613-000762 Rev.A 070328

TELESYN® Series
Component Specification
Release 8.0
Issue 3

Introduction

Congratulations on your purchase of a Telesyn® product. This product is part of a family of products that leverages Ethernet switching technology to offer service providers a range of services, such as video over xDSL and voice over IP.

Who Should Read This Guide?

This document provides a reference for the components that comprise the Telesyn product.

About this Guide

This guide includes:

- Section 1 provides an overview of the documentation set for Telesyn products.
- Section 2 lists all components and their specifications.
- Section 3 lists the cabling specifications.
- Section 4 lists miscellaneous specifications.

Reason for Reissue

This Guide is being issued for Release 8.0 to include the component changes for release 8.0. This Guide is being up-issued to add information about slot provisioning.

Reason for Update

Information that has been added or changed is shown using change bars.

Component Changes:

- The 10G product, an Telesyn 9000 that includes the CFC56 as well as other cards that are new for 8.0.
- The CFC56 Control Module
- The EPON2 Service Module
- The SHDSL24SA Service Module
- The XE1 Network Module
- The GE8, which serves as a Service Module as well as Resource Module

Table of Contents

1. Documentation Release

1.1 Overview

User documentation for the Allied Telesyn Products is divided into the following areas:

- Installation Guides - An installation guide is created for each product, and includes the information needed to:
  - unpack the materials
  - take inventory of what the product container includes
  - provide tools and materials not included with the product
  - install the components
  - connect the local interface
  - apply power and check the startup sequence

  Note that the installation guides do not provide component specifications; these are provided here.
- User Guide - Covers both the 7000 and 9000 series products.
- Component Specification - Provides all the supporting information needed for the Allied Telesyn products.
- Log / Troubleshooting Manual - Provides the following:
  - describes the maintenance system for both the Allied Telesyn products and the Allied Telesyn NMS
  - lists all the logs produced by the Allied Telesyn products that have a severity level and explains the nature of the log, the scope of the problem, and steps to resolve the problem
  - lists and explains all the alarm messages produced by the Allied Telesyn NMS.
- Command Handbook - Includes all command syntax for all Allied Telesyn products.

1.2 Document Release and Issue Numbering

The following rules are followed for the labeling of documents for a release:

- When a document is created for a release, it is labeled as having a Release and an Issue. These two attributes uniquely identify a document.
- A document may be issued more than once for a release, for either corrections or technical changes. As a result, a document may be for the same release, but have a higher issue number.
- If a document that already exists is updated for a new release, the document will be identified by its Release number and Issue, which will be Issue 1.

- If there is a new release and the document does not require updating, the document for the previous release will still be valid for the new release. This is especially true for the installation guides, since the overall procedure may not change, and any new components are covered in this document, the Component Specification. As a result, an Installation Guide will include in its title “and Up Unless Reissued.”

1.3 Document Availability for Allied Telesyn Releases

Table 1-1 lists the documents that are available for the Allied Telesyn, starting from release 6.0. If a document was released in one release and is still valid for the next release(s), the cells are blank.

TABLE 1-1 Latest Document Issues from 4.1 Forward

Document	Release 6.0	Release 6.1	Release 7.0[a]	Release 8.0	Notes
Allied Telesyn User Guide	Issue 2	Issue 1	Issue 3	Issue 2	Always updated
Allied Telesyn Services Guide	Issue 1 Preliminary	Issue 1	Issue 1	Issue 1	Includes engineering notes
Component Specification	Issue 1	Issue 1	Issue 5	Issue 3	Included in document introduction
Log / Troubleshooting Manual	Issue 1		Issue 1	Issue 1	Always updated
Command Handbook	Issue 1	Issue 1	Issue 1	Issue 1	Always updated

a. There was a 7.1 and 7.2 Release, which included techncal fixes as well as provided bonding on the SHDSL24 card on a port (rather than card) basis. This is covered in the Release Notes.

2. Component Reference

2.1 Overview

This chapter provides basic specifications and descriptions for Allied Telesyn 7000 and 9000 components. The information provided here is accurate as of Release 5.0.

Allied Telesyn products are identified by their acronym and their model number. For example, the 6Gbps Central Fabric and Controller card for the 7000 series carries the following identifiers:

Acronym = CFC6

Model Number = TN-400-B

The acronym serves as the mnemonic for system components. In discussions, it is much easier to refer to and remember an acronym rather than a model number. The model number not only identifies the system component, just like the acronym, but also conveys the product's version.

The general model number format is: **TN-XXXX-Y** where,

TN = Telesyn

XXXX = "Base Number" field, identifying the basic product. The base number field is a 3 or 4 alphanumeric characters.

Y = "Version" field, used to indicate "major" changes to or variants of the basic product. Alphabetic characters, starting with A and working through Z, but not including the letters I and O, indicates a major form, fit, or functionality changes. Minor changes are tracked by the second character of the hardware revision field.

The Version field is used to indicate variants of the basic product. Changes to the model's version signify that the product has different capabilities such as new or enhanced features. System users can easily identify the versions of hardware installed in their systems as the model number is labeled on all circuit boards.

2.2 Components not Supported in 7.0 Forward

As the Allied Telesyn product line evolves, newer components may replace previous components. While these previous components will continue to be supported as long as necessary, they will not support a newer release and therefore cannot support new/updated features. This Guide can be used to identify these components and help the customer make purchasing decisions, since in most cases the newer components provide more features or greater traffic capacity, usually resulting in cost reduction.

The following table lists certain components and their status. Consult with your Allied Telesyn representative on whether a component can still be ordered (and used in a release prior to 7.0).

Note: As components become no longer available, only a general description or reference will be included in this Guide. Users can reference previous issues of customer document (available at the Allied Telesyn Support website) if they wish for a detailed description.

TABLE 2-1 Component Status for Release 7.0

Component	Description	Status	Replacement Strategy
TN-100-A (ADSL16 Card)	ADSL Annex A	No 7.0 Support	Replace with the TN-121-A (2.9.4)
TN-116-A (SHDSL16 Card)	High speed symmetric Ethernet	No 7.0 Support	
TN-300-A (GE1 Card)	Gigabit Ethernet	No 7.0 Support	Replace with the TN-301-A
TN-400-A/B	CFC6	No 7.0 Support	Replace with the TN-401-B

2.3 Component/Product Compatibility

2.3.1 Overview

At the hardware level, the Allied Telesyn series products are offered in a chassis group configuration. Each chassis is comprised of a set of modular, replaceable components. Moreover, many of these components can be used in different products when a product-level feature is needed (such as duplex). The exception is the Allied Telesyn 7100 and 9100 series, which comes equipped as a complete unit.

Table 2-2 lists the components for the Allied Telesyn products and which systems are compatible.

TABLE 2-2 Product/Component Compatibility for Commercial Allied Telesyn Products in Release 8.0

Category	Type	Component	9100 (CFC12)	9400/ 9700 (CFC24)	9400/ 9700 (CFC56)
Service Modules (SM)	Fast Ethernet	FE10 (TN-102-A)[a]	x	x	x
		FX10FX (TN-104-A)	x	x	x
		FX10LX (TN-107-A)	x	x	x
		FX10BX (TN-109-A)	x	x	x
	ADSL	ADSL16 (TN-100-A)		x	
		ADSL24 (TN-112-A) - Annex A	x	x	
		ADSL24A (TN-121-A) - Annex A[b]	x	x	
	SHDSL	SHDSL16 (TN-116-A)	x	x	
	CES	CES8 (TN-119-A)	x	x	x
	GE8	GE8 (TN-117-A) - in Service Module slot[c d]	x	x	x
	EPON2	EPON2 (TN-118-A) - note d	x	x	x
Network Modules (NM)	Gigabit Ethernet	GE1 (TN-300-A)			
		GE3 (TN-301-A)		x	x
		GE4 (CFC12)	x		
		GE2RJ (CFC12)	x		
		GE8 (TN-117-A) - in Resource Module slot [e]			x
		XE1 (TN-308-A)			x
Control Modules (CM)	CFC	CFC24 (TN-401-B)		x	
		CFC12 (on 9100)	x		

a. The FE/FX10 card can also be used as an upstream interface. Refer to 18.10.

b. Supports Annex M.
c. When GE1 interface is set for customer, the card supports customer features (on port basis) at 1G rate.
d. In 9700 simplex, cannot be plugged into the unused CFC slot (8 or 12).
e. When plugged into Resource Module (slots 6/7 in 9700 and slots 6/8 in 9400), can provide high capacity ring distribution.

2.3.2 Allied Telesyn Series Components

Table 2-3 lists the components that are available for this release and shows their minimum software release. A more complete hardware description of these components is provided in Section 2.6.

TABLE 2-3 Component Availability for the Allied Telesyn Series Products

Component Type	Component	Model Number	Reference	Detail	Minimum Software Release
Chassis	x400	TN-251-A	2.6.1	x400 Chassis Group	1.0
	x700	TN-250-A	2.6.2	x700 Chassis Group	1.1
	910x	TN-9101-A TN-9102-A TN-9103-A	2.15.1 2.15.2 2.15.3	910x Chassis Group	7.0
Cooling and Power	FC7	TN-E004-B replaces TN-E004-A	2.7.1	Control of FM7, OAM and ALM connections	1.0
	FAN8/FMX7	TN-E001-C replaces TN-E001-A	2.7.2	Cooling and ALM IN, ALM OUT ports	1.1
	FM7	TN-E003-A	2.7.3	Cooling	-NA-
	PEM7	TN-E005-A	2.8.1	Power and Grounding	-NA-
	PEM8	TN-E002-A	2.8.2	Power and Grounding	-NA-
	AC Power Supply	TN-E010-A	2.15.2	Fits in rear slot of 9102	7.0

TABLE 2-3 Component Availability for the Allied Telesyn Series Products (Continued)

Component Type	Component	Model Number	Reference	Detail	Minimum Software Release
Service Modules	ADSL16	TN-100-A	2.9.1	16-port ADSL Annex-A	1.0
	ADSL24	TN-112-A	2.9.3	24-port ADSL Annex-A	3.0
	ADSL24A - Annex A	TN-121-A	2.9.4	24-port ADSL Annex-A	6.0
	SHDSL16	TN-116-A	2.9.5	16 ports SHDSL	4.0
	FE10	TN-102-A	2.9.6	10-port, 10/100BT	2.0
	FX10FX FX10LX	TN-104-A TN-107-A	2.9.7	10-port, 100BaseFx Ethernet	2.1
	FX10BX	TN-109-A	2.9.8	Optical Fiber- based Fast Ethernet	2.1
	CES8	TN-119-A	2.9.9	8-port DS1/E1	5.0
	EPON2	TN-118-A	2.9.10	8-port passive optical network interface	8.0
Network Modules	GE1	TN-300-A	2.10.1	1-port GB Ethernet	1.0
	GE3	TN-301-A	2.10.2	3-port GB Ethernet	2.0
	GE8	TN-117-A	2.10.3	in Service Module or Resource Module slot	8.0
	XE1	TN-308-A	2.10.4	10GE Network Module	8.0
Control Modules	CFC6 [a]	TN-400-B replaces TN-400-A	2.11.1	CFC6G core	1.1.1
	CFC6 (note a)	TN-406-A	2.11.2	Annex-C	6.1
	CFC24	TN-401-B	2.11.3	CFC24G core	3.0
	CFC12	TN-408-A	2.11.4	9100, slot 3	7.0
Filler Plate	FPH	TN-M002-A	2.12.1	Half-height	-NA-
	FPF	TN-M000-A	2.12.2	Full-height	-NA-
	FP91	TN-M015-A		9102/3 - AC Power Supply	-NA-

a. Not available in 7.0, since software loads for 7000 products are stopped at 6.1

2.3.3 Slot Restrictions for Double-width Cards

For the x400 chassis the following rules apply for the double-width cards:

- The slot combination 6/4 is not allowed
- Slot 11 is not allowed for the left side of the card, since that is the top of the chassis.

For the x700 chassis the following rules apply for the double-width cards:

- For a simplex, with the CFC on the left:
  - Slot 13 not allowed for any SM
  - Slot 12 is allowed only for a single-wide SM (no double-width card allowed for 12/13)
- For a simplex, with the CFC on the right:
  - Slot 7/8 is allowed
  - Slot 9 not allowed for any SM
  - Slot 8 is allowed for a single-wide SM

2.3.4 Allied Telesyn 7100 Series

Table 2-4 lists the current versions of the 7100 series. A more complete hardware description of these components is provided in Section 2.6.

