PMC-CGM

Installation and Use

6806800D53C

March 2008

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About this Manual

Overview of Contents

This manual is divided into the following chapters and appendices.

- *Safety Notes* on page 13 provides safety relevant information when handling the product.
- *Sicherheitshinweise* on page 17 provides a German translation of the Safety Notes section.
- *Introduction* on page 21 provides a basic overview of the features of the product.
- *Hardware Preparation and Installation* on page 25 outlines the installation requirements, switch settings, installation and removal procedures.
- *Controls, LEDs and Connectors* on page 31 describes the LEDs, key, and connectors of the product.
- *Access and Configuration* on page 35 provides procedures that necessary when handling the product.
- *MIB Description* on page 47 gives an overview on the Private Emerson CGM-CONTROL-MIB and describes the implemented MIB objects.
- Appendix A, *Related Documentation,* on page 63 lists related documentation and specifications.

Abbreviations

This document uses the following abbreviations:

Abbreviation	Definition
AdvancedTCA	Advanced Telecom Computing Architecture
AIS	Alarm Indication Signal
AMC	Alarm Management Controller
ANSI	American National Standards Institute
BITS	Building Integrated Timing Source
CD-ROM	Compact-Disk Read-Only Memory
CGM	Clock Generator Module
CISPR	Comité Internationale Spécial des Perturbations Radioelectrotechnique (International Special Committee on Radio Interference, IEC)
DC	Direct Current
DHCP	Dynamic Host Configuration Protocol
DPLL	Digital Phase-Locked Loop

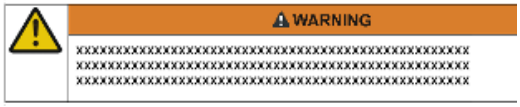
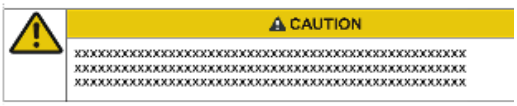
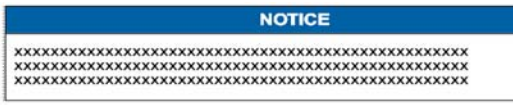
Abbreviation	Definition
EMC	Electromagnetic Compatibility
EN	European Norm
ESF	Extended Super Frame
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
FDL	Facility Data Link
FPGA	Field Programmable Gate-Array
FPS	Frames Per Second
FW	Firmware
GmbH	Gesellschaft mit begrenzter Haftung
IEC	International Electrotechnical Commission
IP	Internet Protocol
IPMI	Intelligent Platform Management Interface
IS	In Sevice
KHz	Kilohertz
LED	Light Emitting Diode
MHz	Megahertz
MIB	Management Information Base
NEBS	Network Equipment Building Standards
NVRAM	Non-Volatile Random Access Memory
OID	Object Identifier
OOS	Out of Service
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
PICMG	PCI Industrial Computer Manufacturers Group
PLL	Phase-Locked Loop
PMC	PCI Mezzanine Card
RTM	Rear Transmission Module
RoHS	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment
SELV	Safety Extra Low Voltage
SGA	Shelf Geographical Address
SNMP	Simple Network Management Protocol
TFTP	Trivial File Transfer Protocol
TNV	Telecommunication Network Voltage

Abbreviation	Definition
TPE	Twisted-Pair Ethernet
UL	Underwriters Laboratories Incorporated
VCCI	Voluntary Control Council for Interference
VLAN	Virtual Local Area Network

Conventions

The following table describes the conventions used throughout this manual.

Notation	Description
0x00000000	Typical notation for hexadecimal numbers (digits are 0 through F), for example used for addresses and offsets
0b0000	Same for binary numbers (digits are 0 and 1)
bold	Used to emphasize a word
`Screen`	Used for on-screen output and code related elements or commands in body text
`Courier + Bold`	Used to characterize user input and to separate it from system output
Reference	Used for references and for table and figure descriptions
File > Exit	Notation for selecting a submenu
<text>	Notation for variables and keys
[text]	Notation for software buttons to click on the screen and parameter description
...	Repeated item for example node 1, node 2, ..., node 12
. . .	Omission of information from example/command that is not necessary at the time being
..	Ranges, for example: 0..4 means one of the integers 0,1,2,3, and 4 (used in registers)
|	Logical OR

Notation	Description
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
	Indicates a property damage message
	No danger encountered. Pay attention to important information

Summary of Changes

This manual has been revised and replaces all prior editions.

Part Number	Publication Date	Description
6806800D53A	June 2007	Development acces draft version
6806800D53B	September 2007	Added content to chapters "Access and Configuration" and "MIB Description", editorial changes
6806800D53C	March 2008	Updated manual to Emerson style, added section *Configuring the Module* on page 28, updated front panel graphics to include crossed-out telephone receiver, added section *Using a MIB Browser* on page 37, updated section *Define SNMP Trap Destinations* on page 38, removed object cgmPathStateT4, added Table "Input Assignments" on page 48, added "cgmBootString" object to Table "cgmSys Objects" on page 58, editorial changes

Comments and Suggestions

We welcome and appreciate your comments on our documentation. We want to know what you think about our manuals and how we can make them better.

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In "Area of Interest" select "Technical Documentation". Be sure to include the title, part number, and revision of the manual and tell us how you used it.

Safety Notes

This section provides warnings that precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed during all phases of operation, service, and repair of this equipment. You should also employ all other safety precautions necessary for the operation of the equipment in your operating environment. Failure to comply with these precautions or with specific warnings elsewhere in this manual could result in personal injury or damage to the equipment.

Emerson intends to provide all necessary information to install and handle the product in this manual. Because of the complexity of this product and its various uses, we do not guarantee that the given information is complete. If you need additional information, ask your Emerson representative.

The product has been designed to meet the standard industrial safety requirements. It must not be used except in its specific area of office telecommunication industry and industrial control.

Only personnel trained by Emerson or persons qualified in electronics or electrical engineering are authorized to install, remove or maintain the product.

The information given in this manual is meant to complete the knowledge of a specialist and must not be used as replacement for qualified personnel.

Keep away from live circuits inside the equipment. Operating personnel must not remove equipment covers. Only factory authorized service personnel or other qualified service personnel may remove equipment covers for internal subassembly or component replacement or any internal adjustment.

Do not install substitute parts or perform any unauthorized modification of the equipment or the warranty may be voided. Contact your local Emerson representative for service and repair to make sure that all safety features are maintained.

Electrical Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Emerson could void the user's authority to operate the equipment. A proper installation in a compliant system will maintain the required performance. Use only shielded cables when connecting peripherals to assure that appropriate radio frequency emissions compliance is maintained.

Operation

Product Damage
Surface
High humidity and condensation on the product surface causes short circuits.
Do not operate the product outside the specified environmental limits. Make sure the product is completely dry and there is no moisture on any surface before applying power.

Overheating and Product Damage
Operating the product without forced air cooling may lead to overheating and thus damage of the product.
When operating the product, make sure that forced air cooling is available in the shelf.

Installation

Damage of Circuits
Electrostatic discharge and incorrect installation and removal of the product can damage circuits or shorten their life.
Before touching the product or electronic components, make sure that your are working in an ESD-safe environment.

Product Damage
Incorrect installation of the product can cause damage of the product.
Only use handles when installing/removing the product to avoid damage/deformation to the face plate and/or PCB.

Damage to Product/Backplane or System Components
Bent pins or loose components can cause damage to the product, the backplane, or other system components.
Therefore, carefully inspect the product and the backplane for both pin and component integrity before installation.

Emerson and our suppliers take significant steps to ensure there are no bent pins on the backplane or connector damage to the boards prior to leaving the factory. Bent pins caused by improper installation or by inserting boards with damaged connectors could void the Emerson warranty for the backplane or boards.

Configuration Switches

Malfunction of the Product
Switches marked as "Reserved" might carry production-related functions and can cause the product to malfunction if their setting is changed.
Therefore, do not change settings of switches marked as "reserved".

Damage of the Product
Setting/resetting the switches during operation can cause damage of the product.
Therefore, check and change switch settings before you install the product.

Cabling and Connectors

Product Damage
The RJ-45 connector(s) on the face plate are BITS interfaces. Connecting a telephone to such a connector may destroy your telephone as well as the product.
Make sure that BITS connectors near your working area are clearly marked as network connectors. In addition, observe the following safety notes:

- **Verify that the length of an electric cable connected to a BITS bushing does not exceed 100 m.**
- **Make sure the BITS bushing of the system is connected only to Telecommunication Network Voltage level 1 (TNV-1) circuits.**

If in doubt, ask your system administrator.

Environment

Always dispose of used modules, system components and RTMs according to your country’s legislation and manufacturer’s instructions.

Sicherheitshinweise

Dieses Kapitel enthält Hinweise, die potentiell gefährlichen Prozeduren innerhalb dieses Handbuchs vorrangestellt sind. Beachten Sie unbedingt in allen Phasen des Betriebs, der Wartung und der Reparatur des Systems die Anweisungen, die diesen Hinweisen enthalten sind. Sie sollten außerdem alle anderen Vorsichtsmaßnahmen treffen, die für den Betrieb des Produktes innerhalb Ihrer Betriebsumgebung notwendig sind. Wenn Sie diese Vorsichtsmaßnahmen oder Sicherheitshinweise, die an anderer Stelle diese Handbuchs enthalten sind, nicht beachten, kann das Verletzungen oder Schäden am Produkt zur Folge haben.

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Das System erfüllt die für die Industrie geforderten Sicherheitsvorschriften und darf ausschließlich für Anwendungen in der Telekommunikationsindustrie und im Zusammenhang mit Industriesteuerungen verwendet werden.

