



ACC/ARTM-7221/FC

Installation Guide

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March 2008

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Contents

About this Manual	9
Safety Notes	13
Sicherheitshinweise	17
1 Introduction	21
1.1 About This Manual	21
1.1.1 Organization of This Document	21
1.1.2 Feedback	21
1.2 Features	22
1.3 Standard Compliances	23
1.4 Mechanical data	25
1.5 Ordering Information	25
2 Installation	27
2.1 Action Plan	27
2.2 Before You Start	29
2.2.1 Package Inspection	29
2.2.2 Requirements	29
2.2.2.1 Power Requirements	29
2.2.2.2 Backplane Requirements	29
2.2.2.3 Environmental Requirements	30
2.3 On-Board Connectors	33
2.3.1 IPMB1	34
2.3.2 SATA for On-board Hard Disks	35
2.3.3 Serial ATA for External Hard Disks	37
2.4 Module Installation	38
2.4.1 Nonpowered System	38
2.4.2 Powered System	39
2.5 Face Plate Controls, Indicators and Connectors	43
2.5.1 Connectors	44
2.5.1.1 USB	44
2.5.1.2 Serial	44
2.5.1.3 Fiber Channel	45
2.5.1.4 Keyboard/Mouse	46
2.5.1.5 E1/T1	46
2.5.2 LEDs	48

Contents

2.5.3	Reset Key	50
2.6	Zone 3 Connectors	50
2.7	Devices Connected to RTM's Mezzanine Management Controller	53
A	Related Documentation	57
A.1	Emerson Network Power - Embedded Computing Documents	57
Index	59

List of Tables

Table 1-1	Manual Organization	21
Table 1-2	Mechanical Data	25
Table 2-1	Environmental Requirements	31
Table 2-2	LED Description	49
Table 2-3	Available IPMI Sensors	54

List of Figures

Figure 1-1	Declaration of Conformity	24
Figure 2-1	Action Plan - Part 1	27
Figure 2-2	Action Plan - Part 2	28
Figure 2-3	Critical Temperature Spot	33
Figure 2-4	Location of IPMB1 Connector	34
Figure 2-5	IPMB1 Connector Pinout	34
Figure 2-6	Location of Serial ATA Connector for On-Board Hard Disks	35
Figure 2-7	Serial ATA for On-Board Hard Disk Connector Pinout	36
Figure 2-8	Location of Serial ATA Connector for External Hard-Disks	37
Figure 2-9	Serial ATA for External Hard Disks Connector Pinout	37
Figure 2-10	Face Plate	43
Figure 2-11	USB Connector Pinout	44
Figure 2-12	Serial Connector Pinout	45
Figure 2-13	Fiber Channel Connector Pinout	45
Figure 2-14	Keyboard/Mouse Connector Pinout	46
Figure 2-15	E1/T1 Connector Pinout	47
Figure 2-16	Face Plate LEDs	48
Figure 2-17	Face Plate Reset Key	50
Figure 2-18	Location of Zone 3 Connectors P30 and P31	51
Figure 2-19	P30 Connector Pinout, Rows a-d	52
Figure 2-20	P30 Connector Pinout, Rows e-h	52
Figure 2-21	P31 Connector Pinout, Rows a-d	53
Figure 2-22	P31 Connector Pinout, Rows e-h	53
Figure 2-23	Location of IPMI Temperature Sensor	56

About this Manual

Overview of Contents

This manual is intended for users qualified in electronics or electrical engineering. Users must have a working understanding of AdvancedTCA and telecommunications.

Abbreviations

This document uses the following abbreviations:







Abbreviation	Definition
ATA	AT Attachment
ATCA	Advanced Telecommunications Computing Architecture
BIB	Board Information Block
CPU	Central Processing Unit
CTS	Clear to Send
DTR	Data Terminal Ready
EMC	Electromagnetic Compatibility
ESD	Electrostatic Sensitive Device
FCC	Federal Communications Commission
GND	Ground
HDD	Hard Disk Drive
IPMB	Intelligent Platform Management Bus
IPMC	Intelligent Platform Management Controller
IPMI	Intelligent Platform Management Interface
LED	Light Emitting Diode
LFM	Linear Feet per Minute
PICMG	PCI Industrial Computer Manufacturers Group
PMC	PCI Mezzanine Card
ROM	Read-Only Memory
TPE	Twisted Pair Ethernet
TXD	Transmit Data
USB	Universal Serial Bus
EMV	Elektromagnetische Verträglichkeit

Abbreviation	Definition
EN	European Norm
FRU	Field Replacable Unit
GmbH	Gesellschaft mit beschraenkter Haftung
IEC	International Electric Code
MMC	Mezzanine Management Controller
NEBS	Network Equipment Building System
OOS	Out-Of-Service
PCI	Peripheral Component Interconnect
RTM	Rear Transition Module
RoHS	Restriction of the use of Certain Hazardous Substances
S.M.A.R.T.	Software Maintenance and Reference Tool
SATA	Serial ATA
SFP	Small Form-Factor Pluggable
UL	Underwriters Laboratory Inc.

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
<i>Screen</i>	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
<i>Reference</i>	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

Notation	Description
.	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
 <div style="border: 1px solid black; padding: 2px; width: fit-content;">  </div>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
 <div style="border: 1px solid black; padding: 2px; width: fit-content;">  </div>	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
<div style="border: 1px solid black; padding: 2px; width: fit-content;">  </div>	Indicates a property damage message
	No danger encountered. Pay attention to important information

Summary of Changes

Order No.	Rev.	Date	Description
223454	AA	December 2004	Preliminary Installation Guide
223454	AB	March 2005	Changed Force Computers to Motorola throughout the document; Added section "About this manual"; replaced Force with Motorola copyright; renamed ARTM from ARTM-720 to ARTM-7120 (new Motorola name)
223454	AC	June 2005	Updated front panel figures; editorial changes;
223454	AD	December 2005	Updated safety notes; included 3D RTM graphics, updated front panel description; editorial changes; included IPMI sensor information; updated LED description; renamed RTM name to ACC/ARTM-7221/FC; added power requirements and critical temperature spots
223454	AE	April 2006	Update for final release
223454	AF	April 2006	Update on installation procedure
6806800E9 8A		March 2008	Update document to Emerson style (logo, copyright, etc.)

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Mail comments to us by filling out the following online form:

<http://www.emersonnetworkpowerembeddedcomputing.com/> > Contact Us > Online Form

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 safety precautions to follow when installing, operating, and maintaining the product.

We intend to provide all necessary information to install and handle the product in this manual. However, as the product is complex and its usage manifold, 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 taken as replacement for qualified personnel.

EMC

The RTM has been tested in a standard Emerson system and found to comply with the limits for a Class A digital device in this system, pursuant to part 15 of the FCC Rules, EN 55022 Class A respectively. These limits are designed to provide reasonable protection against harmful interference when the system is operated in a commercial environment.

The RTM generates and uses radio frequency energy and, if not installed properly and used in accordance with this guide, may cause harmful interference to radio communications. Operating the system 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.

Installation

Damage of Circuits

Electrostatic discharge and incorrect RTM installation and removal can damage circuits or shorten their life.

Before touching the RTM or electronic components, make sure that you are working in an ESD-safe environment.

RTM Malfunctioning

Incorrect RTM installation and removal can result in RTM malfunctioning.

