symphony™

Instruction
Harmony Series

Rack Mount Terminations

ABB

Preface

The Rack Mount Termination System is a termination solution for process applications where conservation of space is essential. Many different rack mount terminations are available to support a wide variety of analog and digital termination requirements.

This instruction explains how to install and use a rack mount termination system in a Symphony Enterprise Management and Control System enclosure.

List of Effective Pages

Total number of pages in this instruction is 68, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through ix	Original
1-1 through 1-7	Original
2-1 through 2-3	Original
3-1 through 3-3	Original
4-1 through 4-2	Original
5-1 through 5-2	Original
6-1 through 6-3	Original
7-1 through 7-4	Original
8-1	Original
9-1 through 9-4	Original
10-1 through 10-3	Original
11-1	Original
12-1 through 12-2	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-3	Original
PR3-1 through PR3-2	Original
PR4-1 through PR4-3	Original
PR5-1 through PR5-3	Original
PR6-1 through PR6-3	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-2	Original
PR9-1 through PR9-2	Original
Index-1	Original

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Section 1 Introduction 1-1

Overview 1-1
Intended User 1-1
Description 1-1
Instruction Content 1-2
How to Use this Instruction 1-3
Document Conventions 1-3
Reference Documents 1-3
Related Nomenclature 1-4
Design Standards 1-5
Specifications 1-6

Section 2 NTBMA2 2-1

Introduction 2-1
Description 2-1
Terminal Designations 2-2

Section 3 NTBMB2 and NTBMB4 3-1

Introduction 3-1
Description 3-1
Terminal Designations 3-2

Section 4 NTBMC2 4-1

Introduction 4-1
Description 4-1
Terminal Designations 4-2

Section 5 NTBMD2 5-1

Introduction 5-1
Description 5-1
Terminal Designations 5-2

Section 6 NTBMG2 and NTBMH2 6-1

Introduction 6-1
Description 6-1
Terminal Designations 6-2

Table of Contents (continued)

Section 7 NTBMJ2, NTBML2, and NTBML4 7-1
Introduction 7-1
Description 7-1
Terminal Designations 7-4

Section 8 NTBMM1 and NTBMM2 8-1
Introduction 8-1
Description 8-1

Section 9 NTBMN2, NTBMO2, and NTBMO4 9-1
Introduction 9-1
Description 9-1
Terminal Designations 9-2

Section 10 Installation 10-1
Introduction 10-1
Special Handling 10-1
Unpacking and Inspection 10-2
Installation 10-2

Section 11 Maintenance 11-1
Introduction 11-1
Maintenance 11-1

Section 12 Repair and Replacement 12-1
Introduction 12-1
Replacement Parts and Ordering Instructions 12-1
Replacement and Spare Parts 12-1

List of Procedures

No.	Title
PR1	Module Mounting Unit Brackets Attachment
PR2	Termination Device and Cable Installation
PR3	P-ME-CAB-01 Terminal Device Mounting
PR4	P-ME-CAB-04/12 Terminal Device Mounting
PR5	P-ME-CAB-04/12 Cable Tray and Air Conduit Mounting
PR6	P-ME-CAB-01 Cable Tray and Air Conduit Mounting
PR7	Clamp Termination Wiring
PR8	Power Connection
PR9	Fuse Replacement

List of Figures

No.	Title	Page
1-1.	Rack Mount Termination System (Rear View)	1-2
2-1.	NTBMA2 Termination Device	2-1
3-1.	NTBMB2 and NTBMB4 Termination Devices	3-1
4-1.	NTBMC2 Termination Device	4-1
5-1.	NTBMD2 Termination Device	5-1
6-1.	NTBMG2 and NTBMH2 Termination Devices	6-2
7-1.	NTBMJ2 Termination Device	7-2
7-2.	NTBML2 and NTBML4 Termination Devices	7-3
8-1.	NTBMM1 and NTBMM2 Termination Devices	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-2
10-1.	Installation Sequence Flowchart	10-3
PR1-1.	Backplane and Mounting Brackets Installation	PR1-2
PR1-2.	Backplane, Mounting Brackets and Insulated Spacers	PR1-3
PR2-1.	Cable Installation	PR2-2
PR2-2.	Termination Device Installation	PR2-3
PR3-1.	Rack Mount Termination System Installation (P-ME-CAB-01)	PR3-2
PR4-1.	Rack Mount Termination System Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR4-2
PR5-1.	Cable Tray Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR5-3
PR6-1.	Cable Tray Installation (P-ME-CAB-01)	PR6-2
PR7-1.	Clamp Termination	PR7-2
PR8-1.	Power Connection	PR9-2
PR9-1.	Fuse Replacement	PR10-1

List of Tables

No.	Title	Page
1-1.	Reference Documents	1-4
1-2.	Related Nomenclature	1-4
1-3.	Design Standards	1-5
1-4.	Termination Device Specifications	1-6
2-1.	NTBMA2 Operating Information	2-2
2-2.	NTBMA2 Termination Device	2-2
2-3.	NTBMA2 Terminal	2-3
3-1.	NTBMB2 and NTBMB4 Operating Information	3-2
3-2.	NTBMB2 Termination Device	3-2
3-3.	NTBMB4 Termination Device	3-3
3-4.	NTBMB2 and NTBMB4 Terminals	3-3
4-1.	NTBMC2 Operating Information	4-2
4-2.	NTBMC2 Termination Device	4-2
4-3.	NTBMC2 Terminals	4-2
5-1.	NTBMD2 Operating Information	5-2
5-2.	NTBMD2 Termination Device	5-2
5-3.	NTBMD2 Terminal	5-2
6-1.	NTBMG2 and NTBMH2 Operating Information	6-1
6-2.	NTBMG2 and NTBMH2 Termination Devices	6-3
6-3.	NTBMG2 and NTBMH2 Terminals	6-3
7-1.	NTBMJ2, NTBML2, and NTBML4 Operating Information	7-3
7-2.	NTBMJ2, NTBML2, and NTBML4 Terminal Device	7-4
7-3.	NTBMJ2, NTBML2, and NTBML4 Terminals	7-4
8-1.	NTBMM1 and NTBMM2 Terminals	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Operating Information	9-1
9-2.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-3
9-3.	NTBM02 and NTBM04 Terminals	9-3
9-4.	NTBMN2 Terminal	9-3
9-5.	P1 Terminals	9-4
11-1.	Preventive Maintenance Schedule	11-1
12-1.	Parts	12-1

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete. (p. PR3-1, PR4-1, PR5-1, PR6-1, PR7-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Trademarks and Registrations

Registrations and trademarks used in this document include:

® INFI 90	Registered trademark of Elsag Bailey Process Automation

Preface

The Rack Mount Termination System is a termination solution for process applications where conservation of space is essential. Many different rack mount terminations are available to support a wide variety of analog and digital termination requirements.

This instruction explains how to install and use a rack mount termination system in a Symphony Enterprise Management and Control System enclosure.

List of Effective Pages

Total number of pages in this instruction is 68, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through ix	Original
1-1 through 1-7	Original
2-1 through 2-3	Original
3-1 through 3-3	Original
4-1 through 4-2	Original
5-1 through 5-2	Original
6-1 through 6-3	Original
7-1 through 7-4	Original
8-1	Original
9-1 through 9-4	Original
10-1 through 10-3	Original
11-1	Original
12-1 through 12-2	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-3	Original
PR3-1 through PR3-2	Original
PR4-1 through PR4-3	Original
PR5-1 through PR5-3	Original
PR6-1 through PR6-3	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-2	Original
PR9-1 through PR9-2	Original
Index-1	Original

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Section 1 Introduction 1-1

Overview 1-1
Intended User 1-1
Description 1-1
Instruction Content 1-2
How to Use this Instruction 1-3
Document Conventions 1-3
Reference Documents 1-3
Related Nomenclature 1-4
Design Standards 1-5
Specifications 1-6

Section 2 NTBMA2 2-1

Introduction 2-1
Description 2-1
Terminal Designations 2-2

Section 3 NTBMB2 and NTBMB4 3-1

Introduction 3-1
Description 3-1
Terminal Designations 3-2

Section 4 NTBMC2 4-1

Introduction 4-1
Description 4-1
Terminal Designations 4-2

Section 5 NTBMD2 5-1

Introduction 5-1
Description 5-1
Terminal Designations 5-2

Section 6 NTBMG2 and NTBMH2 6-1

Introduction 6-1
Description 6-1
Terminal Designations 6-2

Table of Contents (continued)

Section 7 NTBMJ2, NTBML2, and NTBML4 7-1
Introduction 7-1
Description 7-1
Terminal Designations 7-4

Section 8 NTBMM1 and NTBMM2 8-1
Introduction 8-1
Description 8-1

Section 9 NTBMN2, NTBMO2, and NTBMO4 9-1
Introduction 9-1
Description 9-1
Terminal Designations 9-2

Section 10 Installation 10-1
Introduction 10-1
Special Handling 10-1
Unpacking and Inspection 10-2
Installation 10-2

Section 11 Maintenance 11-1
Introduction 11-1
Maintenance 11-1

Section 12 Repair and Replacement 12-1
Introduction 12-1
Replacement Parts and Ordering Instructions 12-1
Replacement and Spare Parts 12-1

List of Procedures

No.	Title
PR1	Module Mounting Unit Brackets Attachment
PR2	Termination Device and Cable Installation
PR3	P-ME-CAB-01 Terminal Device Mounting
PR4	P-ME-CAB-04/12 Terminal Device Mounting
PR5	P-ME-CAB-04/12 Cable Tray and Air Conduit Mounting
PR6	P-ME-CAB-01 Cable Tray and Air Conduit Mounting
PR7	Clamp Termination Wiring
PR8	Power Connection
PR9	Fuse Replacement

List of Figures

No.	Title	Page
1-1.	Rack Mount Termination System (Rear View)	1-2
2-1.	NTBMA2 Termination Device	2-1
3-1.	NTBMB2 and NTBMB4 Termination Devices	3-1
4-1.	NTBMC2 Termination Device	4-1
5-1.	NTBMD2 Termination Device	5-1
6-1.	NTBMG2 and NTBMH2 Termination Devices	6-2
7-1.	NTBMJ2 Termination Device	7-2
7-2.	NTBML2 and NTBML4 Termination Devices	7-3
8-1.	NTBMM1 and NTBMM2 Termination Devices	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-2
10-1.	Installation Sequence Flowchart	10-3
PR1-1.	Backplane and Mounting Brackets Installation	PR1-2
PR1-2.	Backplane, Mounting Brackets and Insulated Spacers	PR1-3
PR2-1.	Cable Installation	PR2-2
PR2-2.	Termination Device Installation	PR2-3
PR3-1.	Rack Mount Termination System Installation (P-ME-CAB-01)	PR3-2
PR4-1.	Rack Mount Termination System Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR4-2
PR5-1.	Cable Tray Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR5-3
PR6-1.	Cable Tray Installation (P-ME-CAB-01)	PR6-2
PR7-1.	Clamp Termination	PR7-2
PR8-1.	Power Connection	PR9-2
PR9-1.	Fuse Replacement	PR10-1

List of Tables

No.	Title	Page
1-1.	Reference Documents	1-4
1-2.	Related Nomenclature	1-4
1-3.	Design Standards	1-5
1-4.	Termination Device Specifications	1-6
2-1.	NTBMA2 Operating Information	2-2
2-2.	NTBMA2 Termination Device	2-2
2-3.	NTBMA2 Terminal	2-3
3-1.	NTBMB2 and NTBMB4 Operating Information	3-2
3-2.	NTBMB2 Termination Device	3-2
3-3.	NTBMB4 Termination Device	3-3
3-4.	NTBMB2 and NTBMB4 Terminals	3-3
4-1.	NTBMC2 Operating Information	4-2
4-2.	NTBMC2 Termination Device	4-2
4-3.	NTBMC2 Terminals	4-2
5-1.	NTBMD2 Operating Information	5-2
5-2.	NTBMD2 Termination Device	5-2
5-3.	NTBMD2 Terminal	5-2
6-1.	NTBMG2 and NTBMH2 Operating Information	6-1
6-2.	NTBMG2 and NTBMH2 Termination Devices	6-3
6-3.	NTBMG2 and NTBMH2 Terminals	6-3
7-1.	NTBMJ2, NTBML2, and NTBML4 Operating Information	7-3
7-2.	NTBMJ2, NTBML2, and NTBML4 Terminal Device	7-4
7-3.	NTBMJ2, NTBML2, and NTBML4 Terminals	7-4
8-1.	NTBMM1 and NTBMM2 Terminals	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Operating Information	9-1
9-2.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-3
9-3.	NTBM02 and NTBM04 Terminals	9-3
9-4.	NTBMN2 Terminal	9-3
9-5.	P1 Terminals	9-4
11-1.	Preventive Maintenance Schedule	11-1
12-1.	Parts	12-1

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete. (p. PR3-1, PR4-1, PR5-1, PR6-1, PR7-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Trademarks and Registrations

Registrations and trademarks used in this document include:

® INFI 90	Registered trademark of Elsag Bailey Process Automation

Preface

The Rack Mount Termination System is a termination solution for process applications where conservation of space is essential. Many different rack mount terminations are available to support a wide variety of analog and digital termination requirements.

This instruction explains how to install and use a rack mount termination system in a Symphony Enterprise Management and Control System enclosure.