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Halten Sie sich von stromführenden Leitungen innerhalb des Produktes fern. Entfernen Sie auf keinen Fall Abdeckungen am Produkt. Nur werksseitig zugelassenes Wartungspersonal oder anderweitig qualifiziertes Wartungspersonal darf Abdeckungen entfernen, um Komponenten zu ersetzen oder andere Anpassungen vorzunehmen.

Installieren Sie keine Ersatzteile oder führen Sie keine unerlaubten Veränderungen am Produkt durch, sonst verfällt die Garantie. Wenden Sie sich für Wartung oder Reparatur bitte an die für Sie zuständige Geschäftsstelle von Emerson. So stellen Sie sicher, dass alle sicherheitsrelevanten Aspekte beachtet werden.

EMV

Das Produkt wurde in einem Emerson Standardsystem getestet. Es erfüllt die für digitale Geräte der Klasse A gültigen Grenzwerte in einem solchen System gemäß den FCC-Richtlinien Abschnitt 15 bzw. EN 55022 Klasse A. Diese Grenzwerte sollen einen angemessenen Schutz vor Störstrahlung beim Betrieb des Produktes in Gewerbe- sowie Industriegebieten gewährleisten.

Das Produkt arbeitet im Hochfrequenzbereich und erzeugt Störstrahlung. Bei unsachgemäßem Einbau und anderem als in diesem Handbuch beschriebenen Betrieb können Störungen im Hochfrequenzbereich auftreten.

Warnung! Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen. In diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen.

Operation

Beschädigung des Produktes
Hohe Luftfeuchtigkeit und Kondensat auf der Oberfläche des Blades können zu Kurzschlüssen führen.
Betreiben Sie das Produkt nur innerhalb der angegebenen Grenzwerte für die relative Luftfeuchtigkeit und Temperatur. Stellen Sie vor dem Einschalten des Stroms sicher, dass sich auf dem Produkt kein Kondensat befindet.

Überhitzung und Beschädigung des Blades
Betreiben Sie das Blade ohne Zwangsbelüftung, kann das Blade überhitzt und schließlich beschädigt werden.
Bevor Sie das Blade betreiben, müssen Sie sicher stellen, dass das Shelf über eine Zwangskühlung verfügt.

Installation

Beschädigung von Schaltkreisen
Elektrostatische Entladung und unsachgemäßer Ein- und Ausbau von Blades kann Schaltkreise beschädigen oder ihre Lebensdauer verkürzen.
Bevor Sie Blades oder elektronische Komponenten berühren, vergewissern Sie sich, dass Sie in einem ESD-geschützten Bereich arbeiten.

Beschädigung des Produktes
Fehlerhafte Installation des Produktes kann zu einer Beschädigung des Produktes führen.
Verwenden Sie die Handles, um das Produkt zu installieren/deinstallieren. Auf diese Weise vermeiden Sie, dass das Front Panel oder die Platine deformiert oder zerstört wird.

Beschädigung des Produktes, der Backplane oder von System Komponenten
Verbogene Pins oder lose Komponenten können zu einer Beschädigung des Produktes, der Backplane oder von Systemkomponenten führen.
Überprüfen Sie daher das Produkt sowie die Backplane vor der Installation sorgältig und stellen Sie sicher, dass sich beide in einwandfreien Zustand befinden und keine Pins verbogen sind.

Emerson und unsere Zulieferer unternehmen größte Anstrengungen um sicherzustellen, dass sich Pins und Stecker von Boards vor dem Verlassung der Produktionsstätte in einwandfreiem Zustand befinden. Verbogene Pins, verursacht durch fehlerhafte Installation oder durch Installation von Boards mit beschädigten Steckern kann die durch Emerson gewährte Garantie für Boards und Backplanes erlöschen lassen.

Schaltereinstellungen

Fehlfunktion des Produktes
Schalter, die mit 'Reserved' gekennzeichnet sind, können mit produktionsrelevanten Funktionen belegt sein. Das Ändern dieser Schalter kann im normalen Betrieb Störungen auslösen.
Verstellen Sie nur solche Schalter, die nicht mit 'Reserved' gekennzeichnet sind. Prüfen und ggf. ändern Sie die Einstellungen der nicht mit 'Reserved' gekennzeichneten Schalter, bevor Sie das Produkt installieren.

Beschädigung des Produktes
Das Verstellen von Schaltern während des laufenden Betriebes kann zur Beschädigung des Produktes führen.
Prüfen und ändern Sie die Schaltereinstellungen, bevor Sie das Produkt installieren.

Kabel und Stecker

Beschädigung des Produktes
Die RJ-45-Stecker an der Frontblende sind BITS-Schnittstellen. Der Anschluss eines Telefones an die RJ-45-Stecker kann sowohl das Telefon als auch das Produkt zerstören.
Stellen Sie daher sicher, dass BITS-Stecker an Ihrem Arbeitsplatz eindeutig als Netzwerkstecker gekennzeichnet sind. Beachten Sie ferner die folgenden Sicherheitsweise:

- **Stellen Sie sicher, dass die Länge eines Kabels, welches an den BITS-Stecker angeschlossen ist, 100 m nicht überschreitet.**
- **Stellen Sie sicher, dass der BITS-Stecker ausschließlich mit einem TNV-1 Stromkreis verbunden ist.**
- **Wenden Sie sich bei Fragen an ihren Systemadministrator.**

Umweltschutz

Entsorgen Sie alte Batterien und/oder Blades/Systemkomponenten/RTMs stets gemäß der in Ihrem Land gültigen Gesetzgebung und den Empfehlungen des Herstellers.

Introduction

1

1.1 Features

The Clock Generator Module (PMC-CGM) is a PMC module which is either available together with the Emerson ATCA-F103 switch or as part of an accessory kit. It can only be used in conjunction with the ARTM-F103-STX.

The PMC-CGM is delivered with payload software which lets you configure and monitor the clock synchronization via SNMPv2 and Management Information Bases (MIBs). You may use the software as an interface to write a higher-level clock manager software.

The PMC-CGM serves the following purposes:

- Synchronizes to a reference clock (line card clock CLK3, aka. REFA/REFB or external E1/T1 clock) and provides a system clock (CLK1/CLK2) in an AdvancedTCA chassis and to up to two extension shelves.
- Acts as temporary stand-alone clock source if all reference clocks failed while maintaining clock phase and frequency as long as possible ("holdover mode").
  This is accomplished by measuring the reference clock against a high-precision oscillator and calculating the frequency/phase offset to be applied when the reference clock fails.

The hardware/firmware is designed so that two clock modules form a protection (master/slave) pair. If the master module fails, the slave module takes over seamlessly without disturbing the system clocks.

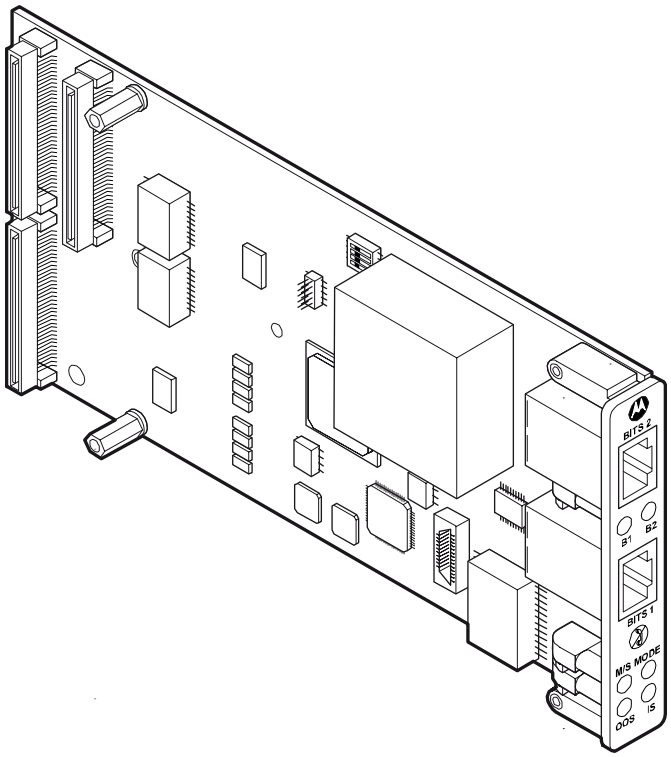
For a PMC-CGM support on the ATCA-F103, the following software versions (or higher) are required on the ATCA-F103:

- Application: 4.0.629
- IPMI firmware: 1.03.082
- Bootloader: 4.0.629

For more details on the clocking concept used in your system refer to the *Centellis CO 31kX Installation and Use* manual.

The following graphic shows the PMC-CGM.

Figure 1-1 PMC-CGM



1.2 Standard Compliances

The PMC-CGM, when installed in a compliant chassis, meets the following standards:

Table 1-1 Standard Compliances and Clocking Standards

Standard	Description
UL 60950-1, EN 60950-1, IEC 60950-1 CAN/CSA C22.2 No 60950-1	Legal safety requirements
CISPR 22 CISPR 24 EN 55022 EN 55024 FCC Part 15 Industry Canada ICES-003 VCCI Japan AS/NZS CISPR 22 EN 300 386 NEBS Standard GR-1089 CORE	Legal EMC requirements on system level (predefined Emerson system)

Table 1-1 Standard Compliances and Clocking Standards (continued)

Standard	Description
G.703	BITS interface
G.813 TR-1244	Clock quality
ANSI/IPC-A610 Rev.C Class 2 ANSI/IPC-7711 ANSI/IPC-7721 ANSI-J-001...003	Manufacturing requirements
NEBS Standard GR-63-CORE ETSI EN 300 019 series	Environmental requirements
PICMG 3.0 R1.0	Defines mechanics, blade dimensions, power distribution, power and data connectors, and system management

The product has been designed to meet the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) Directive 2002/95/EC.