When plugging the RTM in or removing it, do not press on the face plate but use the handles.

Data loss

Removing the RTM with the system power on and the blue LED on the front blade still flashing causes data loss.

Before removing the RTM from a powered system, power down the slot by opening the lower handle of the front blade and wait until the blue LED is permanently ON.

RTM Damage

Installing the RTM with other blades than the PENT/ATCA-7221 damages the RTM.

Only install the RTM with the Emerson PENT/ATCA-7221 blade.

Operation

RTM damage

High humidity and condensation on the RTM surface causes short circuits.

Do not operate the RTM outside the specified environmental limits. Make sure the RTM is completely dry and there is no moisture on any surface before applying power. Do not operate the RTM below 0°C.

RTM Overheating and RTM Damage

Operating the RTM without sufficient forced air cooling may lead to RTM overheating and thus RTM damage.

When operating the RTM, make sure that sufficient forced air cooling is available in the shelf.

When operating the RTM in areas of electromagnetic radiation ensure that the RTM is bolted on the system and the system is shielded by enclosure.

Make sure that contacts and cables of the RTM cannot be touched while the RTM is operating.

RJ-45 Connector

RTM and telephone damage

E1/T1 interfaces on face plate

On the face plate, RJ-45 connectors are used for different interfaces. Mismatching the interfaces, i.e. connecting a telephone or an E1/T1 network to the serial interfaces labeled as COM or connecting a serial device to a RJ-45 connector labeled as E1/T1 may damage the telephone or the RTM.

Therefore, only connect E1/T1 networks to RJ-45 connectors labeled as E1/T1 ports and only connect serial devices to RJ-45 connectors labeled as COM.

Environment

Always dispose of used RTMs according to your country's legislation, if possible in an environmentally acceptable way.

Laser

Some variants of the RTM are a Class I laser product. The use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Sicherheitshinweise

Dieser Abschnitt enthält Sicherheitshinweise, die bei Installation, Betrieb und Wartung des Produkts zu beachten sind.

Wir sind darauf bedacht, alle notwendigen Informationen, die für die Installation und den Betrieb erforderlich sind, in diesem Handbuch bereit zu stellen. Da es sich jedoch um ein komplexes Produkt mit vielfältigen Einsatzmöglichkeiten handelt, können wir die Vollständigkeit der im Handbuch enthaltenen Informationen nicht garantieren. Falls Sie weitere Informationen benötigen sollten, wenden Sie sich bitte an die für Sie zuständige Geschäftsstelle von Emerson.

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

Installation, Wartung und Betrieb dürfen nur von durch Emerson ausgebildetem oder im Bereich Elektronik oder Elektrotechnik qualifiziertem Personal durchgeführt werden. Die in diesem Handbuch enthaltenen Informationen dienen ausschließlich dazu, das Wissen von Fachpersonal zu ergänzen, können es aber in keinem Fall ersetzen.

EMV

Das RTM 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 RTMs in Gewerbe- sowie Industriegebieten gewährleisten.

Das RTM 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.

Installation

Beschädigung von Schaltkreisen

Elektrostatische Entladung und unsachgemäßer Ein- und Ausbau des RTMs kann Schaltkreise beschädigen oder ihre Lebensdauer verkürzen.

Bevor Sie das RTM oder elektronische Komponenten berühren, vergewissern Sie sich, daß Sie in einem ESD-geschützten Bereich arbeiten.

Fehlfunktion des RTMs

Unsachgemäßer Ein- und Ausbau des RTMs kann zu Fehlfunktion des RTMs führen.

Drücken Sie beim Ein- und Ausbau des RTMs nicht auf die Frontblende, sondern benutzen Sie die Griffe.

Beschädigung des RTMs

Wenn Sie das RTM nicht zusammen mit dem PENT/ATCA-7221 Front Blade installieren, wird das RTM beschädigt.

Installieren Sie das RTM deshalb nur zusammen mit dem Emerson PENT/ATCA-7221 Front Blade.

Datenverlust

Wenn Sie das RTM aus einem eingeschaltetem System herausziehen während die blaue LED auf dem Front Blade noch blinkt, gehen Daten verloren.

Bevor Sie das RTM aus einem eingeschaltetem System herausziehen, müssen Sie den Steckplatz durch Oeffnen des unteren Griffs am Front Blade ausschalten und warten bis die blaue LED auf dem Front Blade permanent leuchtet.

Betrieb

Überhitzung und Beschädigung des RTMs

Betreiben Sie das RTM ohne Zwangsbelüftung, kann das RTM überhitzt und schließlich beschädigt werden.

Bevor Sie das RTM betreiben, müssen Sie sicher stellen, dass das Shelf über eine ausreichende Zwangskühlung verfügt.

Wenn Sie das RTM in Gebieten mit starker elektromagnetischer Strahlung betreiben, stellen Sie sicher, dass das RTM mit dem System verschraubt ist und das System durch ein Gehäuse abgeschirmt ist.

Stellen Sie sicher, dass Anschlüsse und Kabel des RTMs während des Betriebs nicht versehentlich berührt werden können.

RJ-45 Stecker

Beschädigung des RTMs und des Telefons

RJ-45 Stecker an der Frontblende

Die RJ-45 Stecker an der Frontblende werden für verschiedene Schnittstellen verwendet, die nicht verwechselt werden dürfen. Wenn Sie ein Telefon oder ein E1/T1 Netzwerk an eines der mit COM gekennzeichneten seriellen Stecker anschließen oder wenn Sie ein serielles Gerät an die mit E1/T1 gekennzeichneten Stecker anschließen, kann das Telefon oder das RTM beschädigt werden.

Schließen Sie deshalb nur E1/T1 Netze an die mit E1/T1 gekennzeichneten Stecker an und schließen Sie nur serielle Geräte an die mit COM gekennzeichneten Stecker an.

Umweltschutz

Entsorgen Sie alte RTMs stets gemäß der in Ihrem Land gültigen Gesetzgebung, wenn möglich immer umweltfreundlich.

Laser

Einige Varianten des Produktes sind Laserprodukte der Klasse I. Um nicht schädlicher Laserstrahlung ausgesetzt zu werden, beachten Sie die folgenden Hinweise:

Anpassungen am Produkt, die Bedienung von Steuerelementen sowie die Durchführung von Prozeduren dürfen nur gemäß den Anweisungen in diesem Dokument erfolgen.

1.1 About This Manual

This Installation Guide provides the information you need to install and use the ACC/ARTM-7221/FC. Furthermore, you may also need the *PENTI/ATCA-7221 Reference Guide*.

1.1.1 Organization of This Document

This reference guide is organized as follows.

Table 1-1 Manual Organization

Chapter	Content Description
Using This Guide	Lists all conventions and abbreviations used in this manual and outlines the revision history
Other Sources of Information	Lists related documentation and specifications
Safety Notes	Describes the safety information which have to be observed before and during installation and during operation.
Sicherheitshinweise	German translation of the chapter "Safety Notes"
Introduction	Lists the interfaces/features and standards the RTM complies with
Installation	Describes: <ul style="list-style-type: none">● Requirements (environmental, power, and backplane requirements)● On-board connectors● RTM installation● Face plate LEDs and connectors● Backplane connectors● Sensors and other devices connected to the Intelligent Platform Management Interface Controller (IPMC)

1.1.2 Feedback

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. Mail comments to:

- Emerson Network Power - Embedded Computing GmbH
Lilienthalstraße 15
85579 Neubiberg
Germany
- Email: reader-comments@mcg.mot.com

In all your correspondence, please list your name, position, and company. Be sure to include the title, part number, and revision of the manual and tell how you used it.

