassis' entry in the Entity MIB's (RFC2737) entPhysicalTable or '0', if none.

pbCChassisOperStatus

Registration: 1.3.6.1.4.1.5987.2.1.1.2
Access: read-only
Reference: None
Description: Chassis' current operational status.

pbCChassisSlots

Registration: 1.3.6.1.4.1.5987.2.1.1.3
Access: read-only
Reference: None
Description: Number of slots in this chassis, or '0' if neither applicable nor determinable.

pbCContactInfo

Registration: 1.3.6.1.4.1.5987.2.1.1.4
Access: read-only
Reference: None
Description: Pacific Broadband contact information.

pbCHostName

Registration: 1.3.6.1.4.1.5987.2.1.1.5
Access: read-write
Reference: None
Description: Name of this system.

pbCDomainName

Registration: 1.3.6.1.4.1.5987.2.1.1.6
Access: read-write
Reference: None
Description: Domain name for this host.

pbCDateTimeOfLastChange

Registration: 1.3.6.1.4.1.5987.2.1.1.7
Access: read-only
Reference: None
Description: Date and time of last change to either the configuration or the software.

pbCCardIfIndexTableNumEntries

Registration: 1.3.6.1.4.1.5987.2.1.1.8
Access: read-only
Reference: None
Description: Number of entries currently in the pbCCardIfIndexTable. This should be the same number as there are entries in the ifTable.

pbcCardEntityIndex

Registration: 1.3.6.1.4.1.5987.2.1.1.11.1.2

Access: read-only

Reference: None

Description: entPhysicalIndex of this card's entry in the Entity MIB's (RFC2737) entPhysicalTable or '0', if none.

pbcCardAdminStatus

Registration: 1.3.6.1.4.1.5987.2.1.1.11.1.3

Access: read-write

Reference: None

Description: The desired state of the card. When a card/module initializes, its initial pbcCardAdminStatus is down(2). As a result of either explicit management action or per configuration information retained by the managed system, pbcCardAdminStatus is then changed to either the up(1) or testing(3) states (or remains in the down(2) state). If a management application writes reset(4) to this object, the card will initiate a full re-initialization.

pbcCardOperStatus

Registration: 1.3.6.1.4.1.5987.2.1.1.11.1.4

Access: read-only

Reference: None

Description: The operational status of the card. pbcCardOperStatus is operational(2) when a card is recognized by the device and is enabled for operation. pbcCardOperStatus is disabled(3) if the card is not recognized by the device, or if it is not enabled for operation. pbcCardOperStatus is standby(4) if the card is enabled and acting as a standby/redundant slave.

pbcCardUpTime

Registration: 1.3.6.1.4.1.5987.2.1.1.11.1.5

Access: read-only

Reference: None

Description: The value of sysUpTime for this management entity, when this card was last (re-)initialized.

pbcCardnvRAMSize

Registration: 1.3.6.1.4.1.5987.2.1.1.11.1.6

Access: read-only

Reference: None

Description: Amount of non-volatile RAM in bytes.

pbcCardNumPorts

Registration: 1.3.6.1.4.1.5987.2.1.1.11.1.7

Access: read-only

Reference: None

Description: Number of ports on this card, or '0' if no ports or not applicable or determinable.

pbcCardPortStatus

Registration: 1.3.6.1.4.1.5987.2.1.1.12.1.1

Access: read-only

Reference: None

Description: The current operational status of this port.

MIB Module PBC-CMTS-MIB

The PBC-CMTS-MIB that follows has been formatted to enhance readability. It was parsed from the actual PBC-CMTS-MIB file that is written in compliance with the Structure of Management Information, Version 2.

Imported Definitions

Last Updated: 200106211721Z

Organization: Pacific Broadband Communications

Contact: Contact: Customer Support Group

Purpose: This module defines all management objects which are common to PBC CMTS products.

Imported Definitions

Definition	Source
docsDevEvLevel	DOCS-CABLE-DEVICE-MIB
docsDevEvId	DOCS-CABLE-DEVICE-MIB
docsDevEvText	DOCS-CABLE-DEVICE-MIB
ifIndex	IF-MIB
pbModuleRegs	PBC-ENT-MIB
pbManagement	PBC-ENT-MIB
pbCaps	PBC-ENT-MIB
pbCardIfPortIndex	PBC-GENERIC-MIB
AGENT-CAPABILITIES	SNMPv2-CONF
OBJECT-GROUP	SNMPv2-CONF
MODULE-COMPLIANCE	SNMPv2-CONF
NOTIFICATION-GROUP	SNMPv2-CONF
Integer32	SNMPv2-SMI
Unsigned32	SNMPv2-SMI
Gauge32	SNMPv2-SMI
Counter32	SNMPv2-SMI
BITS	SNMPv2-SMI
OBJECT-TYPE	SNMPv2-SMI
MODULE-IDENTITY	SNMPv2-SMI
NOTIFICATION-TYPE	SNMPv2-SMI
TruthValue	SNMPv2-TC
TEXTUAL-CONVENTION	SNMPv2-TC