1.3 Ordering Information

As of the printing date of this manual, this guide supports the boards model listed below.

Table 1-2 Available Board Variants

Order Number	Description
PMC-CGM2	TELECOM CLOCK GENERATOR MODULE FOR ATCA-F103 (RoHS 6/6)

Hardware Preparation and Installation

2

2.1 Overview

In this section, you can find information on the following topics:

- Things to observe before the installation
- Installation procedure
- Available accessories

2.2 Before Installation

This section provides the following information:

- Unpacking and inspecting the module
- Requirements

2.2.1 Unpacking and Inspecting the Module

NOTICE

Damage of Circuits
Electrostatic discharge and incorrect module installation and removal can damage circuits or shorten their life.
Before touching the module or electronic components, make sure that you are working in an ESD-safe environment.

Shipment Inspection

To inspect the shipment, perform the following steps.

1. Verify that you have received all items of your shipment:
   Printed user manual
   PMC-CGM module
   Any optional items ordered

2. Check for damage and report any damage or differences to the customer service.
3. Remove the desiccant bag shipped together with the module and dispose of it according to your country's legislation.

The product is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, please contact our customer's service immediately.

2.2.2 Requirements

Before you power up the module, calculate the power needed according to your system configuration.

2.2.2.1 Environmental Requirements

You must make sure that the board, when operated in your particular system configuration, meets the environmental requirements specified below.

Operating temperatures refer to the temperature of the air circulating around the board and not to the component temperature.

NOTICE

Board Damage
High humidity and condensation on the board surface causes short circuits.
Do not operate the board outside the specified environmental limits. Make sure the board is completely dry and there is no moisture on any surface before applying power.

Table 2-1 Environmental Requirements

Feature	Operating	Non-Operating (packed state)
Temperature	+5ºC (+41°F) to +40ºC (+104°F) (normal operation) according to NEBS Standard GR-63-CORE -5°C (+23°F) to +55°C (+131°F) (exceptional operation) according to NEBS Standard GR-63-CORE	-40ºC (-40°F) to +85ºC (+185°F)
Temp. change	+/- 0.25ºC/min according to NEBS Standard GR-63-CORE	+/- 0.25ºC/min
Relative humidity	5% to 90% non-condensing according to Emerson-internal environmental requirements	5% to 95% non-condensing according to Emerson-internal environmental requirements
Vibration (tested in target platform)	0.1 g from 5 to 100 Hz and back to 5 Hz at a rate of 0.1 octave/minute.	5-20 Hz at 0.01 g^2/Hz 20-200 Hz at -3.0 dB/octave Random 5-20 Hz at 1 m^2/Sec^3 Random 20-200 Hz at -3 dB/octave
Shock	Half-sine, 11 mSec, 30 m/Sec^2	Blade level packaging Half-sine, 6 mSec at 180 m/Sec^2
Free fall	-	200 mm/all edges and corners 1.0 m (packaged) per ETSI 300 019-2-2 (Blade level packaging) 100 mm (unpackaged) per GR-63-CORE

2.2.2.2 Power Requirements

Make sure that the module is only used on an ATCA-F103 blade in an AdvancedTCA shelf connected to -48VDC up to -60VDC (rated voltage), according to Telecommunication Network Voltage (TNV-2).

A TNV-2 circuit is a circuit whose normal operating voltages exceed the limits for a safety-extra-low-voltage (SELV) under normal operating conditions, and which is not subject to overvoltages from telecommunication networks.

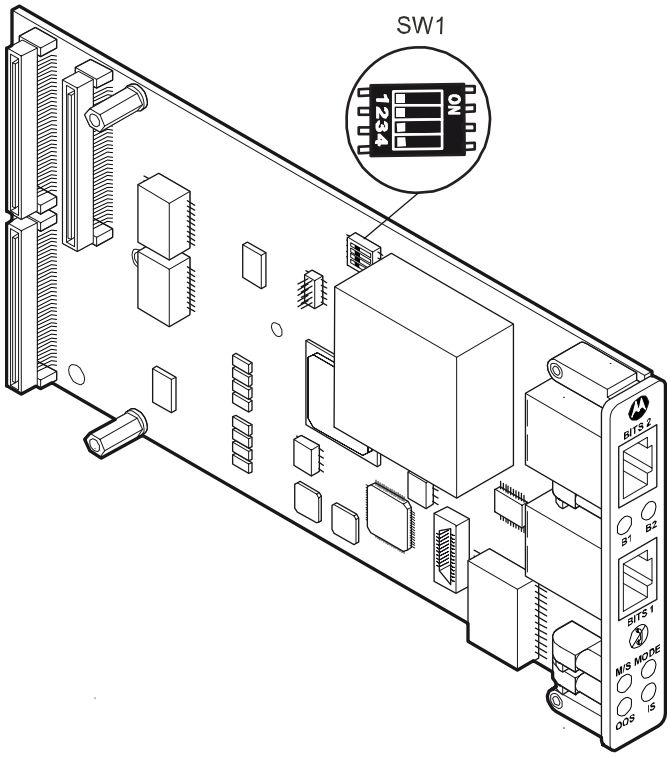
Table 2-2 DC Module Power Requirements

Feature	Value
Rated Voltage	3.3V
Operating Voltage	3.3V +/-3%
Input current	1.5A
PMC-CGM power dissipation	5W (max.)

2.3 Configuring the Module

The module provides the configuration switch SW1 as shown in the following figure. The switch settings shown in the figure correspond to the default settings. The switches are displayed as the small white squares.

Figure 2-1 Switch Location



NOTICE

Product Malfunction
Switches marked as 'reserved' might carry production-related functions and can cause the product to malfunction if their setting is changed.
Therefore, do not change settings of switches marked as 'reserved'. The setting of switches which are not marked as 'reserved' has to be checked and changed before product installation.

Product Damage
Setting/resetting the switches during operation can cause product damage.
Therefore, check and change switch settings before you install the product.

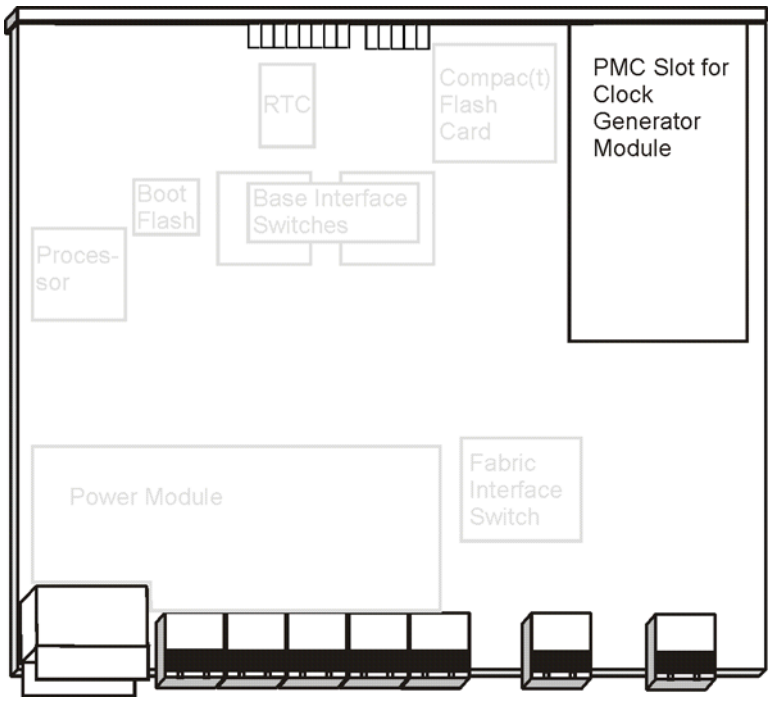
Table 2-3 Switch Settings

Switch	Description
SW1-1	Reserved (OFF: default value)
SW1-2	Reserved (OFF: default value)
SW1-3	Restores default static IP addresses OFF: Dynamic IP addresses are assigned by the ATCA-M100, for details refer to Table "MIB Browser Settings" on page 37 (default) ON: Static IP addresses are assigned 192.168.21.40: acces via ETHA on ARTM-F103-STX 192.168.22.40: acces via ETHB on ARTM-F103-STX
SW1-4	Reserved (OFF: default value)

2.4 Installing and Removing the Module

The PMC-CGM can be installed on the PMC slot of the AdvancedTCA ATCA-F103 blade.

Figure 2-2 Location of PMC Slot on ATCA-F103



Before installing an PMC module observe the following notes.

- **To ensure proper EMC shielding, either operate the blade with the PMC-CGM module installed or with a blind panel.**
- **If the blade is upgraded with a PMC module, ensure that the blind panel is stored in a safe place in order to be reused again when removing the PMC module.**

Installation Procedure

To install the PMC module, proceed as follows:

1. Remove the blind panel from the PMC slot of the ATCA-F103.
2. Store the blind panel in a safe place.
3. Connect the PMC module carefully to the PMC slot.
4. Make sure that standoffs of the PMC module cover the mounting holes of the blade.
5. Place the screws delivered with the PMC module into the mounting holes of the blade (from the back side of the blade).
6. Fasten screws.
7. Connect interface cables as required - for more information refer to the *ARTM-F103-STX Installation and Use* manual.

Removal Procedure

To remove a PMC module, proceed as follows:

1. Remove interface cables, if applicable.
2. Remove screws from back side of the blade's PMC slot.
3. Disconnect PMC module carefully from the PMC slot.
4. Install the blind panel.