Note: Software for these products is available only up to 6.1.

TABLE 2-4 Allied Telesyn 7100 versions

Product	Description	Minimum Software Release
7101 (TN-7101-A) 2.14.1	The 7101 has 48 fixed ADSL ports providing Annex-A service.	2.1

2.3.5 Allied Telesyn 9100 Series

TABLE 2-5 Allied Telesyn 9100 versions

Product	Description	Minimum Software Release
9101 (TN-9101-A-80) 2.15.1	The 9100 has modular (replaceable) cards. The CFC12 is used (always in slot 3), while the other three slots can have 100M or 1Gb backplane Service Modules. Uses redundant -48VDC power supply	7.0
9102 (TN-9102-A-x0) 2.15.2	The 9100 has modular (replaceable) cards. The CFC12 is used (always in slot 3), while the other three slots can have 100M or 1Gb backplane Service Modules. Uses non-redundant AC power supply The value of x depends on the power cord used.	7.0
9103 (TN-9103-A-x0) 2.15.3	The 9100 has modular (replaceable) cards. The CFC12 is used (always in slot 3), while the other three slots can have 100M or 1Gb backplane Service Modules. Uses redundant AC power supply The value of x depends on the power cord used.	7.0

2.3.6 Load Names for Components

Table 2-6 lists the load names that are used for cards that require a software load.

TABLE 2-6 Load Names for Components

Card	Load Name
N/A	cfc4_6.0.7.tar
TN-100-A	adsl16_6.0.7.tar
TN-102-A (FE and FX cards)	fe10_6.0.7.tar
TN-112-A	adsl24_6.0.7.tar
TN-116-A	shdsl16_6.0.7.tar
TN-119-A	ces8_6.0.7.tar
TN-121-A	adsl24a_6.0.7.tar
TN-400-B	cfc6_6.0.7.tar
TN-401-B	cfc24_6.0.7.tar

2.4 System Level Conformance Specifications

Table 2-7 lists the standards relevant to the operation of the Allied Telesyn product, and to which products they apply.

TABLE 2-7 Conformance Specifications

Standard	Specification	7100	7400	7700	9400	9700	9100
Radiated Emissions	GR-1089-CORE, Issue 2, Rev 1, Feb. 1999, Class A	X	X	X	X	X	
Radiated Emissions	FCC Part 15 Class A/ANSI C63.4:1992 Radiated Emissions	X	X	X	X	X	
Radiated Emissions	EN 300 386 V1.3.1:2001-09/ EN 55022:1998, Class A	X	X	X	X	X	
Radiated Emissions	VCCI Class A; ITE/ CISPR 22: 1997 Class A	X	X	X	X	X	
Conducted Emissions	EN 300 386 V1.3.1:2001-09/ EN 55022:1998, Class A	X	X	X	X	X	
Radiated Immunity	EN 300 386 V1.3.1:2001-09/ EN 61000-4-3:1998	X	X	X	X	X	
Conducted Immunity	EN 300 386 V1.3.1:2001-09/ EN 6100-4-6:1996	X	X	X	X	X	
Electrical Fast Transient/ Burst Immunity	EN 300 386 V1.3.1:2001-09/ EN 61000-4-4:1995	X	X	X	X	X	
Surge Immunity	EN 300 386 V1.3.1:2001-09/ EN 61000-4-5:1995	X	X	X	X	X	
Electrostatic Discharge (ESD) Immunity	EN 300 386 V1.3.1:2001-09/ EN 61000-4-2:1999	X	X	X	X	X	
Safety	UL/cUL 60950: IEC60950 Third Edition, 1999	X	X	X	X	X	
Network Equipment-Building System (NEBS)	GR-1089-CORE; Issue 2, December 1997 with Revision 1 February 1999 GR-63, Issue 2, April 2002		X	X			
	NEBS Level 3, GR-1089 Issue 3, GR63 Issue 2	X			X	X	

2.5 Common Specifications

2.5.1 Altitude Range

All Allied Telesyn components are rated as follows:

- Minimum: -60 meters (-197 feet)
- Maximum: 1800 meters (5906 feet)

Note: Any exceptions are noted for a particular component.

2.5.2 Humidity Range

All Allied Telesyn components are rated as follows:

- Minimum: 5 percent
- Maximum: 90 percent

Note: Any exceptions are noted for a particular component.

2.6 Chassis Components

2.6.1 X400 Chassis and Chassis Groups

TABLE 2-8 Specifications for the x400 Chassis Group

Specification	Type	Description	Notes
Model Numbers	TN-251-A	Chassis only, no power/fan/fan controller, no filler plates	
	TN-251G	Chassis with power/fan/fan controller, no filler plates	
	TN-251GF	Chassis with power/fan/fan controller, with filler plates	
Dimensions	Height,	Height: 5.3 in. (13 cm)	
	Width	Width: 17.4 in. (44 cm)	
	Depth	11.8 in. (30 cm)	
Weight	TN-251-A	10.1 lb. (4.5 kg)	
	TN-251G	13.8 lb. (6.25 kg)	
	TN-251GF	16.9 lb. (7.66 kg)	
Temperature Range	TN-251-A / TN-251G / TN-251GF	-40º to 149° F (-40º to 65° C)	Hardened
CLEI Code		VAMD300HRA	

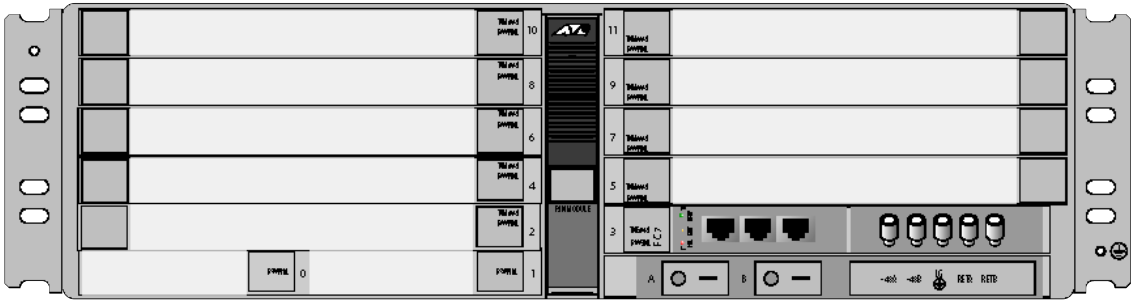


FIGURE 2-1 TN-251GF Chassis (with Filler Plates and Power/Fan/Fan Controller)

2.6.2 X700 Chassis and Chassis Groups

TABLE 2-9 Specifications for the x700 Chassis Group

Specification	Type	Description	Notes
Model Numbers	TN-250-A	Chassis only, no power/fan/fan controller, no filler plates	
	TN-250G	Chassis with power/fan/fan controller, no filler plates	
	TN-250GF	Chassis with power/fan/fan controller, with filler plates	
Dimensions	Height,	Height: 15.8 in. (40 cm)	
	Width	Width: 17.4 in. (44 cm)	
	Depth	11.8 in. (30 cm)	
Weight	TN-250-A	17.4 lb. (7.9 kg)	
	TN-250G	24.9 lb. (11.3 kg)	
	TN-250GF	31.2 lb. (14.2 kg)	
Temperature Range	TN-250-A / TN-250G / TN-250GF	-40º to 149° F (-40º to 65° C)	Hardened
CLEI Code		VAMD200HRA	

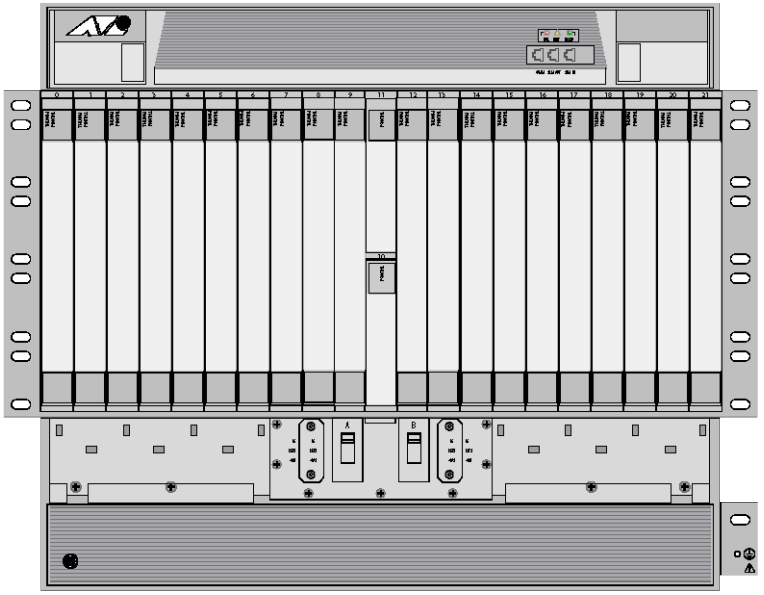


FIGURE 2-2 TN-250GF Chassis (with Filler Plates and Power/Fan/Fan Controller)

2.6.3 910x Chassis

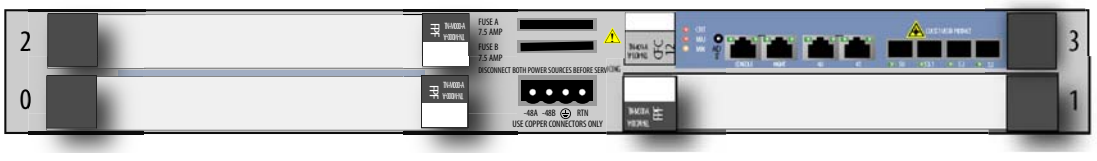
Note: The CFC12 must always go into Slot 3. The chassis is shipped without the CFC12.

Note: Refer to the 9100 Installation Guide for parts shipped with the chassis

2.6.3.1 TN-9101-A-80 (Dual DC Power Supply)

TABLE 2-10 Specifications for the 9101-A

Specification	Type	Description/Notes
Model Number	TN-9101-A-80	9100 Unit with redundant 48VDC Power Supply
Temperature Range	Operating	- 40º to 65 ° C
	Storage	- 40º to 75 ° C
Dimensions	Height	Height: 1.75 in. (4.4 cm)
	Width	Width: 17.4 in. (44 cm)
	Depth	Depth: 12 in. (30.4 cm)
Weight		7 lb 9 oz. (4.4 kg)
Function	Mixture of SM Cards	Refer to 2.3.
Power Requirements	Typical Maximum	28 watts (chassis only) 31 watts (chassis only
Alarm Contacts (Rear of Unit)		Provide ALM IN and ALM OUT contact points. Refer to 3.6.
CLEI Code		None



(Rear of Unit)

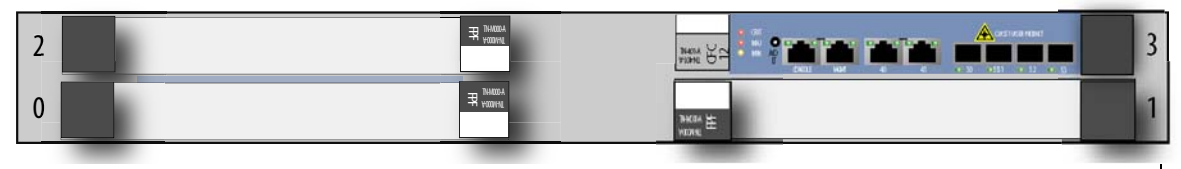
2.6.3.2 TN-9102-A-x0 (Non-Redundant AC Power Supply)

Note: The CFC12 must always go into Slot 3. The chassis is shipped without the CFC12.

