



AK355 System

Installation and User's Guide

Publication Information

©2013 Positron Inc.

AK355/AK355 E System Installation and User's Guide

Publication date: April 2013

Printed in Canada

Published By

Positron Inc.
5101 Buchan Street, Suite 220
Montreal, Quebec, Canada
H4P 2R9
Telephone US and Canada: 1-888-577-5254
International: +1-514-345-2220

Microsoft Windows is a registered trademark of Microsoft Corporation.

Product names, other than Positron's, mentioned herein may be trademarks and/or registered trademarks their respective companies.

FCC Notification

The AK355 System complies with part 15 of the FCC Rules. Operation is subject to the following two conditions (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Confidentiality Notice

The information contained in this document is the property of Positron Inc. Except as specifically authorized in writing by Positron Inc., the holder of this document: 1) shall keep all information contained herein confidential and shall protect same in whole or in part from the disclosure and dissemination to all third parties, and 2) shall use same for operating and maintenance purposes only.

Disclaimer Notice

Although Positron Inc. has made every effort to ensure the accuracy of the information contained herein, this document is subject to change.

CONTENTS

Chapter 1	5
AK355 System	5
1.1 Introduction.....	6
1.2 Installation	7
1.3 AK355 Connections	9
1.3.1 Front View	9
1.3.2 Rear View.....	11
Chapter 2	15
AktinoView Management Software	15
Ethernet Mode	15
2.1 Introduction.....	16
2.2 Installation	16
2.3 System Management	16
2.3.1 Logging in to the System	16
2.3.2 Switching from DS3 Mode to Ethernet Mode (for Systems supporting DS3)	17
2.3.3 AktinoView Main Window.....	18
2.3.4 System	21
2.3.5 Inventory	22
2.3.6 Provisioning.....	24
2.3.7 Alarms.....	54
2.3.8 Performance Monitoring (PM).....	58
2.3.9 Tools	77
2.3.10 Diagnostic	80
2.3.11 License.....	83
Chapter 3	85
AktinoView Management Software	85
DS3 Mode	85
3.1 Introduction.....	86
3.2 Installation	86
3.3 System Management	86
3.3.1 Logging in to an AK355 System	86
3.3.2 Switching from Ethernet Mode to DS3 Mode (for Systems supporting DS3)	87
3.3.3 AktinoView Main Window.....	88
3.3.4 System	91
3.3.5 Inventory	92
3.3.6 Provisioning.....	94
3.3.7 Alarms.....	122
3.3.8 Performance Monitoring (PM).....	126
3.3.9 Tools	141
3.3.10 Diagnostic	144
3.3.11 License.....	147
Chapter 4	149
Technical and Regulatory Specifications	149
4.1 AK355 Technical Specifications.....	150

Chapter 5	153
Maintenance	153
5.1 AK355 Fans and Filters.....	154
Chapter 6	155
Safety and Warnings	155
Chapter 7	159
Warranty and Customer Service	159
Chapter 8	161
Positron Products	161
Appendices	163
Appendix A:	164
System Software Upgrade	164
Appendix B:	166
System Alarm Information	166
Appendix C:	169
System MSPAN Error Information	169

Chapter 1

AK355 System

1.1 Introduction

The AK355 Systems enable point-to-point Ethernet over Copper services and is ideally suited for demanding applications such as DSLAM Backhaul over long distances. The AK355C model offers point-to-point transport of DS3 or Ethernet over Copper, providing a smooth migration from TDM to IP at a later stage (the AK355CE model offers point-to-point transport of Ethernet only). The systems bond together 2 to 16 copper pairs creating a symmetric or asymmetric high bandwidth link capable of delivering up to 100 Mbps out to 12 Kft/3.7 Km (24 AWG) or 45 Mbps out to 17 Kft/5.2 Km (24 AWG).

Positron's signature FlexStream functionality enables the AK355 Systems to run either in symmetric or asymmetric mode with a simple software command. It allows service providers to dictate how much bandwidth is allocated to downstream vs. upstream traffic - an essential tool for ensuring precious bandwidth is used as efficiently as possible.

The AK355 Systems consist of 1RU high Central Office and Remote units for 19" and 23" racks or for wall mounting. It is environmentally hardened and the Remote units can be either line or locally powered.

Note: Read Chapter 5 Safety and Warnings before proceeding.

1.2 Installation

Mounting the AK355

The AK355 units can be mounted in either 19 inch or 23 inch racks. The 19 and 23 inch flanges and mounting screws are included in the installation kit. Mounting holes are provided for flush or mid mount. Note that the mid mount flange can be mounted forward or backward for either 5 or 6 inch recess. Figure 1 shows examples of 19 inch flanges attached to the flush position and 23 inch flanges attached to the mid mount position.

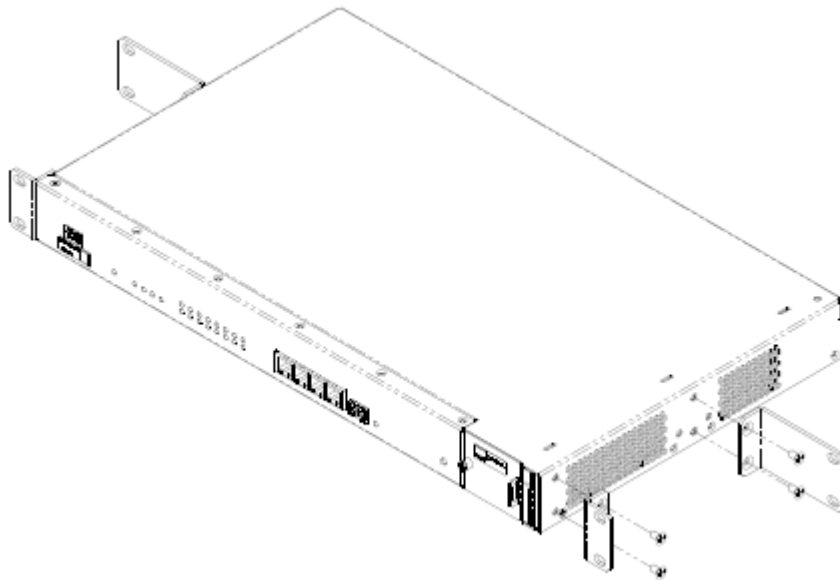


Figure 1 Flange Wall Mounting

The unit can also be mounted on a wall using either 19 or 23 inch flanges (see Figure 2) It is not necessary for the flange to be bonded with the frame; the unit's Ground Lug on the back provides proper grounding.

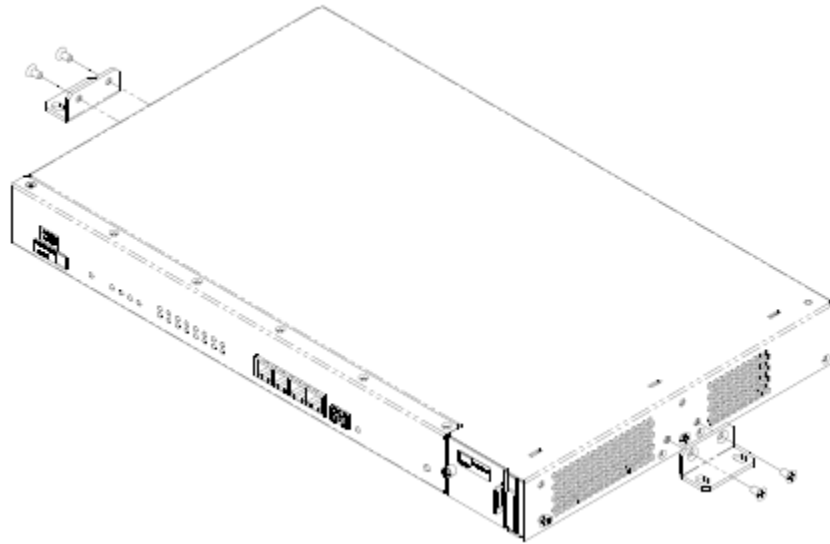


Figure 2 Wall Mounting

NOTE: The fan filter should be replaced every six months. Ordering information can be found at the end of this document.

1.3 AK355 Connections

1.3.1 Front View

Error! Reference source not found. shows the AK355 front panel. The AK355C and AK355R units have identical front panel indicators and functions.

1.3.1.1 Management Connections

The RJ-45 port (located on the front panel) can be used for local or remote management access. The Ethernet port automatically is set to either 10BaseT or 100BaseT and auto-sense the polarity of TX/RX (automatic MDIX).

Caution: In order to comply with the intra-building lightning surge requirements, intra-building Ethernet management wiring must be shielded, and the shield for the wiring must be grounded at both ends.

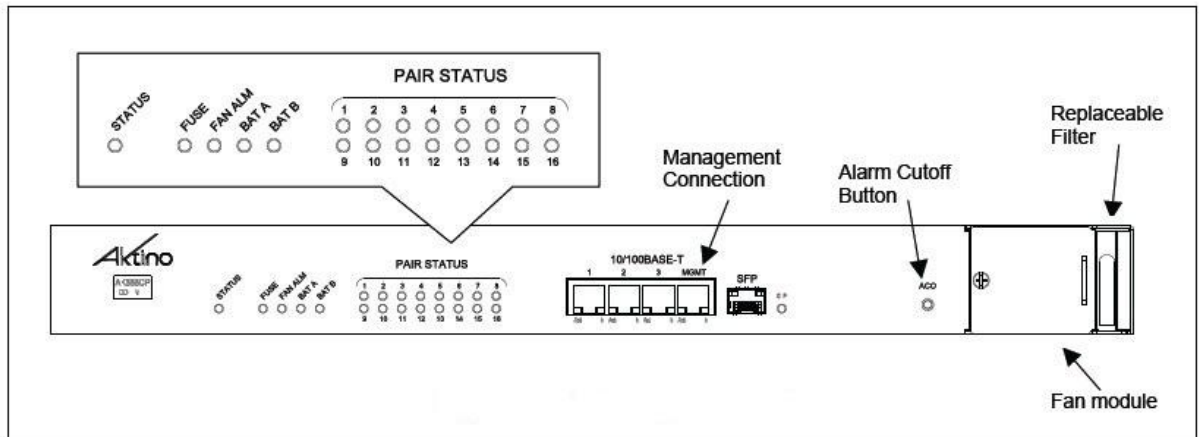


Figure 3 AK355 Front View

AK355 Front Panel Indicators

LED	Condition	Function
Status	Solid Green Flashing Green Solid Yellow Solid Red	Normal DS3 Loopback Active (DS3 Only) Minor Alarm Active Critical or Major Alarm
Fuse	Off Red	Unit Fuse OK Unit Fuse Has Blown
Fan Alarm	Solid Green Solid Yellow Flashing Red	Fan Status Normal One Fan Has Failed More Than One Fan Has Failed
MULTIPAIR SPAN STATUS	Solid Green Solid Yellow Solid Red	Normal Minor Alarm Critical or Major Alarm
PAIR STATUS	Off Solid Green Flashing Green Solid Red	Pair Is Disabled Pair Is Up Pair Is Acquiring Pair LOS/Open Circuit/Short
BAT A BAT B	Off Solid Green	External DC Power Has Not Been Applied External DC Power Is Present

ACO Pushbutton

Pushbutton	Function
ACO	<p>Push Alarm Cut Off pushbutton for at least 1/2 second, deactivates audio (not visual) relay for all active alarms. The ALARM LED on the AK355 indicates ACO has been activated by the connection on the back of the unit.</p> <p>To temporarily override the AK355C IP Address, push and hold the ACO button until the Status LED turns off. The management IP address of the CCU will revert to 192.168.10.1 for a period of 5 minutes. The AK355R will revert to the 192.168.10.2 IP Address.</p>

1.3.2 Rear View

The rear views of the AK355 systems are similar less the DS3 connections on the AK355E model.

1.3.2.1 Frame Ground Connections

The Ground Lug located on the right hand side of the back panel (see Figure 4) can accommodate up to 6 AWG wire. Use a wire gauge for grounding at least as heavy as the power wiring. Attach the grounding wire to the AK355 Ground Lug to a nearby grounding screw on the equipment rack or facility ground. Test the ground connection with an ohm meter; there should be less than 2 ohms between the AK355 Ground Lug and facility ground.

Note that the ground connection is required for proper system operations.

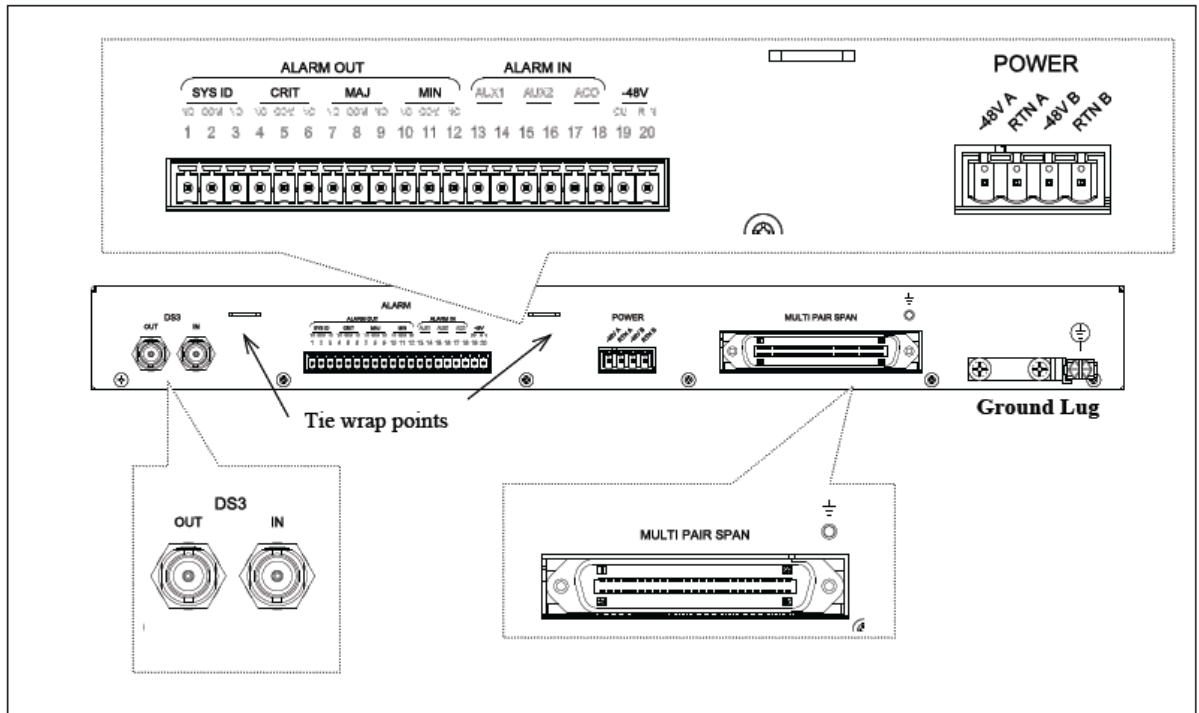


Figure 4 AK355 Rear View

1.3.2.2 Power Connections

A 7.5A to 10A UL listed fuse/circuit breaker must be installed ahead of this unit.

Two redundant power buses are provided (A and B). The two power inputs are identical and can be used for redundant power configurations.

Insert the ends of the -48 Vdc and Return power wires (16 AWG wire is recommended) into the A and B holes on the left side of the Phoenix plug. Insert the Phoenix plug into the Power connector.

Note: The DC return terminal is not connected to the equipment frame or the grounding means of the equipment (Isolated DC Return).

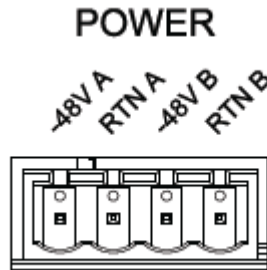


Figure 5 Power Connector

1.3.2.3 Multi-Pair Span Connection

The MSPAN connector is used to connect the AK355 to the outside plant pairs.

The Table shown below specifies the 50-pin AMP connector pin assignments.

Connector Pin Assignments

Pair	TIP	RING
Pair 1	26	1
Pair 2	27	2
Pair 3	28	3
Pair 4	29	4
Pair 5	30	5
Pair 6	31	6
Pair 7	32	7
Pair 8	33	8
Pair 9	34	9
Pair 10	35	10
Pair 11	36	11
Pair 12	37	12
Pair 13	38	13
Pair 14	39	14
Pair 15	40	15
Pair 16	41	16

The CO MSPAN cable should be shielded with a pigtail wire that attaches to the ground lug just above the MSPAN connector. The RT MSPAN cable's shield should NOT be connected to ground (leave open). The MSPAN cable is female. Tie wrap points are available in several places on the back panel. The MSPAN cable can be routed to the left or right.

1.3.2.4 **Alarm Connections**

Alarm connections are generally used on the CO end. Insert alarm connections into the supplied Phoenix connector. Alarm connections available are:

- Critical, audio and visual
- Major, audio and visual
- Minor, audio and visual
- SysID
- Alarm-CutOff (ACO)
- Aux1, Aux2 Alarm in

Each alarm can be connected to Normally Open (NO) or Normally Closed (NC) position. Use the Common (COM) connection to complete the connection. SysID connections can be used to identify the equipment in alarm. SysID is active during any alarm activation. Aux1 and Aux2 are input alarm dry contact relay point. The Alarm-CutOff (ACO) connections are input dry contact relay points used for remote activation of ACO.

Note: The AK355CPS and the AK355RP only support the Alarm In connections.

1.3.2.5 **-48 Vdc OUT Connection**

The AK355R and the AK355CPS can supply 48Vdc output to power external devices. **Note:** DO NOT attach external voltages to these outputs.

1.3.2.6 **DS3 Connection**

Attach the transmit and receive DS3 coax cables to the In and Out BNC connectors on the back panel (see Figure 14).

Note: See Chapter 8 for AK355 Systems that support DS3.

Chapter 2

AktinoView Management Software

Ethernet Mode

2.1 Introduction

AktinoView is a Microsoft Windows software package used to manage one or more systems. In AktinoView, the AK355 unit located at the Central Office is referred to as the CO and the AK355 unit located at the Remote Office is referred to as the RT.

2.2 Installation

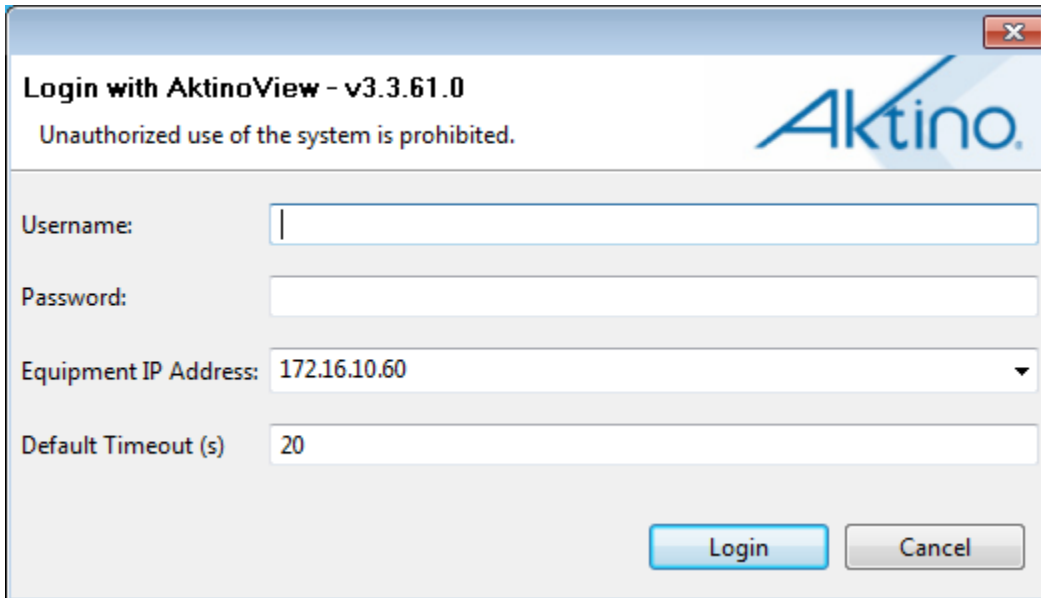
To install AktinoView proceed through the following:

- Insert the AktinoView CD into the CD ROM drive or download AktinoView from Positron's portal located at <http://www.positronaccess.com>
- Open Windows Explorer and click on the CD drive
- Double-click on install.exe in the AktinoView folder
- Follow the instructions on the screen

2.3 System Management

2.3.1 Logging in to the System

From the Start Menu select **Aktino > AktinoView**, and you will see a dialog box similar to the following:



The screenshot shows a Windows-style dialog box titled "Login with AktinoView - v3.3.61.0". At the top right is a close button (X). Below the title bar, there is a warning message: "Unauthorized use of the system is prohibited." and the Aktino logo. The main area contains four input fields: "Username:" (empty text box), "Password:" (empty text box), "Equipment IP Address:" (dropdown menu showing "172.16.10.60"), and "Default Timeout (s):" (text box with "20"). At the bottom right are "Login" and "Cancel" buttons.

Enter a Username and Password appropriate for the system. The default Username is "superuser" and the default password is "superuser". Enter the system's IP address in the Equipment IP Address field, and Click **Login**. The default IP address for the CO unit is 192.168.10.1 and the default IP address for the RT unit is 192.168.10.2.

2.3.2 Switching from DS3 Mode to Ethernet Mode (for Systems supporting DS3)

- 1 Go to the Tools tab.
- 2 Right click on the RT Unit. **Note:** Always start this process by switching the RT unit first.
- 3 Select **Switch to Ethernet Mode** from the RT drop-down box and then select **OK**. This will initiate a process that will result with the RT rebooting.
- 4 Right click on the CO once the RT disappears.
- 5 Select **Switch to Ethernet Mode** from the CO drop-down box and then select **OK**. This will initiate a process that will result with the CO rebooting. **Note:** Wait a couple of minutes before continuing with the remainder of this process.
- 6 Go to the File Menu and select **Connect to...** This will bring up the Login to AktinoView dialog box.
- 7 Type in the Username and Password. The default Username is "superuser" and the default Password is also "superuser."
- 8 Click **Login**.
- 9 Follow the same process when returning to DS3 Mode.

2.3.3 AktinoView Main Window

Once you are logged into the system you will see three menu options:

File Menu

The File Menu provides two options:

Connect to: Allows you to connect to and manage several Aktino systems simultaneously.

Exit: Exits the AktinoView program.

Action Menu

The Action Menu provides four options:

Refresh: Refreshes the system.

System Backup: Opens a dialog box allowing you to save your System Configuration in an XML file to your PC so that you may retrieve and restore the configuration at a later date.

System Restore: Opens a dialog box to import and apply a previously saved System Configuration file. The process of restoring your system configuration will reboot your system.

System Software Upgrade: Opens a dialog box allowing you to upgrade the Aktino System software. (See Appendix A for System Software Upgrade procedures.)

Export: Provides three options: **Alarm Log**, **Alarm History**, and **PM** (Performance Monitoring). These options allow you to export the desired information to a .csv file.

Help Menu

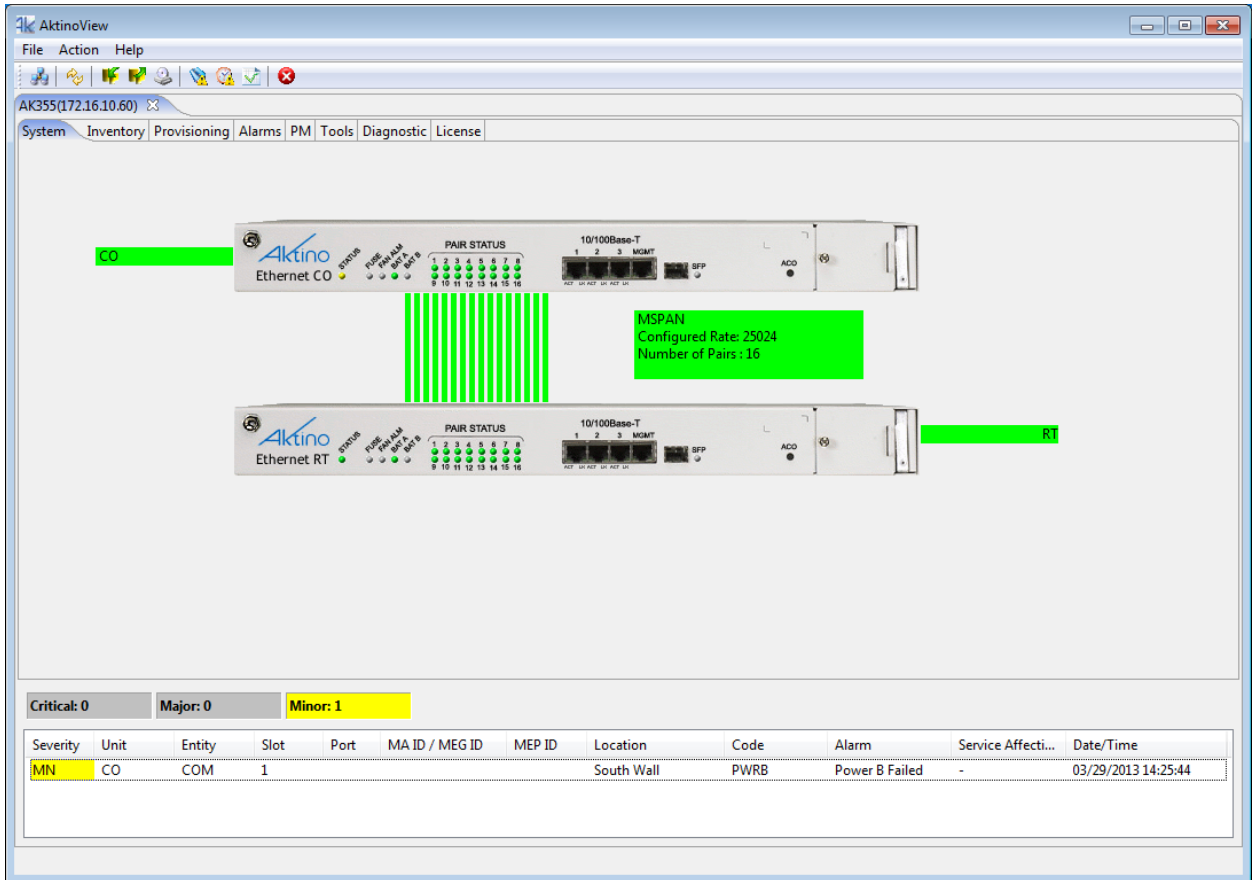
The Help Menu provides one option:

About: Displays the AktinoView software version information.

AktinoView provides Quick-Launch buttons for all the menus:



Under the Menus and Quick-Launch buttons, AktinoView displays a tab for all the systems currently being managed. Each tab will display the System Name and IP address of the selected system.



When AktinoView connects to a given system, it will display several additional tabs appropriate for the selected system. In this case, AktinoView displays the following tabs for the system in Ethernet mode: System, Inventory, Provisioning, Alarms, PM, Tools, Diagnostic, and License.

AktinoView provides Alarm details by right-clicking on the unit. If alarms are present in the system, AktinoView will display them at the bottom of the screen. For more information about a particular alarm, double-click on the alarm for details and trouble-shooting information.

Alarm Details

System ID: AK355_1

IP Address: 172.16.1.81

Unit: CO

Entity: COM

Code: PWRB

Troubleshooting Info: No power detected on power input B
Recommended action:
1. Check B side wiring and Fuse

Cancel

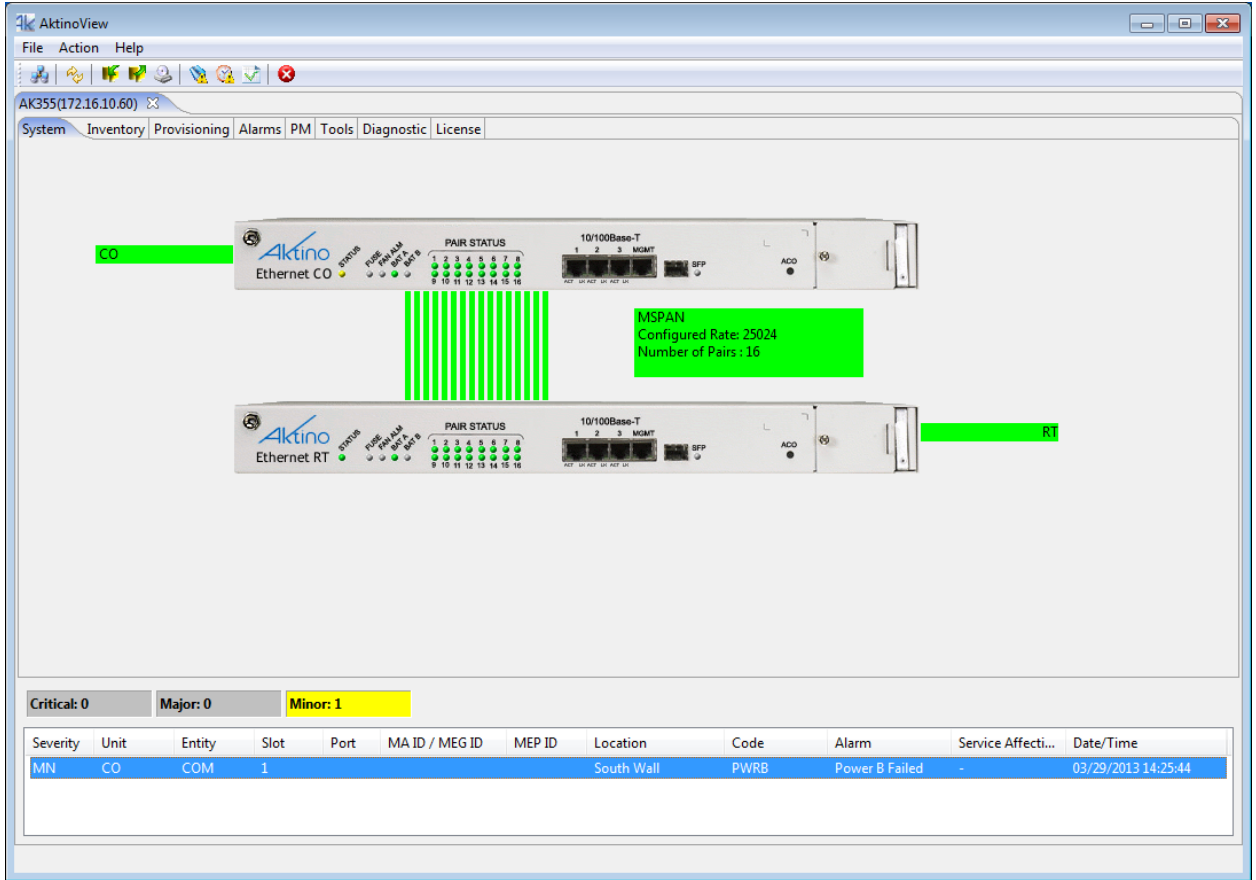
Alarm Details

AktinoView displays detailed alarm information for each system. It displays counters for the active Critical, Major, and Minor alarms, as well as detailed alarm information for each of the alarms present. The columns can be sorted and resized as desired.

Critical: 0		Major: 0		Minor: 1							
Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

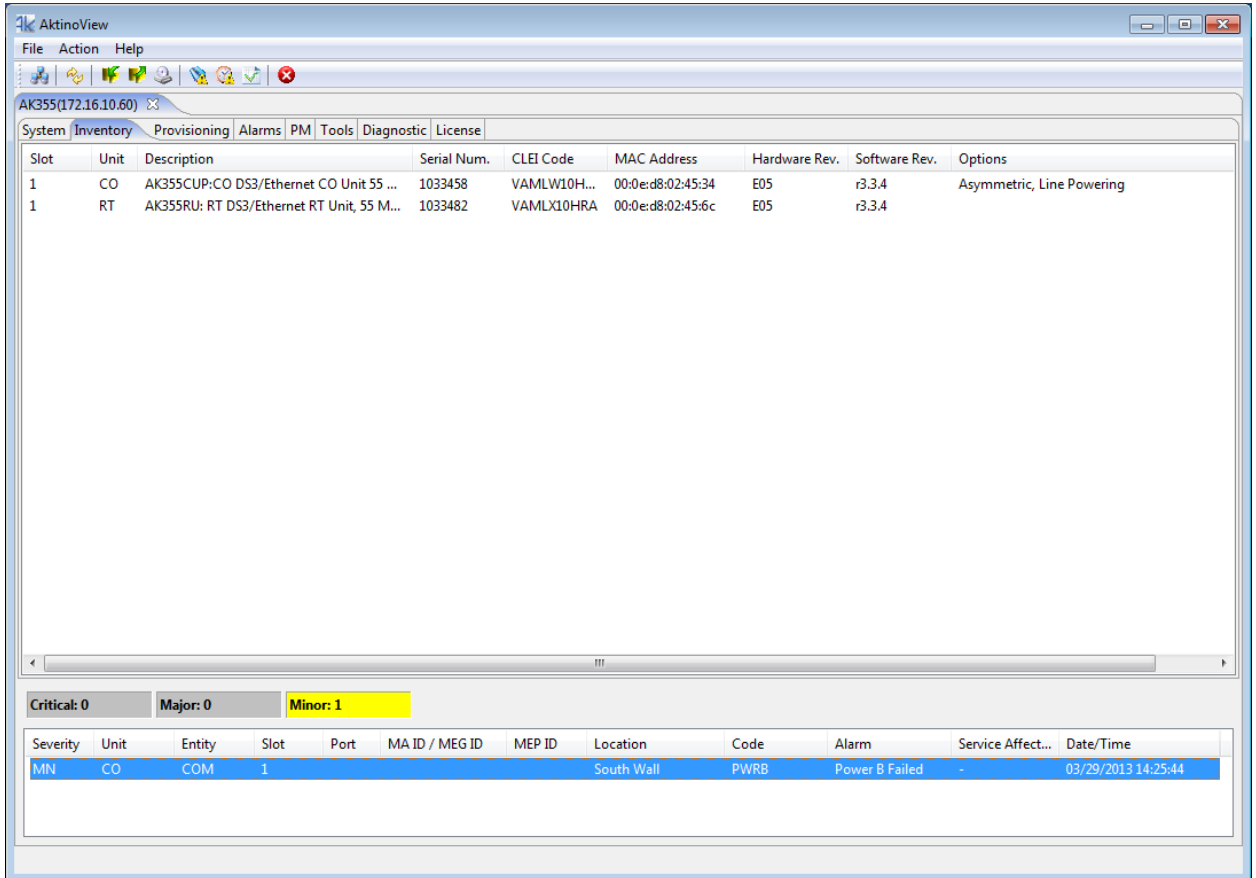
2.3.4 System

The System tab provides a front panel representation of the system.



2.3.5 Inventory

The Inventory tab provides details for the CO and RT Units comprising the system.



It displays a Description for each of the devices, as well as their Serial Number, CLEI Code, Hardware and Software Revision Levels. It also displays any applied feature options.

