POSITRON
Access Solutions

AK355 System

Installation and User's Guide

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AK355/AK355 E System
Installation and User's Guide

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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.

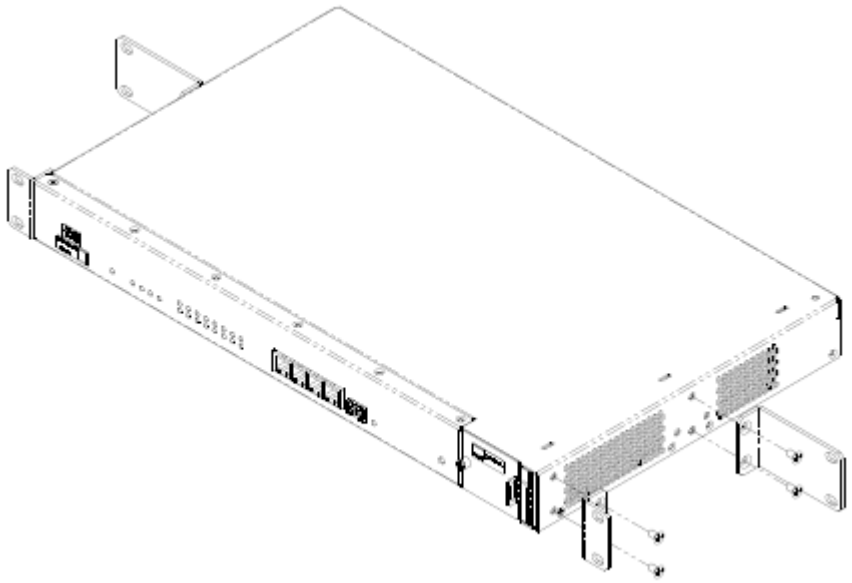


Figure 1 Flange Wall Mounting

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.

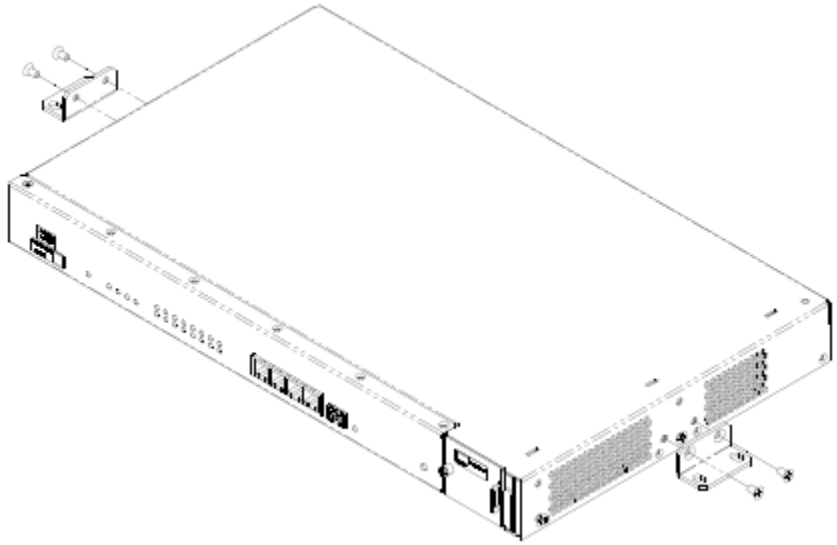


Figure 2 Wall Mounting

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.

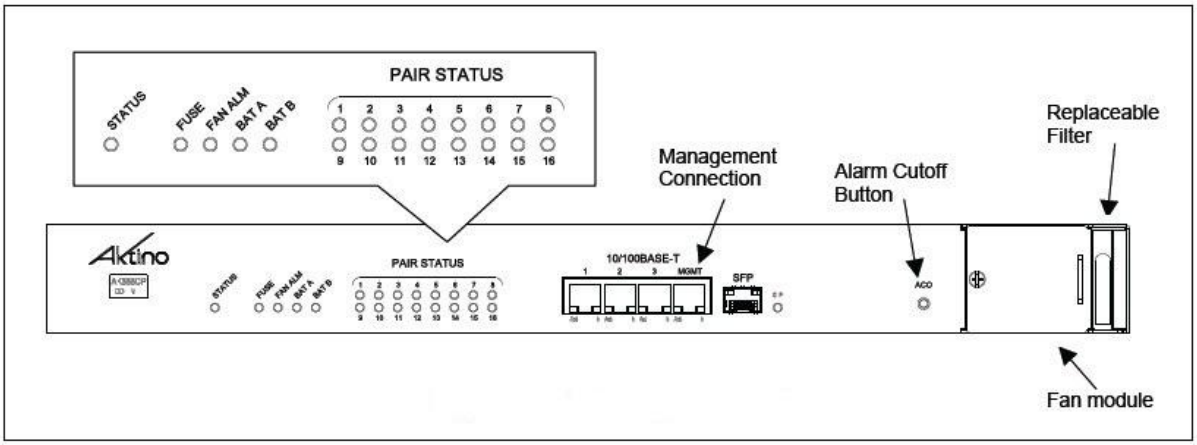


Figure 3 AK355 Front View

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	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. 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.

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.

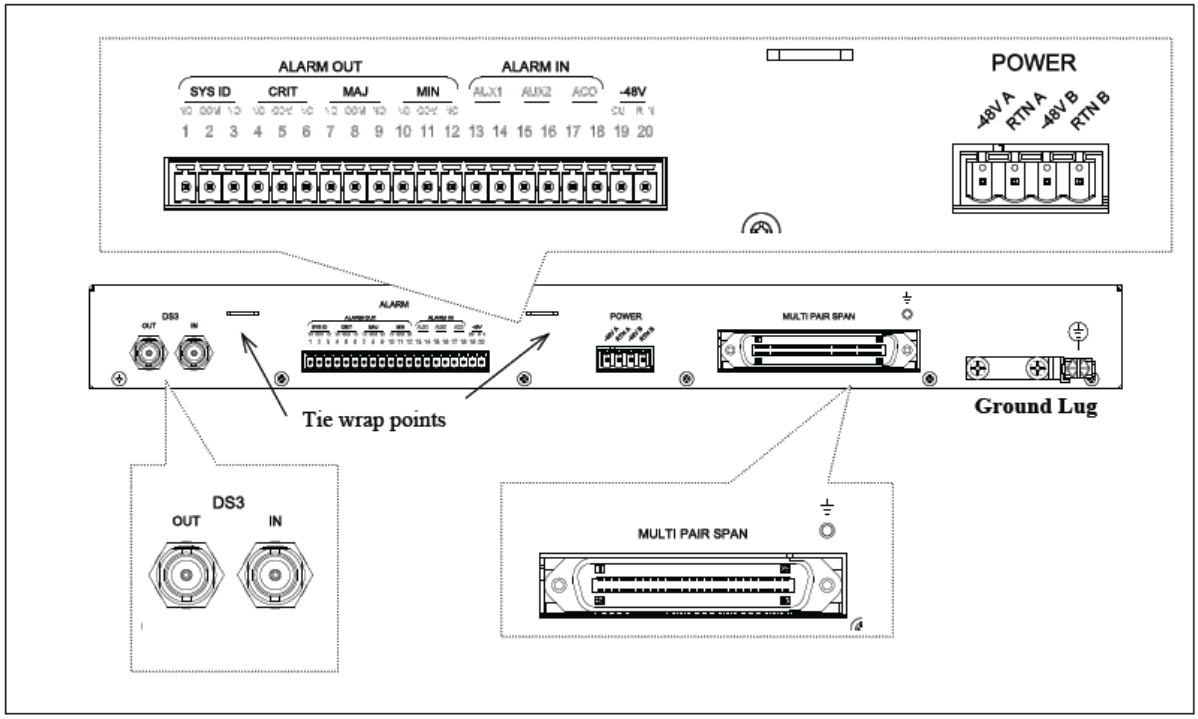


Figure 4 AK355 Rear View

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).

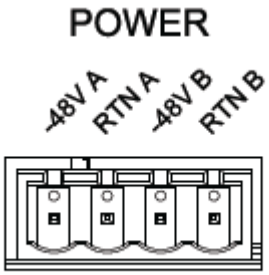


Figure 5 Power Connector

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

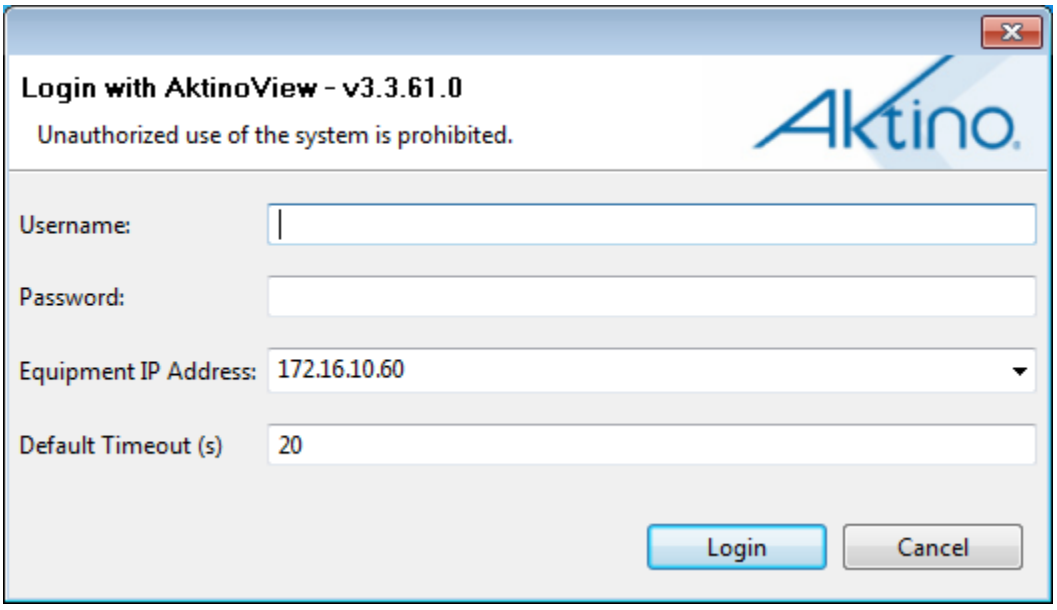
To install AktinoView proceed through the following:

- 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:



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.

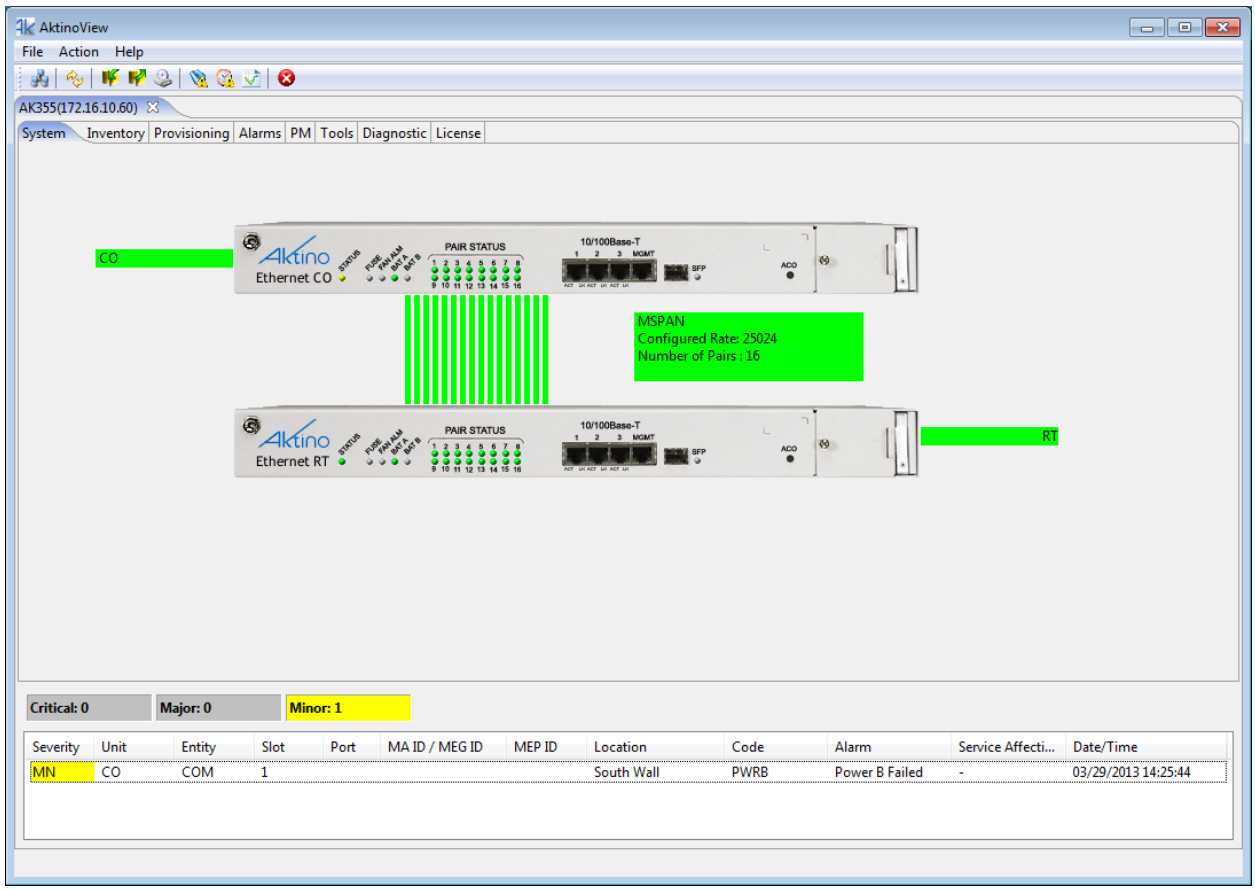
Help Menu

The Help Menu provides one option:

About: Displays the AktinoView software version information.

AktinoView provides Quick-Launch buttons for all the menus:

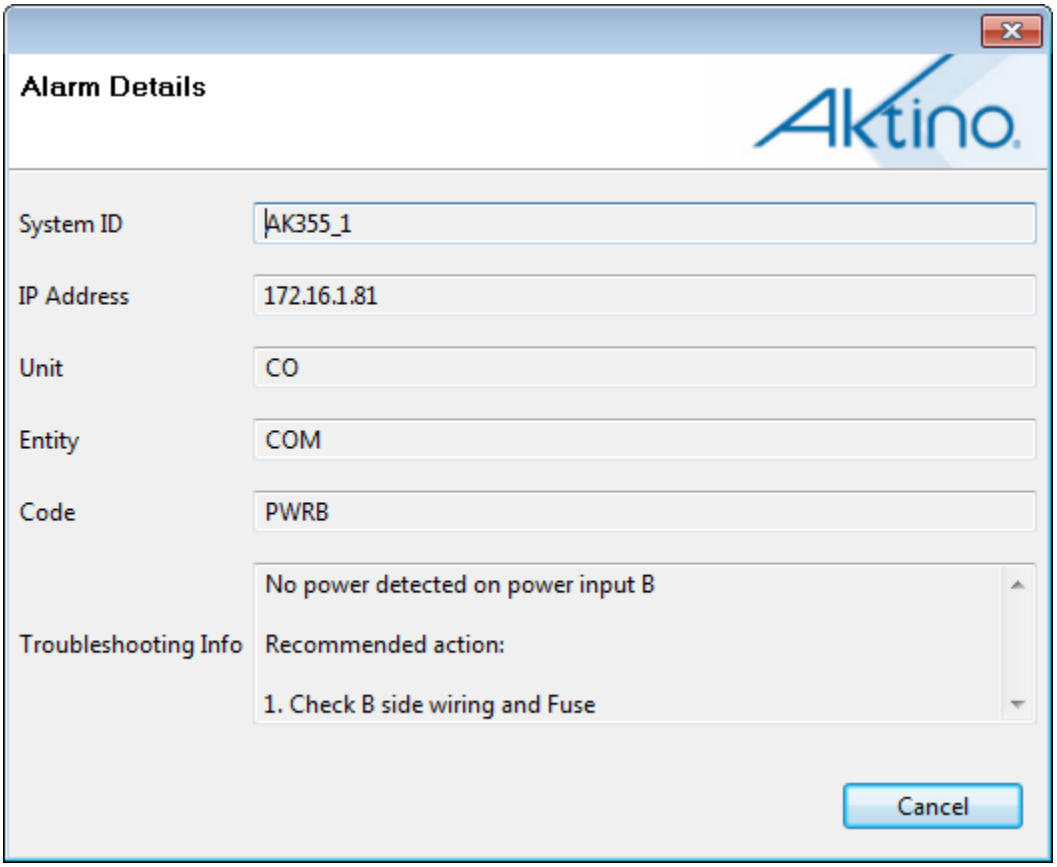
Under the Menus and Quick-Launch buttons, AktinoView displays a tab for all the systems currently being managed. Each tab will display the System Name and IP address of the selected system.



.

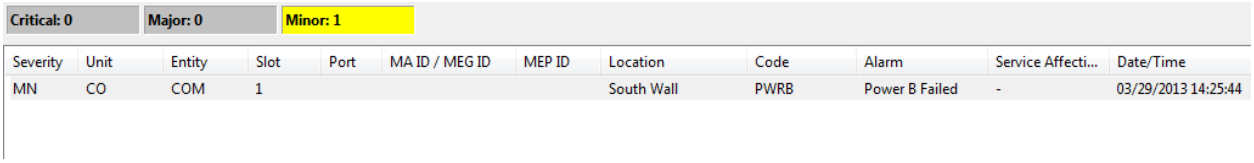
When AktinoView connects to a given system, it will display several additional tabs appropriate for the selected system. In this case, AktinoView displays the following tabs for the system in Ethernet mode: System, Inventory, Provisioning, Alarms, PM, Tools, Diagnostic, and License.

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.



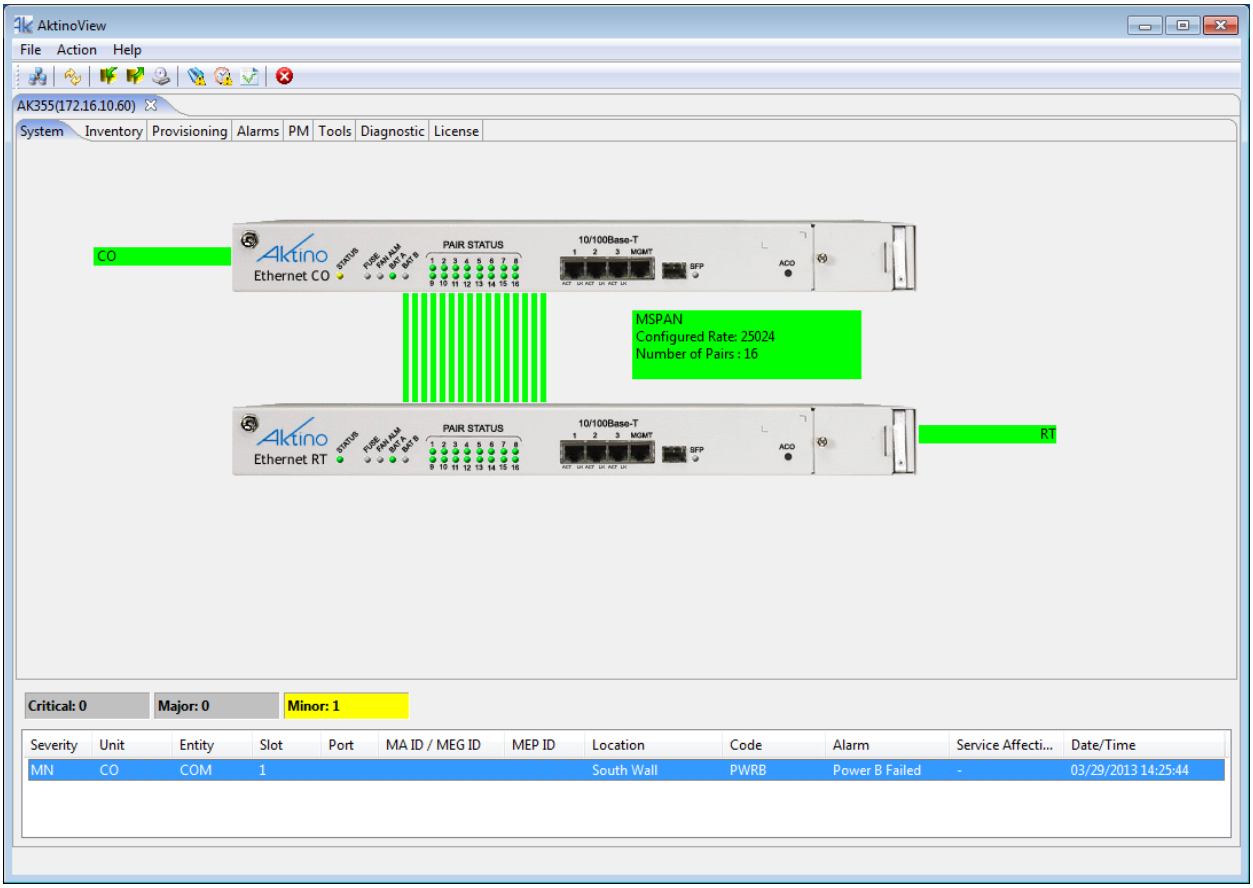
Alarm Details

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.



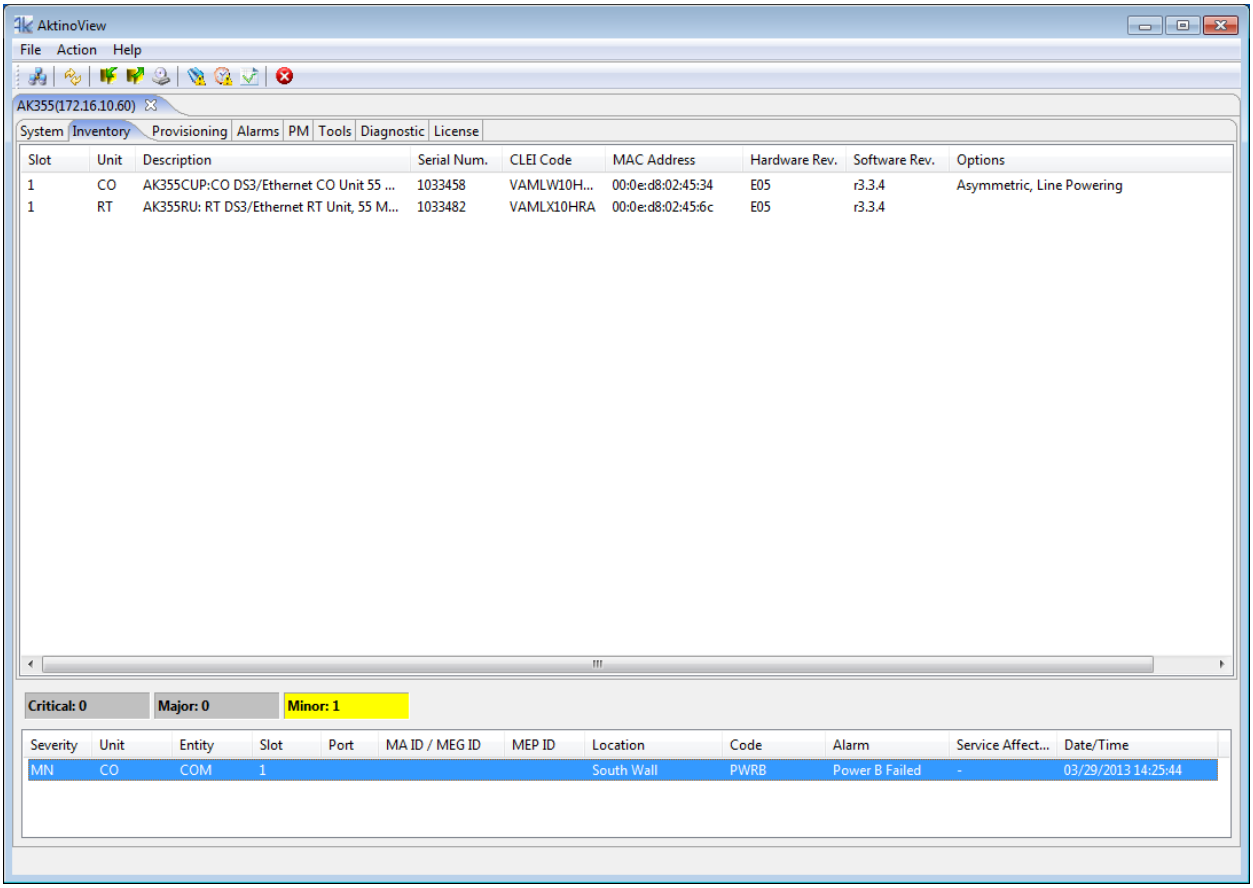
2.3.4 System

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:

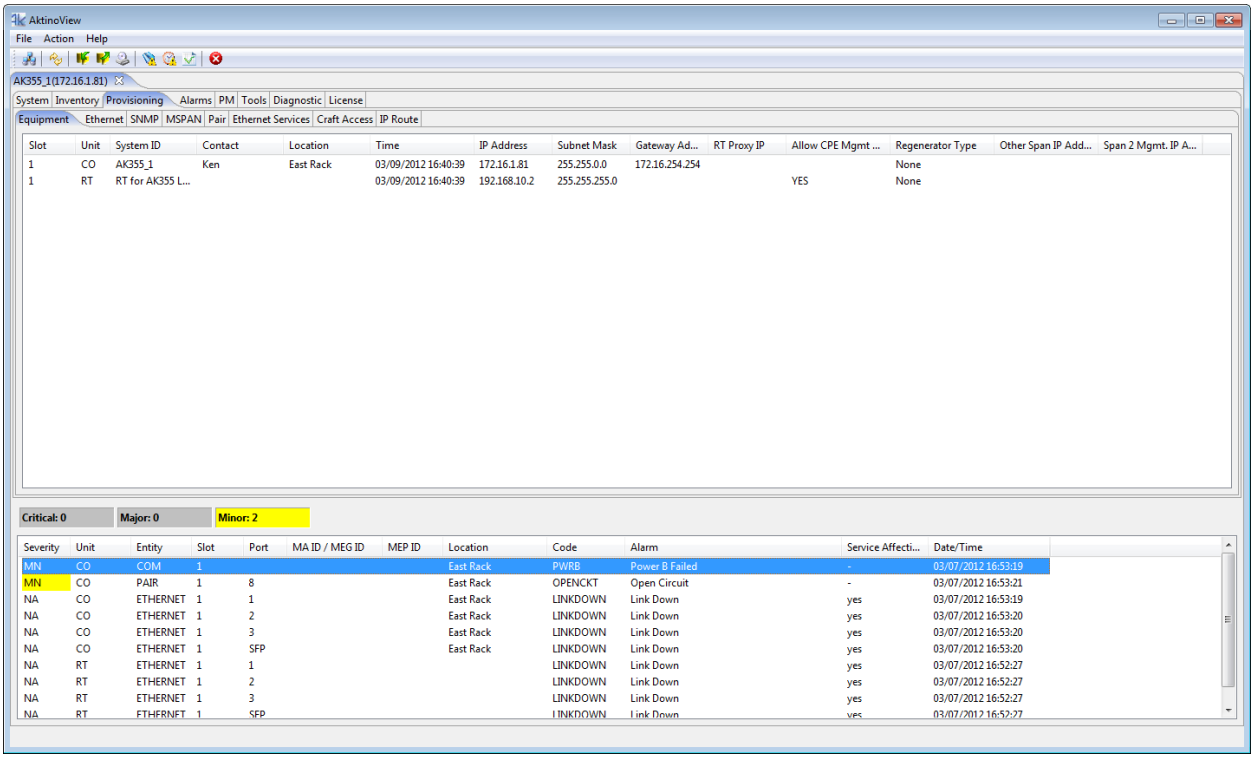
Parameter	Values
Slot	Slot number
Unit	Location
Description	Detailed description
Serial	Serial Number
CLEI Code	Telcordia assigned CLEI code
MAC Address	MAC Address for the device
Hardware Rev.	Hardware Revision Level
Software Rev.	Software Revision Level
Options	Asymmetric: Support for Asymmetric Mode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

2.3.6 Provisioning

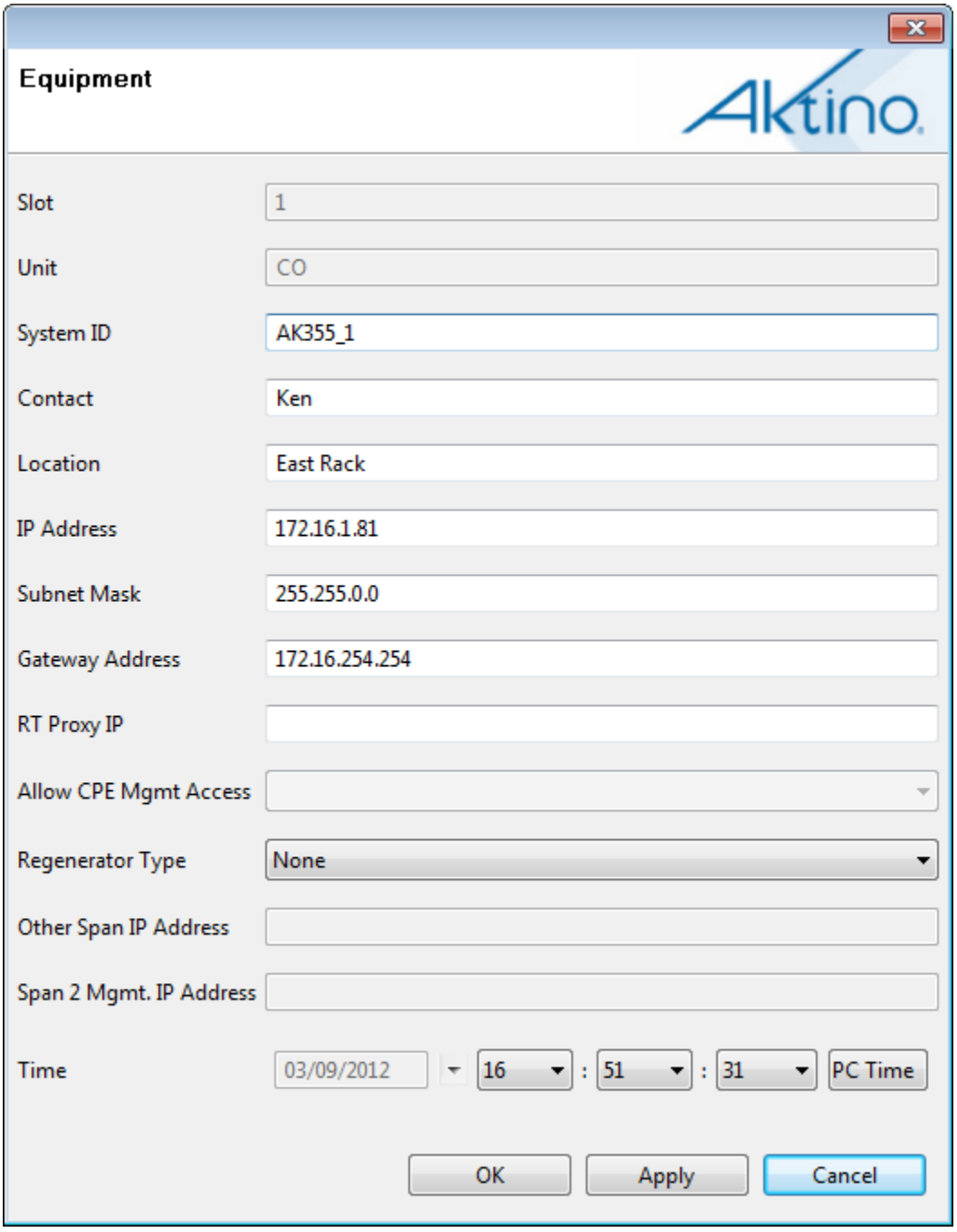
Clicking the Provisioning tab displays all the provisioning sub-sections supported by the system.