List of Effective Pages

Total number of pages in this instruction is 68, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through ix	Original
1-1 through 1-7	Original
2-1 through 2-3	Original
3-1 through 3-3	Original
4-1 through 4-2	Original
5-1 through 5-2	Original
6-1 through 6-3	Original
7-1 through 7-4	Original
8-1	Original
9-1 through 9-4	Original
10-1 through 10-3	Original
11-1	Original
12-1 through 12-2	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-3	Original
PR3-1 through PR3-2	Original
PR4-1 through PR4-3	Original
PR5-1 through PR5-3	Original
PR6-1 through PR6-3	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-2	Original
PR9-1 through PR9-2	Original
Index-1	Original

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Section 1 Introduction 1-1

Overview 1-1
Intended User 1-1
Description 1-1
Instruction Content 1-2
How to Use this Instruction 1-3
Document Conventions 1-3
Reference Documents 1-3
Related Nomenclature 1-4
Design Standards 1-5
Specifications 1-6

Section 2 NTBMA2 2-1

Introduction 2-1
Description 2-1
Terminal Designations 2-2

Section 3 NTBMB2 and NTBMB4 3-1

Introduction 3-1
Description 3-1
Terminal Designations 3-2

Section 4 NTBMC2 4-1

Introduction 4-1
Description 4-1
Terminal Designations 4-2

Section 5 NTBMD2 5-1

Introduction 5-1
Description 5-1
Terminal Designations 5-2

Section 6 NTBMG2 and NTBMH2 6-1

Introduction 6-1
Description 6-1
Terminal Designations 6-2

Table of Contents (continued)

Section 7 NTBMJ2, NTBML2, and NTBML4 7-1
Introduction 7-1
Description 7-1
Terminal Designations 7-4

Section 8 NTBMM1 and NTBMM2 8-1
Introduction 8-1
Description 8-1

Section 9 NTBMN2, NTBMO2, and NTBMO4 9-1
Introduction 9-1
Description 9-1
Terminal Designations 9-2

Section 10 Installation 10-1
Introduction 10-1
Special Handling 10-1
Unpacking and Inspection 10-2
Installation 10-2

Section 11 Maintenance 11-1
Introduction 11-1
Maintenance 11-1

Section 12 Repair and Replacement 12-1
Introduction 12-1
Replacement Parts and Ordering Instructions 12-1
Replacement and Spare Parts 12-1

List of Procedures

No.	Title
PR1	Module Mounting Unit Brackets Attachment
PR2	Termination Device and Cable Installation
PR3	P-ME-CAB-01 Terminal Device Mounting
PR4	P-ME-CAB-04/12 Terminal Device Mounting
PR5	P-ME-CAB-04/12 Cable Tray and Air Conduit Mounting
PR6	P-ME-CAB-01 Cable Tray and Air Conduit Mounting
PR7	Clamp Termination Wiring
PR8	Power Connection
PR9	Fuse Replacement

List of Figures

No.	Title	Page
1-1.	Rack Mount Termination System (Rear View)	1-2
2-1.	NTBMA2 Termination Device	2-1
3-1.	NTBMB2 and NTBMB4 Termination Devices	3-1
4-1.	NTBMC2 Termination Device	4-1
5-1.	NTBMD2 Termination Device	5-1
6-1.	NTBMG2 and NTBMH2 Termination Devices	6-2
7-1.	NTBMJ2 Termination Device	7-2
7-2.	NTBML2 and NTBML4 Termination Devices	7-3
8-1.	NTBMM1 and NTBMM2 Termination Devices	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-2
10-1.	Installation Sequence Flowchart	10-3
PR1-1.	Backplane and Mounting Brackets Installation	PR1-2
PR1-2.	Backplane, Mounting Brackets and Insulated Spacers	PR1-3
PR2-1.	Cable Installation	PR2-2
PR2-2.	Termination Device Installation	PR2-3
PR3-1.	Rack Mount Termination System Installation (P-ME-CAB-01)	PR3-2
PR4-1.	Rack Mount Termination System Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR4-2
PR5-1.	Cable Tray Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR5-3
PR6-1.	Cable Tray Installation (P-ME-CAB-01)	PR6-2
PR7-1.	Clamp Termination	PR7-2
PR8-1.	Power Connection	PR9-2
PR9-1.	Fuse Replacement	PR10-1

List of Tables

No.	Title	Page
1-1.	Reference Documents	1-4
1-2.	Related Nomenclature	1-4
1-3.	Design Standards	1-5
1-4.	Termination Device Specifications	1-6
2-1.	NTBMA2 Operating Information	2-2
2-2.	NTBMA2 Termination Device	2-2
2-3.	NTBMA2 Terminal	2-3
3-1.	NTBMB2 and NTBMB4 Operating Information	3-2
3-2.	NTBMB2 Termination Device	3-2
3-3.	NTBMB4 Termination Device	3-3
3-4.	NTBMB2 and NTBMB4 Terminals	3-3
4-1.	NTBMC2 Operating Information	4-2
4-2.	NTBMC2 Termination Device	4-2
4-3.	NTBMC2 Terminals	4-2
5-1.	NTBMD2 Operating Information	5-2
5-2.	NTBMD2 Termination Device	5-2
5-3.	NTBMD2 Terminal	5-2
6-1.	NTBMG2 and NTBMH2 Operating Information	6-1
6-2.	NTBMG2 and NTBMH2 Termination Devices	6-3
6-3.	NTBMG2 and NTBMH2 Terminals	6-3
7-1.	NTBMJ2, NTBML2, and NTBML4 Operating Information	7-3
7-2.	NTBMJ2, NTBML2, and NTBML4 Terminal Device	7-4
7-3.	NTBMJ2, NTBML2, and NTBML4 Terminals	7-4
8-1.	NTBMM1 and NTBMM2 Terminals	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Operating Information	9-1
9-2.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-3
9-3.	NTBM02 and NTBM04 Terminals	9-3
9-4.	NTBMN2 Terminal	9-3
9-5.	P1 Terminals	9-4
11-1.	Preventive Maintenance Schedule	11-1
12-1.	Parts	12-1

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete. (p. PR3-1, PR4-1, PR5-1, PR6-1, PR7-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Trademarks and Registrations

Registrations and trademarks used in this document include:

® INFI 90	Registered trademark of Elsag Bailey Process Automation

Preface

The Rack Mount Termination System is a termination solution for process applications where conservation of space is essential. Many different rack mount terminations are available to support a wide variety of analog and digital termination requirements.

This instruction explains how to install and use a rack mount termination system in a Symphony Enterprise Management and Control System enclosure.

List of Effective Pages

Total number of pages in this instruction is 68, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through ix	Original
1-1 through 1-7	Original
2-1 through 2-3	Original
3-1 through 3-3	Original
4-1 through 4-2	Original
5-1 through 5-2	Original
6-1 through 6-3	Original
7-1 through 7-4	Original
8-1	Original
9-1 through 9-4	Original
10-1 through 10-3	Original
11-1	Original
12-1 through 12-2	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-3	Original
PR3-1 through PR3-2	Original
PR4-1 through PR4-3	Original
PR5-1 through PR5-3	Original
PR6-1 through PR6-3	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-2	Original
PR9-1 through PR9-2	Original
Index-1	Original

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Section 1 Introduction 1-1

Overview 1-1
Intended User 1-1
Description 1-1
Instruction Content 1-2
How to Use this Instruction 1-3
Document Conventions 1-3
Reference Documents 1-3
Related Nomenclature 1-4
Design Standards 1-5
Specifications 1-6

Section 2 NTBMA2 2-1

Introduction 2-1
Description 2-1
Terminal Designations 2-2

Section 3 NTBMB2 and NTBMB4 3-1

Introduction 3-1
Description 3-1
Terminal Designations 3-2

Section 4 NTBMC2 4-1

Introduction 4-1
Description 4-1
Terminal Designations 4-2

Section 5 NTBMD2 5-1

Introduction 5-1
Description 5-1
Terminal Designations 5-2

Section 6 NTBMG2 and NTBMH2 6-1

Introduction 6-1
Description 6-1
Terminal Designations 6-2

Table of Contents (continued)

Section 7 NTBMJ2, NTBML2, and NTBML4 7-1
Introduction 7-1
Description 7-1
Terminal Designations 7-4

Section 8 NTBMM1 and NTBMM2 8-1
Introduction 8-1
Description 8-1

Section 9 NTBMN2, NTBMO2, and NTBMO4 9-1
Introduction 9-1
Description 9-1
Terminal Designations 9-2

Section 10 Installation 10-1
Introduction 10-1
Special Handling 10-1
Unpacking and Inspection 10-2
Installation 10-2

Section 11 Maintenance 11-1
Introduction 11-1
Maintenance 11-1

Section 12 Repair and Replacement 12-1
Introduction 12-1
Replacement Parts and Ordering Instructions 12-1
Replacement and Spare Parts 12-1

List of Procedures

No.	Title
PR1	Module Mounting Unit Brackets Attachment
PR2	Termination Device and Cable Installation
PR3	P-ME-CAB-01 Terminal Device Mounting
PR4	P-ME-CAB-04/12 Terminal Device Mounting
PR5	P-ME-CAB-04/12 Cable Tray and Air Conduit Mounting
PR6	P-ME-CAB-01 Cable Tray and Air Conduit Mounting
PR7	Clamp Termination Wiring
PR8	Power Connection
PR9	Fuse Replacement

List of Figures

No.	Title	Page
1-1.	Rack Mount Termination System (Rear View)	1-2
2-1.	NTBMA2 Termination Device	2-1
3-1.	NTBMB2 and NTBMB4 Termination Devices	3-1
4-1.	NTBMC2 Termination Device	4-1
5-1.	NTBMD2 Termination Device	5-1
6-1.	NTBMG2 and NTBMH2 Termination Devices	6-2
7-1.	NTBMJ2 Termination Device	7-2
7-2.	NTBML2 and NTBML4 Termination Devices	7-3
8-1.	NTBMM1 and NTBMM2 Termination Devices	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-2
10-1.	Installation Sequence Flowchart	10-3
PR1-1.	Backplane and Mounting Brackets Installation	PR1-2
PR1-2.	Backplane, Mounting Brackets and Insulated Spacers	PR1-3
PR2-1.	Cable Installation	PR2-2
PR2-2.	Termination Device Installation	PR2-3
PR3-1.	Rack Mount Termination System Installation (P-ME-CAB-01)	PR3-2
PR4-1.	Rack Mount Termination System Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR4-2
PR5-1.	Cable Tray Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR5-3
PR6-1.	Cable Tray Installation (P-ME-CAB-01)	PR6-2
PR7-1.	Clamp Termination	PR7-2
PR8-1.	Power Connection	PR9-2
PR9-1.	Fuse Replacement	PR10-1

List of Tables

No.	Title	Page
1-1.	Reference Documents	1-4
1-2.	Related Nomenclature	1-4
1-3.	Design Standards	1-5
1-4.	Termination Device Specifications	1-6
2-1.	NTBMA2 Operating Information	2-2
2-2.	NTBMA2 Termination Device	2-2
2-3.	NTBMA2 Terminal	2-3
3-1.	NTBMB2 and NTBMB4 Operating Information	3-2
3-2.	NTBMB2 Termination Device	3-2
3-3.	NTBMB4 Termination Device	3-3
3-4.	NTBMB2 and NTBMB4 Terminals	3-3
4-1.	NTBMC2 Operating Information	4-2
4-2.	NTBMC2 Termination Device	4-2
4-3.	NTBMC2 Terminals	4-2
5-1.	NTBMD2 Operating Information	5-2
5-2.	NTBMD2 Termination Device	5-2
5-3.	NTBMD2 Terminal	5-2
6-1.	NTBMG2 and NTBMH2 Operating Information	6-1
6-2.	NTBMG2 and NTBMH2 Termination Devices	6-3
6-3.	NTBMG2 and NTBMH2 Terminals	6-3
7-1.	NTBMJ2, NTBML2, and NTBML4 Operating Information	7-3
7-2.	NTBMJ2, NTBML2, and NTBML4 Terminal Device	7-4
7-3.	NTBMJ2, NTBML2, and NTBML4 Terminals	7-4
8-1.	NTBMM1 and NTBMM2 Terminals	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Operating Information	9-1
9-2.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-3
9-3.	NTBM02 and NTBM04 Terminals	9-3
9-4.	NTBMN2 Terminal	9-3
9-5.	P1 Terminals	9-4
11-1.	Preventive Maintenance Schedule	11-1
12-1.	Parts	12-1

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete. (p. PR3-1, PR4-1, PR5-1, PR6-1, PR7-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Trademarks and Registrations

Registrations and trademarks used in this document include:

® INFI 90	Registered trademark of Elsag Bailey Process Automation

Preface

The Rack Mount Termination System is a termination solution for process applications where conservation of space is essential. Many different rack mount terminations are available to support a wide variety of analog and digital termination requirements.

This instruction explains how to install and use a rack mount termination system in a Symphony Enterprise Management and Control System enclosure.