1.2 Features

The ACC/ARTM-7221/FC is a rear transition module (RTM) which provides easy access to I/O signals of the Emerson PENT/ATCA-7221 front blade. The I/O signals are available via the zone 3 connectors.

The ACC/ARTM-7221/FC provides the following:

- System management/IPMI
 - Compliancy to IPMI V 1.5
 - Management Controller (MMC) based on Atmega64
 - Several status sensors, e.g. voltage and temperature
- Interfaces:
 - Two USB 2.0
 - Two RS-232
 - Two fibre channel
 - One keyboard/mouse
 - Four E1/T1
 - Only available if a Emerson PMC-8260/DS1 module is installed on the front blade.
 - IPMB1
 - One SATA for on-board hard disk
 - One SATA for external hard-disk connection

1.3 Standard Compliances

The RTM meets the standards shown in the table below.

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 EN 300386	EMC requirements on system level
NEBS Standard GR-63-CORE ¹ NEBS Standard GR-1089-CORE	NEBS level three - Product is designed to support NEBS level three. The compliance tests must be done with the customer target system.
PICMG 3.0 R.1.0	Defines mechanics, blade dimensions, power distribution, power and data connectors, and system management

1. A test has shown that the RTM is not compliant to the "Unpacked Equipment Shock Criteria" as defined in NEBS GR-63 4.3.2. The test consisted of dropping the RTM from 100mm height. As a result of the test, some locating pins were damaged which fix the two alignment blocks that are required by the PICMG 3.0 specification. Due to the damage, the alignment blocks were allowed to rotate slightly.

Figure 1-1 Declaration of Conformity

Declaration of Conformity

Emerson Network Power -
Embedded Computing GmbH

Lilienthalstr. 15
D-85579 Neubiberg

Declares that the product

Product Name: ACC/ARTM-7221/FC

Conforms to the following Product Specifications:


Safety: EN 60950-1/A11:2004
UL 60950-1:2003
CAN/CSA-C22.2 No. 60950-1:2003

EMC: EN 55022: 1998 + A1:2000 + A2:2003
EN 55024: 1998 + A1:2001 + A2:2003
EN 300386:V1.3.2:2003-05
47 CFR Part 15 Subpart B (FCC)

Supplementary Information:

The product herewith complies with the requirements
of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

This product was tested as an integral part of a
Emerson Network Power defined reference system.



Signature

Neubiberg, 14.02.2008

Quality Management

1.4 Mechanical data

The following table lists physical dimensions and weight of the RTM.

Table 1-2 Mechanical Data

Feature	Value
Physical Dimension of PCB	322.25 mm x 70 mm
Weight of RTM	0.7 kg

1.5 Ordering Information

As of the time of writing this guide, the following RTM variant was available. Consult your local sales representative for a more-up-to-date list.

Order Number	Variant name
121914	ACC/ARTM-7221/FC

2.1 Action Plan

To install the RTM, the following steps are necessary and will be described in further detail in the sections of this chapter.

Figure 2-1 Action Plan - Part 1

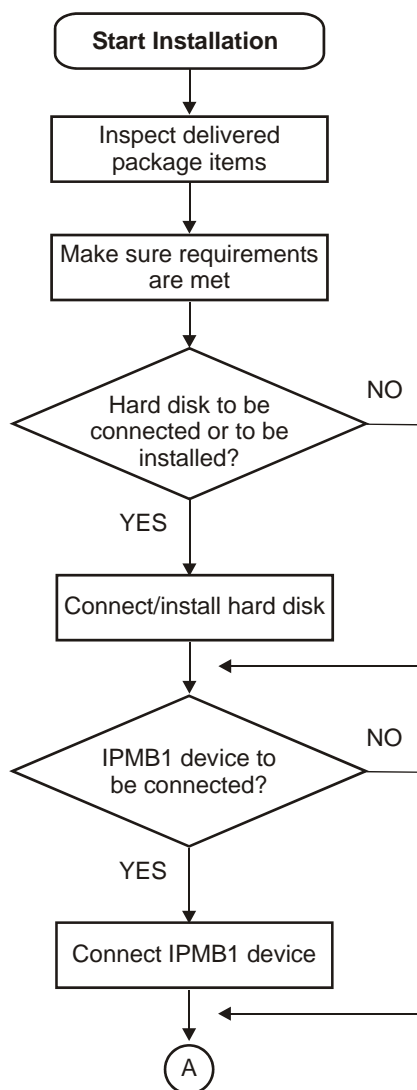
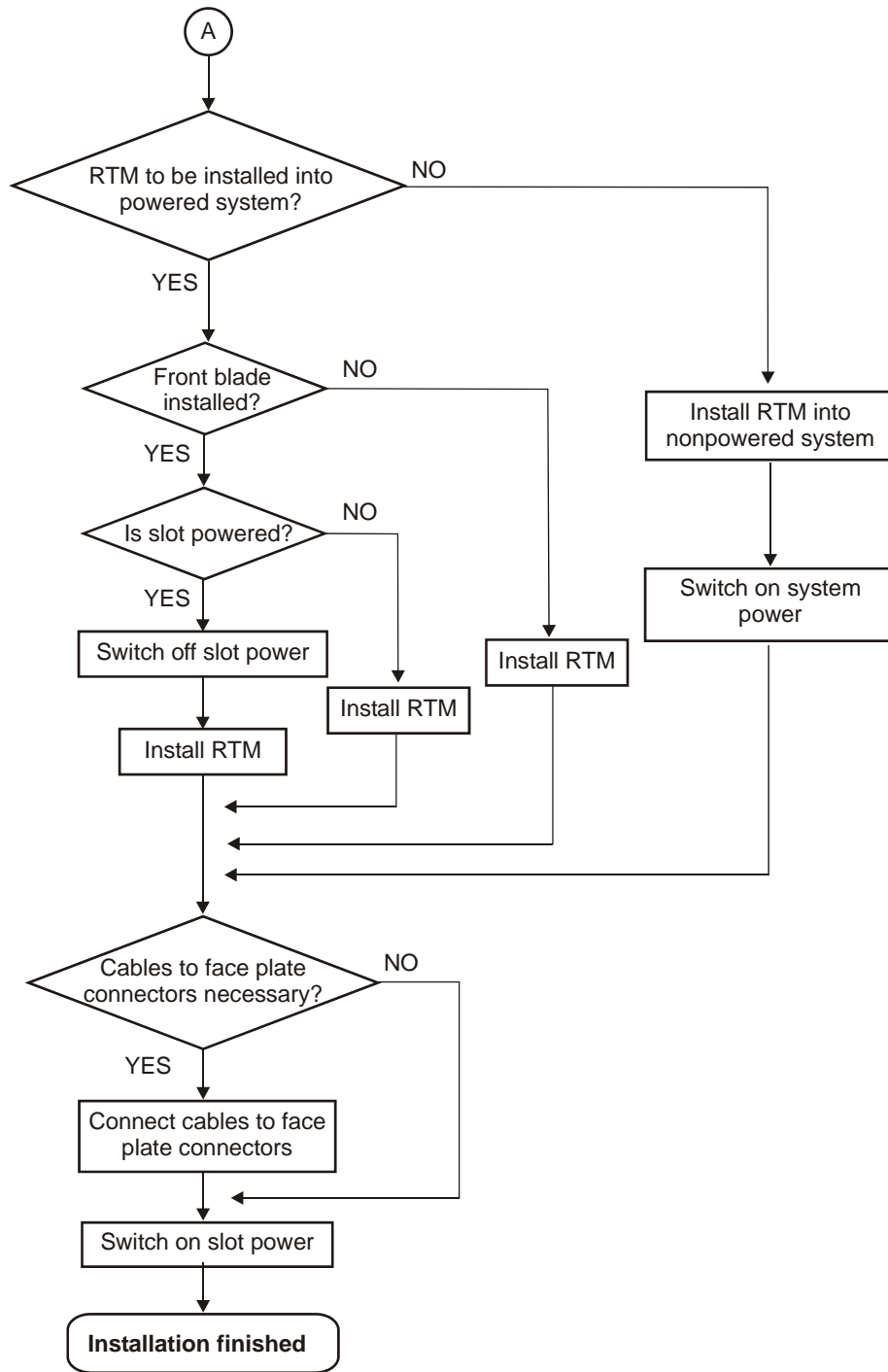