Note: Refer to the 9100 Installation Guide for parts shipped with the chassis

TABLE 2-11 Specifications for the 9102-A-x0

Specification	Type	Description/Notes
Model Number	TN-9102-A-10 (NA) TN-9102-A-30 (UK) TN-9102-A-40 (AUS) TN-9102-A-50 (EU)	9100 Unit with single AC power supply (See photo below) Power Cord varies with market location.
Temperature Range	Operating	0º to 50° C
	Storage	- 40º to 75 ° C
Dimensions	Height	Height: 1.75 in. (4.4 cm)
	Width	Width: 17.4 in. (44 cm)
	Depth	Depth 20.2 in. (51.3 cm)
Weight		14 lb. 12 oz. (6.7 kg)
Function	Mixture of SM Cards	Refer to 2.3.
Power Requirements		110-240 VAC 50-60 Hz
CLEI Code		None



2.6.3.3 TN-9103-A-x0 (Redundant AC Power Supply)

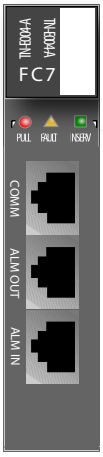
This is the same as the 9102, except a redundant power supply is included. The weight gain is one power supply unit (2 lb. 1 oz. (.95 kg).

2.7 Fan Modules

2.7.1 Fan Controller Module (FC7) - TN-E004-B

The FC7 controls the Fan Module (FM7) and provides the OAM and ALM connections.

TABLE 2-12 Specifications for the FC7

Specification	Type	Description/Notes	FC7
Model Number	TN-E004-A (EOL) TN-E004-B (EXTD TEMP)	TN-E004-B replaces TN-E004-A for all applications.	
Temperature Range	Operating	TN-E004-A: 32º to 122º F (0º to 50º C) TN-E004-B: -40º to 149° F (-40º to 65° C)	
	Storage	-40 to 167 ° F (-40 to 75 ° C)	
Dimensions	Length	4 in. (10.2 cm)	
	Width	0.8 in. (2 cm)	
	Depth	8.7 in. (221mm) with latch	
Weight	:	.8 lb. (0.3 kg)	
Function	System Cooling	Provides system cooling and the RJ-45 connection to the ALM IN and ALM OUT ports. Also provides a COMM connection (inoperable in this release). Note: Be sure to carefully follow card change procedures described in the **Allied Telesyn User Guide** when replacing the FC7	
LED	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
Power Requirements	Typical	45 watts	
	Maximum	54 watts	
Interface	COMM, ALM IN, ALM OUT	N/A	
CLEI Code		VAEQAALEAA	

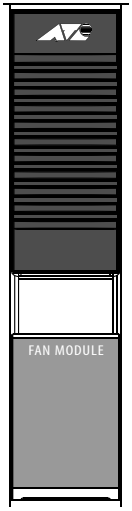
2.7.2 Fan Module (FAN8/FMX7) - TN-E001-C

TABLE 2-13 Specifications for the FAN8/FMX7

Specification	Type	Description/Notes
Model Number	TN-E001-A (EOL) TN-E001-C (EXTD TEMP)	TN-E001-C replaces TN-E001-A for all applications.
Temperature Range	Operating	TN-E001-A: 32º to 122º F (0º to 50º C) TN-E001-C: -40º to 149° F (-40º to 65° C)
	Storage	-40 to 167 ° F (-40 to 75 ° C)
Dimensions	Height	2.3 in. (5.8 mm)
	Width	17.3 in. (43.8 cm)
	Depth	9 in. (22.6 cm) with latch
Weight	:	6.5 lb. (2.9 kg)
Function	System Cooling	Contains 6 fans and provides cooling for the shelf. Also provides the RJ-45 connection to the ALM IN and ALM OUT ports and a COMM connection (inoperable in this release)
LED	PULL	When lit, card can be pulled without further affecting service
	FAULT	When lit, card needs to be checked
	INSRV	In service
Power Require-ments	Typical	110 watts
	Maximum	132 watts
Interface	COMM, ALM IN, ALM OUT	N/A
CLEI Code		VAEQAAHEAA

2.7.3 Fan Module (FM7) - TN-E003-A

TABLE 2-14 Specifications for the Fan Module 7

Specification	Type	Description/Notes	FM7
Model Number	TN-E003-A	n/a	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)[a]	
	Storage	-40º to 167 ° F (-40º to 75 ° C)	
Dimensions	Length	4.9 in. (12.5 cm)	
	Width	1.1 in. (2.8 cm)	
	Depth	9.06 (25.4 mm) with latches	
Weight		1.4 lb. (0.7 kg)	
Function(s)	System cooling	The FM7 contains six fans and provides cooling for the shelf.	
LEDs	None	Commands are provided at the CLI user interface to disable and enable the FM7 for replacement purposes.	
Power Requirements	Typical	45 watts	
	Maximum	54 watts	
Interface	None	n/a	
CLEI Code		VAEQAAJEAA	

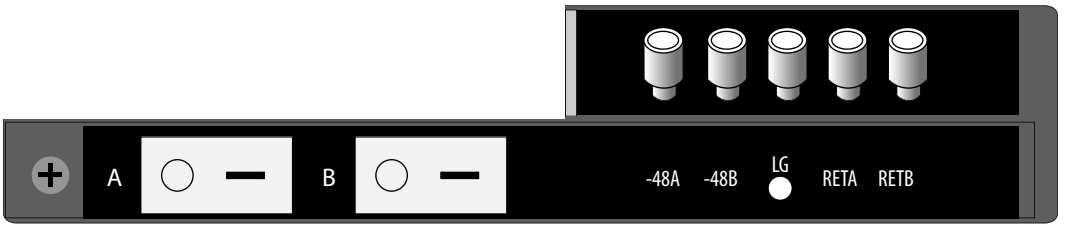
a. Must be used with the FC7 (E004-B) for hardened applications, otherwise the commercial temperature range only, 32º to 122º F (0º to 50º C).

2.8 Power Modules

2.8.1 Power Entry Module 7 (PEM7) - TN-E005-A

TABLE 2-15 Specifications for the PEM7

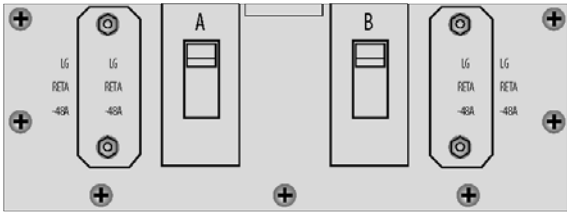
Specification	Type	Description/Notes
Model Number	TN-E005-A	Power Entry Module
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)
	Storage	- 40º to 167 ° F (- 40º to 75 ° C)
Dimensions	Height	1.8 in. (4.5 cm)
	Width	7.5 in. (19.1 cm)
	Depth	9.8 in. (25 cm)
Weight	:	1.5 lb. (0.7 kg)
Function(s)	Provides system power	The PEM7 provides power and grounding for the shelf.
LEDs	None	N/A
Interface	None	N/A
CLEI Code		VAP1FMDHAA

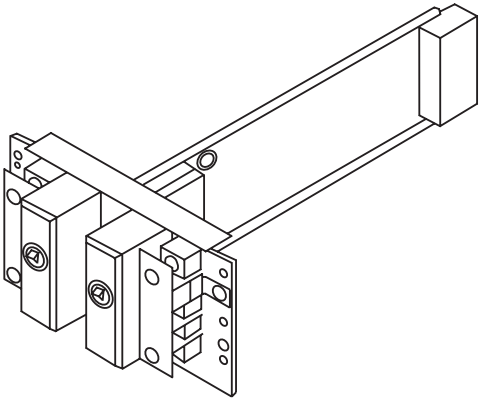


2.8.2 Power Entry Module 8 (PEM8) - TN-E002-A

TABLE 2-16 Specifications for the PEM8

Specification	Type	Description/Notes
Model Number	TN-E002-A	Power Entry Module
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)
	Storage	-40º to 167 ° F (- 40º to 75 ° C)
Dimensions	Height,	3 in. (75mm)
	Width	5.5 in. (140 mm)
	Depth	10 in. (254 mm)
Weight		1 lb. (0.45 kg)
Function(s)	Provides system power	Provides power and grounding for the shelf.
LEDs	None	N/A
Interface	None	Terminal block for power and ground wiring.
CLEI Code		VAP1FMCHAA

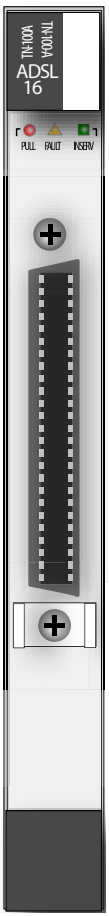




2.9 Service Modules

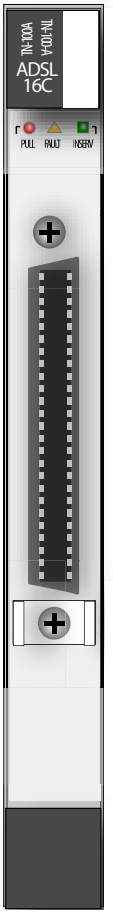
2.9.1 ADSL16 - TN-100-A

TABLE 2-17 Specifications for the ADSL Interface (16 Ports)

Specification	Type	Description/Notes	ADSL16 Card
Model Number	TN-100-A	Annex-A	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.9 lb. (0.43 kg)	
Function(s)	ADSL ports	Provides ADSL Annex-A service for 16 ports.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
Power Requirements	Typical	29 watts	
	Maximum	35 watts	
Port Interface	RJ21 See Table 3-1	Standard telco RJ21 pinout.	
CLEI Code			

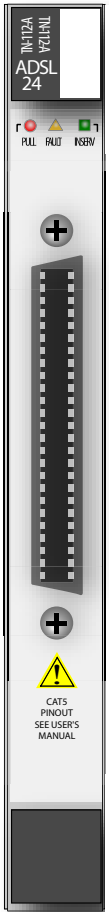
2.9.2 ADSL16C - TN-115-A

TABLE 2-18 Specifications for the ADSL Interface (Annex-C 16 Ports)

Specification	Type	Description/Notes	ADSL16C Card
Model Number	TN-115-A	n/a	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.9 lb. (0.41 kg)	
Function(s)	ADSL ports	Provides ADSL Annex-C service for 16 ports.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
Power Requirements	Typical	29 watts	
	Maximum	35 watts	
Port Interface	RJ21 See Table 3-1	Standard telco RJ21 pinout.	
CLEI Code			

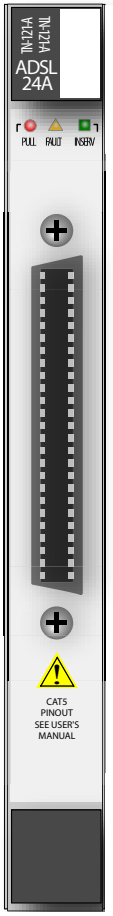
2.9.3 ADSL24 - Annex-A - TN-112-A

TABLE 2-19 Specifications for the ADSL Interface (24 Ports with Integrated POTS Splitters)

Specification	Type	Description/Notes	ADSL24 Annex-A Card
Model Number	TN-112-A	Annex-A	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		1.2 lb. (0.54 kg)	
Function(s)	ADSL ports	Provides ADSL Annex-A service for 24 ports.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
Power Requirements	Typical	50 watts	
	Maximum	55 watts	
Port Interface	RJ21 See Table 3-2	Non-standard (optimized) RJ21 pin-out.	
CLEI Code		VAUCAAZGTA	

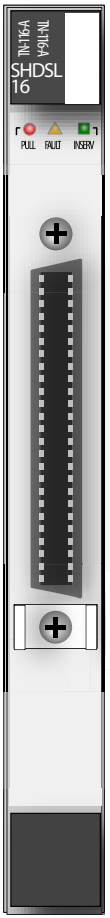
2.9.4 ADSL24A (TN-121-A) - Annex A

TABLE 2-20 Specifications for the ADSL Interface (24 Ports)

Specification	Type	Description/Notes	ADSL24A Card
Model Number	TN-121-A	Annex-A	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		1.2 lb. (0.54 kg)	
Function(s)	ADSL ports	Provides ADSL Annex-A service for 24 ports.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
Power Requirements	Typical	48 watts	
	Maximum	53 watts	
Port Interface	RJ21 See Table 3-2	Non-standard (optimized) RJ21 pin-out.	
CLEI Code		VAUCABHGTA	

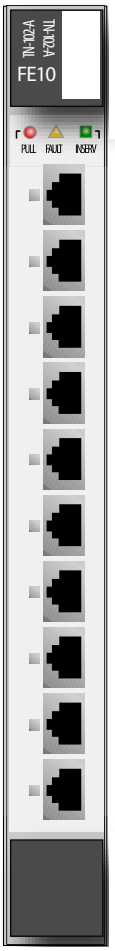
2.9.5 SHDSL16 - (TN-116-A)