List of Effective Pages

Total number of pages in this instruction is 68, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through ix	Original
1-1 through 1-7	Original
2-1 through 2-3	Original
3-1 through 3-3	Original
4-1 through 4-2	Original
5-1 through 5-2	Original
6-1 through 6-3	Original
7-1 through 7-4	Original
8-1	Original
9-1 through 9-4	Original
10-1 through 10-3	Original
11-1	Original
12-1 through 12-2	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-3	Original
PR3-1 through PR3-2	Original
PR4-1 through PR4-3	Original
PR5-1 through PR5-3	Original
PR6-1 through PR6-3	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-2	Original
PR9-1 through PR9-2	Original
Index-1	Original

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Section 1 Introduction 1-1

Overview 1-1
Intended User 1-1
Description 1-1
Instruction Content 1-2
How to Use this Instruction 1-3
Document Conventions 1-3
Reference Documents 1-3
Related Nomenclature 1-4
Design Standards 1-5
Specifications 1-6

Section 2 NTBMA2 2-1

Introduction 2-1
Description 2-1
Terminal Designations 2-2

Section 3 NTBMB2 and NTBMB4 3-1

Introduction 3-1
Description 3-1
Terminal Designations 3-2

Section 4 NTBMC2 4-1

Introduction 4-1
Description 4-1
Terminal Designations 4-2

Section 5 NTBMD2 5-1

Introduction 5-1
Description 5-1
Terminal Designations 5-2

Section 6 NTBMG2 and NTBMH2 6-1

Introduction 6-1
Description 6-1
Terminal Designations 6-2

Table of Contents (continued)

Section 7 NTBMJ2, NTBML2, and NTBML4 7-1
Introduction 7-1
Description 7-1
Terminal Designations 7-4

Section 8 NTBMM1 and NTBMM2 8-1
Introduction 8-1
Description 8-1

Section 9 NTBMN2, NTBMO2, and NTBMO4 9-1
Introduction 9-1
Description 9-1
Terminal Designations 9-2

Section 10 Installation 10-1
Introduction 10-1
Special Handling 10-1
Unpacking and Inspection 10-2
Installation 10-2

Section 11 Maintenance 11-1
Introduction 11-1
Maintenance 11-1

Section 12 Repair and Replacement 12-1
Introduction 12-1
Replacement Parts and Ordering Instructions 12-1
Replacement and Spare Parts 12-1

List of Procedures

No.	Title
PR1	Module Mounting Unit Brackets Attachment
PR2	Termination Device and Cable Installation
PR3	P-ME-CAB-01 Terminal Device Mounting
PR4	P-ME-CAB-04/12 Terminal Device Mounting
PR5	P-ME-CAB-04/12 Cable Tray and Air Conduit Mounting
PR6	P-ME-CAB-01 Cable Tray and Air Conduit Mounting
PR7	Clamp Termination Wiring
PR8	Power Connection
PR9	Fuse Replacement

List of Figures

No.	Title	Page
1-1.	Rack Mount Termination System (Rear View)	1-2
2-1.	NTBMA2 Termination Device	2-1
3-1.	NTBMB2 and NTBMB4 Termination Devices	3-1
4-1.	NTBMC2 Termination Device	4-1
5-1.	NTBMD2 Termination Device	5-1
6-1.	NTBMG2 and NTBMH2 Termination Devices	6-2
7-1.	NTBMJ2 Termination Device	7-2
7-2.	NTBML2 and NTBML4 Termination Devices	7-3
8-1.	NTBMM1 and NTBMM2 Termination Devices	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-2
10-1.	Installation Sequence Flowchart	10-3
PR1-1.	Backplane and Mounting Brackets Installation	PR1-2
PR1-2.	Backplane, Mounting Brackets and Insulated Spacers	PR1-3
PR2-1.	Cable Installation	PR2-2
PR2-2.	Termination Device Installation	PR2-3
PR3-1.	Rack Mount Termination System Installation (P-ME-CAB-01)	PR3-2
PR4-1.	Rack Mount Termination System Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR4-2
PR5-1.	Cable Tray Installation (P-ME-CAB-12 or P-ME-CAB-04)	PR5-3
PR6-1.	Cable Tray Installation (P-ME-CAB-01)	PR6-2
PR7-1.	Clamp Termination	PR7-2
PR8-1.	Power Connection	PR9-2
PR9-1.	Fuse Replacement	PR10-1

List of Tables

No.	Title	Page
1-1.	Reference Documents	1-4
1-2.	Related Nomenclature	1-4
1-3.	Design Standards	1-5
1-4.	Termination Device Specifications	1-6
2-1.	NTBMA2 Operating Information	2-2
2-2.	NTBMA2 Termination Device	2-2
2-3.	NTBMA2 Terminal	2-3
3-1.	NTBMB2 and NTBMB4 Operating Information	3-2
3-2.	NTBMB2 Termination Device	3-2
3-3.	NTBMB4 Termination Device	3-3
3-4.	NTBMB2 and NTBMB4 Terminals	3-3
4-1.	NTBMC2 Operating Information	4-2
4-2.	NTBMC2 Termination Device	4-2
4-3.	NTBMC2 Terminals	4-2
5-1.	NTBMD2 Operating Information	5-2
5-2.	NTBMD2 Termination Device	5-2
5-3.	NTBMD2 Terminal	5-2
6-1.	NTBMG2 and NTBMH2 Operating Information	6-1
6-2.	NTBMG2 and NTBMH2 Termination Devices	6-3
6-3.	NTBMG2 and NTBMH2 Terminals	6-3
7-1.	NTBMJ2, NTBML2, and NTBML4 Operating Information	7-3
7-2.	NTBMJ2, NTBML2, and NTBML4 Terminal Device	7-4
7-3.	NTBMJ2, NTBML2, and NTBML4 Terminals	7-4
8-1.	NTBMM1 and NTBMM2 Terminals	8-1
9-1.	NTBMN2, NTBMO2, and NTBMO4 Operating Information	9-1
9-2.	NTBMN2, NTBMO2, and NTBMO4 Termination Devices	9-3
9-3.	NTBM02 and NTBM04 Terminals	9-3
9-4.	NTBMN2 Terminal	9-3
9-5.	P1 Terminals	9-4
11-1.	Preventive Maintenance Schedule	11-1
12-1.	Parts	12-1

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete. (p. PR3-1, PR4-1, PR5-1, PR6-1, PR7-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Trademarks and Registrations

Registrations and trademarks used in this document include:

® INFI 90	Registered trademark of Elsag Bailey Process Automation

Introduction

Section 1

Overview

The Rack Mount Termination System is a termination solution for process applications where space is limited. Rack mount terminations can be integrated into enclosures with other I/O components. Typically, the termination portion of a system requires at least one dedicated enclosure. The rack mount termination system can be intermixed with other I/O components to reduce the overall system space requirement.

Intended User

Personnel installing, operating, or maintaining the rack mount terminations should read this instruction before performing any installation, operation, or maintenance procedures. Installation requires an engineer or technician with experience handling electronic circuitry. Those working with the rack mount terminations should have experience working with and know the precautions to take around AC/DC power. A knowledge of the Symphony system and electronic principles is also required.

Description

The rack mount termination system consists of a module mounting unit (MMU), cable tray, termination brackets (Fig. 1-1), and a series of termination devices.

Module Mounting Unit

I/O modules can be easily installed from the front of the module mounting unit into the respective termination device that is attached to the rear of the module mounting unit. The module mounting unit is open at the top and bottom to allow air to flow over the modules. Mounting flanges are provided for mounting the rack mount termination system to the enclosure.

Cable Tray

The cable tray is mounted to either a rear or front mounting airflow conduit and is used to keep wires and cables organized and untangled. The airflow conduit is normally mounted below

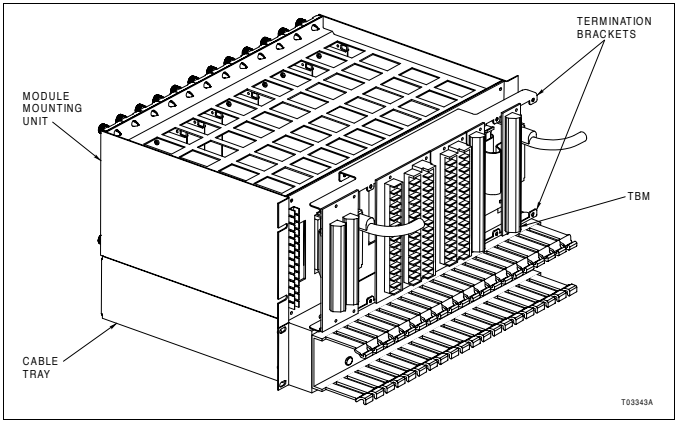

Figure 1-1. Rack Mount Termination System (Rear View)

the rack mount termination system and provides a path for cabinet cooling.

Termination Brackets

A set of two termination brackets attach to the back of a standard module mounting unit. These brackets provide support for the termination devices.

Termination Device

There are several termination devices (TBM) to choose from for the rack mount termination system. The available termination devices cover a wide range of I/O applications. The width of the termination device varies from one to two slots in a module mounting unit.

Instruction Content

This instruction contains information on the rack mount termination system. It is organized into several sections and a set of individual procedures that simplify the installation process.

Introduction

Contains a brief description, general usage information and technical specifications.

Termination Device Descriptions

These sections describe the termination device by providing operating details, and terminal designations.

Installation — Contains unpacking information and organizes the installation process by providing a flowchart that breaks the process down into individual procedures.

Maintenance — Lists the maintenance requirements of the rack mount termination system.

Repair and Replacement — Provides replacement parts and ordering information for the rack mount termination system.

Procedures — Procedure sections provide steps for each individual task associated with setting up the rack mount termination system.

How to Use this Instruction

Read this instruction in sequence. It is important to become familiar with the entire contents of this instruction before using the termination devices. Refer to a specific section for information as needed.

1. Read the appropriate termination device description section before installing.

2. Perform the steps in the installation section.

3. Refer to the maintenance section for scheduled maintenance requirements.

4. Refer to the repair and replacement procedures to replace a rack mount termination device.

Document Conventions

The ? in a nomenclature or a part number indicates a variable for that position, i.e., IMDSI1?.

Reference Documents

Table 1-1 lists instructions which are related to the rack mount termination system and are referenced in this instruction.

Table 1-1. Reference Documents

Number	Title
WBPEEUI240762??	Digital Output Module (IMDSO14)
WBPEEUI240763??	Digital Output Module (IMDSO15)
WBPEEUI240764??	High Level Analog Input (IMFEC11)
WBPEEUI240765??	Analog Output Module (IMASO11)
WBPEEUI240766??	Isolated Analog Input Module (IMASI13)
WBPEEUI240767??	Digital Input Modules, (IMDSI12, IMDSI13, IMDSI14, IMDSI15)
WBPEEUI240769??	Control I/O module and Quick Response I/O Module (IMCIS12, IMQRS12)

Related Nomenclature

Table 1-2 lists the related nomenclature. Select the termination device type based on the application requirements.

Table 1-2. Related Nomenclature

Termination Device Type	Function	Power	I/O Modules
NTBMA2 (1 slot)	16 digital inputs	Field	IMDSI12, IMDSI13, IMDSI4, IMDSI15, IMDSI22
	16 digital outputs	Field	IMDSO14
	14 analog outputs	System	IMASO11
NTBMB2 (1 slot)	16 digital inputs switching common	System	IMDSI12, IMDSI13, IMDSI14, IMDSI15, IMDSI22
	16 digital outputs	System	IMDSO14
	8 single pole double throw relay outputs	Field	IMDSO15
NTBMB4 (1 slot)	14 digital inputs switching hot	System	IMDSI12, IMDSI13, IMDSI14, IMDSI15, IMDSI22
	14 digital outputs	System	IMDSO14
NTBMC2 (1 slot)	15 analog inputs (4-20 mA current loop) FSK (P mode)	System	IMFEC11 (analog mode) FSK (P mode)
NTBMD2 (1 slot)	15 analog inputs (4-20 mA current loop or differential voltage)	Field	IMFEC11 (analog mode) IMFEC12

Table 1-2. Related Nomenclature *(continued)*

Termination Device Type	Function	Power	I/O Modules
NTBMG2 (1 slot)	3 digital inputs 4 digital outputs 4 analog inputs 2 analog outputs	Field Field Field System	IMCIS12, IMQRS12
NTBMH2 (1 slot)	3 digital inputs 4 digital outputs 4 analog inputs 2 analog outputs	Field Field System System	
NTBMJ2 (2 slots)	16 analog inputs (2 wire 4-20 mA devices)	System	IMASI13
NTBML2 (2 slots)	16 analog inputs (TC, 3 wire RTD and diff. analog volt)	Field	
NTBML4 (2 slots)	16 analog inputs (4-20 mA)	Field	
NTBMM1 (2 slots)	Vacant slot cover	N/A	—
NTBMM2 (1 slot)	Vacant slot cover	N/A	—
NTBMN2 (1 slot)	16 digital inputs	Field	IMSET01, IMSED01
NTBMO2 (1 slot)	16 digital inputs switching common	System	
NTBMO4 (1 slot)	16 digital inputs switching hot	System	

Design Standards

Table 1-3 lists the design standards for the rack mount termination system.

Table 1-3. Design Standards

Category	Standard	Description
Safety	CSA C22.2 No. 1010.1 EN 61010-1 IEC 61010-1	Safety standards for electrical equipment for measurement and control.