2.5 Hardware Upgrades and Acessories

In multi-shelf configurations, you need a clock distribution cable. Emerson offers an accessory kit which contains a category 5 cable of 10 m length. For more information refer to the *CABLE-CGM2-CLK Installation and Use* manual.

Controls, LEDs and Connectors

3

3.1 Overview

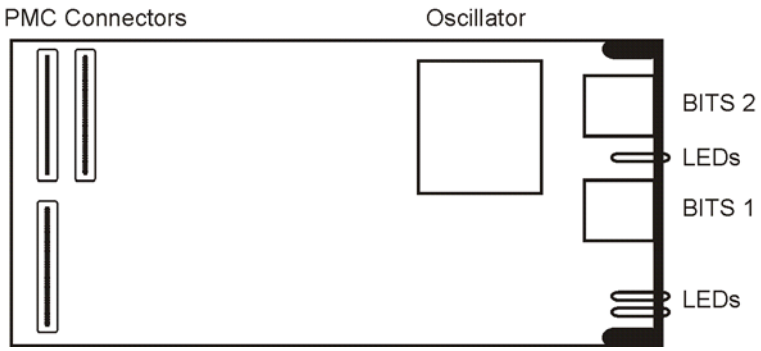
This chapter describes:

- Layout
- Front panel connectors and LEDs

3.2 Layout

The following figure shows the main components of the PMC-CGM.

Figure 3-1 Module Layout



3.3 Front Panel Connectors and LEDs

At the front panel of the PMC-CGM, there are the two RJ-45 connectors for the Building Integrated Timing Source (BITS) interfaces and six LEDs.

The Ethernet ports for the PMC-CGM are located on the ARTM-F103.

Figure 3-2 Front Panel

3.3.1 BITS Interface Connectors

The module provides two RJ-45 BITS front panel connectors.

NOTICE

Product Damage
The RJ-45 connector(s) on the face plate are BITS interfaces. Connecting a telephone to such a connector may destroy your telephone as well as the product.
Make sure that BITS connectors near your working area are clearly marked as network connectors. In addition, observe the following safety notes:

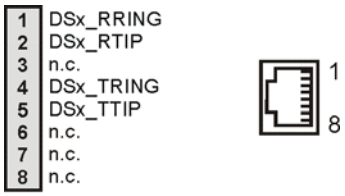
- **Verify that the length of an electric cable connected to a BITS bushing does not exceed 100 m.**
- **Make sure the BITS bushing of the system is connected only to Telecommunication Network Voltage level 1 (TNV-1) circuits.**

If in doubt, ask your system administrator.

Figure 3-3 BITS Connector Location

You can find the signal description of the the BITS connectors in the following figure where x is the number of the BITS connector.

Figure 3-4 BITS Connector Pin Assignment



3.3.2 LEDs

The product provides the following LEDs.

Figure 3-5 LED Location

You can find a description of the LEDs in the following table.

Table 3-1 LED Description

Name	Description
B1	BITS Interface 1 Status Green: BITS interface 1 is in use and status is okay Orange: BITS interface 1 is in use and status is not okay Red: : BITS interface 1 is out-of-service OFF: Not defined
B2	BITS Interface 2 Status Green: BITS interface 2 is in use and status is okay Orange: BITS interface 2 is in use and status is not okay Red: : BITS interface 2 is out-of-service OFF: Not defined
M/S	Master/Slave Operation Green: PMC-CGM operates as Master Amber: Not defined Yellow: PMC-CGM operates as Slave OFF: PMC-CGM is non-operational (by application)
Mode	Mode Green: PMC-CGM operates in locked mode Amber: PMC-CGM operates in holdover mode Yellow: PMC-CGM operates in free-run mode OFF: not defined
OOS	Out-Of-Service Red: PMC-CGM is out-of-service Off: Not defined
IS	In Service Green: PMC-CGM is in service Off: Not defined

Access and Configuration

4

4.1 Overview

In this chapter, you can find information on the following topics:

- How to access the module.
- What to observe when using a MIB browser.
- How to configure the module.

4.2 Accessing the PMC-CGM

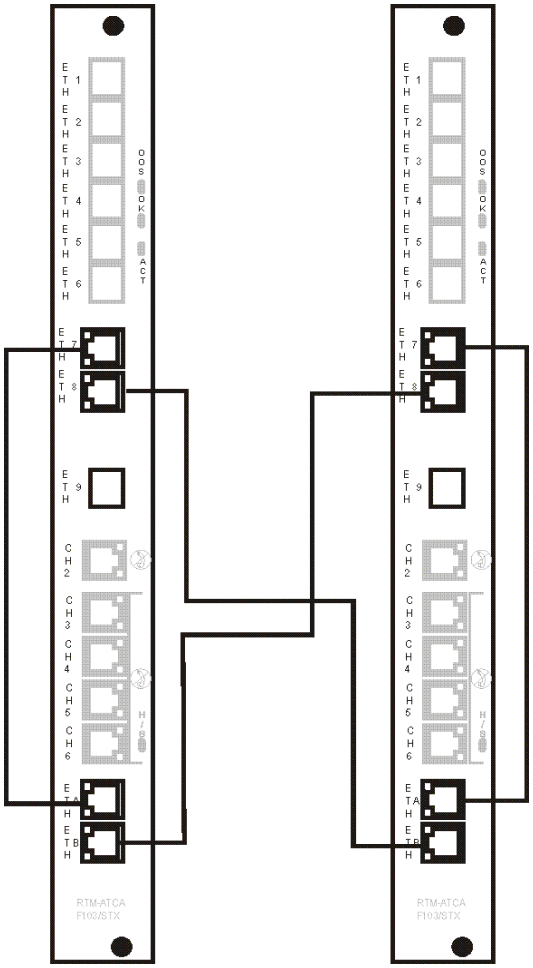
To access the module you have to provide the necessary cabling and then use IPMI or a MIB browser to access to the module, for details refer to the following sections.

4.2.1 Cabling

To access the PMC-CGM, you have to attach an Ethernet cable to the ARTM-F103-STX as shown in the following graphic.

It is mandatory that you connect port ETH7 with ETHA on the same ARTM-F103-STX and that you cross-connect ETH8 with ETHB on the peer ARTM-F103-STX as indicated below.

Figure 4-1 Connecting the ARTM-F103-STX Ethernet Ports



4.2.2 Access

To access the module you can either use IPMI or a MIB browser.

For details on how to access the module via IPMI refer to the *PMC-CGM: Control via IPMI Programmer's Reference*.

When using a MIB browser, you have to specify the settings described in *Using a MIB Browser* on page 37.

4.3 Using a MIB Browser

When you are using a MIB browser to configure the PMC-CGM, you have to use the following settings.

Table 4-1 MIB Browser Settings

Setting	Value
Read community	Public
Write community	Public
Dynamic IP addresses assigned by ATCA-M100	172.17.<SGA>.18: acces via ETHA on left ARTM-F103-STX 172.18.<SGA>.18: acces via ETHB on left ARTM-F103-STX 172.17.<SGA>.28: acces via ETHB on right ARTM-F103-STX 172.18.<SGA>.28: acces via ETHA on right ARTM-F103-STX The first three octets of the IP addresses correspond to the first three octets of the shelf manager IP connection record (SMICR) which is part of the chassis FRU. It can be extracted by the ShM of your system. For details of the SMICR refer to the *PICMG 3.0 Rev. 1.0 AdvancedTCA Base Specification*.

All changes that you apply via the MIB browser are volatile, that means they are lost when the module is rebooted. The only exception is the cgmBootString (OID:.1.3.6.1.4.1.3656.8152.1.3.33) object, which is stored in the NVRAM.

4.4 Configuring the PMC-CGM

To configure the PMC-CGM, you can perform the following tasks which are described in detail in the following sections.

- Define the IP address of the protection partner module
- Define SNMP trap destinations
- Configure the interface mode - SDH/E1 versus SONET/T1
- Configure the BITS interface
- Configure the initial master/slave role
- Setup a multishelf configuration
- Configure the reference clock
- Upgrade the firmware/software
- Reset the PMC-CGM
- Configure parameters for event handling

You can perform these tasks independently from each other.

4.4.1 Define IP Address of the Protection Partner Module

The PMC-CGM modules usually work in a master/slave configuration. The protection partner is the other PMC-CGM module, regardless of the master/slave role. The default partner address is configured according to the IP address configuration described in Table "MIB Browser Settings" on page 37.

Defining the IP address of the protection partner module

To define the IP address via the MIB, process as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. In object cgmProtectionPartnerAddress OID: .1.3.6.1.4.1.3656.8152.1.1.22.0 set the IP address of the partner PMC-CGM module.

4.4.2 Define SNMP Trap Destinations

The PMC-CGM firmware keeps an event log which captures errors, warnings and informative messages in a RAM buffer. The event log can always be accessed via SNMP. Additionally, it is possible to configure the firmware so that each entry up to a certain severity level is posted as an SNMP trap to a specified destination.

Defining SNMP Trap Destinations

To define SNMP trap destinations, proceed as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. Go to object cgmBootString OID:.1.3.6.1.4.1.3656.8152.1.3.33.
4. Enter IP address to which the SNMP traps have to be sent in the h|host|trapDest parameter.
   This setting is stored persitently in the NVRAM of the module and is applied after the next reboot.
5. Go to object cgmTrapDestination OID: .1.3.6.1.4.1.3656.8152.1.3.32.0.
6. Enter IP address to which the SNMP traps have to be sent.
   This setting is only valid until the next reboot. After the reboot, the default IP address defined via the cgmBootString object is applied.

4.4.3 Configure the Interface Mode

You can chose between SONET/T1 and SDH/E1 mode via the MIB object cgmInterfaceMode OID: .1.3.6.1.4.1.3656.8152.1.1.10.0. The modes are used in different regions.