TABLE 2-21 Specifications for the SHDSL16 Interface

Specification	Type	Description/Notes	SHDSL16 Card
Model Number	TN-116-A	n/a	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.9 lb. (0.42 kg)	
Function(s)	SHSDL ports	Provides symmetric Ethernet access at T1/E1 data rates of Annex-B service for 16 ports.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
Power Requirements	Typical	21 watts	
	Maximum	33 watts	
Port Interface	RJ21 See Table 3-3	Standard telco RJ21 pin-out	
CLEI Code		VAUCAA1GTA	

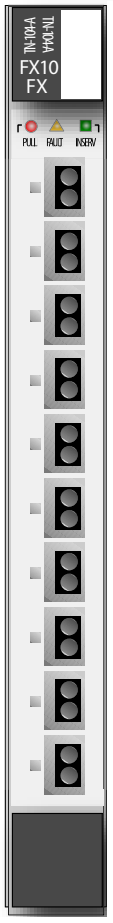
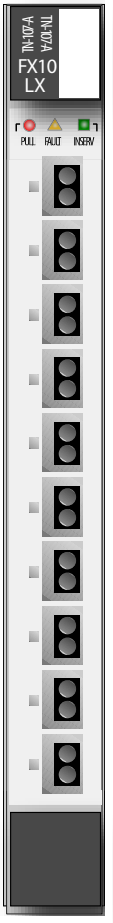
2.9.6 FE10 - TN-102-A

TABLE 2-22 Specifications for the Fast Ethernet interface (10 Ports)

Specification	Type	Description/Notes	FE10 Card
Model Number	TN-102-A		
Temperature Range	Operating	-40º to 65° C	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.8 lb. (0.34 kg)	
Function(s)	Fast Ethernet 10/ 100BT ports	Provides 10 Fast Ethernet service ports.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
	LINK	When illuminated, indicates that the port is operationally UP and data traffic is flowing over the port.	
Power Requirements	Typical	16 watts	
	Maximum	25 watts	
Port Interface	RJ-45 See Table 3-4	N/A	
CLEI Code		VAUCAAWGTA	

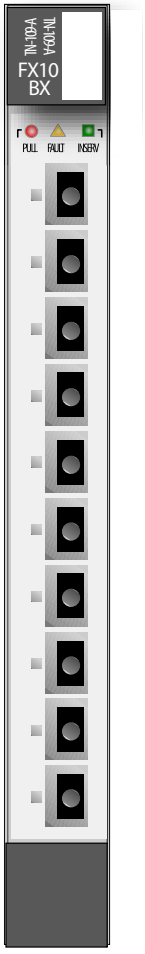
2.9.7 FX10 FX/LX - TN-104-A, TN-107-A

TABLE 2-23 Specifications for the Optical Fiber-based Fast Ethernet interface (10 Ports) - FX, LX

Specification	Type	Description/Notes	FX	LX
Model Number	TN-104-A (FX10FX)	- 2 km 1310nm, Dual Fiber, Multi mode		
	TN-107-A (FX10LX)	- 10 km, 1310nm, Dual Fiber, Single mode		
Minimum loss budgets		FX: 7.5dBm		
		LX: 16dBm		
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)		
	Storage	-40º to 167 ° F (- 40º to 75 ° C)		
Dimensions	Length	7.5 in (19.1 cm)		
	Width	.87 in (2.2 cm)		
	Depth	9.8 in. (25 cm) with latches		
Weight		1.0 lb. (0.45 kg)		
Function(s)	100BaseFx Ethernet ports	Provides 100 Fiber-based Fast Ethernet service ports.		
Software Download	Yes	Must Check to ensure correct version		
LEDs	PULL	When lit, card can be pulled without further affecting service		
	FAULT	When lit, card needs to be checked		
	INSRV	In service		
	LINK	When illuminated, indicates that the port is operationally UP and data traffic is flowing over the port.		
Power Requirements	Typical	23 watts, FX / 20 watts, LX		
	Maximum	37 watts, FX / 38 watts, LX		
Port Interface	Optical duplex LC-style receptacles	N/A		
CLEI Code	TN-104-A TN-107-A	VAUCABGGTA VAUCAAXGTA		

2.9.8 FX10 BX - TN-109-A

TABLE 2-24 Specifications for the Optical Fiber-based Fast Ethernet interface (10 Ports) - BX

Specification	Type	Description/Notes	BX
Model Number	TN-109-A (FX10BX) (Fiber Ports)	- 10 km, Single mode, Single fiber, Tx 1550nm, Rx 1310nm, i-temp, transmit power -14 to -8dBm, receive sensitivity -33dBm	
Minimum loss budgets		BX: 19dBm	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		1.0 lb. (0.45 kg)	
Function(s)	100BaseFx Ethernet ports	Provides 100 Fiber-based Fast Ethernet service ports.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	In service	
	LINK	When illuminated, indicates that the port is operationally UP and data traffic is flowing over the port.	
Power Requirements	Typical	21 watts	
	Maximum	36 watts	
Port Interface	Optical duplex LC-style receptacles	N/A	
CLEI Code		VAUCAAYGTA	

2.9.9 Circuit Emulation Service (CES8) - TN-119-A

TABLE 2-25 Specifications for the Circuit Emulation Service (CES) Interface (8 Ports)

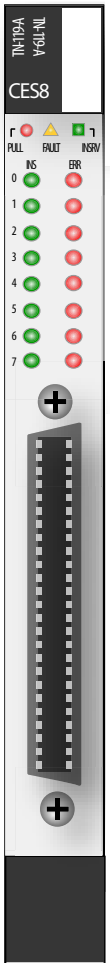
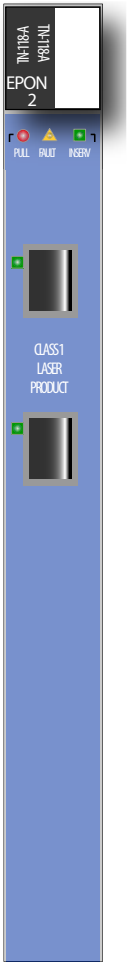
Specification	Type	Description/Notes	CES8 Card
Model Number	TN-119-A	T1/E1 Transport Over Ethernet, 8 Ports	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.8 lb. (0.37 kg)	
Function(s)	Circuit Emulation service	Provides 8 Circuit Emulation Service ports.	
Software Download	Yes	Must Check to ensure correct version	
Card LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	When lit, in service	
Port LEDs		When INS lit, physical port is operationally UP and data traffic is flowing over the port When ERR lit, faults on the physical port When ERR blinking, a degradation of service When both blinking, loopback mode	
Power Requirements	Typical	16 watts	
	Maximum	23 watts	
Port Interface	RJ21 - See Table 3-5	Non-standardized (optimized) RJ-21 pinout	
	Line Rate	DS1 = 1.544Mbps, E1 = 2.048Mbps	
	Line Code	DS1 = AMI, B8ZS, E1 = AMI, HDB3	
	Framing	In unstructured mode, all framing types are supported since they are transparently passed through the network	

TABLE 2-25 Specifications for the Circuit Emulation Service (CES) Interface (8 Ports) (Continued)

Specification	Type	Description/Notes	CES8 Card
CLEI Code		VAUCAA2GTA	
	Packet Size	16 to 1023 bytes	
	PDV Buffer	The Max. is 74.432 ms for DS1 or 56.112 ms for E1, but the capability varies on the packet size setting.	
Timing / Synchronization	Timing Source	Derived from Loop, packet stream, or card	
	Jitter	DS1 - ANSI T1.102, T1.403, GR-499-CORE E1 - ITU-T G.823	
	Wander	DS1 - T1.403, E1 - ITU-T G.823	
	Holdover Accuracy	Stratum 4 local oscillator	

2.9.10 Ethernet Passive Optical Network (EPON2) - TN-118-A

TABLE 2-26 Specifications for the Ethernet Passive Optical Network (EPON2) Interface (2 Ports)

Specification	Type	Description/Notes	EPON2 Card
Model Number	TN-118-A	Ethernet Transport Over Optical Network, 2 Ports	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.8 lb. (0.37 kg)	
Function(s)	Ethernet services over optical network	Works with Optical Network Unit (iMG646PX-ON)	
Software Download	Yes	Must Check to ensure correct version	
Card LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	When lit, in service	
	ONU Link	When lit, there are ONUs with links registered to the EPON's OLT	
Power Requirements	Typical		
	Maximum		
Port Interface	Optical ports	Refer to IEEE 802.3ah	

2.10 Network Modules

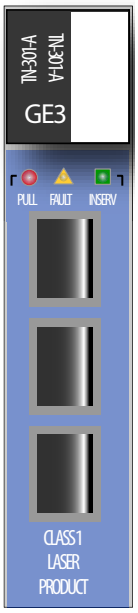
2.10.1 Gigabit Ethernet 1 (GE1) - TN-300-A

TABLE 2-27 Specifications for the Gigabit Ethernet 1 port

Specification	Type	Description/Notes	GE1
Model Number	TN-300-A		
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	3.6 in. (9.2 cm)	
	Width	0.9 in. (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.4 lb. (0.2 kg)	
Function(s)	WAN interface card	1 port gigabit Ethernet. A Small Form Factor Pluggable (SFP) provides the optical interface.	
Software Download	No		
LEDs	PULL - Red FAULT - Yellow INSRV - Green LINK UP- Green	PULL - Red - OK to Pull, the card is out of service and can be removed FAULT - Yellow - fault is present on the card, display the fault using the SHOW ALARMS command INSRV - Green- the card is in service LINK - Green - Link up	
Power Requirements	Typical	12 watts	
	Maximum	15 watts	
Port Interfaces	1 GbE SFP	N/A	
CLEI Code		VAUIADGMAA	

2.10.2 Gigabit Ethernet 3 (GE3) - TN-301-A

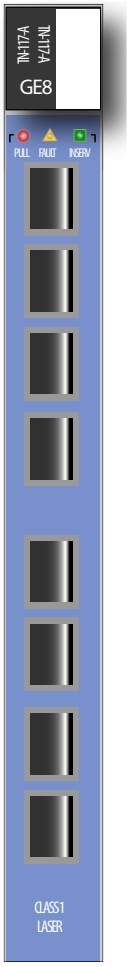
TABLE 2-28 Specifications for the Gigabit Ethernet 3 port

Specification	Type	Description/Notes	GE3
Model Number	TN-301-A	N/A	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	3.6 in. (9.2 cm)	
	Width	0.9 in. (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.6 lb. (0.27 kg)	
Function(s)	WAN interface card	3 port gigabit Ethernet. Small Form Factor Pluggable (SFP) interfaces provide the optical interfaces.	
Software Download	No		
LEDs	PULL - Red FAULT - Yellow INSRV - Green LINK - Green	PULL - Red - OK to Pull, the card is out of service and can be removed FAULT - Yellow - fault is present on the card, display the fault using the SHOW ALARMS command INSRV - Green- the card is in service LINK - Green - Link up	
Power Requirements	Typical	17 watts	
	Maximum	28 watts	
Interfaces	3 GbE SFP	N/A	
CLEI Code		VAUIADHMAA	

Note: The TN-301-C provides double tagging to support the VLAN-based HVLAN feature in release 7.0. Note that in release 7.0 the user must use this card to enable this feature and cannot upgrade the FGPA in existing GE3 cards. (This limitation should be lifted in subsequent releases.)