OBJECT IDENTIFIERS

Identifier	Registration
pbCmts	1.3.6.1.4.1.5987.2.2
pbCmtsIfMibExtendedObjects	1.3.6.1.4.1.5987.2.2.1
pbCGeneral	1.3.6.1.4.1.5987.2.2.1.1
pbCDownStreamMgmt	1.3.6.1.4.1.5987.2.2.1.2
pbCUpStreamMgmt	1.3.6.1.4.1.5987.2.2.1.3
pbCmtsNotificationManagement	1.3.6.1.4.1.5987.2.2.3
pbCmtsSystemNotifications	1.3.6.1.4.1.5987.2.2.3.3
pbCmtsConformance	1.3.6.1.4.1.5987.2.2.3
pbCmtsGroups	1.3.6.1.4.1.5987.2.2.3.1
pbCmtsCompliances	1.3.6.1.4.1.5987.2.2.3.2

Textual Conventions

Name: TenthdBmV
Syntax: Integer32

Name: TenthdB
Syntax: Integer32

Name: OneHundredthdBmVPerHz
Syntax: Integer32

pbCDownStreamMgmt

Name	Syntax	Access	Registration
pbCmtsIfDownstreamNumEntries	Unsigned32	read-only	1.3.6.1.4.1.5987.2.2.1.2.1

Table: pbCmtsIfDownstreamChannelTable

PBC-specific management objects associated with downstream channels.

PbcCmtsIfDownstreamChannelEntry

Name	Syntax	Access	Registration
pbCmtsIfDownstreamIfTxPower	Enumerated	read-only	1.3.6.1.4.1.5987.2.2.1.2.2.1.1

pbCUpStreamMgmt

Name	Syntax	Access	Registration
pbCmtsIfUpstreamNumEntries	Unsigned32	read-only	1.3.6.1.4.1.5987.2.2.1.3.1

Table: pbCmtsIfUpstreamChannelTable

PBC-specific management objects associated with upstream channels.

PbcCmtsIfUpstreamChannelEntry

Name	Syntax	Access	Registration
pbCmtsIfUpstreamPort	Integer32	read-write	1.3.6.1.4.1.5987.2.2.1.3.2.1.1
pbCmtsIfUpstreamOperMode	Enumerated	read-write	1.3.6.1.4.1.5987.2.2.1.3.2.1.2
pbCmtsIfUpstreamCmdRcvdPwr	Integer32	read-write	1.3.6.1.4.1.5987.2.2.1.3.2.1.3
pbCmtsIfUpstreamPowerLevel	Integer32	read-only	1.3.6.1.4.1.5987.2.2.1.3.2.1.4
pbCmtsIfUpstreamMER	Integer32	read-only	1.3.6.1.4.1.5987.2.2.1.3.2.1.5
pbCmtsIfUpstreamHcsErrors	Counter32	read-only	1.3.6.1.4.1.5987.2.2.1.3.2.1.6
pbCmtsIfUpstreamCrcErrors	Counter32	read-only	1.3.6.1.4.1.5987.2.2.1.3.2.1.7
pbCmtsIfUpstreamCER	Gauge32	read-only	1.3.6.1.4.1.5987.2.2.1.3.2.1.8

pbCmtsNotificationManagement

Name	Syntax	Access	Registration
pbCmtsEventsEnable	Enumerated	read-write	1.3.6.1.4.1.5987.2.2.3.1
pbCmtsNotificationsControl	BITS	read-write	1.3.6.1.4.1.5987.2.2.3.2

PBC-CMTS-MIB Object Details

pbCmtsIfDownstreamNumEntries

Registration: 1.3.6.1.4.1.5987.2.2.1.2.1

Access: read-only

Reference: None

Description: Number of downstream channels represented in the downstream channel table.

pbCmtsIfDownstreamIfTxPower

Registration: 1.3.6.1.4.1.5987.2.2.1.2.2.1.1

Access: read-only

Reference: None

Description: Intermediate Frequency (IF) signal power being supplied to the upconverter on this channel.

pbCmtsIfUpstreamNumEntries

Registration: 1.3.6.1.4.1.5987.2.2.1.3.1

Access: read-only

Reference: None

Description: Number of upstream channels in the upstream channel table.