Table 1-3. Design Standards *(continued)*

Category	Standard	Description
Environmental	IEC 60068-2-1,2,14	Ambient temperature
	IEC 60068-2-3	Relative humidity
	ISA S71.04 (Class LA, IB, LC-Level1)	Air quality
EMI, RFI, and electrical surge[1]	IEC 61000-4-2 IEC 61000-4-3 EMI susceptibility	Electrostatic discharge
	IEC 61000-4-4 IEC 61000-4-6 conducted immunity	Fast transient bursts
	IEC 61000-4-5	Voltage-current surge
	IEC 61000-4-8	Power frequency magnetic field
	IEC 61000-4-9	Pulse magnetic field
	IEC 61000-4-10	Damped oscillatory magnetic field
	IEC 61000-4-12	Damped oscillatory wave
	IEC 61000-4-12	Ring wave
Flammability of product components	UL 94 V-0, V-1, V-2	Flammability of plastic materials

NOTE:
1. Verify the severity level of the relevant module used with the NTBM?? module.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Specifications

Table 1-4 lists general specifications for termination devices.

Table 1-4. Termination Device Specifications

Property	Characteristic/Value
Mounting	Screw mount to bracket on rear of the module mounting unit.
Wire size	
Clamp terminal	0.32 sq-mm to 2.1 sq-mm (22 AWG to 14 AWG).
Dimensions	
Single slot	35 mm (1.38 in.)
Double slot	70 mm (2.76 in.)

Table 1-4. Termination Device Specifications *(continued)*

Property	Characteristic/Value
Environmental	
Temperature	0° to 70°C (32° to 158°F)
Relative humidity	5% to 90% up to 55°C (131°F) noncondensing. 5% to 40% up to 70°C (158°F) noncondensing.
Air quality	Equipment should be operated and stored in a noncorrosive environment.
Pollution	Pollution degree 1.
Cooling requirements	None necessary when used in a Symphony enclosure.
CE Mark declaration	This product, when installed in a Harmony enclosure, complies with the following directives/standards requested for CE marking:
EMC 89/336/EEC	EN50081-2 Generic Emission Standard - Part 2: Industrial Environment. EN50082-2 Generic Immunity Standard - Part 2: Industrial Environment.
Low Voltage Directive 73/23/EEC	EN61010-1 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements.
Certifications (pending)	
Canadian Standards Association (CSA)	Certified for use as process control equipment in an ordinary (nonhazardous) location.
Factory Mutual (FM) (pending)	Approval as nonincendive equipment for use in Class I; Division 2; Groups A,B,C,D; hazardous locations.
Overvoltage (installation) category	I for circuits above 150 V. II for circuits below 150 V.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

NTBMA2

Section 2

Introduction

This section describes and lists terminal designations for the NTBMA2 termination device.

Description

The NTBMA2 termination device is field powered and designed to terminate 16 digital signals and 14 analog outputs. Figure 2-1 shows the NTBMA2 termination device. Table 2-1 provides operating information for the NTBMA2 termination device.

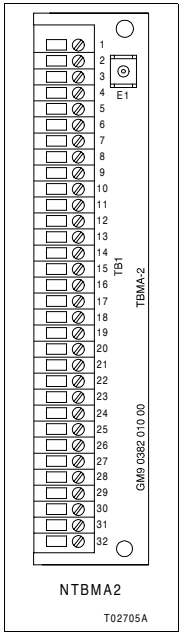

Figure 2-1. NTBMA2 Termination Device

Table 2-1. NTBMA2 Operating Information

Type	Function	Power	I/O Modules	Cable (P/N)
NTBMA2 (1 slot)	16 DI	Field	IMDSI12, IMDSI13, IMDSI14, IMDSI15	ITC30W (GC9038600201)
	16 DO	Field	IMDSO14	
	14 AO	System	IMASO11	
	8 single pole double throw relay outputs	Field	IMDSO15	

Terminal Designations

Tables 2-2 and 2-3 list termination designations for the NTBMA2 termination device.

Table 2-2. NTBMA2 Termination Device

TB1 Terminal	I/O Modules[1]		
	IMDSO14 IMDSO15	IMDSI12 IMDSI13 IMDSI14 IMDSI15	IMASO11
1	DO1+	DI1+	AO1+
2	DO1-	DI1-	AO1-
3	DO2+	DI2+	AO2+
4	DO2-	DI2-	AO2-
5	DO3+	DI3+	AO3+
6	DO3-	DI3-	AO3-
7	DO4+	DI4+	AO4+
8	DO4-	DI4-	AO4-
9	DO5+	DI5+	AO5+
10	DO5-	DI5-	AO5-
11	DO6+	DI6+	AO6+
12	DO6-	DI6-	AO6-
13	DO7+ (shared with DO8+)	DI7+ (shared with DI8+)	AO7+
14	DO7-	DI7-	AO7-
15	DO8+ (shared wtih DO7+)	DI8+ (shared with DI7+)	AO7+ (duplicate)
16	DO8-	DI8-	+24 VDC

Table 2-2. NTBMA2 Termination Device *(continued)*

TB1 Terminal	I/O Modules[1]		
	IMDSO14 IMDSO15	IMDSI12 IMDSI13 IMDSI14 IMDSI15	IMASO11
17	DO9+	DI9+	AO8+
18	DO9-	DI9-	AO8-
19	DO10+	DI10+	AO9+
20	DO10-	DI10-	AO9-
21	DO11+	DI11+	AO10+
22	DO11-	DI11-	AO10-
23	DO12+	DI12+	AO11+
24	DO12-	DI12-	AO11-
25	DO13+	DI13+	AO12+
26	DO13-	DI13-	AO12-
27	DO14+	DI14+	AO13+
28	DO14-	DI14-	AO13-
29	DO15+ (shared wtih DO16+)	DI15+ (shared with DI16+)	AO14+
30	DO15-	DI15-	AO14-
31	DO16+ (shared with DO15+)	DI16+ (shared with DI15+)	AO14+ (duplicate)
32	DO16-	DI16-	Not used

NOTE:
1. Refer to appropriate instruction for further explanation.

Table 2-3. NTBMA2 Terminal

Terminal	Description
E1	Ground (connect to chassis)

NTBMB2 and NTBMB4

Section 3

Introduction

This section describes and lists terminal designations for NTBMB2 and NTBMB4 termination devices.

Description

The NTBMB2 and NTBMB4 termination devices are designed to be used with system powered field devices through the E-1 and E-2 terminals (Fig. 3-1). The NTBMB2 device works in a switching common configuration where the field device is used to complete the path to ground. The NTBMB4 device works in a switching hot configuration. Table 3-1 provides operating information for the termination devices.

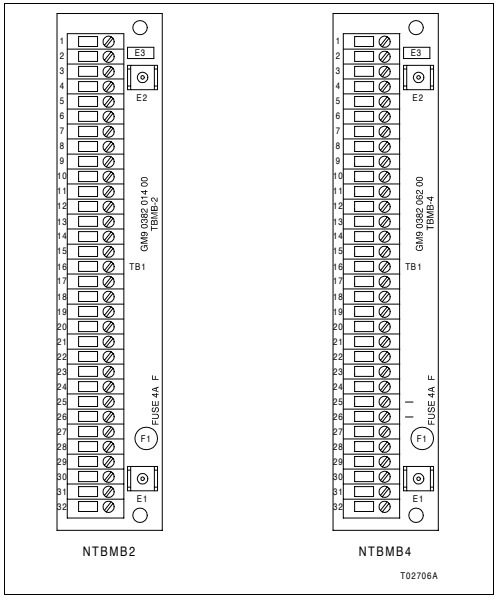

Figure 3-1. NTBMB2 and NTBMB4 Termination Devices

Table 3-1. NTBMB2 and NTBMB4 Operating Information

Type	Function	Power	I/O Modules	Cable (P/N)	Fuse (P/N)
NTBMB2 (1 slot)	16 DI[1]	System	IMDSI12, IMDSI13, IMDSI14, IMDSI15, IMDSI22	ITC30W (GC9038600201)	4 A (469500401)
	16 DO[1]	System	IMDSO14		
NTBMB4 (1 slot)	14 DI[2]	System	IMDSI12, IMDSI13, IMDSI14, IMDSI15, IMDSI22		
	14 DO[2]	System	IMDSO14		

NOTES:
1. Switching common.
2. Switching hot.

Terminal Designations

Tables 3-2 and 3-3 list terminal designations for the NTBMB2 and NTBMB4 drives respectively. Table 3-4 describes terminal designations for E-1, E-2 and E-3.

Table 3-2. NTBMB2 Termination Device

TB1 Terminal	I/O Modules		TB1 Terminal	I/O Modules	
	IMDSO14	IMDSI12, IMDSI13, IMDSI14, IMDSI15		IMDSO14	IMDSI12, IMDSI13, IMDSI14, IMDSI15
1	DO1+	DI1+	17	DO9+	DI9+
2	DO1-	DI1-	18	DO9-	DI9-
3	DO2+	DI2+	19	DO10+	DI10+
4	DO2-	DI2-	20	DO10-	DI10-
5	DO3+	DI3+	21	DO11+	DI11+
6	DO3-	DI3-	22	DO11-	DI11-
7	DO4+	DI4+	23	DO12+	DI12+
8	DO4-	DI4-	24	DO12-	DI12-
9	DO5+	DI5+	25	DO13+	DI13+
10	DO5-	DI5-	26	DO13-	DI13-
11	DO6+	DI6+	27	DO14+	DI14+
12	DO6-	DI6-	28	DO14-	DI14-
13	DO7+	DI7+	29	DO15+	DI15+
14	DO7-	DI7-	30	DO15-	DI15-
15	DO8+	DI8+	31	DO16+	DI16+
16	DO8-	DI8-	32	DO16-	DI16-

Table 3-3. NTBMB4 Termination Device

TB1 Terminal	I/O Modules		TB1 Terminal	I/O Modules	
	IMDSI14	IMDSI12, IMDSI13, IMDSI14, IMDSI15		IMDSI14	IMDSI12, IMDSI13, IMDSI14, IMDSI15
1	DO1+	DI1+	17	DO9+	DI9+
2	DO1-	DI1-	18	DO9-	DI9-
3	DO2+	DI2+	19	DO10+	DI10+
4	DO2-	DI2-	20	DO10-	DI10-
5	DO3+	DI3+	21	DO11+	DI11+
6	DO3-	DI3-	22	DO11-	DI11-
7	DO4+	DI4+	23	DO12+	DI12+
8	DO4-	DI4-	24	DO12-	DI12-
9	DO5+	DI5+	25	DO13+	DI13+
10	DO5-	DI5-	26	DO13-	DI13-
11	DO6+	DI6+	27	DO14+	DI14+
12	DO6-	DI6-	28	DO14-	DI14-
13	DO7+	DI7+	29	DO15+	DI15+
14	DO7-	DI7-	30	DO15-	DI15-
15	DO8+	Not used	31	DO16+	Not used
16	DO8-	Not used	32	DO16-	Not used

Table 3-4. NTBMB2 and NTBMB4 Terminals

Terminal	Description
E1	Hot voltage (+)
E2	Common voltage (-)
E3	Ground (connect to chassis)

NTBMC2

Section 4

Introduction

This section describes and lists terminal designations for the NTBMC2 termination device.

Description

The NTBMC2 termination device provides single ended analog inputs to an I/O module. It is designed to be used with system powered field devices. Figure 4-1 shows the NTBMC2 termination device. Table 4-1 lists operating information for the termination device.

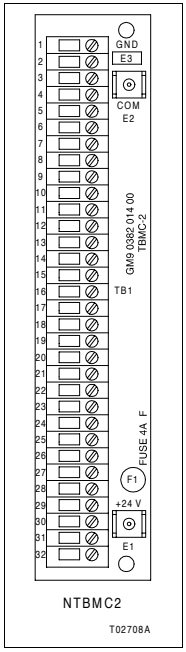

Figure 4-1. NTBMC2 Termination Device

Table 4-1. NTBMC2 Operating Information

Type	Function	Power	I/O Module	Cable (P/N)	Fuse (P/N)
NTBMC2 (1 slot)	15 AI (4-20 mA current loop) FSK (P-P mode)	System	IMFEC11 (analog mode) FSK (P-P mode)	ITC30W (GC9038600201)	4 A (469500401)

Terminal Designations

Tables 4-2 and 4-3 list terminal designations for the NTBMC2 termination device.

Table 4-2. NTBMC2 Termination Device

TB1 Terminal	I/O Module IMFEC11	TB1 Terminal	I/O Module IMFEC11
1	AI1+	17	AI9+
2	AI1-	18	AI9-
3	AI2+	19	AI10+
4	AI2-	20	AI10-
5	AI3+	21	AI11+
6	AI3-	22	AI11-
7	AI4+	23	AI12+
8	AI4-	24	AI12-
9	AI5+	25	AI13+
10	AI5-	26	AI13-
11	AI6+	27	AI14+
12	AI6-	28	AI14-
13	AI7+	29	AI15+
14	AI7-	30	AI15-
15	AI8+	31	Not used
16	AI8-	32	Not used

Table 4-3. NTBMC2 Terminals

Terminal	Description
E1	Hot voltage (24 VDC)
E2	Common voltage (24 VDC common)
E3	Ground (connect to chassis)

NTBMD2

Section 5

Introduction

This section describes and lists terminal designations for the NTBMD2 termination device.

Description

The NTBMD2 termination device provides differential or 4 to 20 milliampere analog inputs. It is designed to be used with field powered devices. Figure 5-1 shows the NTBMD2 termination device. Table 5-1 provides operating information for the NTBMD2 termination device.