See the following table for Parameters and Values:

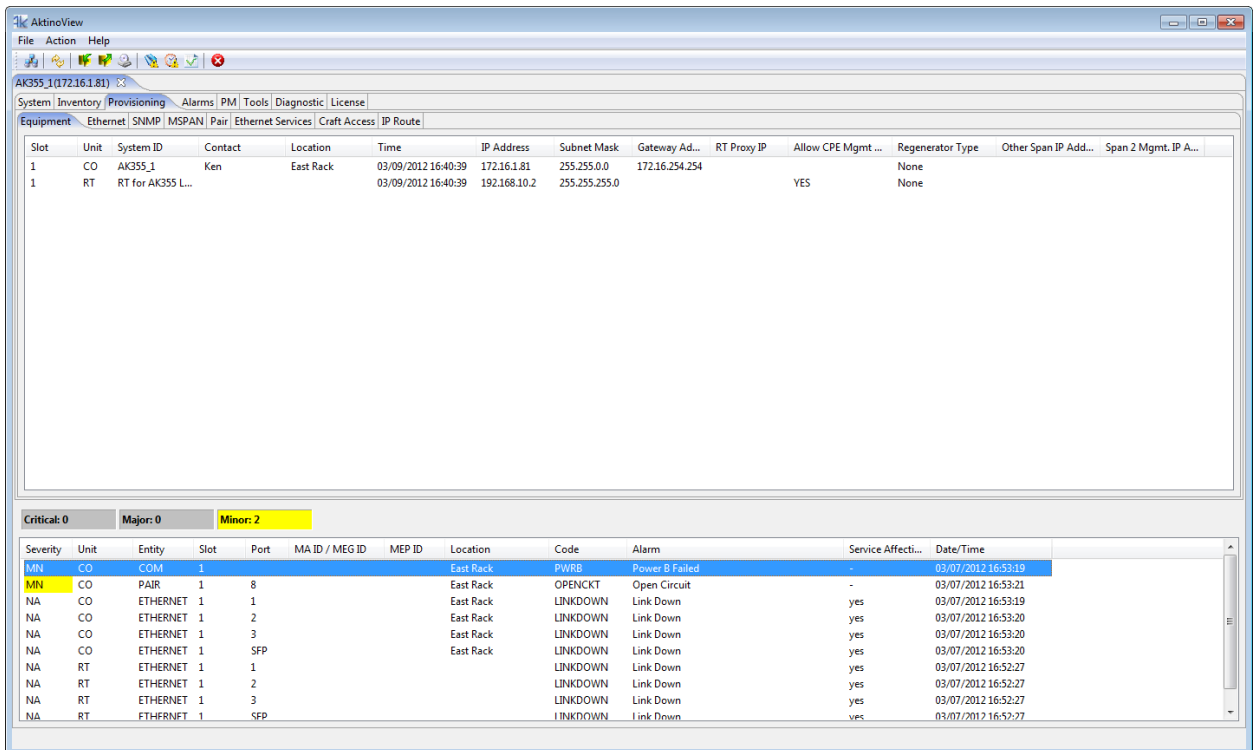
Parameter	Values
Slot	Slot number
Unit	Location
Description	Detailed description
Serial	Serial Number
CLEI Code	Telcordia assigned CLEI code
MAC Address	MAC Address for the device
Hardware Rev.	Hardware Revision Level
Software Rev.	Software Revision Level
Options	Asymmetric: Support for Asymmetric Mode
	2.2 Mhz: Support for 2.2 Mhz Mode
	Line Powering: Support for Line Powering Mode

2.3.6 Provisioning


Clicking the Provisioning tab displays all the provisioning sub-sections supported by the system.

2.3.6.1 Equipment

Selecting the Equipment tab under Provisioning allows equipment provisioning of the system.



Clicking on either a CO or RT unit brings up the Equipment dialog box for that specific unit.

Equipment 

Slot: 1

Unit: CO

System ID: AK355_1

Contact: Ken

Location: East Rack

IP Address: 172.16.1.81

Subnet Mask: 255.255.0.0

Gateway Address: 172.16.254.254

RT Proxy IP:

Allow CPE Mgmt Access:


Regenerator Type: None

Other Span IP Address:

Span 2 Mgmt. IP Address:

Time: 03/09/2012 16:51:31 PC Time

OK Apply Cancel

Equipment 

Slot: 1

Unit: RT

System ID: RT for AK355 Legacy

Contact:

Location:

IP Address: 192.168.10.2

Subnet Mask: 255.255.255.0

Gateway Address:

RT Proxy IP:

Allow CPE Mgmt Access: YES

Regenerator Type: None

Other Span IP Address:

Span 2 Mgmt. IP Address:

Time: 03/09/2012 : : : PC Time

OK Apply Cancel

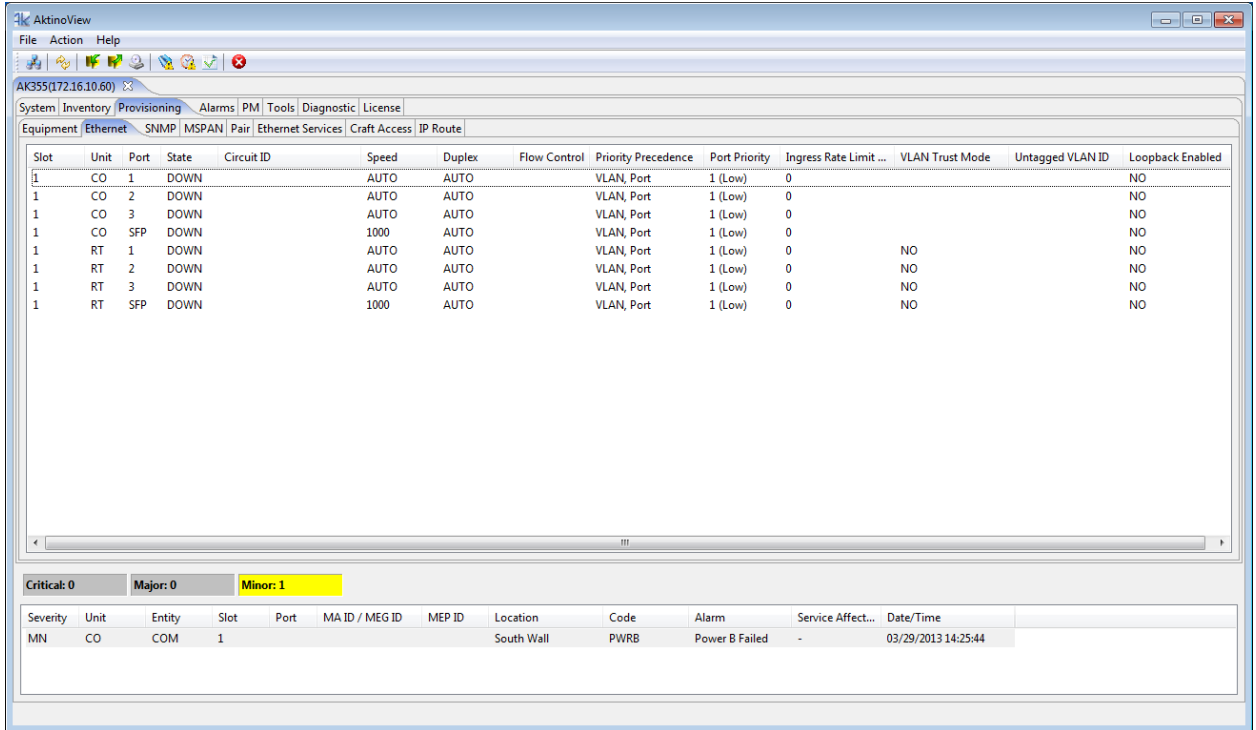
See the following tables for Parameters and Values:

AK355C Equipment Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
IP Address	IP Address of the unit
Subnet Mask	Subnet Mask of the unit
Gateway Address	Gateway Address of the unit
RT Proxy IP	Proxy IP address of the CRU, used to access the CRU through the MSPAN link
Allow CPE Management Access	Enable or Disable local management access for CRU
Regenerator Type	For Regenerator Applications
Other Span IP Address	For Regenerator Applications, indicate the Other Span IP Address (Do not use the same IP Address as the device's management port)
Span 2 Mgmt. IP Address	For Regenerator Applications, indicate the Span 2 management IP address (Do not use the same IP Address as the device's management port)

AK355R Equipment Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
IP Address	IP Address of the unit
Subnet Mask	Subnet Mask of the unit
Gateway Address	Gateway Address of the unit
Allow CPE Management Access	Enable or Disable local management access for CRU

2.3.6.2 Ethernet

Selecting the Ethernet tab under Provisioning allows Ethernet provisioning of the system.



Double-click on an Ethernet Port to bring up an Ethernet provisioning dialog box.

The screenshot shows the 'Ethernet' provisioning dialog box. The title bar includes the text 'Ethernet' and the Aktino logo. The dialog contains the following fields and controls:

- Slot: 1
- Unit: CO
- Port: 1
- Circuit ID: |
- Speed: AUTO
- Duplex: AUTO
- Flow Control: (empty)
- Priority Precedence: VLAN, Port
- Port Priority: 1 (Low)
- Ingress Rate Limit (Mbps): 0
- VLAN Trust Mode: (empty)
- Untagged VLAN ID: (empty)
- Loopback Enabled: (empty)
- State: UP

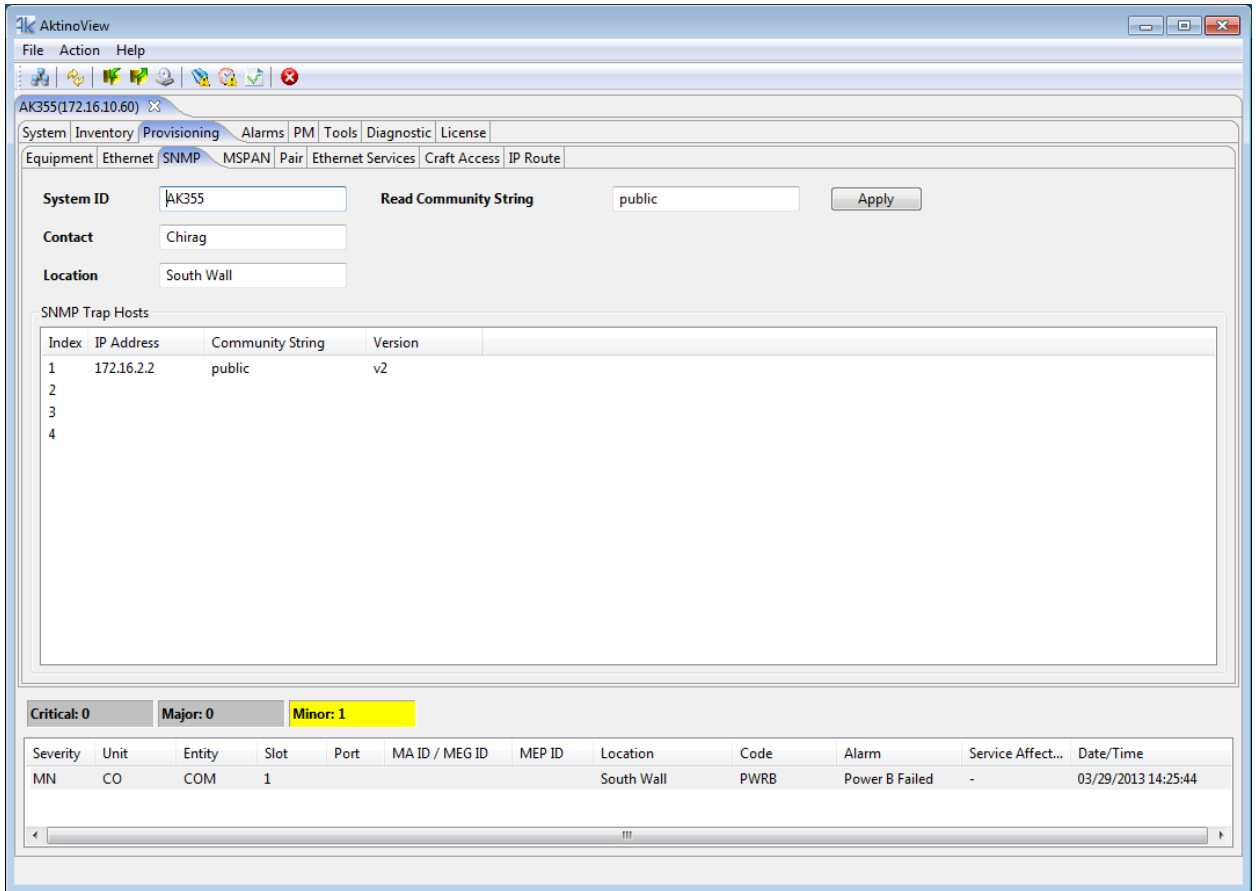
At the bottom of the dialog are three buttons: OK, Apply, and Cancel.

See the following table for the Parameters and Values:

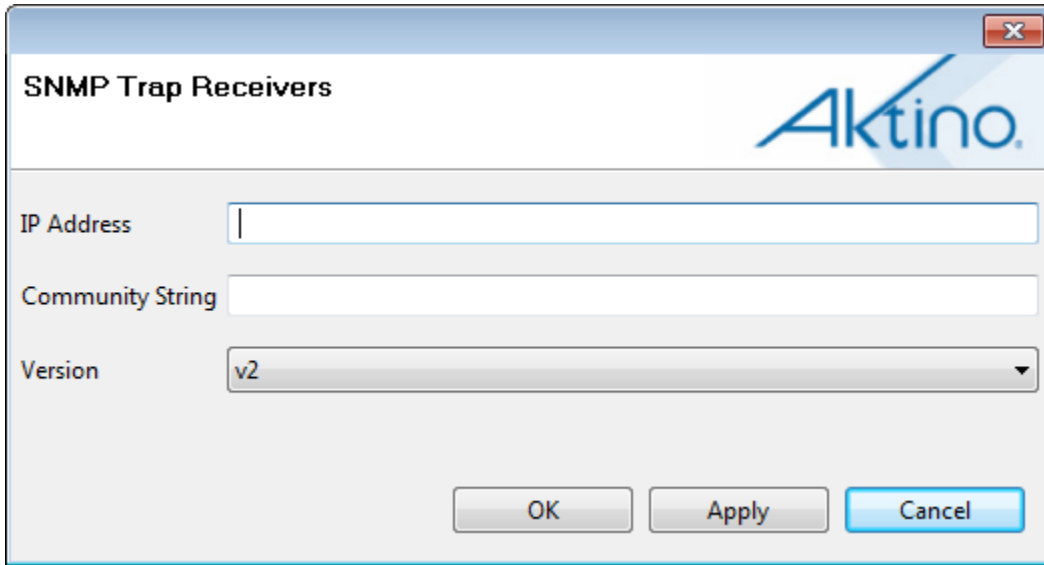
Ethernet Parameters	Values
Circuit ID	User configurable string of up to 48 characters
Speed	Sets the Ethernet Speed for the selected port
Duplex	Sets the Ethernet Duplex for the selected port
Priority Preference	Sets the Priority Ranking for ingress Ethernet data to: VLAN, DiffServ, Port VLAN, Port DiffServ, Port Port Only
Port Priority	Sets the Port's Priority Ranking for the ingress Ethernet data
Ingress Rate Limit (Mbps)	Sets an ingress Rate Limit for the Ethernet data, where "0" means no Ingress Rate Limit is set
VLAN Trust Mode	For CRUs in Tunneled VLAN mode only (see Ethernet Services Tab): YES - RT Ingress packets which have a VLAN ID matching a provisioned VLAN ID will be passed through transparently, otherwise the packet is dropped. RT Egress packets are passed through transparently. NO - RT Ingress packets have the VLAN ID assigned to the port added to the packet (the outer VLAN ID if a VLAN ID is already present). RT Egress packets have the outer VLAN ID stripped.
Untagged VLAN ID	For CRUs in Tunneled VLAN mode only: The VLAN ID entered will be added to RT Ingress untagged packets, then checked for VLAN membership.
Loopback Enabled	Yes - Ethernet Loopback enabled No - Ethernet Loopback disabled
State	Up - Ethernet Port is in service Down - Ethernet Port is out of service

2.3.6.3 SNMP

Selecting the SNMP tab allows setting SNMP receiver parameters.



Double-clicking on the Index brings up the SNMP Trap Receivers dialog box enabling SNMP provisioning.



See the following for the Parameters and Values for both of these screens:

SNMP Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
Read Community String	The SNMP Read Community String for the AK355 System

SNMP Trap Host Parameters	Values
IP Address	IP Address of the SNMP Trap Receiver
Community String	SNMP Community String of the Trap Receiver
Version	SNMP Trap Version Number (v1 or v2)

2.3.6.4 MSPAN

Selecting the MSPAN tab under Provisioning allows MSPAN provisioning of the system.

Note: Configuring Line Powering on an AK355RP is done by connecting to the AktinoView session to the AK355RP instead of connecting to the AK355CPS.

The screenshot displays the AktinoView software interface. The top menu bar includes File, Action, and Help. Below the menu is a toolbar with various icons. The main window title is 'AK355_1(172.16.1.81)'. The 'Provisioning' tab is selected, and the 'MSPAN' sub-tab is active. The interface is divided into several sections:

- General Parameters:** A table with columns: Slot, Unit, State, Circuit ID, Mode, Rate Upstream..., Rate Downstre..., Line Powering, SNR Margin..., Margin Threshold (d..., Reserve Pairs, PSD Mask, 2.2 Mhz. Row 1: Slot 1, Unit CO, State UP, Mode Symmetric, Rate Upstream 25000, Rate Downstre 25000, Line Powering -185V, SNR Margin 5, Margin Threshold 3, Reserve Pairs 0, PSD Mask AUTO Select.
- Advanced Parameters:** A table with columns: Slot, Unit, Reed-Solomon Up..., Reed-Solomon Do..., Latency Upstream, Latency Downstre..., Impulse Prot. Upst..., Impulse Prot. Dow..., Power Back-Off U..., Power Back-Off D..., Max SNR Margin (...), Rate Alarm Threshold Ups..., Rate Alan. Row 1: Slot 1, Unit CO, Reed-Solomon Up 5.30, Reed-Solomon Do 5.30, Latency Upstream 2, Latency Downstre 2, Impulse Prot. Upst 50, Impulse Prot. Dow 50, Power Back-Off U AUTO, Power Back-Off D AUTO, Max SNR Margin 50, Rate Alarm Threshold Ups 25000, Rate Alan 25000.
- Alarm Summary:** Critical: 0, Major: 0, Minor: 2.
- Alarm Log Table:**

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				East Rack	PWRB	Power B Failed	-	03/07/2012 16:53:19
MN	CO	PAIR	1	8			East Rack	OPENCKT	Open Circuit	-	03/07/2012 16:53:21
NA	CO	ETHERNET	1	1			East Rack	LINKDOWN	Link Down	yes	03/07/2012 16:53:19
NA	CO	ETHERNET	1	2			East Rack	LINKDOWN	Link Down	yes	03/07/2012 16:53:20
NA	CO	ETHERNET	1	3			East Rack	LINKDOWN	Link Down	yes	03/07/2012 16:53:20
NA	CO	ETHERNET	1	SFP			East Rack	LINKDOWN	Link Down	yes	03/07/2012 16:53:20
NA	RT	ETHERNET	1	1				LINKDOWN	Link Down	yes	03/07/2012 16:52:27
NA	RT	ETHERNET	1	2				LINKDOWN	Link Down	yes	03/07/2012 16:52:27
NA	RT	ETHERNET	1	3				LINKDOWN	Link Down	yes	03/07/2012 16:52:27
NA	RT	ETHERNET	1	SFP				LINKDOWN	Link Down	yes	03/07/2012 16:52:27

Double-clicking on the Slot number entry in either the General Parameters area or the Advanced Parameters area provides the MSPAN Parameters dialog box for both General and Advanced Parameters.

MSPAN

General Parameters

Slot: 1
Unit: CO
Circuit ID:
Mode: Symmetric
MSPAN Rate (kbps): 25000
Rate Upstream (kbps): 25000
Rate Downstream (kbps): 25000
Line Powering: -185V
SNR Margin (dB): 5
Margin Threshold (dB): 3
Reserve Pairs: 0
PSD Mask: AUTO Select
2.2 Mhz:
State: UP

Advanced Parameters

Reed-Solomon Upstream: 5.30
Reed-Solomon Downstream: 5.30
Latency Upstream: 2
Latency Downstream: 2
Impulse Prot. Upstream (μs): 50
Impulse Prot. Downstream (μs): 50
Power Back-Off Upstream (dB): AUTO
Power Back-Off Downstream (dB): AUTO
Max SNR Margin (dB): 50
Rate Alarm Threshold (kbps): 25000
Rate Alarm Threshold Upstream (kbps): 25000
Rate Alarm Threshold Downstream (kbps): 25000
 Configure Rate Alarm Threshold

OK Apply Cancel

See the following table for Parameters and Values:

MSPAN General Parameters	Values
State	Sets the MSPAN State: Up - MSPAN is in service Down - MSPAN is out of service
Circuit ID	User configurable string of up to 48 characters
Mode	Sets the MSPAN Mode: Symmetric Asymmetric
MSPAN Rate (kbps)	Sets the MSPAN Rate in Symmetric Mode
Rate Upstream	Sets the Upstream MSPAN Rate in Asymmetric Mode
Rate Downstream	Sets the Downstream MSPAN Rate in Asymmetric Mode
Line Powering	Sets Line Powering to: Off, -135v, or -185v
SNR Margin	Sets the SNR Margin: 0 to 18dB
Margin Threshold	Sets the SNR Margin Threshold. If the SNR Margin falls below this threshold, an Alarm will be generated
Reserve Pairs	Sets the number of Reserve Pairs
PSD Mask	Sets the PSD Mask: Auto - Selects the best PSD Mask automatically Select - M0, M1, M2, M3, M4 or M5
2.2 Mhz	If the 2.2 Mhz feature is enabled: Select - Auto, or No

Note: PSD Masks attempt to equalize the upstream and downstream MSPAN rates and are optimized for particular loop lengths.

PSD Mask	Best for Loop Lengths (26 AWG)
M1	0 to 6500 feet
M2	6500 to 9500 feet
M3	9500 to 11500 feet
M4	11500 to 13500 feet
M5	Greater than 13500 feet

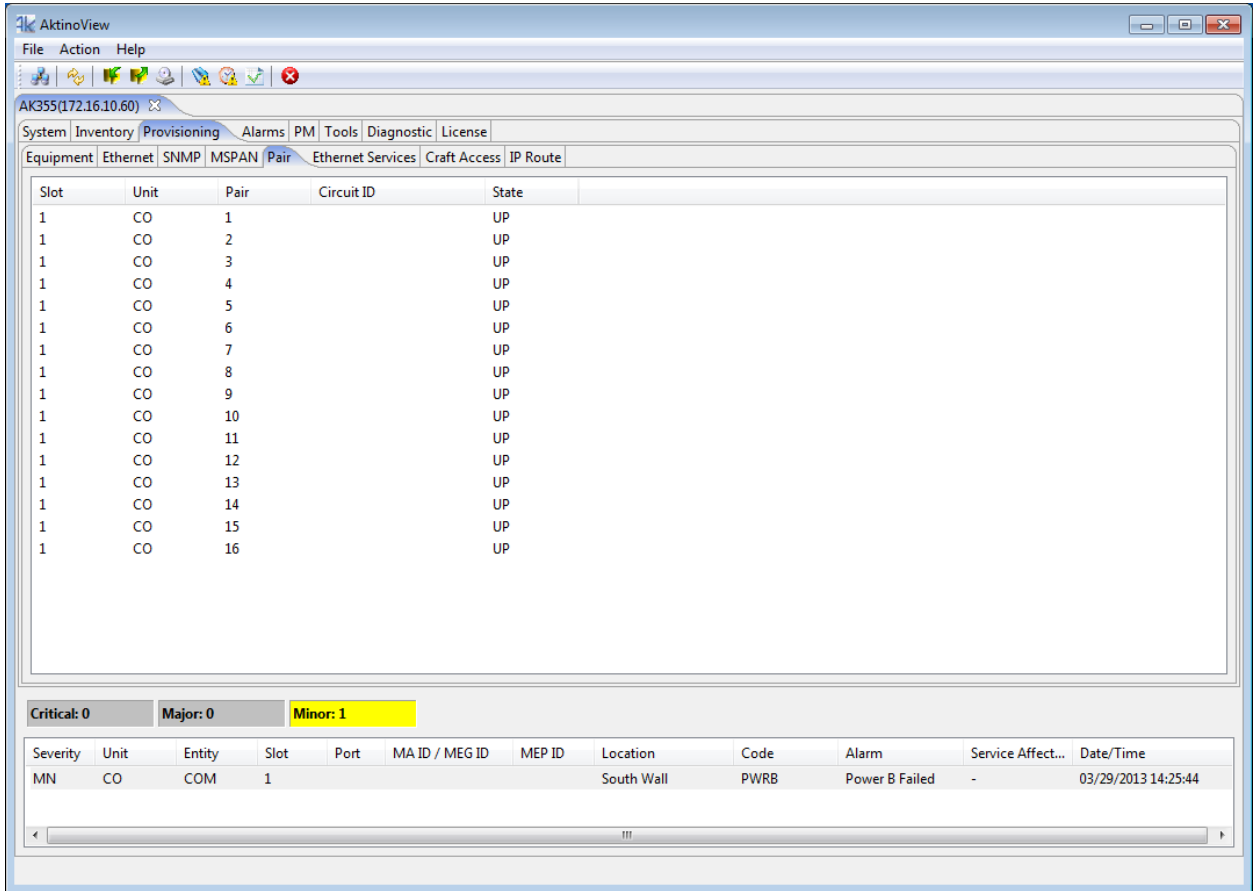
PSD Mask	Best for Loop Lengths (24 AWG)
M1	0 to 8667 feet
M2	8667 to 12667 feet
M3	12667 to 15333 feet
M4	15333 to 18000 feet
M5	Greater than 18000 feet

See the following table for Advanced Parameters and Values:

MSPAN Advanced Parameters	Values
Reed-Solomon Upstream	Calculated Reed-Solomon Overhead percentage Upstream: $RS\% = 2 * INP / Latency$
Reed-Solomon Downstream	Calculated Reed-Solomon Overhead percentage Downstream: $RS\% = 2 * INP / Latency$
Latency Upstream	Sets the Upstream Latency: 0, 1, 2, 4, 8, 12, 16, 20, 32msec
Latency Downstream	Sets the Downstream Latency: 0, 1, 2, 4, 8, 12, 16, 20, 32msec
Impulse Protection Upstream	Length of Upstream Impulse Noise Protection: 50, 125, 250, 500, 750, 1000, 2000, 4000 μ sec
Impulse Protection Downstream	Length of Downstream Impulse Noise Protection: 50, 125, 250, 500, 750, 1000, 2000, 4000 μ sec
Power Back-Off Upstream	Auto, -3 to 16dB
Power Back-Off Downstream	Auto, -3 to 16dB
Rate Alarm Threshold	MSPAN Rate Alarm Threshold for Symmetric Mode
Rate Alarm Threshold Upstream	MSPAN Upstream Rate Alarm Threshold for Asymmetric Mode
Rate Alarm Threshold Downstream	MSPAN Downstream Rate Alarm Threshold for Asymmetric Mode

2.3.6.5 Pair

Selecting the Pair tab under the Provisioning tab allows Pair provisioning of the system.



Double-clicking on the Pair brings up the following Pair provisioning dialog box:

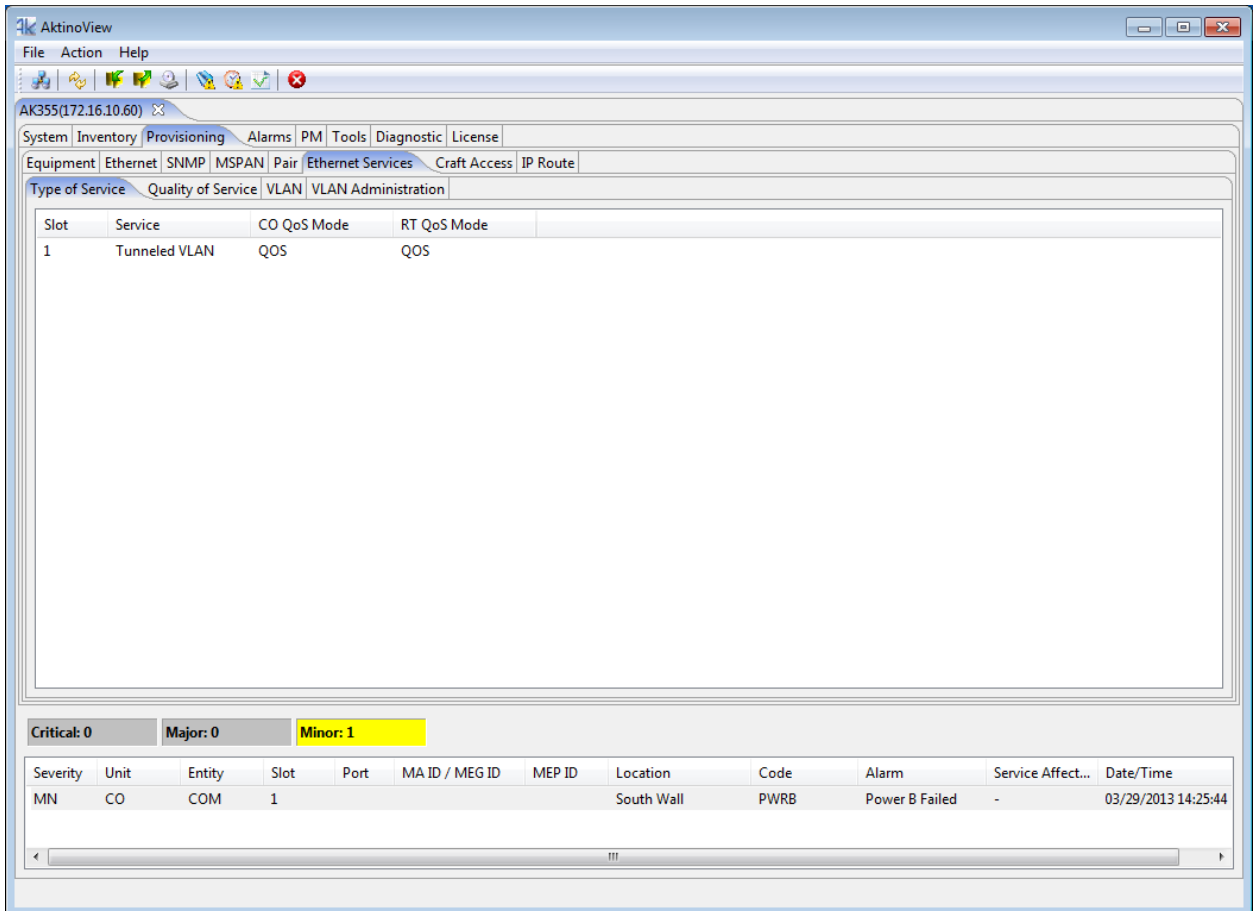
See the following table for Pair Provisioning Parameters and Values:

Pair Parameters	Values
Circuit ID	User configurable string of up to 48 characters
State	Sets the Pair State: Up - Pair is in service Down - Pair is out of service

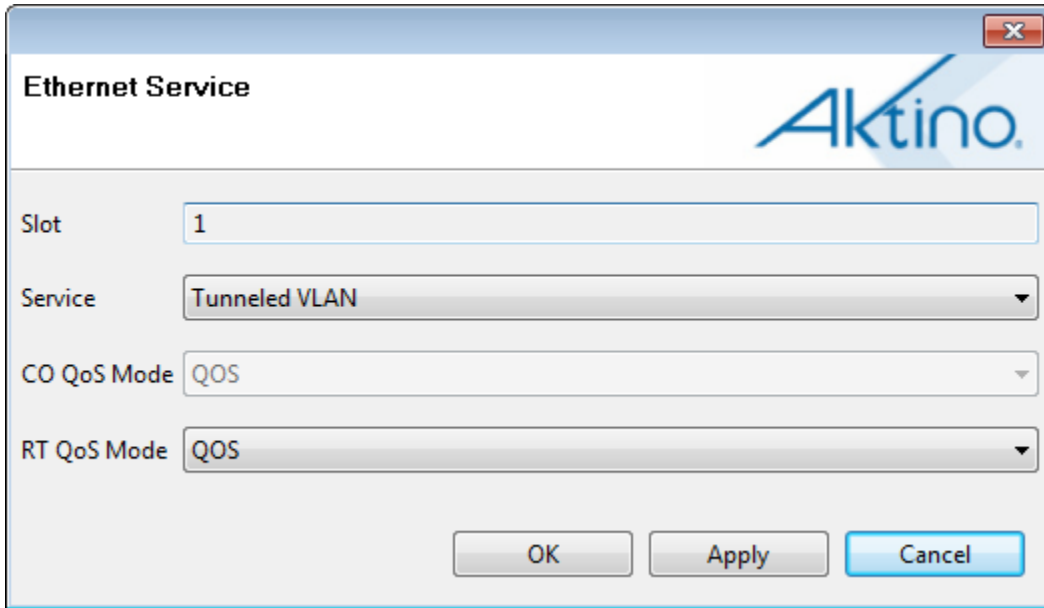
2.3.6.6 Ethernet Services

2.3.6.6.1 Type of Service

Selecting the Ethernet Type of Services tab allows type of service provisioning of the system.