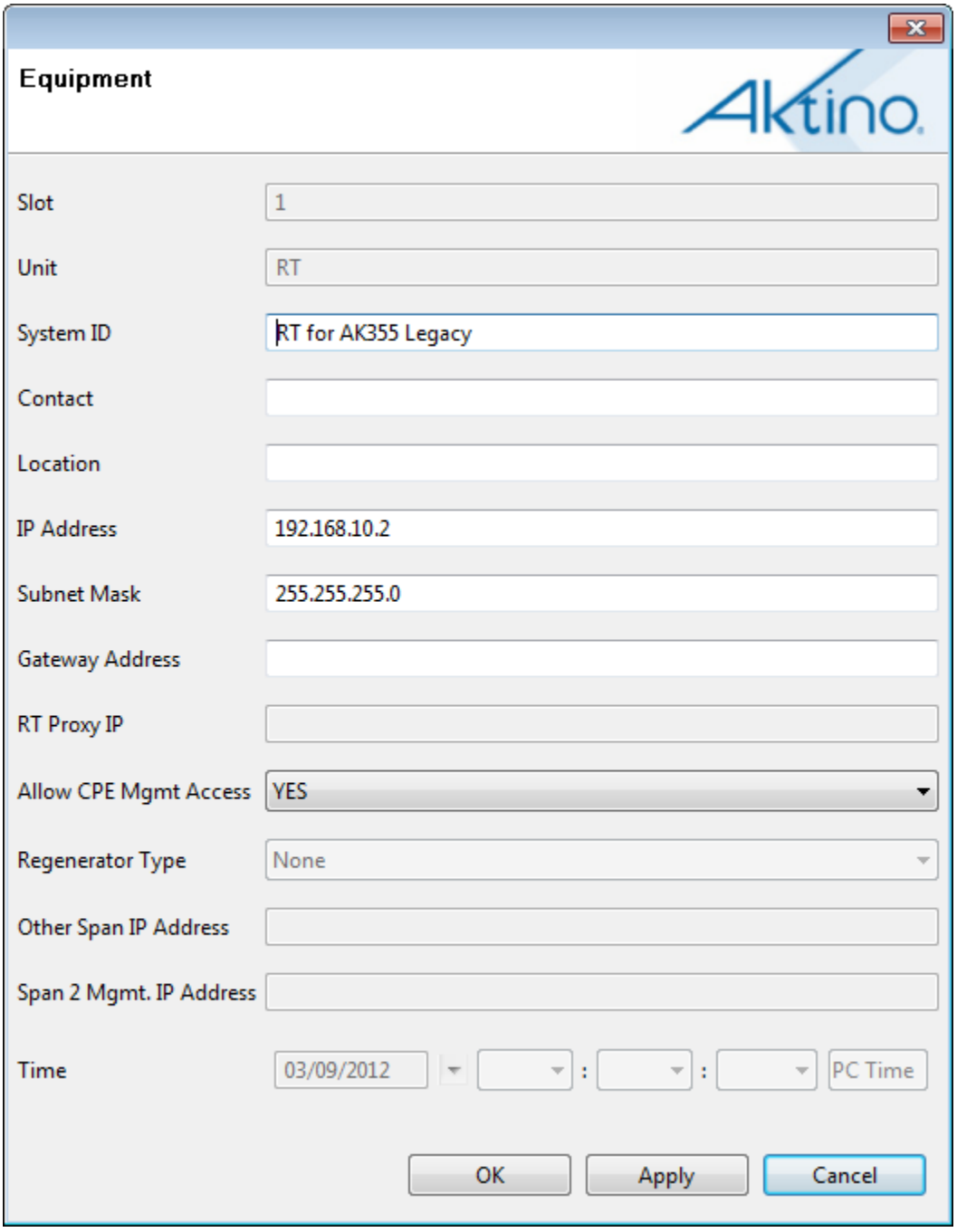
2.3.6.1 Equipment

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
Aktino
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
Aktino
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

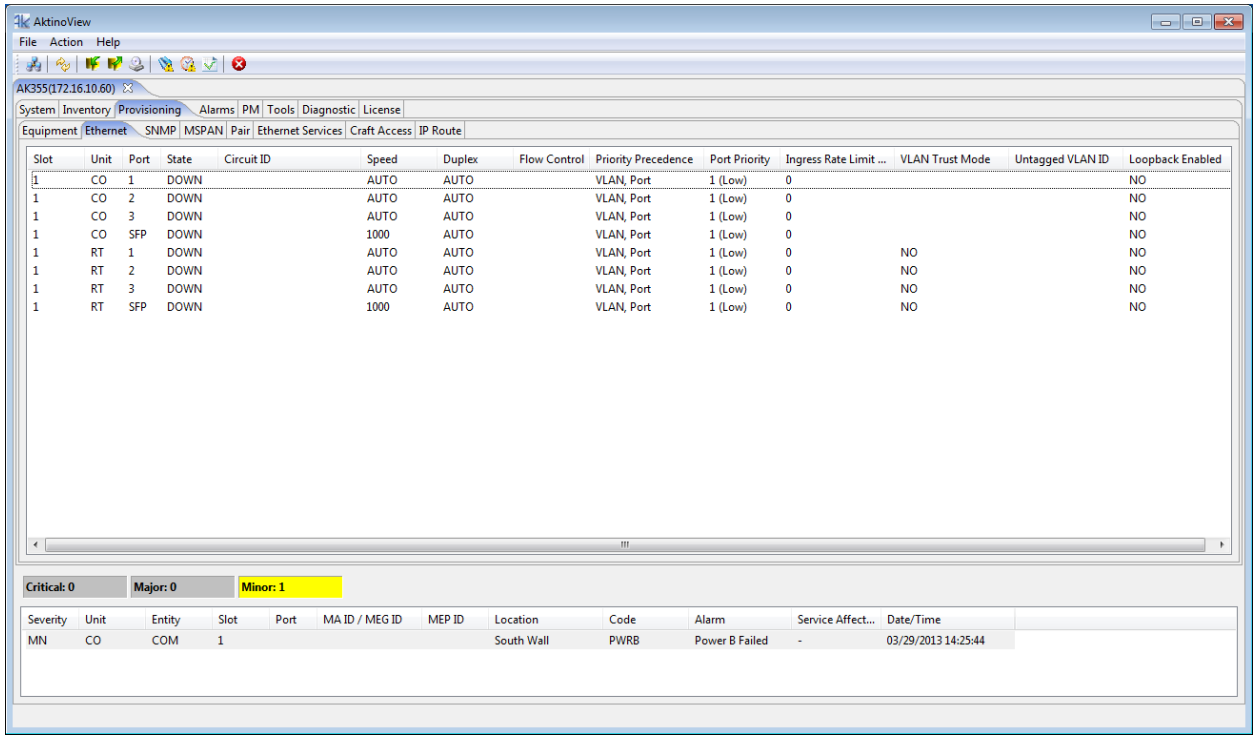
See the following tables for Parameters and Values:

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)

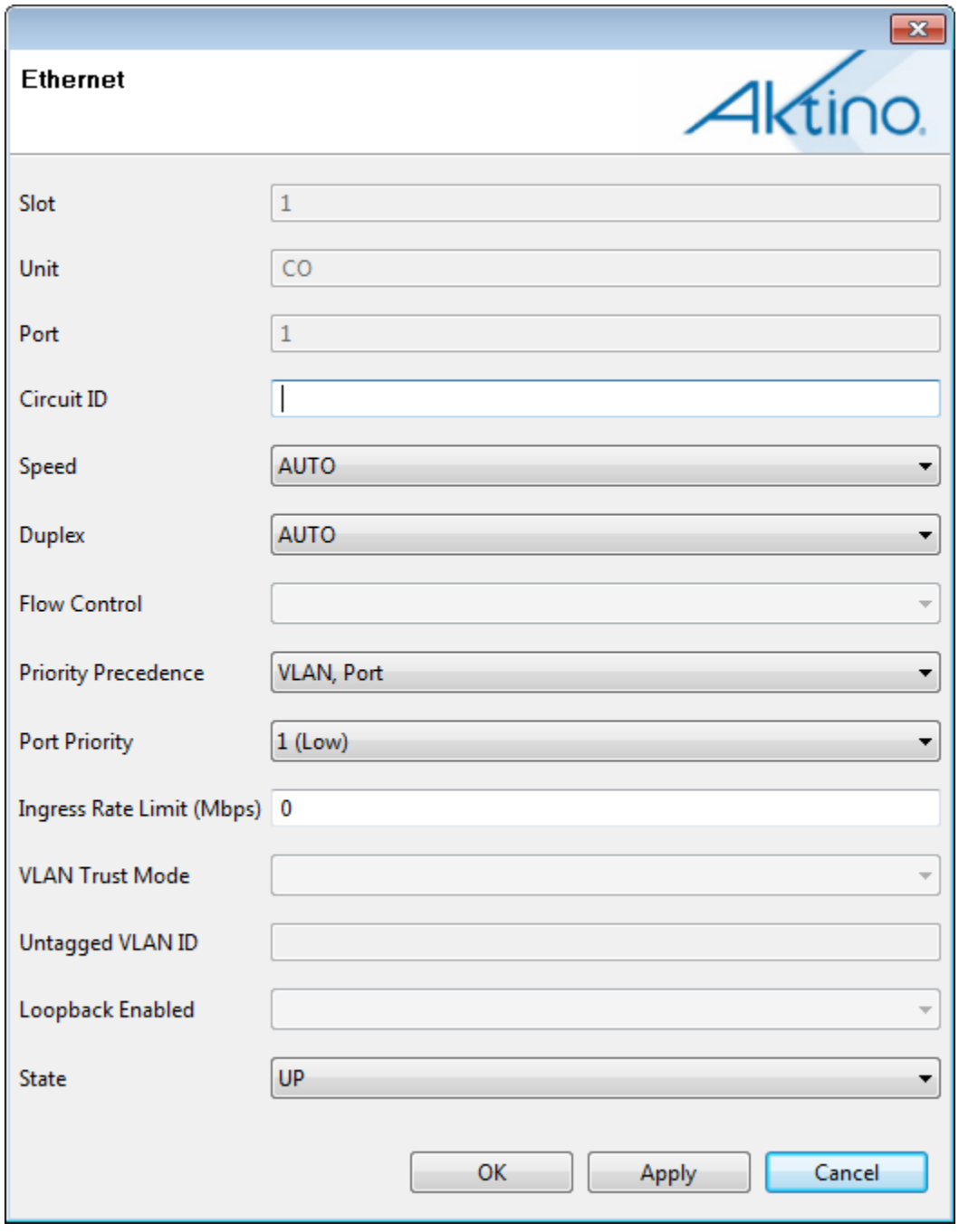
AK355R Equipment Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
IP Address	IP Address of the unit
Subnet Mask	Subnet Mask of the unit
Gateway Address	Gateway Address 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.

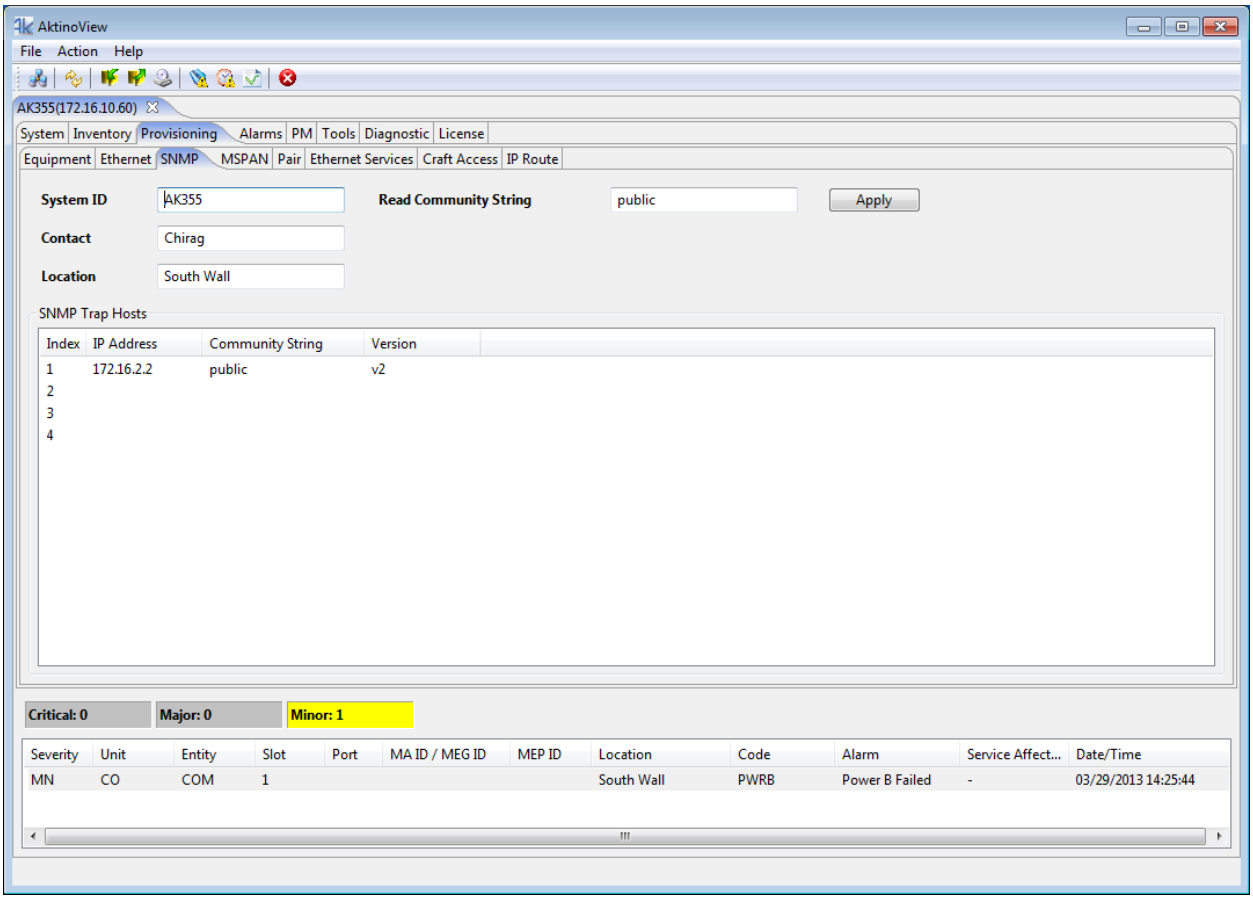


See the following table for the Parameters and Values:

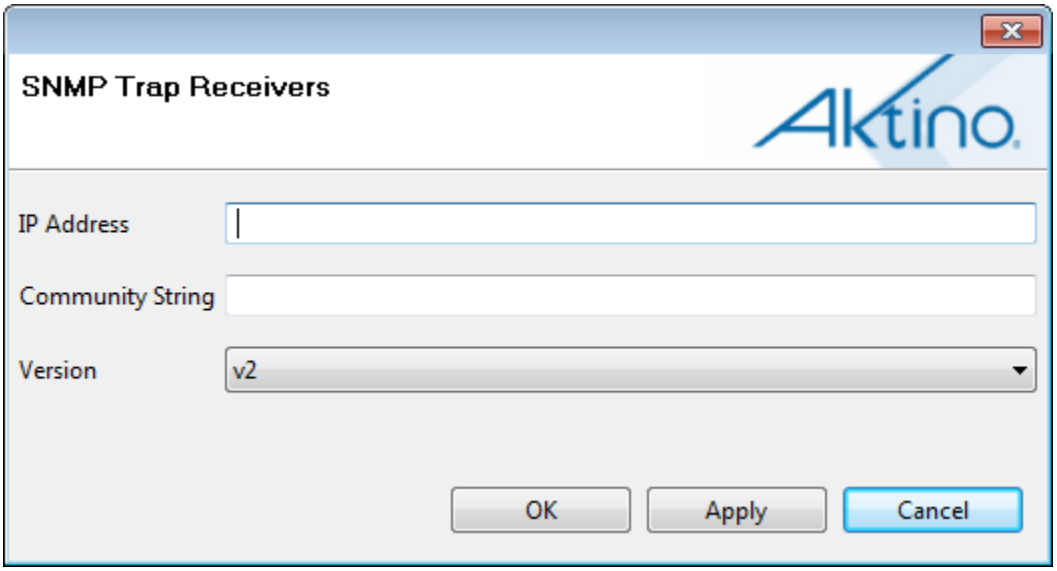
Ethernet Parameters	Values
Circuit ID	User configurable string of up to 48 characters
Speed	Sets the Ethernet Speed for the selected port
Duplex	Sets the Ethernet Duplex for the selected port
Priority Preference	Sets the Priority Ranking for ingress Ethernet data to: VLAN, DiffServ, Port VLAN, Port DiffServ, 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:

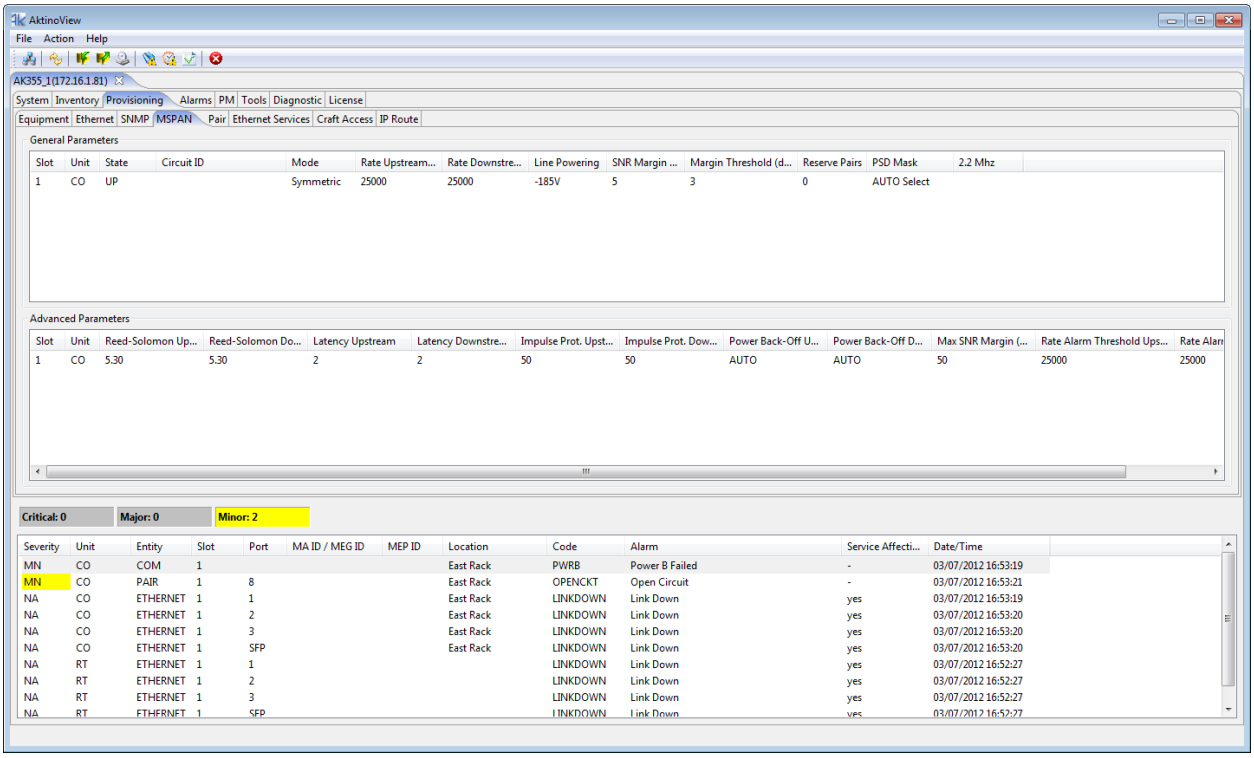
SNMP Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
Read Community String	The SNMP Read Community String for the AK355 System

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)

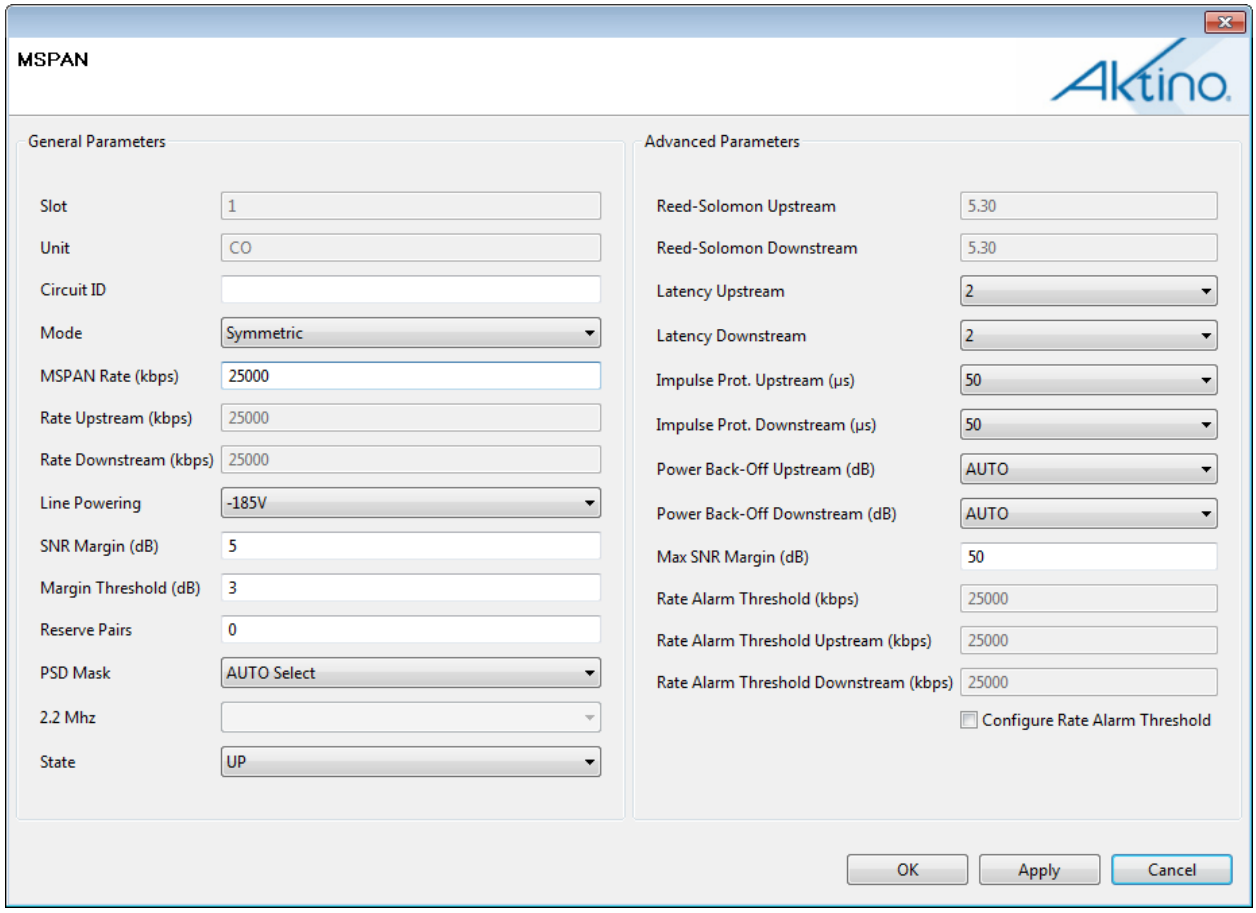
2.3.6.4 MSPAN

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.



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.



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

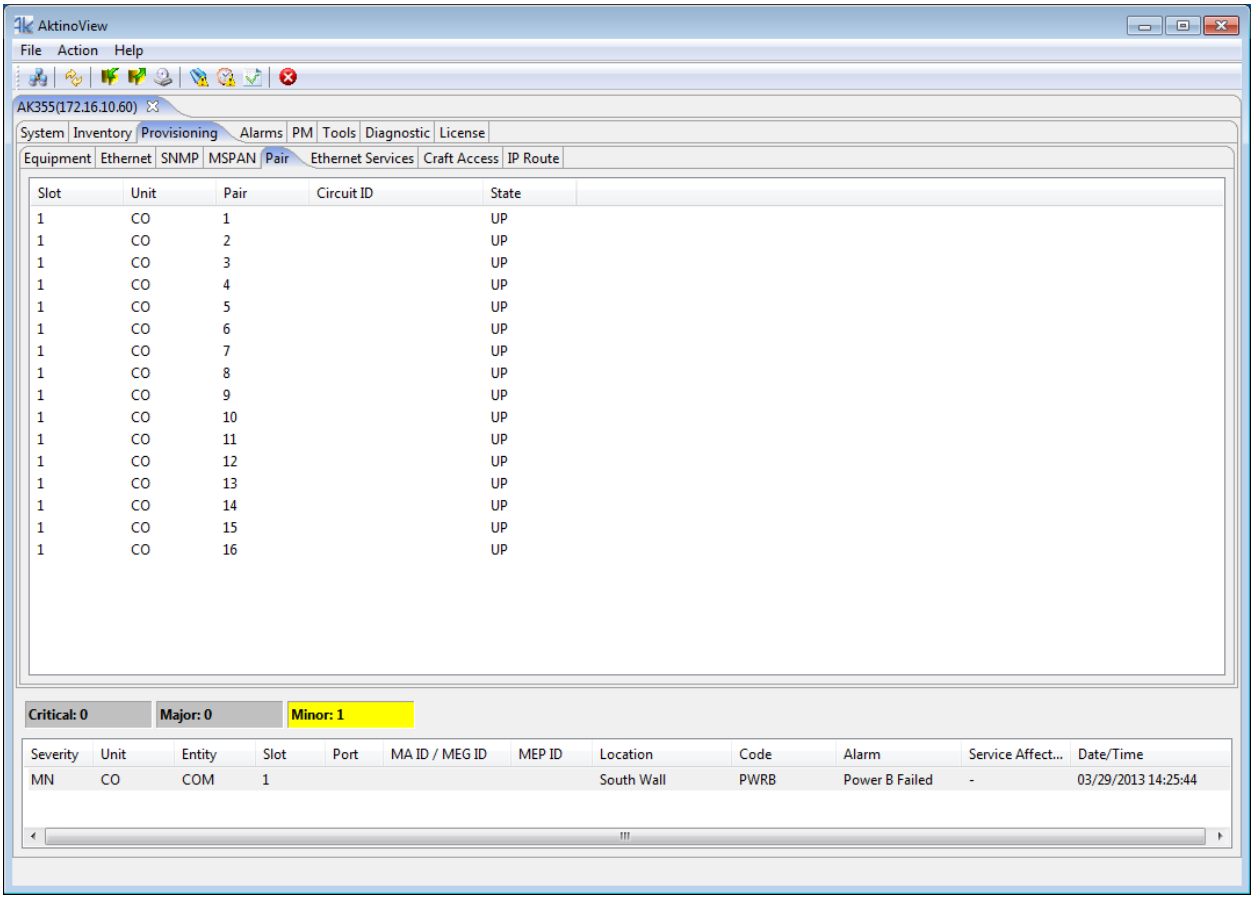
PSD Mask	Best for Loop Lengths (24 AWG)
M1	0 to 8667 feet
M2	8667 to 12667 feet
M3	12667 to 15333 feet
M4	15333 to 18000 feet
M5	Greater than 18000 feet

See the following table for Advanced Parameters and Values:

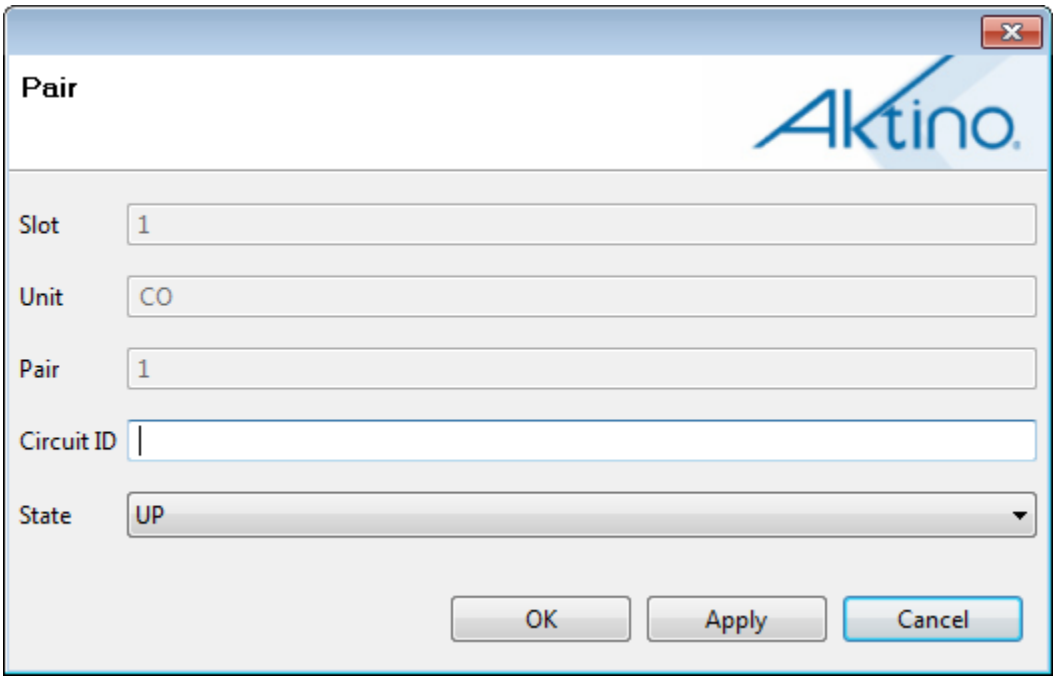
MSPAN Advanced Parameters	Values
Reed-Solomon Upstream	Calculated Reed-Solomon Overhead percentage Upstream: RS% = 2 * INP / Latency
Reed-Solomon Downstream	Calculated Reed-Solomon Overhead percentage Downstream: RS% = 2 * INP / Latency
Latency Upstream	Sets the Upstream Latency: 0, 1, 2, 4, 8, 12, 16, 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 µsec
Impulse Protection Downstream	Length of Downstream Impulse Noise Protection: 50, 125, 250, 500, 750, 1000, 2000, 4000 µsec
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:



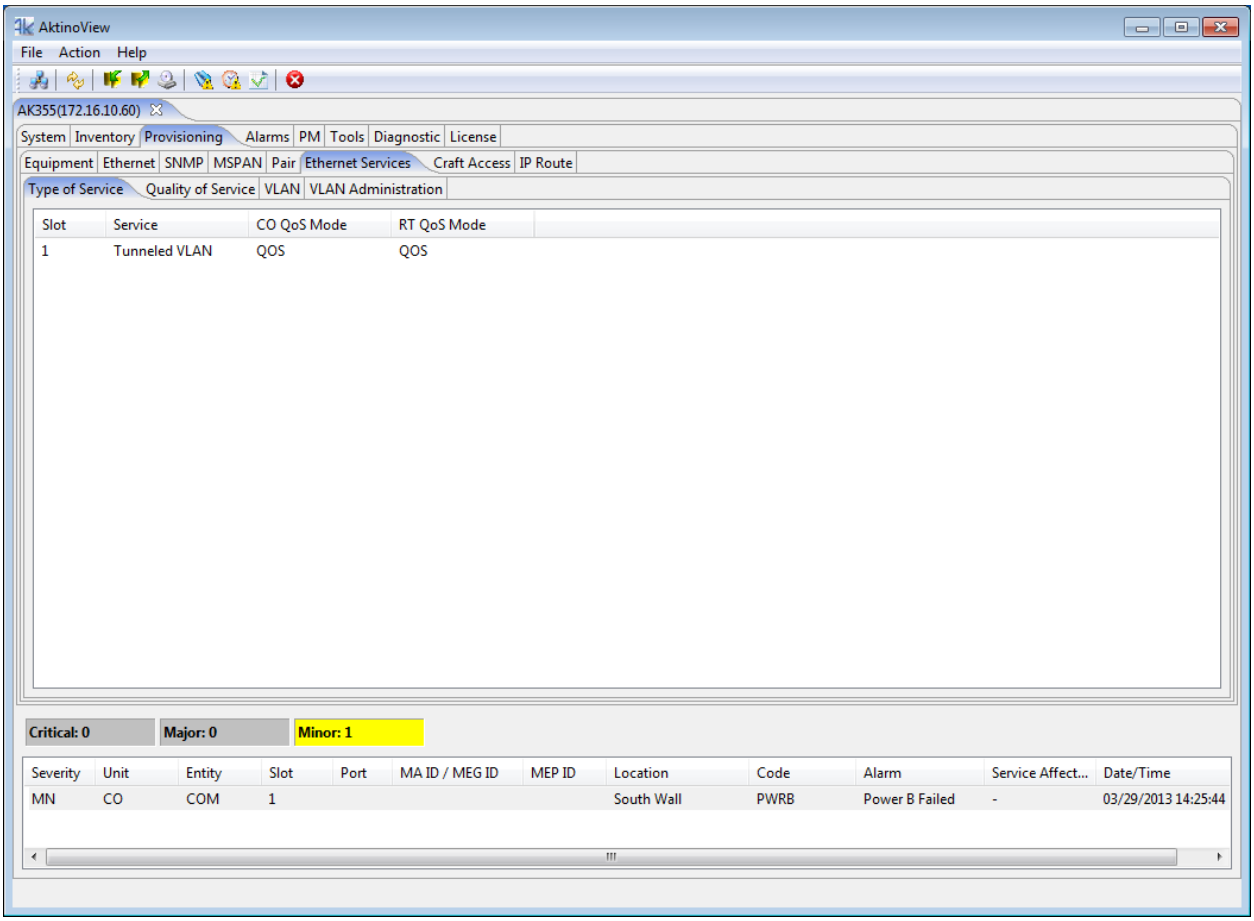
See the following table for Pair Provisioning Parameters and Values:

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

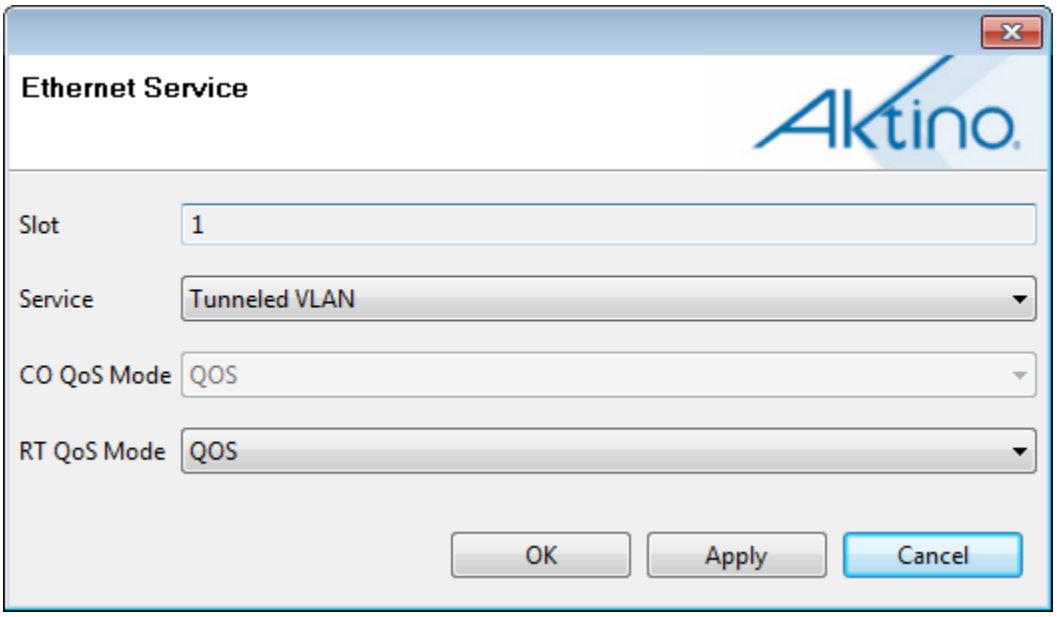
2.3.6.6 Ethernet Services

2.3.6.6.1Type 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:

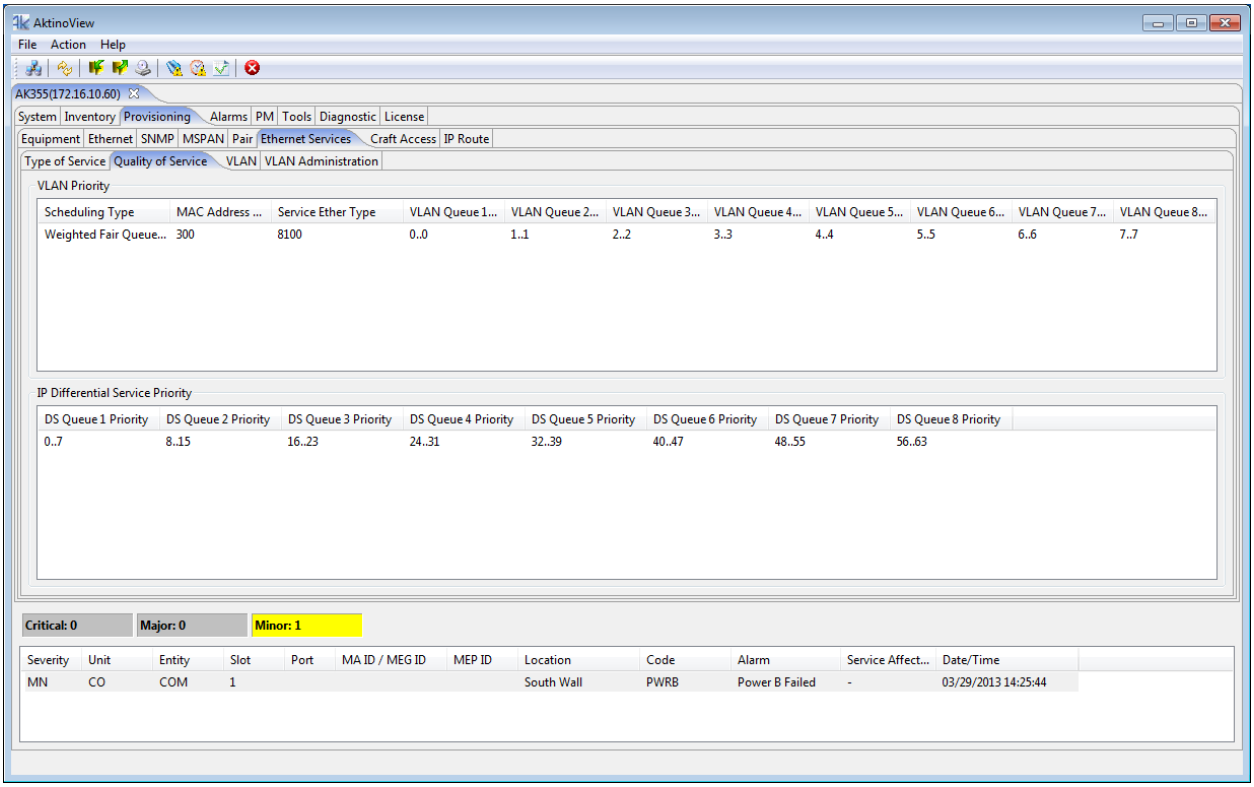


See the following table for Ethernet Type of Service Parameters and Values:

Type of Service Parameters	Values
Service	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. 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. Tunneled VLAN - VLAN IDs are assigned to each port. The VLAN IDs determine which packets go to which ports.
Co QoS Mode	QoS - Port, VLAN, and DiffServ priorities are used as the flow control mechanism. Pause frames are not sent for flow control Lossless - Pause frames are used as the flow control mechanism. The Port, VLAN, and DiffServ priorities are also active
RT QoS Mode	QoS - Port, VLAN, and DiffServ priorities are used as the flow control mechanism. Pause frames are not sent for flow control Lossless - Pause frames are used as the flow control mechanism. The Port, VLAN, and DiffServ priorities are also active

2.3.6.6.2 Quality of Service

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



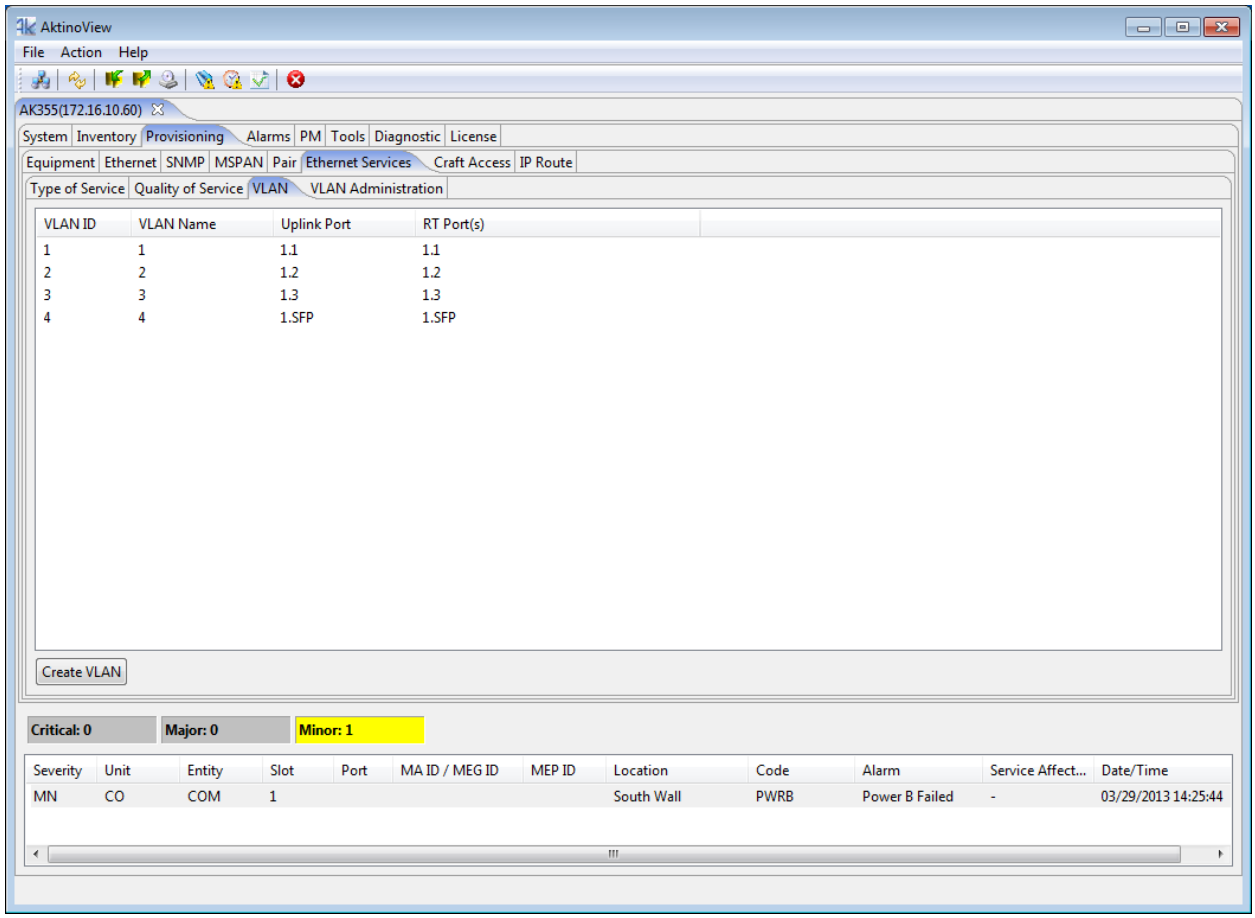
Double-clicking on any area in the VLAN Priority or IP Differential Service Priority brings up the following Ethernet Quality of Service provisioning dialog box:

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

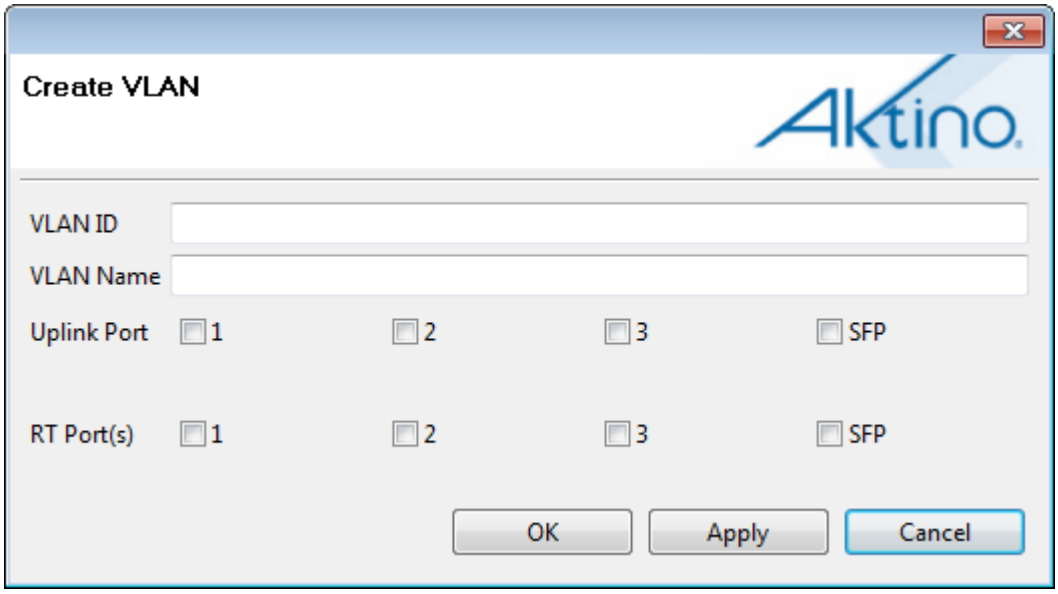
QoS Parameters	Values
Scheduling Type	Weighted Fair Queuing Strict Priority Strict Priority & Weighted Fair Queuing
MAC Address Aging Timeout	Time in seconds after which MAC Addresses are removed from the MAC Address table
Service Ether Type	Value for Ether Type Field that is used when adding a service 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.

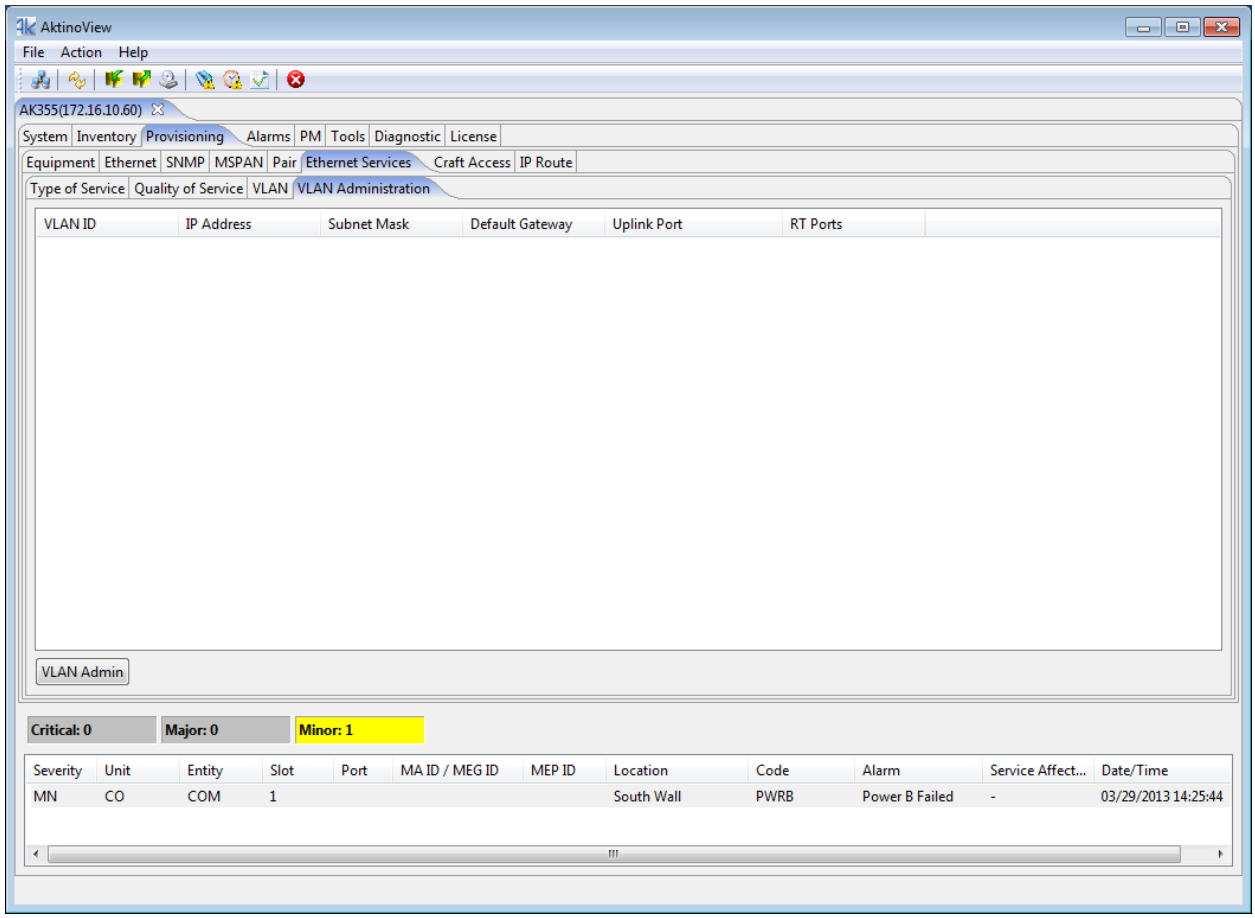


See the following table for the VLAN Parameters and Values:

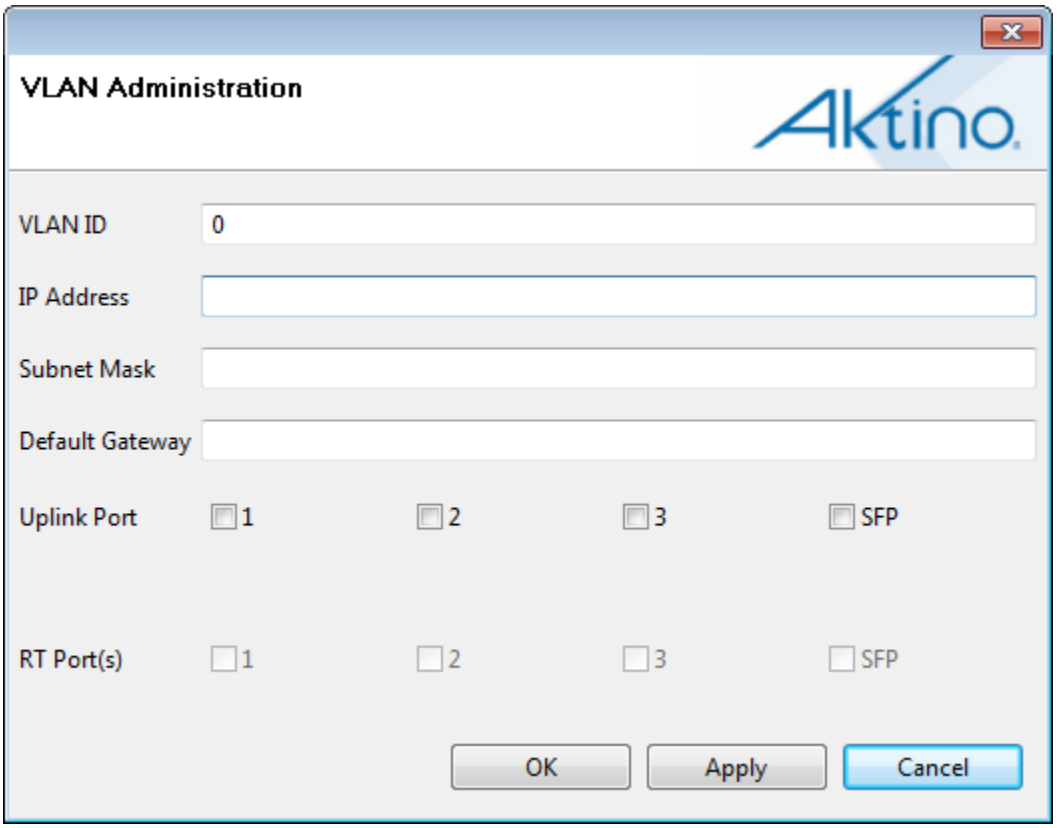
VLAN Parameters	Values
VLAN ID	Enter a VLAN ID from 1 to 4092.
VLAN Name	User configurable string of up to 31 characters.
Uplink Port	Specify the Uplink Port on the on AK355C Unit this VLAN ID is assigned to.
RT Port(s)	Specify the AK355R Port(s) this VLAN ID is assigned to.

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:

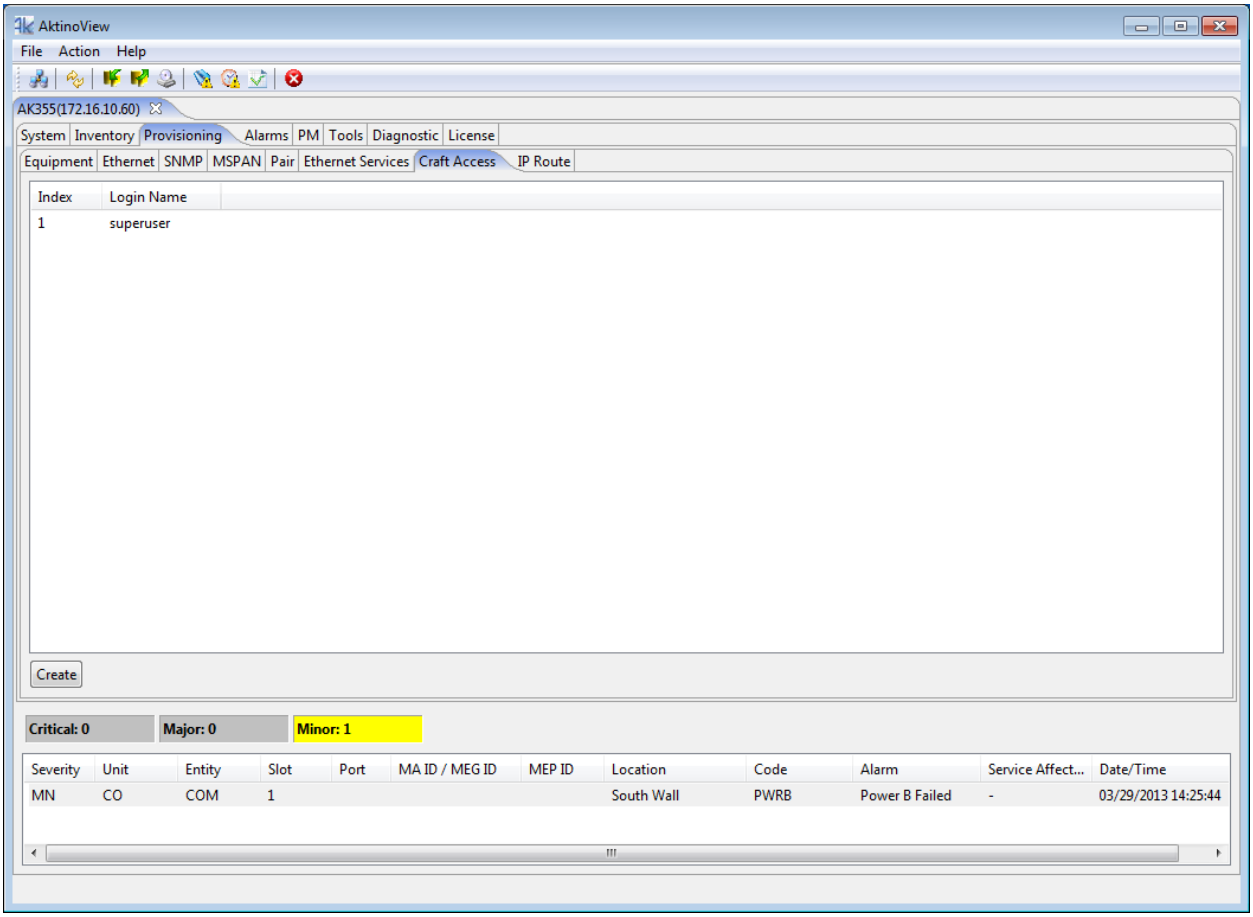


See the following table for the VLAN Administration Parameters and Values:

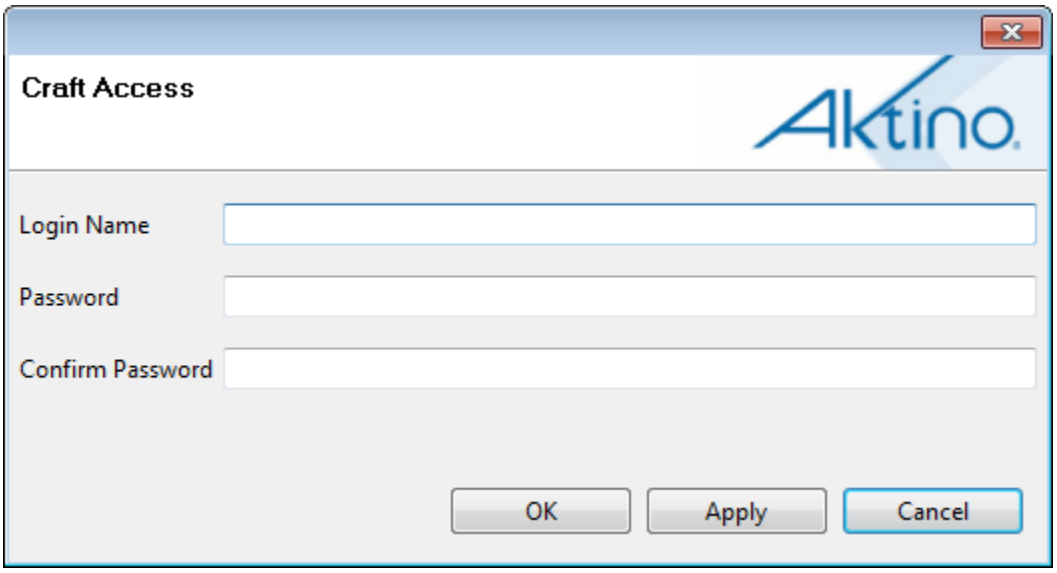
VLAN Administration Parameters	Values
VLAN ID	Enter a VLAN ID from 1 to 4092, a value of 0 disables the Management VLAN
IP Address	The IP Address for the Management VLAN
Subnet Mask	The Subnet Mask for the Management VLAN
Default Gateway	The Default Gateway for the Management VLAN
Uplink Port	Specify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



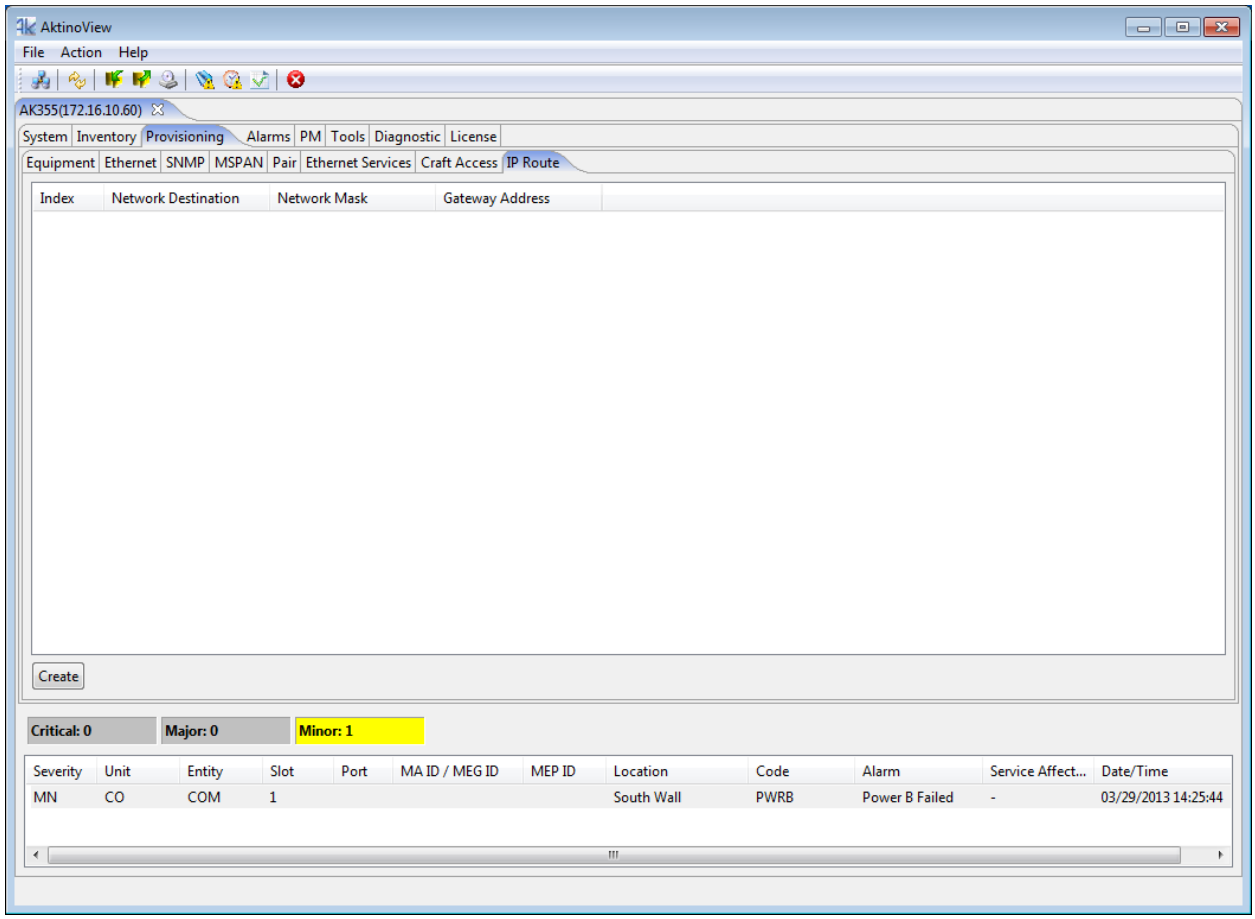
Click on **Create** to display the following Craft Access dialog box:



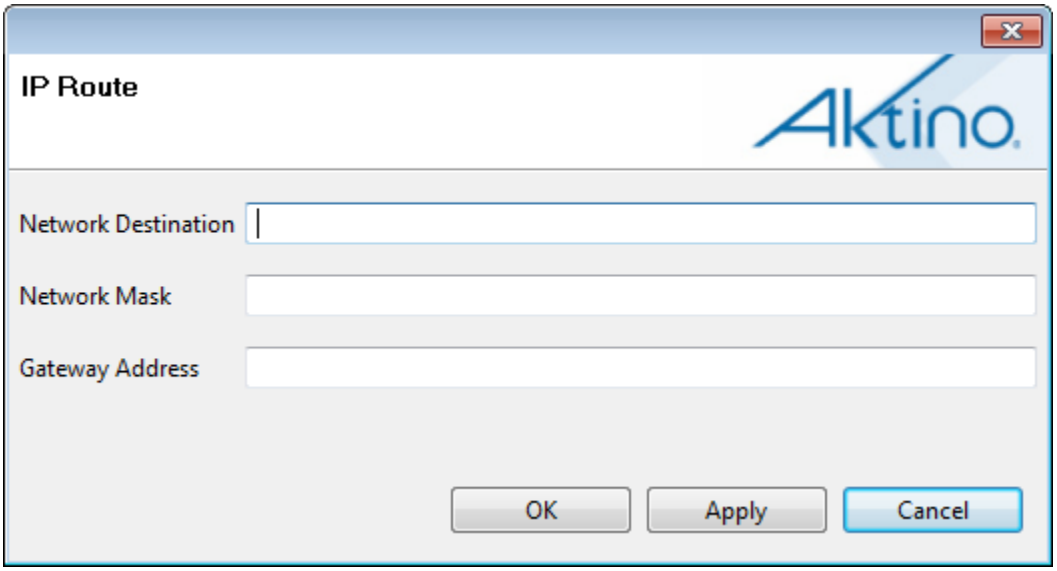
The Craft Access dialog box provides fields where the Login Name and Password is created for the new Craft Access user.