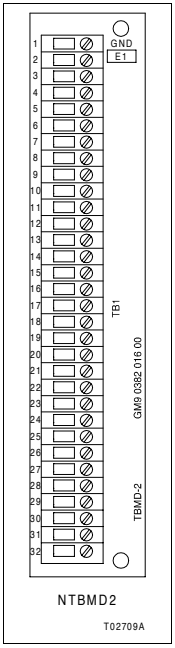

Figure 5-1. NTBMD2 Termination Device

Table 5-1. NTBMD2 Operating Information

Type	Function	Power	I/O Module	Cable (P/N)
NTBMD2 (1 slot)	15 analog inputs (4-20 ma current loop or differential voltage)	Field[1]	IMFEC11 (analog mode) IMFEC12 (voltage mode)	ITC30W (GC9038600201)

NOTE:
1. Differential analog voltage.

Terminal Designations

Tables 5-2 and 5-3 list terminal designations for the NTBMD2 termination device.

Table 5-2. NTBMD2 Termination Device

TB1 Terminal	I/O Modules IMFEC11 IMFEC12	TB1 Terminal	I/O Modules IMFEC11 IMFEC12
1	AI1+	17	AI9+
2	AI1-	18	AI9-
3	AI2+	19	AI10+
4	AI2-	20	AI10-
5	AI3+	21	AI11+
6	AI3-	22	AI11-
7	AI4+	23	AI12+
8	AI4-	24	AI12-
9	AI5+	25	AI13+
10	AI5-	26	AI13-
11	AI6+	27	AI14+
12	AI6-	28	AI14-
13	AI7+	29	AI15+
14	AI7-	30	AI15-
15	AI8+	31	Not used
16	AI8-	32	Not used

Table 5-3. NTBMD2 Terminal

Terminal	Description
E1	Ground (connect to chassis)

NTBMG2 and NTBMH2

Section 6

Introduction

This section describes and lists terminal designations for NTBMG2 and NTBMH2 termination devices.

Description

The NTBMG2 and NTBMH2 termination devices provide termination for the following signals:

- Three digital inputs.
- Four digital outputs.
- Four analog inputs (4 to 20 milliampere loop or single ended voltage).
- Two analog outputs.

They are designed to be used with field powered devices. Table 6-1 lists operating information for the NTBMG2 and NTBMH2 termination devices. Figure 6-1 shows these devices.

Table 6-1. NTBMG2 and NTBMH2 Operating Information

Type	Function	Power[1]	I/O Module	Cable (P/N)	Fuse (P/N)
NTBMG2 (1 slot)	3 DI 4 DO 4 AI 2 AO	Field Field Field System	IMCIS12 IMQRS12	ITC30W (GC9038600201)	4 A (469500401)
NTBMH2 (1 slot)	3 DI 4 DO 4 AI 2 AO	Field Field System System			

NOTE:
1. NTBMG2 and NTBMH2 have a 24 VDC power requirement.

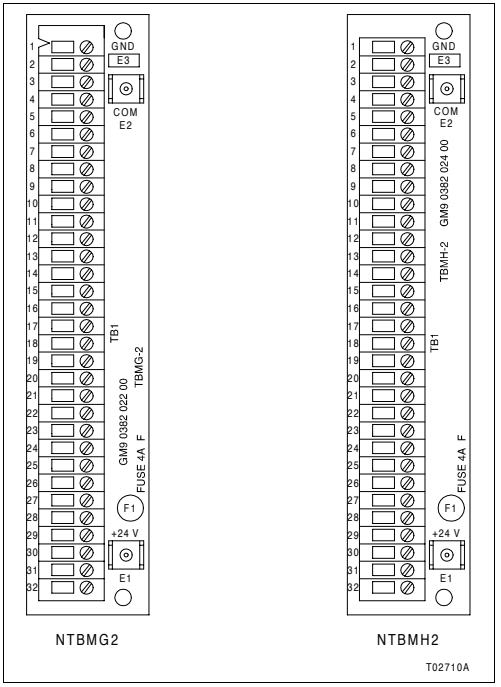

Figure 6-1. NTBMG2 and NTBMH2 Termination Devices

Terminal Designations

Tables 6-2 and 6-3 list terminal information for the termination devices.

Table 6-2. NTBMG2 and NTBMH2 Termination Devices

TB1 Terminal	I/O Modules IMCIS12 IMQRS12	TB1 Terminal	I/O Modules IMCIS12 IMQRS12
1	Not used	17	DI3+
2	Not used	18	DI3-
3	DO1+	19	+24 VDC
4	DO1-	20	Common
5	DO2+	21	AO1+
6	DO2-	22	AO1-
7	DO3+	23	AO2+
8	DO3-	24	AO2-
9	DO4+	25	AI1+
10	DO4-	26	AI1-
11	Not used	27	AI2+
12	Not used	28	AI2-
13	DI1+	29	AI3+
14	DI1-	30	AI3-
15	DI2+	31	AI4+
16	D2-	32	AI4-

Table 6-3. NTBMG2 and NTBMH2 Terminals

Terminal	Description
E1	Hot voltage (24 VDC)
E2	Neutral voltage (24 VDC common)
E3	Ground (connect to chassis)

NTBMJ2, NTBML2, and NTBML4

Section 7

Introduction

This section describes and lists terminal designations for NTBMJ2, NTBML2, and NTBML4 termination devices.

Description

The NTBMJ2 termination device is used to terminate 16 analog input signals for 4 to 20 milliampere devices. It provides separate overload protection for each channel.

The NTBML2 termination device is used to terminate 16 analog input signals for thermocouple, three wire RTD signals and differential analog voltage. The NTBML4 termination device is used to terminate up to 16 analog input signals for 4 to 20 milliampere devices.

Figure 7-1 shows the NTBMJ2 termination device. Figure 7-2 shows the NTBML2 and NTBML4 termination devices. Table 7-1 provides operating information for the termination devices.

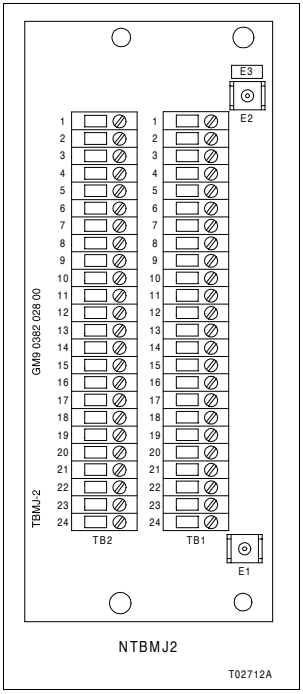

Figure 7-1. NTBMJ2 Termination Device

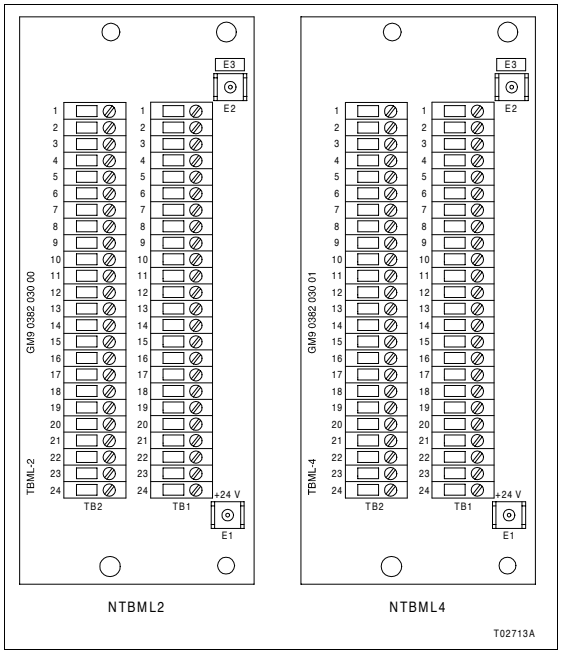

Figure 7-2. NTBML2 and NTBML4 Termination Devices

Table 7-1. NTBMJ2, NTBML2, and NTBML4 Operating Information

TB	Function	Power[1]	I/O Module	Cable (P/N)	Fuse (P/N)
NTBMJ2 (2 slots)	16 AI (2 wire 4-20 mA devices)	System[2]	IMASI13	ITC50W (GC9038600601)	4 A (469500401)
NTBML2 (2 slots)	16 AI (TC, 3 wire RTD and diff. analog volt)	Field			
NTBML4 (2 slots)	16 AI (4-20 mA)	Field			

NOTES:

1. Cold junction reference.
2. Isolated channels to system with field power supply not isolated channel to channel.

Terminal Designations

Tables 7-2 and 7-3 list terminal designations for NTBMJ2, NTBML2, and NTBML4 termination devices.

Table 7-2. NTBMJ2, NTBML2, and NTBML4 Terminal Device

TB1 Terminal	I/O Module IMASI13	TB1 Terminal	I/O Module IMASI13	TB2 Terminal	I/O Module IMASI13
1	AI1+	17	AI6-	1	Common
2	AI1-	18	COM	2	AI12+
3	Common	19	AI7+	3	AI12-
4	AI2+	20	AI7-	4	Common
5	AI2-	21	COM	5	AI13+
6	Common	22	AI8+	6	AI13-
7	AI3+	23	AI8-	7	Common
8	AI3-	24	COM	8	AI14+
9	Common	25	AI9+	9	AI14-
10	AI4+	26	AI9-	10	Common
11	AI4-	27	COM	11	AI15+
12	Common	28	AI10+	12	AI15-
13	AI5+	29	AI10-	13	Common
14	AI5-	30	COM	14	AI16+
15	Common	31	AI11+	15	AI16V-
16	AI6+	32	AI11-	16	Common

Table 7-3. NTBMJ2, NTBML2, and NTBML4 Terminals

Terminal	Description
E1	Hot voltage (24 VDC)
E2	Common voltage (24 VDC common)
E3	Ground (connect to chassis)

NTBMM1 and NTBMM2

Section 8

Introduction

This section describes NTBMM1 and NTBMM2 termination devices.

Description

NTBMM1 and NTBMM2 termination devices are used to cover vacant slots on the rack mount termination system. NTBMM1 covers two open slots. NTBMM2 covers one open slot.

Figure 8-1 shows the NTBMM1 and NTBMM2 termination devices. Table 8-1 lists terminal designation for the devices.

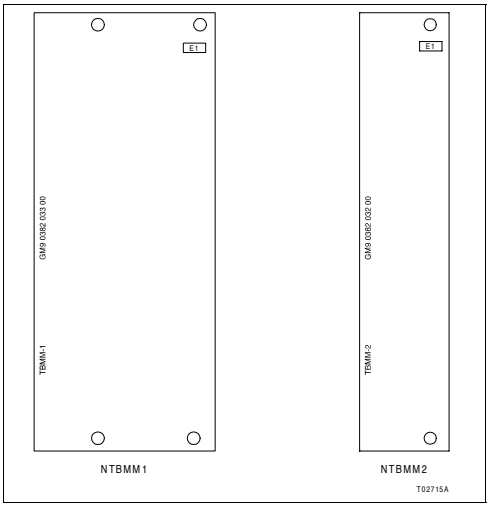

Figure 8-1. NTBMM1 and NTBMM2 Termination Devices

Table 8-1. NTBMM1 and NTBMM2 Terminals

Terminal	Description
E1	Ground (connect to chassis)

NTBMN2, NTBMO2, and NTBMO4

Section 9

Introduction

This section describes and lists terminal designations for NTBMN2, NTBMO2, and NTBMO4 termination devices.

Description

The NTBMN2 field powered termination device is used to terminate up to 16 input signals.

The NTBMO2 system powered termination device terminates up to 16 input signals that are switched common. The NTBMO4 system powered termination device terminates up to 16 input signals that are switched hot.

The NTBMN2, NTBMO2, and NTBMO4 termination devices provide a connector (P1) that allows connection of the IMSET01 module to a NTST01 module.

Table 9-1 lists operating information for the NTBMN2, NTBMO2, and NTBMO4 termination devices. Figure 9-1 shows the termination devices.

Table 9-1. NTBMN2, NTBMO2, and NTBMO4 Operating Information

TB	Function	Power	Fuse (P/N)	I/O Module	Cable (P/N)
NTBMN2 (1 slot)	16 I	Field	N/A	IMSET01 IMSED01	ITC36W (GC9038600301)
NTBMO2 (1 slot)	16 I (switching common)	System	4A (46G500401)		
NTBMO4 (1 slot)	16 I (switching hot)				

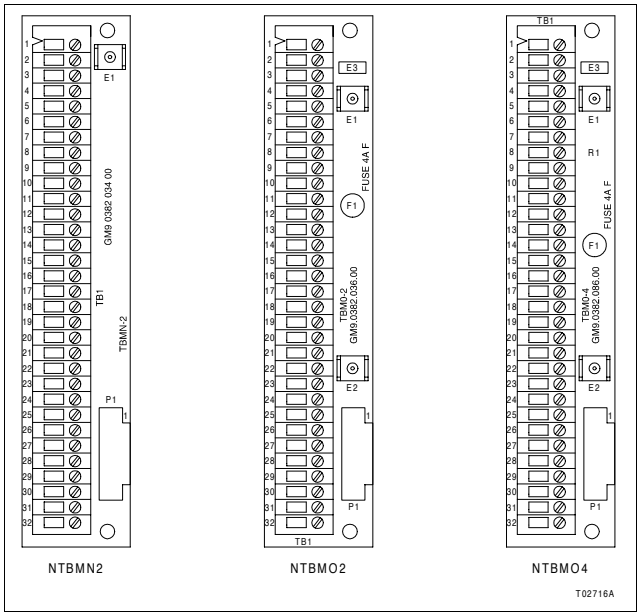

Figure 9-1. NTBMN2, NTBMO2, and NTBMO4 Termination Devices

Terminal Designations

Table 9-2 lists terminal designations for NTBMN2, NTBMO2, and NTBMO4 termination devices. Table 9-3 describes terminal designations for NTBMO2 and NTBMO4 termination devices. Table 9-4 describes terminal designations for the NTBMN2 termination device. Table 9-5 describes terminal designations for P1.