Double-clicking on a slot brings up the following Ethernet Service provisioning dialog box:



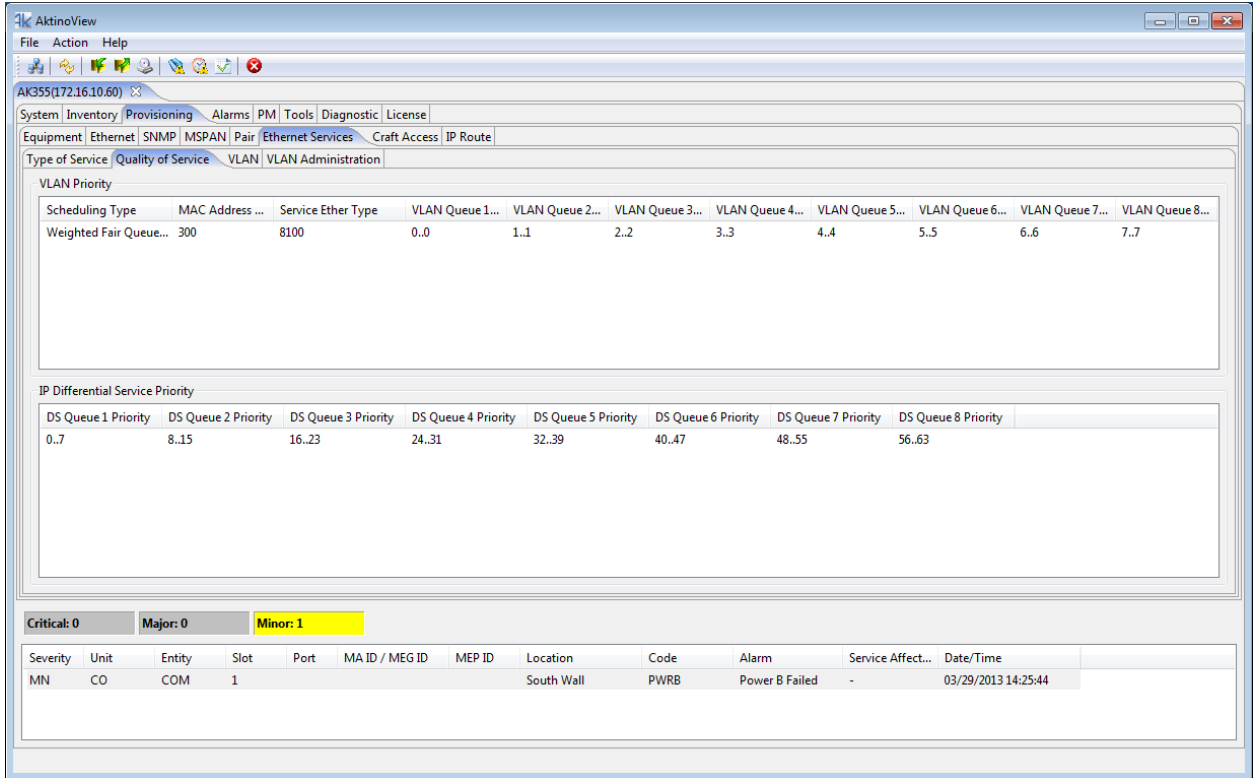
The image shows a software dialog box titled "Ethernet Service" with the Aktino logo in the top right corner. The dialog contains four input fields: "Slot" with the value "1", "Service" with a dropdown menu showing "Tunneled VLAN", "CO QoS Mode" with a dropdown menu showing "QoS", and "RT QoS Mode" with a dropdown menu showing "QoS". At the bottom, there are three buttons: "OK", "Apply", and "Cancel".

See the following table for Ethernet Type of Service Parameters and Values:

Type of Service Parameters	Values
Service	<p>Transparent Switch - The CO and RT units behave as a 6-port switch (three ports on each end). Frames may go from any port to any other port. Frames are transported transparently.</p> <p>Transparent Port - CO/RT 1000BaseT Port-1 is connected to Port-1, Port-2 to Port-2, and Port-3 to Port-3 Data between each port is not mixed. SFP module cannot be used in this mode.</p> <p>Tunneled VLAN - VLAN IDs are assigned to each port. The VLAN IDs determine which packets go to which ports.</p>
Co QoS Mode	<p>QoS - Port, VLAN, and DiffServ priorities are used as the flow control mechanism. Pause frames are not sent for flow control</p> <p>Lossless - Pause frames are used as the flow control mechanism. The Port, VLAN, and DiffServ priorities are also active</p>
RT QoS Mode	<p>QoS - Port, VLAN, and DiffServ priorities are used as the flow control mechanism. Pause frames are not sent for flow control</p> <p>Lossless - Pause frames are used as the flow control mechanism. The Port, VLAN, and DiffServ priorities are also active</p>

2.3.6.6.2 Quality of Service

Selecting the Quality of Service tab unit allows Global Quality of Service provisioning of the system.



Double-clicking on any area in the VLAN Priority or IP Differential Service Priority brings up the following Ethernet Quality of Service provisioning dialog box:

Ethernet Quality of Service

Scheduling Type:

MAC Address Aging Timeout (sec):

Service Ether Type:

Queue	VLAN Priority	IP Differential Service Priority
Queue 1 (Lowest Priority)	0	7
Queue 2	1	15
Queue 3	2	23
Queue 4	3	31
Queue 5	4	39
Queue 6	5	47
Queue 7	6	55
Queue 8 (Highest Priority)	7	63

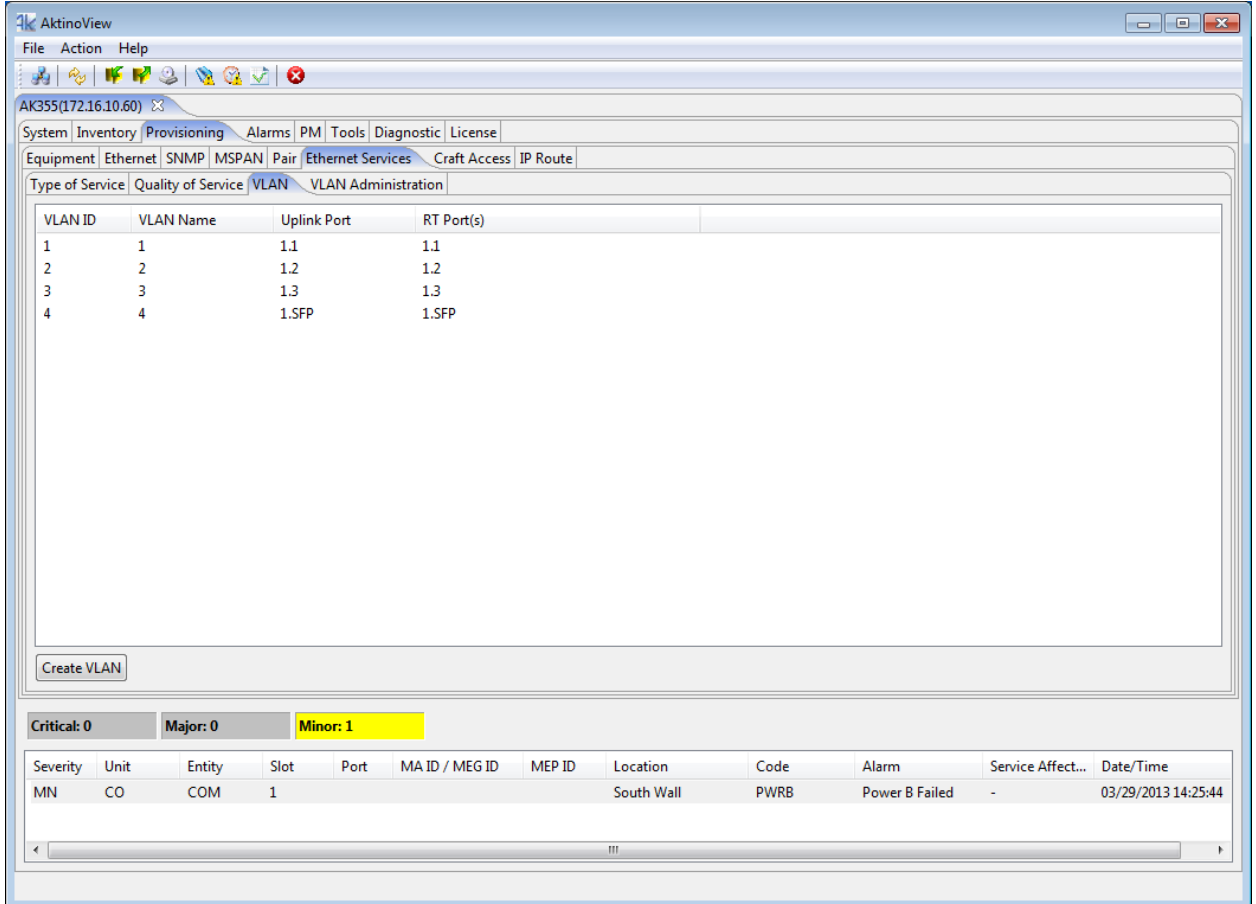
Buttons:

See the following table for Quality of Service Parameters and Values:

QoS Parameters	Values
Scheduling Type	Weighted Fair Queuing Strict Priority Strict Priority & Weighted Fair Queuing
MAC Address Aging Timeout	Time in seconds after which MAC Addresses are removed from the MAC Address table
Service Ether Type	Value for Ether Type Field that is used when adding a service VLAN tag
VLAN Priority	Allows for the mapping of priority levels for each of the AK355 System's eight priority queues
IP Differential Service Priority	Allows for the mapping of IP DiffServ ranges for each of the AK355 System's eight system priority queues

2.3.6.6.3 VLAN

Selecting the VLAN tab allows the VLAN provisioning of the system. Note that this menu is available when the System is provisioned for Tunneled VLAN service.



Right-clicking on the **Create VLAN** button brings up the Create VLAN dialog box.

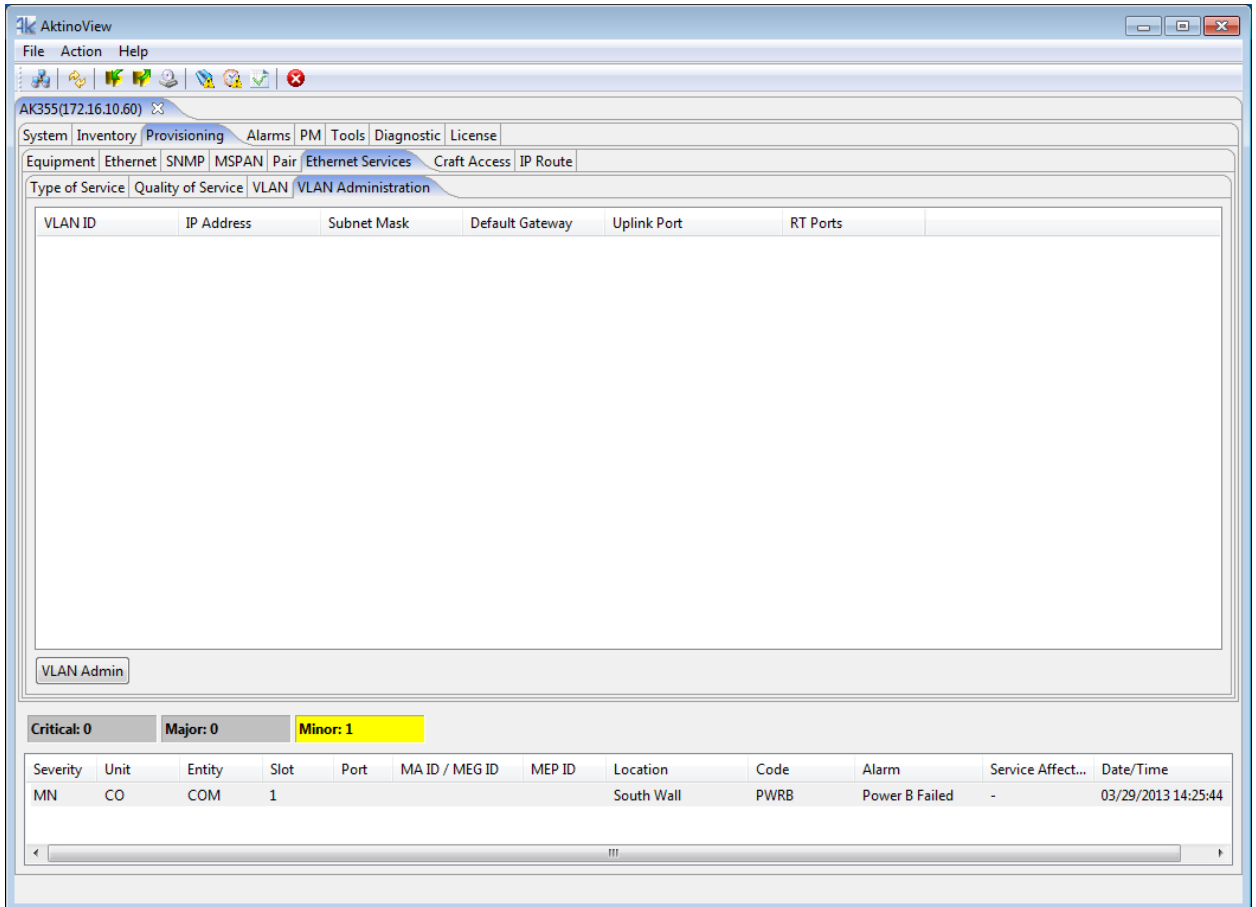


See the following table for the VLAN Parameters and Values:

VLAN Parameters	Values
VLAN ID	Enter a VLAN ID from 1 to 4092.
VLAN Name	User configurable string of up to 31 characters.
Uplink Port	Specify the Uplink Port on the on AK355C Unit this VLAN ID is assigned to.
RT Port(s)	Specify the AK355R Port(s) this VLAN ID is assigned to.

2.3.6.6.4 VLAN Administration

Selecting the VLAN Administration tab allows you to provision a management VLAN. The VLAN can be transparently passed through to RT ports to allow other equipment to use the same management VLAN.



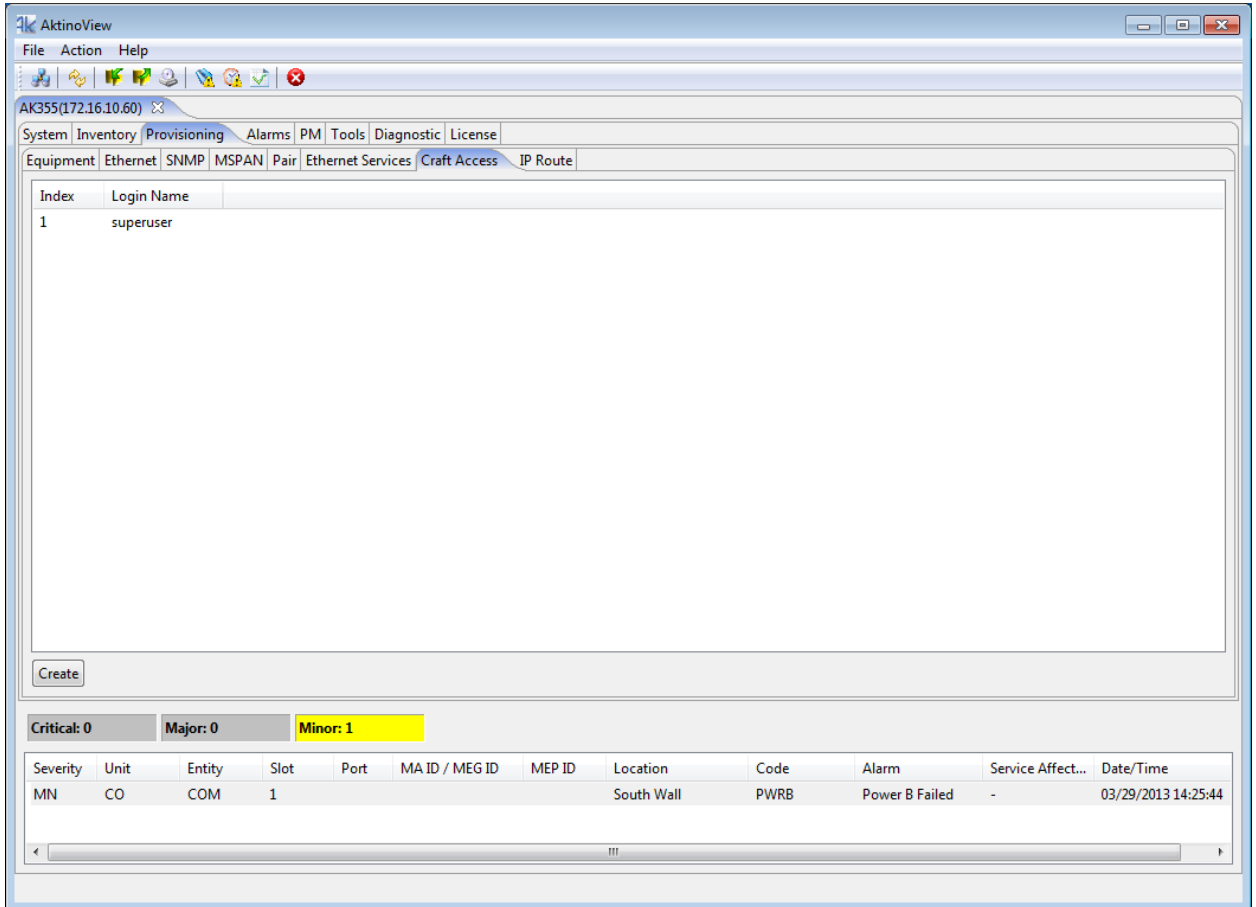
Click VLAN Admin to bring up the following dialog box:

See the following table for the VLAN Administration Parameters and Values:

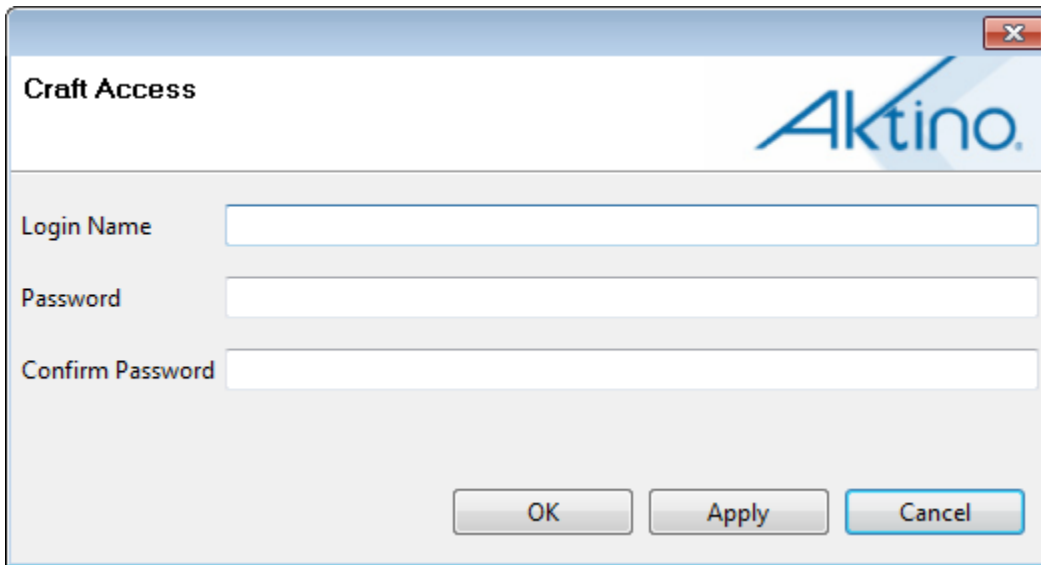
VLAN Administration Parameters	Values
VLAN ID	Enter a VLAN ID from 1 to 4092, a value of 0 disables the Management VLAN
IP Address	The IP Address for the Management VLAN
Subnet Mask	The Subnet Mask for the Management VLAN
Default Gateway	The Default Gateway for the Management VLAN
Uplink Port	Specify the Uplink Port on the AK355C Unit this VLAN ID is assigned to

2.3.6.7 Craft Access

Selecting the Craft Access tab under Provisioning allows management administration.



Click on **Create** to display the following Craft Access dialog box:

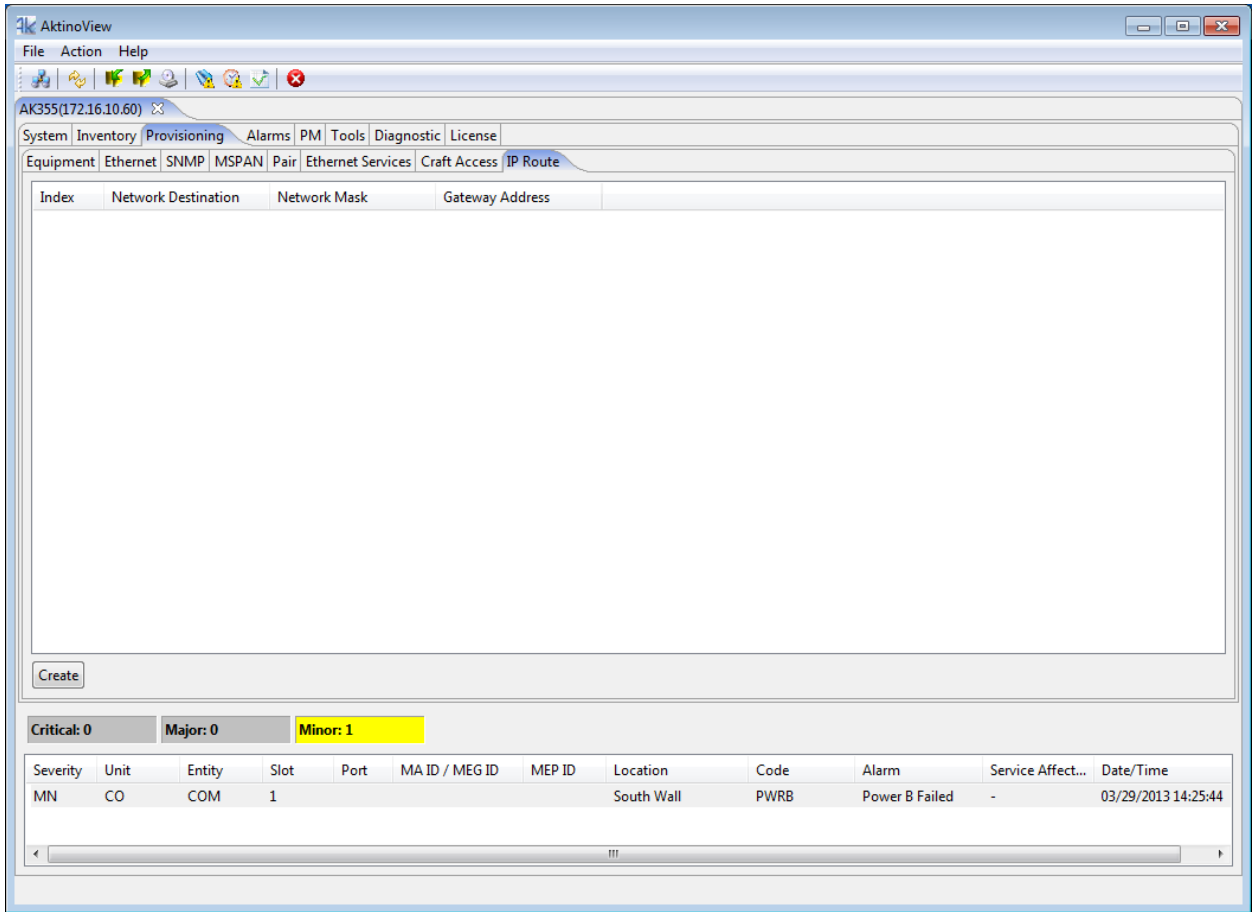


The image shows a software dialog box titled "Craft Access" with the Aktino logo in the top right corner. The dialog box contains three text input fields labeled "Login Name", "Password", and "Confirm Password". At the bottom of the dialog box, there are three buttons: "OK", "Apply", and "Cancel".

The Craft Access dialog box provides fields where the Login Name and Password is created for the new Craft Access user.

2.3.6.8 IP Route

The IP Route tab allows you to provision static routes for the CO unit.



Click the **Create** button to display the following dialog:

The screenshot shows a standard Windows-style dialog box titled "IP Route" with the Aktino logo in the top right corner. The dialog contains three text input fields stacked vertically, labeled "Network Destination", "Network Mask", and "Gateway Address". At the bottom of the dialog, there are three buttons: "OK", "Apply", and "Cancel".

IP Route Parameters	Values
Network Destination	Destination Network Address
Network Mask	Network Mask
Gateway Address	Default Gateway Address

2.3.7 Alarms

2.3.7.1 CO > Alarm Log

The CO Alarm Log tab displays a list of all the alarms observed on the AK355C including time-stamp information as to when the alarm was triggered or cleared.

Note: See Appendix B for more Alarm details.

The screenshot shows the AktivoView application window for device AK355(172.16.10.60). The 'Alarms' tab is active, displaying a table of alarm events. The table has columns for Severity, Unit, Entity, Slot, Port, MA ID / MEG ID, MEP ID, Location, Code, Alarm, Service Affecti..., Active, and Date/Time. Below the table is a 'Refresh' button and a summary bar showing 'Critical: 0', 'Major: 0', and 'Minor: 1'. A detailed view of the selected minor alarm is shown at the bottom.

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Active	Date/Time
MN	CO	PAIR	1	13			South Wall	LOS	Loss of Signal	-	-	03/29/2013 14:27:18
MN	CO	PAIR	1	13			South Wall	LOS	Loss of Signal	-	yes	03/29/2013 14:27:02
CR	CO	MSPAN	1				South Wall	LOF	Loss of Frame	yes	-	03/29/2013 14:27:02
CR	CO	MSPAN	1				South Wall	LOF	Loss of Frame	yes	yes	03/29/2013 14:25:50
NA	CO	COM	1				South Wall	SYSTEM_REB...	System Reboot	yes	yes	03/29/2013 14:25:44
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	yes	03/29/2013 14:25:44

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.7.2 CO > Alarm History

The CO Alarm History tab displays the alarms that have been observed by the CO unit and how many times each of the alarms has been observed, as well as the first and last times the alarm has been observed.

Note: See Appendix B for more Alarm details.

AK355(172.16.10.60)

System | Inventory | Provisioning | Alarms | PM | Tools | Diagnostic | License

CO RT

Alarm Log | Alarm History

Last retrieved time: 04/02/2013 11:23:13

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	First Time	Last Time	Occ
MN	CO	PAIR	1	13				LOS	Loss of Signal	-	03/29/2013 14:27:02	03/29/2013 14:27:02	1
CR	CO	MSPAN	1					LOF	Loss of Frame	yes	03/29/2013 14:25:50	03/29/2013 14:25:50	1
NA	CO	COM	1					SYSTEM_REB...	System Reboot	yes	03/29/2013 14:25:44	03/29/2013 14:25:44	1
MN	CO	COM	1					PWRB	Power B Failed	-	03/29/2013 14:25:44	03/29/2013 14:25:44	1

Refresh

Critical: 0 Major: 0 Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.7.3 RT > Alarm Log

The RT Alarm Log tab displays a list of all the alarms observed on the RT unit including time-stamp information as to when the alarm was triggered or cleared.

Note: See Appendix B for more Alarm details.

The screenshot shows the AktivoView application window. The main content area displays the 'Alarm Log' for the 'RT' unit. The table below represents the data shown in the interface:

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Active	Date/Time
MN	RT	COM	1				South Wall	PWRB	Power B Failed	-	-	03/29/2013 14:27:43
MN	RT	COM	1				South Wall	PWRB	Power B Failed	-	yes	03/29/2013 14:25:17

Below the main table, there is a summary bar with the following counts:

- Critical: 0
- Major: 0
- Minor: 1

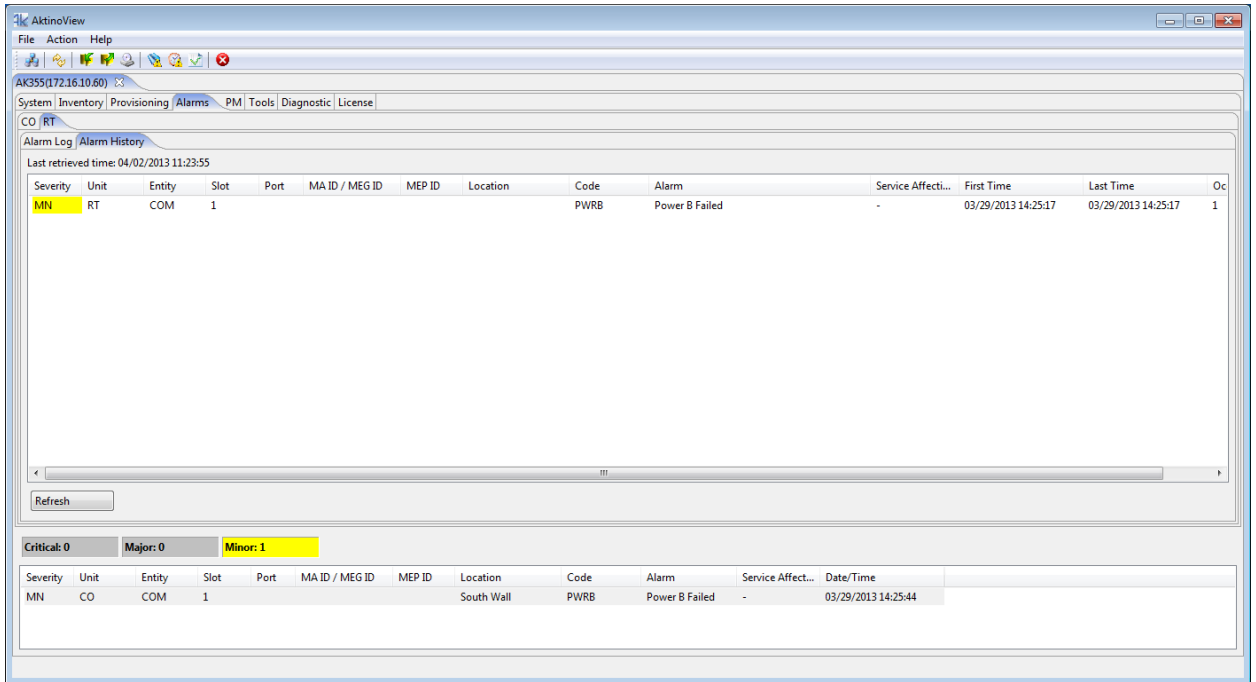
A secondary table at the bottom of the window shows a summary row:

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.7.4 RT > Alarm History

The RT Alarm History tab displays the alarms that have been observed by the RT unit and how many times each of the alarms has been observed, as well as the first and last times the alarm has been observed.

Note: See Appendix B for more Alarm details.



2.3.8 Performance Monitoring (PM)

The PM tab allows you to display detailed Performance related information for the system's Ethernet Ports, MSPAN interfaces, and individual MSPAN Pairs. This PM data is provided for both the CO and RT sides of the system.

Note: See Appendix C for more details.

2.3.8.1 CO > Ethernet > Summary

The Summary tab displays Ethernet Link information and counters for the Ethernet Ports. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView application window. The main content area is divided into two sections. The top section displays a table of Ethernet link information:

Time	Slot	Unit	Port	State	Resolved	Speed	Duplex	In Frames	Out Frames	In Errors	Discarded Pkts
04/11/2013 16:45:41	1	CO	1	UP	YES	100	FULL	309976231	39735886	1088	0
04/11/2013 16:45:41	1	CO	2	UP	YES	100	FULL	106162	211	0	0
04/11/2013 16:45:42	1	CO	3	DOWN	NO	10	HALF	0	0	0	0
04/11/2013 16:45:42	1	CO	SFP	DOWN	NO	1000	FULL	0	0	0	0

The bottom section displays a table of error counters:

Time	Slot	Unit	Port	In Octets	Bad Octets	Undersize	Oversize	Fragments	Align Errors	Jabber	Collision
04/11/2013 16:45:41	1	CO	1	1266350160	195589	0	0	4627	0	0	0
04/11/2013 16:45:41	1	CO	2	8045615	0	0	0	0	0	0	0
04/11/2013 16:45:42	1	CO	3	0	0	0	0	0	0	0	0
04/11/2013 16:45:42	1	CO	SFP	0	0	0	0	0	0	0	0

Below the tables, there is a 'Refresh' button, a dropdown menu set to 'now', and a 'Slot' dropdown menu set to '1'. At the bottom of the window, a status bar shows 'Critical: 0', 'Major: 0', and 'Minor: 1'. Below the status bar is an alarm table:

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1				West Wall	PWRB	Power B Failed	-	04/04/2013 10:59:32

2.3.8.2 CO > Ethernet > Detail

The Detail tab displays detailed Ethernet counters for the Ethernet Ports. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot displays the AktinoView interface for a CO unit. The main window shows the 'Ethernet' section with the 'Detail' tab selected. Below the navigation pane, there are two data tables: 'In Parameters' and 'Out Parameters'. Each table lists statistics for four different time slots (04/11/2013 16:47:25 to 04/11/2013 16:47:27) across three ports (1, 2, 3) and an SFP port. The 'In Parameters' table shows significant traffic on port 2, while the 'Out Parameters' table shows traffic on port 1. Below the tables, there is a 'Refresh' button and a dropdown menu for 'Slot' set to '1'. At the bottom, an alarm summary shows 'Critical: 0', 'Major: 0', and 'Minor: 1'. A table below this summary lists the alarm details: Severity: MN, Unit: CO, Entity: COM, Slot: 1, Port: (blank), MA ID / MEG ID: (blank), MEP ID: (blank), Location: West Wall, Code: PWRB, Alarm: Power B Failed, Service Affecti...: -, Date/Time: 04/04/2013 10:59:32.

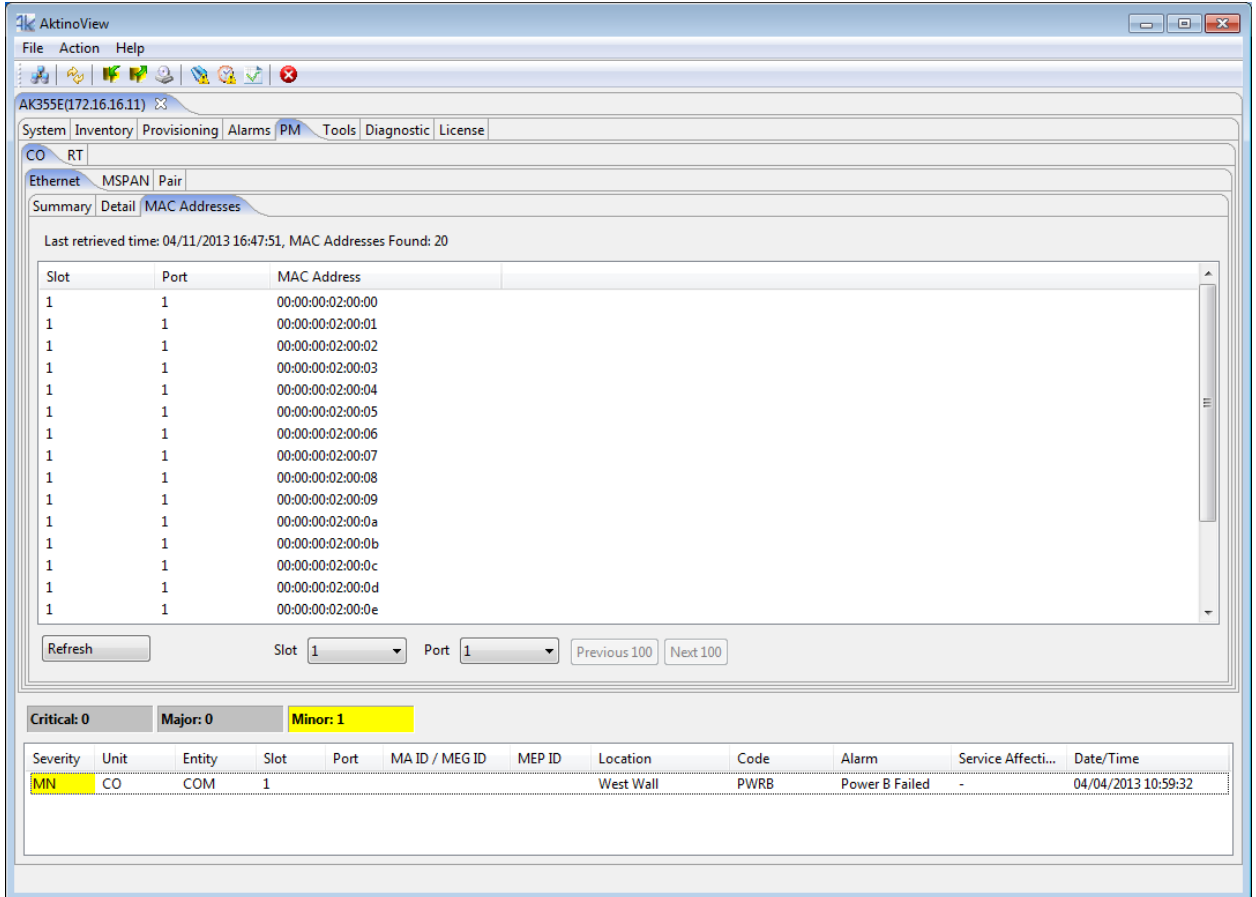
Time	Slot	Unit	Port	Unicast Pkts	Broadcasts	Multicasts	Pause	Octets	64 Octets	127 Octets	255 Octets	511 Octets
04/11/2013 16:47:25	1	CO	1	310024454	0	0	0	1340513904	0	0	1088	263072802
04/11/2013 16:47:26	1	CO	2	17917	34167	54261	0	8059455	51041	52030	2160	1106
04/11/2013 16:47:26	1	CO	3	0	0	0	0	0	0	0	0	0
04/11/2013 16:47:27	1	CO	SFP	0	0	0	0	0	0	0	0	0

Time	Slot	Unit	Port	Unicast Pkts	Broadcasts	Multicasts	Pause	Octets	64 Octets	127 Octets	255 Octets	511 Octets
04/11/2013 16:47:25	1	CO	1	39777597	0	0	0	3027009756	0	0	0	0
04/11/2013 16:47:26	1	CO	2	211	0	0	0	17140	0	0	0	0
04/11/2013 16:47:26	1	CO	3	0	0	0	0	0	0	0	0	0
04/11/2013 16:47:27	1	CO	SFP	0	0	0	0	0	0	0	0	0

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1				West Wall	PWRB	Power B Failed	-	04/04/2013 10:59:32

2.3.8.3 CO > Ethernet > MAC Addresses

The MAC Addresses tab displays the Ethernet MAC Addresses learned by the selected port.