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:



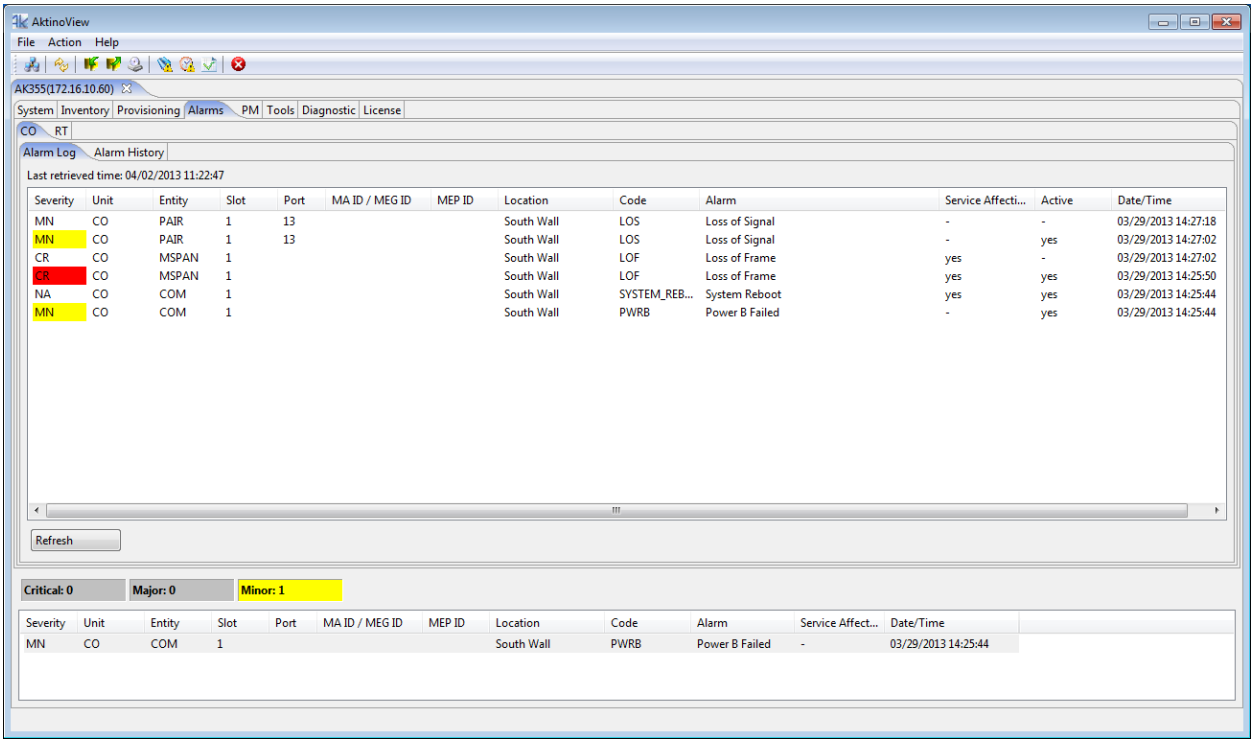
IP Route Parameters	Values
Network Destination	Destination Network Address
Network Mask	Network Mask
Gateway Address	Default Gateway Address

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.

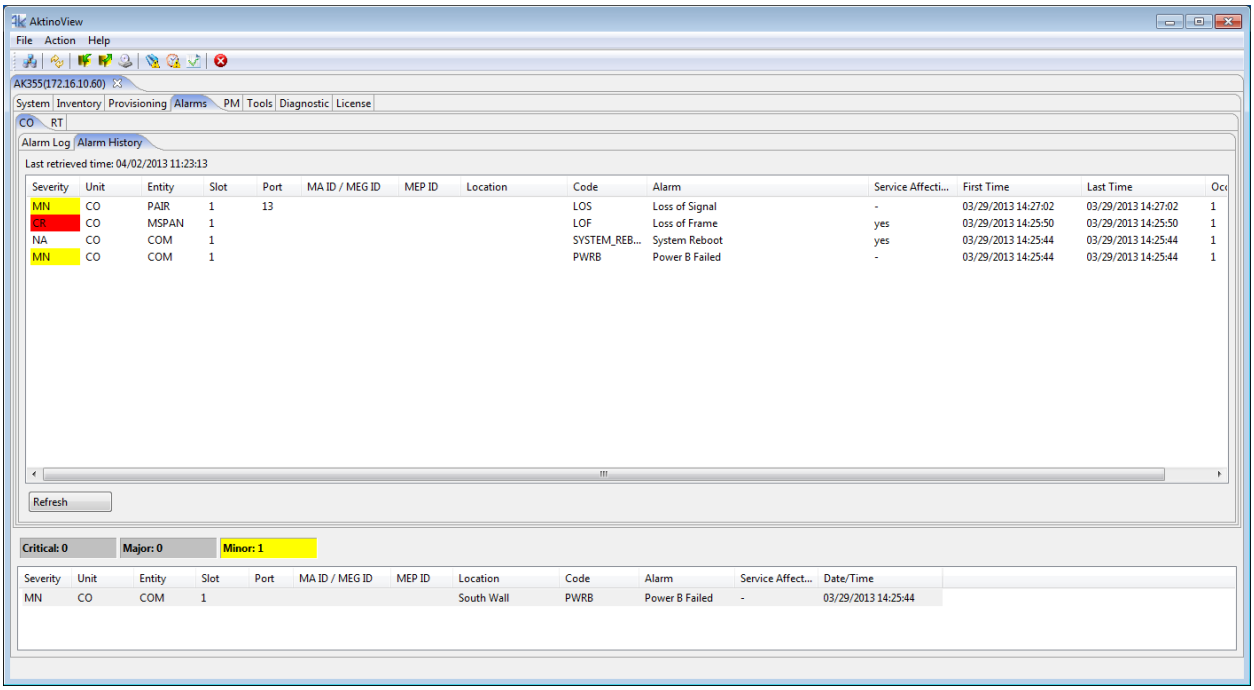
Note: See Appendix B for more Alarm details.



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.

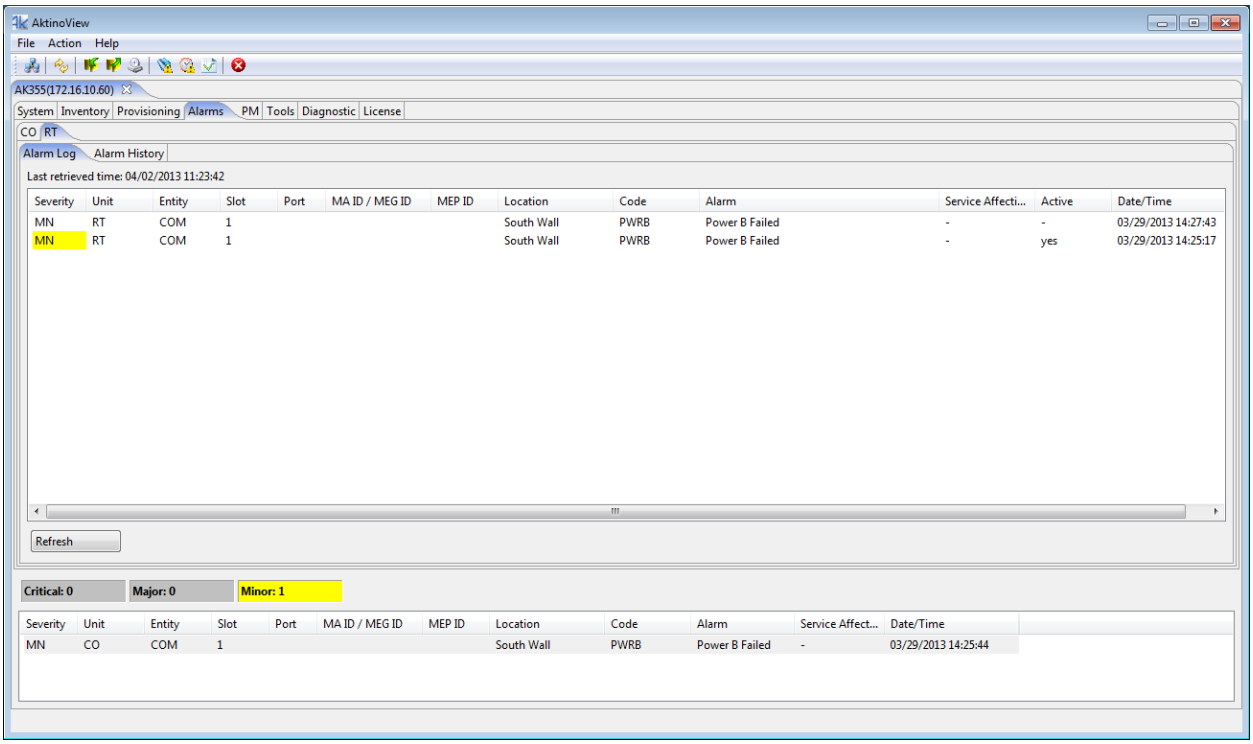
Note: See Appendix B for more Alarm details.



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.

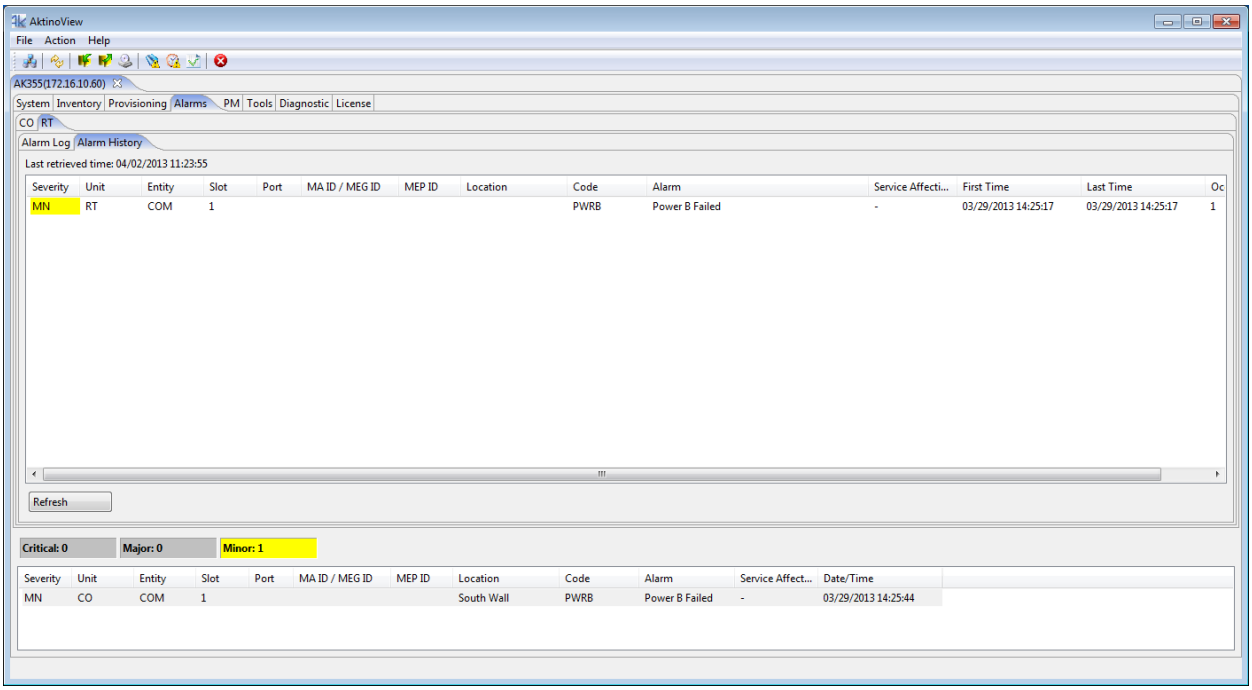
Note: See Appendix B for more Alarm details.



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.



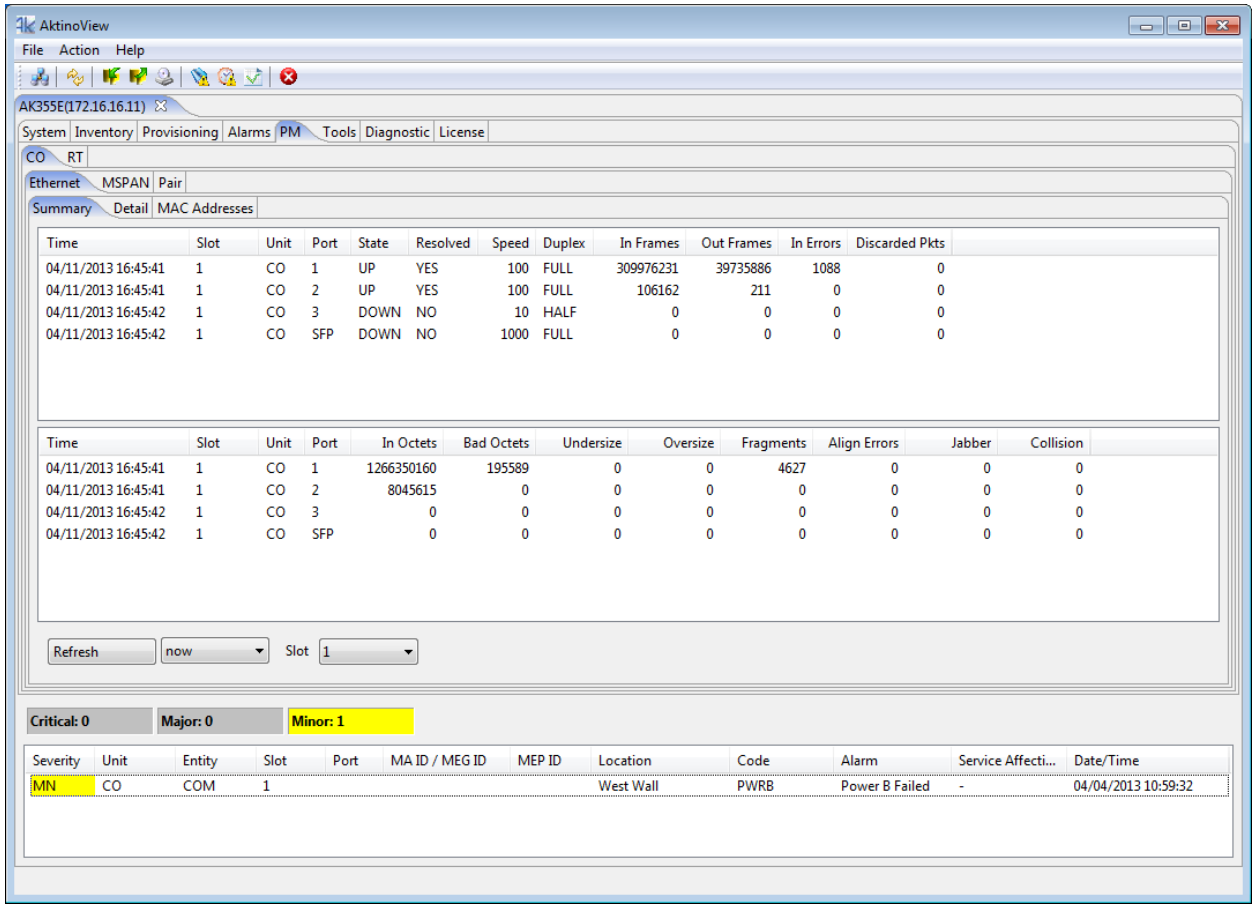
2.3.8 Performance Monitoring (PM)

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.

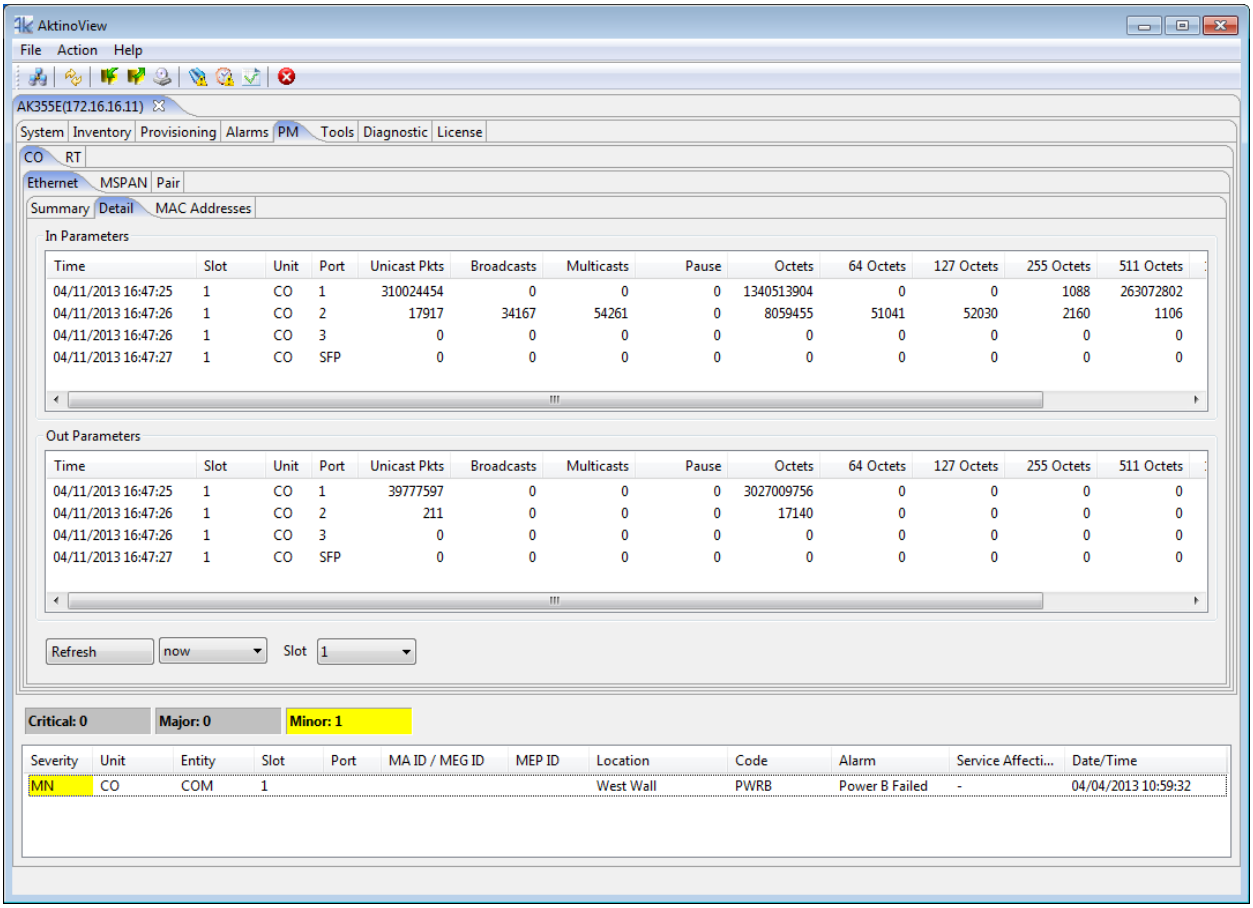
2.3.8.1 CO > Ethernet > Summary

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.



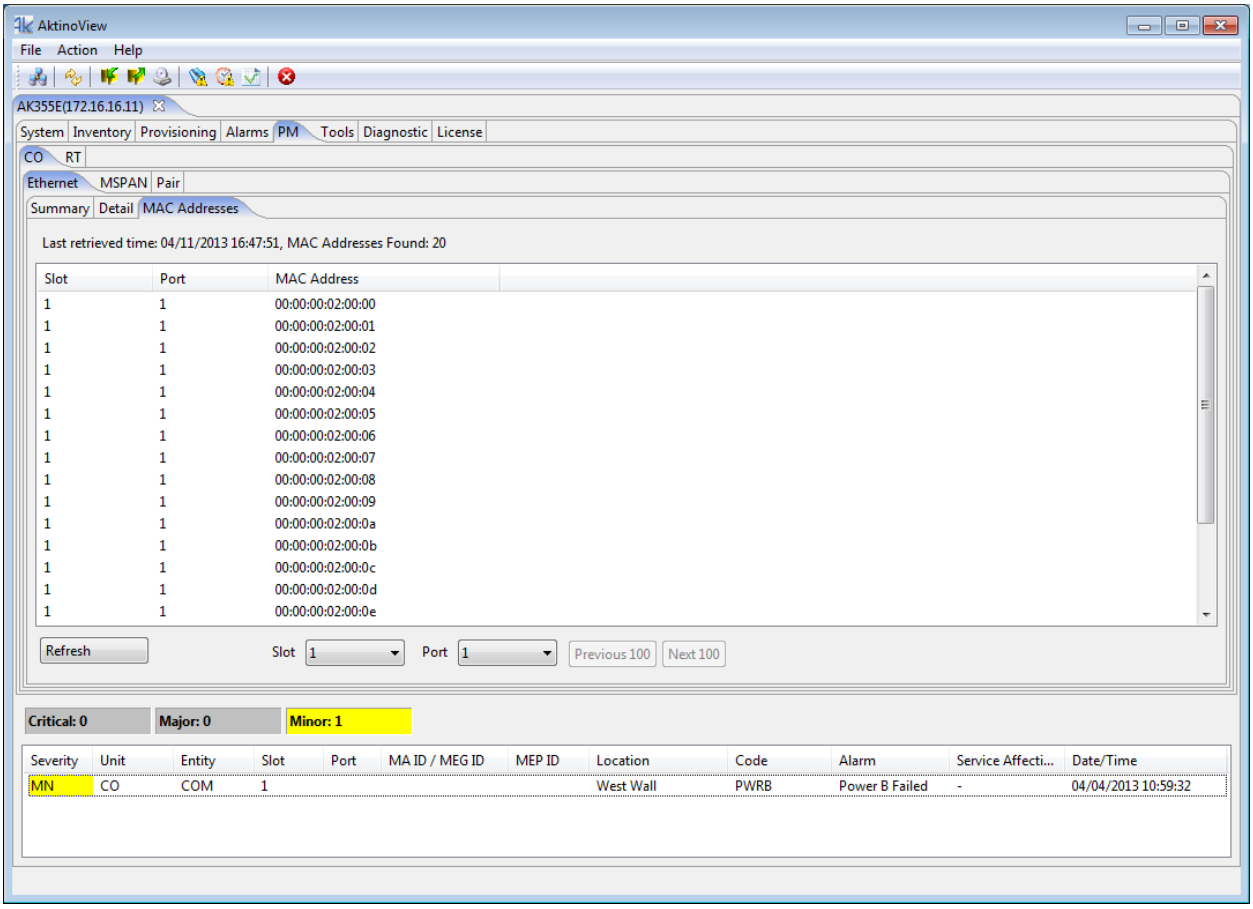
2.3.8.2 CO > Ethernet > Detail

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.



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

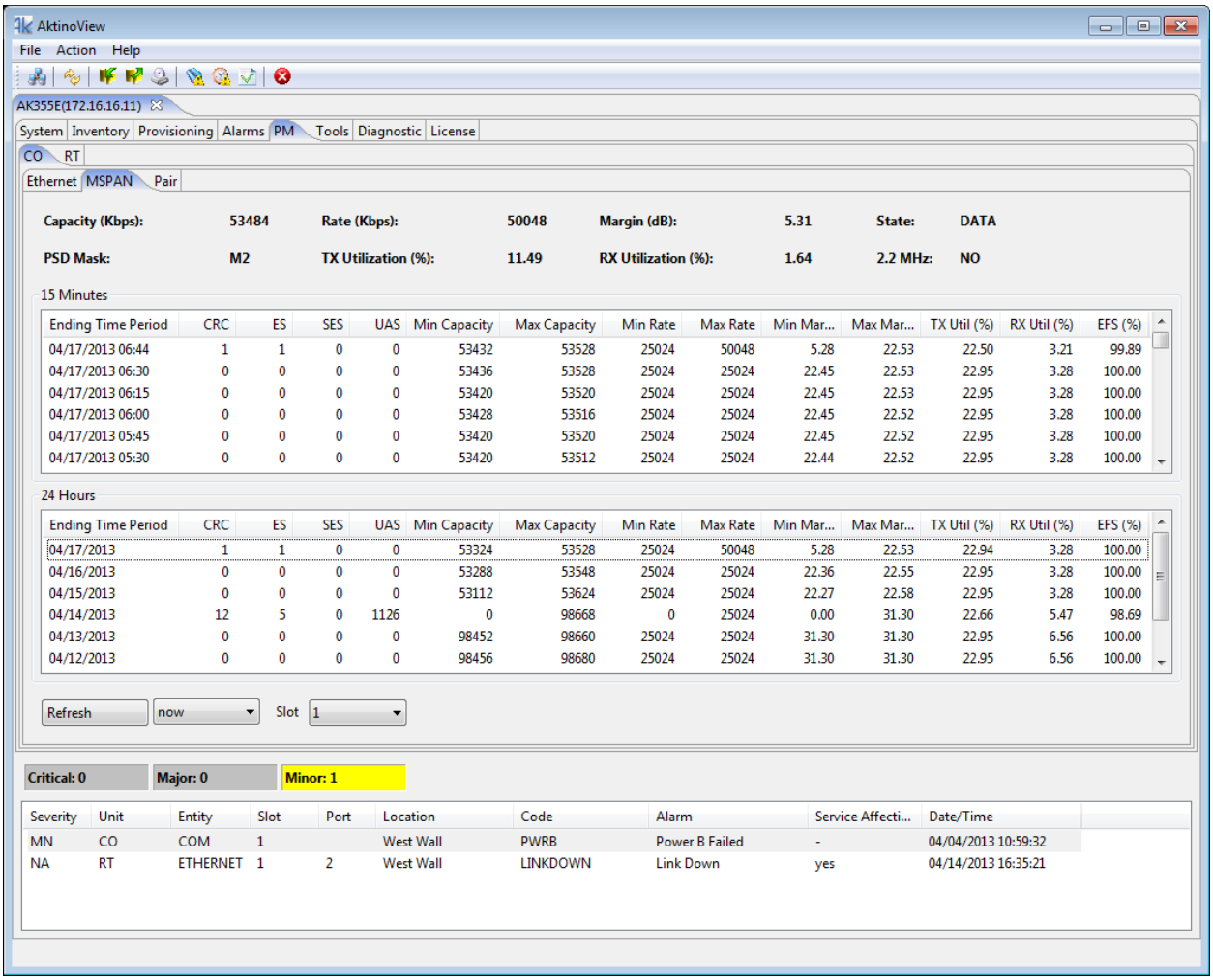
The MSPAN tab displays the upstream PM information for the MSPAN. This PM data is separated into three sections:

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.

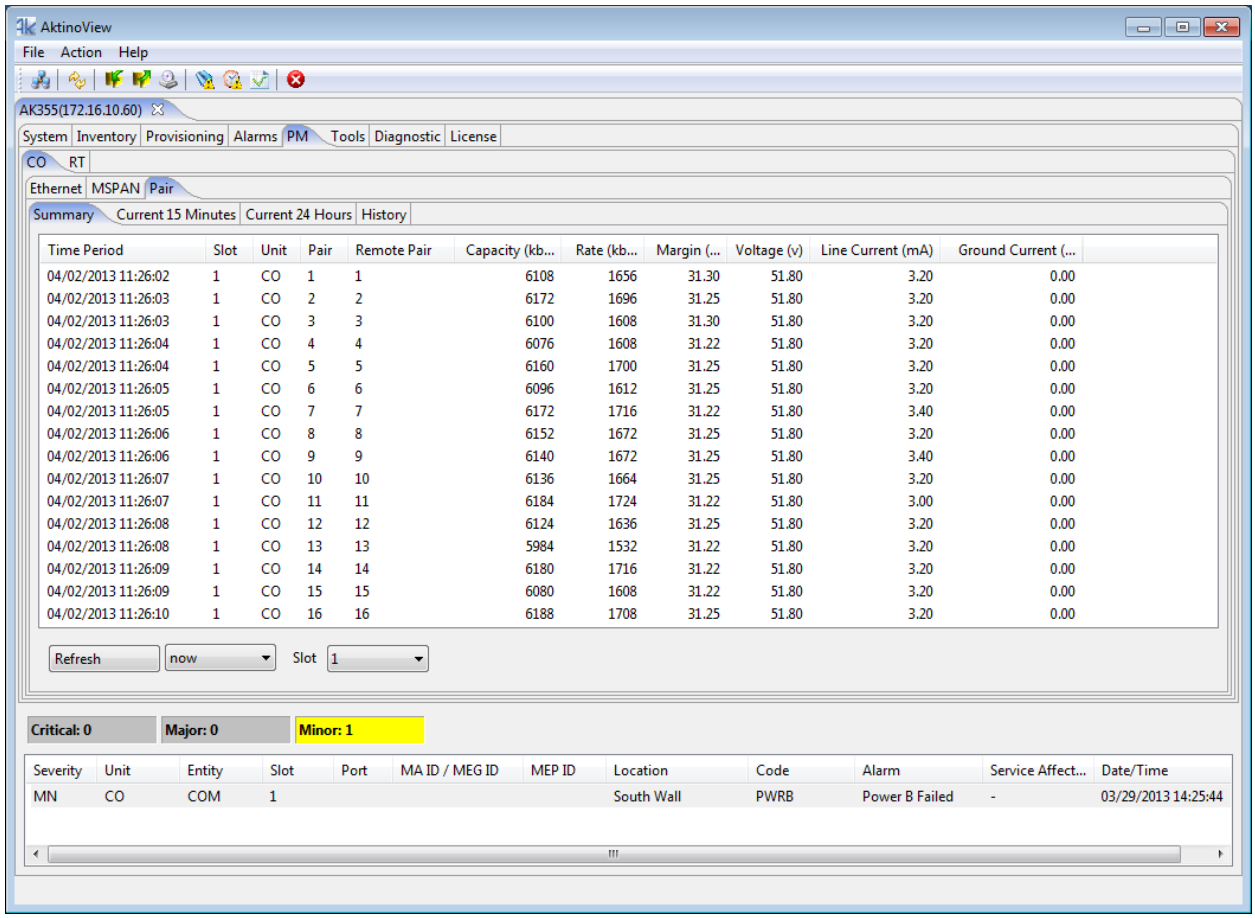
3 The 24-Hours section provides PM data for the previous 7 days.

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.



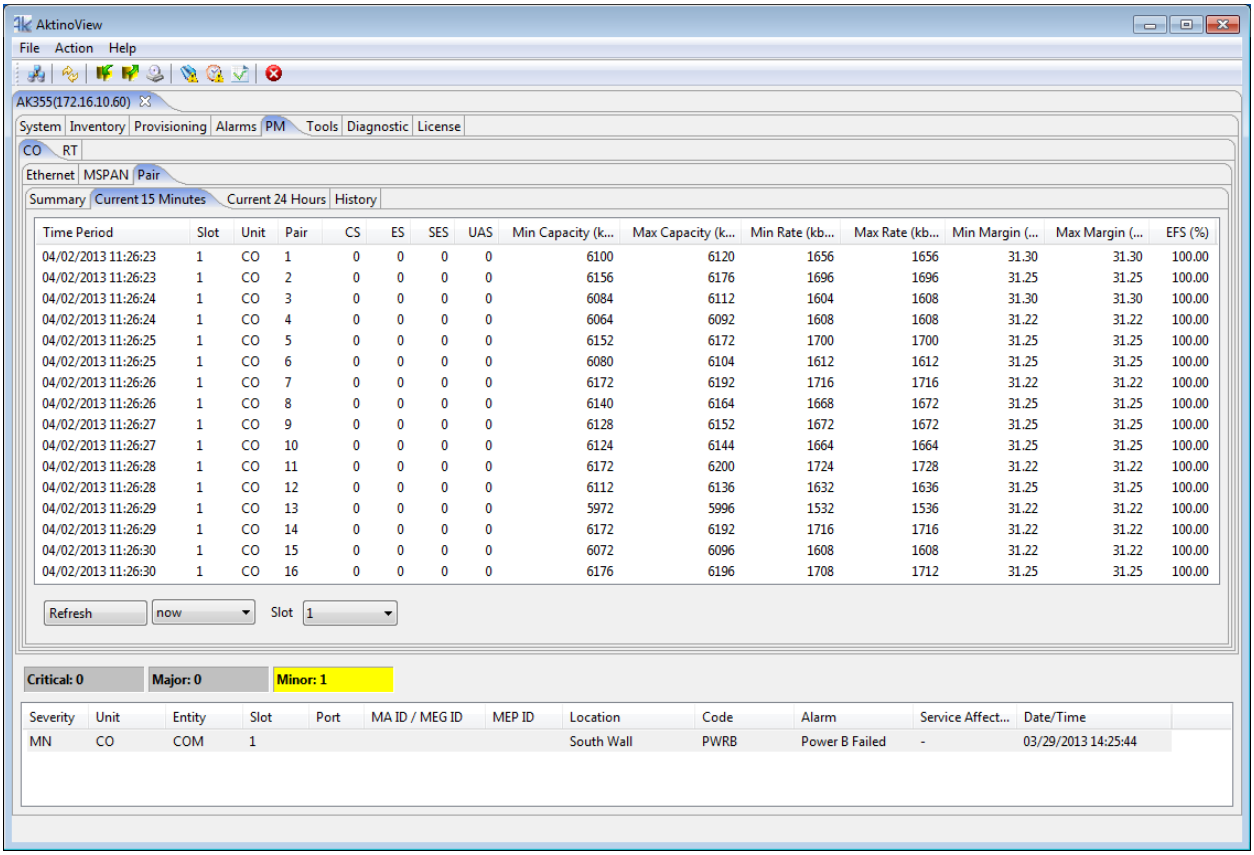
2.3.8.5 CO > Pair > Summary

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.