Table 9-2. NTBMN2, NTBMO2, and NTBMO4 Termination Devices

TB1 Terminal	I/O Module IMSET01, IMSED01	TB1 Terminal	I/O Module IMSET01, IMSED01
1	DI1+	17	DI9+
2	DI1-	18	DI9-
3	DI2+	19	DI10+
4	DI2-	20	DI10-
5	DI3+	21	DI11+
6	DI3-	22	DI11-
7	DI4+	23	DI12+
8	DI4-	24	DI12-
9	DI5+	25	DI13+
10	DI5-	26	DI13-
11	DI6+	27	DI14+
12	DI6-	28	DI14-
13	DI7+	29	DI15+
14	DI7-	30	DI15-
15	DI8+	31	DI16+
16	DI8-	32	DI16-

Table 9-3. NTBMO2 and NTBMO4 Terminals

Terminal	Description
E1	Hot voltage
E2	Common voltage
E3	Ground (connect to module mounting unit)

Table 9-4. NTBMN2 Terminal

Terminal	Description
E1	Ground (connect to MMU)

Table 9-5. P1 Terminals

Terminal	Description
1	Rxd
2	Rxd
3	PTU+
4	PTU-

Installation

Section 10

Introduction

This section covers the installation process for the rack mount terminations.

Special Handling

Rack mount termination devices do not use electrostatic sensitive devices. However, during installation it may be necessary to remove modules that have static sensitive devices.

Observe these steps when handling electronic circuitry:

1. ***Use Static Shielding Bag.*** Keep an assembly in its static shielding bag until ready to install it in the system. Save the bag for future use.

2. ***Ground Bags before Opening.*** Before opening a bag containing an assembly with static sensitive devices, touch it to the equipment housing or ground to equalize charges.

3. ***Avoid Touching Circuitry.*** Handle assemblies by the edges; avoid touching the circuitry.

4. ***Avoid Partial Connection of Semiconductors.*** Verify that all devices connected to the module are properly grounded before using them.

5. ***Ground Test Equipment.***

6. ***Use an Antistatic Field Service Vacuum.*** Remove dust from assemblies if necessary.

7. ***Use a Grounded Wrist Strap.*** Use the ABB Automation field static kit (part number 1948385A1 - consisting of two wrist straps, ground cord assembly, alligator clip, and static dissipative work surface) when working with modules and termination units. The kit grounds a technician and the static dissipative work surface to the same ground point to prevent damage to the circuitry by electrostatic discharge. Connect the wrist strap to the appropriate grounding plug on the power

supply or to an unpainted portion of the enclosure with the alligator clip. The wrist strap must be effectively connected to the earth grounding electrode system through the AC safety ground.

8. ***Do Not Use Lead Pencils to Set Switches.*** To avoid contamination of switch contacts that can result in unnecessary circuit board malfunction, do not use a lead pencil to set a switch.

Unpacking and Inspection

1. Examine the hardware immediately to verify it has not been damaged in transit.

2. Notify the nearest ABB sales office of any such damage.

3. File a claim for any damage with the transportation company that handled the shipment.

4. Use the original packing material and container to store the hardware.

5. Store the hardware in an environment of good air quality, free from temperature and moisture extremes.

Installation

This instruction provides information needed to correctly install a rack mount termination system.

Refer to Figure 10-1 for the installation sequence of the rack mount termination system. Each block in the flowchart represents a single task that should be completed before continuing with the sequence. Most devices of the flowchart have alphanumeric codes in the corner (e.g., PR1). The codes identify the procedure section that describe the tasks.

The procedures have check boxes in the margin by each step. When performing a procedure, check each box after completing the step. The procedures are found in the back of this instruction.

Begin the installation process at the starting device and follow the flow.

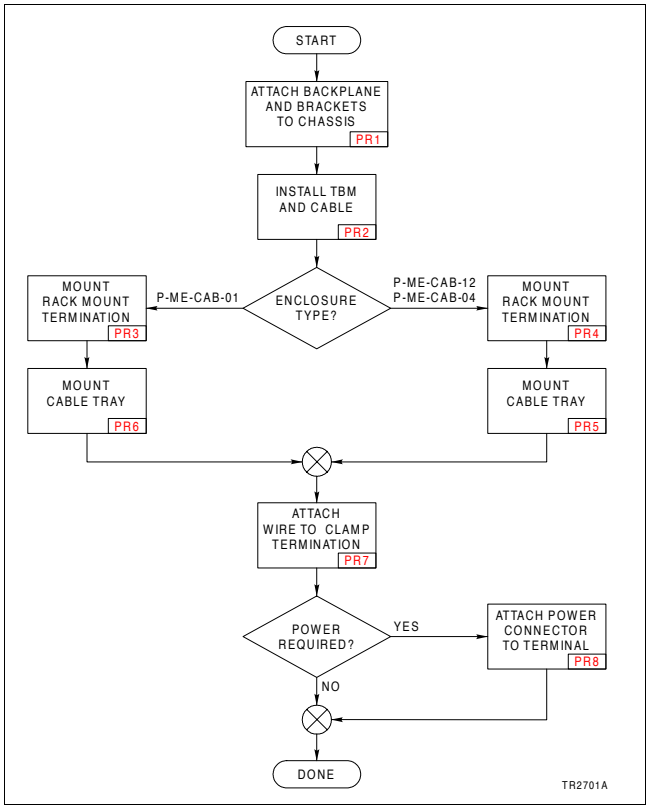

Figure 10-1. Installation Sequence Flowchart

Maintenance

Section 11

Introduction

This section contains a preventive maintenance schedule for rack mount terminations (Table 11-1).

The preventive maintenance tasks are guidelines to assist in establishing good preventive maintenance practices. Maintenance personnel should be:

- Qualified electrical technicians.
- Familiar with the rack mount terminations and know what proper precaution to take while working with live power.

Maintenance

Table 11-1 is the preventive maintenance schedule for rack mount terminations. The table lists the preventive maintenance tasks in groups based on the maintenance interval.

Table 11-1. Preventive Maintenance Schedule

Task	Frequency
Check rack mount termination system for dust. Clean as necessary using an antistatic vacuum.	Three months.
Clean all power and grounding connections.	Every six months or during plant shutdown, whichever occurs first.
Clean and tighten all field wiring terminals.	

Repair and Replacement

Section 12

Introduction

This section lists replacement parts, ordering information, and spare parts for rack mount terminations.

Replacement Parts and Ordering Instructions

Order replacement parts through a local sales or service office. Provide the following information when ordering:

1. Part description, part number and quantity.

2. Model and serial number (if applicable) and ratings of the assembly for which the part has been ordered.

3. Publication number and reference used in identifying the part.

4. When ordering parts, use part numbers and part descriptions from equipment manuals. Parts with no commercial description must be ordered from a local sales or service office. Recommended spare parts lists, including prices, on standard assemblies are available through a local sales or service office.

Replacement and Spare Parts

Table 12-1 lists parts associated with the rack mount terminations. Contact ABB service for help determining the type and quantity of spare parts to keep on hand.

Table 12-1. Parts

Item	Part Number	Description
Fuse[1]	469500401	4 A, 125 V FAST fuse.
Cable		
ITC30W	GC9038600201	30 pin cable.
ITC36W	GC9038600301	36 pin cable.
ITC50W	GC9038600601	50 pin cable.

Table 12-1. Parts *(continued)*

Item	Part Number	Description
30 pin cable hood	GM3038001000	Fits on to cable end to secure in backplane.
36/50 pin cable hood	GM3038001001	
IEBKT11	GM9038002700	MMU bracket for attaching NTBM?? complete kit.
	GM3038001500	Top.
	GM3038001600	Bottom.
IETRA11	GM9038002500	Rear mounting air flow conduit (without cable tray).
IETRA12	GM9038002600	Front mounting air flow conduit (without cable tray).
IETRA21	GM9038002300	Rear mounting air flow conduit (with metal cable tray).
IETRA22	GM9038002400	Rear mounting air flow conduit (with metal cable tray).
Fasteners		
	EL2089	Phillips-head screw (M6).
	EL 2094	Captive nut (M6).
	NIDHA16008	Phillips-head screw.
	NMPCC16002	Captive nut.

NOTE:
1. Refer to PR9 for fuse replacement information.

Module Mounting Unit Brackets Attachment

PR1

Purpose/Scope

10 min.

This procedure explains how to install the module mounting unit brackets to the chassis of the rack mount termination system.

Parts

Number	Quantity	Description
197702?2	10	Screw
GM3038001500	1	Bracket (top)
GM3038001600	1	Bracket (bottom)
6632005?1	1	Backplane
IB1/IBT1	6	Insulated spacers (only for MMU 21/22)

Tools Phillips screwdriver.

Procedure

☐ 1. Align the four holes of the backplane with the four holes on the chassis (Fig. PR1-1. PR1-2).

☐ 2. Insert and tighten the screws on each corner of the backplane.

☐ 3. Align the holes of the top bracket with the holes on the top of the backplane.

☐ 4. Fasten the bracket to the backplane by inserting and tightening the three screws on the backplane. For the IMMU21/22 only, place the insulated spacer between the module mounting unit and the backplane and tighten.

☐ 5. Repeat Steps 3 and 4 for the bottom bracket.

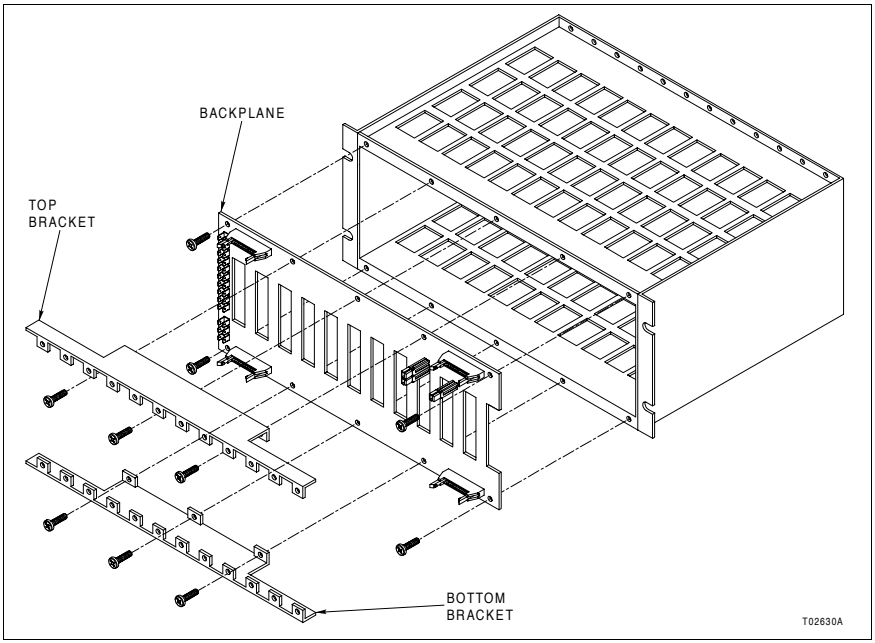

Figure PR1-1. Backplane and Mounting Brackets Installation

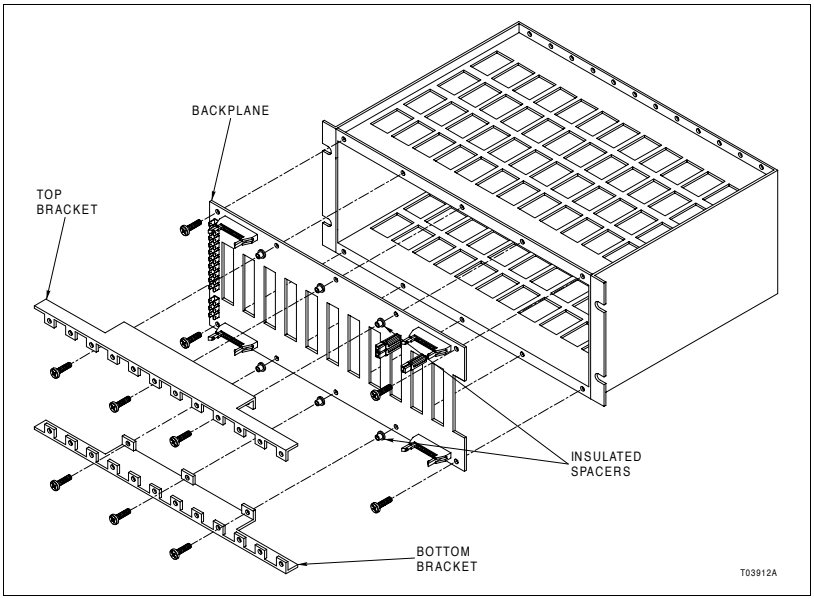

Figure PR1-2. Backplane, Mounting Brackets and Insulated Spacers

Termination Device and Cable Installation

PR2

Purpose/Scope

5 min.

This procedure explains how to attach the cable and the termination device to the backplane.

Parts

Number	Quantity	Description
GC9038600201	1	Backplane to termination device cable (30 pin).
GC9038600301		Backplane to termination device cable (36 pin).
GC9038600601		Backplane to termination device cable (50 pin).
197702?2	2 (single slot)	Screw.
	4 (double slot)	

Tools None.