The page can be provisioned to refresh automatically, and scroll between the discovered MAC Addresses.



2.3.8.4 CO > MSPAN

The MSPAN tab displays the upstream PM information for the MSPAN. This PM data is separated into three sections:

- 1 The heading section provides summary information for the MSPAN including upstream MSPAN Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries. For more information see Appendix C.

The screenshot shows the AktinoView interface for device AK355E(172.16.16.11). The 'PM' tab is active, displaying the following summary information:

Capacity (Kbps):	53484	Rate (Kbps):	50048	Margin (dB):	5.31	State:	DATA
PSD Mask:	M2	TX Utilization (%):	11.49	RX Utilization (%):	1.64	2.2 MHz:	NO

Below the summary are two data tables:

15 Minutes

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EPS (%)
04/17/2013 06:44	1	1	0	0	53432	53528	25024	50048	5.28	22.53	22.50	3.21	99.89
04/17/2013 06:30	0	0	0	0	53436	53528	25024	25024	22.45	22.53	22.95	3.28	100.00
04/17/2013 06:15	0	0	0	0	53420	53520	25024	25024	22.45	22.53	22.95	3.28	100.00
04/17/2013 06:00	0	0	0	0	53428	53516	25024	25024	22.45	22.52	22.95	3.28	100.00
04/17/2013 05:45	0	0	0	0	53420	53520	25024	25024	22.45	22.52	22.95	3.28	100.00
04/17/2013 05:30	0	0	0	0	53420	53512	25024	25024	22.44	22.52	22.95	3.28	100.00

24 Hours

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EPS (%)
04/17/2013	1	1	0	0	53324	53528	25024	50048	5.28	22.53	22.94	3.28	100.00
04/16/2013	0	0	0	0	53288	53548	25024	25024	22.36	22.55	22.95	3.28	100.00
04/15/2013	0	0	0	0	53112	53624	25024	25024	22.27	22.58	22.95	3.28	100.00
04/14/2013	12	5	0	1126	0	98668	0	25024	0.00	31.30	22.66	5.47	98.69
04/13/2013	0	0	0	0	98452	98660	25024	25024	31.30	31.30	22.95	6.56	100.00
04/12/2013	0	0	0	0	98456	98680	25024	25024	31.30	31.30	22.95	6.56	100.00

At the bottom, there is a 'Refresh' button, a dropdown menu set to 'now', and a 'Slot' dropdown set to '1'. Below these are summary counts: Critical: 0, Major: 0, and Minor: 1. A log table shows the following entries:

Severity	Unit	Entity	Slot	Port	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1		West Wall	PWRB	Power B Failed	-	04/04/2013 10:59:32
NA	RT	ETHERNET	1	2	West Wall	LINKDOWN	Link Down	yes	04/14/2013 16:35:21

2.3.8.5 CO > Pair > Summary

The Summary tab displays the upstream Pair Summary information for all the Pairs supported by the MSPAN. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView interface for the AK355(172.16.10.60) device. The navigation path is CO > RT > Ethernet > MSPAN > Pair > Summary. The main data table is as follows:

Time Period	Slot	Unit	Pair	Remote Pair	Capacity (kb...)	Rate (kb...)	Margin (...)	Voltage (v)	Line Current (mA)	Ground Current (...)
04/02/2013 11:26:02	1	CO	1	1	6108	1656	31.30	51.80	3.20	0.00
04/02/2013 11:26:03	1	CO	2	2	6172	1696	31.25	51.80	3.20	0.00
04/02/2013 11:26:03	1	CO	3	3	6100	1608	31.30	51.80	3.20	0.00
04/02/2013 11:26:04	1	CO	4	4	6076	1608	31.22	51.80	3.20	0.00
04/02/2013 11:26:04	1	CO	5	5	6160	1700	31.25	51.80	3.20	0.00
04/02/2013 11:26:05	1	CO	6	6	6096	1612	31.25	51.80	3.20	0.00
04/02/2013 11:26:05	1	CO	7	7	6172	1716	31.22	51.80	3.40	0.00
04/02/2013 11:26:06	1	CO	8	8	6152	1672	31.25	51.80	3.20	0.00
04/02/2013 11:26:06	1	CO	9	9	6140	1672	31.25	51.80	3.40	0.00
04/02/2013 11:26:07	1	CO	10	10	6136	1664	31.25	51.80	3.20	0.00
04/02/2013 11:26:07	1	CO	11	11	6184	1724	31.22	51.80	3.00	0.00
04/02/2013 11:26:08	1	CO	12	12	6124	1636	31.25	51.80	3.20	0.00
04/02/2013 11:26:08	1	CO	13	13	5984	1532	31.22	51.80	3.20	0.00
04/02/2013 11:26:09	1	CO	14	14	6180	1716	31.22	51.80	3.20	0.00
04/02/2013 11:26:09	1	CO	15	15	6080	1608	31.22	51.80	3.20	0.00
04/02/2013 11:26:10	1	CO	16	16	6188	1708	31.25	51.80	3.20	0.00

Below the table, there is a 'Refresh' button, a dropdown menu set to 'now', and a 'Slot' dropdown menu set to '1'. At the bottom of the window, there is an alarm summary section:

Critical: 0 Major: 0 **Minor: 1**

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.8.6 CO > Pair > Current 15 Minutes

The 15 Minutes tab displays the upstream Pair PM information for all the Pairs supported by the MSPAN for the last 15-minute interval. The page can be provisioned to refresh automatically, and time-stamp is displayed for each of the entries. For more information see Appendix C.

The screenshot shows the AktinoView interface with the following data:

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013 11:26:23	1	CO	1	0	0	0	0	6100	6120	1656	1656	31.30	31.30	100.00
04/02/2013 11:26:23	1	CO	2	0	0	0	0	6156	6176	1696	1696	31.25	31.25	100.00
04/02/2013 11:26:24	1	CO	3	0	0	0	0	6084	6112	1604	1608	31.30	31.30	100.00
04/02/2013 11:26:24	1	CO	4	0	0	0	0	6064	6092	1608	1608	31.22	31.22	100.00
04/02/2013 11:26:25	1	CO	5	0	0	0	0	6152	6172	1700	1700	31.25	31.25	100.00
04/02/2013 11:26:25	1	CO	6	0	0	0	0	6080	6104	1612	1612	31.25	31.25	100.00
04/02/2013 11:26:26	1	CO	7	0	0	0	0	6172	6192	1716	1716	31.22	31.22	100.00
04/02/2013 11:26:26	1	CO	8	0	0	0	0	6140	6164	1668	1672	31.25	31.25	100.00
04/02/2013 11:26:27	1	CO	9	0	0	0	0	6128	6152	1672	1672	31.25	31.25	100.00
04/02/2013 11:26:27	1	CO	10	0	0	0	0	6124	6144	1664	1664	31.25	31.25	100.00
04/02/2013 11:26:28	1	CO	11	0	0	0	0	6172	6200	1724	1728	31.22	31.22	100.00
04/02/2013 11:26:28	1	CO	12	0	0	0	0	6112	6136	1632	1636	31.25	31.25	100.00
04/02/2013 11:26:29	1	CO	13	0	0	0	0	5972	5996	1532	1536	31.22	31.22	100.00
04/02/2013 11:26:29	1	CO	14	0	0	0	0	6172	6192	1716	1716	31.22	31.22	100.00
04/02/2013 11:26:30	1	CO	15	0	0	0	0	6072	6096	1608	1608	31.22	31.22	100.00
04/02/2013 11:26:30	1	CO	16	0	0	0	0	6176	6196	1708	1712	31.25	31.25	100.00

Summary: Critical: 0, Major: 0, Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.8.7 CO > Pair > Current 24 Hours

The Current 24 Hours tab displays the upstream Pair PM information for all the Pairs supported by the MSPAN for the current day. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView application window. The main content area displays a table of performance metrics for various CO Pairs over a 24-hour period. The table has the following columns: Time Period, Slot, Unit, Pair, CS, ES, SES, UAS, Min Capacity (k...), Max Capacity (k...), Min Rate (kb...), Max Rate (kb...), Min Margin (...), Max Margin (...), and EFS (%). The data rows show a sequence of pairs from 13 to 12, with various capacity and rate values. Below the table, there are 'Refresh' and 'now' buttons, and a 'Slot' dropdown menu set to '1'. At the bottom of the window, there are status indicators: 'Critical: 0', 'Major: 0', and 'Minor: 1'. Below these indicators is a table with columns: Severity, Unit, Entity, Slot, Port, MA ID / MEG ID, MEP ID, Location, Code, Alarm, Service Affect..., and Date/Time. One alarm entry is visible: MN, CO, COM, 1, South Wall, PWRB, Power B Failed, -, 03/29/2013 14:25:44.

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013 11:26:29	1	CO	13	0	0	0	0	5972	6004	1516	1536	31.22	31.22	100.00
04/02/2013 11:26:29	1	CO	14	0	0	0	0	6172	6200	1708	1736	31.22	31.22	100.00
04/02/2013 11:26:30	1	CO	15	0	0	0	0	4928	6108	1444	1616	28.83	31.22	100.00
04/02/2013 11:26:30	1	CO	16	0	0	0	0	6172	6204	1704	1720	31.25	31.25	100.00
04/02/2013 11:26:44	1	CO	1	0	0	0	0	6096	6128	1652	1668	31.30	31.30	100.00
04/02/2013 11:26:45	1	CO	2	0	0	0	0	6152	6184	1688	1712	31.25	31.25	100.00
04/02/2013 11:26:45	1	CO	3	0	0	0	0	6084	6120	1604	1644	31.30	31.30	100.00
04/02/2013 11:26:46	1	CO	4	0	0	0	0	6060	6100	1600	1628	31.22	31.22	100.00
04/02/2013 11:26:46	1	CO	5	0	0	0	0	6152	6180	1696	1716	31.25	31.25	100.00
04/02/2013 11:26:47	1	CO	6	0	0	0	0	6076	6112	1596	1628	31.25	31.25	100.00
04/02/2013 11:26:47	1	CO	7	0	0	0	0	6168	6200	1708	1732	31.22	31.22	100.00
04/02/2013 11:26:48	1	CO	8	0	0	0	0	6136	6168	1660	1688	31.25	31.25	100.00
04/02/2013 11:26:48	1	CO	9	0	0	0	0	6124	6156	1660	1684	31.25	31.25	100.00
04/02/2013 11:26:49	1	CO	10	0	0	0	0	6116	6148	1656	1676	31.25	31.25	100.00
04/02/2013 11:26:49	1	CO	11	0	0	0	0	6172	6204	1716	1740	31.22	31.22	100.00
04/02/2013 11:26:50	1	CO	12	0	0	0	0	6108	6152	1628	1656	31.25	31.25	100.00

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.8.8 CO > Pair > History

The History tab displays the upstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

- 1 The heading section provides summary information for the MSPAN including upstream Pair Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView application window. The main content area is titled 'AK355(172.16.10.60)' and has tabs for 'System', 'Inventory', 'Provisioning', 'Alarms', 'PM', 'Tools', 'Diagnostic', and 'License'. The 'PM' tab is active, showing a 'CO' > 'RT' > 'Ethernet' > 'MSPAN' > 'Pair' hierarchy. The 'History' sub-tab is selected, displaying summary information and two data tables.

Summary Information:

Capacity (Kbps):	6116	Rate (Kbps):	1656	Margin (dB):	31.3
Line Voltage (V):	51.8	Current (mAmp):	3.2	Ground Current (mAmp):	0.0
State:	ACTIVE	Remote Pair:	1		

15 Minutes Data Table:

Ending Time Period	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin ...	EFS (%)
04/02/2013 11:27	0	0	0	0	6100	6120	1656	1656	31.30	31.30	100.00
04/02/2013 11:15	0	0	0	0	6100	6124	1656	1656	31.30	31.30	100.00
04/02/2013 11:00	0	0	0	0	6104	6124	1656	1656	31.30	31.30	100.00

24 Hours Data Table:

Ending Time Period	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin ...	EFS (%)
04/02/2013	0	0	0	0	6096	6128	1652	1668	31.30	31.30	100.00
04/01/2013	0	0	0	0	6092	6128	1644	1664	31.30	31.30	100.00
03/31/2013	0	0	0	0	6096	6128	1648	1660	31.30	31.30	100.00

Below the tables are controls for 'Refresh', a dropdown menu set to 'now', and dropdowns for 'Slot 1' and 'Pair 1'.

Alarm Summary: Critical: 0, Major: 0, Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

Note the highlighted portion of the Pair History screen shown below:



Refresh: This button refreshes the screen counters based on the time interval selected from the drop down box to its right.

Slot: This drop down selection is always "1" on the AK355.

Pair: This drop down selects the Pair to be displayed in the PM counters.

2.3.8.9 RT > Ethernet > Summary

The Summary tab displays Ethernet Link information and counters for the Ethernet Ports. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView interface for device AK355E(172.16.16.11). The 'Ethernet' section is active, showing a summary of link parameters. Below the navigation tabs, there are two tables: 'In Parameters' and 'Out Parameters'. Each table lists data for four time intervals: 04/11/2013 16:58:04, 04/11/2013 16:58:05, 04/11/2013 16:58:05, and 04/11/2013 16:58:06. The columns include Time, Slot, Unit, Port, Unicast Pkts, Broadcasts, Multicasts, Pause, Octets, 64 Octets, 127 Octets, 255 Octets, and 511 Octets. At the bottom, there is an alarm status section showing 'Critical: 0', 'Major: 0', and 'Minor: 1'. A table below this shows a single alarm entry with severity 'MN', unit 'CO', entity 'COM', slot '1', location 'West Wall', code 'PWRB', and alarm description 'Power B Failed'.

In Parameters													
Time	Slot	Unit	Port	Unicast Pkts	Broadcasts	Multicasts	Pause	Octets	64 Octets	127 Octets	255 Octets	511 Octets	
04/11/2013 16:58:04	1	RT	1	20105798	0	0	0	1543387600	0	0	0	20105798	
04/11/2013 16:58:05	1	RT	2	19974148	0	0	0	1477036000	0	0	0	19974148	
04/11/2013 16:58:05	1	RT	3	0	0	0	0	0	0	0	0	0	
04/11/2013 16:58:06	1	RT	SFP	0	0	0	0	0	0	0	0	0	

Out Parameters													
Time	Slot	Unit	Port	Unicast Pkts	Broadcasts	Multicasts	Pause	Octets	64 Octets	127 Octets	255 Octets	511 Octets	
04/11/2013 16:58:04	1	RT	1	330253852	0	0	0	3059193248	0	0	0	0	
04/11/2013 16:58:05	1	RT	2	67255220	0	0	0	3652109928	0	0	0	0	
04/11/2013 16:58:05	1	RT	3	0	0	0	0	0	0	0	0	0	
04/11/2013 16:58:06	1	RT	SFP	0	0	0	0	0	0	0	0	0	

Refresh now Slot 1

Critical: 0		Major: 0		Minor: 1							
Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1				West Wall	PWRB	Power B Failed	-	04/04/2013 10:59:32

2.3.8.10 RT > Ethernet > Detail

The Detail tab displays detailed Ethernet counters for the Ethernet Ports. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView application window. The main content area is divided into several sections:

- Navigation:** File, Action, Help menu; System, Inventory, Provisioning, Alarms, PM, Tools, Diagnostic, License tabs.
- Context:** CO | RT; Ethernet, MSPAN, Pair; Summary, Detail, Circuit, MAC Addresses.
- In Parameters Table:**

Time	Slot	Unit	Port	Unicast Pkts	Broadcasts	Multicasts	Pause	Octets	64 Octets	127 Octets	255 Octets	511 Octets
04/11/2013 16:58:35	1	RT	1	20111970	0	0	0	1546498288	0	0	0	20111970
04/11/2013 16:58:35	1	RT	2	19980321	0	0	0	1480147192	0	0	0	19980321
04/11/2013 16:58:36	1	RT	3	0	0	0	0	0	0	0	0	0
04/11/2013 16:58:36	1	RT	SFP	0	0	0	0	0	0	0	0	0
- Out Parameters Table:**

Time	Slot	Unit	Port	Unicast Pkts	Broadcasts	Multicasts	Pause	Octets	64 Octets	127 Octets	255 Octets	511 Octets
04/11/2013 16:58:35	1	RT	1	330274616	0	0	0	3084192932	0	0	0	0
04/11/2013 16:58:35	1	RT	2	67275989	0	0	0	3677115120	0	0	0	0
04/11/2013 16:58:36	1	RT	3	0	0	0	0	0	0	0	0	0
04/11/2013 16:58:36	1	RT	SFP	0	0	0	0	0	0	0	0	0
- Controls:** Refresh button, dropdown menu (now), Slot dropdown menu (1).
- Alarm Summary:** Critical: 0, Major: 0, Minor: 1.
- Alarm Table:**

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1				West Wall	PWRB	Power B Failed	-	04/04/2013 10:59:32

2.3.8.11 RT > Ethernet > Circuit

The Circuit tab shows performance monitoring traffic from the RT Port to the CO Port.

The screenshot shows the AktinoView application window. The main content area displays a table of performance monitoring data for a circuit. The table has the following columns: Time, Slot, Entity, Port, In Frames, Out Frames, Discarded Pkts, Filtered Pkts, Paused, and Tail Drop Fram... The data rows are as follows:

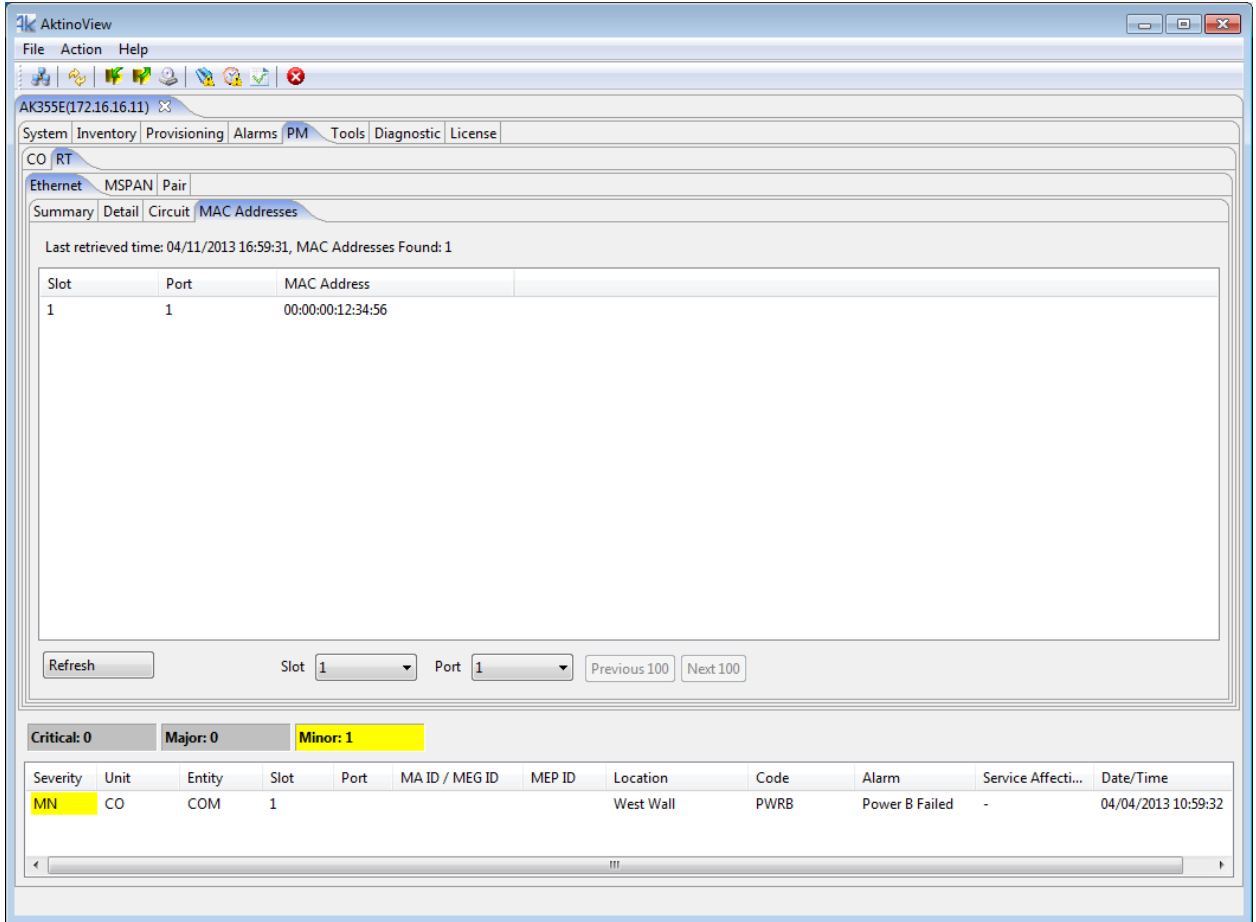
Time	Slot	Entity	Port	In Frames	Out Frames	Discarded Pkts	Filtered Pkts	Paused	Tail Drop Fram...
04/11/2013 16:59:08	1	RT	1	20118626	330297009	0	0	0	
04/11/2013 16:59:09	1	RT	IMSL	310310400	40060652	0	0	0	22865
04/11/2013 16:59:09	1	CO	IMSL	40060282	310357251	0	0	0	0

Below the table, there are controls for Refresh, now, Slot (1), and Port (1). At the bottom of the window, there are status indicators for Critical: 0, Major: 0, and Minor: 1. Below these indicators is a table of alarms:

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
MN	CO	COM	1				West Wall	PWRB	Power B Failed	-	04/04/2013 10:59:32

2.3.8.12 RT > Ethernet > MAC Addresses

The MAC Addresses tab displays the Ethernet MAC Addresses learned by the selected port.



The page can be provisioned to refresh automatically, and scroll between the discovered MAC Addresses.



2.3.8.13 RT > MSPAN

The MSPAN tab displays the downstream PM information for the MSPAN. This PM data is separated into three sections:

- 1 The heading section provides summary information for the MSPAN including upstream MSPAN Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries. For more information see Appendix C.

The screenshot shows the AktinoView interface for the MSPAN tab. It displays summary statistics, two data tables (15 Minutes and 24 Hours), and an alarm list.

Summary Statistics:

Capacity (Kbps):	109976	Rate (Kbps):	25024	Margin (dB):	30.64	State:	DATA
PSD Mask:	M1	TX Utilization (%):	0.0	RX Utilization (%):	0.0	2.2 MHz:	NO

15 Minutes Data Table:

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EFS (%)
04/02/2013 11:29	0	0	0	0	109288	110164	25024	25024	30.64	30.64	0.00	0.00	100.00
04/02/2013 11:15	0	0	0	0	109548	110176	25024	25024	30.64	30.64	0.00	0.00	100.00
04/02/2013 11:00	0	0	0	0	109480	110204	25024	25024	30.64	30.66	0.00	0.00	100.00
04/02/2013 10:45	0	0	0	0	109236	110204	25024	25024	30.64	30.66	0.00	0.00	100.00

24 Hours Data Table:

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EFS (%)
04/02/2013	0	0	0	0	108836	110360	25024	25024	30.50	30.66	0.00	0.00	100.00
04/01/2013	0	0	0	0	109004	110320	25024	25024	30.64	30.66	0.00	0.00	100.00
03/31/2013	0	0	0	0	108832	110276	25024	25024	30.64	30.66	0.00	0.00	100.00
03/29/2013	4	4	0	0	109244	110224	25024	25024	30.58	30.64	0.00	0.00	100.00

Refresh and Slot: Refresh [now] Slot [1]

Alarm Summary: Critical: 0 Major: 0 Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.8.14 RT > Pair > Summary

The RT side, Pair Summary tab displays the downstream Pair Summary information for all the Pairs supported by the MSPAN. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView interface for the AK355 system. The main window displays the 'Pair Summary' tab for the RT side. The table below shows the data for various time periods and slots.

Time Period	Slot	Unit	Pair	Remote Pair	Capacity (kb...)	Rate (kb...)	Margin (...)	Voltage (v)	Line Current (mA)	Ground Current (...)
04/02/2013 11:29:54	1	RT	1	1	6544	1400	30.75			
04/02/2013 11:29:55	1	RT	2	2	6788	1612	30.75			
04/02/2013 11:29:55	1	RT	3	3	6660	1476	30.67			
04/02/2013 11:29:56	1	RT	4	4	6748	1544	30.67			
04/02/2013 11:29:56	1	RT	5	5	6888	1648	30.64			
04/02/2013 11:29:57	1	RT	6	6	6928	1724	30.64			
04/02/2013 11:29:57	1	RT	7	7	6916	1728	30.64			
04/02/2013 11:29:58	1	RT	8	8	6788	1560	30.64			
04/02/2013 11:29:58	1	RT	9	9	7000	1816	30.67			

Below the table, there are controls for 'Refresh', a dropdown menu set to 'now', and a 'Slot' dropdown menu set to '1'.

Summary of alarm status: **Critical: 0**, **Major: 0**, **Minor: 1**

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.8.15 RT > Pair > Current 15 Minutes

The Current 15 Minutes tab displays the downstream Pair PM information for all the Pairs supported by the MSPAN for the last 15-minute interval. The page can be provisioned to refresh automatically, and time-stamp is displayed for each of the entries. For more information see Appendix C.

The screenshot displays the AktinoView application window. The main content area shows the 'Current 15 Minutes' tab for the 'RT > Pair' view. A table lists performance metrics for various time periods. Below the table, there are controls for refreshing the data and selecting a slot. At the bottom, a summary bar indicates 'Critical: 0', 'Major: 0', and 'Minor: 1' alarms. An alarm table below this summary shows a 'Power B Failed' alarm for unit CO, entity COM, slot 1, at location South Wall, code PWRB, on 03/29/2013 14:25:44.

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013 11:30:13	1	RT	1	0	0	0	0	6548	6556	1404	1404	30.75	30.75	100.00
04/02/2013 11:30:13	1	RT	2	0	0	0	0	6780	6800	1612	1612	30.75	30.75	100.00
04/02/2013 11:30:14	1	RT	3	0	0	0	0	6636	6672	1472	1480	30.67	30.67	100.00
04/02/2013 11:30:14	1	RT	4	0	0	0	0	6728	6756	1544	1544	30.67	30.67	100.00
04/02/2013 11:30:15	1	RT	5	0	0	0	0	6864	6892	1648	1648	30.64	30.64	100.00
04/02/2013 11:30:16	1	RT	6	0	0	0	0	6924	6944	1724	1724	30.64	30.64	100.00
04/02/2013 11:30:16	1	RT	7	0	0	0	0	6900	6936	1728	1732	30.64	30.64	100.00
04/02/2013 11:30:17	1	RT	8	0	0	0	0	6780	6808	1560	1560	30.64	30.64	100.00
04/02/2013 11:30:17	1	RT	9	0	0	0	0	6992	7008	1812	1820	30.67	30.67	100.00
04/02/2013 11:30:17	1	RT	10	0	0	0	0	6816	6836	1596	1596	30.59	30.59	100.00
04/02/2013 11:30:18	1	RT	11	0	0	0	0	6776	6800	1544	1548	30.64	30.64	100.00
04/02/2013 11:30:18	1	RT	12	0	0	0	0	6796	6828	1588	1588	30.59	30.59	100.00
04/02/2013 11:30:19	1	RT	13	0	0	0	0	6988	7012	1764	1772	30.59	30.59	100.00
04/02/2013 11:30:19	1	RT	14	0	0	0	0	7080	7112	1884	1888	30.59	30.59	100.00
04/02/2013 11:30:20	1	RT	15	0	0	0	0	6864	6896	1628	1636	30.64	30.64	100.00
04/02/2013 11:30:20	1	RT	16	0	0	0	0	7216	7244	1996	2000	30.59	30.59	100.00

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.8.16 RT > Pair > Current 24 Hours

The Current 24 Hours tab displays the downstream Pair PM information for all the Pairs supported by the MSPAN for the current day. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView interface with the following data:

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013 11:30:17	1	RT	8	0	0	0	0	6740	6836	1548	1572	30.64	30.67	100.00
04/02/2013 11:30:17	1	RT	9	0	0	0	0	6920	7028	1796	1824	30.67	30.67	100.00
04/02/2013 11:30:17	1	RT	10	0	0	0	0	6776	6868	1584	1608	30.59	30.64	100.00
04/02/2013 11:30:18	1	RT	11	0	0	0	0	6728	6820	1532	1568	30.64	30.67	100.00
04/02/2013 11:30:18	1	RT	12	0	0	0	0	6756	6860	1576	1608	30.56	30.64	100.00
04/02/2013 11:30:19	1	RT	13	0	0	0	0	6916	7048	1756	1784	30.59	30.67	100.00
04/02/2013 11:30:19	1	RT	14	0	0	0	0	7028	7144	1864	1924	30.59	30.59	100.00
04/02/2013 11:30:20	1	RT	15	0	0	0	0	5572	6932	1524	1656	27.59	30.67	100.00
04/02/2013 11:30:20	1	RT	16	0	0	0	0	7132	7260	1984	2016	30.56	30.64	100.00
04/02/2013 11:30:32	1	RT	1	0	0	0	0	6524	6592	1376	1404	30.75	30.80	100.00
04/02/2013 11:30:32	1	RT	2	0	0	0	0	6720	6828	1596	1620	30.75	30.80	100.00
04/02/2013 11:30:33	1	RT	3	0	0	0	0	6584	6708	1456	1488	30.67	30.72	100.00
04/02/2013 11:30:33	1	RT	4	0	0	0	0	6676	6788	1536	1556	30.67	30.72	100.00
04/02/2013 11:30:34	1	RT	5	0	0	0	0	6804	6936	1640	1676	30.59	30.64	100.00
04/02/2013 11:30:34	1	RT	6	0	0	0	0	6852	6960	1712	1736	30.64	30.67	100.00
04/02/2013 11:30:35	1	RT	7	0	0	0	0	6848	6968	1716	1748	30.64	30.67	100.00

Below the table, there are controls for Refresh, a dropdown menu set to 'now', and a Slot dropdown set to '1'.

Alarm Status Summary:

- Critical: 0
- Major: 0
- Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affect...	Date/Time
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	03/29/2013 14:25:44

2.3.8.17 RT > Pair > History

The History tab displays the downstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

- 1 The heading section provides summary information for the MSPAN including upstream Pair Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView application window. The main content area is titled 'AK355(172.16.10.60)' and contains several tabs: System, Inventory, Provisioning, Alarms, PM (selected), Tools, Diagnostic, and License. Under the PM tab, there are sub-tabs for CO, RT, Ethernet, MSPAN, and Pair. The Pair sub-tab is active, showing a 'History' view. The history view is divided into three sections: Summary, Current 15 Minutes, and Current 24 Hours. The Summary section shows Capacity (Kbps): 6544, Rate (Kbps): 1400, Margin (dB): 30.75, State: ACTIVE, and Remote Pair: 1. The 15 Minutes section contains a table with columns: Ending Time Period, CS, ES, SES, UAS, Min Capacity (k...), Max Capacity (k...), Min Rate (kb...), Max Rate (kb...), Min Margin (...), Max Margin (...), and EFS (%). The 24 Hours section contains a similar table. At the bottom, there are status indicators for Critical: 0, Major: 0, and Minor: 1. A table at the very bottom shows details for a minor alarm: Severity: MN, Unit: CO, Entity: COM, Slot: 1, Port: (blank), MA ID / MEG ID: (blank), MEP ID: (blank), Location: South Wall, Code: PWRB, Alarm: Power B Failed, Service Affect...: -, Date/Time: 03/29/2013 14:25:44.