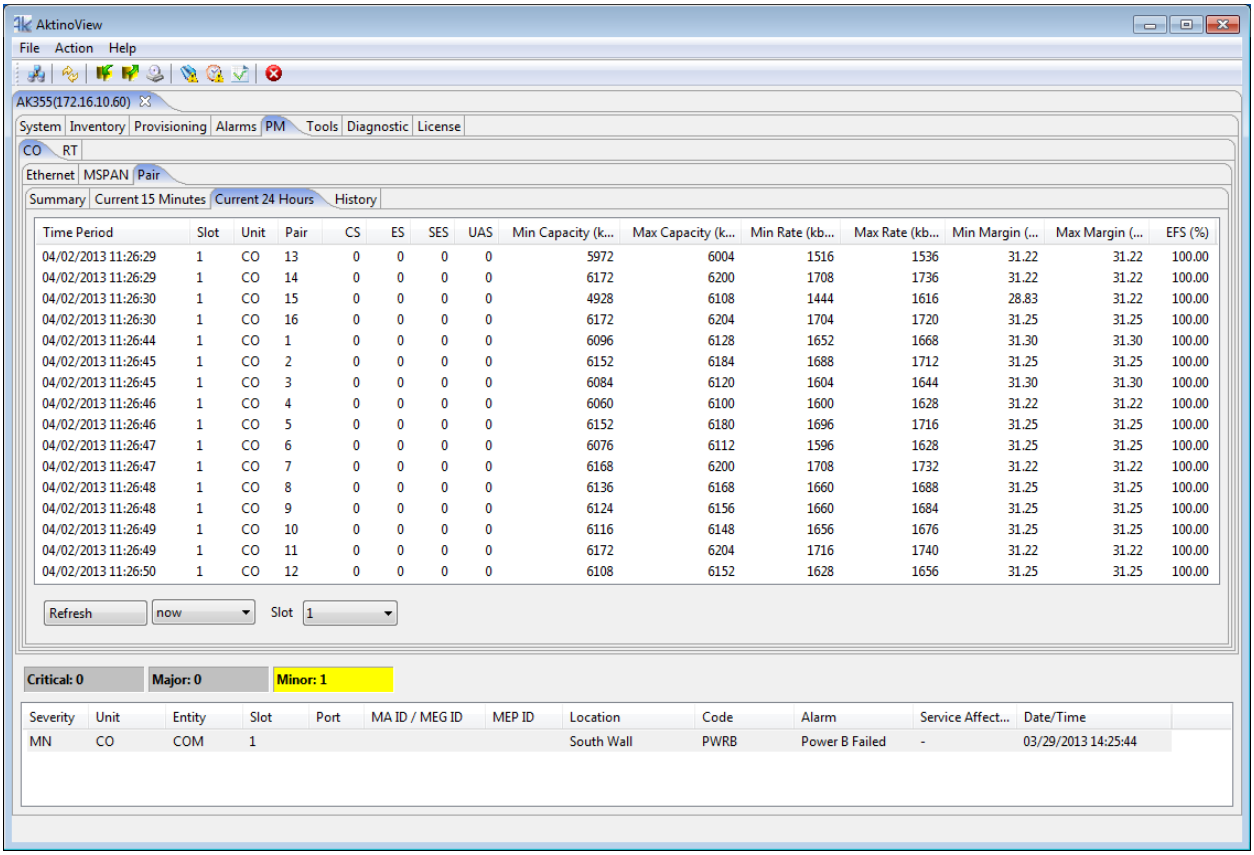
2.3.8.6 CO > Pair > Current 15 Minutes

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.



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.



2.3.8.8 CO > Pair > History

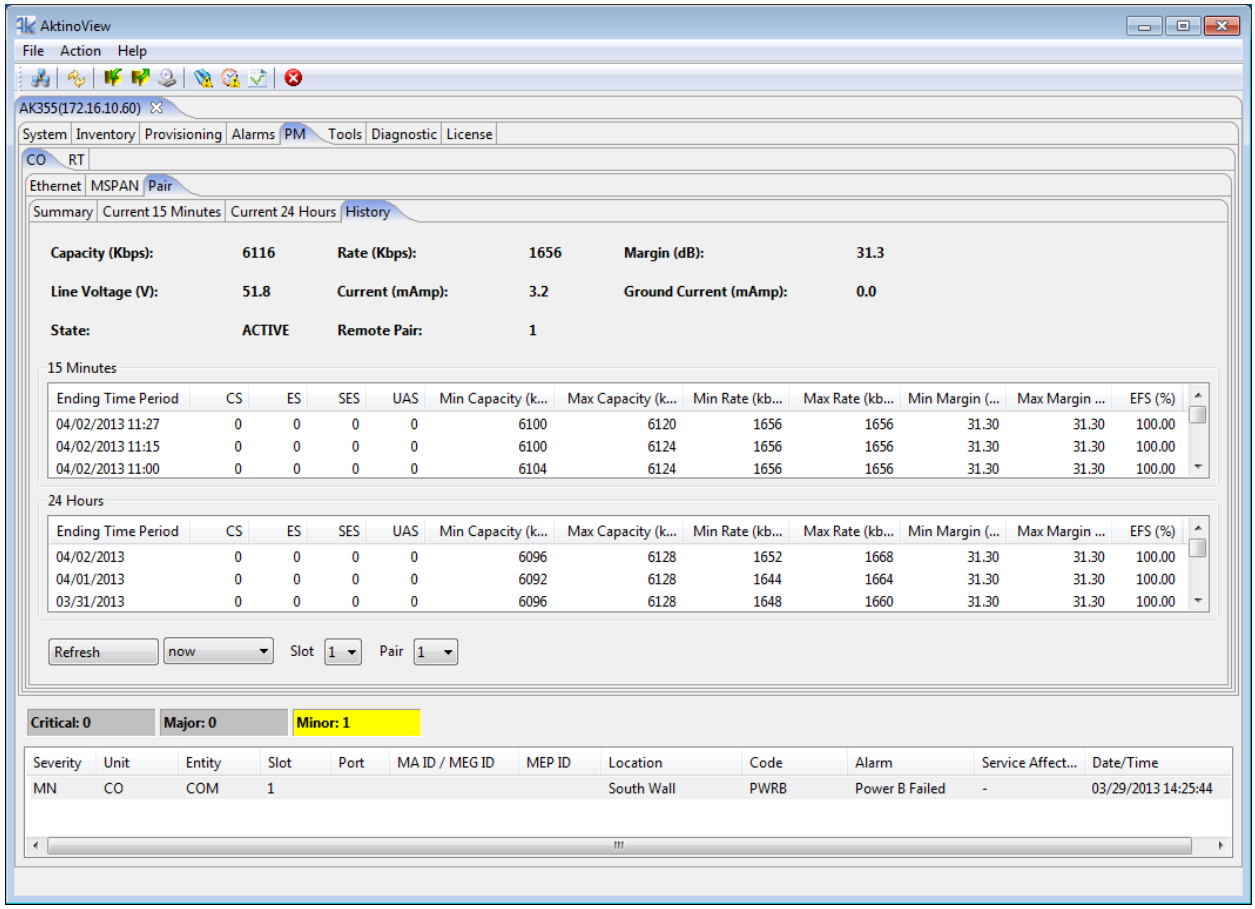
The History tab displays the upstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

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.

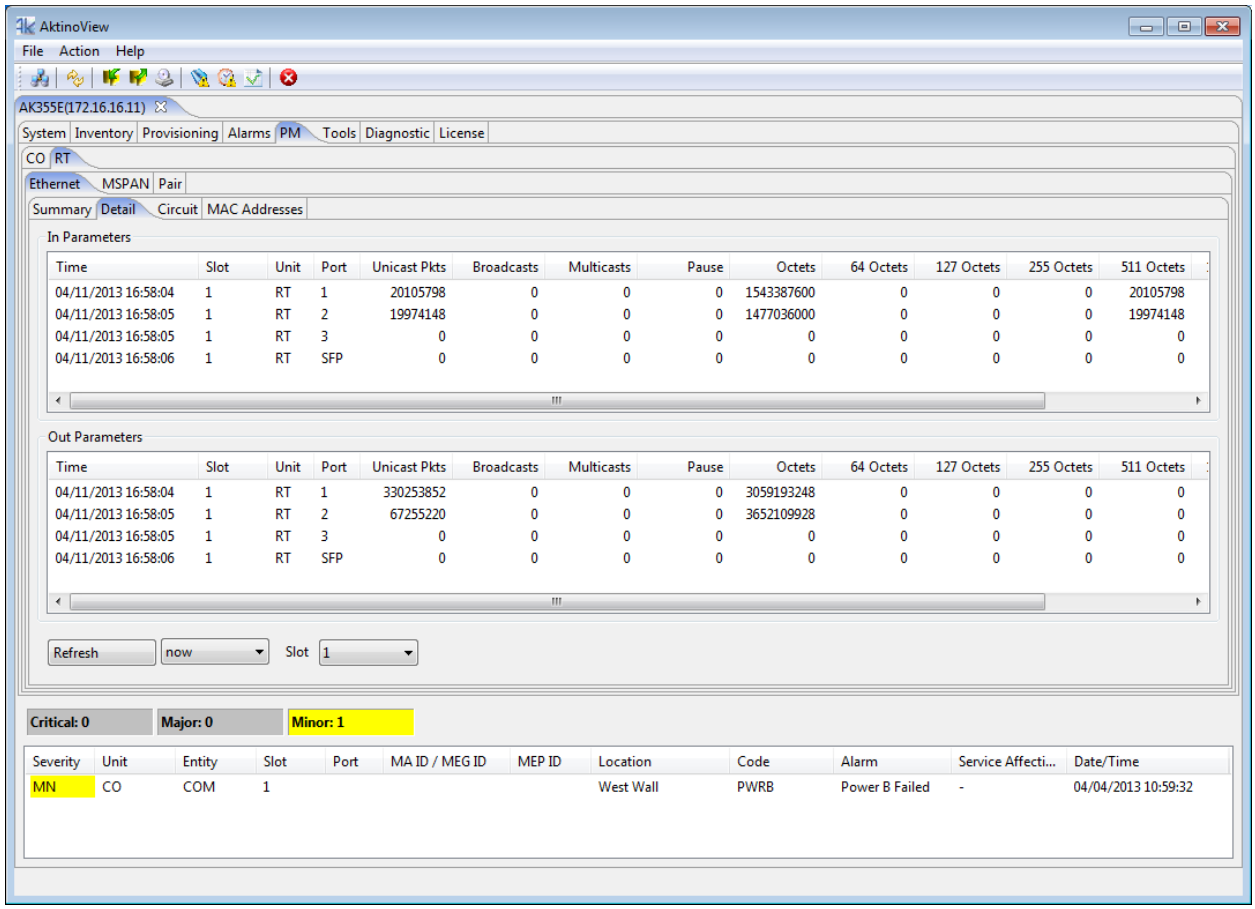


Note the highlighted portion of the Pair History screen shown below:

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.

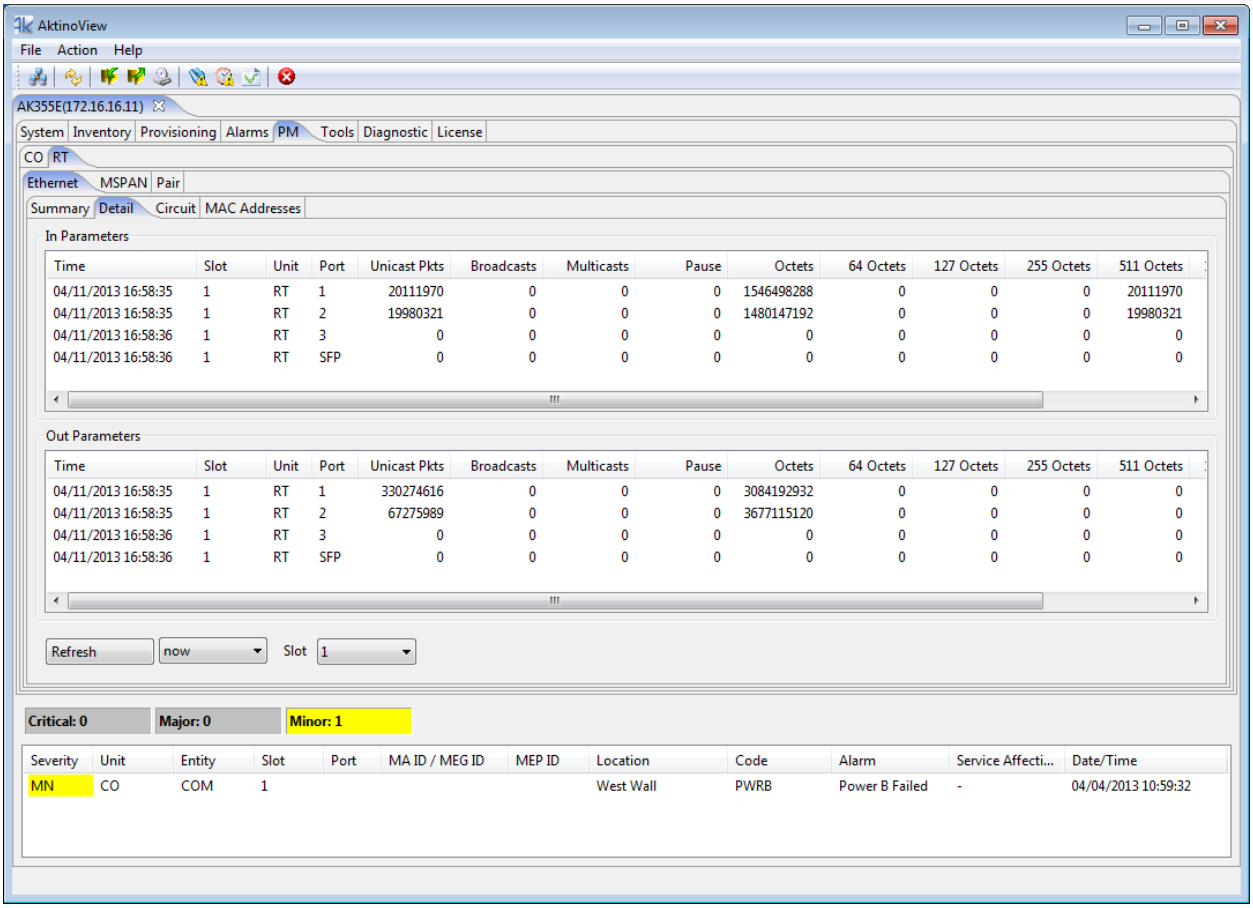
2.3.8.9 RT > Ethernet > Summary

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.



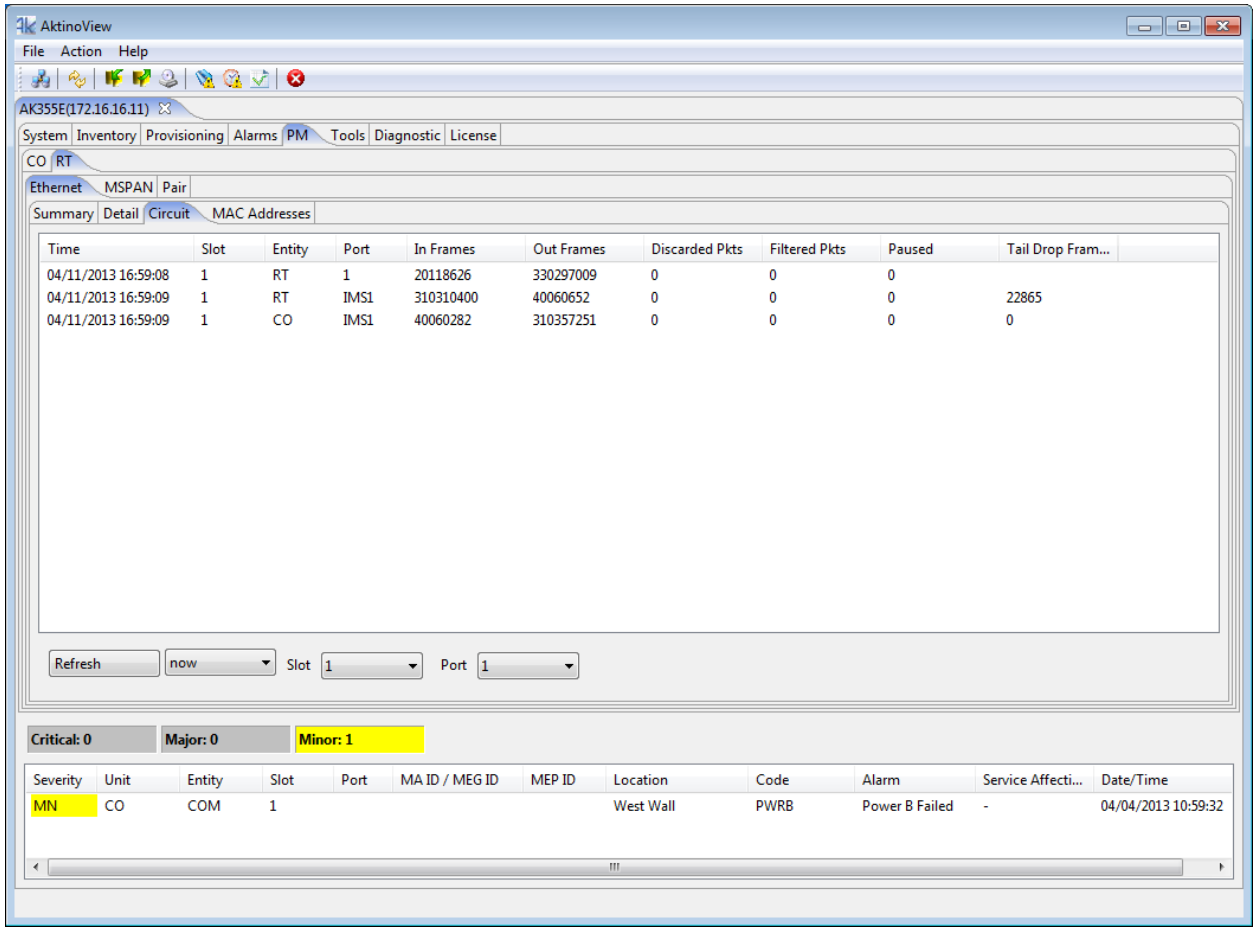
2.3.8.10 RT > Ethernet > Detail

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.



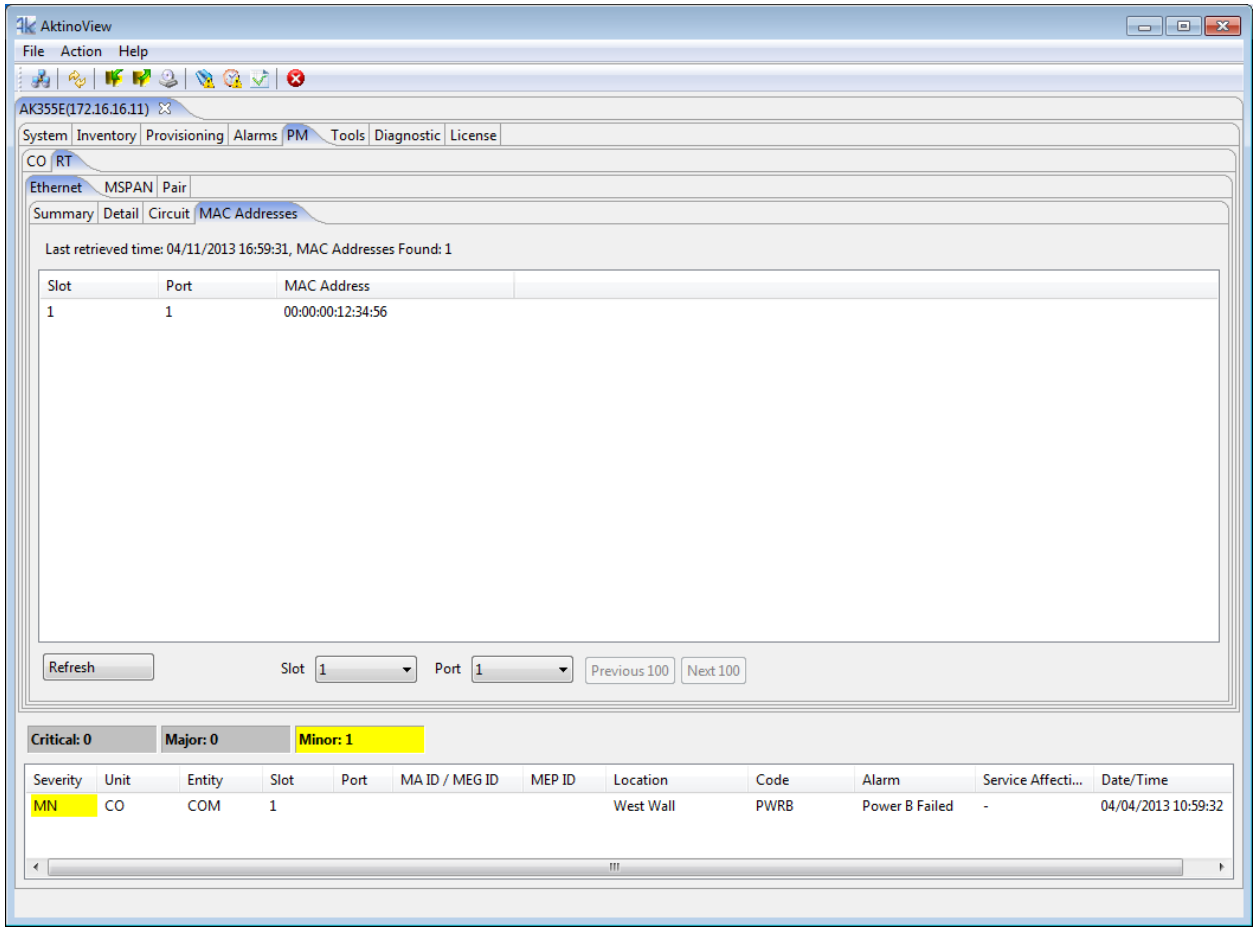
2.3.8.11 RT > Ethernet > Circuit

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

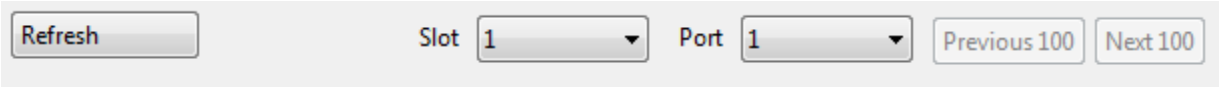


2.3.8.12 RT > Ethernet > MAC Addresses

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

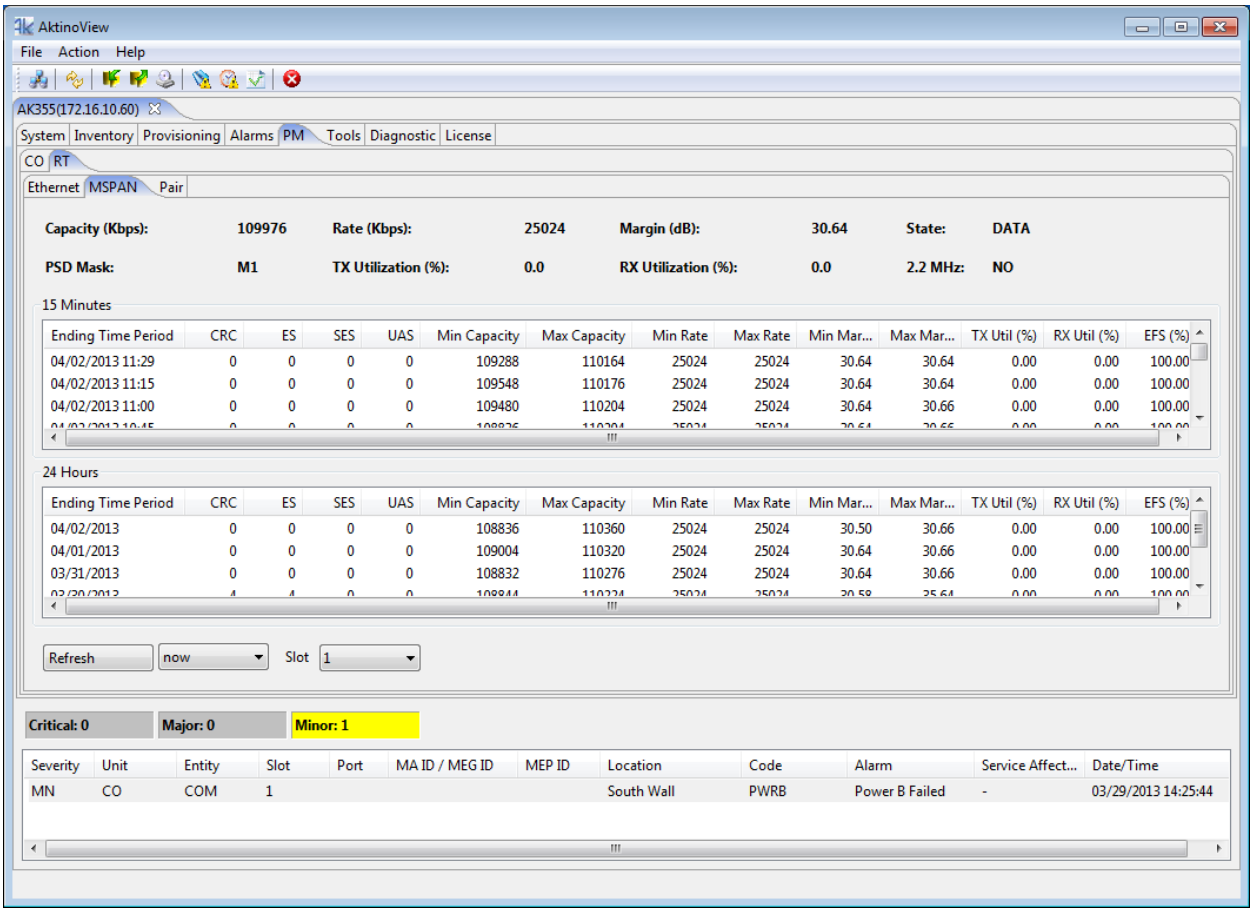
The MSPAN tab displays the downstream PM information for the MSPAN. This PM data is separated into three sections:

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.

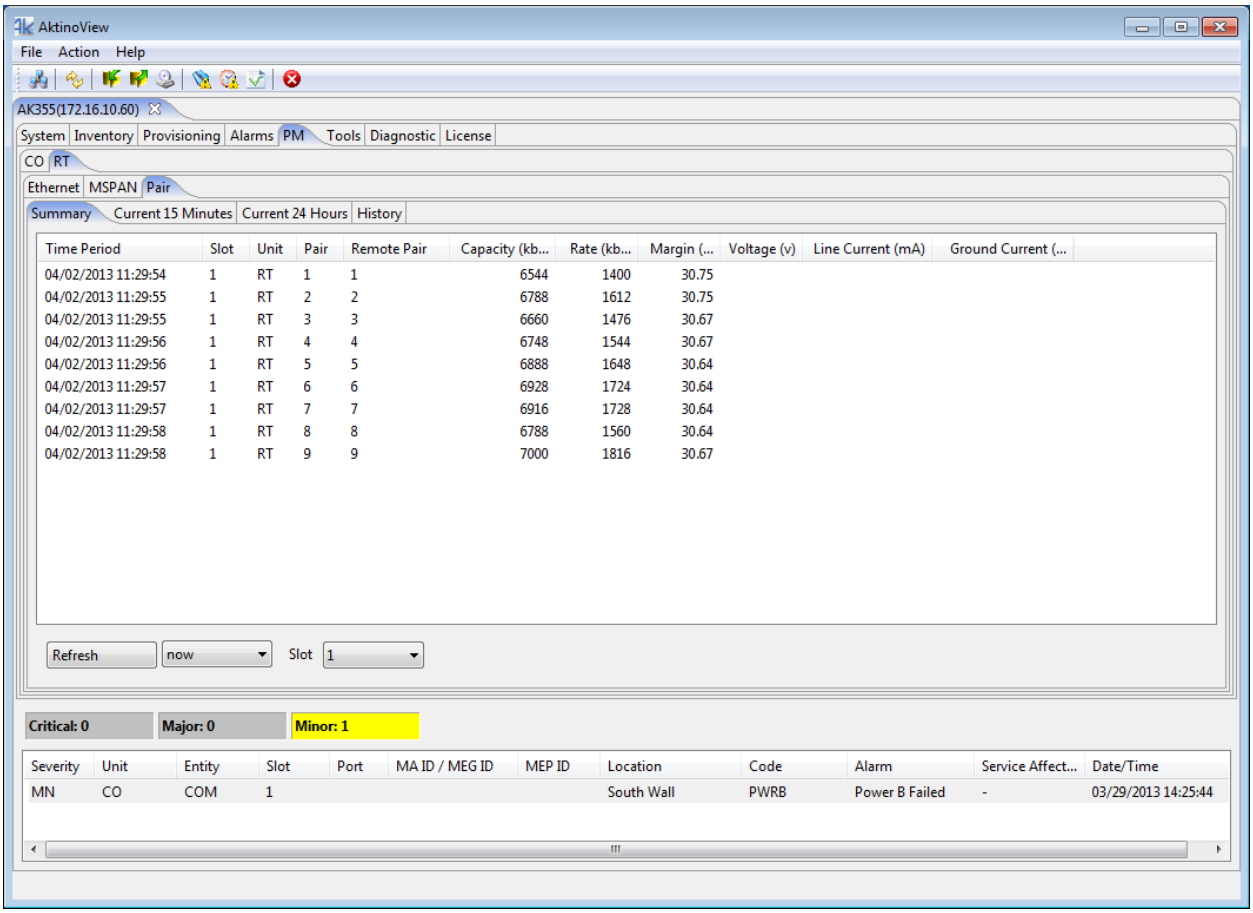
3 The 24-Hours section provides PM data for the previous 7 days.

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.