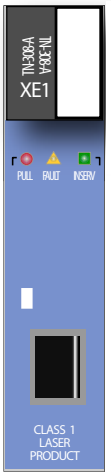
2.10.3 Gigabit Ethernet 8 (GE8) - (TN-117-A)

TABLE 2-29 Specifications for the Gigabit Ethernet 8 port

Specification	Type	Description/Notes	GE8
Model Number	TN-117-A	N/A	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.9 lb. (0.4 kg)	
Function(s)	Ports interface subscriber (in SM slot) or 1G Ring (in RM slot)	8 port gigabit Ethernet. Small Form Factor Pluggable (SFP) interfaces provide the optical interfaces.	
Software Download	None		
LEDs	PULL - Red FAULT - Yellow INSRV - Green LINK - Green	PULL - Red - OK to Pull, the card is out of service and can be removed FAULT - Yellow - fault is present on the card, display the fault using the SHOW ALARMS command INSRV - Green- the card is in service LINK - Green - Link up	
Power Requirements	Typical		
	Maximum		
Interfaces	8-GbE SFP	N/A	
CLEI Code		N/A	

2.10.4 10GE Network Module (XE1) - (TN-308-A)

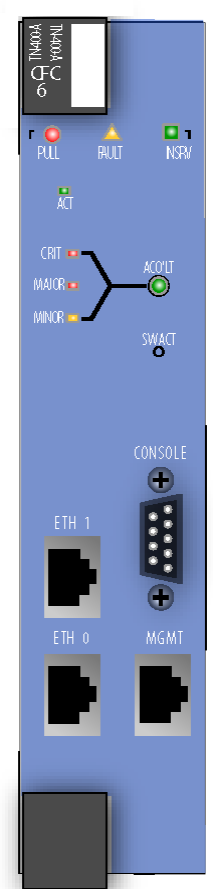
TABLE 2-30 Specifications for the Gigabit Ethernet 8 port

Specification	Type	Description/Notes	XE1
Model Number	TN-308-A	N/A	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	3.6 in. (9.2 cm)	
	Width	0.9 in. (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.53 lb. (0.24 kg)	
Function(s)	Provides 10Ge Interface	Provides 10GE links between 10G products	
Software Download	None		
LEDs	PULL - Red FAULT - Yellow INSRV - Green LINK - Green	PULL - Red - OK to Pull, the card is out of service and can be removed FAULT - Yellow - fault is present on the card, display the fault using the SHOW ALARMS command INSRV - Green- the card is in service LINK - Green when link is up	
Power Requirements	Typical		
	Maximum		
Interfaces	1-10GbE XFP	Refer to 2.16	
CLEI Code		N/A	

2.11 Control Modules

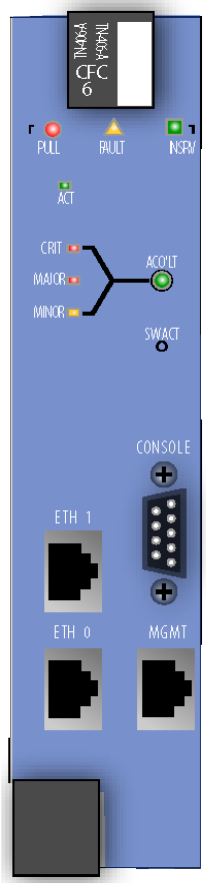
2.11.1 CFC6 - TN-400-A, TN-400-B

TABLE 2-31 Specifications for the CFC6 Controller

Specification	Type	Description/Notes	CFC6 Card
Model Number	TN-400-A TN-400-B	Each version provides different traffic management capabilities. See the **Telesyn User Guide** for more information.	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in. (19.1 cm)	
	Width	1.6 in. (4.1 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		1.8 lb. (0.8 kg)	
Function(s)	Central Controller	6.4 Gbps Central switching fabric and control card.	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	When lit, CFC6 is fully initialized	
	ACT	Currently Active, this card is the Active CFC6 card.	
Controls	ACO/LT	Alarm Cut Off/Lamp Test	
	SWACT	Pressing this button initiates an Activity Swap.	
Software Download	Yes	Must Check to ensure correct version	
Power Requirements	Typical	35 watts	
	Maximum	75 watts	
Ports	CONSOLE (RS-232)	Refer to 3.5.1.	
	MGMT (Ethernet 10/100)	Ethernet Management Port	
	ETH 0 (Ethernet 10/100)	Not currently used	
	ETH 1 (Ethernet 10/100)	Not currently used	
CLEI Code		VAUCAA3GTA	

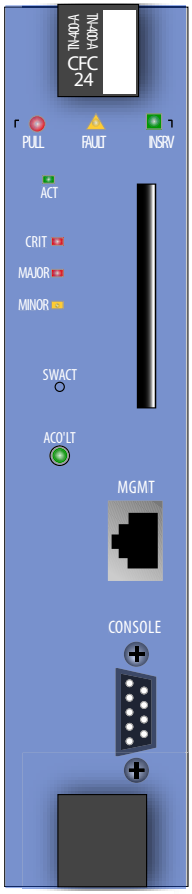
2.11.2 CFC6 - TN-406-A (Support for Annex-C)

TABLE 2-32 Specifications for the CFC6 Controller - Support for Annex-C

Specification	Type	Description/Notes	CFC6 Card
Model Number	TN-406-A	Each version provides different traffic management capabilities. See the **Telesyn User Guide** for more information.	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length	7.5 in. (19.1 cm)	
	Width	1.6 in. (4.1 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		1.9 lb. (0.85 kg)	
Function(s)	Central Controller	6.4 Gbps Central switching fabric and control card. Includes mezzanine card for network synchronization	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	When lit, CFC6 is fully initialized	
	ACT	Currently Active, this card is the Active CFC6 card.	
Controls	ACO/LT	Alarm Cut Off/Lamp Test	
	SWACT	Pressing this button initiates an Activity Swap.	
Software Download	Yes	Must Check to ensure correct version	
Power Requirements	Typical	36 watts	
	Maximum	75 watts	
Ports	CONSOLE (RS-232)	Refer to 3.6.1.	
	MGMT (Ethernet 10/100)	Ethernet Management Port	
	ETH 0 (Ethernet 10/100)	Not currently used	
	ETH 1 (Ethernet 10/100)	Not currently used	
CLEI Code		(None)	

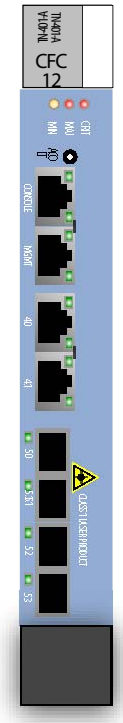
2.11.3 Control Module (CFC24) - TN-401-B

TABLE 2-33 Specifications for the Controller

Specification	Type	Description/Notes	CFC24 Card
Model Number	TN-401-B	Supports Service Modules used in the 9x00 chassis	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length,	7.5 in. (19.1 cm)	
	Width	1.6 in. (4.1 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight	TN-401-B	1.9 lb. (0.85 kg)	
Function(s)	Central Controller	24 Gbps Central switching fabric and control card.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	PULL	When lit, card can be pulled without further affecting service	
	FAULT	When lit, card needs to be checked	
	INSRV	When lit, CFC24 is fully initialized	
	ACT	Currently Active, this card is the Active CFC24 card.	
Controls	ACO/LT	Alarm Cut Off/Lamp Test	
	SWACT	Activity Swap Control	
Power Requirements	Typical	45 watts	
	Maximum	66 watts	
Ports	CONSOLE (RS-232)	Refer to 3.5.1.	
	MGMT (Ethernet 10/100)	Ethernet Management Port	
CLEI Code		VAUCAA4GTA	

2.11.4 Control Module (CFC12) - TN-408-A

TABLE 2-34 Specifications for the Controller

Specification	Type	Description/Notes	CFC12 Card
Model Number	TN-408-A	Supports Service Modules used in the 9100 chassis (slot 3)	
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length,	7.5 in. (19.1 cm)	
	Width	.9 in. (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		1.9 lb. (0.85 kg)	
Function(s)	Central Controller	12 Gbps Central switching fabric and control card.	
Software Download	Yes	Must Check to ensure correct version	
LEDs	Critical, Major, Minor	Alarm levels	
Controls	ACO/LT	Alarm Cut Off/Lamp Test	
Power Requirements	Typical	25	
	Maximum	28	
Management Ports	CONSOLE (RJ-45)	Refer to 3.5.2.	
	MGMT (Ether-net 10/100)	Ethernet Management Port	
CLEI Code		None	

2.12 Filler Plates

2.12.1 Filler Plate Half (FPH) - TN-M002-A

TABLE 2-35 Specifications for the Filler Plate Half Height

Specification	Type	Description/Notes	FPH
Model Number	TN-M002-A	n/a	
Temperature Range	Operating	n/a	
	Storage	n/a	
Dimensions	Length	3.6 in. (9.2 cm)	
	Width	0.9 in. (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
	Weight	0.2 lb. (0.1 kg)	
Function(s)	Assists in system cooling and EMI	Must fill empty half-height card slots. Installation of FPHs are necessary for proper emissions control and air flow.	
LEDs	None	n/a	
Interface	None	n/a	
CLEI Code		(None)	

2.12.2 Filler Plate Full (FPF) - TN-M000-A

TABLE 2-36 Specifications for the Filler Plate Full Height

Specification	Type	Description/Notes	FPF
Model Number	TN-M000-A	n/a	
Temperature Range	Operating	n/a	
	Storage	n/a	
Dimensions	Length	7.5 in (19.1 cm)	
	Width	.87 in (2.2 cm)	
	Depth	9.8 in. (25 cm) with latches	
Weight		0.3 lb. (0.13 kg)	
Function(s)	Assists in system cooling and EMI	Must fill empty full-height card slots. Installation of FPHs are necessary for proper emissions control and air flow.	
LEDs	None	n/a	
Interface	None	n/a	
CLEI Code		(None)	

2.12.3 Filler Plate for 9102 (FP91) - TN-M015-A

The FP91 filler plate is used in the 9102, which does not have the redundant power supply. Refer to the following figure and specifications:

TABLE 2-37 Specifications for the Filler Plate for the 9102

Specification	Type	Description/Notes	FPF
Model Number	TN-M015-A	n/a	Refer to 2.15.2. on page 2-48
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)	
	Storage	-40º to 167 ° F (- 40º to 75 ° C)	
Dimensions	Length		
	Width		
	Depth		
Weight		0.22 lb. (0.9 kg)	
Function(s)	Assists in system cooling and EMI	Must fill empty AC power supply slot. Installation is necessary for proper emissions control and air flow.	
LEDs	None	n/a	
Interface	None	n/a	
CLEI Code		(None)	

2.13 AC Power Kits for x400, x700, 7100, and 9102/3

2.13.1 x400 and x700

AC power kits are available for Telesyns installed in 19-inch rack environments where -48Vdc is not available, as follows:

- **AT-TN-R111** - Provides an AC power supply for one x400 chassis with all possible card configurations.
- **AT-TN-R112** - Allows the AT-TN-R111 to be upgraded to support multiple x400 chassis. One AT-TN-R112 upgrade kit is required for each additional x400 chassis, up to a maximum of three x400 chassis.
- **AT-TN-R113** - Provides an AC power supply for one x700 chassis with all possible card configurations.
- **AT-TN-R114** - Allows the AT-TN-R113 to be upgraded to support multiple x700 chassis. One AT-TN-R112 upgrade kit is required for each additional x700 chassis, up to a maximum of three x700 chassis.

The kits come complete with all cables, cords, hardware. Included with each kit are step-by-step installation instructions.

Ordering options include having the needed power cords (North America, Australia, UK and EU). The entire model number includes the power cord suffix and is used when ordering. For example, the AT-TN-111 has these model numbers:

- **AT-TN-R11-A-10 (NA)**
- **AT-TN-R11-A-30 (UK)**
- **AT-TN-R11-A-40 (AUS)**
- **AT-TN-R11-A-50 (EU)**

2.13.2 7100 Series - AT-TN-R108-A

Note: Refer to the Allied Telesyn 7100 AC Power Supply Installation Guide for detailed instructions.