Note the highlighted portion of the Pair History screen shown below:



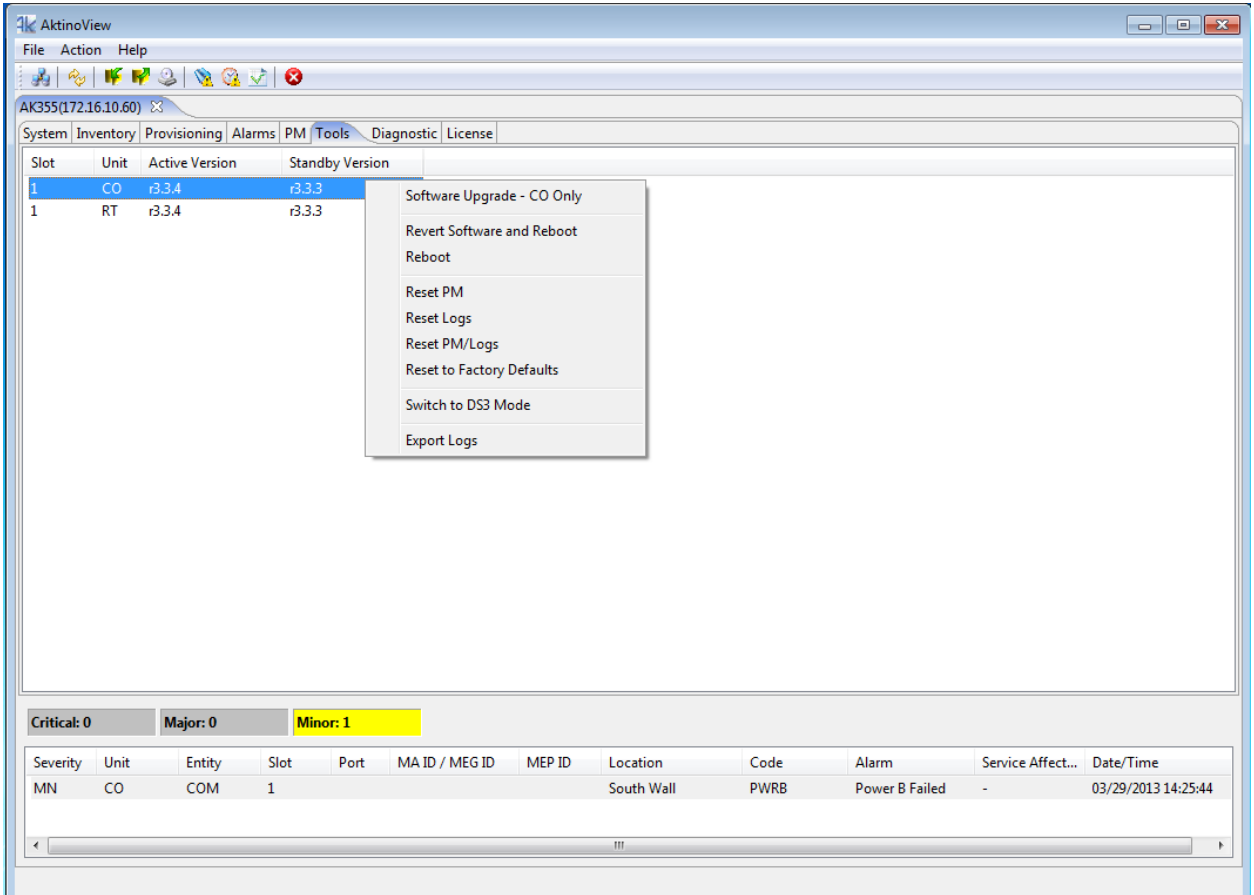
Refresh: This button refreshes the screen counters based on the time interval selected from the drop down box to its right.

Slot: This drop down selection is always "1" on the AK355.

Pair: This drop down selects the Pair to be displayed in the PM counters.

2.3.9 Tools

The Tools tab displays two firmware partitions--the Active and Standby Firmware partition for each component of the system. The Active partition contains the firmware version currently running. The Standby partition is used for firmware upgrades and provides a means of having a backup firmware version on the system.



Right-Clicking on a CO unit allows you to select the following options:

Option	Description
Software Upgrade - CO Only	Upgrades the firmware in the CO Unit only.
Revert Software and Reboot	Reboots the CO unit, and when the unit reboots, the unit selects the firmware version in the Standby partition
Reboot	Reboots the CO unit
Reset PM	Resets only the Performance Monitoring data in the CO unit.
Reset Logs	Resets the Logs in the CO Unit
Reset PM/Logs	Resets the PM and Logs in the CO Unit
Reset System to Factory Defaults	Resets the unit to Factory Defaults
Switch to Ethernet/DS3 Mode	For systems supporting both modes, this option reboots the unit and configures it to come up in the other mode.
Export Logs	Opens a dialog box enabling you to export important system information for analysis by Positron Technical Support.

Right-Clicking on a RT unit allows you to select the following options:

Option	Description
Revert Software and Reboot	Reboots the RT unit, and when the unit reboots, the unit selects the firmware version in the Standby partition
Reboot	Reboots the RT unit
Reset PM	Resets only the Performance Monitoring data in the RT unit.
Reset Logs	Resets the Logs in the RT Unit
Reset PM/Logs	Resets the PM and Logs in the RT Unit
Reset System to Factory Defaults	Resets the unit to Factory Defaults
Switch to Ethernet/DS3 Mode	For systems supporting both modes, this option reboots the unit and configures it to come up in the other mode.

2.3.10 Diagnostic

Diagnostics can be run on the AK355 System. There are two types of tests: Single Ended Loop Test (SELT) and Dual Ended Loop Test (DELT).

2.3.10.1 SELT

Single Ended Loop Test (SELT) provides diagnostics for each pair. Follow this procedure to run SELT:

- 1 SELT is service effecting. The remote unit must be disconnected to run the test.
- 2 The Pairs need to be calibrated. To get distance from the chassis, remove the MSPAN connector from the chassis. If removal of the MSPAN connector is not possible, calibration can be done at any point in the loop, including the MDF. This point will be the start of the Line Length test.
- 3 Click on the Calibrate button to start the calibration process. The Status of the calibration is indicated.
- 4 Connect the pairs back to the Outside Plant. Ensure that the remote unit is NOT connected.
- 5 Click on Start Testing button to run the SELT test. The Status of the SELT test is indicated.
- 6 The results can be exported to an Excel .csv file by clicking on the Export Test Result button.

The results of the SELT test are indicated below:

Slot	Unit	Pair	Line Length (ft)	Tip To Ground Resistance (ohms)	Ring To Ground Resistance (ohms)	Tip To Ring Resistance (ohms)
1	CO	1	0	Open	Open	259008.0
1	CO	2	0	326666.0	Open	259008.0
1	CO	3	0	326666.0	Open	259008.0
1	CO	4	0	Open	Open	259008.0
1	CO	5	0	326666.0	Open	259008.0
1	CO	6	0	326666.0	Open	259008.0
1	CO	7	0	Open	Open	259008.0
1	CO	8	0	Open	Open	259008.0
1	CO	9	0	Open	Open	259008.0
1	CO	10	0	Open	Open	259008.0
1	CO	11	0	326666.0	Open	259008.0
1	CO	12	0	326666.0	Open	259008.0
1	CO	13	0	Open	Open	259008.0
1	CO	14	0	Open	Open	259008.0
1	CO	15	0	Open	Open	259008.0
1	CO	16	0	Open	Open	259008.0

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	MSPAN	1				West Wall	LOS	Loss of Signal	yes	04/14/2013 16:33:48
MN	CO	PAIR	1	10			West Wall	OPENCKT	Open Circuit	-	04/14/2013 16:33:48

For each pair, the following test results are available:

- **Line Length.** This is the physical line length, it is AWG agnostic. If there are large differences in the line length of the pairs, it indicates possibly a short, open, ground fault, or bridge tap. If the pair is open in the middle of a loop, the length will indicate where it exists.
- **Tip to Ground Resistance. Ring to Ground Resistance. Tip to Ring Resistance.** The results should show "Open" for all pairs since the remote is not connected. If there is resistance on any pair, this indicates that there may be a problem.

2.3.10.2 DELT

Dual Ended Loop Test (DELT) provides diagnostics for each pair. Follow this procedure to run DELT:

- 1 DELT is service effecting. The remote unit must be connected to run the test.
- 2 Click on Start Testing button to run the DELT test. The Status of the DELT test is indicated.
- 3 The results can be exported to an Excel csv file by clicking on the Export Test Result button.

The results of the DELT test are indicated below:

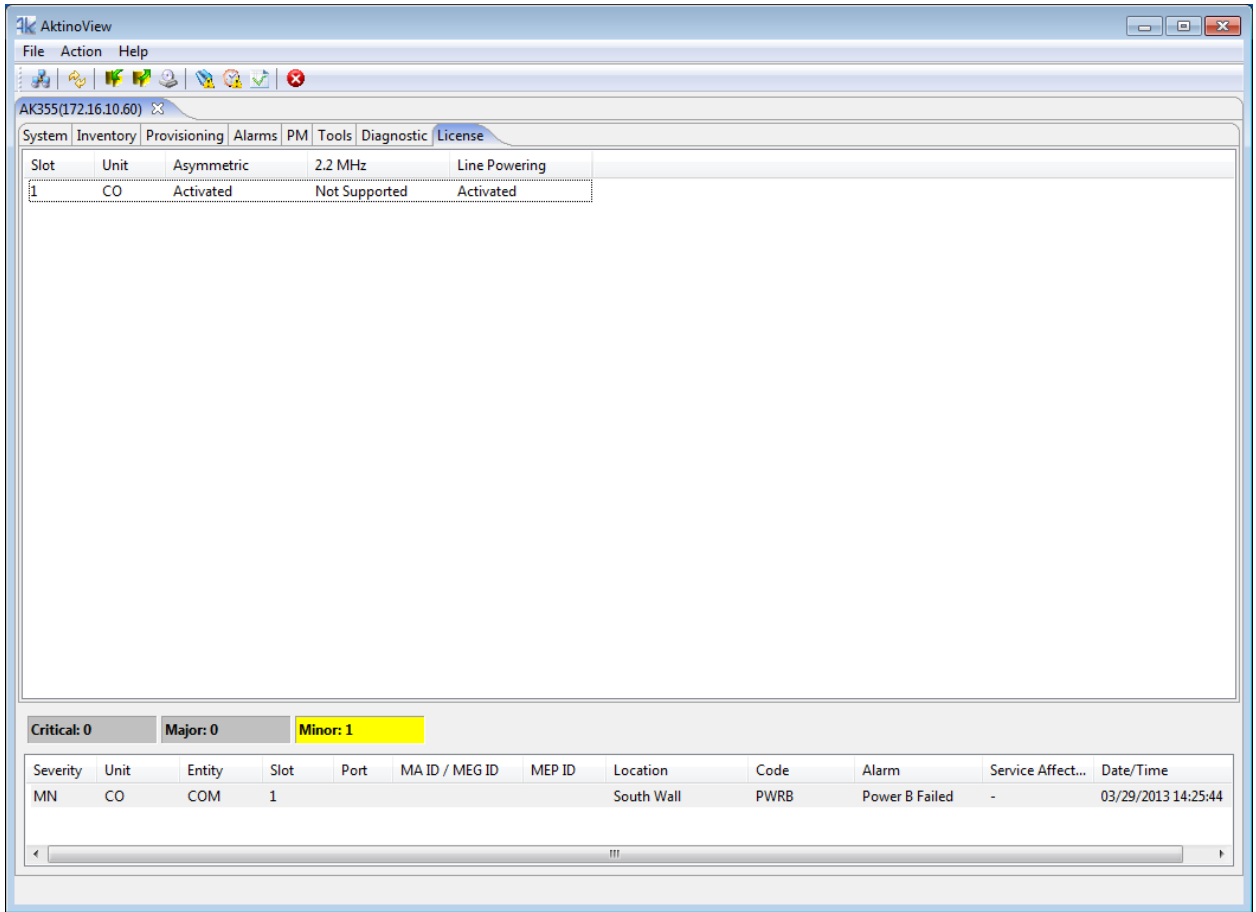
The screenshot shows the AktinoView software interface. The main window displays a table of DELT test results for 16 CO units. The table has columns for Unit, Pair, and 16 pairs of T and R values (T1-R1 to T16-R16). The status is 'Completed'. Below the table, there are buttons for 'Export Test Result' and 'Start Testing', and a status indicator showing 'Completed'. At the bottom, there are summary boxes for 'Critical: 0', 'Major: 0', and 'Minor: 1', along with an alarm log table.

Unit	Pair	T1	R1	T2	R2	T3	R3	T4	R4	T5	R5	T6	R6	T7	R7	T8	R8	T9	R9	T10	R10	T11	R11	T12	R12	T13	R13	T14	R14	T15	R15	T16	R16
CO 1	1	23.6	24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 2	2	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 3	3	0.0	0.0	0.0	0.0	23.2	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 4	4	0.0	0.0	0.0	0.0	0.0	0.0	23.2	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 5	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 6	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 7	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 8	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.2	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 9	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.2	24.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 10	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 11	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 12	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 13	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	24.4	0.0	0.0	0.0	0.0	0.0	0.0	
CO 14	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	24.4	0.0	0.0	0.0	0.0	
CO 15	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.8	24.2	0.0	0.0		
CO 16	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.2		

For each pair's tip and ring, the current in milliamps is indicated on itself and between that pair and every other pair being used in the AK355 System. The screen shot above shows a normal result. There should be current flowing between Pair1 and T1and R1, between Pair 2 and T2 and R2. The current flow numbers should be close in value. Large differences in the current flow values indicate a problem with that pair. No current should be flowing between pairs. If there is current flowing between pairs, this indicates a problem with those pairs, possible a short.

2.3.11 License

The License tab displays the features that are activated for the AK355 System.



Click on the CO unit to bring up the Software License dialog box. Contact customer service to find out more about how to obtain licenses for the AK355 system. Note that the AK355 has only one license available.

The screenshot shows a 'Software License' dialog box. The title bar includes the text 'Software License' and the Aktino logo. The dialog contains the following fields and values:

- Slot: 1
- Unit: CO
- Serial Number: 1031925
- License Key: (empty)

At the bottom of the dialog are three buttons: 'OK', 'Apply', and 'Cancel'.

See the following table for the Features and Values:

Feature	Values
Asymmetric, 2.2 Mhz, Line Powering	Activated - This feature is activated on the selected slot Not Activated - This feature is not activated on the selected slot Not Supported- This features is not supported on the selected slot

Chapter 3

AktinoView Management Software

DS3 Mode

3.1 Introduction

AktinoView is a Microsoft Windows software package used to manage one or more systems. In AktinoView, the AK355 unit located at the Central Office is referred to as the CO and the AK355 unit located at the Remote Office is referred to as the RT.

3.2 Installation

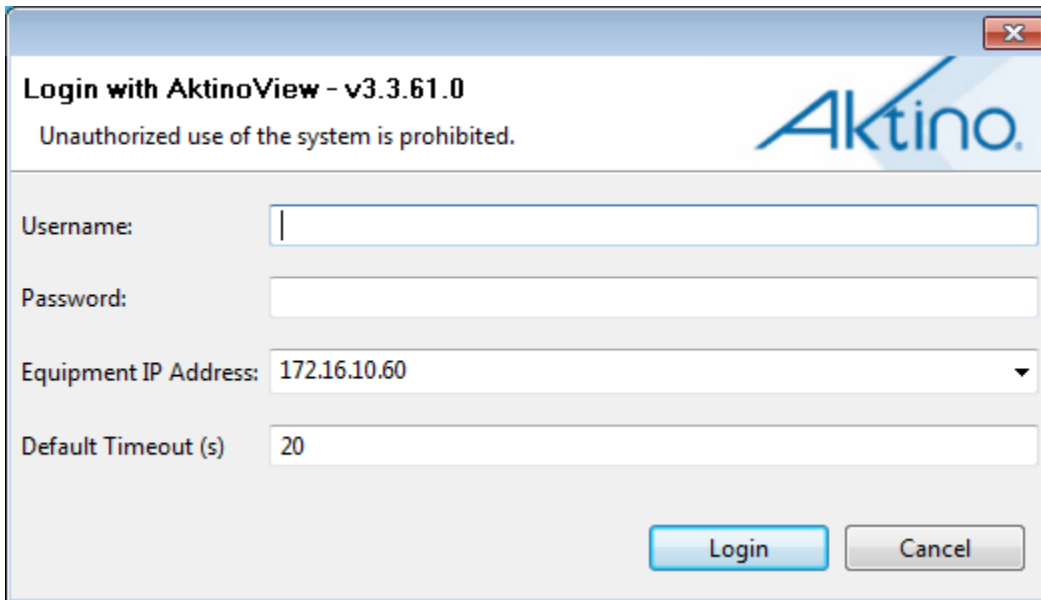
To install AktinoView proceed through the following:

- Insert the AktinoView CD into the CD ROM drive or download AktinoView from Positron's portal located at <http://www.positronaccess.com>
- Open Windows Explorer and click on the CD drive
- Double-click on install.exe in the AktinoView folder
- Follow the instructions on the screen

3.3 System Management

3.3.1 Logging in to an AK355 System

From the Start Menu select **Aktino > AktinoView**, and you will see a dialog box similar to the following:



Enter a Username and Password appropriate for the AK355 System. The default Username is "superuser" and the default Password is "superuser". Enter the system's IP Address in the Equipment IP Address field and Click **Login**. The default IP address for the AK355C is 192.168.10.1 and the default IP address for the AK355R is 192.168.10.2

3.3.2 Switching from Ethernet Mode to DS3 Mode (for Systems supporting DS3)

- 1 Go to the Tools tab.
- 2 Right click on the RT Unit. **Note:** Always start this process by switching the RT unit first.
- 3 Select **Switch to DS3 Mode** from the RT drop-down box and then select **OK**. This will initiate a process that will result with the RT rebooting.
- 4 Right click on the CO Unit once the RT Unit disappears.
- 5 Select **Switch to DS3 Mode** from the CO drop-down box and then select **OK**. This will initiate a process that will result with the CO rebooting. **Note:** Wait a couple of minutes before continuing with the remainder of this process.
- 6 Go to the File Menu and select **Connect to...** This will bring up the Login to AktinoView dialog box.
- 7 Type in the Username and Password. The default Username is "superuser" and the default Password is also "superuser."
- 8 Click **Login**.
- 9 Follow the same process when returning to Ethernet Mode.

3.3.3 AktinoView Main Window

Once you are logged into the system you will see three menu options:

File Menu

The File Menu provides two options:

Connect to: Allows you to connect to and manage several Aktino systems simultaneously.

Exit: Exits the AktinoView program.

Action Menu

The Action Menu provides four options:

Refresh: Refreshes the system.

System Backup: Opens a dialog box allowing you to save your System Configuration in an XML file to your PC so that you may retrieve and restore the configuration at a later date.

System Restore: Opens a dialog box to import and apply a previously saved System Configuration file. The process of restoring your system configuration will reboot your system.

System Software Upgrade: Opens a dialog box allowing you to upgrade the Aktino System software. (See Appendix A for System Software Upgrade procedures.)

Export: Provides three options: **Alarm Log**, **Alarm History**, and **PM** (Performance Monitoring). These options allow you to export the desired information to a .csv file.

Help Menu

The Help Menu provides one option:

About: Displays the AktinoView software version information.

AktinoView provides Quick-Launch buttons for all the menus.

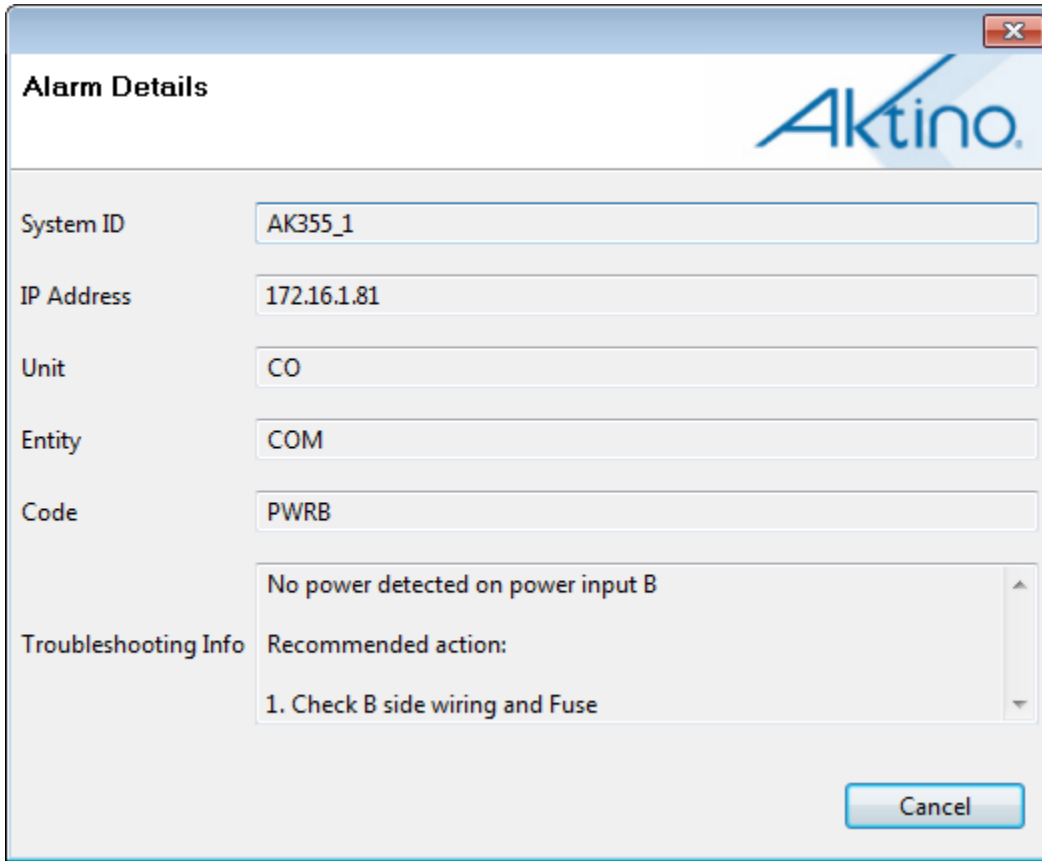


Under the Menus and Quick-Launch buttons, AktinoView displays a tab for all the systems currently being managed. Each tab will display the System Name and IP address of the selected system.

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

When AktinoView connects to a given system, it will display several additional tabs appropriate for the selected system. In this case, AktinoView displays the following tabs for an AK355 System: System, Inventory, Provisioning, Alarms, PM, Tools, Diagnostic, and License.

AktinoView provides Alarm details by right-clicking on the unit. If alarms are present in the system, AktinoView will display them at the bottom of the screen. For more information about a particular alarm, double-click on the alarm for details and trouble-shooting information.



Alarm Details

AktinoView displays detailed alarm information for each system. It displays counters for the active Critical, Major, and Minor alarms, as well as detailed alarm information for each of the alarms present. The columns can be sorted and resized as desired.

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.4 System

The System tab provides a front panel representation of the AK355 System.

Critical: 2 **Major: 0** **Minor: 1**

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.5 Inventory

The Inventory tab provides details for the AK355C and the AK355R comprising the AK355 System.

The screenshot displays the AktinoView application window for an AK355 system (IP: 172.16.10.60). The 'Inventory' tab is active, showing a table of system components:

Slot	Unit	Description	Serial Num.	CLEI Code	MAC Address	Hardware Rev.	Software Rev.	Options
1	CO	AK355CUP:CO DS3/Ethernet CO Unit 55 ...	1033458	VAMLW10H...	00:0ed8:02:45:34	E05	r3.3.4	Asymmetric, Line Powering
1	RT	AK355RU: RT DS3/Ethernet RT Unit, 55 M...	1033482	VAMLX10HRA	00:0ed8:02:45:6c	E05	r3.3.4	

Below the inventory table, the alarm summary shows:

- Critical: 2
- Major: 0
- Minor: 1

The detailed alarm table is as follows:

Severity	Unit	Entity	Slot	Port	MA ID ...	M	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:46:21
MMN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

It displays a Description for each of the devices, as well as their Serial Number, CLEI Code, Hardware and Software Revision Levels. It also displays any applied feature options.

See the following table for Parameters and Values:

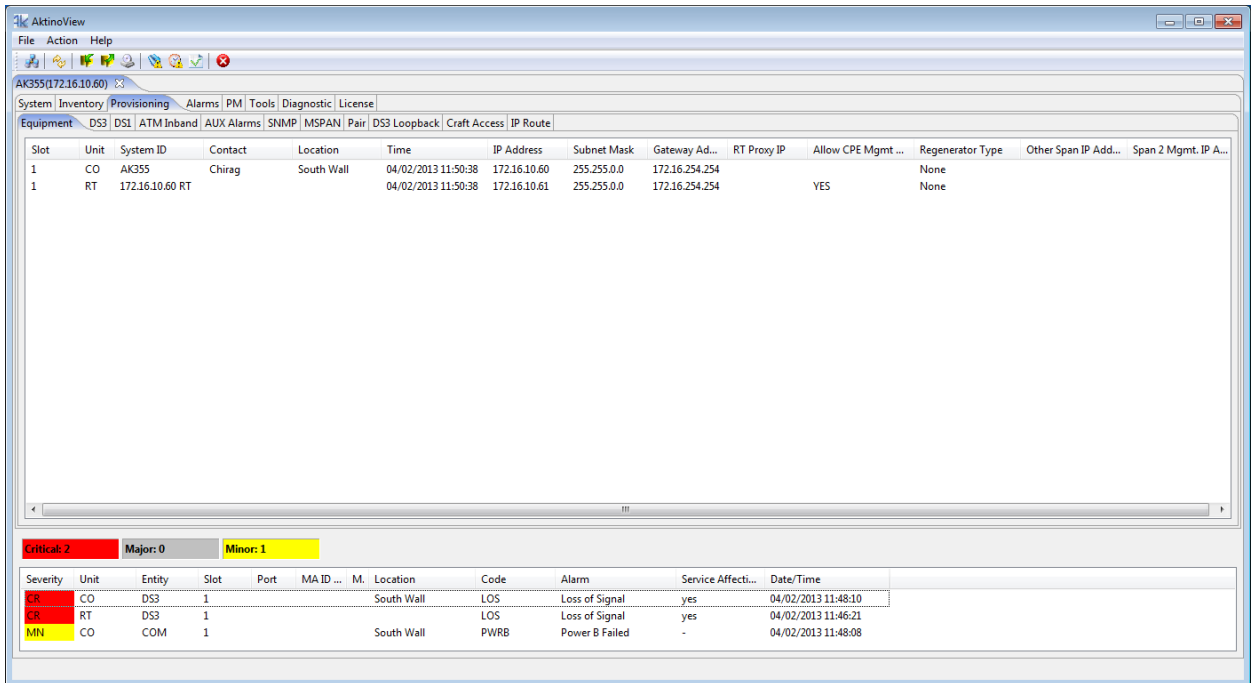
Parameter	Values
Slot	Slot number
Unit	Location
Description	Detailed description
Serial	Serial Number
CLEI Code	Telcordia assigned CLEI code
MAC Address	MAC Address for the device
Hardware Rev.	Hardware Revision Level
Software Rev.	Software Revision Level
Options	Asymmetric: Support for Asymmetric Mode
	2.2 Mhz: Support for 2.2 Mhz Mode
	Line Powering: Support for Line Powering Mode

3.3.6 Provisioning


Clicking the Provisioning tab displays all the provisioning sub-sections supported by the AK355 System.

3.3.6.1 Equipment

Selecting the Equipment tab under Provisioning allows equipment provisioning of the system.



Clicking on either a CO or RT unit brings up the Equipment dialog box for that specific unit.

Equipment 

Slot: 1

Unit: CO

System ID: AK355_1

Contact: Ken

Location: East Rack

IP Address: 172.16.1.81

Subnet Mask: 255.255.0.0

Gateway Address: 172.16.254.254

RT Proxy IP:

Allow CPE Mgmt Access:


Regenerator Type: None

Other Span IP Address:

Span 2 Mgmt. IP Address:

Time: 03/15/2012 14:39:34 PC Time

OK Apply Cancel

Equipment 

Slot: 1

Unit: RT

System ID: RT for AK355 Legacy

Contact:

Location:

IP Address: 192.168.10.2

Subnet Mask: 255.255.255.0

Gateway Address:

RT Proxy IP:

Allow CPE Mgmt Access: YES

Regenerator Type: None

Other Span IP Address:

Span 2 Mgmt. IP Address:

Time: 03/15/2012 : : : PC Time

OK Apply Cancel

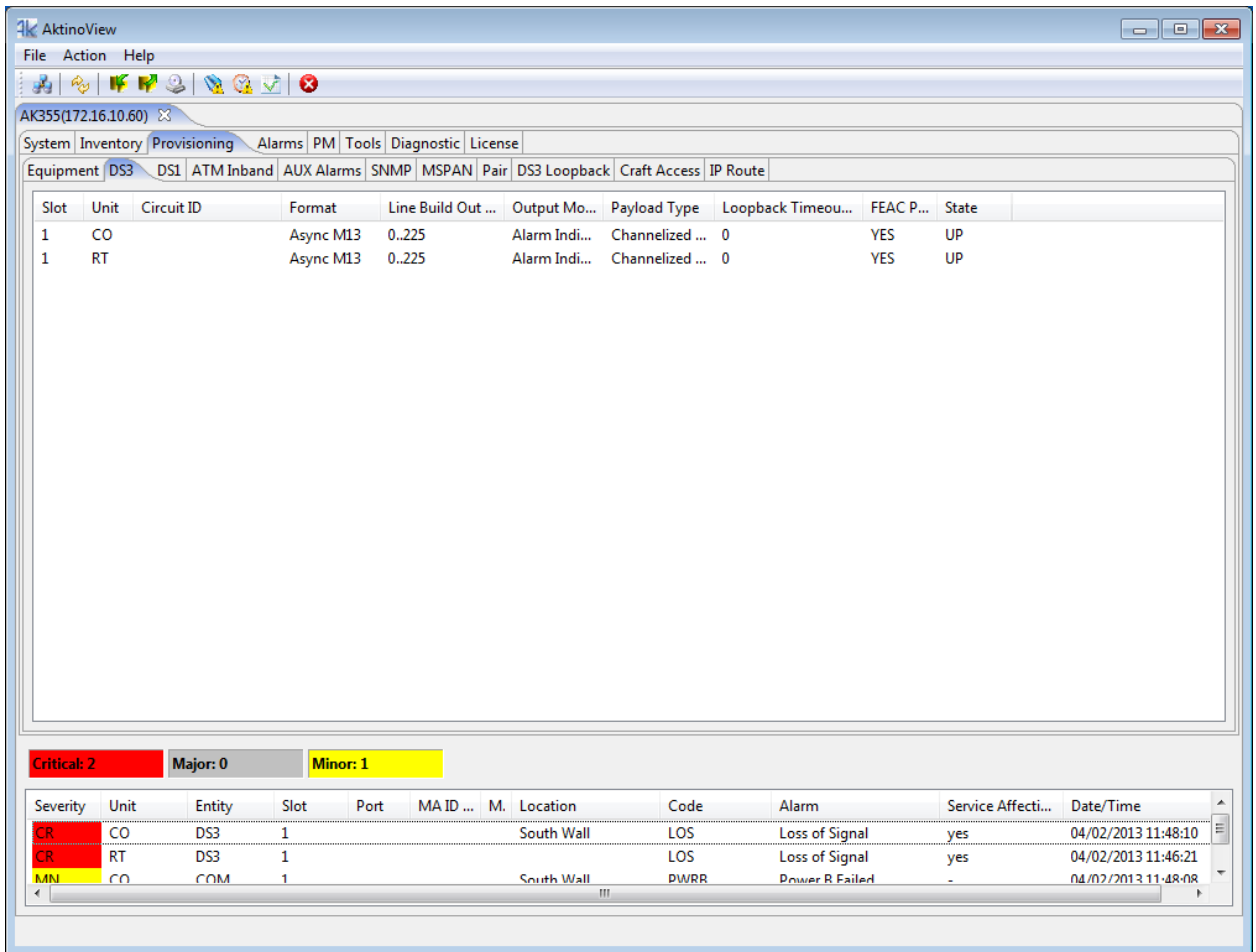
See the following tables for Parameters and Values:

AK355C Equipment Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
IP Address	IP Address of the unit
Subnet Mask	Subnet Mask of the unit
Gateway Address	Gateway Address of the unit
RT Proxy IP	Proxy IP address of the CRU, used to access the CRU through the MSPAN link
Allow CPE Management Access	Enable or Disable local management access for CRU
Regenerator Type	For Regenerator Applications
Other Span IP Address	For Regenerator Applications, indicate the Other Span IP Address (Do not use the same IP Address as the device's management port)
Span 2 Mgmt. IP Address	For Regenerator Applications, indicate the Span 2 management IP address (Do not use the same IP Address as the device's management port)

AK355R Equipment Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
IP Address	IP Address of the unit
Subnet Mask	Subnet Mask of the unit
Gateway Address	Gateway Address of the unit
Allow CPE Management Access	Enable or Disable local management access for CRU

3.3.6.2 DS3

Selecting the DS3 tab under CO unit allows DS3 provisioning of the system.



Double-click on the CO or the RT to bring up the provisioning dialog box for the selected unit. Note that some of the parameters changed on the CO are also reflected on the RT. Double-click on the RT unit to provision the remainder of the RT's parameters and values.

The following is the DS3 CO unit provisioning dialog box:

The screenshot shows a software dialog box titled "DS3" with the Aktino logo in the top right corner. The dialog contains the following fields and values:

Field	Value
Slot	1
Unit	CO
Circuit ID	
Format	Async M13
Line Build Out (ft)	0..225
Output Mode	Alarm Indication Signal
Payload Type	Channelized DS3 (TDM)
Loopback Timeout (min)	0
FEAC Pass Through	YES
State	UP

At the bottom of the dialog are three buttons: "OK", "Apply", and "Cancel".

The following is the DS3 RT unit provisioning dialog box:

The screenshot shows a software dialog box titled "DS3" with the Aktino logo in the top right corner. The dialog contains the following fields and values:

Field	Value
Slot	1
Unit	RT
Circuit ID	
Format	Async M13
Line Build Out (ft)	0..225
Output Mode	Alarm Indication Signal
Payload Type	Channelized DS3 (TDM)
Loopback Timeout (min)	0
FEAC Pass Through	YES
State	UP

At the bottom of the dialog are three buttons: "OK", "Apply", and "Cancel".