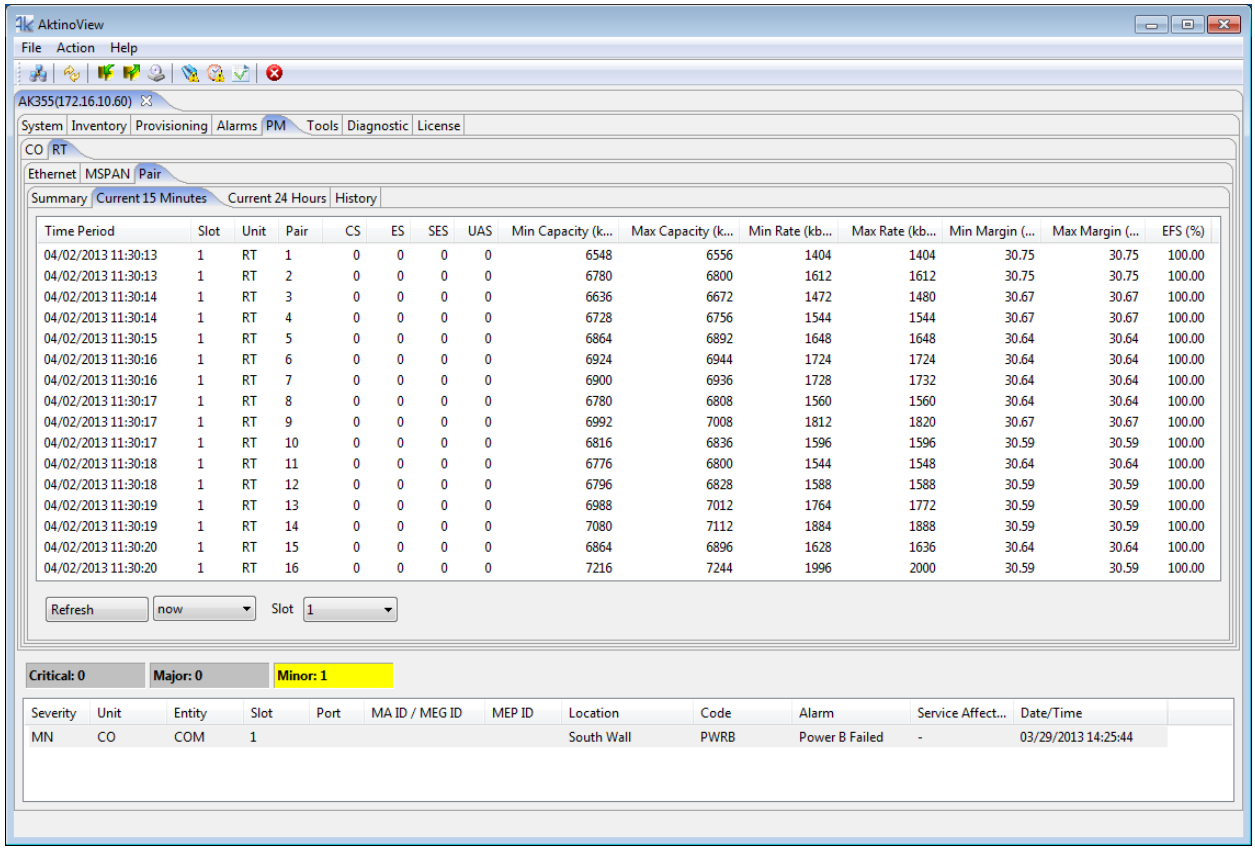
2.3.8.14 RT > Pair > Summary

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.



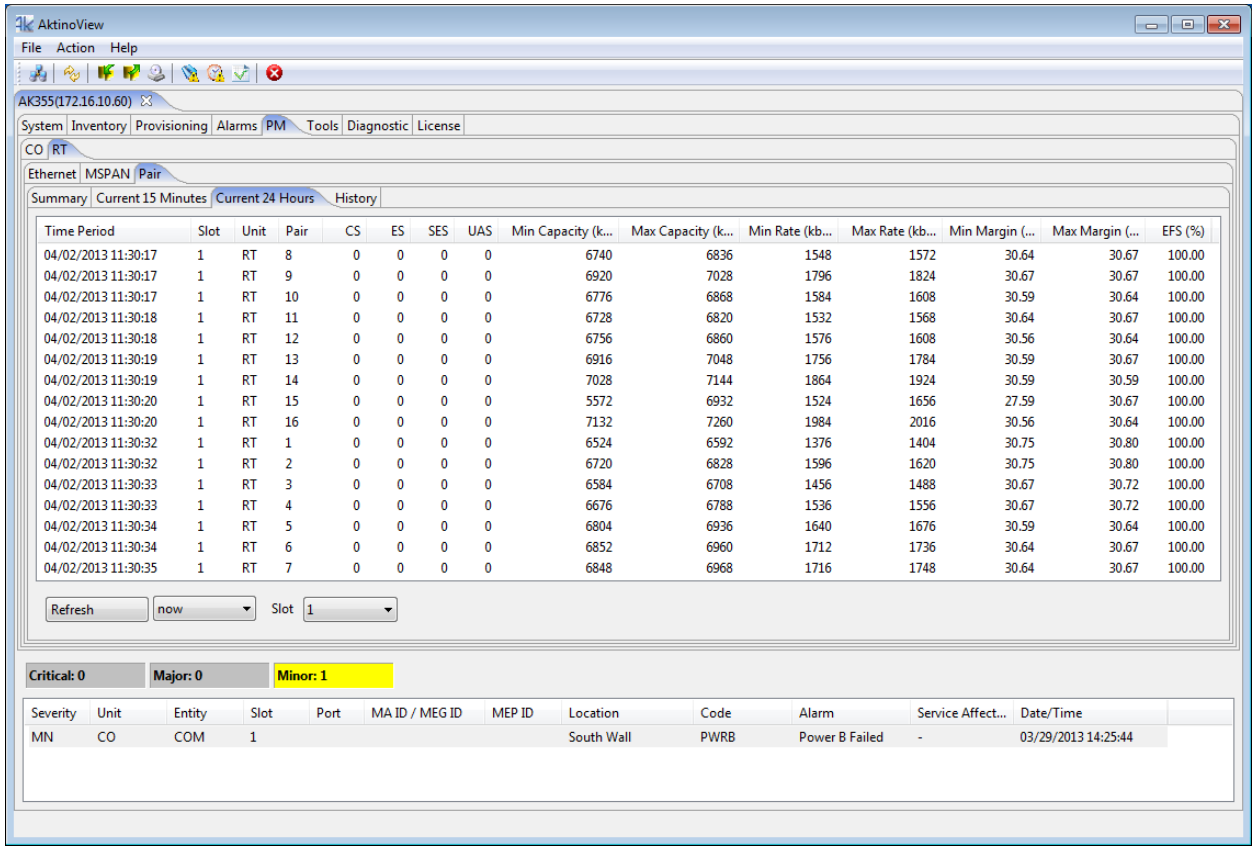
2.3.8.15 RT > Pair >Current 15 Minutes

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.



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.



2.3.8.17 RT > Pair > History

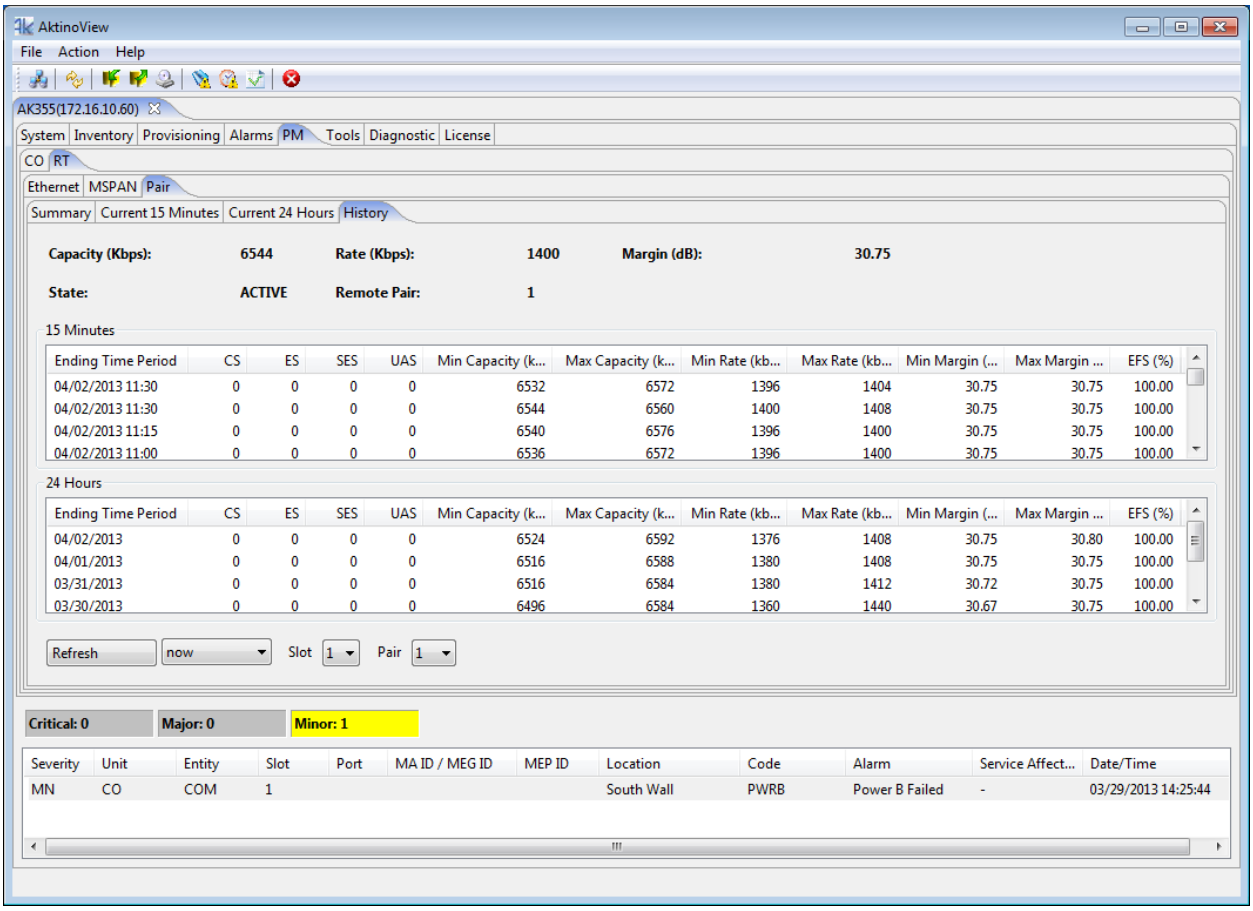
The History tab displays the downstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

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.

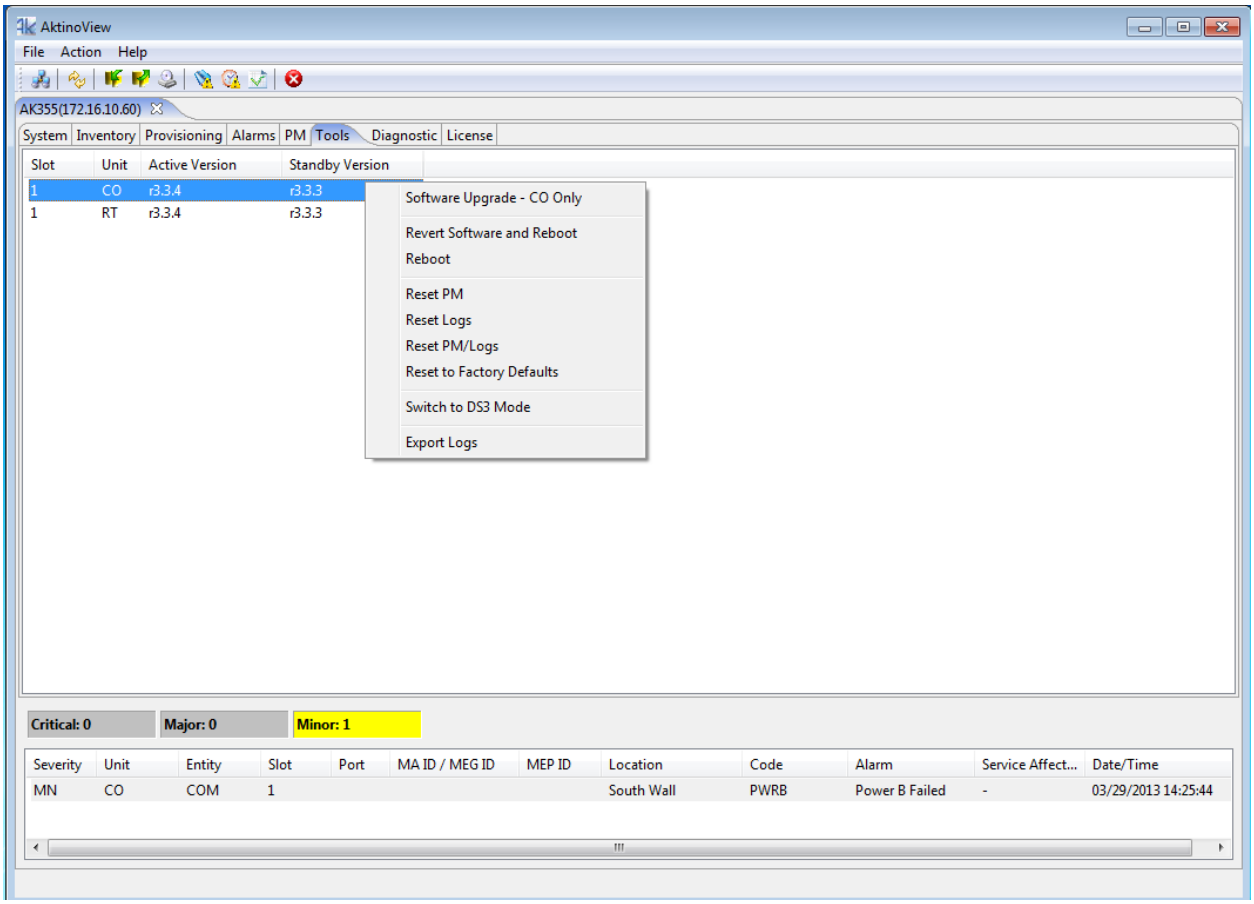


Note the highlighted portion of the Pair History screen shown below:

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

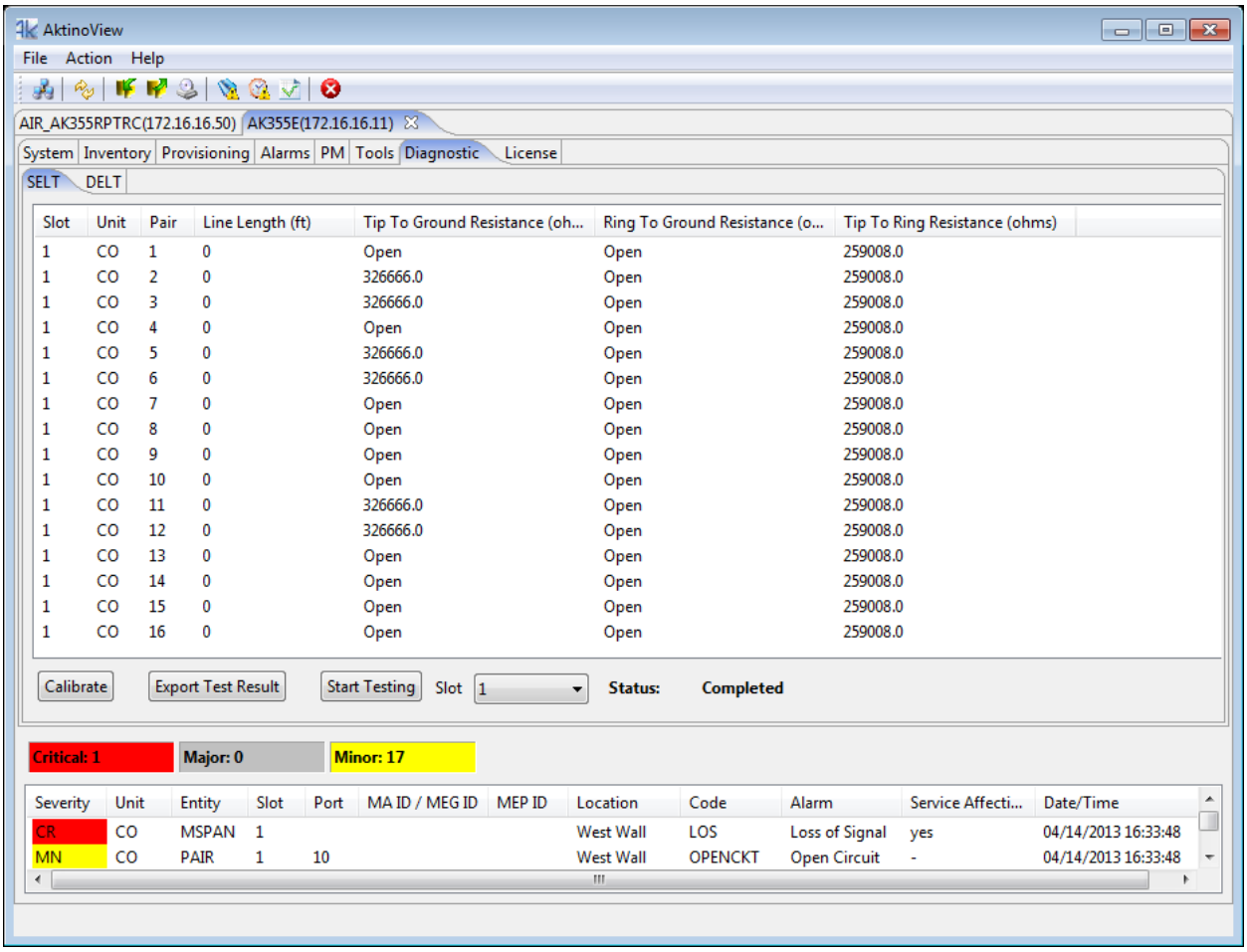
Diagnostics can be run on the AK355 System. There are two types of tests: Single Ended Loop Test (SELT) and Dual Ended Loop Test (DELT).

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:



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

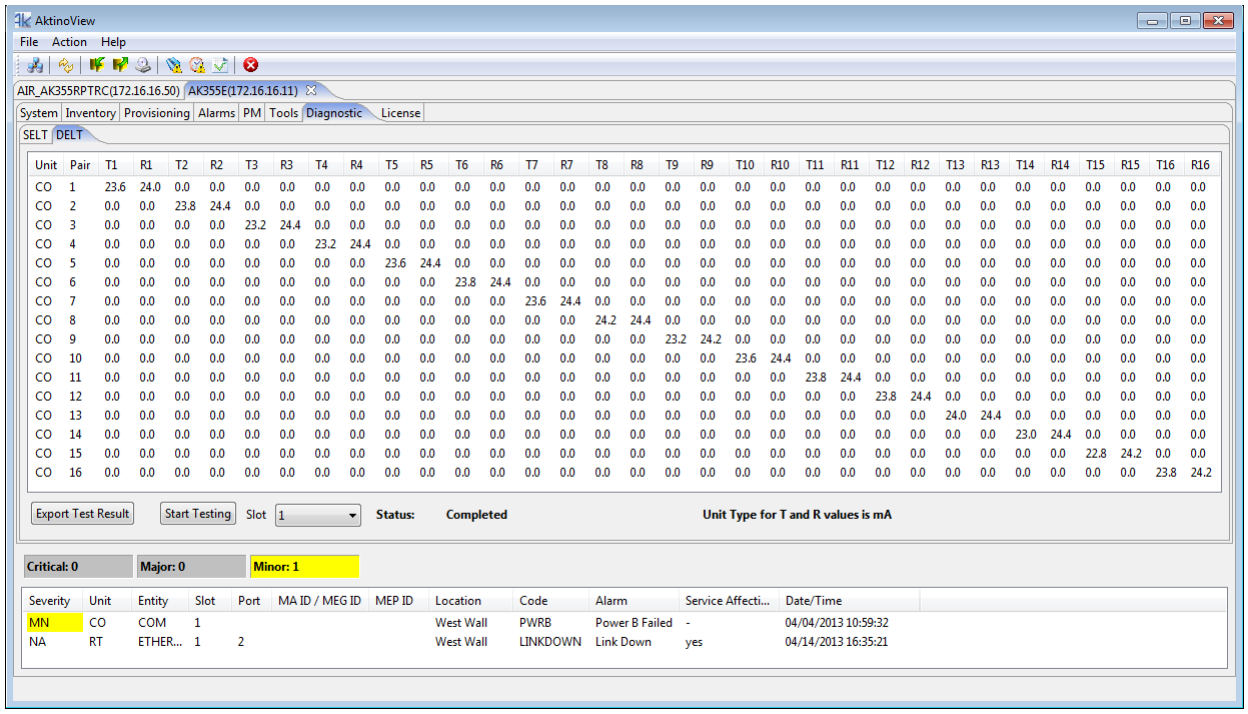
Dual Ended Loop Test (DELT) provides diagnostics for each pair. Follow this procedure to run DELT:

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.

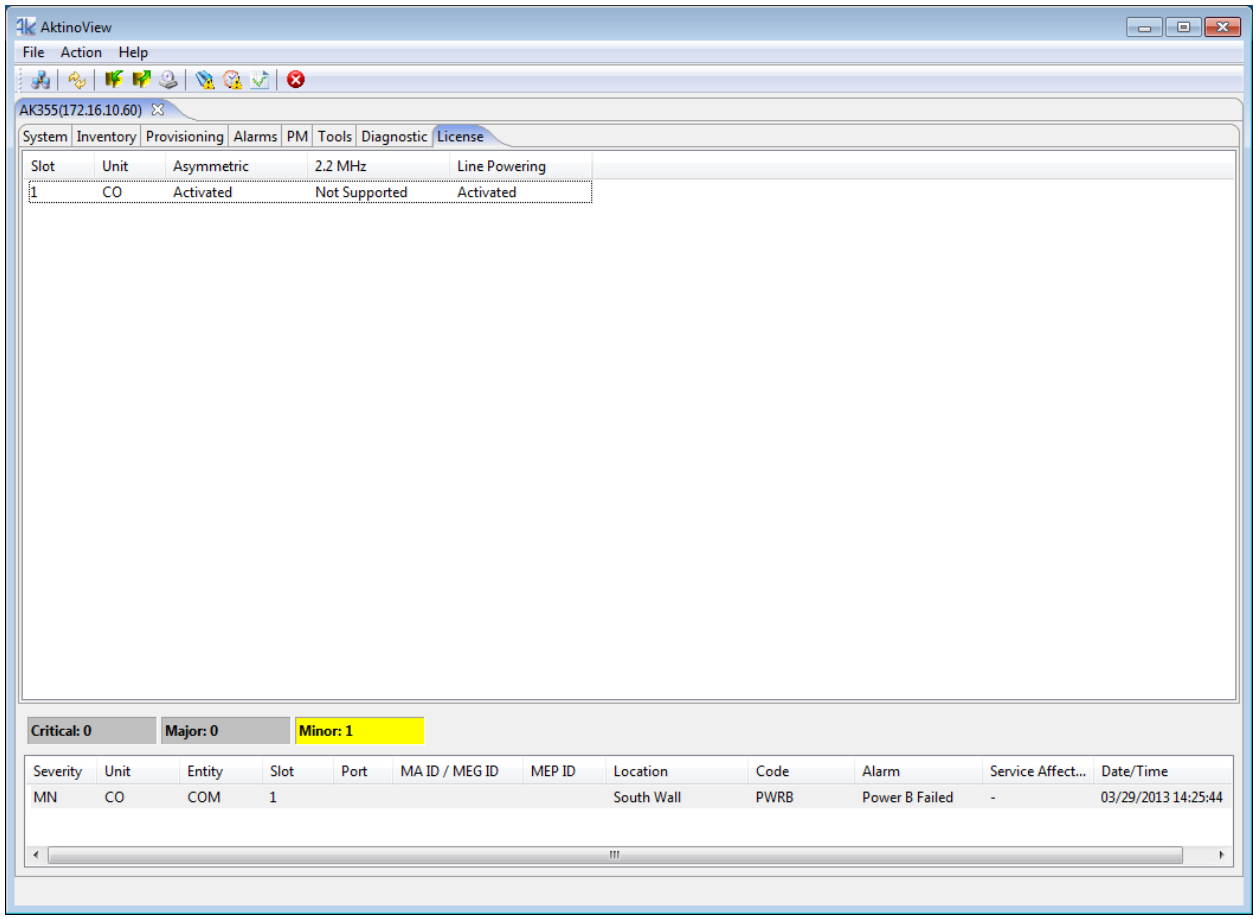
The results of the DELT test are indicated below:



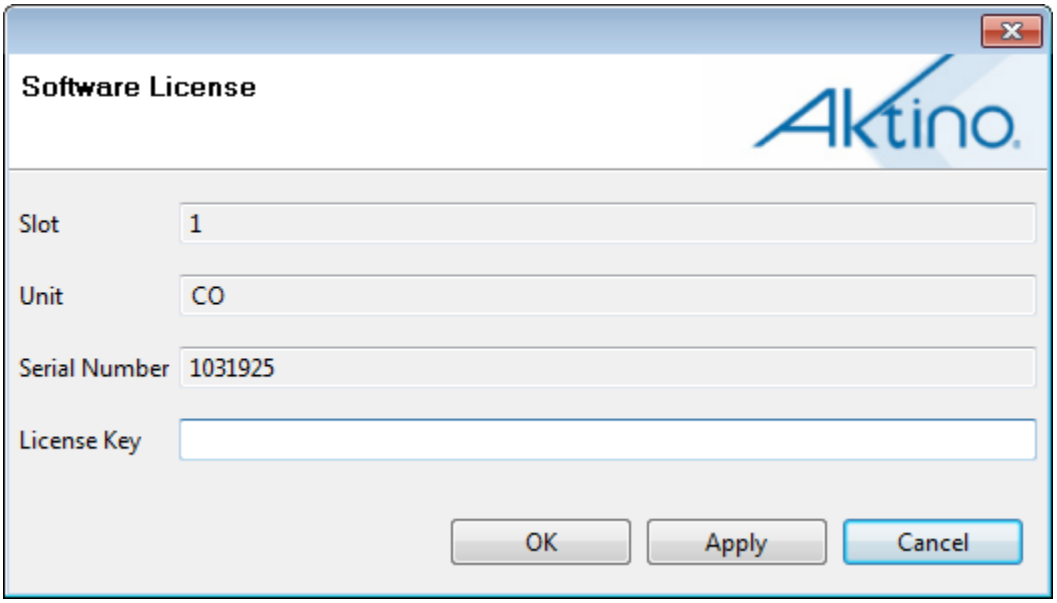
For each pair's tip and ring, the current in milliamps is indicated on itself and between that pair and every other pair being used in the AK355 System. The screen shot above shows a normal result. There should be current flowing between Pair1 and T1and R1, between Pair 2 and T2 and R2. The current flow 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.



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

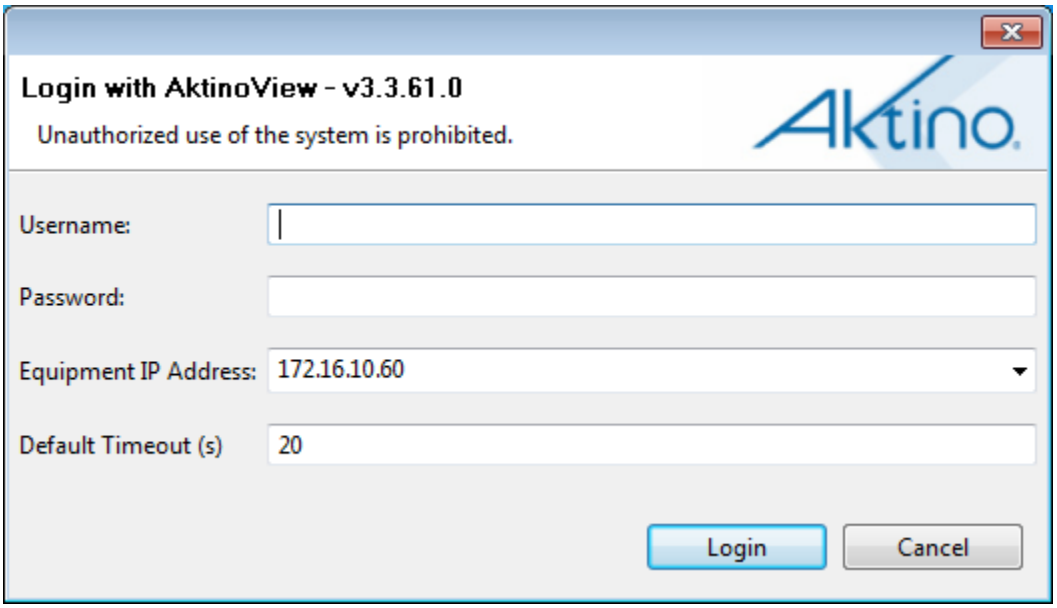
To install AktinoView proceed through the following:

- 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.

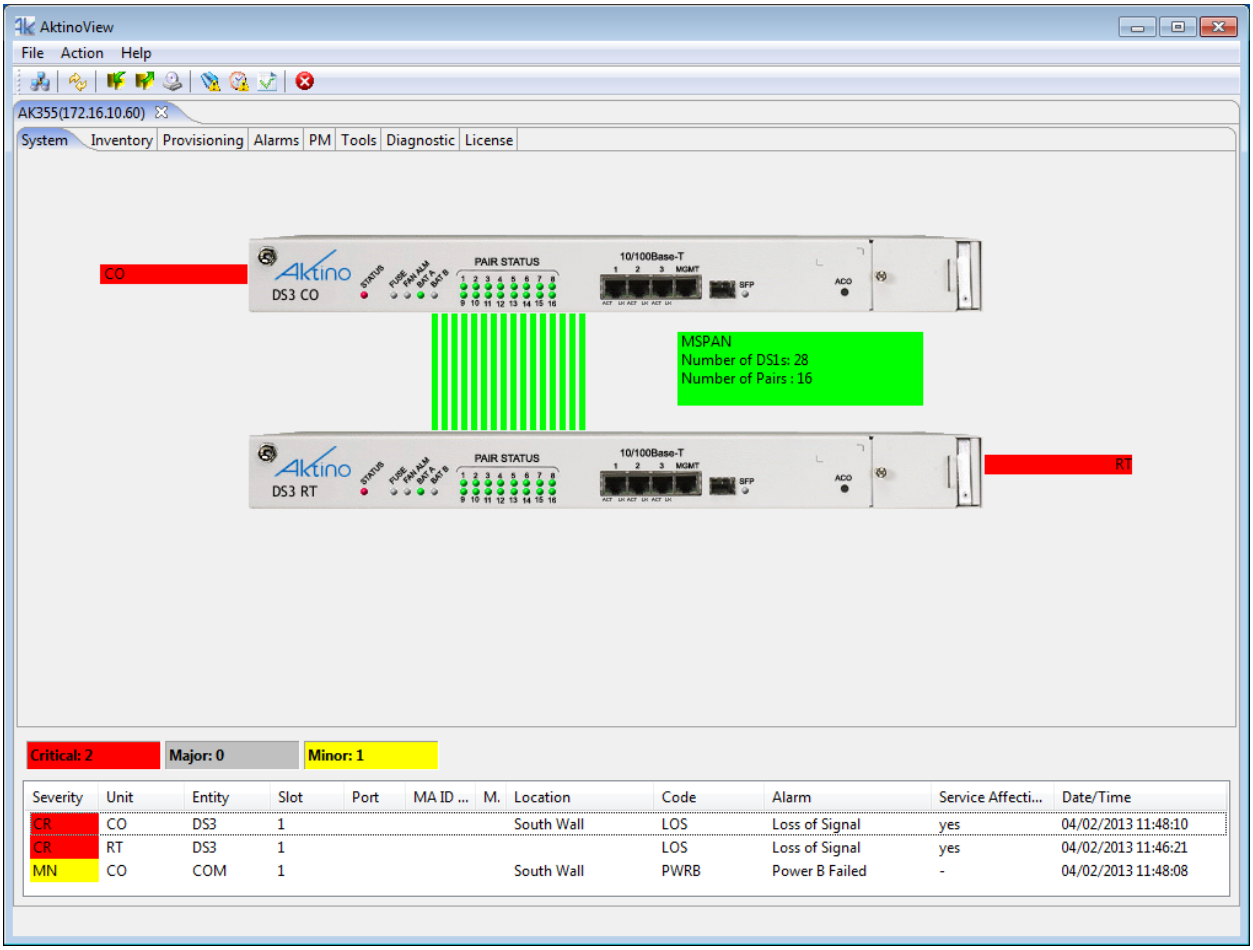
Help Menu

The Help Menu provides one option:.

About: Displays the AktinoView software version information.