Table 4-2 Interface Modes

Mode Type	MIB Value	Purpose
SONET/T1	0	USA
SDH/E1	1 (default)	Europe/Asia

This entry determines whether an input frequency of 1544KHz (Sonet/T1) or 2048KHz (SDH/E1) can be selected for the cgmInputFrequency object (OID:.1.3.6.1.4.1.3656.8152.1.1.1.1.3).

Configuring the interface mode

To configure the interface mode of the PMC-CGM, proceed as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. Go to object cgmInterfaceMode OID: .1.3.6.1.4.1.3656.8152.1.1.10.0.
4. Check whether the default value meets your requirements.
   Otherwise, change the value as required.

4.4.4 Configure the BITS Interface

The interface mode determines whether the BITS interface operates in E1 (default value) or T1 mode.

Configuring the BITS interface

To set the line type and line code of the BITS interface, proceed as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. In cgmBitsTable OID: .1.3.6.1.4.1.3656.8152.1.1.2 go to object dsx1LineCode OID: .1.3.6.1.4.1.3656.8152.1.1.2.1.5 and select desired line code value.
   For details on the available values refer to Table "cgmBitsTable" on page 49.
4. In cgmBitsTable OID: .1.3.6.1.4.1.3656.8152.1.1.2 go to object dsx1LineType OID: .1.3.6.1.4.1.3656.8152.1.1.2.1.4 and select desired line type value.
   For details on the available values refer to Table "cgmBitsTable" on page 49.

4.4.5 Configure Initial Master/Slave Role

After the initial configuration, the master/slave roles are handled by the DPLL software that runs on the processor of the PMC-CGM.

Configuring the initial master/slave roles

To configure the initial master/slave roles, proceed as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. Check the master/slave role of the current PMC-CGM module in the cgmProtectionState object OID:.1.3.6.1.4.1.3656.8152.1.1.19.0.
   The following values are possible: 0 (standaloneMaster: Communication with the partner is not possible and the module is running in master mode.), 1 (slave), 2 (master).
4. Adapt the master/slave role of the current PMC-CGM module, if necessary, in the cgmProtectionCmd object OID:.1.3.6.1.4.1.3656.8152.1.1.20.0.
   The following values are possible:
   0 - Attempt to become master. This is only possible if a valid clock input is present.
   1 - Give up mastership to the protection partner. This is only possible if the partner (slave) has a valid input other than MS_SYNC.
5. Check whether the role change was successful in the cgmProtectionState object OID:.1.3.6.1.4.1.3656.8152.1.1.19.0.

4.4.6 Setup Multi-Shelf Configuration

You have to define the number of extension shelves, up to two extension shelves are possible.

Setting up a multi-shelf configuration

To set up a multi-shelf configuration, proceed as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. Go to cgmExtChConnection object OID:.1.3.6.1.4.1.3656.8152.1.4.11.0.
4. Select the properties of the connections to extension chassis 2 and 3.
   The following values are possible:
   Single Chassis (0) - default value
   Chassis 2 in extension mode (1)
   Chassis 3 in extension mode (3)
   Chassis 2&3 in extension mode (5)

4.4.7 Configure the Reference Clock

You can define the reference clock source, the frequency and the priority of the reference clock inputs. For a description of the respective MIB objects refer to Table "cgmInputTable" on page 47.

Reference clock sources are:

- BITS interface 1 (input 3, frequency automatically configured via interface mode)
- BITS interface 2 (input 4, frequency automatically configured via interface mode)
- Linecard reference clcok A (input 7)
- Linecard reference clock B (input 12)

For the slave, the reference clock is always the Master/Slave synchronization clock. This is automatically configured.

When you initially assign priorities, we recommend to start with the highest priority input. Otherwise, the PLL may switch inputs unnecessarily or end up locked on a low-priority input while a higher priority input is also valid.

If you want to change the selected PLL input by changing the priority, you have to change to revertive mode first (cgmProtectionRevertiveModeState OID:.1.3.6.1.4.1.3656.8152.1.1.18.0).

Configuring the reference clock source for the T0/T4 path

To configure the reference clock, proceed as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. Go to cgmInputFrequency object OID:.1.3.6.1.4.1.3656.8152.1.1.1.1.3.<instance number which is equal to input number -1>.
4. Select the desired input frequency.
   The following values are possible:
   0: 8 KHz
   1: 1544 KHz / 2048 KHz, depending on E1/T1 operation.
   3: 19.44 MHz
5. Go to cgmT0InputPrioritiy object OID:.1.3.6.1.4.1.3656.8152.1.1.1.1.4.<instance number which is equal to input number -1>.
6. Select the desired input priority.
   A priority value from 2 to 15 is used by the T0 PLL to select an input. A lower numerical value means a higher priority. A value of 0 disables the input, that means it will not be selected as reference clock. A value of 1 cannot be set as it is used for the master/slave synchronization clock.
   Default value is 0.
   This setting is applied to the protection partner as well.

7. For the T4 path, repeat steps 5 and 6 with the cgmT4InputPriority object OID:.1.3.6.1.4.1.3656.8152.1.1.1.1.5.<instance number which is equal to input number -1>.

8. Go to cgmInputRefASource object OID:.1.3.6.1.4.1.3656.8152.1.4.16.0.

9. Select the source (chassis) of the primary linecard derived reference clock. The following values are possible:
   local reference A (0) - default value
   local reference B (1)
   Chassis 2 reference A (2)
   Chassis 2 reference B (3)
   Chassis 3 reference A (4)
   Chassis 3 reference B (5)

10. Go to cgmInputRefBSource object OID:.1.3.6.1.4.1.3656.8152.1.4.18.0.

11. Select the source of the "secondary" linecard derived reference clock (REFB input to PLL). Not relevant for distributed mode.
    local reference A (0)
    local reference B (1) - default value
    Chassis 2 reference A (2)
    Chassis 2 reference B (3)
    Chassis 3 reference A (4)
    Chassis 3 reference B (5)

4.4.8 Perform Firmware/Software Upgrade

You can upgrade the firmware/software of the PMC-CGM via the MIB. The firmware/software upgrade is done by downloading an image from a TFTP server and programming it into the inactive partition of the boot flash (that means not the one which is currently running) which is split into two partitions of 32MB each. By default, only one of the two partitions (the active partition) is accessible.

Upgrading the firmware/software

To upgrade the firmware/software, proceed as follows:

1. Start SNMP manager or MIB browser.

2. Connect to the PMC-CGM using one of its IP addresses.

3. Go to object cgmFwUpdateHost OID: .1.3.6.1.4.1.3656.8152.1.3.26.0.

4. Enter the IP address of the TFTP server that contains the new image.

5. Go to object cgmFwUpdateFile OID:.1.3.6.1.4.1.3656.8152.1.3.27.0.

6. Enter the file that contains the new image.

7. Go to object cgmFwUpdateMd5 OID:.1.3.6.1.4.1.3656.8152.1.3.28.0.

8. Enter the checksum (hexadecinal format) of the new image which is contained in the .md5 file delivered together with the new image.
   This checksum is verified after downloading the TFTP image and after programming it into the boot flash.

9. Go to the object cgmFwUpdateOption OID:.1.3.6.1.4.1.3656.8152.1.3.29.0.

10. Select how to handle revision numbers of the old and the new image.
    The following values are possible:
    "newer" (0): only images with a version number higher than the current one can be programmed.
    "newerOrSame" (1): images with the same or a higher version number can be programmed.
    "allowDowngrade" (2): downgrade is possible.
    "noVersionCheck" (3): no version check is performed at all. This allows installing images which do not contain version information.

11. Go to the object cgmFwUpdateStart OID:.1.3.6.1.4.1.3656.8152.1.3.30.0.

12. Start the upgrade by setting the value start (1).
    The upgrade takes about 3-4 minutes.

13. Check the progress of the upgrade by performing a walk on the cgmEventDescr object OID:.1.3.6.1.4.1.3656.8152.1.3.1.1.6.

14. Wait until the message "Firmware update successful" is displayed.

15. Reset the PMC-CGM to apply/boot the new image.

16. Optionally, you can now upgrade the backup partition as well by repeating this procedure.

4.4.9 Reset the PMC-CGM

You can reset the PMC-CGM module via IPMI or SNMP, both methods have the same reset level.

To reset the PMC-CGM via IPMI, the shelf manager issues the IPMI command "Cold Reset". Graceful Shutdown functionality is not implemented for the PMC-CGM.

Resetting the PMC-CGM via SNMP

To reset the module via SNMP, proceed as follows:

1. Start SNMP manager or MIB browser.

2. Connect to the PMC-CGM using one of its IP addresses.

3. Go to object cgmRestartCmd OID:.1.3.6.1.4.1.3656.8152.1.3.25.0.

4. Set object to restart (1).

While resetting the PMC-CGM, the clocks driven by the module are in an undefined state.

4.4.10 Configure Parameters for Event Handling

You can use the following elements as parameters to define how events are handled in your system.

- cgmSysEventLogSize
- cgmSysEventLogCount
- cgmSysEventLogClear
- cgmSysEventLogLevel
- cgmSysEventTrapLevel

You can find a detailed description of these elements in Table "cgmSys Objects" on page 58.