FIGURE 2-3 Power Module Attached to 710n and Rear View

TABLE 2-38 Specifications for the 7100 AC Power Supply

Specification	Type	Description/Notes
Model Number	AT-TN-R108-A-10 (NA) AT-TN-R108-A-30 (UK) AT-TN-R108-A-40 (AUS) AT-TN-R108-A-50 (EU)	AC Power Supply Module
Dimensions	Height	1.75 in. (3.8 cm)
	Width	17 in. (3.8 cm)
	Depth	4 in. (19.3 cm)
Weight		4.5 lb. (.3 kg)

TABLE 2-38 Specifications for the 7100 AC Power Supply (Continued)

Specification	Type	Description/Notes
Function	System Cooling	- AC to 48Vdc converter compatible with any Allied Telesyn 71nn series device. - Can be mounted behind 71xx device (refer to Figure) or rack mounted above, below, or near the 71xx device.
AC Inlet		- IEC-320 inlet, accepts detachable power cords - 86 to 264 Vrms, 50/60 Hz single phase - Internally fused (there are no serviceable components) - Max. continuous inlet current: 4 Arms - Max. inrush current: 35 A
DC output	N/A	- 48 Vdc +/- 1 V - Up to 200 Watt nominal load - Fully protected against output overload and short circuit, with automatic recovery upon removal of the overload condition - Molex 39870-0105 plug
Altitude Range	Operating	-197 to 10,000 ft. (- to m)
	Storage	-197 to 40,000 ft. (to m)
Temperature Range	Operating	32º to 122° F (0º to 50° C)
	Storage	-40º to 149° F (- 40º to 65 ° C)
Agency Approvals		- EN60950-1 (TUV)
EMI and Susceptibility		- FCC CFR title 47 part 15 Subpart B Class B - EN55022 Class - EN61000-4
LEDs	Fan1 Running blinks	Fan is spinning normally
	Fan 2 Running blinks	Fan is spinning normally
	Fans at low speed ON	Fans are slow
	Fans at low speed OFF	Fans are at high speed
	-48V ON	Unit is running normally

2.13.3 9102/3 - TN-E010-A

Note: Refer to the Allied Telesyn 9100 Installation Guide for installation steps.

TABLE 2-39 Specifications for the 9102/3 AC Power Supply

Specification	Type	Description/Notes
Model Number	TN-E010-A	AC Power Supply Module
Dimensions	Height	
	Width	
	Depth	
Weight		2 lbs. 1 oz. (.95 kg.)
Function	100-240 VAC 50-60 Hz 4-2 A	- AC to 48Vdc converter compatible with Allied Telesyn 9102/ 9103 product. - Installed in back of 9102 as only power supply, or next to existing power supply of 9102 for redundancy. (This then becomes a 9103.)
AC Inlet		- IEC-320 inlet, accepts detachable power cords - 86 to 264 Vrms, 50/60 Hz single phase - Internally fused (there are no serviceable components) - Max. continuous inlet current: 4 Arms - Max. inrush current: 35 A
DC output	N/A	- 48 Vdc +/- 1 V - Up to 200 Watt nominal load - Fully protected against output overload and short circuit, with automatic recovery upon removal of the overload condition - Molex 39870-0105 plug
Altitude Range	Operating	-197 to 10,000 ft. (- to m)
	Storage	-197 to 40,000 ft. (to m)
Temperature Range	Operating	0º to 50° C
	Storage	- 40º to 65 ° C
Agency Approvals		- EN60950-1 (TUV)
EMI and Suscepti-bility		- FCC CFR title 47 part 15 Subpart B Class B - EN55022 Class - EN61000-4
LEDs	AC	Unit is receiving AC power
	DC	Unit is providing DC power

2.14 71nn Products

2.14.1 TN-7101-A (7101)

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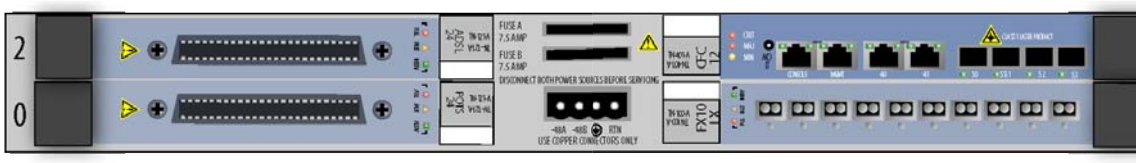
TABLE 2-40 Specifications for the 7101

Specification	Type	Description/Notes
Model Number	TN-7101-A	7101 Unit
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)
	Storage	-40º to 167 ° F (- 40º to 75 ° C)
Dimensions	Height	Height: 1.8 in. (4.4 cm)
	Width	Width: 17.4 in. (44 cm)
	Depth	11.8 in. (30 cm)
Weight		9.9 lb. (4.5 kg)
Function	ADSL ports	Provides ADSL Annex-A service for 48 ports.
LED	CRITICAL, MAJOR,. MINOR	When lit, indicates the severity of the present fault condition
	FAULT	When lit, card needs to be checked
	INSRV	When lit, 7100 is fully initialized
	ADSL port show-time status	Selects the ADSL card and port and its state. See the **Installation Guide** or **User Guide** for operating instructions.
Port Interface	RJ21 See Table 3-1	N/A
Power Requirements	Typical Maximum	122 watts 149 watts
CLEI Code		VAMD400HRA

2.15 9100 Products

2.15.1 TN-9101-A-80 (Dual DC Power Supply))

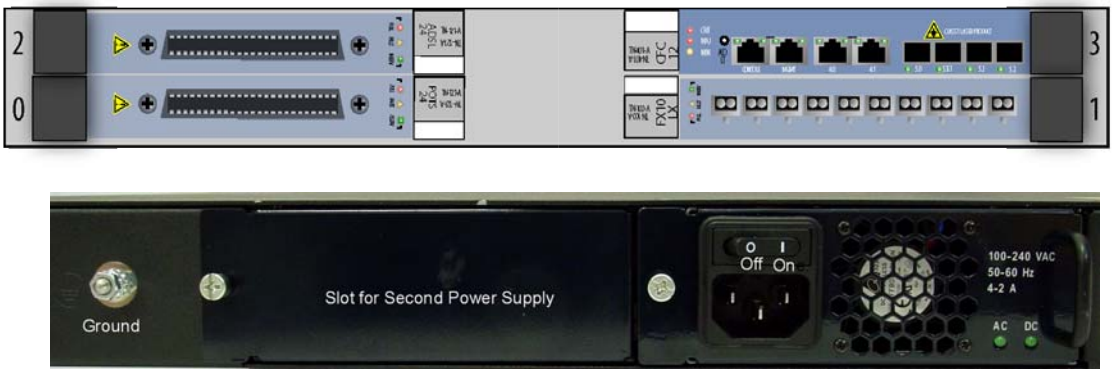
TABLE 2-41 Specifications for the 9102-A

Specification	Type	Description/Notes
Model Number	TN-9101-A-80	9100 Unit with redundant 48VDC Power Supply
Temperature Range	Operating	-40º to 149° F (-40º to 65° C)
	Storage	-40º to 167 ° F (- 40º to 75 ° C)
Dimensions	Height	Height: 1.75 in. (4.4 cm)
	Width	Width: 17.4 in. (44 cm)
	Depth	Depth: 12 in. (30.4 cm)
Weight		Weight of the 9101 chassis and the card mix
Function	Mixture of SM Cards	Refer to 2.3.
Power Requirements	Typical Maximum	28 watts (chassis only) 31 watts (chassis only)
Alarm Contacts (Rear of Unit)		Provide ALM IN and ALM OUT contact points. Refer to 3.6.
CLEI Code		None
		
 (Rear of Unit)		

2.15.2 TN-9102-A-x0 (Non-Redundant AC Power Supply)

TABLE 2-42 Specifications for the 9102-A-x0

Specification	Type	Description/Notes
Model Number	TN-9102-A-10 (NA) TN-9102-A-30 (UK) TN-9102-A-40 (AUS) TN-9102-A-50 (EU)	9100 Unit with single AC power supply (See photo below) Power Cord varies with market location.
Temperature Range	Operating	0º to 50° C
	Storage	- 40º to 75 ° C
Dimensions	Height	Height: 1.75 in. (4.4 cm)
	Width	Width: 17.4 in. (44 cm)
	Depth	20.2 in. (51.5 cm)
Weight		Weight of the 9102 chassis and the card mix
Function	Mixture of SM Cards	Refer to 2.3.
Power Requirements		100-240 VAC 50-60 Hz 4-2 A
CLEI Code		None



2.15.3 TN-9103-A-x0 (Redundant AC Power Supply)

This is the same unit as the 9102, but includes the redundant AC power supply, describer in 2.13.3.

2.16 Optical Specifications

2.16.1 Small Form Factor Pluggable (SFP)

The SFP provides the interface from Allied Telesyn systems to the WAN

Note: These SFPs are the approved list of SFPs. The use of other SFPs may have issues with functional performance or compliance to national regulatory requirements.

TABLE 2-43 Specifications for SFP

Model	CLEI Code	Wavelength (nm)	Distance (km)[a]	Operating Temperature (°C)	Tx PWR Min (dB)	Rx PWR Min (dB)	Optical Budget (dB)
TN-P000-A	VAUIAD BMAA	1310	10[b]	0º to 70° (case)	-9	-22	13
TN-P001-A	VAUIAD-CMAA	850	0.55	0º to 70° (case)	-15	-24	9

a. The distance figure is approximate. Actual reach will depend on the type of fiber used and number of splices.

b. For 0.55 and 10 km modules, no attenuator is required.

2.16.2 FX10 Card

TABLE 2-44 Specifications for FX10

FX10 Model	Distance (km)[a]	Wavelength (nm)	Operating Temperature (°C)[b]	Tx PWR Min (dB)	Rx PWR Min (dB	Optical Budget (db)
FX10 FX	0.55	1310	- 40º to 65°	-24	-31	8
FX10 BX	40	1550 (TX) / 1310	- 40º to 65°	-14	-33	19
FX10 LX	10	1310	- 40º to 65°	-15	-31	16

a. The distance figure is approximate. Actual reach will depend on the type of fiber used and number of splices.

b. Refers to the SFF optics device operating temperature

2.16.3 Optical Connector Interfaces

All optical connector interfaces, except for the FX10 BX, are LC-Duplex. The FX10 BX is Single SC.

2.17 Reliability

The following text provides reliability information for Allied Telesyn components.

TABLE 2-45 Acronyms and Definitions

Acronym	Definition
MTBF	Mean Time Between Failure The accumulated run time where 63.7 % of the operating product is expected to have failed. This excludes infant mortality and wear out failure modes.
FIT	Failure In Time 1 Failure per Billion Hours FIT = 1/MTBF

TABLE 2-46 Failure Rate Summary [a]

Model No.	Component	FITS	Board MTBF (Hrs)
TN-100-A	ADSL16	2710	369,000
TN-102-A	FE10	2130	469,500
TN-104-A	FX10FX	6990	143,100
TN-107-A	FX10LX	6990	143,100
TN-109-A	FX10BX	6990	143,100
TN-112-A	ADSL24	4330	230,900
TN-116-A	SHDSL16	2220	450,500
TN-117-A	GE8	3500	285,700
TN-118-A	EPON2	2220	450,500
TN-119-A	CES8	2910	343,600
TN-121-A	ADSL24A	2770	361,000
TN-250-A	X700	1070	934,600
TN-251-A	X400	630	1,587,300
TN-300-A	GE1	550	1,818,200
TN-301-A	GE3	1160	862,100
TN-308-A	XE1	1900	526,300

TABLE 2-46 Failure Rate Summary (Continued)[a]

Model No.	Component	FITS	Board MTBF (Hrs)
TN-400-B	CFC6	4800	208,300
TN-401-B	CFC24	6150	162,600
TN-7101-A	7101	11,950	83,700
TN-E001-A	FAN8	3650	274,000
TN-E002-A	PEM8	200	5,000,000
TN-E003-A	FM7	320	3,125,000
TN-E004-B	FC7	1140	877,200

a. at 40º Centigrade

2.18 Power Dissipation

The following table provides power dissipation information for Allied Telesyn shelves and individual components

Note: Inrush Current is estimated to be no more than 1.4 times steady state.

TABLE 2-47 Power Dissipation for Cards and Systems (Measured in Watts, @ 48 Volts)

Card	Per Card Power Consumption - Typical	Per Card Power Consumption - Max
	Typical	Max
CFC24	45	66
CFC6	35	75
CFC6 (Annex-C)	36	75
GE1	12	15
GE3	17	28
ADSL16	29	35
ADSL24 (Annex-A)	50	55
ADSL24A	48	53
FC7/FM7	45	54
FC8/FM8	110	132
FX10-LX	20	38
FX10-FX	23	37
FX10-BX	21	36
FE10	16	25
SHDSL16	21	33
CES8	16	23
CFC12	25	28

3. Cabling (Cables and Pinouts)

3.1 Overview

3.1.1 Building Cables

Users that build their own cables must ensure that when making connections at the RJ21 connector end a **MAXIMUM** of .5 inch be untwisted between the twisted pair coming from the cable and the RJ21 connector pins. See the figure below Figure 3-1.