Figure 2-2 Action Plan - Part 2



2.2 Before You Start

This section provides the following information:

- Inspecting the contents of the delivered package
- Requirements

2.2.1 Package Inspection

NOTICE

Damage of Circuits

Electrostatic discharge and incorrect RTM installation and removal can damage circuits or shorten their life.

Before touching the RTM or electronic components, make sure that you are working in an ESD-safe environment.

The accessory kit consists of this Installation Guide and the RTM.

2.2.2 Requirements

Before installing the RTM, make sure the requirements described in this section are met.

2.2.2.1 Power Requirements

The RTM draws approximately 5W from the front blade it is connected to.

2.2.2.2 Backplane Requirements

For installing the RTM, you need a system without a zone 3 midplane.

2.2.2.3 Environmental Requirements

The environmental conditions must be tested and proven in the used system configuration. The conditions refer to the surrounding of the board within the user environment.



- Operating temperatures refer to the temperature of the air circulating around the RTM and not to the actual component temperature.
- To ensure that the operating conditions are met, forced air cooling is required within the chassis environment.
- The environmental values given in the table below only apply to the RTM without any hard disk. If installing hard disks, their environmental requirements must also be taken into account. If you use the RTM together with a hard disk, also check the environmental requirements of the hard disk and make sure that the most restrictive requirements are met.

NOTICE

RTM damage

High humidity and condensation on the RTM surface causes short circuits.

Do not operate the RTM outside the specified environmental limits. Make sure the

RTM is completely dry and there is no moisture on any surface before applying power.

Do not operate the RTM below 0°C.

Table 2-1 Environmental Requirements

Requirement	Operating	Non-Operating
Temperature	+5°C to +40°C (normal operation) according to NEBS Standard GR-63-CORE -5°C to +55°C (exceptional operation) according to NEBS Standard GR-63-CORE All values may be further limited by installed accessories with more restrictive environmental requirements.	-40°C to +70°C (may be further limited by installed accessories)
Temp. Change	+/- 0.25°C/min according to NEBS Standard GR-63-CORE	+/- 0.25°C/min
Rel. Humidity	5% to 95% non-condensing according to Emerson-internal environmental requirements	5% to 95% non-condensing according to Emerson-internal environmental requirements

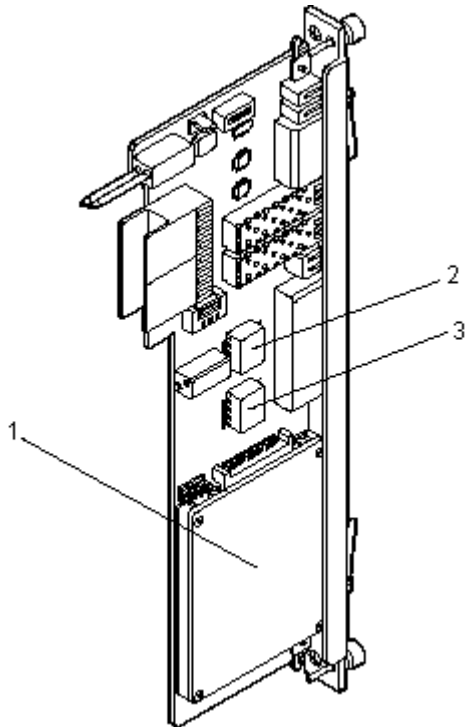
Table 2-1 Environmental Requirements (continued)

Requirement	Operating	Non-Operating
Altitude	Up to +3,000 m	Up to +12,000 m
Vibration 5-20 Hz 20-250 Hz	0.5 mm amplitude 1g	1 mm amplitude 2.0 g
Shock	5 g/11 ms halfsine according to Emerson-internal environmental requirements	15 g/11 ms half sine according to Emerson-internal environmental requirements
Free Fall		1,200 mm/all edges and corners

To guarantee proper RTM operation, you have to make sure that the temperature at the following location is not exceeded.

Location	Component	Temperature Limit
1	Installed hard disk	60°C
2	TX1322 TLV-1 transformer	80°C
3	TX1322 TLV-1 transformer	80°C

Figure 2-3 Critical Temperature Spot



2.3 On-Board Connectors

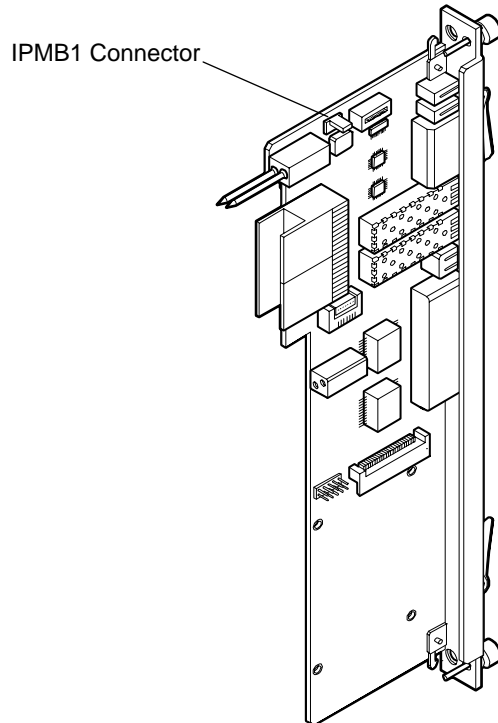
The RTM provides the following on-board connectors:

- IPMB1
- SATA for external hard disks
- SATA for on-board hard disk

2.3.1 IPMB1

The RTM provides an on-board IPMB1 connector which enables you to attach a device such as a fan to the IPMB1 interface of the ATCA-7221. The following figure shows the location of the IPMB1 connector.

Figure 2-4 Location of IPMB1 Connector



The following figure shows the pinout of the IPMB1 connector.