Configuring event handling parameters

To configure the event handling, proceed as follows:

1. Start SNMP manager or MIB browser.
2. Connect to the PMC-CGM using one of its IP addresses.
3. Go to cgmSysEventLogSize object OID:.1.3.6.1.4.1.3656.8152.1.3.10.0.
   It contains the maximum number of events the event log can hold.
4. Go to cgmSysEventLogCount object OID:.1.3.6.1.4.1.3656.8152.1.3.11.0.
   It contains the current number of events present in the event log.
5. Go to cgmSysEventLogClear object OID:.1.3.6.1.4.1.3656.8152.1.3.12.0.
   You can use this element to clear the event log.
   When set to 0, events which have not been accessed will be cleared (an event is marked as "accessed" if its timestamp cgmEventTime is read).
   If set to 1, all events are cleared regardless whether they have been accessed or not. This is not recommended since it may cause events to get lost while the log is about to be cleared.
6. Go to cgmSysEventLogLevel object OID:.1.3.6.1.4.1.3656.8152.1.3.13.0.
   Specifies up to which severity events shall be placed into the event log:
   0 - No events are logged
   1 - Only critical events are logged

2 - Critical events and warnings are logged
3 - Critical events, warning and events are logged
4 - Everything is logged
Default value is (3).

7. Check the default value and adapt it if necessary.

8. Go to cgmSysEventTrapLevel object OID:.1.3.6.1.4.1.3656.8152.1.3.14.0.
Specifies up to which severity new event log entries are posted as a trap (using the cgmLogEvent object).
0 - No events are posted
1 - Only critical events are posted
2 - Critical events and warnings are posted
3 - Critical events, warning and events are posted
4 - Everything is posted
Default value is (3).

9. Check the default value and adapt it if necessary.

MIB Description

5

5.1 Overview

You can use the CGM-CONTROL-MIB to access and control the clock generator module PMC-CGM that is used in your AdvancedTCA system.

It is located at .iso.org.dod.internet.private.enterprises.forceComputers.cgmControlMIB.motCgm (OID: .1.3.6.1.4.1.3656.8152.1).

The CGM-CONTROL-MIB contains the following three main branches.

Table 5-1 MIB Structure

Branch	Used for...
cgmControl	Controlling and configuring the BITS interfaces and the PLL
cgmSys	Maintianing the PMC-CGM (FW/SW upgrade, event log)
cgmClkDist	Distributing clocks in the chassis

5.2 cgmControl

The cgmControl branch contains the following information:

- cgmInputTable - for details refer to Table 5-2 on page 47.
  For details on how to use these MIB objects refer to *Configure the Reference Clock* on page 41.
- cgmBitsTable - for details refer to Table 5-4 on page 49.
  For details on how to use these MIB objects refer to *Configure the BITS Interface* on page 39.
- Various MIB objects that are described in Table 5-5 on page 53.
  For details on how to use these MIB objects refer to *Configure the Interface Mode* on page 39, *Configure Initial Master/Slave Role* on page 40.

The cgmInputTable (OID: .1.3.6.1.4.1.3656.8152.1.1.1) uses the instance number as defined in Table "Input Assignments" on page 48 as index.

Table 5-2 cgmInputTable

OID	MIB Object	Description	Access
.1.1.1.1.2	cgmInputName	Named source for this input. If the string is empty the input is not connected.	r

Table 5-2 cgmInputTable (continued)

OID	MIB Object	Description	Access
.1.1.1.1.3	cgmInputFrequency	Configures the input frequency: 0: 8 KHz 1: 1544 KHz / 2048 KHz, depending on E1/T1 operation. 3: 19.44 MHz	r/w
.1.1.1.1.4	cgmT0InputPriority	This setting is applied to the protection partner as well. A priority value from 2 to 15 used by the T0 PLL to select an input. A lower numerical value means a higher priority. A value of 0 disables the input, that means it will not be selected as reference clock. A value of 1 cannot be set as it is used for the master/slave synchronization clock. Default value is 0.	r/w
.1.1.1.1.5	cgmT4InputPriority	Priority of frequency monitor (T4 Path). Lower numerical values represent a higher priority than greater values. A value of 0 means that the input will never be selected as active input. Default value is 0.	r/w
.1.1.1.1.6	cgmInputState	Indicates whether the input receives a valid clock or not.	r/w
.1.1.1.1.7	cgmInputActivityMonitorEna	Controls whether the activity monitor for this input is enabled.	r/w
.1.1.1.1.8	cgmInputActivityMonitorState	Reports the state of the activity monitor for this input.	r

Table 5-3 Input Assignments

Instance	cgmInputNumber	cgmInputName	Default cgmInputFrequency
2	3	BITS1	freqE1T1 (1)
3	4	BITS2	freqE1T1 (1)
6	7	REFA	freq8K (0)
10	11	MS_SYNC	freq8K (0)
11	12	REFB	freq8K (0)

The cgmBitsTable (OID: .1.3.6.1.4.1.3656.8152.1.1.2) uses bitsInterfaceNumber as index.

Table 5-4 cgmBitsTable

OID	MIB Object	Description	Access
.1.1.2.1.1	bitsInterfaceNumber	0 for BITS interface 1 1 for BITS interface 2	r
.1.1.2.1.2	bitsEnable	Enables (0) or disables (1) a BITS interface. Enabling the interface also applies various default parameters, depending on the operation mode defined in <cgmInterfaceMode>: E1/SDH Mode: - <dsx1LineType> is <dsx1E1> - <dsx1LineCode> is <dsx1HDB3> -< bitsLiuE1Lbo> is <o120> T1/Sonet Mode: - <dsx1LineType> is <dsx1D4> - <dsx1LineCode> is <dsx1B8ZS> - <bitsLiuT1Lbo> is <ft0to133> Default value is enabled (0).	r/w
.1.1.2.1.3	bitsTxEnable	Enables/disables the line interface transmitter. Default value is enabled (1).	r/w
.1.1.2.1.4	dsx1LineType	Line type configuration. The allowed settings depend on the module's interface mode: Applicable for E1: - dsx1E1 (value 4, default) - dsx1E1CRCMF (value 7) - dsx1E1G703 (value 12) - dsx1E1UnframedAll1 (value 9) (Setting this line type is equivalent to Transmit AIS in E1 mode.) - dsx1E1UnframedAlt (value 11, 0101… pattern) Applicable for T1: - dsx1D4 (value 3, default) - dsx1ESF (value 2) - dsx1UnframedAll1 (value 8) - dsx1UnframedAlt (value 10, 0101.. pattern)	r/w
.1.1.2.1.5	dsx1LineCode	E1/T1 Line code. Applicable for E1: - dsx1HDB3 (default) - dsx1AMI Applicable for T1: - dsx1B8ZS (default) - dsx1AMI	r/w

Table 5-4 cgmBitsTable (continued)

OID	MIB Object	Description	Access
.1.1.2.1.6	dsx1LoopbackConfig	Loopback mode Loopback mode disabled (1) local (payload) loopback - Tx to Rx (2) line loopback - Rx to Tx (3) Default value is disabled (1).	r/w
.1.1.2.1.7	dsx1LineStatus	Current line status. This is a bit mask encoding the following states: -Bit 0 (value 0x01): Yellow alarm condition -Bit 3 (value 0x08): Alarm condition -Bit 5 (value 0x20): Loss of Frame condition -Bit 6 (value 0x40): Loss of Signal condition	r
.1.1.2.1.10	bitsCurSsm	The last received synchronization status message **Not yet supported**	r
.1.1.2.1.11	bitsSsmE1SaSelect	Selects on which Sa bit the E1 synchronization status message is expected. Default value is (4). **Not yet supported**	r/w
.1.1.2.1.13	bitsLiuJaEn	Enable jitter attenuator Default value is disabled (0).	r/w
.1.1.2.1.14	bitsLiuJaDs	Jitter attenuator depth (32 or 128 bits) Default value is 128 bits (0).	r/w
.1.1.2.1.16	bitsLiuEgl	Receive equalizer gain limit for T1 (-36/-15dB) and E1 (-43/-12dB) Default value is (0).	r/w
.1.1.2.1.18	bitsLiuE1Lbo	E1 line build-out select in Ohm (without and with high return loss) 120 Ohm (1) 120 Ohm with high return loss (3) Default value is (1).	r/w
.1.1.2.1.19	bitsLiuT1Lbo	T1 line build-out select for DSX-1 application in feet. 0 to 133 ft (0) 133 to 266 (1) 266 to 399 (2) 399 to 533 (3) 533 to 655 (4) Default value is (0).	r/w

Table 5-4 cgmBitsTable (continued)

OID	MIB Object	Description	Access
.1.1.2.1.35	bitsLiuRxLevel	Receive level in dB 2.5 (0) 5.0 (1) 7.5 (2) 10.0 (3) 12.5 (4) 15.0 (5) 17.5 (6) 20.0 (7) 22.5 (8) 25.0 (9) 27.5 (10) 30.0 (11) 32.5 (12) 35.0 (13) 37.5 (14) 40.0 (15)	r
.1.1.2.1.63	bitsT1RxSync	Resynchronization criteria. In D4 framing mode: - opt1 (0): search for Ft pattern, then search for Fs pattern opt2 (1): cross couple Ft and Fs pattern In ESF Framing mode: opt1 (0): search for FPS pattern only opt2 (1): search for FPS and verify with CRC6. Default value is (0).	r/w
.1.1.2.1.69	bitsT1TxYel	Setting this object to on (1), causes the yellow alarm to be transmitted. Default value is (0).	r/w
.1.1.2.1.73	bitsT1TxB7zs	Transmit-side bit 7 zero-suppression enable (bit 7 forced to a 1 in channels with all 0s) Default value is (0).	r/w
.1.1.2.1.75	bitsT1TxFbCT1	Causes the next three consecutive Ft (D4 framing mode) or FPS (ESF framing mode) bits to be corrupted causing the remote end to experience a loss of frame (loss of synchronization) Default value is (0).	r/w
.1.1.2.1.80	bitsT1TaisCi	Transmit AIS-CI Setting this causes the AIS-CI code to be transmitted, as defined in ANSI T1.403 Default value is (0).	r/w