Procedure

☐ 1. Squeeze the tabs of the connectors and hold (Fig. PR2-1).

☐ 2. Align the key on the connector with the slot on the backplane opening.

☐ 3. Insert the connector and release the tabs. The connector should be secure and fully inserted with the stops flush with the backplane.

☐ 4. Point the female connectors outward and align them with the male pins on the termination device (Fig. PR2-2).

☐ 5. Firmly push the female connectors (one at a time) onto the male pins of the termination device.

☐ 6. Align the holes on the termination device with the holes on the mounting bracket.

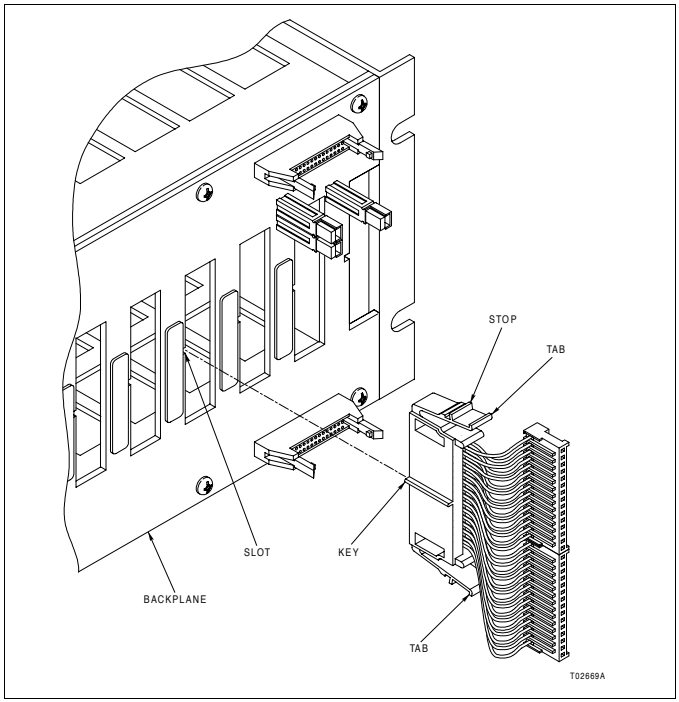

Figure PR2-1. Cable Installation

☐ 7. Secure the termination device to the mounting bracket using the provided screws.

NOTE: Some termination units occupy more than one slot on the backplane. In this case, use all the mounting holes and screws to properly secure it to the mounting bracket.

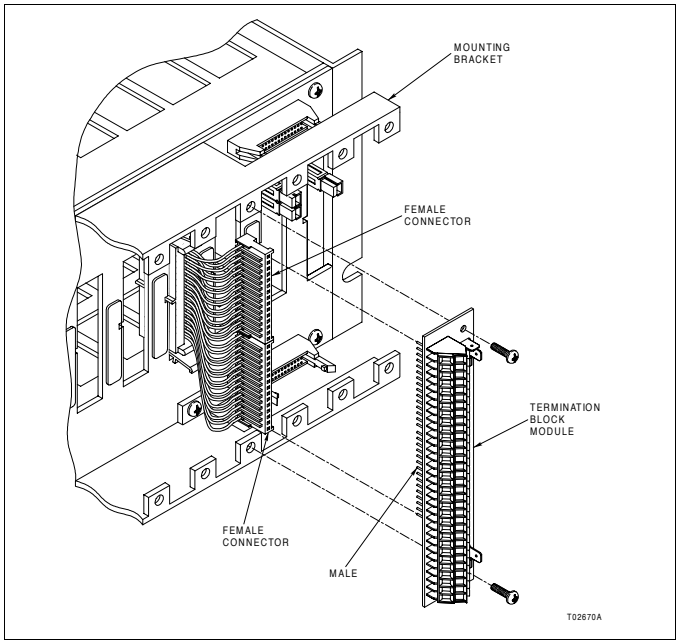

Figure PR2-2. Termination Device Installation

P-ME-CAB-01 Terminal Device Mounting

PR3

Purpose/Scope

15 min.

This procedure explains how to install a rack mount termination system into a P-ME-CAB-01 enclosure.

Parts

Number	Quantity	Description
NIDHA16008	4	Phillips-head screw
NMPCC16002	4	Cage nut

Tools Phillips screwdriver.

Safety Considerations

WARNING

1. Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete.

Procedure

The termination system is secured to the center rail of the enclosure by two notched flanges on the termination chassis.

☐

1. Determine the location of the rack mount termination system inside the enclosure. A minimum vertical distance of 178 millimeters (7.0 inches) is required, or 12 holes on the center rail.

☐ 2. Determine the location of the cage nuts. The cage nuts attach to the center rail of the enclosure and are used to secure the termination system.

a. Establish the 12 holes that the termination system will cover.

b. From the bottom hole (number 12), count up three holes. Mark this hole with a X. This hole will be used to secure the chassis.

c. From the hole marked X, count up seven holes. Mark this hole with a X. This hole will be used to secure the chassis.

☐ 3. Repeat Step 2 for the other vertical rail.

☐ 4. Insert the cage nuts over the designated holes (Fig. PR3-1).

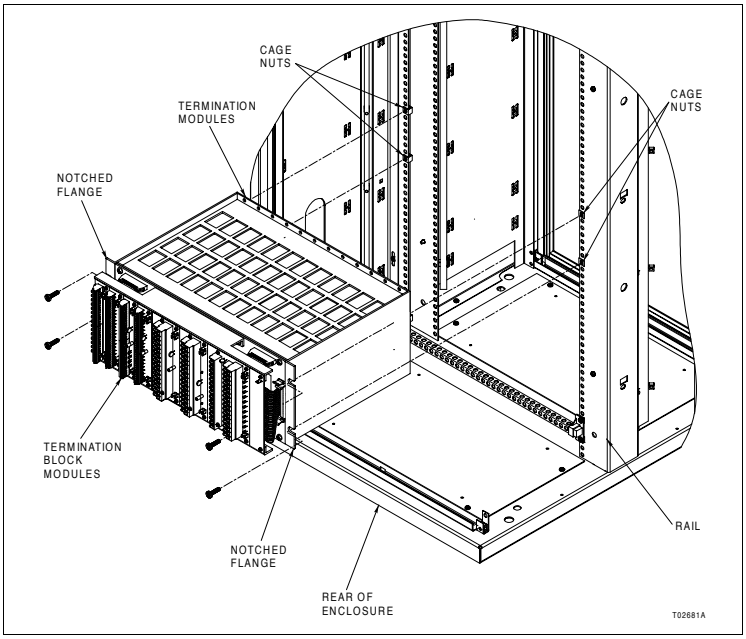

Figure PR3-1. Rack Mount Termination System Installation (P-ME-CAB-01)

☐ 5. Slide the termination chassis into the rear of the enclosure until the notched flanges contact the center rail.

☐ 6. Align the flange notches with the cage nut holes.

☐ 7. Secure the rack mount termination system by inserting and tightening the stainless steel screws.

P-ME-CAB-04/12 Terminal Device Mounting

PR4

Purpose/Scope

15 min.

This procedure explains how to install a rack mount termination system into a P-ME-CAB-12 or P-ME-CAB-04 enclosure.

Parts

Number	Quantity	Description
EL 2089	4	Phillips-head screw (M6)
EL 2094	4	Captive nut (M6)

Tools Phillips screwdriver.

Safety Considerations

WARNING

1. Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete.

Procedure

The termination system is secured to the vertical rail of the enclosure by two notched flanges on the termination chassis.

☐

1. Determine the location of the rack mount termination system inside the enclosure. A minimum vertical distance of 178 millimeters (7.0 inches) is required, or 12 squares on the vertical rail.

☐ 2. Determine the location of the captive nuts. The captive nuts attach to the vertical rail of the enclosure and are used to secure the termination system.

a. Establish which 12 squares the termination system will cover.

b. From the bottom square (number 12), count up three squares. Mark the square with a X. This square will be used to secure the chassis.

c. From the square marked X, count up seven squares. Mark this square with a X. This square will be used to secure the chassis.

☐ 3. Repeat Step 2 for the other vertical rail.

☐ 4. Insert the captive nuts into the designated squares (Fig. PR4-1).

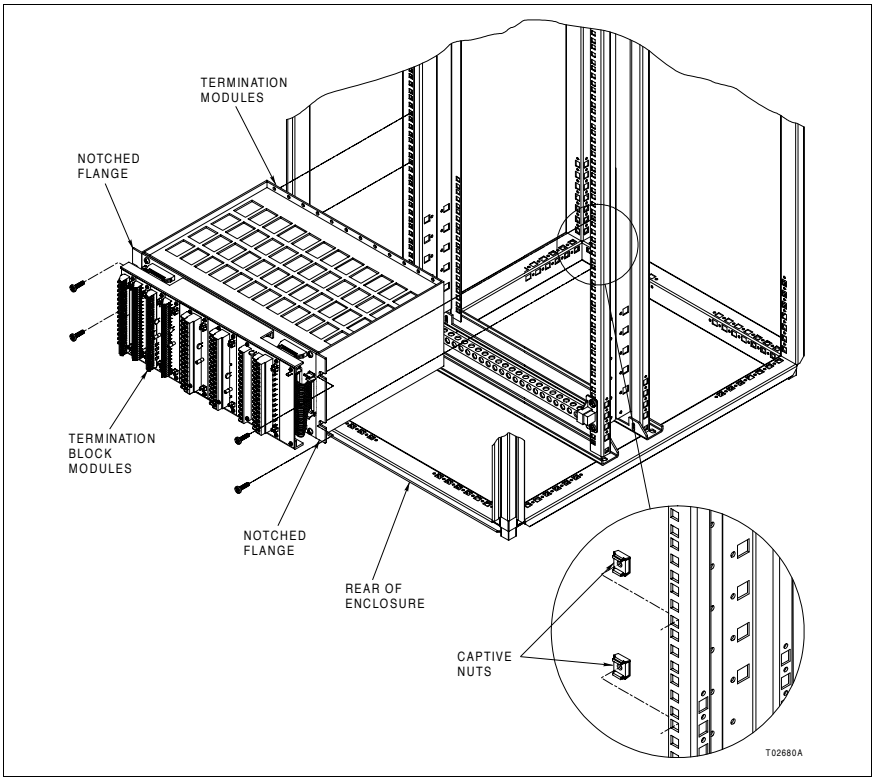

Figure PR4-1. Rack Mount Termination System Installation (P-ME-CAB-12 or P-ME-CAB-04)

☐ 5. Slide the termination chassis into the rear of the enclosure until the notched flanges contact the vertical rail.

☐ 6. Align the flange notches with the captive nut holes.

☐ 7. Secure the rack mount termination system by inserting and tightening the screws.

P-ME-CAB-04/12 Cable Tray and Air Conduit Mounting

Purpose/Scope

15 min.

This procedure explains how to mount a cable tray into a P-ME-CAB-12 or P-ME-CAB-04 enclosure. The cable tray is used to keep wires and cables organized and untangled.

Parts

Number	Quantity	Description
EL 2089	4	Phillips-head screw (M6)
EL 2094	4	Captive nut (M6)

Tools Phillips screwdriver.

Safety Considerations

WARNING

1. Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete.

Procedure

The cable tray is secured to the vertical rail of the enclosure by two notched flanges on the termination chassis.

☐

1. Determine the location of the cable tray inside the enclosure. It is normally located below the termination system. A minimum vertical distance of 89 millimeters (3.5 inches) is required, or six squares on the vertical rail.

☐ 2. Determine the location of the captive nuts. The captive nuts attach to the vertical rail of the enclosure and are used to secure the tray.

a. Establish which six squares the tray will cover.

b. From the bottom square (number six), count up one square. Mark the square with a X. This square will be used to secure the chassis.

c. From the square marked X, count up five squares. Mark this square with a X. This square will be used to secure the tray.

☐ 3. Repeat Step 2 for the other vertical rail.

☐ 4. Insert the captive nuts into the designated squares (Fig. PR5-1).

☐ 5. Slide the cable tray into the rear of the enclosure until the notched flanges contact the vertical rail.

☐ 6. Align the flange notches with the captive nut holes.

☐ 7. Secure the tray by inserting and tightening the stainless steel screws.