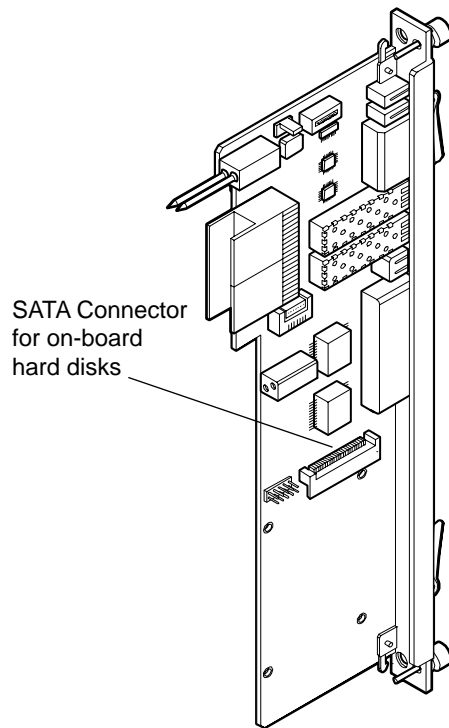
Figure 2-5 IPMB1 Connector Pinout



2.3.2 SATA for On-board Hard Disks

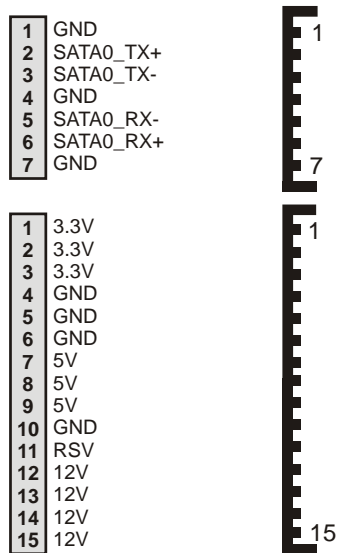
The SATA connector shown in the following figure allows to install an on-board 2.5" hard disk which is available as accessory kit called ACC/ATCA-7221/HDD/SATA for the RTM. For further information refer to the *ACC/ATCA-7221/HDD/SATA Installation Guide* which can be downloaded from the Emerson literature catalog.

Figure 2-6 Location of Serial ATA Connector for On-Board Hard Disks



The following figure shows the connector pinout.

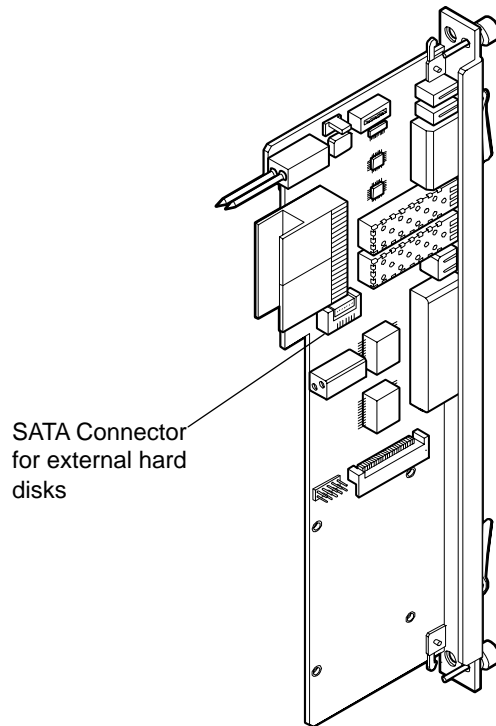
Figure 2-7 Serial ATA for On-Board Hard Disk Connector Pinout



2.3.3 Serial ATA for External Hard Disks

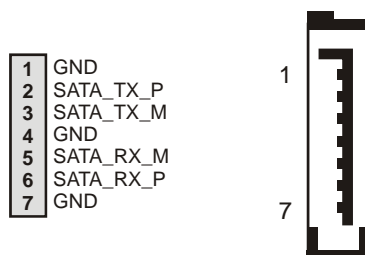
The Serial ATA connector shown in the following figure allows to connect an external SATA hard disk to the RTM. The power for the SATA hard disk must be provided externally.

Figure 2-8 Location of Serial ATA Connector for External Hard-Disks



The following figure shows the connector pinout.

Figure 2-9 Serial ATA for External Hard Disks Connector Pinout



2.4 Module Installation

The RTM can be installed into a powered or nonpowered system and must be installed into a AdvancedTCA system without a zone 3 midplane.

NOTICE

RTM Damage

Installing the RTM with other blades than the PENT/ATCA-7221 damages the RTM. Only install the RTM with the Emerson PENT/ATCA-7221 blade.

2.4.1 Nonpowered System

NOTICE

Damage of Circuits

Electrostatic discharge and incorrect RTM installation and removal can damage circuits or shorten their life.

Before touching the RTM or electronic components, make sure that you are working in an ESD-safe environment.

Installation Procedure

1. Locate the slot the RTM is to be installed into at the shelf's rear which must be the same as that of the front blade
2. Ensure that the top and bottom handles are in outward position
3. Insert the RTM into the shelf by placing the top and bottom edges in the card guides of the slot
4. Slide the RTM into the slot
5. Hook the lower and the upper handle into the shelf rail recesses
6. Fully insert the RTM and lock it to the shelf by pressing the two components of the lower and upper handles together and turning the handles towards the face plate
7. Tighten the two face plate screws
8. Plug interface cables into the face plate connectors, if applicable
9. Turn on system power

Removal Procedure

1. Remove interface cables from the face plate connectors, if applicable
2. Loosen the two face plate screws
3. Open the lower and upper handle by pressing the two handle components together and turning the handles outwards.

NOTICE

RTM Malfunctioning

Incorrect RTM installation and removal can result in RTM malfunctioning.

When plugging the RTM in or removing it, do not press on the face plate but use the handles.

4. Remove the RTM from the slot
5. Turn on the system power

2.4.2 Powered System

You can install the RTM into a powered system if the front blade is already installed or if it is not already installed. If the front blade is already installed, its payload has to be powered down first.

NOTICE

Damage of Circuits

Electrostatic discharge and incorrect RTM installation and removal can damage circuits or shorten their life.

Before touching the RTM or electronic components, make sure that you are working in an ESD-safe environment.

Installation Procedure with Installed Front Blade

1. Locate the slot the RTM is to be installed into at the shelf's rear which must be the same as that of the front blade
2. Open the lower handle of the front blade
The blue LED on the front blade starts to flash while the front blade powers down.
3. Wait until the blue LED on the front blade is ON
4. Ensure that the top and the bottom handles of the RTM are in outward position

5. Insert the RTM into the shelf by placing the top and bottom edges in the card guides of the slot

NOTICE

RTM Malfunctioning

Incorrect RTM installation and removal can result in RTM malfunctioning.

When plugging the RTM in or removing it, do not press on the face plate but use the handles.