pbCmtsIfUpstreamPort

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.1

Access: read-write

Reference: None

Description: Associates the upstream channel with one of the physical upstream cable connectors. A value of -1 indicates that the channel currently is not associated with any port.

pbCmtsIfUpstreamOperMode

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.2

Access: read-write

Reference: None

Description: Controls the usage of this channel as follows: 1 = available (for use)
2 = standby (for redundancy purposes) 3 = inUse (channel is configured for data)
4 = scanning (doing dedicated spectral analysis) 5 = unlicensed (a 'key' is required to access the channel)

pbCmtsIfUpstreamCmdRcvdPwr

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.3

Access: read-write

Reference: None

Description: Commanded received power.

pbCmtsIfUpstreamPowerLevel

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.4

Access: read-only

Reference: None

Description: Upstream's sample-based measured received signal power.

pbcCmtsIfUpstreamMER

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.5
Access: read-only
Reference: None
Description: Upstream channel's modulation error ratio expressed in tenths of a dB.

pbcCmtsIfUpstreamHcsErrors

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.6
Access: read-only
Reference: None
Description: Channel's HCS errors detected.

pbcCmtsIfUpstreamCrcErrors

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.7
Access: read-only
Reference: None
Description: CRC errors detected on this channel.

pbcCmtsIfUpstreamCER

Registration: 1.3.6.1.4.1.5987.2.2.1.3.2.1.8
Access: read-only
Reference: None
Description: Percentage of codewords that had unrecoverable errors.

pbcCmtsEventsEnable

Registration: 1.3.6.1.4.1.5987.2.2.3.1
Access: read-write
Reference: None
Description: Enables or disables vendor specific event generation.

pbcCmtsNotificationsControl

Registration: 1.3.6.1.4.1.5987.2.2.3.2
Access: read-write
Reference: None
Description: A '1' in a given bit position enables that class of notifications.

MIB Module PBC-KODIAK-M-G10-MIB

The PBC-KODIAK-M-G10-MIB that follows has been formatted to enhance readability. It was parsed from the actual PBC-KODIAK-M-G10-MIB file that is written in compliance with the Structure of Management Information, Version 2.

Imported Definitions

Last Updated: 200106211721Z
Organization: Pacific Broadband Communications
Contact: Contact: Customer Support Group
Purpose: MIB Module for the Kodiak M-G10 CMTS.

Imported Definitions

Definition	Source
pbModuleRegs	PBC-ENT-MIB
pbProducts	PBC-ENT-MIB
pbCaps	PBC-ENT-MIB
pbReqs	PBC-ENT-MIB
pbCardIfCardIndex	PBC-GENERIC-MIB
OBJECT-GROUP	SNMPv2-CONF
AGENT-CAPABILITIES	SNMPv2-CONF
MODULE-COMPLIANCE	SNMPv2-CONF
Integer32	SNMPv2-SMI
Unsigned32	SNMPv2-SMI
OBJECT-TYPE	SNMPv2-SMI
MODULE-IDENTITY	SNMPv2-SMI

OBJECT IDENTIFIERS

Identifier	Registration
pbKodiakMG10Cmts	1.3.6.1.4.1.5987.3.1
pbG10SystemEnvMon	1.3.6.1.4.1.5987.3.1.1
systemEnvMonObjects	1.3.6.1.4.1.5987.3.1.1.1
systemEnvMonPowerSupply	1.3.6.1.4.1.5987.3.1.1.1.1
systemEnvMonTemperature	1.3.6.1.4.1.5987.3.1.1.1.3
pbG10SystemConformance	1.3.6.1.4.1.5987.3.1.2
pbG10SystemGroups	1.3.6.1.4.1.5987.3.1.2.1
pbG10SystemCompliance	1.3.6.1.4.1.5987.3.1.2.2

systemEnvMonPowerSupply

Name	Syntax	Access	Registration
systemEnvMonPowerSupplyEntityIndex	Integer32	read-write	1.3.6.1.4.1.5987.3.1.1.1.1.1
systemEnvMonPowerSupplyStatus	Enumerated	read-write	1.3.6.1.4.1.5987.3.1.1.1.1.2

systemEnvMonTemperature

Name	Syntax	Access	Registration
systemEnvMonAmbientTemperatureHighThreshold	Integer32	read-write	1.3.6.1.4.1.5987.3.1.1.1.3.1
systemEnvMonAmbientTemperatureLowThreshold	Integer32	read-write	1.3.6.1.4.1.5987.3.1.1.1.3.2
systemEnvMonAmbientTemperatureNumEntries	Unsigned32	read-only	1.3.6.1.4.1.5987.3.1.1.1.3.3

Table: systemEnvMonAmbientTemperatureTable

Table of temperature status maintained by the system/chassis environment monitor.