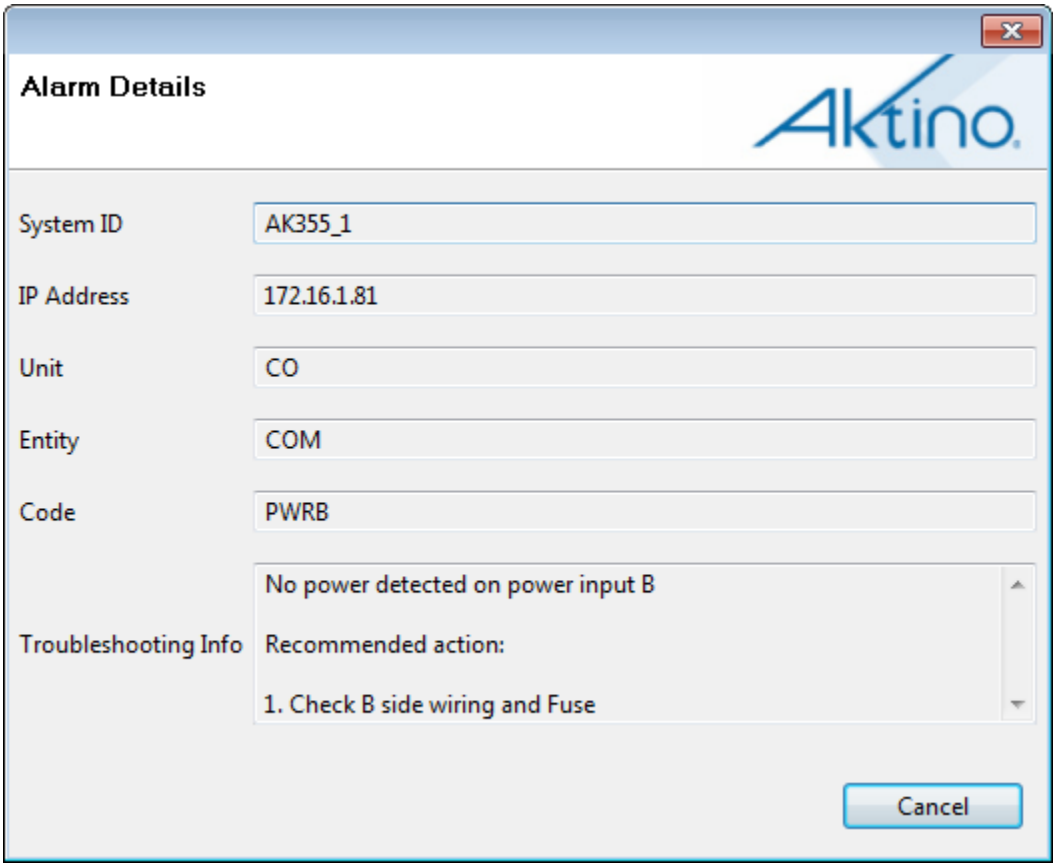
AktinoView provides Quick-Launch buttons for all the menus.

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.



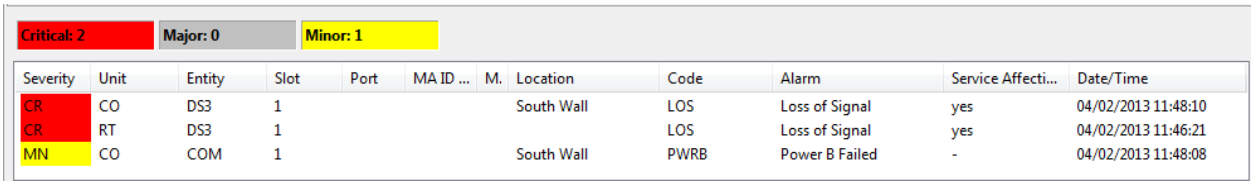
When AktinoView connects to a given system, it will display several additional tabs appropriate for the selected system. In this case, AktinoView displays the following tabs for an AK355 System: System, Inventory, Provisioning, Alarms, PM, Tools, Diagnostic, and License.

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.



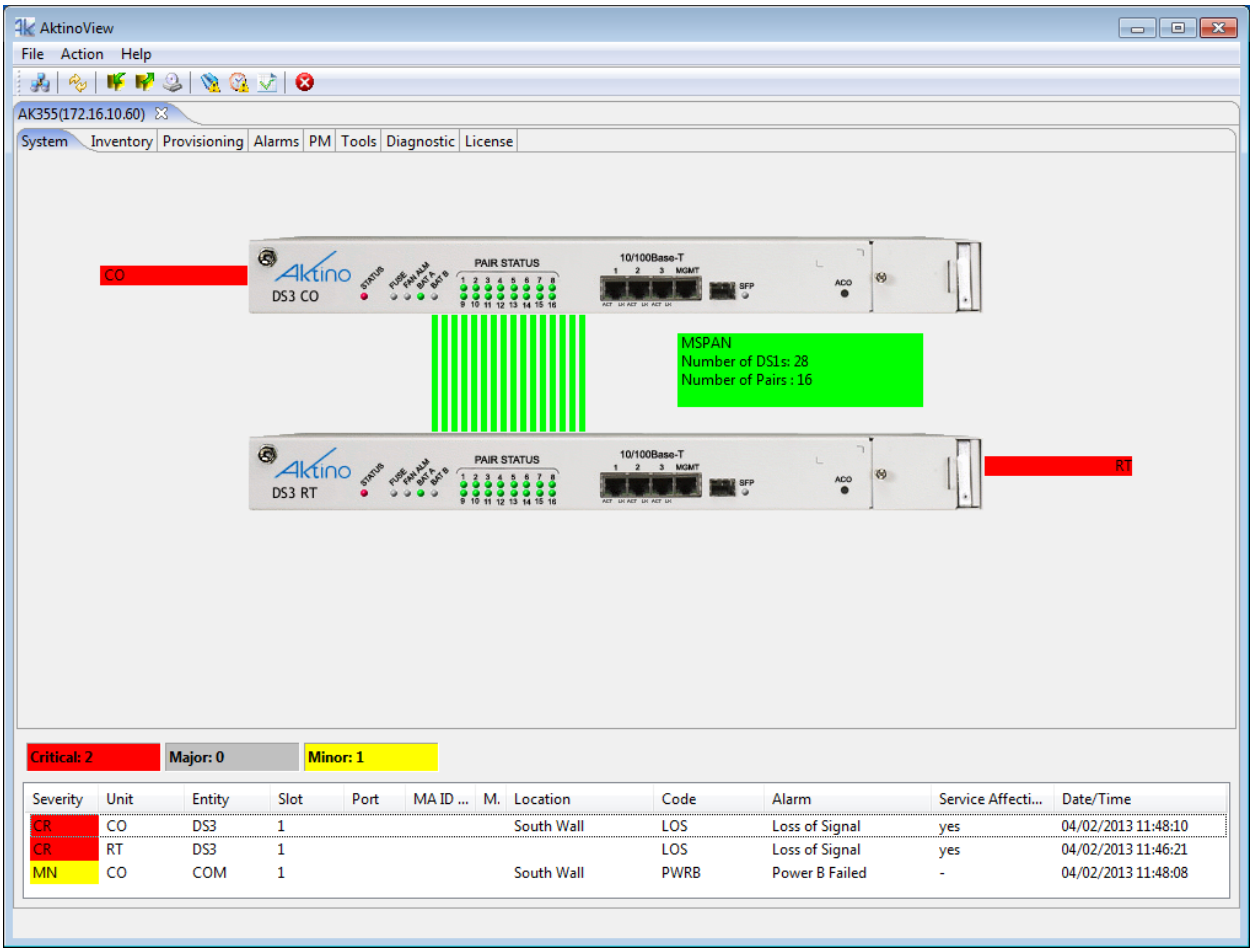
Alarm Details

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.



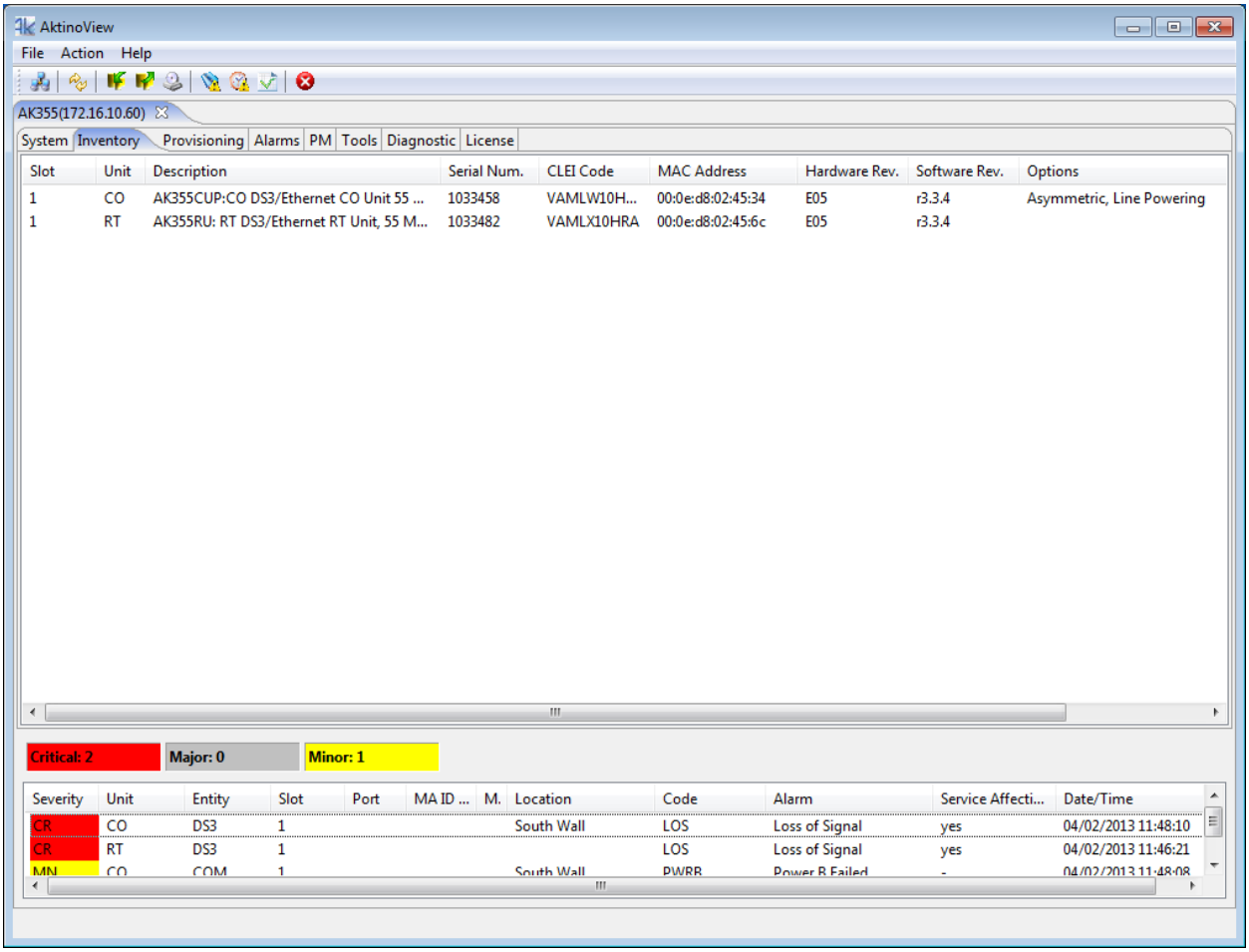
3.3.4 System

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



3.3.5 Inventory

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

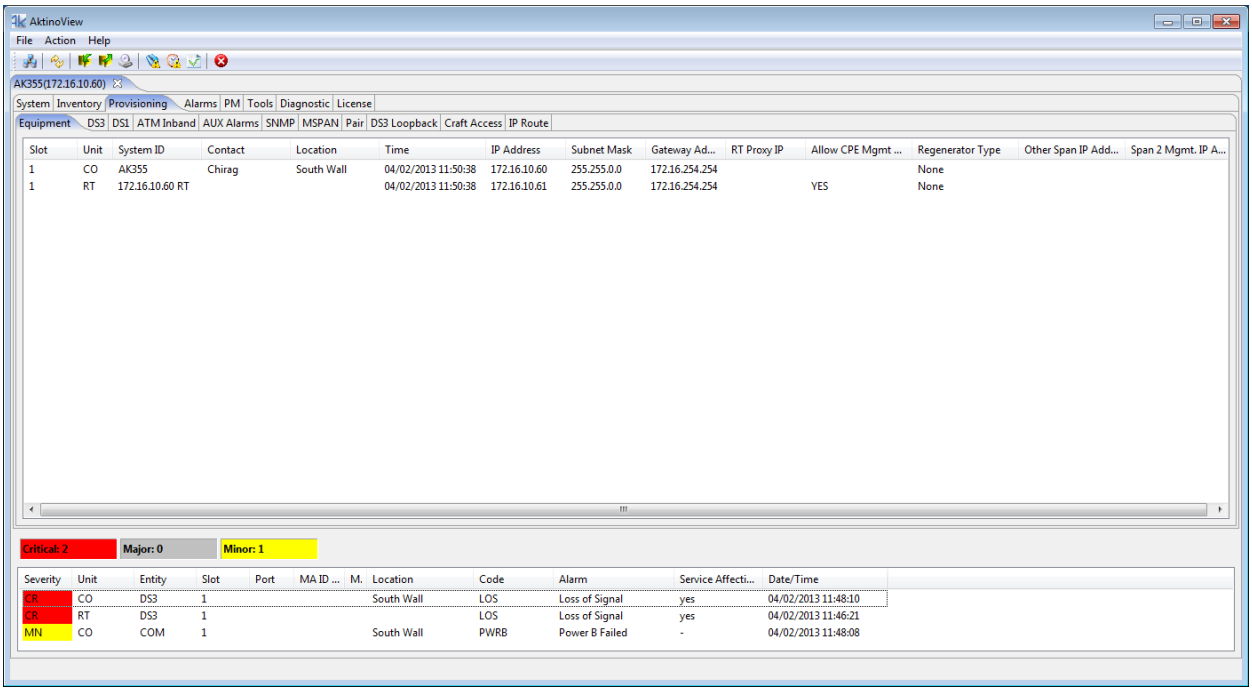
Parameter	Values
Slot	Slot number
Unit	Location
Description	Detailed description
Serial	Serial Number
CLEI Code	Telcordia assigned CLEI code
MAC Address	MAC Address for the device
Hardware Rev.	Hardware Revision Level
Software Rev.	Software Revision Level
Options	Asymmetric: Support for Asymmetric Mode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

3.3.6 Provisioning

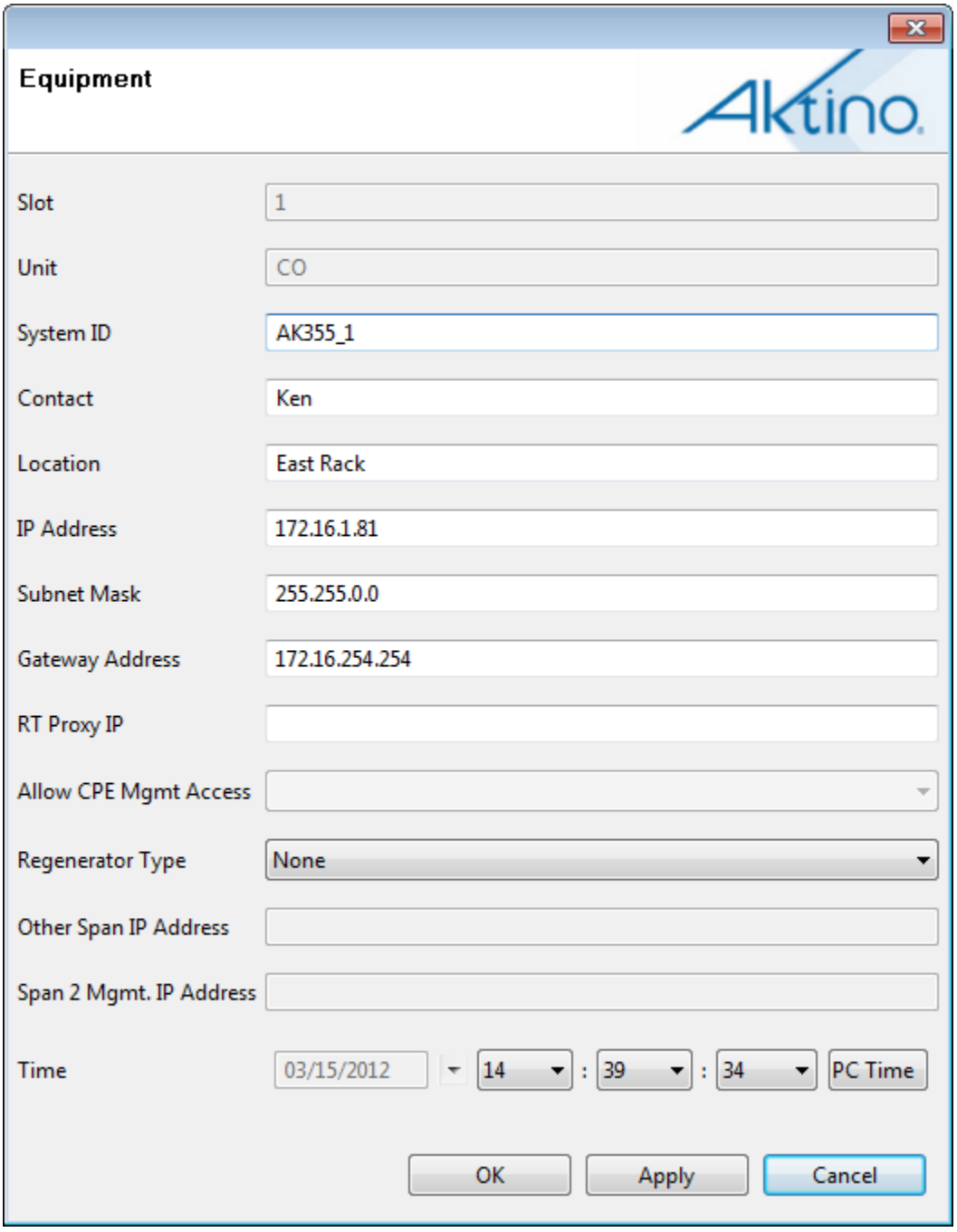
Clicking the Provisioning tab displays all the provisioning sub-sections supported by the AK355 System.

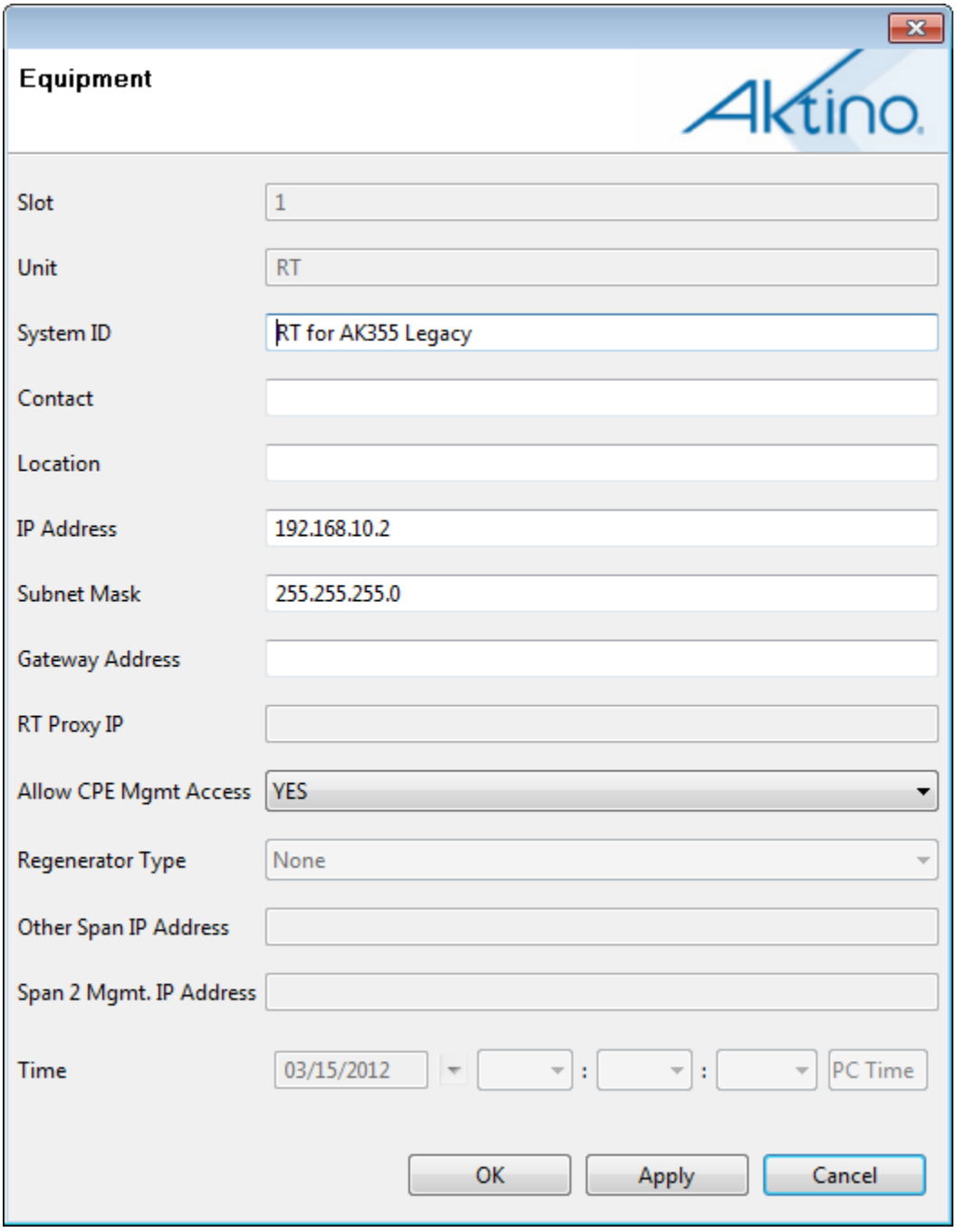
3.3.6.1 Equipment

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
Aktino
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
Aktino
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

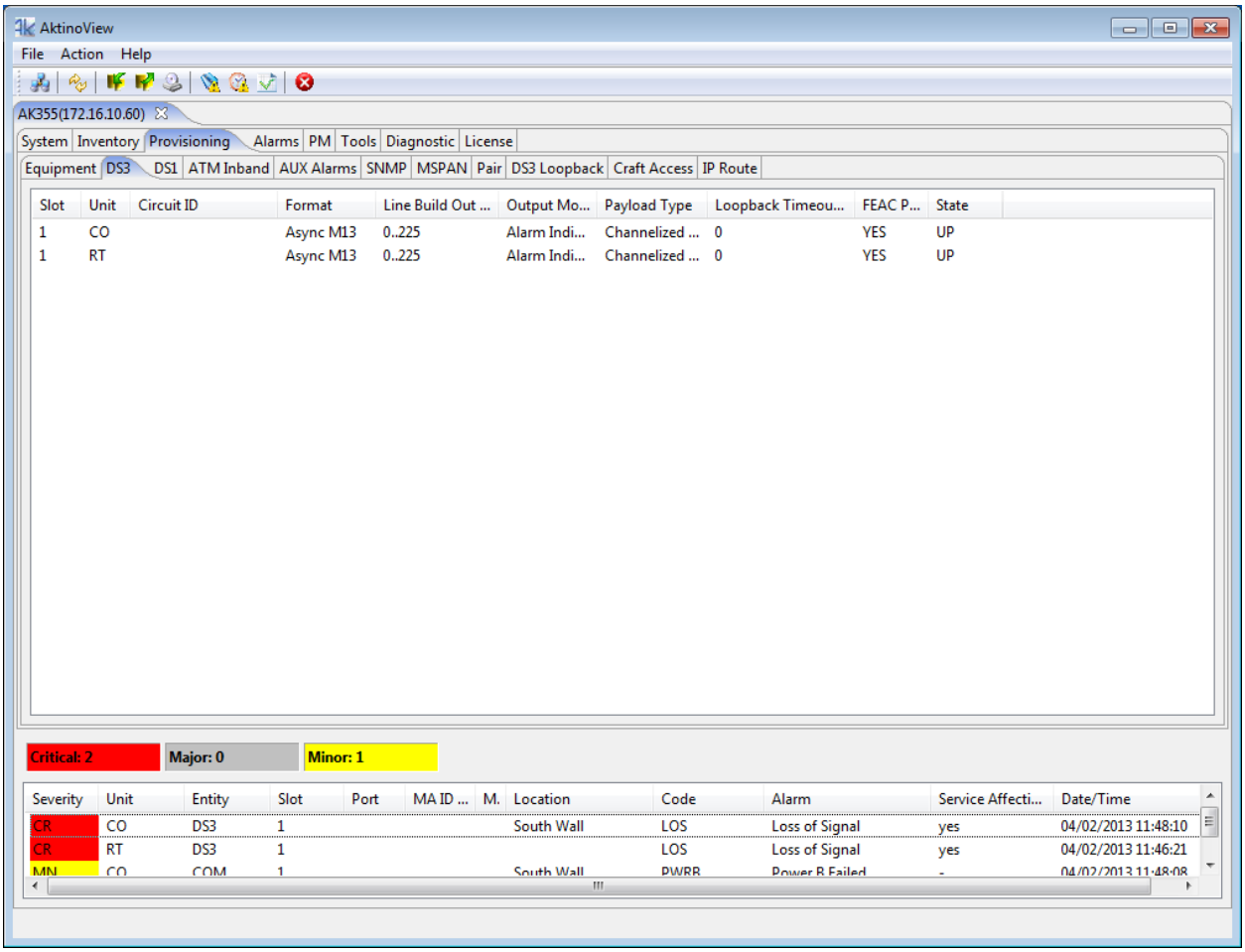
See the following tables for Parameters and Values:

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

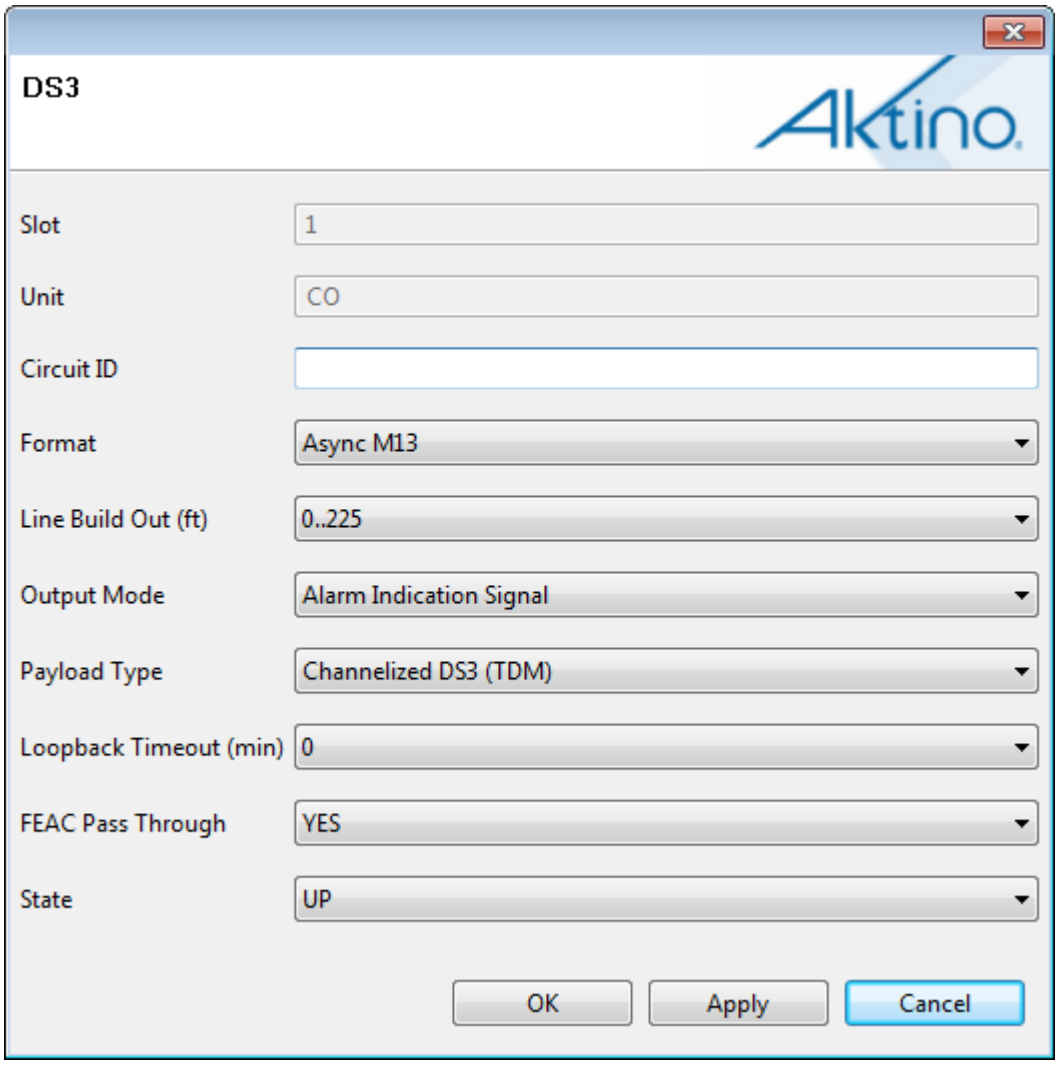
3.3.6.2 DS3

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

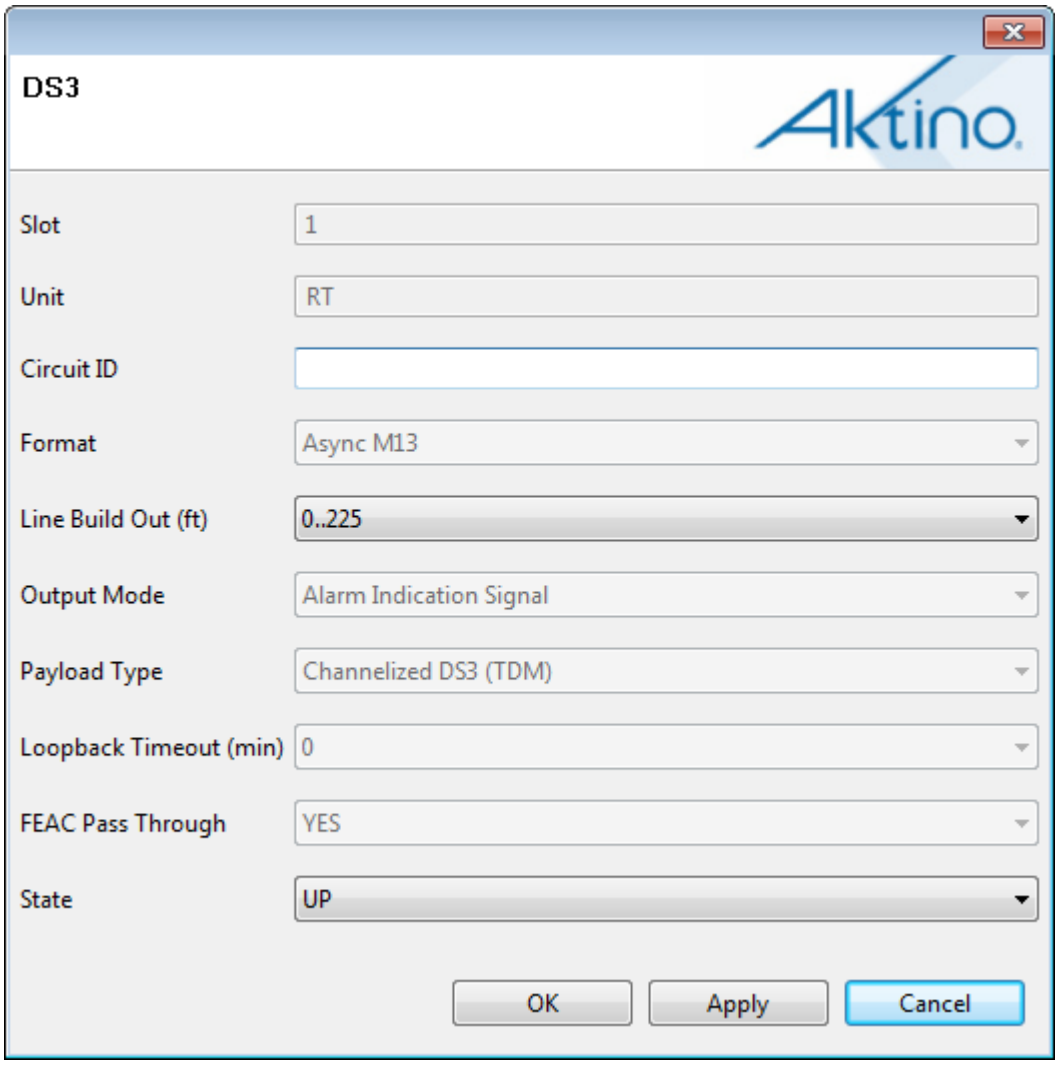


Double-click on the CO or the RT to bring up the provisioning dialog box for the selected unit. Note that some of the parameters changed on the CO are also reflected on the RT. Double-click on the RT unit to provision the remainder of the RT's parameters and values.