6. Slide the RTM into the slot
7. Hook the lower and the upper handle into the shelf rail recesses
8. Fully insert the RTM and lock it to the shelf by pressing the two components of the lower and upper handles together and turning the handles towards the face plate
9. Close the lower handle of the front blade
The front blade and the RTM are powered up while the blue LED on the front blade is flashing.
10. Tighten both face plate screws on the RTM
11. Wait until the blue LED of the front blade is OFF
12. Plug interface cables into face plate connectors, if applicable

Installation Procedure without Installed Front Blade

1. Ensure that the top and bottom handles of the RTM are in outward position
2. Insert the RTM into the shelf by placing the top and bottom edges in the card guides of the slot
3. Slide the RTM into the slot
4. Hook the lower and the upper handle into the shelf rail recesses
5. Fully insert the RTM and lock it to the shelf by pressing the two components of the lower and upper handles and turning the handles towards the face plate
6. Fasten both screws on the RTM
7. Insert the front blade from the system's front into the same slot as the RTM
8. Close the handles of the front blade
The blue LED on the front blade starts flashing during the power-up procedure.
9. Tighten the two face plate screws on the front blade

10. Wait until the blue LED on the front blade is OFF
11. Plug interface cable into the face plate connectors, if applicable

Removal Procedure

1. Open the lower handle of the front blade
The blue LED on the front blade starts flashing and the front blade and the RTM power down.

NOTICE

Data loss

Removing the RTM with the system power on and the blue LED on the front blade still flashing causes data loss.

Before removing the RTM from a powered system, power down the slot by opening the lower handle of the front blade and wait until the blue LED is permanently ON.

2. Wait until the blue LED on the front blade is ON
3. Loosen the two RTM face plate screws
4. Open the lower and the upper handle by pressing the two handle components together and turning the handles outwards.
5. Remove interface cables from face plate connectors, if applicable

NOTICE

RTM Malfunctioning

Incorrect RTM installation and removal can result in RTM malfunctioning.

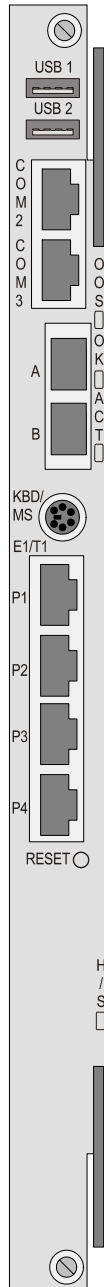
When plugging the RTM in or removing it, do not press on the face plate but use the handles.

6. Remove the RTM from slot

2.5 Face Plate Controls, Indicators and Connectors

The following figure shows the face plate of the RTM.

Figure 2-10 Face Plate



2.5.1 Connectors

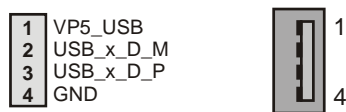
The face plate of the RTM provides the following connectors:

- Two USB 2.0
- Two serial (RJ-45)
- Two fiber channel
- One Keyboard/Mouse
- Four E1/T1

2.5.1.1 USB

Two USB 2.0 devices can be connected via the USB connectors USB 1 and USB 2. The following connector pinout gives information on which signal is assigned to which pin. The "x" stands for the number of the interface.

Figure 2-11 USB Connector Pinout



2.5.1.2 Serial

NOTICE

RTM and telephone damage

E1/T1 interfaces on face plate

On the face plate, RJ-45 connectors are used for different interfaces. Mismatching the interfaces, i.e. connecting a telephone or an E1/T1 network to the serial interfaces labeled as COM or connecting a serial device to a RJ-45 connector labeled as E1/T1 may damage the telephone or the RTM.

Therefore, only connect E1/T1 networks to RJ-45 connectors labeled as E1/T1 ports and only connect serial devices to RJ-45 connectors labeled as COM.

Two serial devices can be connected to the RTM via the two RJ-45 connectors on the face plate. Both connectors correspond to the serial interfaces COM2 and COM3. The following connector pinout gives information on which signal is assigned to which pin. The "x" stands for the number of the interface.

Figure 2-12 Serial Connector Pinout

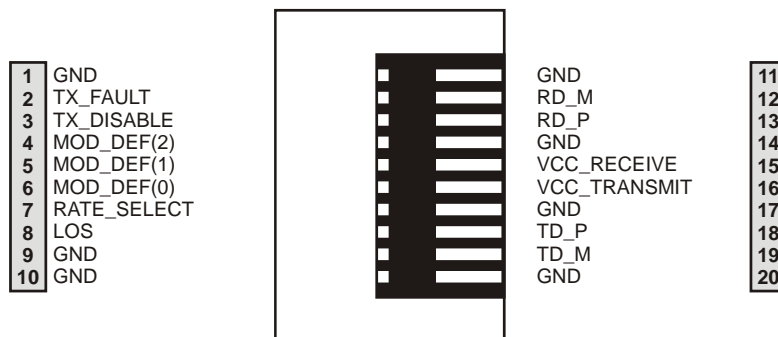


2.5.1.3 Fiber Channel

The RTM provides two small-form-factor pluggable (SFP) cages for connecting mass storage devices, for example.

The following connector pinout gives information on which signal is assigned to which pin.

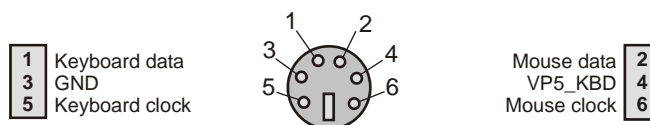
Figure 2-13 Fiber Channel Connector Pinout



2.5.1.4 Keyboard/Mouse

One PS/2 keyboard or one PS/2 mouse can directly be connected to the RTM. If you use a splitter cable, you can connect a PS/2 keyboard and mouse simultaneously. The following connector pinout gives information on which signal is assigned to which pin.

Figure 2-14 Keyboard/Mouse Connector Pinout



2.5.1.5 E1/T1

NOTICE

RTM and telephone damage

E1/T1 interfaces on face plate

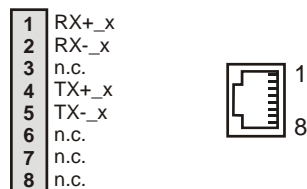
On the face plate, RJ-45 connectors are used for different interfaces. Mismatching the interfaces, i.e. connecting a telephone or an E1/T1 network to the serial interfaces labeled as COM or connecting a serial device to a RJ-45 connector labeled as E1/T1 may damage the telephone or the RTM.

Therefore, only connect E1/T1 networks to RJ-45 connectors labeled as E1/T1 ports and only connect serial devices to RJ-45 connectors labeled as COM.

The RTM face plate provides four E1/T1 interface connectors. The respective signals derive from a PMC-8260/DS1 module installed on the front blade. The number of E1/T1 interfaces actually available at the RTM depends on the particular PMC-8260/DS1 variant used. Refer to the respective documentation.

The following connector pinout gives information on which signal is assigned to which pin. The "x" stands for the number of the interface.