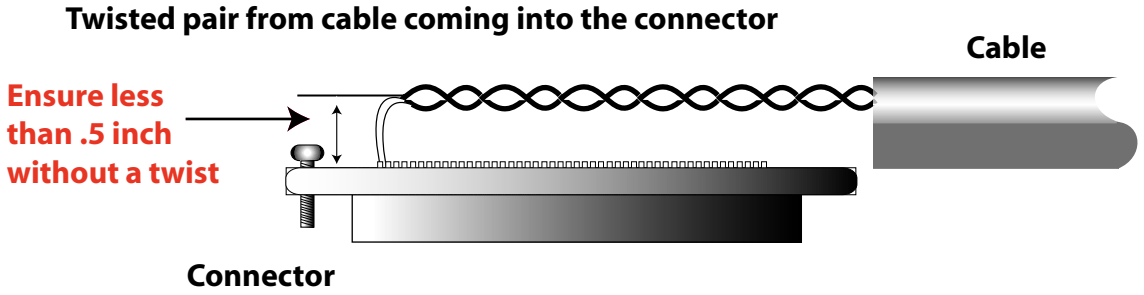


FIGURE 3-1 Twisted pair MAXIMUM untwisted length at the RJ21 connector

3.1.2 xDSL Pin Numbering and Location

For the xDSL cards in this section, the physical location of the pin numbers is shown in Figure 3-2.

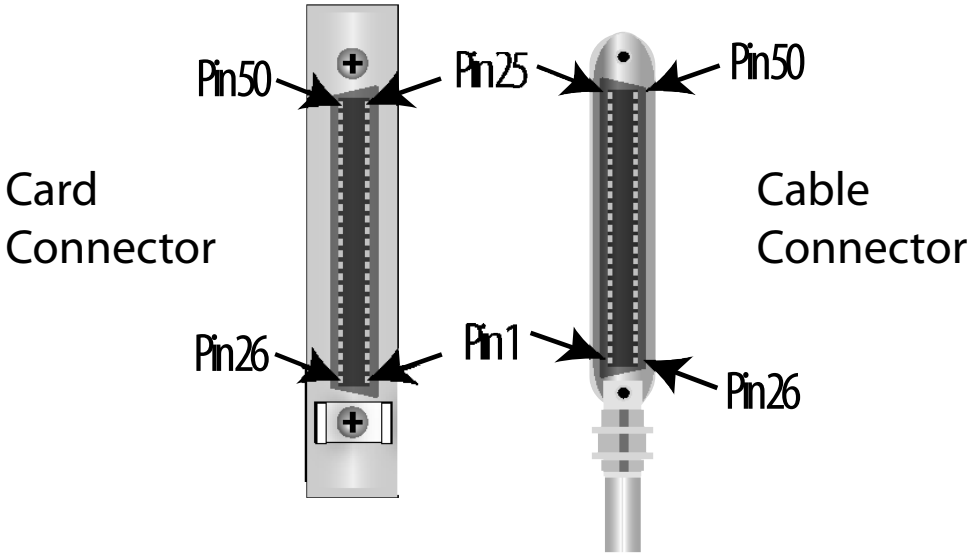


FIGURE 3-2 xDSL Pin Locations (RJ21)

3.2 xDSL Cable Specifications

3.2.1 ADSL16 Cable Specifications

TABLE 3-1 Wiring table for RJ21 - ADSL16

		TIP		RING	
Pair	ADSL Port	Pin #	Wire Color	Pin #	Wire Color
1	0	26	WHITE/BLUE	1	BLUE/WHITE
2	1	27	WHITE/ORANGE	2	ORANGE/WHITE
3	2	28	WHITE/GREEN	3	GREEN/WHITE
4	3	29	WHITE/BROWN	4	BROWN/WHITE
5	4	30	WHITE/SLATE	5	SLATE/WHITE
6	5	31	RED/BLUE	6	BLUE/RED
7	6	32	RED/ORANGE	7	ORANGE/RED
8	7	33	RED/GREEN	8	GREEN/RED
9	8	34	RED/BROWN	9	BROWN//RED
10	9	35	RED/SLATE	10	SLATE/RED
11	10	36	BLACK/BLUE	11	BLUE/BLACK
12	11	37	BLACK/ORANGE	12	ORANGE/BLACK
13	12	38	BLACK/GREEN	13	GREEN/BLACK
14	13	39	BLACK/BROWN	14	BROWN//BLACK
15	14	40	BLACK/SLATE	15	SLATE/BLACK
16	15	41	YELLOW/BLUE	16	BLUE/YELLOW
17-25	Unused	42-50	No Connect	17-25	No Connect

Note: Cat 5, 25 pair cable must be used.

Caution: Pair untwist at termination shall not exceed .5 inch (1.24 cm).

3.2.2 ADSL24 Cable Specifications

TABLE 3-2 Wiring table for RJ21 - ADSL24 - Refer to Figure 3-2 for pin location

---	---	TIP		RING	
Pair	ADSL Port	Pin #	Wire Color	Pin #	Wire Color
1	0	2	WHITE/BLUE	1	BLUE/WHITE
2	1	4	WHITE/ORANGE	3	ORANGE/WHITE
3	2	6	WHITE/GREEN	5	GREEN/WHITE
4	3	8	WHITE/BROWN	7	BROWN/WHITE
5	4	10	WHITE/SLATE	9	SLATE/WHITE
6	5	12	RED/BLUE	11	BLUE/RED
7	6	15	RED/ORANGE	14	ORANGE/RED
8	7	17	RED/GREEN	16	GREEN/RED
9	8	19	RED/BROWN	18	BROWN//RED
10	9	21	RED/SLATE	20	SLATE/RED
11	10	23	BLACK/BLUE	22	BLUE/BLACK
12	11	25	BLACK/ORANGE	24	ORANGE/BLACK
13	12	27	BLACK/GREEN	26	GREEN/BLACK
14	13	29	BLACK/BROWN	28	BROWN//BLACK
15	14	31	BLACK/SLATE	30	SLATE/BLACK
16	15	33	YELLOW/BLUE	32	BLUE/YELLOW
17	16	35	YELLOW/ORANGE	34	ORANGE/YELLOW
18	17	37	YELLOW/GREEN	36	GREEN/YELLOW
19	18	40	YELLOW/BROWN	39	BROWN/YELLOW
20	19	42	YELLOW/SLATE	41	SLATE/YELLOW
21	20	44	VIOLET/BLUE	43	BLUE/VIOLET
22	21	46	VIOLET/ORANGE	45	ORANGE/VIOLET
23	22	48	VIOLET/GREEN	47	GREEN/VIOLET
24	23	50	VIOLET/BROWN	49	BROWN/VIOLET
25	NC	38	VIOLET/SLATE	13	SLATE/VIOLET

Note: Cat 5, 25 pair cable must be used.

Caution: Pair untwist at termination shall not exceed .5 inch (1.24 cm).

3.2.3 SHDSL16 Cable Specifications

TABLE 3-3 Wiring table for RJ21 - SHDSL16 - Refer to Figure 3-2 for pin location

		TIP		RING	
Pair	ADSL Port	Pin #	Wire Color	Pin #	Wire Color
1	0	26	WHITE/BLUE	1	BLUE/WHITE
2	1	27	WHITE/ORANGE	2	ORANGE/WHITE
No connection, Unused		28		3	
3	2	29	WHITE/GREEN	4	GREEN/WHITE
4	3	30	WHITE/BROWN	5	BROWN/WHITE
No connection, Unused		31		6	
5	4	32	WHITE/SLATE	7	SLATE/WHITE
6	5	33	RED/BLUE	8	BLUE/RED
No connection, Unused		34		9	
7	6	35	RED/ORANGE	10	ORANGE/RED
8	7	36	RED/GREEN	11	GREEN/RED
No connection, Unused		37		12	
9	8	38	RED/BROWN	13	BROWN//RED
10	9	39	RED/SLATE	14	SLATE/RED
No connection, Unused		40		15	
11	10	41	BLACK/BLUE	16	BLUE/BLACK
12	11	42	BLACK/ORANGE	17	ORANGE/BLACK
No connection, Unused		43		18	
13	12	44	BLACK/GREEN	19	GREEN/BLACK
14	13	45	BLACK/BROWN	20	BROWN//BLACK
No connection, Unused		46		21	
15	14	47	BLACK/SLATE	22	SLATE/BLACK
16	15	48	YELLOW/BLUE	23	BLUE/YELLOW
No connection, Unused		49		24	
		50		25	

Note: Neatly cut and dress unused wire pairs. CAT5 cable required.

3.3 FE10 Cable Specifications

TABLE 3-4 Wiring table for RJ45 - FE10

		TIP		RING	
Port	10/100 Port	Pin #	Color Code	Pin #	Color Code
0	0	26	WHITE/BLUE	1	BLUE/WHITE
1	1	27	WHITE/ORANGE	2	ORANGE/WHITE
2	2	28	WHITE/GREEN	3	GREEN/WHITE
3	3	29	WHITE/BROWN	4	BROWN/WHITE
4	4	30	WHITE/SLATE	5	SLATE/WHITE
5	5	31	RED/BLUE	6	BLUE/RED
6	6	32	RED/ORANGE	7	ORANGE/RED
7	7	33	RED/GREEN	8	GREEN/RED
8	8	34	RED/BROWN	9	BROWN//RED
9	9	35	RED/SLATE	10	SLATE/RED

3.4 CES8 Cable Specifications

TABLE 3-5 Wiring table for RJ21 - CES8

---	TTIP Pin #	TRING Pin #	RTIP Pin #	RRING Pin #
Line 0	26	1	39	14
Line 1	27	2	40	15
Line 2	28	3	41	16
Line 3	29	4	42	17
Line 4	30	5	43	18
Line 5	31	6	44	19
Line 6	32	7	45	20
Line 7	33	8	46	21
No Conn.	Pin # 9,10,11,12,13,22,23, 24,25,34,35,36,37,38 ,47,48,49,50	---	---	---

Allied Telesyn offers a shielded, 100 ohm, DS1 cable for use with the CES8 SM. As shown in Figure 3-3, this cable is connectorized at the MAP end and provides the conductors for both the Transmit and Receive pairs for eight DS1s. This cable consists of separate shielded conductor bundles for Transmit signals from the MAP and Receive signals supplied to the MAP. The cable is equipped with the drain wires of these two shields combined and brought out for chassis ground termination on the faceplate of the associated CES8 module.

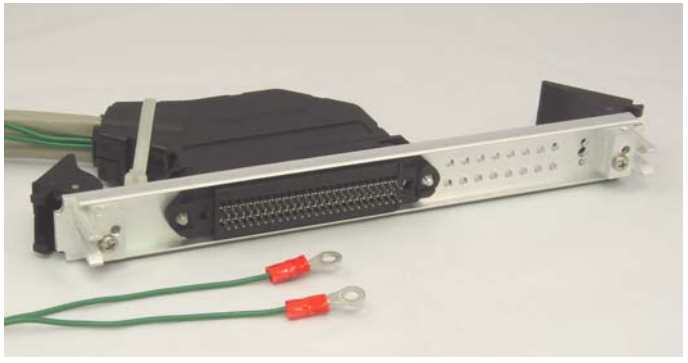


FIGURE 3-3 CES8 Card Connector with Shield Drain Wires

3.5 Pinouts for Console Port

3.5.1 RS-232

Figure 3-4 gives the RS-232 pin assignments for a male-to-female local terminal cable.

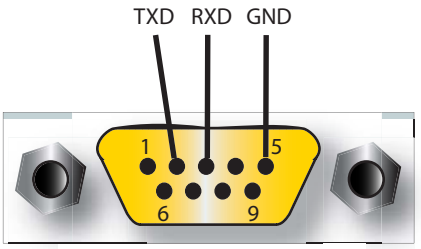


FIGURE 3-4 Pin outs for DB9 CONSOLE plug on the Control Module

3.5.2 RJ-45 - CONSOLE port on CFC12 (9100)

The CONSOLE port is an RJ45 connection (not a DB9 connection as is standard with are other Allied Telesyn units). Pinout is as follows. Refer to Figure 3-5.