Table 5-4 cgmBitsTable (continued)

OID	MIB Object	Description	Access
.1.1.2.1.81	bitsT1TraiCi	Transmit RAI-CI Setting this bit causes the ESF RAI-CI code to be transmitted in the FDL bit position. Default value is (0).	r/w
.1.1.2.1.91	bitsE1RxSyncC	Frame resynchronization criteria Default value is (0).	r/w
.1.1.2.1.112	bitsT3ClkForce	When set to (1), it, forces the T3 clock output from the framer to be output to the PLL even if no signal is present. This should only be set for test purposes since the framer will generate a free-running clock in the absence of a valid input. Default value is (0).	r/w
.1.1.2.1.113	bitsT3ClkSquelch	When set to disabled (1), it forces the T3 output to the PLL to be active even if a loss of frame or an alarm condition exists. This would typically be disabled for normal operation and only be set for unframed operation. Default value is (0).	r/w
.1.1.2.1.114	bitsTestPattern	An 8- or 16-bit test pattern that will be serialized and repeatedly output on T1E1 port when the test output is enabled. Applies to the following line-type settings: dsx1ESF dsx1D4 dsx1E1 dsx1E1CRCMF dsx1E1unframed Default value is (0).	r/w
.1.1.2.1.115	bitsTestPatternLength	Determines whether a 8 bit (0) or 16 bit (1) test pattern is generated. Applies to the following line-type settings: dsx1ESF dsx1D4 dsx1E1 dsx1E1CRCMF dsx1E1unframed Default value is (0).	r/w

Table 5-4 cgmBitsTable (continued)

OID	MIB Object	Description	Access
.1.1.2.1.116	bitsTestPatternType	Determines the type of the generated test pattern. fixed(0) to use a pattern as defined in bitsTestPattern / bitsTestPatternLength. prbs11 (1) prbs15 (2) qrss20 (3) Default value is (1). Applies to the following line-type settings: dsx1ESF dsx1D4 dsx1E1 dsx1E1CRCMF dsx1E1unframed	r/w

The following table describes the elements of the cgmControl MIB branch (OID:.1.3.6.1.4.1.3656.8152.1.1).

Table 5-5 cgmControl Elements

OID	MIB Object	Description	Access
.1.1.10	cgmInterfaceMode	Defines Sonet/T1 (0) or SDH/E1 (1) operation mode for both BITS interfaces. Affects whether an input frequency of 1544KHz (Sonet/T1) or 2048KHz (SDH/E1) can be selected for the cgmInputFrequency object. Default value is (1).	r/w
.1.1.15	cgmMasterSlaveShelfCombination	Defines whether the master/slave combination is on the same shelf (0) or on different shelves (1). **Note**: only "same shelf" is supported. Default value is (0).	r/w
.1.1.16	cgmMasterSlaveSync	Defines the communication path to the protection partner. Default value is backplane (0).	r/w
.1.1.18	cgmProtectionRevertiveModeState	When a clock module is in revertive operation (0), it will always choose the highest priority valid input. When in nonrevertive operation (1), a selected input will remain selected until it fails. The highest priority valid input will be chosen at that point and remain selected until it fails as well. Default value is (1).	r/w

Table 5-5 cgmControl Elements (continued)

OID	MIB Object	Description	Access
.1.1.19	cgmProtectionState	Indicates whether this module is the master or slave of a protection pair: 0 - standaloneMaster: Communication with the partner is not possible and the module is running in master mode. 1 - slave 2 - master	r
.1.1.20	cgmProtectionCmd	Can be used to manually change the state of the module. 0 - Attempt to become master. This is only possible if a valid clock input is present. 1 - Give up mastership to the protection partner. This is only possible if the partner (slave) has a valid input other than MS_SYNC. Whether the operation failed or succeeded can be seen in the cgmProtectionState element.	r/w
.1.1.21	cgmProtectionMasterToSlaveTrackDelay	The tracking delay for the master/slave synchronization signal in ns units. Default value is automatically configured.	r/w
.1.1.22	cgmProtectionPartnerAddress	The IP address of the protection partner. Default value depends on your configuration.	r/w
.1.1.30	cgmPathStateT0	The current state of the T0 PLL: 0 - freerun 1 - locked 2 - holdover 3 - preLocked 4 - preLocked2 5 - phaseLost 6 - forcedFreerun 7 - forcedHoldover	r
.1.1.32	cgmPathInputT0	The input currently selected for the T0 PLL. The value 255 indicates that no input is selected.	r
.1.1.34	cgmPathInputT4	The input currently selected for the T4 PLL. The value 255 indicates that no input is selected. Other values reflect the cgmInputNumber element in the cgmInputTable table, for details refer to Table "Input Assignments" on page 48.	r
.1.1.40	cgmCLK1OutputFrequency	The output frequency of CLK1: 0 - CLK1 output disabled 1 - 8 KHz Default value is (1).	r/w

Table 5-5 cgmControl Elements (continued)

OID	MIB Object	Description	Access
.1.1.41	cgmCLK2OutputFrequency	The output frequency of CLK2: 0 - CLK2 output disabled 1 - 19.44 MHz Default value is (1).	r/w
.1.1.42	cgmCLK3OutputFrequency	**Not supported on PMC-CGM**	r/w
.1.1.43	cgmCLK1OutputFramePulse	The output frame pulse of the T1 clock: 0 - Not inverted, not pulsed 1 - Not inverted, pulsed 2 - Inverted, not pulsed 3 - Inverted, pulsed Default value is (0).	r/w
.1.1.44	cgmT4ClkSquelch	When set to 0 (enable) the output of the T4 PLL is squelched if no valid input is selected. If set to 1 (disable) an output is provided in any case.	

5.3 cgmSys

The cgmSys branch contains the following information:

- cgmEventTable - for details refer to Table 5-6 on page 55.
- Various MIB objects that are described in Table 5-8 on page 58.
  For a description on how to use these objects refer to *Configure Parameters for Event Handling* on page 44, *Perform Firmware/Software Upgrade* on page 42.

The cgmEventTable (OID:.1.3.6.1.4.1.3656.8152.1.3.1) uses cgmEventNumber as index. The elements of the trap definiton cgmLogEvent (OID:.1.3.6.1.4.1.3656.8152.1.2.0.1) is identical to the elements defined in cgmEventTable.

Table 5-6 cgmEventTable

OID	MIB Object	Description	Access
.1.3.1.1.2	cgmEventTime	System time stamp when event occurred (this is the module's run-time since power-up).	r
.1.3.1.1.3	cgmEventSeverity	The event's severity level 1. Critical (0): An error has occurred which needs immediate attention. 2. Warnings (1): An error has occurred which may affect board operation but does not require immediate attention. 3. Events (2): An event occurred in a board subsystem which may need attention (e.g. the PLL gained lock). 4. Information (3): Various information messages helpful for troubleshooting or monitoring the state of the CGM module.	r

Table 5-6 cgmEventTable (continued)

OID	MIB Object	Description	Access
.1.3.1.1.4	cgmEventCode	A pre-defined event code - for details refer to Table 5-7 on page 56.	r
.1.3.1.1.5	cgmEventData	Event specific data	r
.1.3.1.1.6	cgmEventDescr	Textual event description	r

The following table lists all event codes and their severity. Events which cause the module to give up mastership are marked with an asterisk in the "severity" column.

Table 5-7 Event Codes and Severity

Code	Severity	Description
inputChanged (1)	Event	The selected PLL input has changed.
lostLock (2)	Event	The T0 PLL lost lock and enters holdover mode.
gainedLock (3)	Event	The PLL gained lock.
nowMaster (4)	Event	The module has acquired mastership.
nowSlave (5)	Event	The module has entered slave mode.
validInputsChanged (6)	Event	The validity or more of the PLL inputs has changed .
selectedInputFailed (7)	Event	The selected clock input has failed.
dpllInitError (10)	Warning	Error while initializing the DPLL.
freqValidationError(11)	Warning	One of the clock sources measured in the FPGA is out of range.
inputStateChange (12)	Event	Reported when a state change is detected by the activity monitor. EventData: Upper 16 bits encode the new state, lower 16 bits encode the input number. State can be 0 (working) 1 (failing) 2 (failed) 3 (recovering) 4 (unknown) This is the same information as presented in the cgmInputActivityMonitor element.
lineCardClkError (20)	Warning	Not applicable for PMC-CGM.
lineCardClkSelected (21)	Event	Not applicable for PMC-CGM.
bitsRlof/c (30/34)	Event	"Loss of frame" / "Loss of frame cleared" event detected on a BITS interface. EventData: The BITS interface on which the event has been detected (0 or 1).

Table 5-7 Event Codes and Severity (continued)

Code	Severity	Description
bitsRlos/c (31/35)	Event	"Loss of signal" / "loss of signal cleared" event detected on a BITS interface. EventData: The BITS interface on which the event has been detected (0 or 1).
bitsRais/c (32/36)	Event	"Alarm indication" / "Alarm indication cleared" event detected on a BITS interface. EventData: The BITS interface on which the event has been detected (0 or 1).
bitsRyel/c (33/37)	Event	"Yellow alarm" / "Yellow alarm cleared" event detected on a BITS interface. EventData: The BITS interface on which the event has been detected (0 or 1).
bitsRxSsmChange (38)	Event	A new synchronization status message has been received. EventData: The new SSM message received.
memoryLeak (100)	*Warning	The task checker has detected that the amount of available memory has dropped below the critical threshold.
memAllocError (101)	*Warning	Required memory could not be allocated. EventData: The amount of memory which was attempted to be allocated.
tftpError(102)	Event	A TFTP error occurred (firmware update).
firmwareUpdateFailedNc (103)	Warning	The firmware update failed before accessing the boot flash device.
firmwareUpdateFailedC (104)	*Critical	The firmware update failed possible corruption of the boot flash device. The standby boot flash image has not been made active.
firmwareUpdateSuccess(105)	Event	The firmware update completed successfully.
firmwareUpdateProgress (106)	Event	A firmware update progress message.
abnormalReset(110)	Warning	The last reset resulted from a fatal error condition (checkstop or watchdog). EventData: A bit mask with the following values: 0x10000000: Indicates watchdog reset 0x08000000: Indicates checkstop reset
linkFailure (120)	Warning	The active network connection failed, the firmware switched to the inactive link. EventData: either 0 or 1, indicating the link which failed.
linkSwitch (121)	Event	The active network link was switched. EventData: The new active link (0 or 1)
info (200)	Info	General system information. For debugging only.