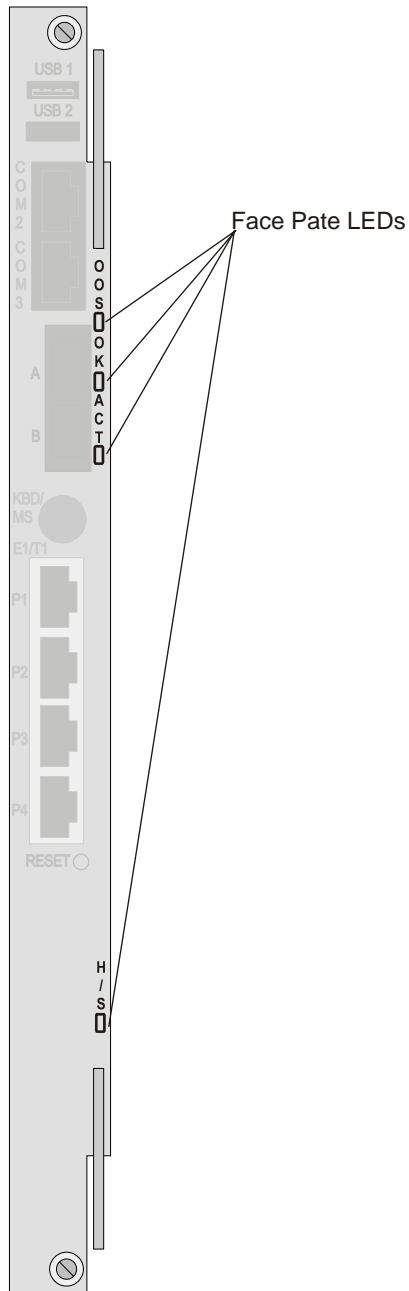
Figure 2-15 E1/T1 Connector Pinout



2.5.2 LEDs

The following figure highlights the LEDs available at the RTM's face plate. .

Figure 2-16 Face Plate LEDs



A detailed description of each LED is given in the following table.

Table 2-2 LED Description

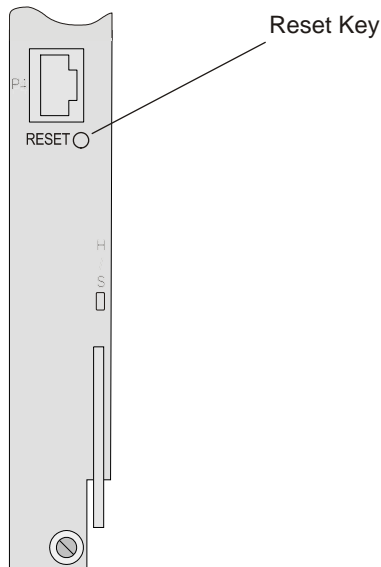
LED	Description
OOS	Out-of-Service This LED is controlled by upper layer software, such as middleware or applications. It works in parallel to the OOS LED at the front blade's face plate.
OK	RTM Power Status Green: The RTM power has been enabled by the MMC. OFF: RTM power is disabled
ACT	This LED is controlled by upper layer software, such as middleware or applications. It works in parallel to the ACT LED at the front blade's face plate.
H/S	Indicates whether the RTM can be installed or removed During RTM installation: Permanently blue: RTM powers up Flashing blue: RTM communicates with shelf management controller OFF: RTM is active During RTM removal: Flashing blue: RTM notifies shelf management controller of desired deactivation. In this state the RTM must not be removed. Permanently blue: RTM is powered down and is ready to be extracted OFF: RTM is active and cannot be removed

The status of all LEDs can be determined via the PICMG 3.0 command "Get FRU LED State".
The status of the LEDs can be changed via the PICMG 3.0 command "Set FRU LED State".

2.5.3 Reset Key

The following figure highlights the position of the RTM's reset key.

Figure 2-17 Face Plate Reset Key



By pressing the reset key, you reset the RTM and the front blade.



The RTM's MMC and the front blade's IPMC are not reset via this key.

2.6 Zone 3 Connectors

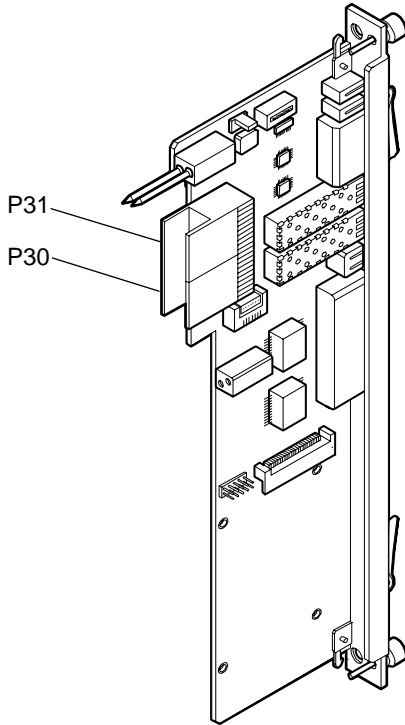
The RTM provides two zone 3 connectors: P30 and P31. They provide interfaces to:

- Serial (RS-232)
- Serial ATA
- Fiber channels
- USB
- Keyboard/Mouse
- IPMI

- Power
- PMC user I/O

The following figure shows the location of P30 and P31.

Figure 2-18 Location of Zone 3 Connectors P30 and P31



The following connector pinouts give information on which signal is assigned to which pin.

Figure 2-19 P30 Connector Pinout, Rows a-d

	a	b	a	b	c	d	e	f	g	h	c	d	
1	RS232_1_RXD	RS232_1_TXD	□	□	□	□	□	□	□	□	RS232_1_RTS	RS232_1_CTS	1
2	RS232_1_DCD	RS232_1_DTR	□	□	□	□	□	□	□	□	RS232_1_DSR	RS232_1_RI	2
3	n.c.	n.c.	□	□	□	□	□	□	□	□	n.c.	n.c.	3
4	USB0_P	USB0_M	□	□	□	□	□	□	□	□	USB1_P	USB1_M	4
5	n.c.	n.c.	□	□	□	□	□	□	□	□	n.c.	n.c.	5
6	FC0_TX_P	FC0_TX_M	□	□	□	□	□	□	□	□	FC0_RX_P	FC0_RX_M	6
7	SATA0_TX_P	SATA0_TX_M	□	□	□	□	□	□	□	□	SATA0_RX_P	SATA0_RX_M	7
8	n.c.	n.c.	□	□	□	□	□	□	□	□	n.c.	n.c.	8
9	IPMB1_SCL	IPMB1_SDA	□	□	□	□	□	□	□	□	V3P3_IPMI	n.c.	9
10	VP12_RTM	VP12_RTM	□	□	□	□	□	□	□	□	V3P3_RTM	V3P3_RTM	10

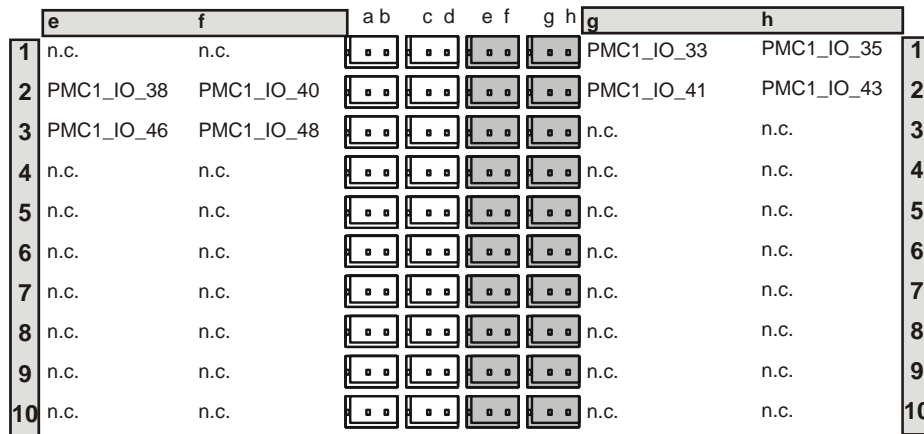
Figure 2-20 P30 Connector Pinout, Rows e-h

e		f		a	b	c	d	e	f	g	h	g		h	
1	RS232_2_RXD	RS232_2_TXD								RS232_2_RTS	RS232_2_CTS	1			
2	RS232_2_DCD	RS232_2_DTR								RS232_2_DSR	RS232_2_RI	2			
3	KBD_DAT	KBD_CLK								MSY_DAT	MSY_CLK	3			
4	n.c.	n.c.								n.c.	n.c.	4			
5	n.c.	n.c.								n.c.	n.c.	5			
6	FC1_TX_P	FC1_TX_M								FC1_RX_P	FC1_RX_M	6			
7	SATA1_TX_P	SATA1_TX_M								SATA1_RX_P	SATA1_RX_M	7			
8	n.c.	n.c.								n.c.	n.c.	8			
9	BRD_PRES_N	RTM_PRES_N								RTM_RST_KEY_N	RTM_RST_N	9			
10	VP5_RTM	n.c.								RTM_SCL	RTM_SDA	10			