See the following table for parameters and values:

DS3 CO unit Parameters and Values table

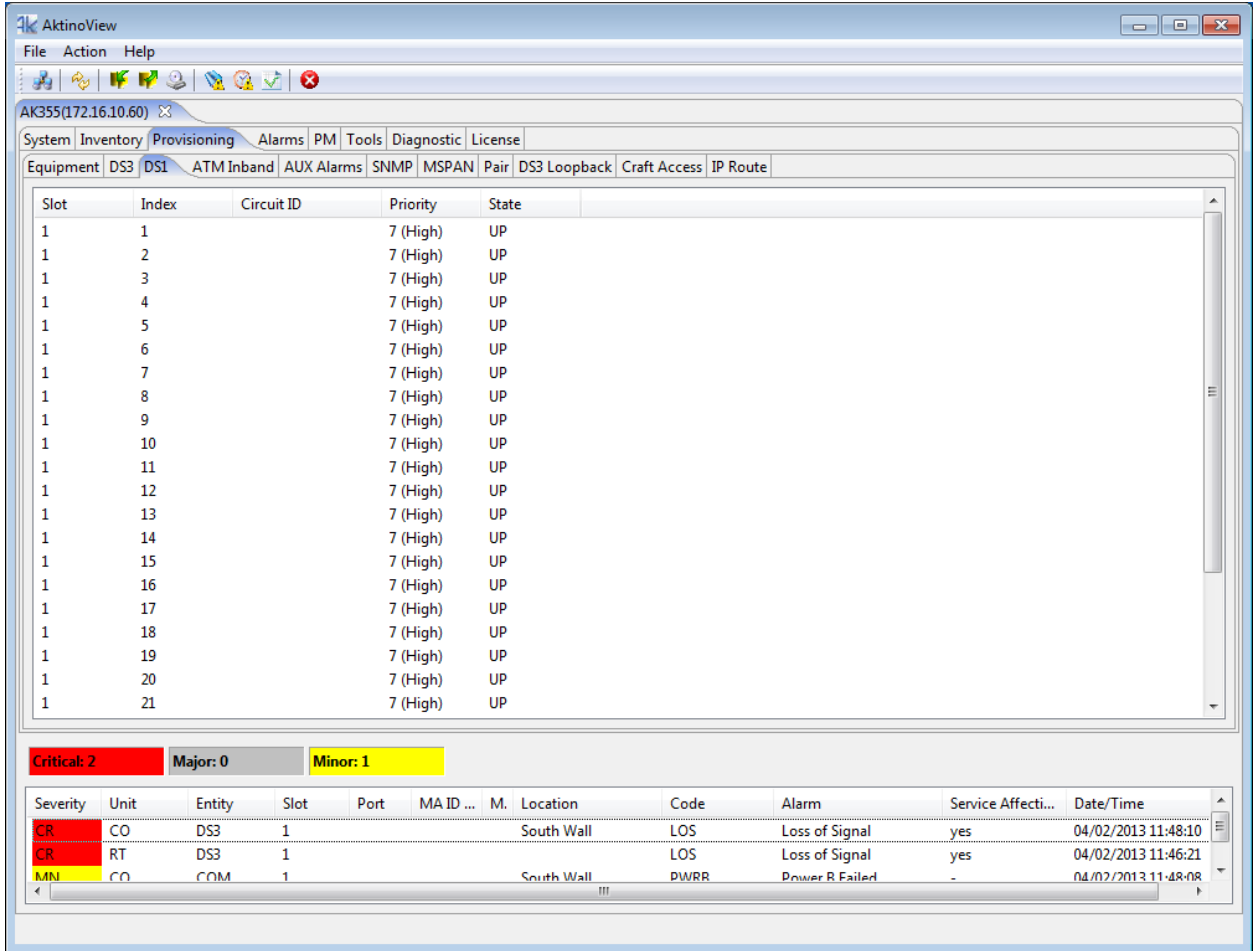
Parameters	Values
DS3 Circuit ID	Allows input of description of the DS3 circuit up to 48 characters.
DS3 Line Format	C-Bit Parity Asynchronous M13
CO unit DS3 Line Build Out	0..225 ft 226..450 ft
Output Mode (Alarm Mode)	Normal - Idle, Alarm Indication Signal (AIS)
Payload Type	Channelized DS3 (TDM) ATM* Scrambled ATM* Clear Channel
Loopback Timeout	0, 20, 60, 3600 (24 hours) minutes
FEAC Pass Through	YES - DS3 FEAC loopback messages from the network are reacted upon by the CO. NO - DS3 FEAC loopback messages from the network are ignored.
State	UP - CO DS3 port is in service. Down - CO DS3 port is out of service.

DS3 RT unit Parameters and Values table

Parameters	Values
DS3 Circuit ID	Allows input of description of the DS3 circuit up to 48 characters.
RT Unit DS3 Line Build Out	0..225 ft 226..450 ft
State	UP - RT DS3 port is in service Down - RT DS3 port is out of service

3.3.6.3 DS1

Selecting the DS1 tab under the CO unit allows DS3 tributary provisioning of the system.



Double-click on the Index to bring up the DS1 provisioning dialog box. Note that this screen is only active if DS3 Payload Type is set to Channelized DS3 (TDM). The MSPAN rate is the sum rate of each DS1 set to UP state.

The following is the DS1 provisioning dialog box:

The screenshot shows a dialog box titled "DS1" with the Aktino logo in the top right corner. The dialog contains the following fields and values:

- Slot: 1
- Index: 1
- Circuit ID: (empty)
- Priority: 7 (High)
- State: UP

At the bottom of the dialog are three buttons: "OK", "Apply", and "Cancel".

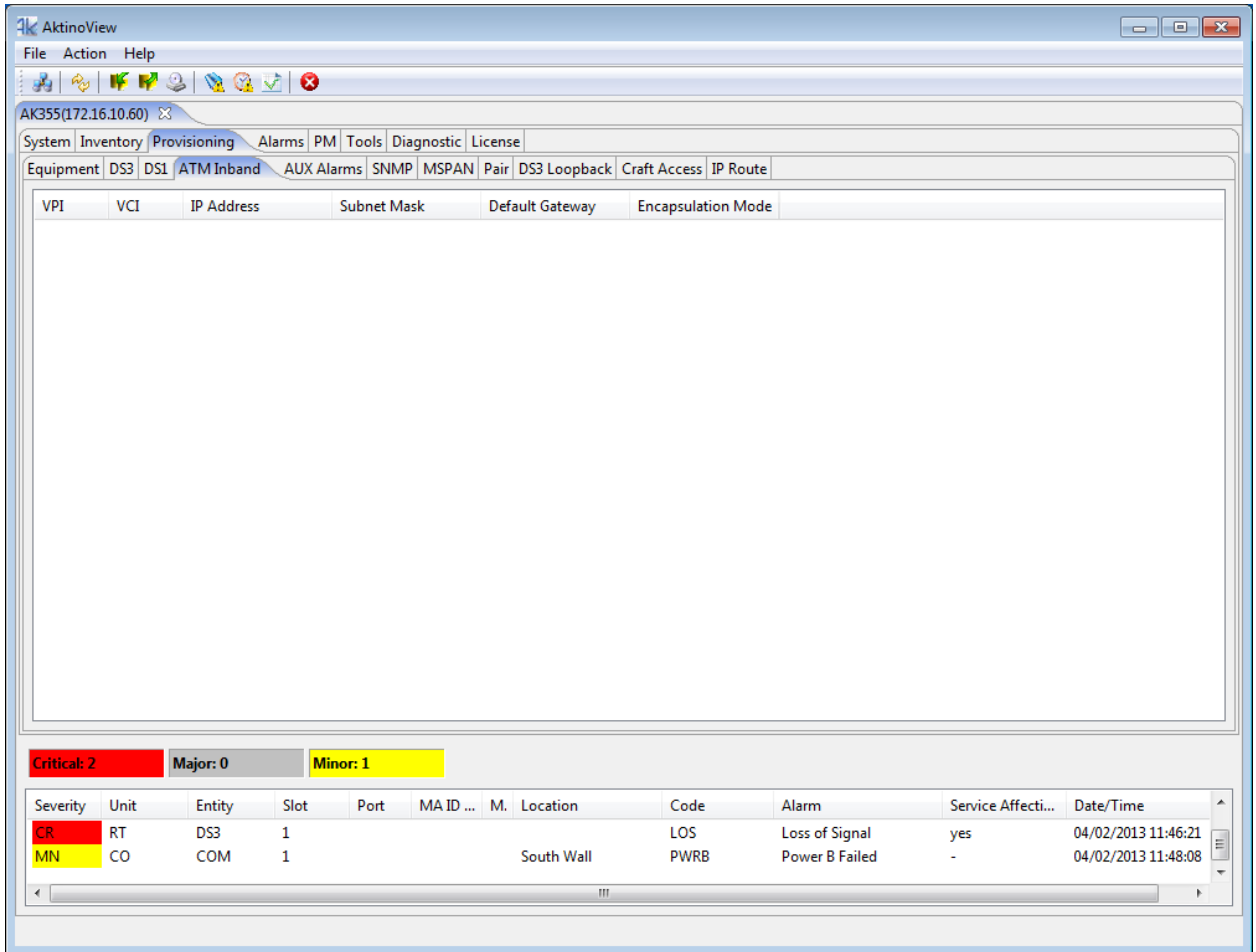
See the following table for parameters and values:

DS1 Provisioning Parameters and Values

Parameter	Values
Circuit ID	Circuit ID of DS1 up to 48 characters
Priority	0 [Low] through 7 [High] When system needs to downshift the MSPAN rate during adverse conditions (e.g. a pair failed), the priority parameter determines the order of DS1's dropped.
State	Down - DS1 tributary is not transported. UP - DS1 tributary is transported.

3.3.6.4 ATM Inband

Selecting the ATM Inband tab under Provisioning allows ATM Inband Management provisioning of the system. The DS3 Payload Type must be in an ATM mode to allow provisioning this item.



Double-click on the line to bring up the following ATM Inband dialog box:

ATM Inband

VPI: 0

VCI: 32

IP Address: |

Subnet Mask:

Default Gateway: 172.16.254.254

Encapsulation Mode: [Dropdown]

Buttons: OK, Apply, Cancel

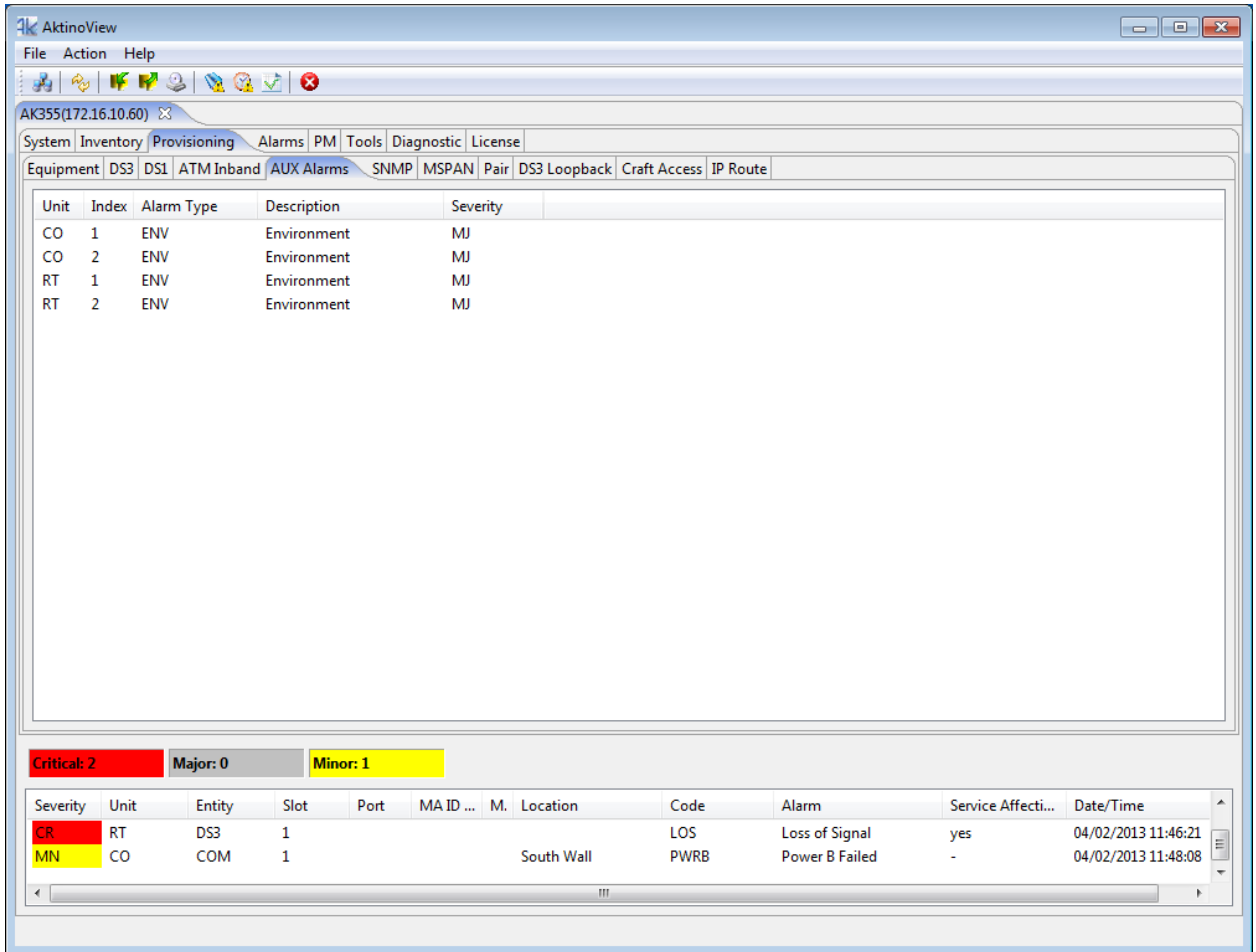
See the following table for parameters and values:

ATM Inband Parameters and Values

Parameters	Values
VPI	Virtual Path Identifier
VCI	Virtual Circuit Identifier
IP Address	IP Address of the Positron unit (must be in a different subnet vs. the local management port).
Subnet Mask	Subnet Mask for the Positron Unit
Default Gateway	Gateway address for the Positron Unit

3.3.6.5 AUX Alarms

Selecting the AUX Alarms tab under Provisioning allows external alarm provisioning of the system. These parameters determine how the AUX1 and AUX2 input pins on the Positron units react. Note that the alarm input pins are Normally Open (NO).



Double-click on the Index to bring up the AUX Alarm provisioning dialog.

The screenshot shows a software dialog box titled "AUX Alarm" with the Aktino logo in the top right corner. The dialog contains the following fields and values:

- Unit: CO
- Index: 1
- Alarm Type: ENV
- Description: Environment
- Severity: MJ

At the bottom of the dialog are three buttons: "OK", "Apply", and "Cancel".

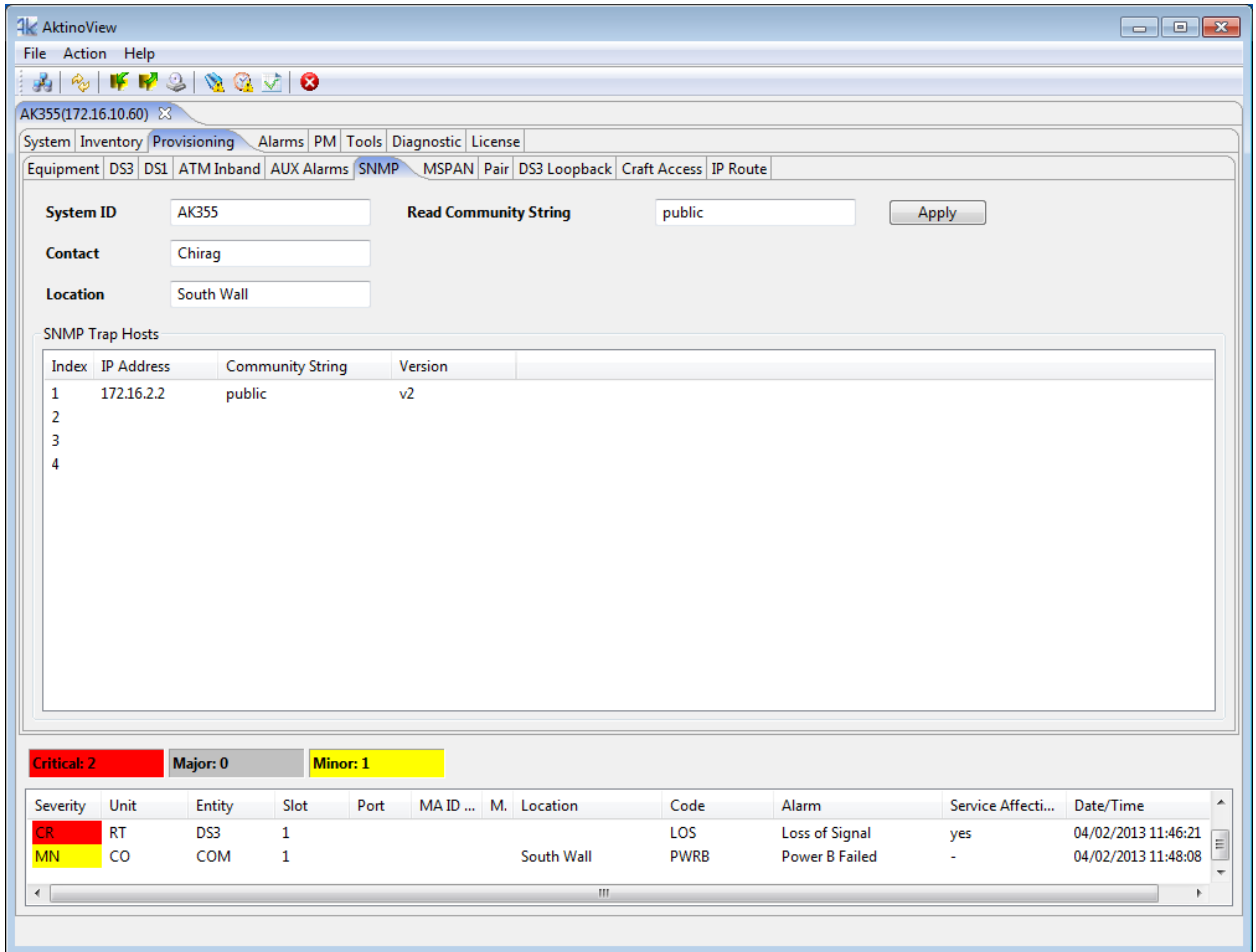
See the following table for Parameters and Values:

AUX Alarm Parameters and Values

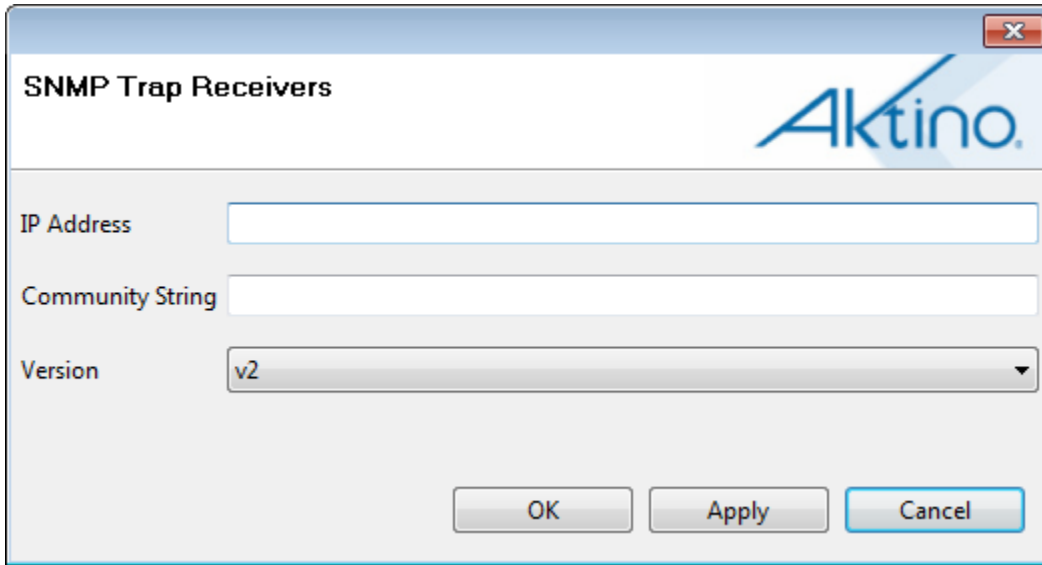
Parameters	Values
Alarm Type	This value is reported as alarm type in the TL 1 alarm message up to 16 characters.
Description	This values is reported as alarm description in the TL1 alarm message up to 48 characters.
Severity	Critical, Major, Minor

3.3.6.6 **SNMP**

Selecting the SNMP tab allows setting SNMP receiver parameters.



Double-clicking on the Index brings up the SNMP Trap Receivers dialog box enabling SNMP provisioning.



See the following for the Parameters and Values for both of these screens:

SNMP Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
Read Community String	The SNMP Read Community String for the AK355 System

SNMP Trap Host Parameters	Values
IP Address	IP Address of the SNMP Trap Receiver
Community String	SNMP Community String of the Trap Receiver
Version	SNMP Trap Version Number (v1 or v2)

3.3.6.7 MSPAN

Selecting the MSPAN tab under Provisioning allows MSPAN provisioning of the system.

Note: Configuring Line Powering on an AK355RP is done by connecting to the AktinoView session to the AK355RP instead of connecting to the AK355CPS.

The screenshot displays the AktinoView software interface for MSPAN provisioning. The main window shows the following data:

General Parameters Table:

Slot	Unit	State	Circuit ID	Mode	Rate Upstream...	Rate Downstre...	Line Powering	SNR Margin ...	Margin Threshold (d...	Reserve Pairs	PSD Mask	2.2 Mhz
1	CO	UP					-185V	5	3	0	AUTO Select	

Advanced Parameters Table:

Slot	Unit	Reed-Solomon Up...	Reed-Solomon Do...	Latency Upstream	Latency Downstre...	Impulse Prot. Upst...	Impulse Prot. Dow...	Power Back-Off U...	Power Back-Off D...	Max SNR Margin (...	Rate Alarm Threshold Ups...	Rate A
1	CO	5:30	5:30	2	2	50	50	AUTO	AUTO	50	0	0

Alarm Status: Critical: 2, Major: 0, Minor: 1

Alarm Log Table:

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

Double-clicking on a Slot entry in either the General Parameters area or the Advanced Parameters area provides the MSPAN Parameters dialog box for both General and Advanced Parameters.

MSPAN - General Parameters

General Parameters

Slot: 1

Circuit ID: []

Mode: []

MSPAN Rate (kbps): []

Rate Upstream (kbps): []

Rate Downstream (kbps): []

Line Powering: -185V

SNR Margin (dB): 5

Margin Threshold (dB): 3

Reserve Pairs: 0

PSD Mask: AUTO Select

2.2 Mhz: []

State: UP

Advance Parameters

Reed-Solomon Upstream: 5.30

Reed-Solomon Downstream: 5.30

Latency Upstream: 2

Latency Downstream: 2

Impulse Prot. Upstream (us): 50

Impulse Prot. Downstream (us): 50

Power Back-Off Upstream (dB): AUTO

Power Back-Off Downstream (dB): AUTO

Max SNR Margin (dB): 50

Rate Alarm Threshold (kbps): []

Rate Alarm Threshold Upstream (kbps): []

Rate Alarm Threshold Downstream (kbps): []

Configure Rate Alarm Threshold

OK Apply Cancel

See the following table for Parameters and Values:

MSPAN General Parameters	Values
State	Sets the MSPAN State: Up - MSPAN is in service Down - MSPAN is out of service
Circuit ID	User configurable string of up to 48 characters
Mode	Sets the MSPAN Mode: Symmetric Asymmetric
MSPAN Rate (kbps)	Sets the MSPAN Rate in Symmetric Mode
Rate Upstream	Sets the Upstream MSPAN Rate in Asymmetric Mode
Rate Downstream	Sets the Downstream MSPAN Rate in Asymmetric Mode
Line Powering	Sets Line Powering to: Off, -135v, or -185v
SNR Margin	Sets the SNR Margin: 0 to 18dB
Margin Threshold	Sets the SNR Margin Threshold. If the SNR Margin falls below this threshold, an Alarm will be generated
Reserve Pairs	Sets the number of Reserve Pairs
PSD Mask	Sets the PSD Mask: Auto - Select the best PSD Mask automatically Select - M0, M1, M2, M3, M4 or M5
2.2 Mhz	If the 2.2 Mhz feature is enabled: Select - Auto, or No

See the following table for Advanced Parameters and Values:

MSPAN Advanced Parameters	Values
Reed-Solomon Upstream	Calculated Reed-Solomon Overhead percentage Upstream: $RS\% = 2 * INP / Latency$
Reed-Solomon Downstream	Calculated Reed-Solomon Overhead percentage Downstream: $RS\% = 2 * INP / Latency$
Latency Upstream	Sets the Upstream Latency: 0, 1, 2, 4, 8, 12, 16, 20, 32msec
Latency Downstream	Sets the Downstream Latency: 0, 1, 2, 4, 8, 12, 16, 20, 32msec
Impulse Protection Upstream	Length of Upstream Impulse Noise Protection: 50, 125, 250, 500, 750, 1000, 2000, 4000 μ sec
Impulse Protection Downstream	Length of Downstream Impulse Noise Protection: 50, 125, 250, 500, 750, 1000, 2000, 4000 μ sec
Power Back-Off Upstream	Auto, -3 to 16dB
Power Back-Off Downstream	Auto, -3 to 16dB
Rate Alarm Threshold	MSPAN Rate Alarm Threshold for Symmetric Mode
Rate Alarm Threshold Upstream	MSPAN Upstream Rate Alarm Threshold for Asymmetric Mode
Rate Alarm Threshold Downstream	MSPAN Downstream Rate Alarm Threshold for Asymmetric Mode

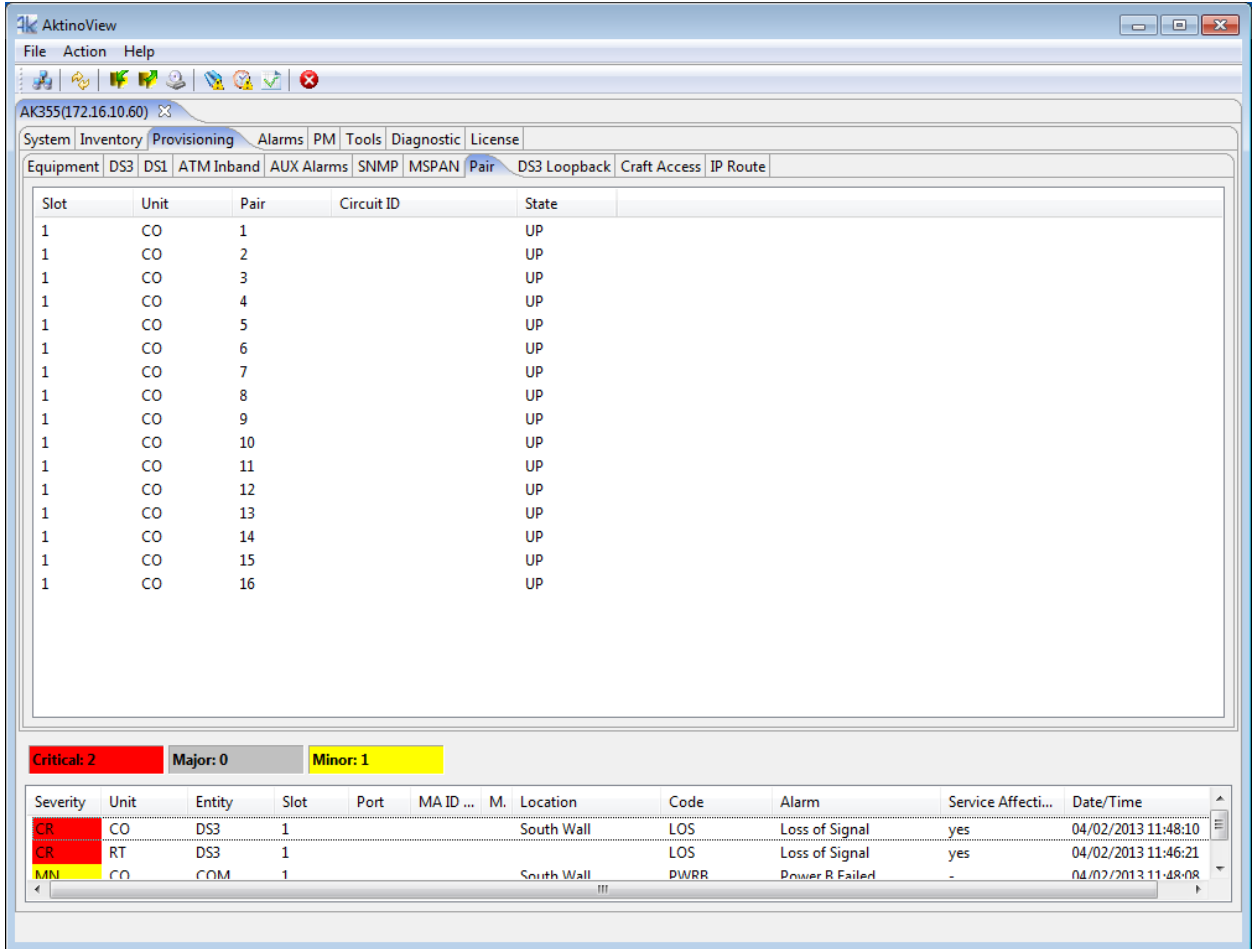
Note: PSD Masks attempt to equalize the upstream and downstream MSPAN rates and are optimized for particular loop lengths.

PSD Mask	Best for Loop Lengths (26 AWG)
M1	0 to 6500 feet
M2	6500 to 9500 feet
M3	9500 to 11500 feet
M4	11500 to 13500 feet
M5	Greater than 13500 feet

PSD Mask	Best for Loop Lengths (24 AWG)
M1	0 to 8667 feet
M2	8667 to 12667 feet
M3	12667 to 15333 feet
M4	15333 to 18000 feet
M5	Greater than 18000 feet

3.3.6.8 Pair

Selecting the Pair tab under the Provisioning tab allows Pair provisioning of the system.



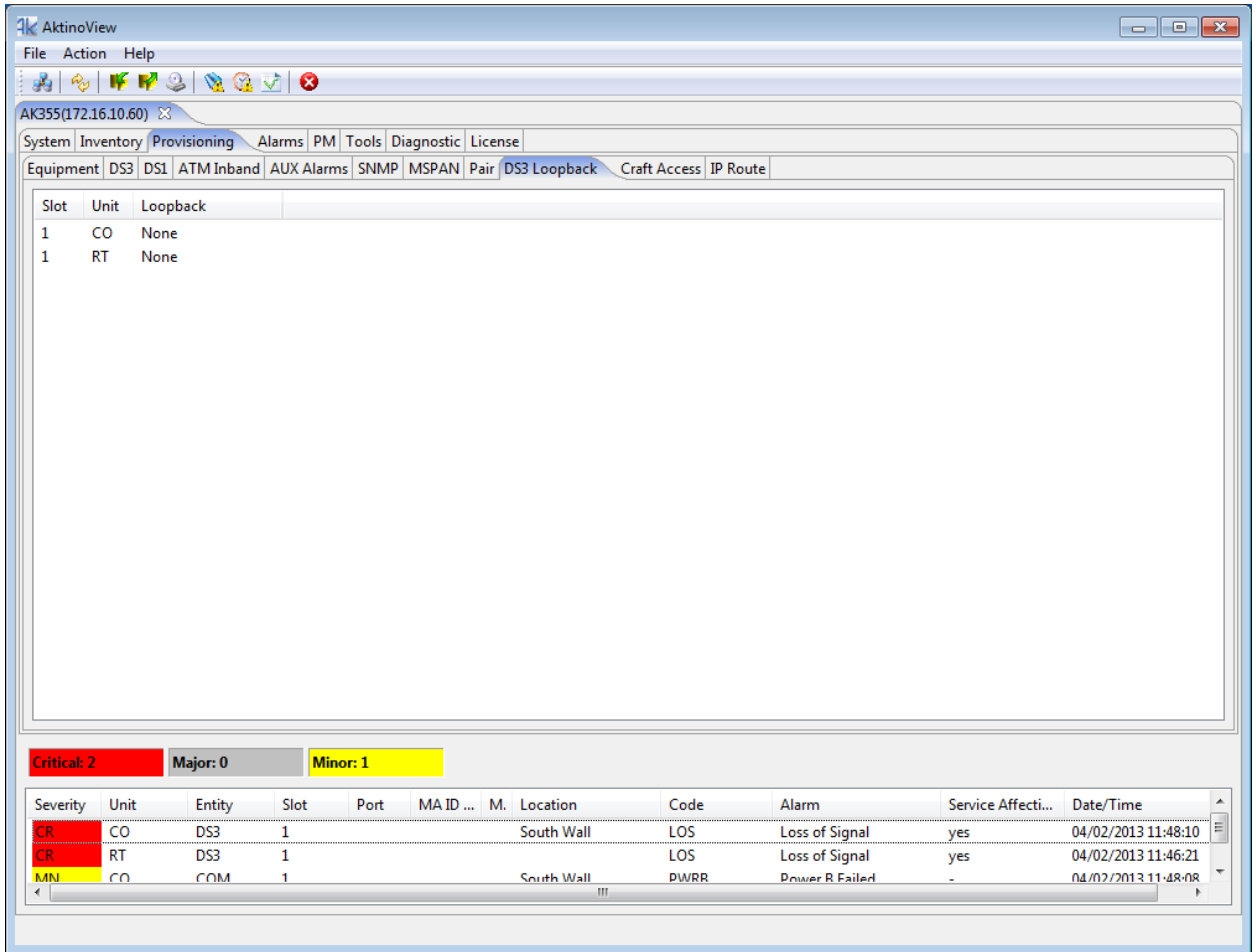
Double-clicking on the Pair entry to bring up the Pair provisioning dialog box.

See the following table for Pair Provisioning Parameters and Values:

Pair Parameters	Values
Circuit ID	User configurable string of up to 48 characters
State	Sets the Pair State: Up - Pair is in service Down - Pair is out of service

3.3.6.9 DS3 Loopback

Selecting the DS3 Loopback tab under Provisioning allows you to enable DS3 loopbacks on either the CO or RT unit. Right click on the Unit to select the type of DS3 Loopback desired. When a loopback is set, right clicking on the Unit will provide release loopback option.