SystemEnvMonAmbientTemperatureEntry

Name	Syntax	Access	Registration
systemEnvMonAmbientTemperature	Integer32	read-only	1.3.6.1.4.1.5987.3.1.1.1.3.4.1.1

systemEnvMonObjects

Name	Syntax	Access	Registration
systemEnvMonFanTrayStatusNumEntries	Unsigned32	read-only	1.3.6.1.4.1.5987.3.1.1.1.5

Table: systemEnvMonFanTrayStatusTable

Table of fan status maintained by the system environment monitor.

SystemEnvMonFanTrayStatusEntry

Name	Syntax	Access	Registration
systemEnvMonFanTrayStatusIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.3.1.1.1.6.1.1
systemEnvMonFanTrayStatusEntityIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.3.1.1.1.6.1.2

systemEnvMonObjects

Name	Syntax	Access	Registration
systemEnvMonFanStatusNumEntries	Unsigned32	read-only	1.3.6.1.4.1.5987.3.1.1.1.7

Table: systemEnvMonFanStatusTable

Table with individual fan speeds for the fans in each tray.

SystemEnvMonFanStatusEntry

Name	Syntax	Access	Registration
systemEnvMonFanStatusIndex	Unsigned32	read-only	1.3.6.1.4.1.5987.3.1.1.1.8.1.1
systemEnvMonFanStatusSpeed	Integer32	read-only	1.3.6.1.4.1.5987.3.1.1.1.8.1.2

PBC-KODIAK-M-G10-MIB Object Details

systemEnvMonPowerSupplyEntityIndex

Registration: 1.3.6.1.4.1.5987.3.1.1.1.1
Access: read-write
Reference: None
Description: entPhysicalIndex of this card's entry in the Entity MIB's (RFC2737) entPhysicalTable or '0', if none.

systemEnvMonPowerSupplyStatus

Registration: 1.3.6.1.4.1.5987.3.1.1.1.2
Access: read-write
Reference: None
Description: The current status of the power supply which can be: (1) Normal (2) Degraded (3) Failed.

systemEnvMonAmbientTemperatureHighThreshold

Registration: 1.3.6.1.4.1.5987.3.1.1.1.3.1
Access: read-write
Reference: None
Description: If the ambient temperature exceeds this value, a warning notification will be generated. The user may use this feature to be alerted to problems with the HVAC at the installed location.

systemEnvMonAmbientTemperatureLowThreshold

Registration: 1.3.6.1.4.1.5987.3.1.1.1.3.2
Access: read-write
Reference: None
Description: If the ambient temperature falls below this value, a warning notification will be generated. The user may use this feature to be alerted to problems with the HVAC at the installed location.

systemEnvMonAmbientTemperatureNumEntries

Registration: 1.3.6.1.4.1.5987.3.1.1.1.3.3
Access: read-only
Reference: None
Description: Number of entries in the temperature monitoring status table.

systemEnvMonAmbientTemperature

Registration: 1.3.6.1.4.1.5987.3.1.1.1.3.4.1.1
Access: read-only
Reference: None
Description: Current temperature at the monitoring point for this module (card).

systemEnvMonFanTrayStatusNumEntries

Registration: 1.3.6.1.4.1.5987.3.1.1.1.5
Access: read-only
Reference: None
Description: Number of entries in the fan status monitoring table.

systemEnvMonFanTrayStatusIndex

Registration: 1.3.6.1.4.1.5987.3.1.1.1.6.1.1
Access: read-only
Reference: None
Description: Chassis-assigned index number of this fan tray.

systemEnvMonFanTrayStatusEntityIndex

Registration: 1.3.6.1.4.1.5987.3.1.1.1.6.1.2
Access: read-only
Reference: None
Description: entPhysicalIndex of this fan tray's entry in the Entity MIB's (RFC2737) entPhysicalTable or '0', if none.

systemEnvMonFanStatusNumEntries

Registration: 1.3.6.1.4.1.5987.3.1.1.1.7
Access: read-only
Reference: None
Description: Number of fan entries in the fan status table.

systemEnvMonFanStatusIndex

Registration: 1.3.6.1.4.1.5987.3.1.1.1.8.1.1
Access: read-only
Reference: None
Description: Description.

systemEnvMonFanStatusSpeed

Registration: 1.3.6.1.4.1.5987.3.1.1.1.8.1.2
Access: read-only
Reference: None
Description: The chassis-assigned index number for this fan.

Part 2

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