- Pin 3 -TXD
- Pin 6 - RXD
- Pin 4 (or 5) - GND

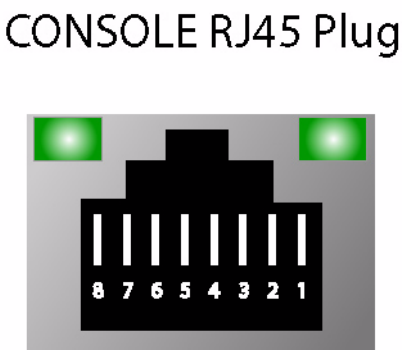


FIGURE 3-5 CONSOLE Pinout for 9100

3.6 System Alarm Connections (RJ45 Pinouts)

The system provides both ALM IN and ALM OUT ports.

The ALM IN can be connected to external alarm and indicator inputs as required, such as open door, motion detector, ambient temperature, etc.

The ALM OUT can be connected for all alarms, so that any alarm of a severity completes a contact. The three severities are Minor, Major, and Critical.

Figure 3-6 shows the overall configuration and an example for an open door.

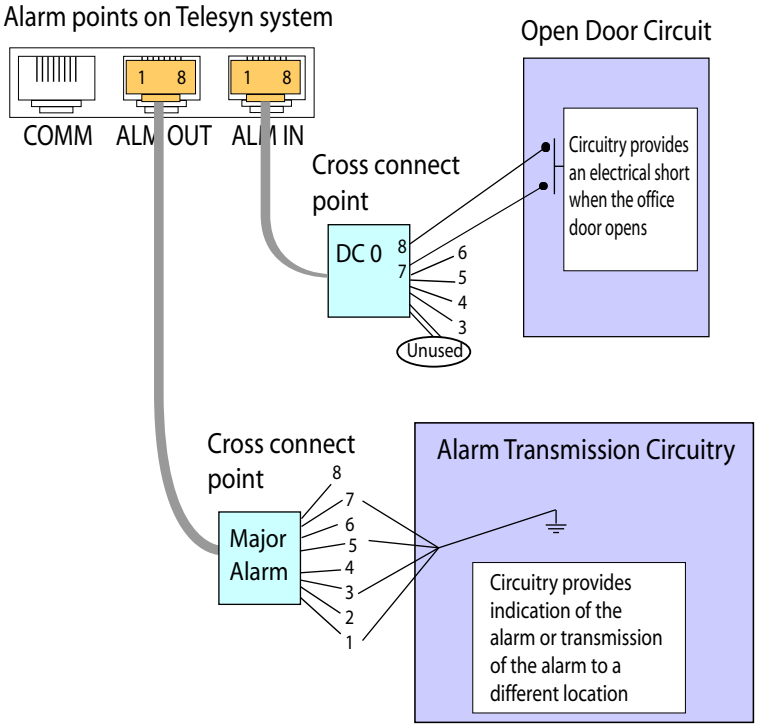


FIGURE 3-6 Example Alarm Points Configuration

3.6.1 ALM IN Configuration

Figure 3-7 shows the ALM IN pinout, which receives closure inputs on an RJ45 connector, with the following conditions listed in Table 3-6. Pin numbers correspond to the RJ45 socket as shown in Figure 3-6

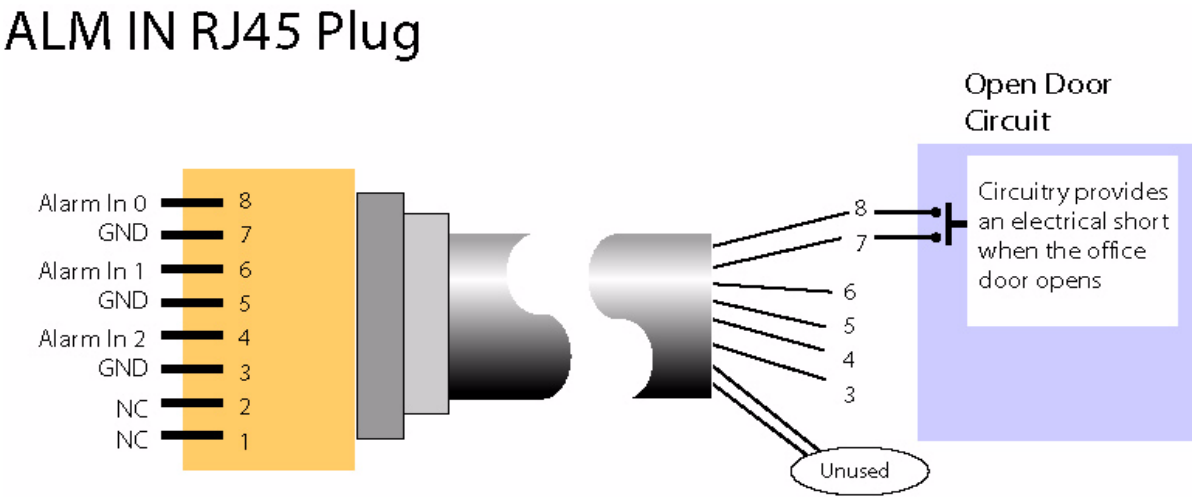


FIGURE 3-7 ALM IN Pinouts

TABLE 3-6 ALM IN Connector Specifications

Type	Specification	Notes
Multiple Systems	The alarms can be daisy chained through multiple co-located systems	
Loop Closure	Provided by either relay contacts or solid state devices. Loop Closure return can be connected to a GND pin, or any convenient chassis ground or battery return ground, as long as the battery return is properly grounded.	
Reference	Alarm Inputs 0, 1, and 2 are referenced to -48VDC, such that current flows **into** these inputs upon loop closure to GND.	
Input Current	10mA, maximum	
Solid State Switch	If a solid state switch device is used to provide loop closure, it must support the current polarity (see Reference above) and be saturated at 10mA. The loop closure device when open must withstand the maximum system battery voltage of -57.7VDC	

3.6.2 ALM OUT Configuration

Figure 3-8 shows the ALM OUT pinout, which sends loop closure for system-level Minor, Major, and Critical, and Audible alarms on an RJ45 connector, with the following conditions listed in Table 3-7. Pin numbers correspond to the RJ45 socket as shown in Figure 3-6

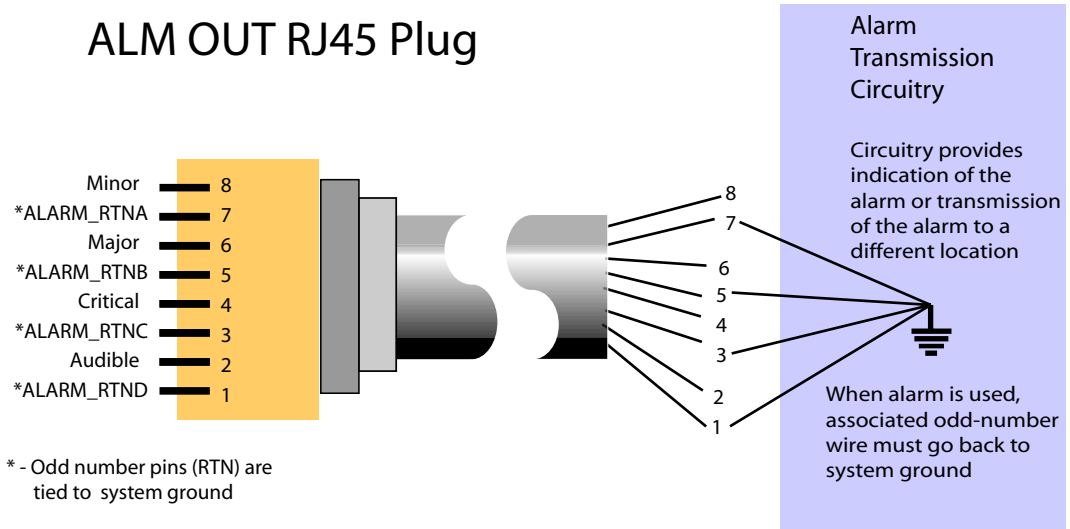


FIGURE 3-8 ALM OUT Pinouts

TABLE 3-7 ALM OUT Connector Specifications

Type	Specification	Notes
RTN	All return lines are tied together as a **floating** common point.	
Open Circuit Voltage	60VDC	
Resistive Load	250mADC	
Inductive Load	Acceptable if **both** these conditions are met: - Maximum current is less than 250mADC - The load is clamped to maintain less than 60VDC across the alarm output at turn-off	
Capacitance Load	Not to exceed 0.1uF	
Reference	The RTN must be positive with respect to loop closure outputs (loads must be -48V referenced).	

4. Miscellaneous Specifications

4.1 Air Filter

4.1.1 Model Number

TN-M003-A - 5-pack for x700 (TN-250-A, TN-250-G, TN-250-GF)

4.1.2 Procedure for Cleaning

The air filter is used in the x700 products to ensure that filtered air is pulled into the chassis by the fan module.

The air filter should be inspected periodically, especially where non-filtered air can enter the room where the x700 device is used. The procedure to inspect the air filter is as follows:

1. Pull down the front flange along the bottom edge of the x700. This will expose the latches.
2. Pull the latches forward (toward you) until they stop, about 1 inch (2.5 cm).
3. The filter is placed in a slightly upward position. Grasp the edge of the filter and manipulate it (dropping it about 0.5 inch [1.3 cm] until you can slide the filter out. Refer to Figure 4-1.

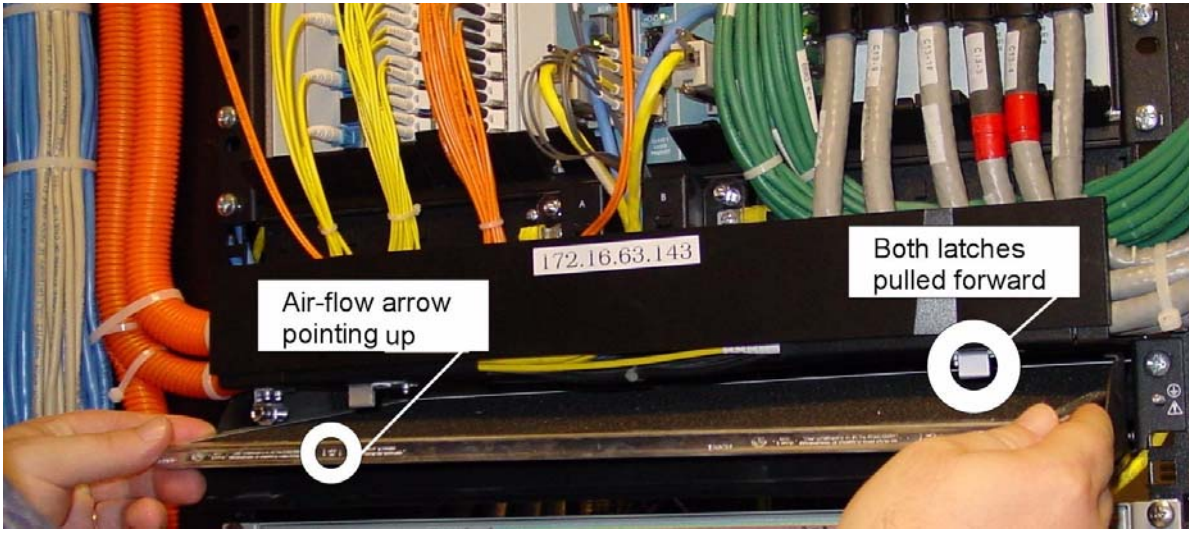


FIGURE 4-1 Removing Air Filter for Inspection

4. Inspect the filter. If there is a film of dust on the filter, take the filter to an area away from the device, and wipe the filter with a clean, slightly moistened cloth.
5. Ensure the air flow arrow is pointing up (refer to Figure 4-2) and slide the filter back into place.
6. Manipulate the filter so it goes up about 0.5 inch (1.3 cm).
7. Push the latches back (away from you) until they lock into place.
8. Return the front flange to its original position.

FIGURE 4-2 Air filter with the AIr Flow Arrows Up.

4.2 Fuses

4.2.1 71xx 5A Fuses

The 5A fuses are standard and can be ordered from an electronics distributor. One example is from Cooper-Bussmann, part number BK/GMT-5A. Example websites are www.digikey.com and www.farnell.com.

4.2.2 9101 7.5A Fuses

The 7.5A fuses are standard and can be ordered from an electronics distributor. One example is from Cooper-Bussmann, part number BK/GMT-7$_{1/2}$A. Example websites are www.digikey.com and www.farnell.com.