Table 5-7 Event Codes and Severity (continued)

Code	Severity	Description
genSysError (1000)	Warning	A general system error. For debugging only.
genSysErrorC (1001)	*Critical	A general critical system error. For debugging only.
startupComplete (130)	Event	Indicates that the clock module has started and is ready for operation.
resetRequest (131)	Event	Indication that the module is being resetted.
invalidBootOptions (140)	Warning	Invalid parameters were given for the cgmBootString.

The following table describes the elements of the cgmSys MIB branch (OID:.1.3.6.1.4.1.3656.8152.1.3). They provide general control and status operations for the event log.

Table 5-8 cgmSys Objects

OID	MIB Object	Description	Access
.1.3.10	cgmSysEventLogSize	The maximum number of events the event log can hold (about 80000).	r
.1.3.11	cgmSysEventLogCount	The current number of events present in the event log.	r
.1.3.12	cgmSysEventLogClear	Clears the event log. When set to 0, events which have not been accessed will be cleared (an event is marked as "accessed" if its timestamp cgmEventTime is read). If set to 1, all events are cleared regardless whether they have been accessed or not. This is not recommended since it may cause events to get lost while the log is about to be cleared.	r/w
.1.3.13	cgmSysEventLogLevel	Specifies up to which severity events shall be placed into the event log: 0 - No events are logged 1 - Only critical events are logged 2 - Critical events and warnings are logged 3 - Critical events, warning and events are logged 4 - Everything is logged Default value is (3).	r/w
.1.3.14	cgmSysEventTrapLevel	Specifies up to which severity new event log entries are posted as a trap (using the cgmLogEvent object). 0 - No events are posted 1 - Only critical events are posted 2 - Critical events and warnings are posted 3 - Critical events, warning and events are posted 4 - Everything is posted Default value is (3).	r/w

Table 5-8 cgmSys Objects (continued)

OID	MIB Object	Description	Access
.1.3.23	cgmSysHwVersion	The hardware revision of the PMC-CGM.	r
.1.3.24	cgmSysSwVersion	The firmware revision of the board in the format "x.y.z" which corresponds to "<major revision>.<minor revision>.<build count>.	r
.1.3.25	cgmRestartCmd	Restarts the module when set to 1. The operation is ignored while a firmware update is ongoing. After a successful firmware update this will start the new firmware.	r/w
.1.3.26	cgmFwUpdateHost	The IP address of the TFTP server where the new firmware image is located.	r/w
.1.3.27	cgmFwUpdateFile	The name of the firmware update image to be downloaded from the TFTP server.	r/w
.1.3.28	cgmFwUpdateMd5	The MD5 checksum of the firmware image. This checksum is verified after downloading the TFTP image and after programming it into the boot flash.	r/w
.1.3.29	cgmFwUpdateOption	Controls how to handle revision numbers of the old and the new firmware image: If "newer" (0) only images with a version number higher than the current one can be programmed. If "newerOrSame" (1), images with the same or a higher version number can be programmed. If "allowDowngrade" (2), firmware downgrade is possible. If "noVersionCheck" (3), no version check is performed at all. This allows installing images which do not contain version information. Default value is (0).	r/w
.1.3.30	cgmFwUpdateStart	A value of 1 initiates the firmware update. The value remains 1 as long as the update is ongoing.	r/w
.1.3.31	cgmSysTelnetEnable	Enables(1) / disables (0) a telnet server on the module. Used only for debugging purposes. Default value is (1).	r/w
.1.3.32	cgmTrapDestination	IP address where to send traps to. Default value is the host address specified in the boot parameters of the PMC-CGM.	r/w

Table 5-8 cgmSys Objects (continued)

OID	MIB Object	Description	Access
.1.3.33	cgmBootString	The boot configuration data consists of a list of parameter=value pairs separated by spaces. The following parameters/values are defined: (e|ethaddr)=<ip-address>[:netmask] Defines the module's IP address/netmask. This is overwritten by dynamic configuration options (see below). Default netmask is ffffff00. (h|host|trapDest)=<ip-address> Defines the default address for the cgmTrapDestination element. (g|gatewayip)=<ip-address> Defines the default gateway address. (m|mode)=<flag>[,<flag>[,...]] Defines various configuration flags. <flag> may be one of -ipmi: Obtain IP/gateway address via IPMI (from shelf manager). -dhcp: Configure network interfaces via DHCP. -static: Use static network setup as defined here. When obtaining network address via IPMI or DHCP, and the host address (h=statement) is on the same subnet as the statically configured IP address (e=statement), the network part of the host address is adjusted according to the dynamically obtained IP address. Setting this element has no immediate effect, modifications are applied at the next reboot.	r/w

5.4 cgmClkDist

The cgmClkDist branch contains the following information which is used for controlling clock distribution and measurement:

- cgmDmClkTable - not supported for the PMC-CGM.
- cgmFrqMonTable - not supported for the PMC-CGM.
- Various MIB objects that are described in Table 5-5 on page 53.
  For details on how to use these MIB objects refer to *Configure the Reference Clock* on page 41.

The following table describes the elements of the cgmClkDist MIB branch (OID:.1.3.6.1.4.1.3656.8152.1.4).

Table 5-9 cgmClkDist Objects

OID	MIB Object	Description	Access
.1.4.10	cgmClkDistMode	The clock distribution mode of the module. There are four main modes a module can be operated in: ● Distributed Mode (0) For each clock domain (CLK1/2/3), the module selects a payload card in the shelf and replicates it to the other payload cards. The selection can be done manually or automatically. **Not applicable for PMC-CGM.** ● Extension Mode (1) The module receives CLK1/2 from the main shelf and distributes them to the local payloads. Reference clocks (CLK3) can be routed to the main shelf. **Not applicable for PMC-CGM.** ● Buffer Mode (2) The module receives CLK1/2/3 from the main shelf and distributes them to the local payloads. **Not applicable for PMC-CGM.** ● Centralized Mode (3) The module generates the T0 clocks based on internal or external references. In centralized mode there may be up to two shelves connected, operating in either extension or distribution mode. ● Extended Centralized Mode (4) Like centralized mode, except that CLK3 is routed to the main shelf via the front-panel connector (i.e. REF A/B can not be selected as input). **Not applicable for PMC-CGM.** Default value is centralized mode (3).	r/w
.1.4.11	cgmExtChConnection	In centralized mode, selects the properties of the connections to extension chassis 2 and 3 (not connected, extended mode or buffered mode): Single Chassis (0) Chassis 2 in extension mode (1) Chassis 3 in extension mode (3) Chassis 2 and 3 in extension mode (5) Default value is (0).	r/w

Table 5-9 cgmClkDist Objects (continued)

OID	MIB Object	Description	Access
.1.4.16	cgmInputRefASource	Determines the source of the "primary" linecard derived reference clock (REFA input to PLL). local reference A (0) local reference B (1) Chassis 2 reference A (2) Chassis 2 reference B (3) Chassis 3 reference A (4) Chassis 3 reference B (5) Default value is (0).	r/w
.1.4.17	cgmInputRefASourceLinecard	Determines the source (linecard) of the primary linecard derived reference clock. **Not applicable for PMC-CGM.**	r/w
.1.4.18	cgmInputRefBSource	Determines the source of the "secondary" linecard derived reference clock (REFB input to PLL). local reference A (0) local reference B (1) Chassis 2 reference A (2) Chassis 2 reference B (3) Chassis 3 reference A (4) Chassis 3 reference B (5) Default value is (1).	r/w
.1.4.19	cgmInputRefBSourceLinecard	Determines the source (linecard) of the secondary linecard derived reference clock. **Not applicable for PMC-CGM.**	r/w

Related Documentation

A

A.1 Emerson Network Power - Embedded Computing Documents

The Emerson Network Power - Embedded Computing publications listed below are referenced in this manual. You can obtain electronic copies of Emerson Network Power - Embedded Computing publications by contacting your local Emerson sales office. For documentation of final released (GA) products, you can also visit the following website: http://www.emersonnetworkpowerembeddedcomputing.com > Resource Center > Technical Documentation Search. This site provides the most up-to-date copies of Emerson Network Power - Embedded Computing product documentation.

Table A-1 Emerson Network Power - Embedded Computing Publications

Document Title	Publication Number
Centellis CO 31kX Installation and Use	6806800A99
ATCA-F103 Installation and Use	6806800D97
ARTM-F103-STX Installation and Use	6806800D79
PMC-CGM: Control via IPMI Programmer's Reference	6806800D54
CABLE-CGM2-CLK Installation and Use	6806800F47

A.2 Related Specifications

For additional information, refer to the following table for related specifications. As an additional help, a source for the listed document is provided. Please note that, while these sources have been verified, the information is subject to change without notice.

Company/Org.	Documents
PICMG can be ordered via www.picmg.org	PICMG 3.0 AdvancedTCA Base Specification

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