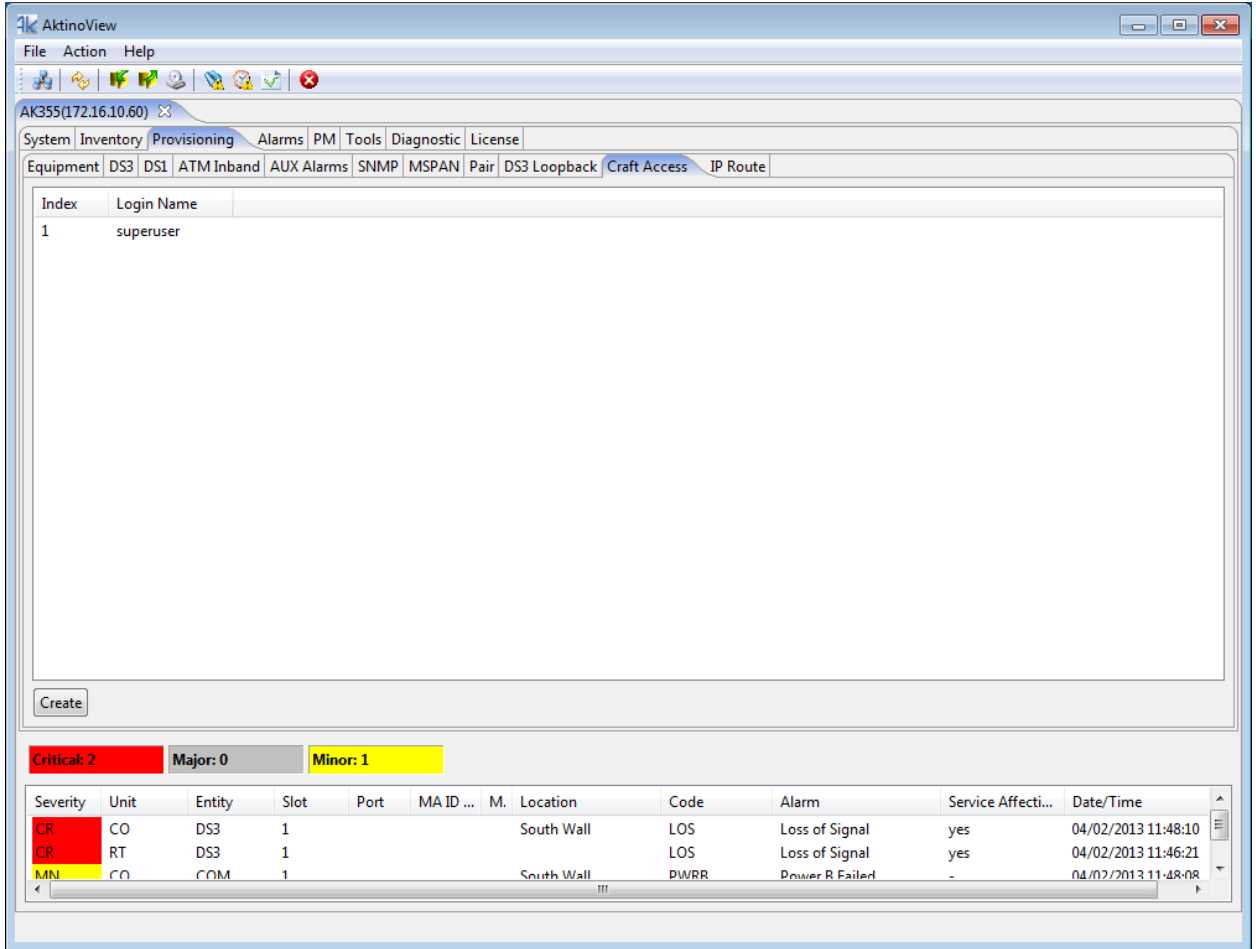
The following screen shot from the System tab reveals a loopback set Toward Network.

Alarm Summary:
 Critical: 2 Major: 0 Minor: 1

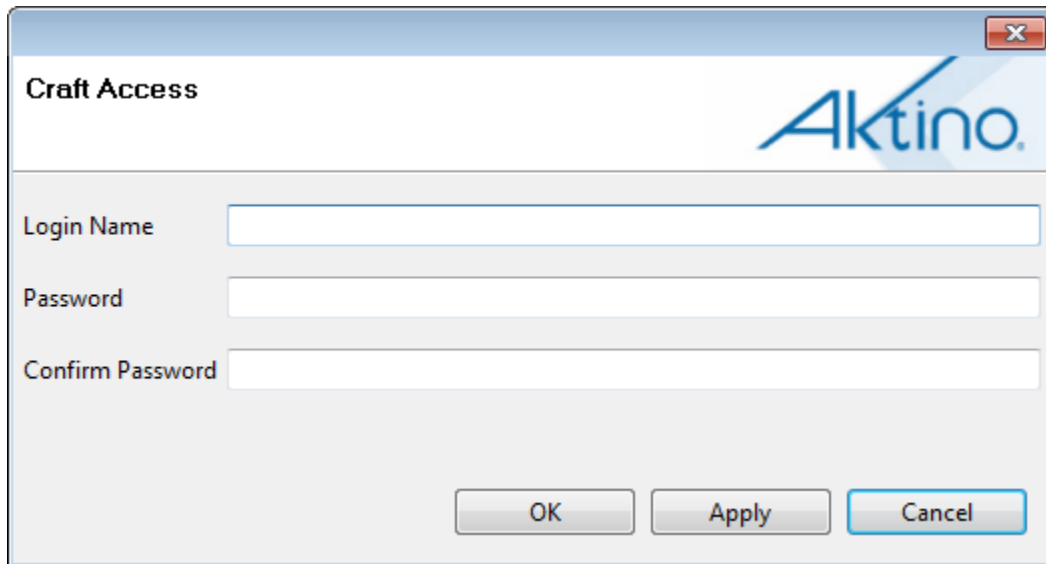
Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MMN	CO	COM	1				South Wall	DWRR	Power R Failed	-	04/02/2013 11:48:08

3.3.6.10 Craft Access

Selecting the Craft Access tab under Provisioning allows User Management Administration.



Click on **Create** to bring up the following Craft Access dialog box:

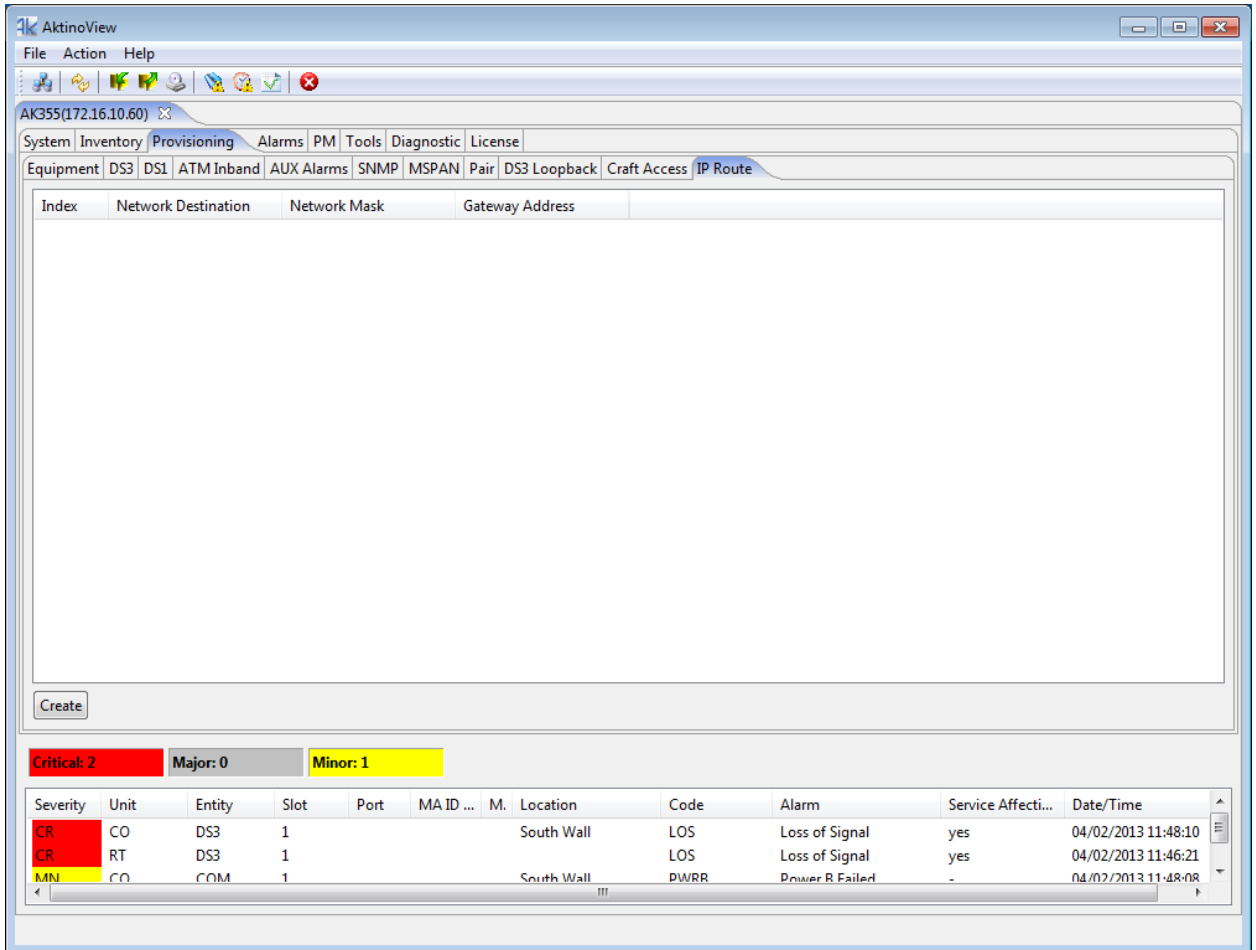


The image shows a software dialog box titled "Craft Access" with the Aktino logo in the top right corner. The dialog contains three text input fields: "Login Name", "Password", and "Confirm Password". At the bottom of the dialog are three buttons: "OK", "Apply", and "Cancel".

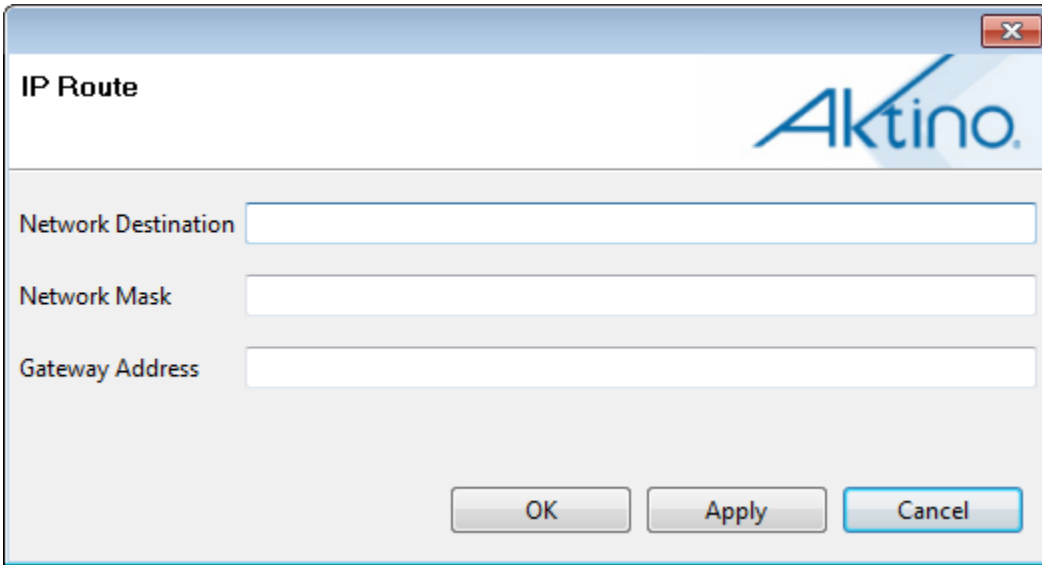
The Craft Access dialog box provides fields where the Login Name and Password is created for the new Craft Access user.

3.3.6.11 IP Route

The IP Route tab allows you to provision static routes for the AK355C.



Click the **Create** button to display the following dialog box:



See the following table for the IP Route Parameters and Values:

IP Route Parameters	Values
Network Destination	Destination Network Address
Network Mask	Network Mask
Gateway Address	Default Gateway Address

3.3.7 Alarms

3.3.7.1 CO > Alarm Log

The CO Alarm Log tab displays a list of all the alarms observed on the AK355C including time-stamp information as to when the alarm was triggered or cleared.

Note: See Appendix B for more Alarm details.

The screenshot shows the AktinoView application window. The 'Alarms' tab is active, displaying a table of alarm logs. The table has the following columns: Severity, Unit, Entity, Slot, Port, MA ID / MEG ID, MEP ID, Location, Code, and Alarm. The data is as follows:

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm
NA	CO	DS3	1				South Wall	LPBKLINE	Line Loopback
NA	CO	DS3	1				South Wall	LPBKLINE	Line Loopback
CR	CO	MSPAN	1				South Wall	LOF	Loss of Frame
CR	CO	MSPAN	1				South Wall	LOF	Loss of Frame
CR	CO	DS3	1				South Wall	LOS	Loss of Signal
NA	CO	COM	1				South Wall	SYSTEM_REB...	System Reboot
MN	CO	COM	1				South Wall	PWRB	Power B Failed
MN	CO	PAIR	1	13			South Wall	LOS	Loss of Signal
CR	CO	MSPAN	1				South Wall	LOF	Loss of Frame
CR	CO	MSPAN	1				South Wall	LOF	Loss of Frame
NA	CO	COM	1				South Wall	SYSTEM_REB...	System Reboot
MN	CO	COM	1				South Wall	PWRB	Power B Failed

Below the table, there is a 'Refresh' button and a summary bar showing: Critical: 2, Major: 0, Minor: 1.

A detailed view of the alarm log is shown at the bottom of the window, with the following columns: Severity, Unit, Entity, Slot, Port, MA ID ..., M., Location, Code, Alarm, Service Affecti..., and Date/Time. The data is as follows:

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.7.2 CO > Alarm History

The CO Alarm History tab displays the alarms that have been observed by the AK355C and how many times each of the alarms has been observed, as well as the first and last times the alarm has been observed.

Note: See Appendix B for more Alarm details.

AK355(172.16.10.60)

System Inventory Provisioning Alarms PM Tools Diagnostic License

CO RT

Alarm Log Alarm History

Last retrieved time: 04/02/2013 12:01:48

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm
NA	CO	DS3	1					LPBKLINE	Line Loopback
CR	CO	MSPAN	1					LOF	Loss of Frame
CR	CO	DS3	1					LOS	Loss of Signal
NA	CO	COM	1					SYSTEM_REB...	System Reboot
MN	CO	COM	1					PWRB	Power B Failed
MN	CO	PAIR	1	13				LOS	Loss of Signal

Refresh

Critical: 2 **Major: 0** **Minor: 1**

Severity	Unit	Entity	Slot	Port	MA ID ...	M	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRR	Power B Failed	-	04/02/2013 11:48:08

3.3.7.3 RT > Alarm Log

The RT Alarm Log tab displays a list of all the alarms observed on the AK355R including time-stamp information as to when the alarm was triggered or cleared.

Note: See Appendix B for more Alarm details.

Severity Unit Entity Slot Port MA ID / MEG ID MEP ID Location Code Alarm

CR	RT	DS3	1					LOF	Loss of Frame
MN	RT	COM	1					PWRB	Power B Failed
CR	RT	DS3	1					LOS	Loss of Signal
MN	RT	COM	1					PWRB	Power B Failed
CR	RT	DS3	1					LOF	Loss of Frame

Refresh

Critical: 2 Major: 0 Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRR	Power B Failed	-	04/02/2013 11:48:08

3.3.7.4 Alarm History

The RT Alarm History tab displays the alarms that have been observed by the AK355R and how many times each of the alarms has been observed, as well as the first and last times the alarm has been observed.

Note: See Appendix B for more Alarm details.

The screenshot shows the AktinoView application window. The main content area displays the 'Alarm History' tab with a table of alarm records. Below the table is a 'Refresh' button. At the bottom of the window, a summary bar indicates the status of alarms: Critical: 2, Major: 0, and Minor: 1.

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	DWRR	Power B Failed	-	04/02/2013 11:48:08

3.3.8 Performance Monitoring (PM)

The PM tab allows you to display detailed Performance related information for the AK355 System's Ethernet Ports, MSPAN interfaces, and individual MSPAN Pairs. This PM data is provided for both the CO and RT sides of the system.

Note: See Appendix C for more details.

3.3.8.1 CO > DS3

DS3 performance monitoring shows the errors coming INTO the AK355C. Ninety six fifteen minute time period bins and seven 24 hour time period bins display the DS3's performance monitoring. Select Refresh to update screen.

Ending Time Period	CVL	ESL	SESL	LOSSL	CVP	CVCP	ESP	ESCP	SESP	SESCO	SASP	AISSP	UASP	UASCP	EFS (%)
04/02/2013 12:02	0	149	149	149	0	0	0	0	0	0	0	0	149	0	0.00
04/02/2013 12:00	0	712	712	712	0	0	0	0	0	0	0	0	712	0	0.00

Ending Time Period	CVL	ESL	SESL	LOSSL	CVP	CVCP	ESP	ESCP	SESP	SESCO	SASP	AISSP	UASP	UASCP	EFS (%)
04/02/2013	0	861	861	861	0	0	0	0	0	0	0	0	861	0	0.00

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

See the following table for Performance Monitoring Parameters and Values:

Parameters	Values
Ingress Cell Count	Numbers of ATM cells flowing into either CO or RT Positron DS3 port (ATM modes only)
Egress Cell Count	Numbers of ATM cells flowing out of either CO or RT Positron DS3 port (ATM modes only).
CVL	Line Code Violations
ESL	Line Errored Seconds
SESL	Line Severely Errored Seconds
LOSSL	Line Loss of Signal Seconds
CVP	Path Code Violations
CVCP	Path Code Violations CP-bit Parity
ESP	Path Errored Seconds
ESCP	Path Errored Seconds CP-bit Parity
SESP	Path Severely Errored Seconds CP-bit Parity
SESP	Path Severely Errored Seconds
SASP	SEF/AIS Second C-bit Parity
AISSP	Path Alarm Indications Status Seconds
UASP	Path Unavailable Seconds
EFS%	Error Free Seconds %

3.3.8.2 CO > MSPAN

The MSPAN tab displays the upstream PM information for the MSPAN. This PM data is separated into three sections:

- 1 The heading section provides summary information for the MSPAN including upstream MSPAN Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries. For more information see Appendix C.

The screenshot shows the AktinoView interface for the AK355(172.16.10.60) device. The 'PM' tab is active, displaying MSPAN performance data. The summary section shows Capacity (Kbps) at 98168, Rate (Kbps) at 43232, and Margin (dB) at 27.44. Below this, the 15 Minutes and 24 Hours sections provide detailed performance data in table format. At the bottom, there is a summary of alarm counts (Critical: 2, Major: 0, Minor: 1) and a table of active alarms.

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EFS (%)
04/02/2013 12:03	0	0	0	0	98100	98200	43232	43232	27.42	27.44			100.00
04/02/2013 12:00	0	0	0	76	0	98216	0	43232	0.00	27.45			89.33

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EFS (%)
04/02/2013	0	0	0	76	0	98216	0	43232	0.00	27.45			91.75

Refresh now Slot 1

Critical: 2 Major: 0 Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.8.3 CO > Pair > Summary

The Summary tab displays the upstream Pair Summary information for all the Pairs supported by the MSPAN. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView application window. The main content area displays the 'Summary' tab for the 'CO > Pair' configuration. The table below lists various pairs with their respective metrics.

Time Period	Slot	Unit	Pair	Remote Pair	Capacity (kb...)	Rate (kb...)	Margin (...)	Voltage (v)	Line Current (mA)	Ground Current (...)
04/02/2013 12:03:47	1	CO	1	1	6104	2916	27.47	185.08	27.80	0.00
04/02/2013 12:03:48	1	CO	3	3	6084	2892	27.44	185.08	28.00	0.00
04/02/2013 12:03:49	1	CO	4	4	6084	2876	27.47	185.08	28.20	0.00
04/02/2013 12:03:49	1	CO	5	5	6156	2976	27.41	185.08	28.20	0.00
04/02/2013 12:03:50	1	CO	6	6	6092	2892	27.47	185.08	28.20	0.00
04/02/2013 12:03:50	1	CO	7	7	6176	2996	27.36	185.08	28.80	0.00
04/02/2013 12:03:51	1	CO	2	2	6152	2968	27.44	185.08	27.80	0.00
04/02/2013 12:03:51	1	CO	8	8	6140	2936	27.47	185.08	28.60	0.00
04/02/2013 12:03:51	1	CO	9	9	6124	2944	27.39	185.08	27.80	0.00
04/02/2013 12:03:52	1	CO	10	10	6148	2964	27.39	185.08	27.80	0.00
04/02/2013 12:03:52	1	CO	11	11	6180	2980	27.48	185.08	27.40	0.00
04/02/2013 12:03:53	1	CO	12	12	6108	2912	27.44	185.08	27.20	0.00
04/02/2013 12:03:53	1	CO	13	13	6136	2952	27.39	185.08	27.40	0.00
04/02/2013 12:03:54	1	CO	14	14	6156	2968	27.41	185.08	27.40	0.00
04/02/2013 12:03:54	1	CO	15	15	6096	2892	27.47	185.08	27.20	0.00
04/02/2013 12:03:55	1	CO	16	16	6192	3008	27.41	185.08	27.20	0.00

Below the table, there are controls for 'Refresh' (set to 'now'), a 'Slot' dropdown menu (set to '1'), and a summary bar showing 'Critical: 2', 'Major: 0', and 'Minor: 1'.

Severity	Unit	Entity	Slot	Port	MA ID ...	M	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.8.4 CO > Pair > Current 15 Minutes

The 15 Minutes tab displays the upstream Pair PM information for all the Pairs supported by the MSPAN for the last 15-minute interval. The page can be provisioned to refresh automatically, and time-stamp is displayed for each of the entries. For more information see Appendix C.

The screenshot shows the AktinoView interface for device AK355(172.16.10.60). The 'PM' (Performance Monitoring) tab is active, showing the 'Current 15 Minutes' view for a CO Pair. The main data table is as follows:

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013 12:04:10	1	CO	1	0	0	0	0	6096	6116	2916	2920	27.39	27.52	100.00
04/02/2013 12:04:11	1	CO	2	0	0	0	0	6148	6164	2968	2972	27.41	27.52	100.00
04/02/2013 12:04:11	1	CO	3	0	0	0	0	6072	6092	2892	2896	27.38	27.50	100.00
04/02/2013 12:04:12	1	CO	4	0	0	0	0	6072	6092	2872	2876	27.41	27.53	100.00
04/02/2013 12:04:12	1	CO	5	0	0	0	0	6152	6172	2968	2976	27.38	27.52	100.00
04/02/2013 12:04:13	1	CO	6	0	0	0	0	6084	6108	2892	2900	27.41	27.55	100.00
04/02/2013 12:04:13	1	CO	7	0	0	0	0	6164	6184	2992	2996	27.30	27.42	100.00
04/02/2013 12:04:14	1	CO	8	0	0	0	0	6128	6148	2932	2940	27.41	27.52	100.00
04/02/2013 12:04:14	1	CO	9	0	0	0	0	6120	6140	2936	2944	27.33	27.47	100.00
04/02/2013 12:04:15	1	CO	10	0	0	0	0	6140	6164	2960	2968	27.30	27.48	100.00
04/02/2013 12:04:16	1	CO	11	0	0	0	0	6168	6184	2976	2980	27.38	27.50	100.00
04/02/2013 12:04:16	1	CO	12	0	0	0	0	6096	6116	2912	2916	27.33	27.48	100.00
04/02/2013 12:04:17	1	CO	13	0	0	0	0	6136	6152	2952	2956	27.36	27.50	100.00
04/02/2013 12:04:17	1	CO	14	0	0	0	0	6148	6168	2960	2968	27.34	27.48	100.00
04/02/2013 12:04:18	1	CO	15	0	0	0	0	6084	6112	2892	2896	27.39	27.52	100.00
04/02/2013 12:04:18	1	CO	16	0	0	0	0	6176	6196	3004	3012	27.30	27.44	100.00

Below the table, there are controls for 'Refresh', a dropdown menu set to 'now', and a 'Slot' dropdown set to '1'. At the bottom, there are status indicators: Critical: 2 (red), Major: 0 (grey), and Minor: 1 (yellow). Below these is an alarm log table:

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.8.5 CO > Pair > Current 24 Hours

The Current 24 Hours tab displays the upstream Pair PM information for all the Pairs supported by the MSPAN for the current day. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView interface with the following data:

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013 12:04:41	1	CO	1	0	0	0	78	0	6116	0	2956	0.00	27.52	92.15
04/02/2013 12:04:42	1	CO	2	0	0	0	78	0	6168	0	2980	0.00	27.58	92.15
04/02/2013 12:04:42	1	CO	3	0	0	0	78	0	6100	0	2900	0.00	27.50	92.15
04/02/2013 12:04:43	1	CO	4	0	0	0	78	0	6096	0	2884	0.00	27.55	92.16
04/02/2013 12:04:43	1	CO	5	0	0	0	78	0	6176	0	2976	0.00	27.52	92.16
04/02/2013 12:04:44	1	CO	6	0	0	0	78	0	6112	0	2908	0.00	27.58	92.17
04/02/2013 12:04:44	1	CO	7	0	0	0	78	0	6188	0	3000	0.00	27.55	92.17
04/02/2013 12:04:45	1	CO	8	0	0	0	78	0	6148	0	2940	0.00	27.56	92.18
04/02/2013 12:04:45	1	CO	9	0	0	0	78	0	6140	0	2944	0.00	27.55	92.18
04/02/2013 12:04:46	1	CO	10	0	0	0	78	0	6164	0	2968	0.00	27.52	92.18
04/02/2013 12:04:46	1	CO	11	0	0	0	78	0	6192	0	2988	0.00	27.58	92.18
04/02/2013 12:04:47	1	CO	12	0	0	0	78	0	6120	0	2916	0.00	27.58	92.19
04/02/2013 12:04:47	1	CO	13	0	0	0	78	0	6156	0	2960	0.00	27.50	92.19
04/02/2013 12:04:48	1	CO	14	0	0	0	78	0	6172	0	2976	0.00	27.52	92.20
04/02/2013 12:04:48	1	CO	15	0	0	0	78	0	6112	0	2904	0.00	27.52	92.20
04/02/2013 12:04:49	1	CO	16	0	0	0	78	0	6200	0	3012	0.00	27.50	92.21

Summary: Critical: 2, Major: 0, Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.8.6 CO > Pair > History

The History tab displays the upstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

- 1 The heading section provides summary information for the MSPAN including upstream Pair Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView interface for a CO > Pair configuration. The 'History' tab is active, displaying summary statistics and performance data tables.

Summary Statistics:

Capacity (Kbps):	6104	Rate (Kbps):	2912	Margin (dB):	27.48
Line Voltage (V):	185.08	Current (mAmp):	27.8	Ground Current (mAmp):	0.0
State:	ACTIVE	Remote Pair:	1		

15 Minutes Performance Data:

Ending Time Period	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin ...	EFS (%)
04/02/2013 12:05	0	0	0	0	6096	6116	2912	2920	27.39	27.52	100.00
04/02/2013 12:00	0	0	0	78	0	6116	0	2956	0.00	27.52	89.04

24 Hours Performance Data:

Ending Time Period	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin ...	EFS (%)
04/02/2013	0	0	0	78	0	6116	0	2956	0.00	27.52	92.44

Alarm Log:

Severity	Unit	Entity	Slot	Port	MA ID ...	M. Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1			South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1			South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

Note the highlighted portion of the Pair History screen shown below:



Refresh: This button refreshes the screen counters based on the time interval selected from the drop down box to its right.

Slot: This drop down selection is always "1" on the AK355.

Pair: This drop down selects the Pair to be displayed in the PM counters.

3.3.8.7 RT > DS3

DS3 performance monitoring shows the errors coming INTO the RT unit. Ninety six fifteen minute time period bins and seven 24 hour time period bins display the DS3's performance monitoring. Select Refresh to update screen.

The screenshot shows the AktinoView interface for monitoring a DS3 unit. The main display area is divided into two sections: '15 Minutes' and '24 Hours'. Each section contains a table of performance metrics. Below these tables is a 'Refresh' button and a dropdown menu set to 'now'. At the bottom, there is an alarm summary bar and a detailed alarm log table.

Ingress Cell Count: 0 **Egress Cell Count:** 0

15 Minutes

Ending Time Period	CVL	ESL	SESL	LOSSL	CVP	CVCP	ESP	ESCP	SESP	SESCP	SASP	AISSP	UASP	UASCP	EF5 (%)
04/02/2013 12:05	0	344	344	344	0	0	0	0	0	0	0	0	344	0	0.00
04/02/2013 12:00	0	823	823	823	0	0	0	0	0	0	0	0	823	0	0.00

24 Hours

Ending Time Period	CVL	ESL	SESL	LOSSL	CVP	CVCP	ESP	ESCP	SESP	SESCP	SASP	AISSP	UASP	UASCP	EF5 (%)
04/02/2013	0	1167	1167	1167	0	0	0	0	0	0	0	0	1167	0	0.00

Refresh now

Critical: 2 **Major: 0** **Minor: 1**

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.8.8 RT > MSPAN

The MSPAN tab displays the upstream PM information for the MSPAN. This PM data is separated into three sections:

- 1 The heading section provides summary information for the MSPAN including upstream MSPAN Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries. For more information see Appendix C.

The screenshot shows the AktinoView interface for MSPAN configuration and monitoring. The main window displays summary statistics and two data tables for 15-minute and 24-hour intervals. At the bottom, there is a summary of alarm counts and a detailed alarm log table.

Capacity (Kbps):	109872	Rate (Kbps):	43232	Margin (dB):	27.41	State:	DATA
PSD Mask:	M1	TX Utilization (%):		RX Utilization (%):		2.2 MHz:	NO

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EFS (%)
04/02/2013 12:05	0	0	0	0	109140	109876	43232	43232	27.16	27.42			100.00
04/02/2013 12:00	0	0	0	187	0	110136	0	43232	0.00	27.58			77.28

Ending Time Period	CRC	ES	SES	UAS	Min Capacity	Max Capacity	Min Rate	Max Rate	Min Mar...	Max Mar...	TX Util (%)	RX Util (%)	EFS (%)
04/02/2013	0	0	0	187	0	110136	0	43232	0.00	27.58			84.17

Refresh Slot

Critical: 2	Major: 0	Minor: 1
--------------------	-----------------	-----------------

Severity	Unit	Entity	Slot	Port	MA ID ...	M. Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1			South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1			South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.8.9 RT > Pair > Summary

The RT side, Pair Summary tab displays the upstream Pair Summary information for all the Pairs supported by the MSPAN. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

The screenshot shows the AktinoView application window with the following navigation path: System > Inventory > Provisioning > Alarms > PM > Tools > Diagnostic > License > CO > RT > DS3 > MSPAN > Pair > Summary.

Time Period	Slot	Unit	Pair	Remote Pair	Capacity (kb...)	Rate (kb...)	Margin (...)	Voltage (v)	Line Current (mA)	Ground Current (
04/02/2013 12:06:18	1	RT	1	1	6560	2660	27.38			
04/02/2013 12:06:18	1	RT	2	2	6784	2884	27.36			
04/02/2013 12:06:19	1	RT	3	3	6604	2704	27.31			
04/02/2013 12:06:19	1	RT	4	4	6736	2820	27.31			
04/02/2013 12:06:20	1	RT	5	5	6864	2988	27.27			
04/02/2013 12:06:20	1	RT	6	6	6912	2984	27.42			
04/02/2013 12:06:21	1	RT	7	7	6976	3064	27.39			
04/02/2013 12:06:21	1	RT	8	8	6816	2904	27.30			
04/02/2013 12:06:21	1	RT	9	9	7028	3072	27.42			
04/02/2013 12:06:23	1	RT	10	10	6764	2864	27.31			
04/02/2013 12:06:23	1	RT	11	11	6736	2820	27.34			
04/02/2013 12:06:24	1	RT	12	12	6744	2852	27.27			
04/02/2013 12:06:24	1	RT	13	13	6952	3060	27.30			
04/02/2013 12:06:25	1	RT	15	15	6876	2968	27.31			

Below the table, there is a 'Refresh' button, a dropdown menu set to 'now', and a 'Slot' dropdown menu set to '1'.

Summary of alarm status: Critical: 2, Major: 0, Minor: 1.

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRR	Power B Failed	-	04/02/2013 11:48:08

3.3.8.10 RT > Pair > Current 15 Minutes

The Current 15 Minutes tab displays the upstream Pair PM information for all the Pairs supported by the MSPAN for the last 15-minute interval. The page can be provisioned to refresh automatically, and time-stamp is displayed for each of the entries. For more information see Appendix C.

The screenshot shows the AktinoView interface for device AK355(172.16.10.60). The navigation path is System > Inventory > Provisioning > Alarms > PM > Tools > Diagnostic > License. The current view is CO > RT > DS3 > MSPAN > Pair > Current 15 Minutes.

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...	Max Capacity (k...	Min Rate (kb...	Max Rate (kb...	Mir
04/02/2013 12:06:45	1	RT	1	0	0	0	0	6544	6584	2656	2672	
04/02/2013 12:06:45	1	RT	2	0	0	0	0	6748	6812	2880	2892	
04/02/2013 12:06:46	1	RT	3	0	0	0	0	6552	6648	2696	2712	
04/02/2013 12:06:46	1	RT	4	0	0	0	0	6700	6756	2812	2824	
04/02/2013 12:06:47	1	RT	5	0	0	0	0	6828	6892	2984	2992	
04/02/2013 12:06:48	1	RT	6	0	0	0	0	6880	6932	2972	2996	
04/02/2013 12:06:48	1	RT	7	0	0	0	0	6936	7000	3052	3068	
04/02/2013 12:06:49	1	RT	8	0	0	0	0	6780	6836	2904	2916	
04/02/2013 12:06:49	1	RT	9	0	0	0	0	6980	7040	3064	3080	
04/02/2013 12:06:50	1	RT	10	0	0	0	0	6744	6788	2860	2872	
04/02/2013 12:06:50	1	RT	11	0	0	0	0	6704	6760	2812	2844	
04/02/2013 12:06:51	1	RT	12	0	0	0	0	6712	6780	2848	2860	
04/02/2013 12:06:51	1	RT	13	0	0	0	0	6924	6984	3052	3064	
04/02/2013 12:06:52	1	RT	14	0	0	0	0	7000	7068	3096	3116	
04/02/2013 12:06:52	1	RT	15	0	0	0	0	6852	6900	2964	2980	

Summary: Critical: 2, Major: 0, Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID ...	M.	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1					LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B. Failed	-	04/02/2013 11:48:08

3.3.8.11 RT > Pair > Current 24 Hours

The Current 24 Hours tab displays the upstream Pair PM information for all the Pairs supported by the MSPAN for the current day. The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

Summary | Current 15 Minutes | **Current 24 Hours** | History

Time Period	Slot	Unit	Pair	CS	ES	SES	UAS	Min Capacity (k...	Max Capacity (k...	Min Rate (kb...	Max Rate (kb...	Min Margin (...	Max Margin (...	EFS (%)
04/02/2013 12:10:24	1	RT	1	0	0	0	187	0	6604	0	2808	0.00	27.52	87.07
04/02/2013 12:10:24	1	RT	2	0	0	0	187	0	6812	0	2968	0.00	27.53	87.07
04/02/2013 12:10:25	1	RT	3	0	0	0	187	0	6656	0	2720	0.00	27.59	87.08
04/02/2013 12:10:25	1	RT	4	0	0	0	187	0	6772	0	2840	0.00	27.63	87.08
04/02/2013 12:10:26	1	RT	5	0	0	0	187	0	6904	0	2992	0.00	27.59	87.09
04/02/2013 12:10:26	1	RT	6	0	0	0	187	0	6940	0	3000	0.00	27.58	87.09
04/02/2013 12:10:27	1	RT	8	0	0	0	187	0	6860	0	2920	0.00	27.67	87.09
04/02/2013 12:10:28	1	RT	9	0	0	0	187	0	7060	0	3116	0.00	27.47	87.10
04/02/2013 12:10:28	1	RT	10	0	0	0	187	0	6804	0	2872	0.00	27.48	87.10
04/02/2013 12:10:29	1	RT	11	0	0	0	187	0	6764	0	2844	0.00	27.58	87.11
04/02/2013 12:10:29	1	RT	12	0	0	0	187	0	6796	0	2864	0.00	27.66	87.11
04/02/2013 12:10:30	1	RT	7	0	0	0	187	0	7004	0	3072	0.00	27.61	87.12
04/02/2013 12:10:30	1	RT	13	0	0	0	187	0	7000	0	3108	0.00	27.53	87.12
04/02/2013 12:10:30	1	RT	14	0	0	0	187	0	7084	0	3116	0.00	27.67	87.12
04/02/2013 12:10:31	1	RT	15	0	0	0	187	0	6912	0	2988	0.00	27.52	87.13
04/02/2013 12:10:31	1	RT	16	0	0	0	187	0	7272	0	3320	0.00	27.77	87.13

Refresh | now | Slot 1

Critical: 2 | **Major: 0** | **Minor: 1**

Severity	Unit	Entity	Slot	Port	MA ID ...	M	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				South Wall	LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1				South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

3.3.8.12 RT > Pair > History

The History tab displays the upstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

- 1 The heading section provides summary information for the MSPAN including upstream Pair Capacity, Rate, and SNR Margin values.
- 2 The 15-Minutes section provides PM data for 15-Minute intervals for the last 24-hours.
- 3 The 24-Hours section provides PM data for the previous 7 days.