Figure 2-21 P31 Connector Pinout, Rows a-d

a		b		a	b	c	d	e	f	g	h	c	d
1	n.c.	n.c.										n.c.	n.c.
2	PMC1_IO_34	PMC1_IO_36										PMC1_IO_37	PMC1_IO_39
3	PMC1_IO_42	PMC1_IO_44										PMC1_IO_45	PMC1_IO_47
4	n.c.	n.c.										n.c.	n.c.
5	n.c.	n.c.										n.c.	n.c.
6	n.c.	n.c.										n.c.	n.c.
7	n.c.	n.c.										n.c.	n.c.
8	n.c.	n.c.										n.c.	n.c.
9	n.c.	n.c.										n.c.	n.c.
10	VP12_RTM	VP5_RTM										V3P3_RTM	n.c.

Figure 2-22 P31 Connector Pinout, Rows e-h



2.7 Devices Connected to RTM's Mezzanine Management Controller

The RTM provides a Mezzanine Management Controller (MMC) based on the Atmega64L controller which is fully compliant to the Intelligent Platform Management Standard V1.5 Rev. 1.1. It is connected to the front blade's IPMC via IPMB1. Emerson offers a Monta Vista Linux Carrier Edition 3.1 (MVL CGE 3.1) driver for the IPMC of the front blade and the MMC of the RTM. Attached to the MMC are:

- Face plate LEDs
- IDROM
The IDROM is accessible via an I2C interface and you can store data via the "Master Write-Read" command in the IDROM. The I2C address is 0xAA.
- Temperature, voltage and other status sensors

The following table lists all IPMI sensors.

Table 2-3 Available IPMI Sensors

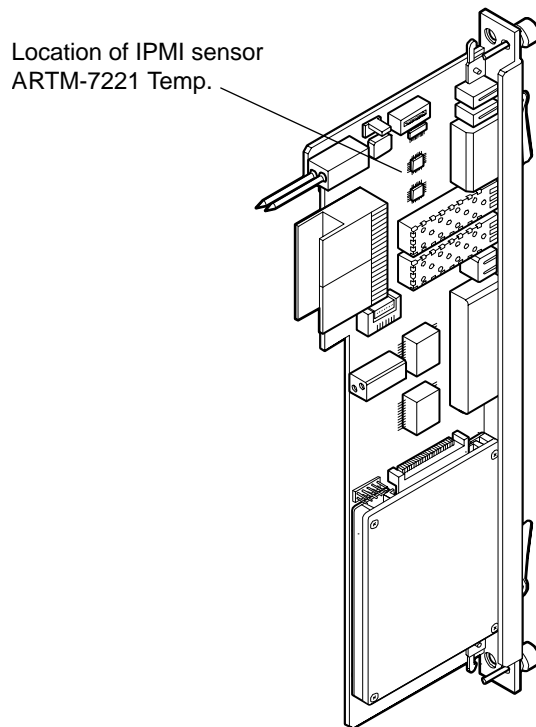
Sensor Name	Type of Measurement	What does it measure?	Sensor Type	Sensor Availability
ARTM-7221 Temp.	Temperature	RTM temperature	Analog	Always
Voltage +1.8V	Voltage	+1.8V voltage level of RTM	Analog	While payload powered ON
Voltage +3.3V	Voltage	+3.3V voltage level of RTM	Analog	While Payload powered ON
Voltage +5VCC	Voltage	+5V voltage level of RTM	Analog	While Payload powered ON
Voltage +12V	Voltage	+12V voltage level of RTM	Analog	While Payload powered ON

Table 2-3 Available IPMI Sensors (continued)

Sensor Name	Type of Measurement	What does it measure?	Sensor Type	Sensor Availability
Voltage +5V USB1	Voltage	+5V voltage level of USB interface 1	Analog	While Payload powered ON
Voltage +5V USB2	Voltage	+5V voltage level of USB interface 2	Analog	While Payload powered ON
Volt +5V KB PWR	Voltage	+5V voltage level of keyboard/mouse interface	Analog	While Payload powered ON
ARTM FW Revision	Firmware revision	Application firmware revision	Discrete	Always
ARTM-7221 MMC	Reset type	Status and type of the last reset of the IPMC	Discrete	Always
BOOT FW Revision	Firmware revision	Boot loader firmware revision	Discrete	Always

The location of the temperature sensor ARTM7221 Temp. is shown in the following figure.

Figure 2-23 Location of IPMI Temperature Sensor



For further details about IPMI sensors as well as supported IPMI commands, refer to the *ACCI/ARTM-7221/FC: Control via IPMI Programmer's Guide* which can be downloaded from the Emerson literature catalog.



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.

Note: Check the Motorola literature catalog for any errata sheets that may be applicable to the RTM.

Company/ Organisation	www.	Document
Emerson		PENT/ATCA-7221 Reference Guide PENT/ATCA-7221: Control via IPMI Programmer's Guide ACC/ATCA-7221/HDD/SATA Installation Guide ACC/ARTM-7221/FC: Control via IPMI Programmer's Guide
PCI-SIG	pcisig.com/specifications	PCI Local Bus Specification Revision 2.2 PCI-X Addendum to the PCI Local Bus Specification 1.0
PICMG	picmg.org/specifications.stm	PICMG 3.0 Revision 1.0 Advanced TCA Base Specification PICMG 3.1 Revision 1.0 Specification Ethernet/Fiber Channel for AdvancedTCA Systems

Symbols

Main features [22](#)

C

Contact information [21](#)

F

Face plate

E1/T1 interface connectors [46](#)

Fibre channel connector [45](#)

Keyboard/mouse connector [46](#)

LEDs [48](#)

Reset key [50](#)

Serial interface connector [45](#)

USB connector [44](#)

I

I2C address of IDROM [54](#)

IDROM I2C address [54](#)

Installation

Into nonpowered systems [38](#)

Into powered systems [39](#)

IPMI interface connector [34](#)

IPMI sensors [54](#)

R

Requirements

Environmental requirements [30](#)

Power requirements [29](#)

S

Serial ATA interface

For external hard disk [37](#)

For on-board hard disk [35](#)

Standard compliances [23](#)

T

Temperatures

Critical hot spots [32](#)

Non-operating [31](#)

Operating [31](#)

Z

Zone 3 connectors [51](#)