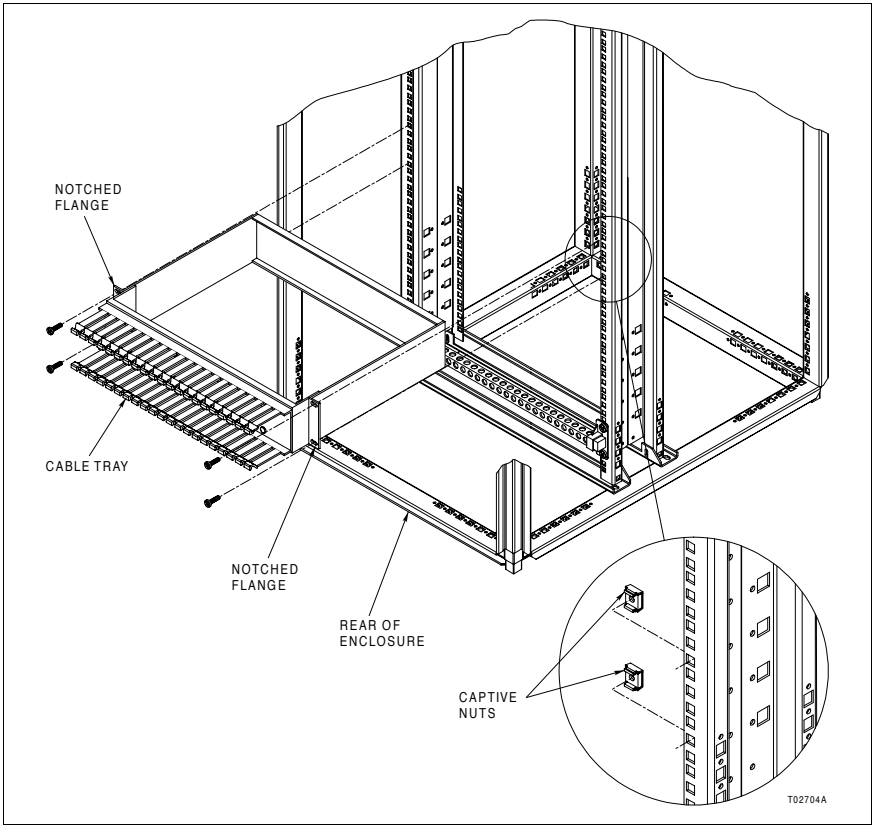

Figure PR5-1. Cable Tray Installation (P-ME-CAB-12 or P-ME-CAB-04)

P-ME-CAB-01 Cable Tray and Air Conduit Mounting

PR6

Purpose/Scope

15 min.

This procedure explains how to mount a cable tray into a P-ME-CAB-01 enclosure. The cable tray is used to keep wires and cables organized and untangled.

Parts

Number	Quantity	Description
NUS 2224-3	4	Cage nut.
NIGHA16006	4	Stainless steel screw (0.190-32 by 0.375).

Tools Phillips screwdriver.

Safety Considerations

WARNING

1. Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete.

Procedure

The termination system is secured to the center rail of the enclosure by two notched flanges on the cable tray.

☐

1. Determine the location of the tray inside the enclosure. It is normally located below the termination system. A minimum vertical distance of 89 millimeters (3.5 inches) is required, or six holes on the center rail.

☐ 2. Determine the location of the cage nuts. The cage nuts attach to the center rail of the enclosure and are used to secure the termination system.

a. Determine the six holes that the cable tray will cover.

b. From the bottom hole (number six), count up one hole. Mark this hole with a X. This hole will be used to secure the tray.

c. From the hole marked X, count up five holes. Mark this hole with a X. This hole will be used to secure the cable tray.

☐ 3. Repeat Step 2 for the other vertical rail.

☐ 4. Insert the cage nuts over the designated holes (Fig. PR6-1).

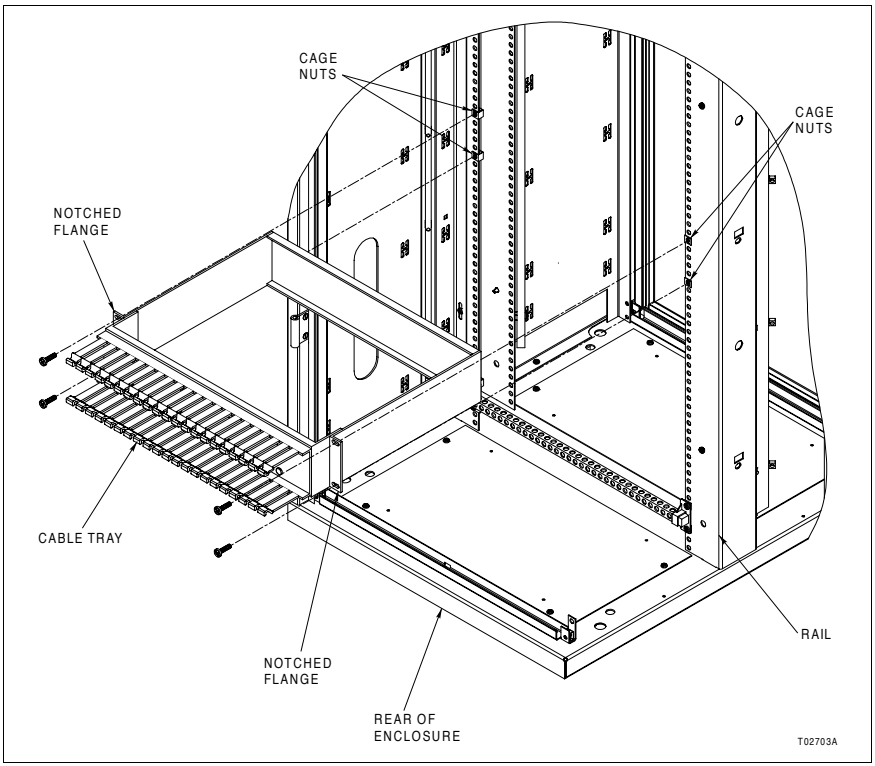

Figure PR6-1. Cable Tray Installation (P-ME-CAB-01)

☐ 5. Slide the cable tray into the rear of the enclosure until the notched flanges contact the center rail.

☐ 6. Align the flange notches with the cage nut holes.

☐ 7. Secure the cable tray by inserting and tightening the stainless steel screws.

Clamp Termination Wiring

PR7

Purpose/Scope

2 min.

This procedure explains how to prepare and attach wires to a clamp termination. Wire sizes for clamp terminations are 22 to 14 AWG or 0.32 sq-mm to 2.1 sq-mm.

Parts None.

Tools Screwdriver (small).
Wire strippers.

Safety Considerations

WARNING	**1. Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete.**

Procedure

☐ W1 1. Strip approximately 10 mm (⅜-inch) of insulating material from the end of the wire.

☐ 2. Insert the stripped portion of the wire into the desired hole of the terminal device (Fig. PR7-1).

☐ 3. Firmly tighten the screw above the terminal device hole.

☐ 4. Check the seating of the wire by tugging on it. If the wire slides out, reinsert and tighten the screw.

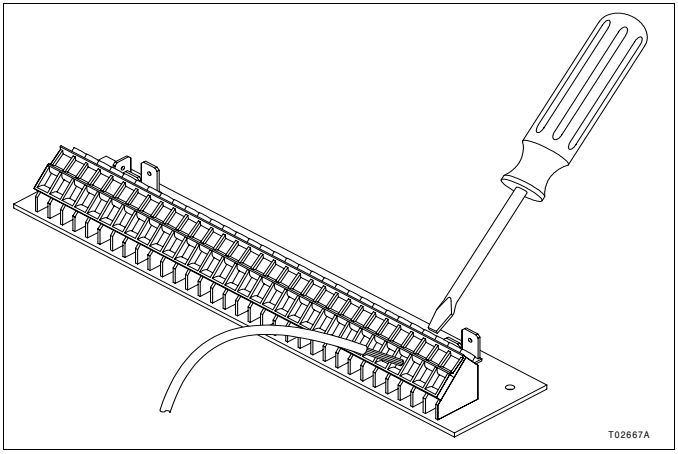

Figure PR7-1. Clamp Termination

Power Connection

PR8

Purpose/Scope

5 min.

This procedure explains how to attach power wires to the terminals on a termination device. Terminal devices that have terminals are labeled as E1, E2, or E3.

NOTE: Refer to the individual terminal device sections for the terminal assignments.

Tools None.

Safety Considerations

WARNING	**1. Verify the main power and power entry panel circuit breakers or switches are turned off before starting installation, retrofit, upgrade, or wiring procedures. Failure to do so could result in severe or fatal shock. Do not turn the power on until the installation, retrofit, upgrade, or wiring procedures are complete.**

Procedure

☐

1. Carefully align the Faston connector on the wire with the terminal post on the terminal device.

☐ 2. Firmly slide the Faston connector over the terminal post until it is fully inserted.

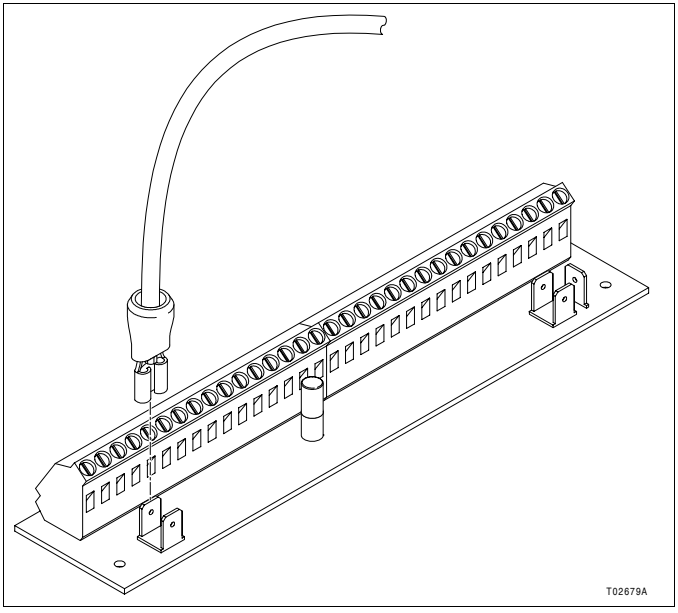

Figure PR8-1. Power Connection

Fuse Replacement

PR9

Purpose/Scope

1 min.

This procedure explains how to remove and replace a fuse on a termination device. Some termination devices have a fuse located on the circuit board near the terminal device.

Parts

Number	Quantity	Description
469500401	1	Fuse (4 A,125 V, FAST)

Tools None.

Procedure

☐ 1. Locate the fuse on the termination device.

☐ 2. Carefully pull up on the fuse to remove it from the board. This can be done by hand or by using needlenose pliers.

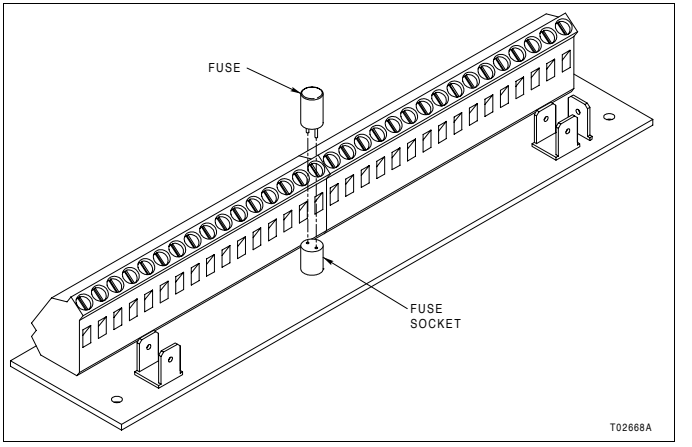

Figure PR9-1. Fuse Replacement

☐ 3. Align the posts on the fuse with the holes on the fuse socket.

☐ 4. Slide the fuse into the fuse socket and push firmly on top of the fuse until it is fully seated.

Index

C

Cage clamp, using PR7-1
Conventions, document 1-3

D

Design standards 1-5

F

Fuse PR10-1

H

Hardware description 1-1
How to use instruction 1-3

I

Installation 10-2
Installation flowchart 10-3
Installing
  Brackets PR1-1
  Cables PR2-1
  Fuse PR10-1
Instruction content 1-2
Intended user 1-1

M

Maintenance 11-1
Module mounting unit 1-1
Mounting
  Cable tray
    P-ME-CAB-01 ..... PR6-1
    P-ME-CAB-04 ..... PR5-1
    P-ME-CAB-12 ..... PR5-1
  Termination system
    P-ME-CAB-01 ..... PR3-1
    P-ME-CAB-04 ..... PR4-1
    P-ME-CAB-12 ..... PR4-1
Mounting flanges 1-1

N

NTBMA1/A2 2-1
NTBMB1/B1/B3/B4 3-1
NTBMC1/C2 4-1
NTBMD1/D2 5-1
NTBMG1/G2 6-1
NTBMH1/H2 6-1
NTBMJ1/J2 7-1
NTBML1/L2/L3/L4 7-1
NTBMM1/M2 8-1
NTBMN1/N2 9-1
NTBMO1/O2/O3/O4 9-1

O

Ordering instructions 12-1
Overview 1-1

P

Power connector, attaching PR9-1
Preventive maintenance schedule 11-1

R

Reference documents 1-3, 1-4
Replacement parts 12-1

S

Spare parts 12-1
Special handling 10-1

T

Termination block modules 1-2
Termination brackets 1-2

For the latest information on ABB and Year 2000 Product Compatibility
Visit us on the World Wide Web at http://www.abb.com

Our worldwide staff of professionals is ready to meet *your* needs for process automation.
For the location nearest you, please contact the appropriate regional office.

Americas
29801 Euclid Avenue
Wickliffe, Ohio USA 44092
Telephone 1-440-585-8500
Telefax 1-440-585-8756

Asia/Pacific
539 Yishun Industrial Park A
Singapore 768740
Telephone 65-756-7655
Telefax 65-756-7309

Germany
Industriestrasse 28
D-65760 Eschborn
Germany
Telephone 49-6196-800-0
Telefax 49-6196-800-1119

Europe, Africa, Middle East
Via Puccini 2
16154 Genoa, Italy
Telephone 39-010-6584-943
Telefax 39-010-6584-941

Form WBPEEUI260041A0 Litho in U.S.A. 899

Copyright © 1999 by ABB Automation Inc., as an Unpublished Work
® Registered Trademark of Elsag Bailey Process Automation
™ Trademark of Elsag Bailey Process Automation