The page can be provisioned to refresh automatically, and time-stamp information is displayed for each of the entries.

Summary

Capacity (Kbps): 6568 Rate (Kbps): 2668 Margin (dB): 27.34
 State: ACTIVE Remote Pair: 1

15 Minutes

Ending Time Period	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013 12:10	0	0	0	0	6544	6584	2656	2672	27.28	27.50	100.00
04/02/2013 12:00	0	0	0	187	0	6604	0	2808	0.00	27.52	77.28

24 Hours

Ending Time Period	CS	ES	SES	UAS	Min Capacity (k...)	Max Capacity (k...)	Min Rate (kb...)	Max Rate (kb...)	Min Margin (...)	Max Margin (...)	EFS (%)
04/02/2013	0	0	0	187	0	6604	0	2808	0.00	27.52	87.25

Refresh now Slot 1 Pair 1

Critical: 2 Major: 0 Minor: 1

Severity	Unit	Entity	Slot	Port	MA ID ...	M. Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	DS3	1			South Wall	LOS	Loss of Signal	yes	04/02/2013 11:48:10
CR	RT	DS3	1				LOS	Loss of Signal	yes	04/02/2013 11:46:21
MN	CO	COM	1			South Wall	PWRB	Power B Failed	-	04/02/2013 11:48:08

Note the highlighted portion of the Pair History screen shown below:



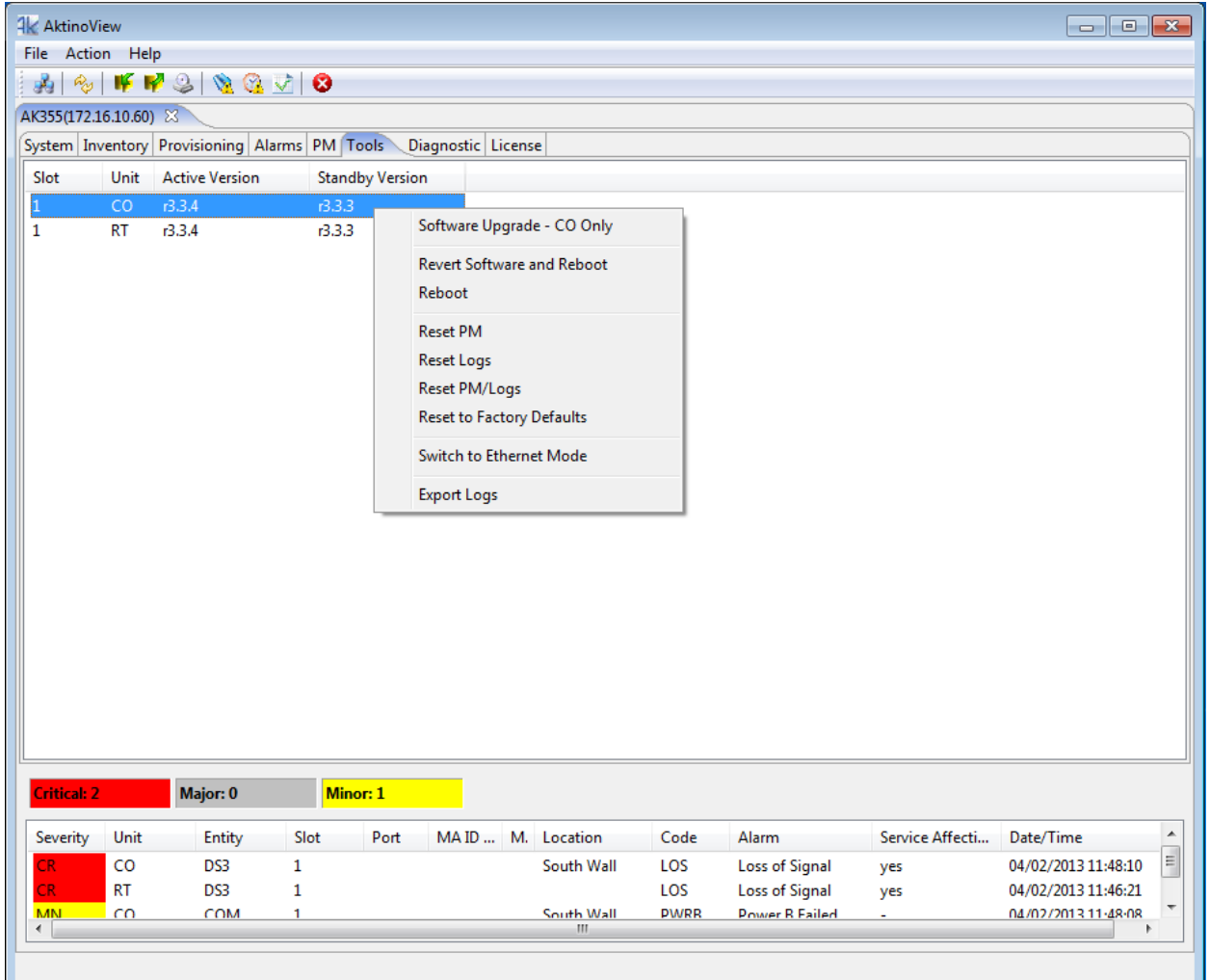
Refresh: This button refreshes the screen counters based on the time interval selected from the drop down box to its right.

Slot: This drop down selection is always "1" on the AK355.

Pair: This drop down selects the Pair to be displayed in the PM counters.

3.3.9 Tools

The Tools tab displays the Active and Standby Firmware versions for each components of the AK355 System.



Right-Clicking on a CO unit allows you to select the following options:

Option	Description
Software Upgrade - CO Only	Upgrades the firmware in the CO Unit only.
Revert Software and Reboot	Reboots the CO unit, and when the unit reboots, the unit selects the firmware version in the Standby partition
Reboot	Reboots the CO unit
Reset PM	Resets only the Performance Monitoring data in the CO unit.
Reset Logs	Resets the Logs in the CO Unit
Reset PM/Logs	Resets the PM and Logs in the CO Unit
Reset System to Factory Defaults	Resets the unit to Factory Defaults
Switch to Ethernet/DS3 Mode	For systems supporting both modes, this option reboots the unit and configures it to come up in the other mode.
Export Logs	Opens a dialog box enabling you to export important system information for analysis by Positron Technical Support.

Right-Clicking on a RT unit allows you to select the following options:

Option	Description
Revert Software and Reboot	Reboots the RT unit, and when the unit reboots, the unit selects the firmware version in the Standby partition
Reboot	Reboots the RT unit
Reset PM	Resets only the Performance Monitoring data in the RT unit.
Reset Logs	Resets the Logs in the RT Unit
Reset PM/Logs	Resets the PM and Logs in the RT Unit
Reset System to Factory Defaults	Resets the unit to Factory Defaults
Switch to Ethernet/DS3 Mode	For systems supporting both modes, this option reboots the unit and configures it to come up in the other mode.

3.3.10 Diagnostic

Diagnostics can be run on the AK355 System. There are two types of tests: Single Ended Loop Test (SELT) and Dual Ended Loop Test (DELT).

3.3.10.1 SELT

Single Ended Loop Test (SELT) provides diagnostics for each pair. Follow this procedure to run SELT:

- 1 SELT is service effecting. The remote unit must be disconnected to run the test.
- 2 The Pairs need to be calibrated. To get distance from the chassis, remove the MSPAN connector from the chassis. If removal of the MSPAN connector is not possible, calibration can be done at any point in the loop, including the MDF. This point will be the start of the Line Length test.
- 3 Click on the Calibrate button to start the calibration process. The Status of the calibration is indicated.
- 4 Connect the pairs back to the Outside Plant. Ensure that the remote unit is NOT connected.
- 5 Click on Start Testing button to run the SELT test. The Status of the SELT test is indicated.

The results can be exported to an Excel csv file by clicking on the Export Test Result button.

The results of the SELT test are indicated below:

Slot	Unit	Pair	Line Length (ft)	Tip To Ground Resistance (ohms)	Ring To Ground Resistance (ohms)	Tip To Ring Resistance (ohms)
1	CO	1	0	Open	Open	259008.0
1	CO	2	0	326666.0	Open	259008.0
1	CO	3	0	326666.0	Open	259008.0
1	CO	4	0	Open	Open	259008.0
1	CO	5	0	326666.0	Open	259008.0
1	CO	6	0	326666.0	Open	259008.0
1	CO	7	0	Open	Open	259008.0
1	CO	8	0	Open	Open	259008.0
1	CO	9	0	Open	Open	259008.0
1	CO	10	0	Open	Open	259008.0
1	CO	11	0	326666.0	Open	259008.0
1	CO	12	0	326666.0	Open	259008.0
1	CO	13	0	Open	Open	259008.0
1	CO	14	0	Open	Open	259008.0
1	CO	15	0	Open	Open	259008.0
1	CO	16	0	Open	Open	259008.0

Severity	Unit	Entity	Slot	Port	MA ID / MEG ID	MEP ID	Location	Code	Alarm	Service Affecti...	Date/Time
CR	CO	MSPAN	1				West Wall	LOS	Loss of Signal	yes	04/14/2013 16:33:48
MN	CO	PAIR	1	10			West Wall	OPENCKT	Open Circuit	-	04/14/2013 16:33:48

For each pair, the following test results are available:

- Line Length. This is the physical line length, it is AWG agnostic. If there are large differences in the line length of the pairs, it indicates possibly a short, open, ground fault, or bridge tap. If the pair is open in the middle of a loop, the length will indicate where it exists.
- Tip to Ground Resistance. Ring to Ground Resistance. Tip to Ring Resistance. The results should show "Open" for all pairs since the remote is not connected. If there is resistance on any pair, this indicates that there may be a problem.

3.3.10.2 DELT

Dual Ended Loop Test (DELT) provides diagnostics for each pair. Follow this procedure to run DELT:

- 1 DELT is service effecting. The remote unit must be connected to run the test.
- 2 Click on Start Testing button to run the DELT test. The Status of the DELT test is indicated.
- 3 The results can be exported to an Excel csv file by clicking on the Export Test Result button.

The results of the DELT test are indicated below:

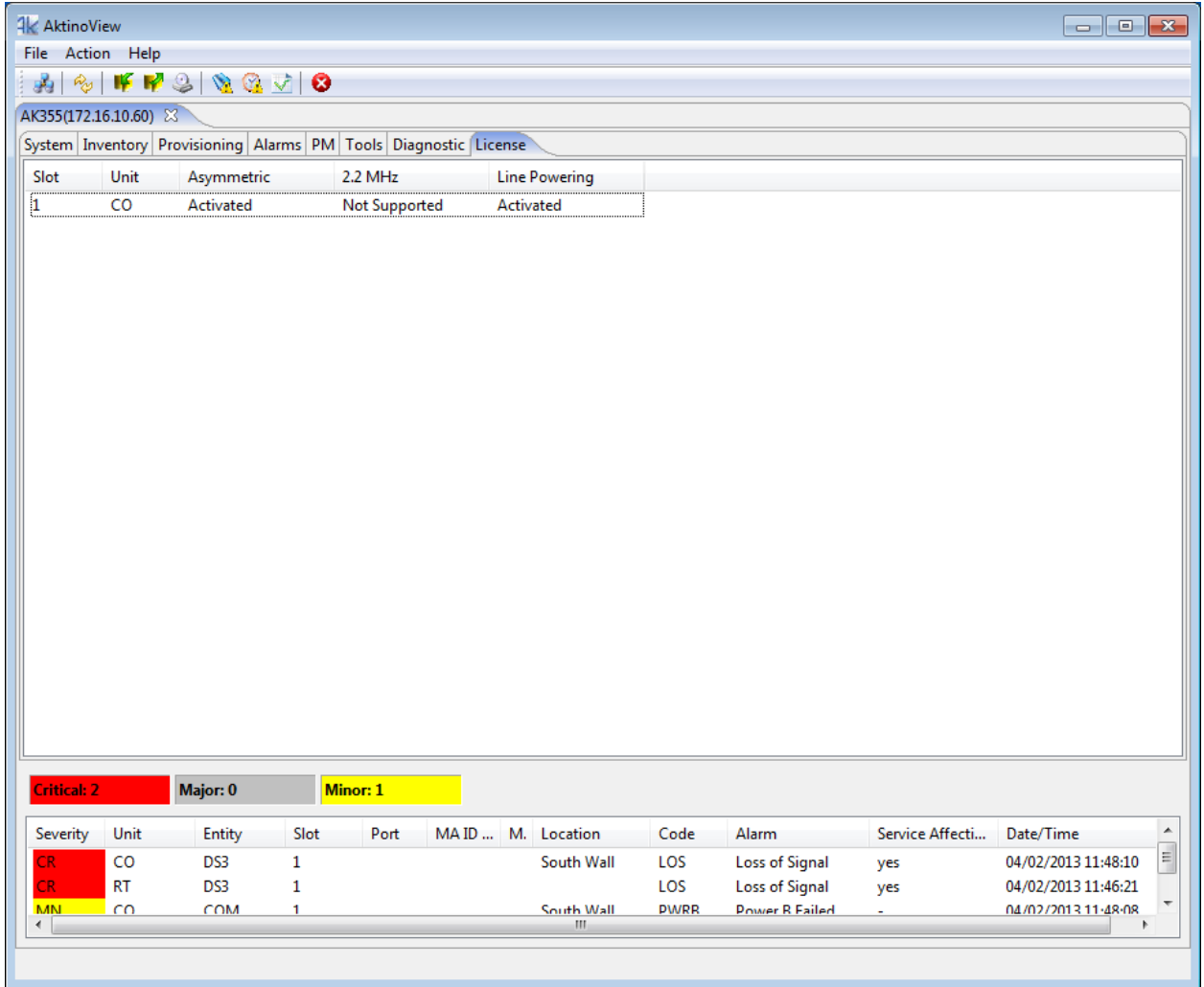
The screenshot shows the AktinoView software interface. The main window displays a table of DELT test results for 16 CO units. The table has columns for Unit, Pair, and 32 individual T and R values (T1-R16, T2-R16). The status is 'Completed'. Below the table, there are buttons for 'Export Test Result' and 'Start Testing', and a status indicator showing 'Completed'. At the bottom, there are summary boxes for 'Critical: 0', 'Major: 0', and 'Minor: 1', along with an alarm log table.

Unit	Pair	T1	R1	T2	R2	T3	R3	T4	R4	T5	R5	T6	R6	T7	R7	T8	R8	T9	R9	T10	R10	T11	R11	T12	R12	T13	R13	T14	R14	T15	R15	T16	R16
CO 1	1	23.6	24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 2	2	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 3	3	0.0	0.0	0.0	0.0	23.2	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 4	4	0.0	0.0	0.0	0.0	0.0	0.0	23.2	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 5	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 6	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 7	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 8	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.2	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 9	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.2	24.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 10	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 11	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 12	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CO 13	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	24.4	0.0	0.0	0.0	0.0	0.0	0.0	
CO 14	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	24.4	0.0	0.0	0.0	0.0	
CO 15	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.8	24.2	0.0	0.0	0.0	
CO 16	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	24.2	0.0	

For each pair's tip and ring, the current in milliamps is indicated on itself and between that pair and every other pair being used in the AK355 System. The screen shot above shows a normal result. There should be current flowing between Pair1 and T1and R1, between Pair 2 and T2 and R2. The current flow numbers should be close in value. Large differences in the current flow values indicate a problem with that pair. No current should be flowing between pairs. If there is current flowing between pairs, this indicates a problem with those pairs, possible a short.

3.3.11 License

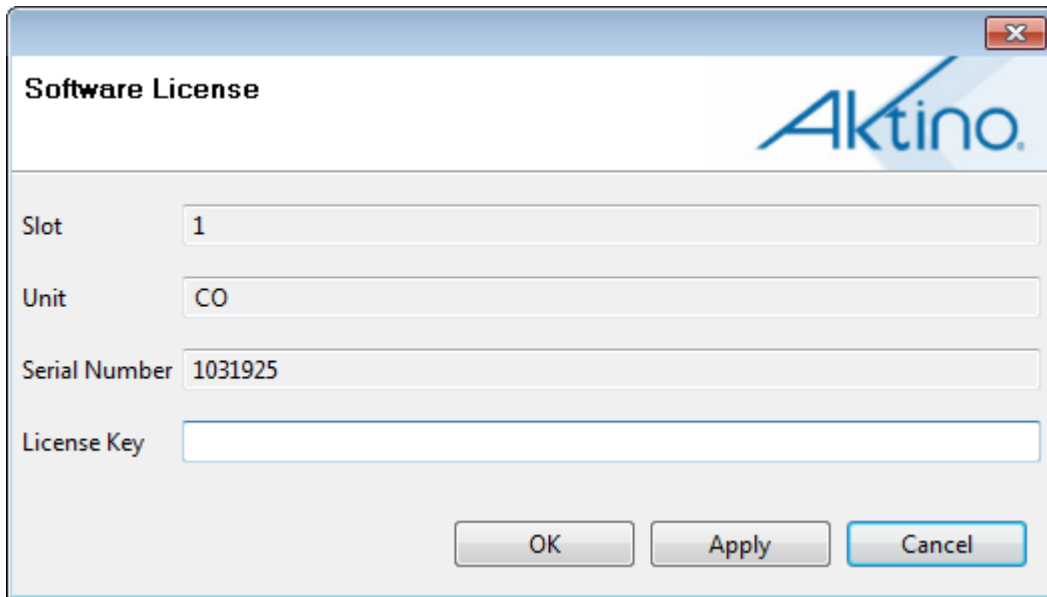
The License tab displays the features that are activated for the various units of the AK355 System.



See the following table for the Features and Values pertaining to the screen above:

Feature	Values
Asymmetric, 2.2 Mhz, Line Powering	Activated - This feature is activated on the selected slot Not Activated - This feature is not activated on the selected slot Not Supported- This features is not supported on the selected slot

Click on the CO unit to bring up the Software License dialog box.



The screenshot shows a 'Software License' dialog box with the Aktino logo in the top right corner. The dialog contains the following fields and values:

Field	Value
Slot	1
Unit	CO
Serial Number	1031925
License Key	

At the bottom of the dialog are three buttons: 'OK', 'Apply', and 'Cancel'.

Contact customer service to find out more about how to obtain licenses. For the AK355, only the Line Powering license is available for purchase.

Chapter 4

Technical and Regulatory Specifications

4.1 AK355 Technical Specifications

System

- Bandwidth over 16 pairs:
DS3 **: 45 Mbps Asymmetric or Symmetric at CSA Reaches with Full Disturbance.
Ethernet: 100 Mbps Symmetric at 4 Kft 100 Mbps Asymmetric, 55 Mbps Symmetric at CSA Reaches with Full Disturbance.
- System Latency: 2 ms
- Resiliency: Carrier Grade Automatic Pair Failure Protection
- BER: 10^{-12}

Standard Interfaces: DS3**

- Number of BNC Ports: 2 Per Card
- Line Code/Rate: B3ZS/44.736 Mbps \pm 20 ppm
- Framing: C-bit Parity or M13
- Payload Mode: Clear Channel, TDM, ATM, Scrambled ATM,
- Timing: Internal or Line

Standard Interfaces: Ethernet

- Interfaces: Three 10/100BaseT RJ45 and one 100 BaseFX or 1000BaseX SFP port
- Compliance: IEEE 802.3

Outside Plant Pairs

- Technology: MIMO on DMT
- Number of pairs: 2 to 16
- Connector: 50-pin Telco
- Compliance: T1.417 (Spectral)
- IEEE 802.3

Management Interfaces

- 10/100T RJ45

Front Panel Indicators

- Status, Fuse, Fan Alarm, Battery A/B Alarm, SFP Status, Ethernet Link and Activity
- Outside Plant Pair Status (16)

Layer 2 Features

- VLAN Tagging: IEEE 802.1q Support
- Stacked VLAN Tagging
- Priorities: IEEE 802.1p, Port, or IP DSCP
- Dynamic Bridging: 8K MAC Addresses
- Metro Ethernet Forum Certified (MEF9, MEF14)

Electrical Specifications

- AK355CP and AK355CP E units
 - Power Input: -42 to -56.7 Vdc
 - Max Heat Dissipation: 65 Watts
- AK355R and AK355R E units
 - Line Powered by CO Unit or
 - Local Power Input: -42 to -56.7 Vds
 - Max Heat Dissipation: 60 Watts
 - Provides 48 Vdc, 15 Watt output
- AK355CPS Unit
 - Line Powered by the AK355RP Unit
 - Local Power Input: -42 to -56.7 Vdc
 - Max Heat Dissipation: 60 Watts
 - 48Vdc output
- AK355RP Unit
 - Power Input: -42 to -56.7 Vdc
 - Max Heat Dissipation: 65 Watts

Environmental Specifications

- Operating Temperature: - 40 to + 65° C
- Storage Temperature: - 40 to +70° C
- Relative Humidity: Up to 95%, Non-condensing

Mechanical

- Chassis Dimensions: 1.75" (45 mm) High (1RU) x 17.2" (437 mm) Wide x 10.5" (267 mm) Deep
- Weight: Approximately 10 lbs (4.50 kg).

Alarm Contacts

- Critical, Major, Minor, SysID
- Alarm-Cutoff Pushbutton
- Auxiliary alarm inputs (2)

Network Management

- TL1, SNMP
- EMS or AktinoView
- DS3 ATM Inband Management**
- Ethernet VLAN Inband Management

Regulatory Approval

- NEBS
- UL60950
- FCC Part 15 Class A

*24 AWG copper pair

**AK355 System supporting DS3

Chapter 5

Maintenance

5.1 **AK355 Fans and Filters**

The fans for the AK355 Systems should be replaced as needed. Ordering information for fans can be found at the end of this document.

The filters for the systems should be replaced every six months. Care should be taken when replacing filters to ensure collected dust on the filters does not enter into the equipment. Ordering information for filters can be found at the end of this document.

Chapter 6

Safety and Warnings

Safety and Warnings

To ensure your safety when servicing and installing this equipment, please take the following precautions:

A 7.5 to 10A UL listed use/circuit breaker must be installed ahead of this unit in the end use building installation.

A fuse panel must be installed near the unit in accordance with the National Electrical Code so that it is accessible to the operator.

A fuse panel must be provided as part of the building installation wiring in order to provide a UL required disconnect point.

The Positron products accept -48Vdc for powering. The -48Vdc voltage range must be between -42.5Vdc to -56.5Vdc.

Be careful when installing or modifying telephone lines; dangerous voltages can be present. It is unsafe to install telephone wiring during a lightning storm.

Only qualified personnel should service this system.

The equipment must be connected to a protective ground in accordance with the instructions provided in this manual. Improper grounding may result in an electrical shock.

Follow local grounding practice to ensure a good frame ground connection to the Positron chassis. The frame ground is required for secondary voltage protection.

For performance and safety reasons, only power supplies listed for use with telephone equipment by a locally recognized organization should be used with Positron equipment.

All wiring external to the product should follow the local wiring codes.

Use of this product in a manner other than defined in this installation guide may cause damage to equipment or injury to personnel.

If a problem has been isolated to this unit, do not attempt to repair. The unit's components are not user serviceable and therefore must not be replaced. Please return the unit to Positron for repair.

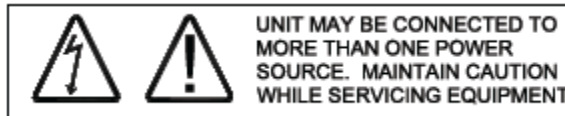
All fuses on the unit are located in non accessible areas and are not field serviceable. Please return the unit to Positron for repair.

Observe local practice electrostatic discharge precautions when handling electronic equipment. Do not hold electronic plugs by their edge. Do not touch components or circuitry. Use a grounding wrist strap attached to grounding connection point on the left side of the chassis. Use only ESD-protective packaging materials when transporting equipment.

Care should be taken when installing in a closed or multi-unit rack to ensure that the maximum operating ambient temperature of 65°C (149°F) is not exceeded.

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Connect the unit only to a properly rated supply circuit. Reliable earthing (grounding) of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).



During installation and service do not connect the chassis to a live power source. Ensure that fuses are removed from the fuse panel.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: AK355 & AK5000 Product Family 3 Document 180-0037-001 R06A

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This product is intended for installation in Restricted Access Locations only.

Mounting of equipment in a rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

The Positron Multi Pair span interface is designed to coordinate with a standard 300 Vdc gas discharge tube protector. Carbon block protectors shall not be used. The 300Vdc gas tube protector shall have the performance characteristics as follows:

- DC Breakdown Voltage (Max.) 475 V @ 2000V/sec
- Impulse Breakdown Voltage (Max.) 650 V max @ 100 V/μsec

NOTE: If line powering is enabled, voltage on MSPAN pairs is either -135Vdc or -185Vdc.

The effective capacitance of the units between the connection points for the conductors of the tip and ring is 46.2uF. The effective capacitance of the units between the connection point for one conductor of tip or ring and earth is 0.25uF.

At the time of installation, a system assessment shall be carried out to ensure that the effective capacitance of the total system, including the capacitance of the equipment, does not exceed the values specified in Figure 2 of UL60950-21.

At the time of installation, it shall be checked that the voltage rating of the wiring of the telecommunication network is adequate for the normal Positron unit's circuit voltage, together with superimposed transients.

At the time of installation it shall be checked that all multi-pair span circuits to be connected together are all RFT-V circuits. In practical terms as all equipment supplied by Positron only uses RFT-V circuits, then it should be checked that the multi-pair span of Positron equipment is not connected to any other vendor's equipment.

WARNING: The intra-building ports of the equipment are suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building ports of the equipment **MUST NOT** be metallically connected to interfaces which connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

Chapter 7

Warranty and Customer Service

Positron will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found in your Positron customer web portal:

<http://portal.positronaccess.com/login.asp>

Positron Sales Pricing/Availability

+1-949-258-0545

Positron Technical Support

Pre-Sales Applications/Post-Sales Technical Assistance:

+1-949-258-0545

7days/week, 24 hours/day

Positron Repair

Return for Repair/Upgrade:

+1-949-258-0545

<http://ticketmaster.positronaccess.com/>

Repair and Return Address

Contact Customer Service prior to returning equipment to Positron.

Positron Access Systems, Inc.

4931 Birch Street

Newport Beach CA 92660

Chapter 8

Positron Products

Positron Products (AK355)

Part Number	Description
AK355C	AK355 CO Unit, DS3/Ethernet, 45Mbps DS3 or up to 100Mbps Ethernet at CSA, Local Powered
AK355C P	AK355 CO Unit DS3/Ethernet, 45Mbps DS3 and up to 100Mbps Ethernet at CSA, with Line Power Option
AK355C E	AK355 CO Unit, Ethernet Only up to 100Mbps at CSA, Local Powered
AK355C PE	AK355 CO Unit, Ethernet Only up to 100Mbps at CSA, with Line Power Option
AK355CPS	AK355 CO Unit, DS3/Ethernet, 45Mbps DS3 and up to 100Mbps Ethernet as CSA, Local Powered or Line Powered
AK355CPS E	AK355 CO Unit, Ethernet Only up to 100Mbps at CSA, Local Powered or Line Powered
AK355R	AK355 RT Unit, DS3/Ethernet, 45Mbps DS3 and up to 100Mbps Ethernet at CSA, Local Powered or Line Powered
AK355RP	AK355 RT Unit DS3/Ethernet Unit, 45Mbps DS3 and up to 100Mbps Ethernet at CSA, with Line Power Option
AK355R E	AK355 RT Unit, Ethernet Only up to 100Mbps at CSA, Local Powered or Line Powered
AK355RP E	AK355 RT Unit, Ethernet Only up to 100Mbps at CSA, with Line Power Option
AK355RPT	AIR AK355 Regenerator, DS3/Ethernet
AK355RPTRC	AIR AK355 Regenerator, DS3/Ethernet, Reverse Line Powered
AK355RPT E	AIR AK355 Regenerator, Ethernet Only
AK355RPTRC E	AIR AK355 Regenerator, Ethernet Only, Reverse Line Powered
AK355TR	AK355 Tracer Card
AK355NTE00	AK355 Self Contained DS3/Ethernet Network Termination Unit
AKCOPS	AK355 CO Unit Power Supply, Universal Input, -48Vdc Output 320W
AKRTPS	AK355 RT Unit Power Supply, Universal Input, -48Vdc Output 130W
AK300FAN	Fan Asy, Spare AK300/355/555
AK300FL6	AK355 Air Filter (6-Pack)
AK300CON	AK355 Connector Kit

Appendices

Appendix A:

System Software Upgrade

Proceed through the following steps to perform the System Software Upgrade:

Note: All MSPAN connections must be up.

- 1 Go to <http://www.positronaccess.com>
- 2 Select Partners > Partner Login.
- 3 Select the **Registered Users Click Here to Login** option if you are already a registered user.

Note: If you are not a registered user, select the **Partner Portal Request Form** option and allow 24-48 hours for your account to be setup.

- 4 Enter Name and Password into the **FileMan Login** dialog box located on the Customer/Partner Portal.
- 5 Select **Firmware - Unified General Release AK355**.
- 6 Select the appropriate software version.
- 7 Select the corresponding self-extracting .exe file and store the file in the place of your choice on your PC.
- 8 Extract the files from the self-extracting .exe file to a location of your choice.
- 9 Go to the tool bar and select Action Menu > System Software Upgrade... This will bring up the System Software Upgrade dialog box.
- 10 Select the system you want to upgrade and then click on the **Upgrade** button.
- 11 Select the folder with the firmware files created in step 8 and click the **OK** button.
- 12 Select **Yes** to switch and reboot after upgrade if you choose to upgrade immediately. Otherwise, you can switch and reboot manually later.
- 13 Select **OK** to confirm the selected system(s) will be upgraded to the desired version.

The system will begin the process of upgrading the system. Note that this process will take a few minutes. The RT's will be the first to reboot followed by the CO's.

Appendix B:

System Alarm Information

Alarm	Entity	Severity	Alarm Description
Loss of Signal	PAIR	MN	The Circuit Pair signal is lost
Short Circuit	PAIR	MN	The Circuit Pair is shorted
Open Circuit	PAIR	MN	The Circuit Pair has been disconnected
Ground Fault	PAIR	MN	The Circuit Pair has been shorted to ground
Loss of Signal	MSPAN	CR	Loss of signal (LOS) is a condition where the received signal drops below threshold due to an obstruction
Loss of Frame	MSPAN	CR	LOF indicates that the CO Unit is attempting to sync up with the RT Unit
SNR Margin Below Margin Threshold	MSPAN	MN	The obtained SNR margin is below the configured SNR margin
Line Powering Failure	MSPAN	CR	Not enough cable pairs have been provisioned for the MSPAN or the overall cable distance is too long for Line Power
Equipment Failure	EQPT	CR	Generated when the system cannot communicate with line powering subsystem
Mismatched Equipment	EQPT	CR	Generated when software version on CO Unit is different than Software version on RT. The data path will be down in this condition
Mismatched Hardware	EQPT	CR	CO Unit's Interface does not match the RT Unit's Interface (DS3/Ethernet mismatch)
High Temperature	COM	MN	Triggered when the temperature is 85 degrees Celsius or above, once set the alarm is cleared after the temperature falls below 80 degrees Celsius
Power A Failed	COM	MN	No power detected on power input A
Power B Failed	COM	MN	No power detected on power input B

Alarm	Entity	Severity	Alarm Description
Environmental Alarm 1	COM	MN	Alarm detected from Alarm Connections
Environmental Alarm 2	COM	MN	Alarm detected from Alarm Connections
Fan Failure	FAN	MN MJ	Minor Alarm if one fan fails, Major Alarm if more than one fan fails
Improper Fan Removal	FAN	MJ	Fan Module cannot be detected
Link Down	ETHERNET	NA	No Ethernet equipment detected
Loss of Signal	DS3	CR	No DS3 signal from the attached equipment
Loss of Frame	DS3	CR	Loss of DS3 framing
Rate Below Configured Rate Threshold	MSPAN	NA	Capacity below configured rate. Not enough cable pairs have been provisioned or the overall cable distance is too long for the desired data rate
Alarm Indication Signal	DS3	NA	An alarm indication signal (AIS) is a valid framed signal with payload containing a repeating 1010 pattern is present
Remote Alarm Indication	DS3	NA	Remote Alarm Indication detected
Local Loopback	DS3	NA	Unit is in Local Loopback mode
Line Loopback	DS3	NA	Unit is in Line Loopback mode
Clock Change	EQPT	NA	System time has been changed
System Reboot	COM	NA	System rebooted or was powered on

Appendix C:

System MSPAN Error Information

MSPAN Errors	Description
CRC Error	A CRC is a way of identifying if data was received error free. Transmitted data is divided into blocks that are appended with 1 or 2 CRC bytes that are derived from the original data. The receiver re-computes the CRC bytes from the received data and if there is a mismatch, it signifies that there was a mismatch between the transmitted and received data
MSPAN ES	An Errored Second is any second in which the MSPAN incurs a CRC error
MSPAN SES	A Severely Errored Second is and second in which the MSPAN exceeds 18 CRC errors or has suffered an LOF event
MSPAN UAS	An Unavailable second is any second in which the MSPAN is in LOS or LOF and has experienced 10 MSPAN SES's in a row (in which case 10 SES shall be subtracted from the UAS total)
Pair CS	Any second during which a correctable error occurred, i.e. an error occurred during transmission, but the Reed Solomon (RS) error protection mechanisms was able to detect and correct it
Pair ES	An Errored Second is any second that has at least one CRC error
Pair SES	A Severely Errored Second is any second that has more than 18 CRC errors
Pair UAS	An Unavailable Second is any second with an LOS (Loss of Signal), LOF (Loss of Frame), or 10 SES in a row (in which case 10 shall be subtracted from the SES total)