The following is the DS3 CO unit provisioning dialog box:



The following is the DS3 RT unit provisioning dialog box:



See the following table for parameters and values:

DS3 CO unit Parameters and Values table

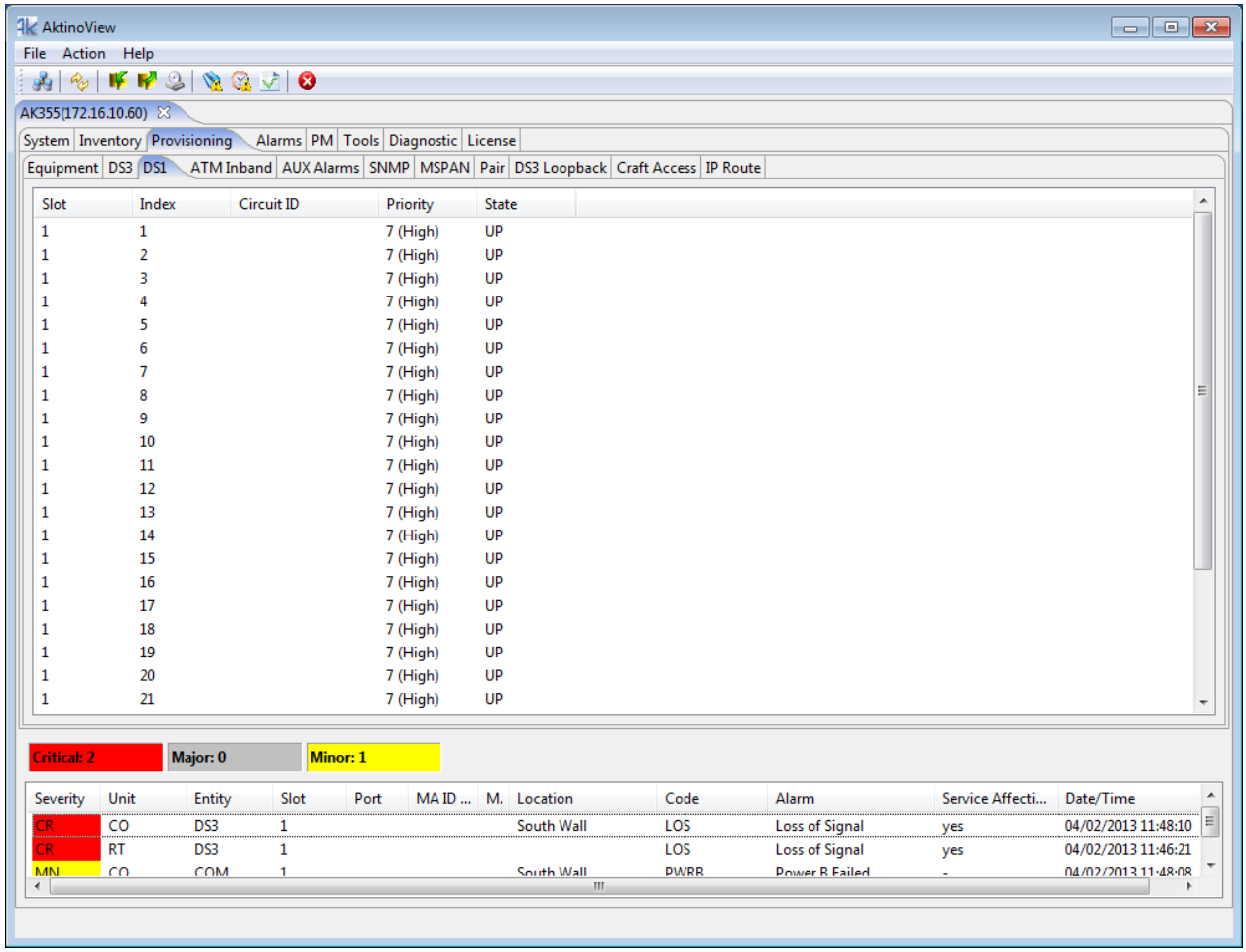
Parameters	Values
DS3 Circuit ID	Allows input of description of the DS3 circuit up to 48 characters.
DS3 Line Format	C-Bit Parity Asynchronous M13
CO unit DS3 Line Build Out	0..225 ft 226..450 ft
Output Mode (Alarm Mode)	Normal - Idle, Alarm Indication Signal (AIS)
Payload Type	Channelized DS3 (TDM) 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

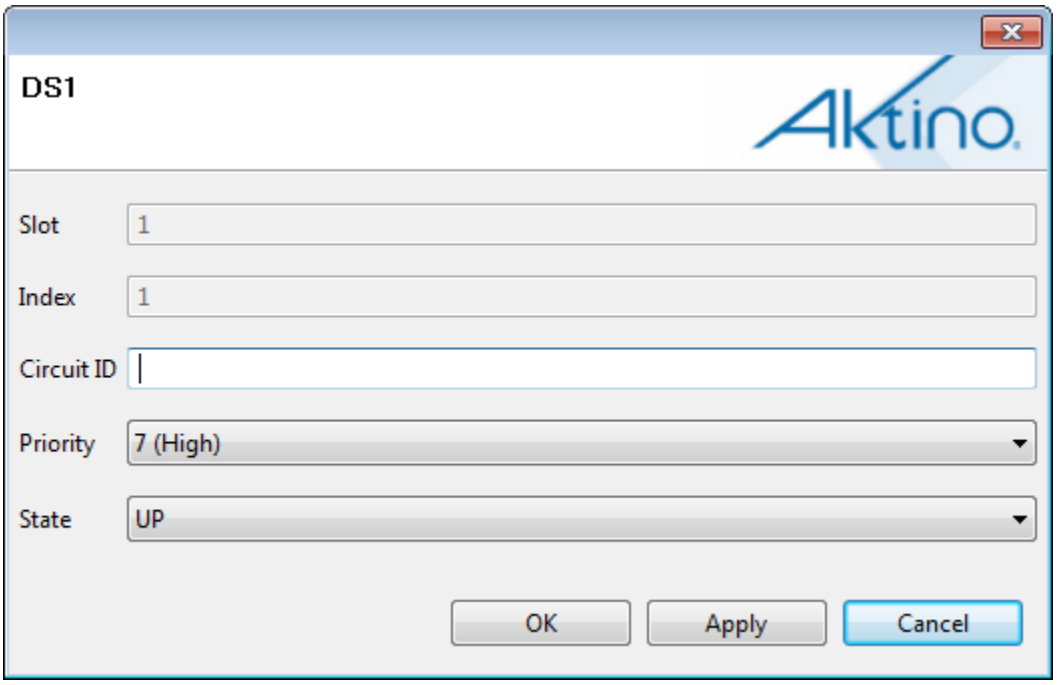
3.3.6.3 DS1

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 DS1set to UP state.

The following is the DS1 provisioning dialog box:



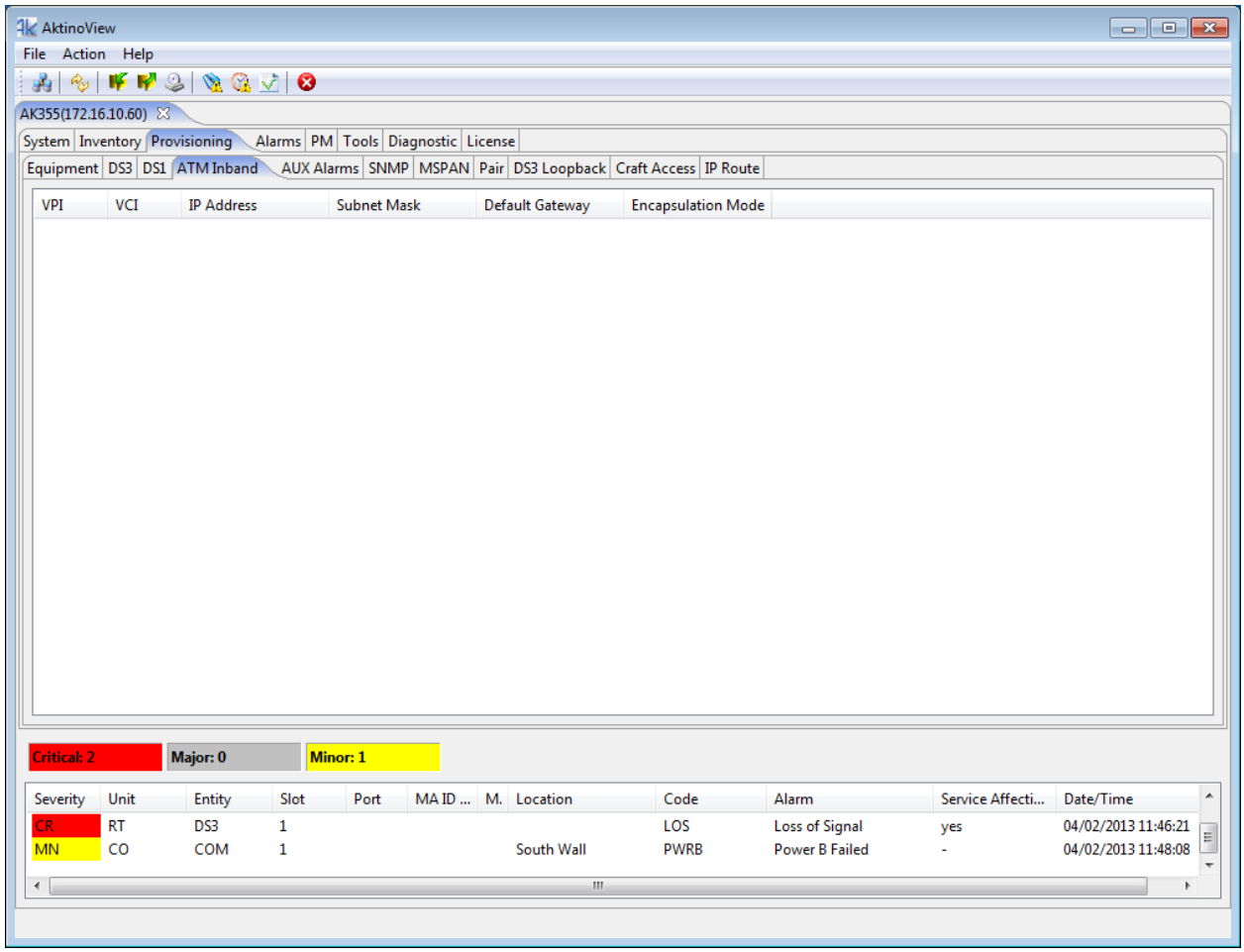
See the following table for parameters and values:

DS1 Provisioning Parameters and Values

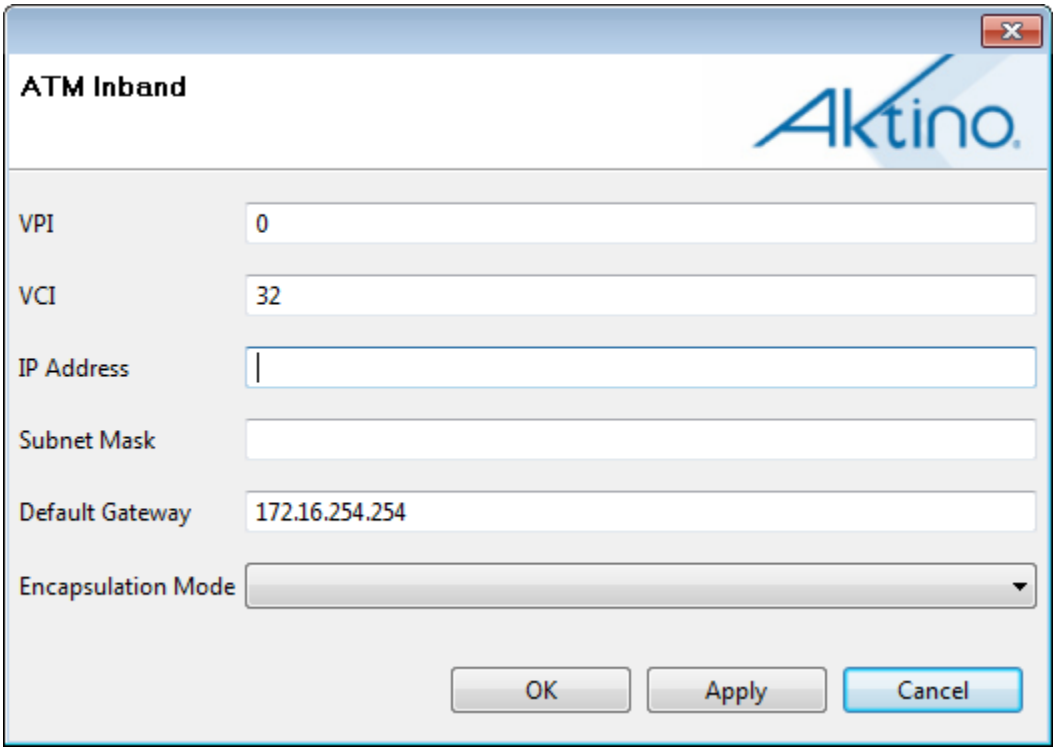
Parameter	Values
Circuit ID	Circuit ID of DS1 up to 48 characters
Priority	0 [Low] through 7 [High] When system needs to downshift the MSPAN rate during adverse conditions (e.g. a pair failed), the priority parameter determines the order of DS1's dropped.
State	**Down** - DS1 tributary is not transported.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



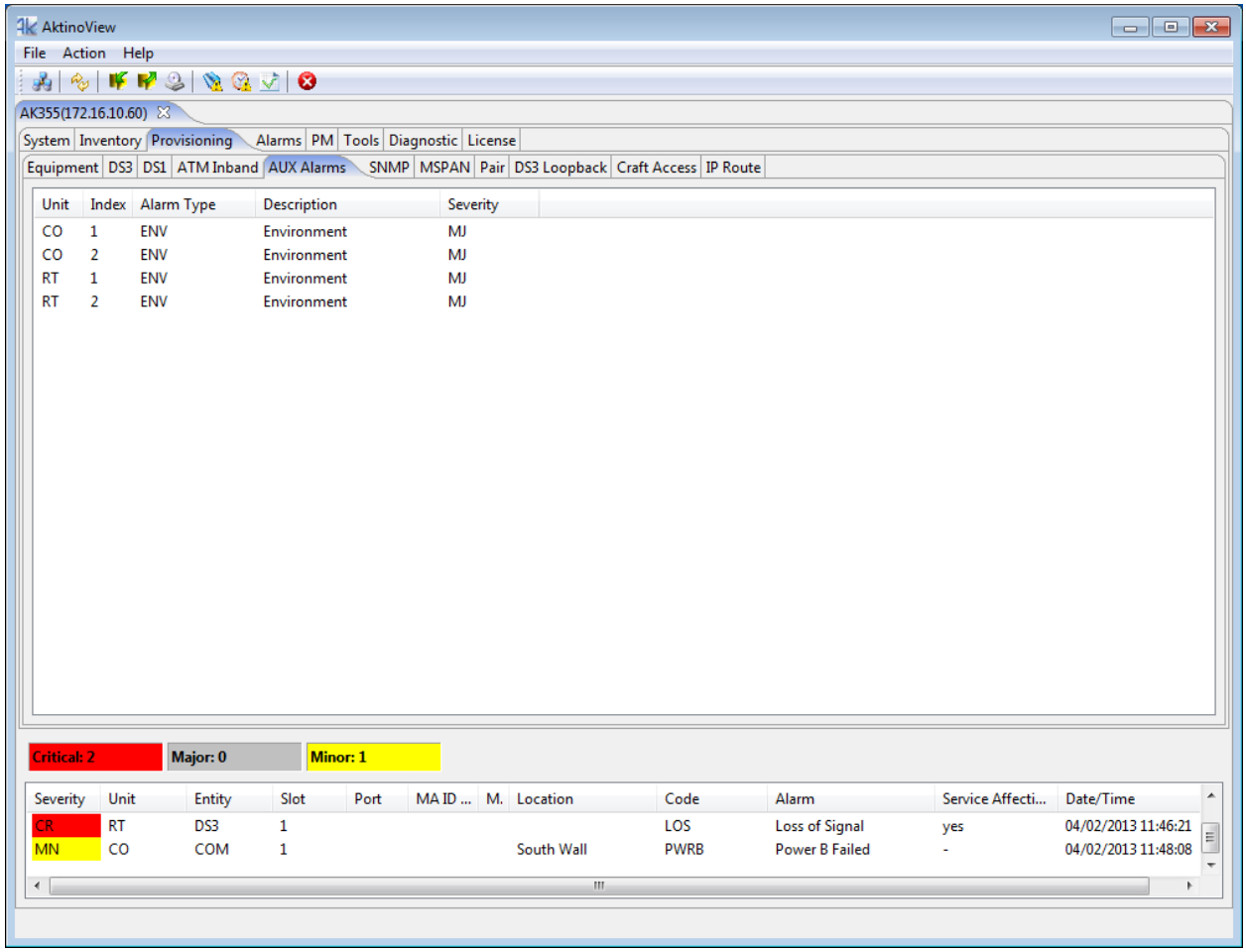
See the following table for parameters and values:

ATM Inband Parameters and Values

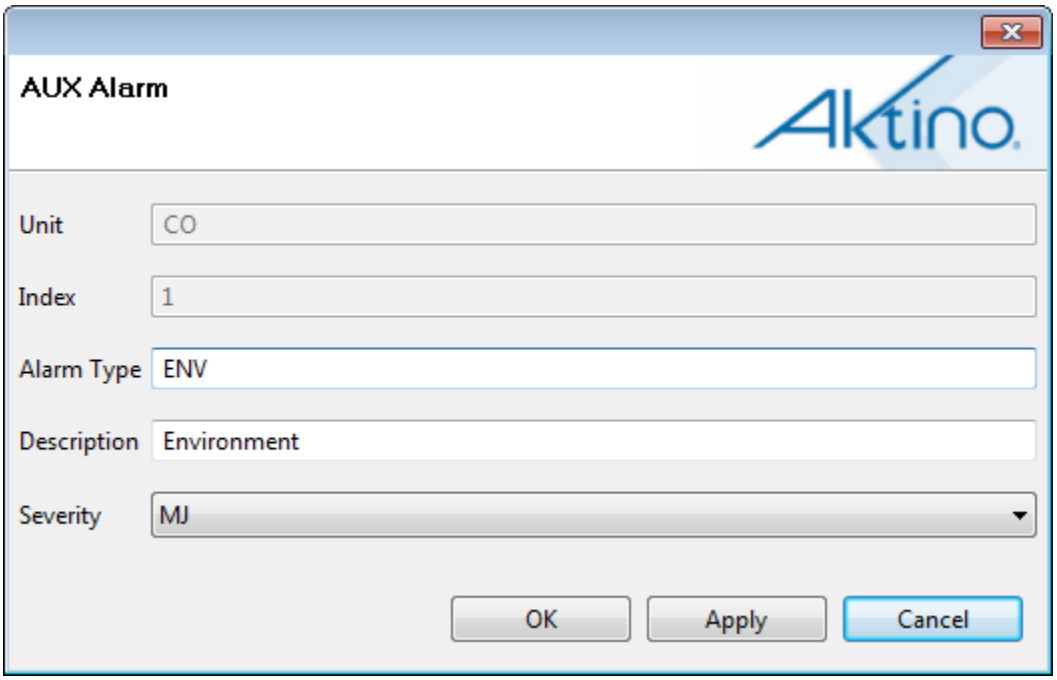
Parameters	Values
VPI	Virtual Path Identifier
VCI	Virtual Circuit Identifier
IP Address	IP Address of the Positron unit (must be in a different subnet vs. the local management port).
Subnet Mask	Subnet Mask for the Positron Unit
Default Gateway	Gateway address for the Positron Unit

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.



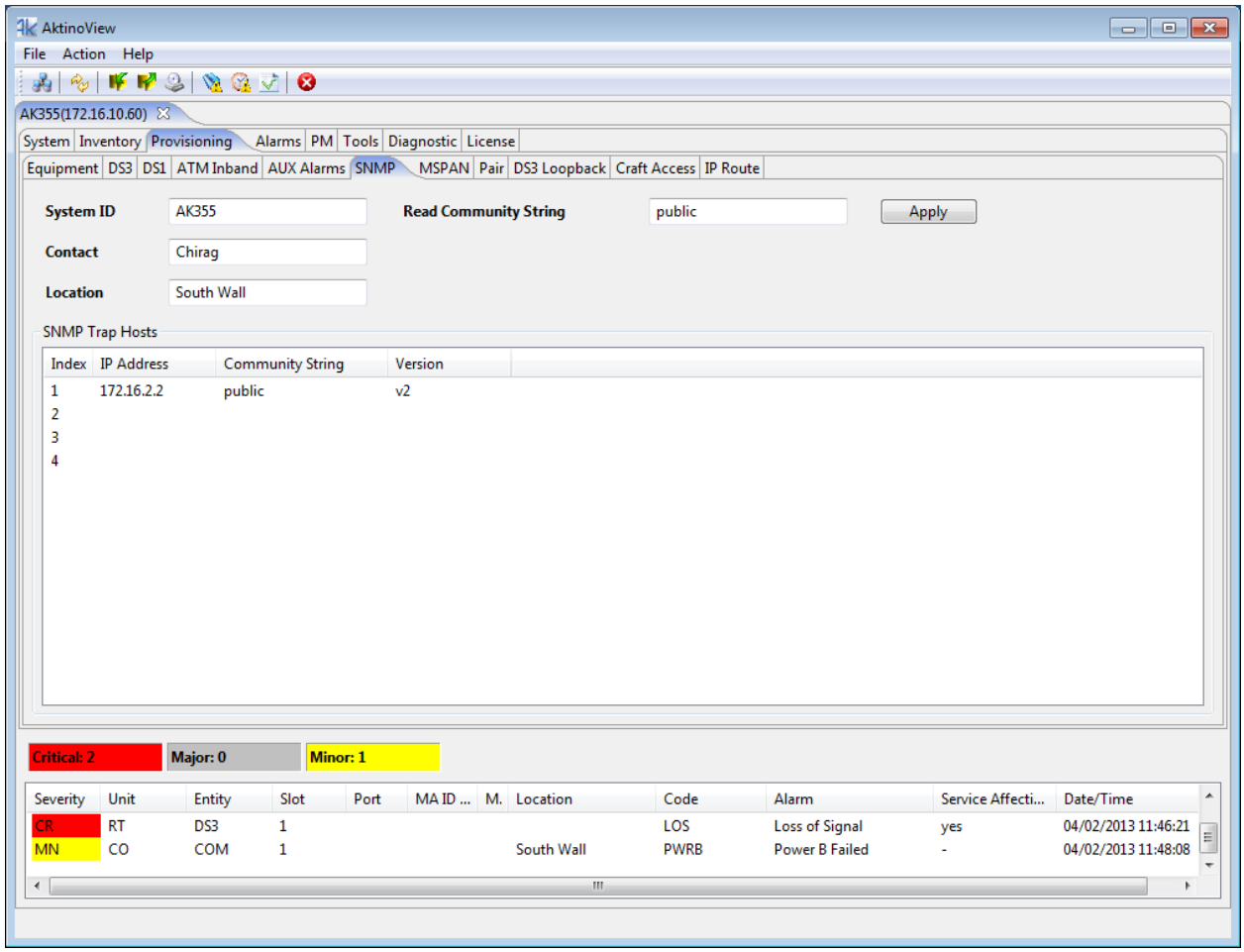
See the following table for Parameters and Values:

AUX Alarm Parameters and Values

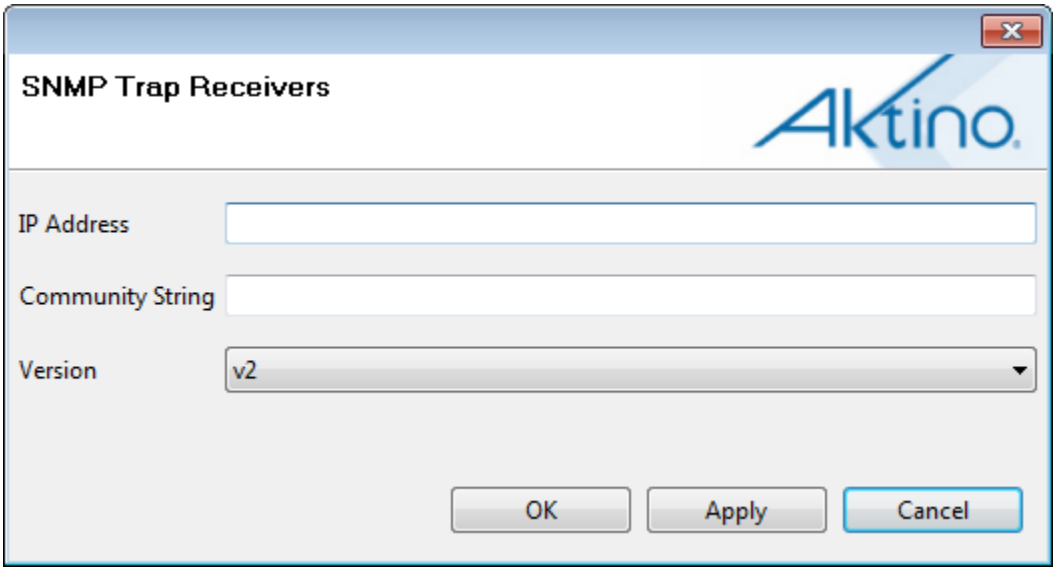
Parameters	Values
Alarm Type	This value is reported as alarm type in the TL 1 alarm message up to 16 characters.
Description	This values is reported as alarm description in the TL1 alarm message up to 48 characters.
Severity	Critical, Major, Minor

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:

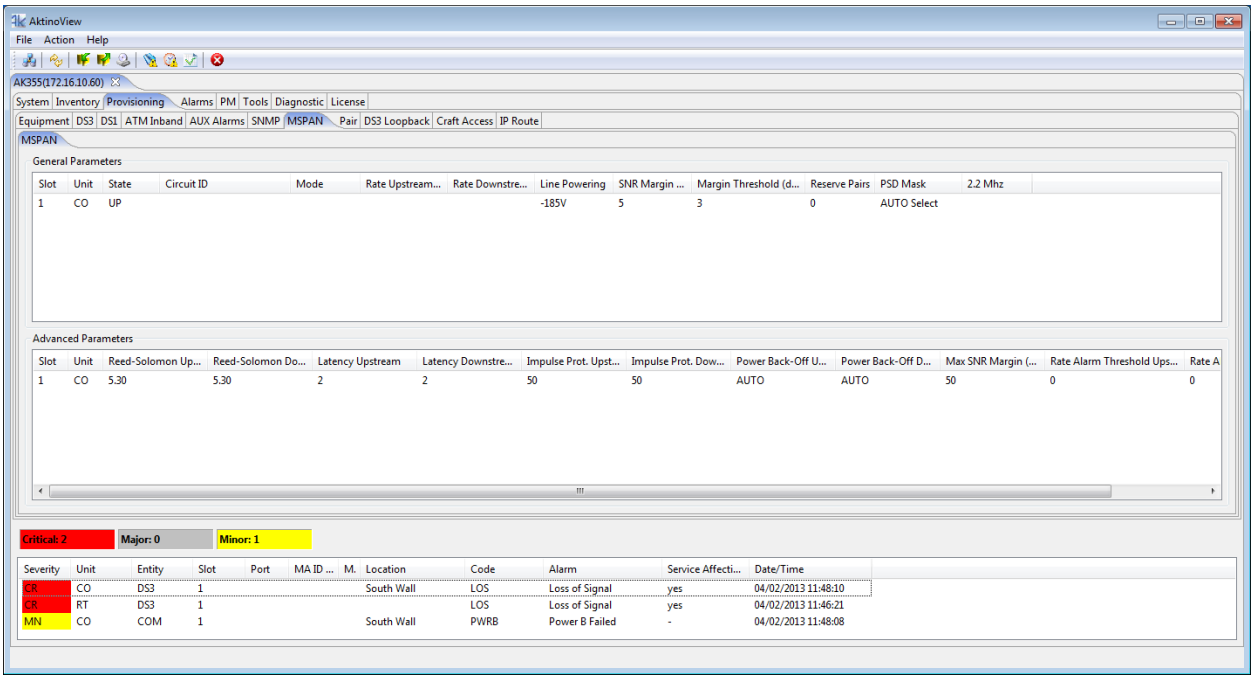
SNMP Parameters	Values
System ID	User configurable string of up to 20 characters
Contact	User configurable string of up to 64 characters
Location	User configurable string of up to 64 characters
Read Community String	The SNMP Read Community String for the AK355 System

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)

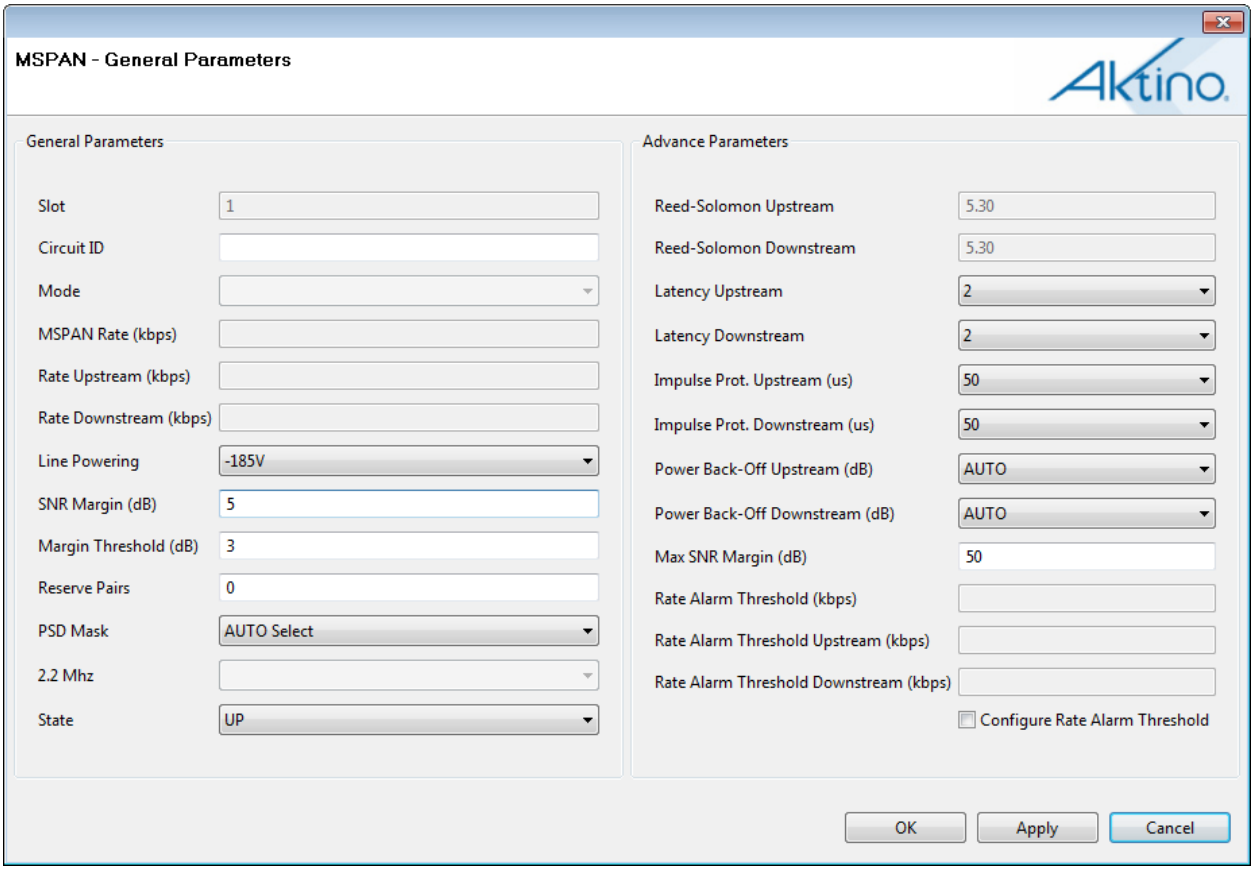
3.3.6.7 MSPAN

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.



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.



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 µsec
Impulse Protection Downstream	Length of Downstream Impulse Noise Protection: 50, 125, 250, 500, 750, 1000, 2000, 4000 µsec
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

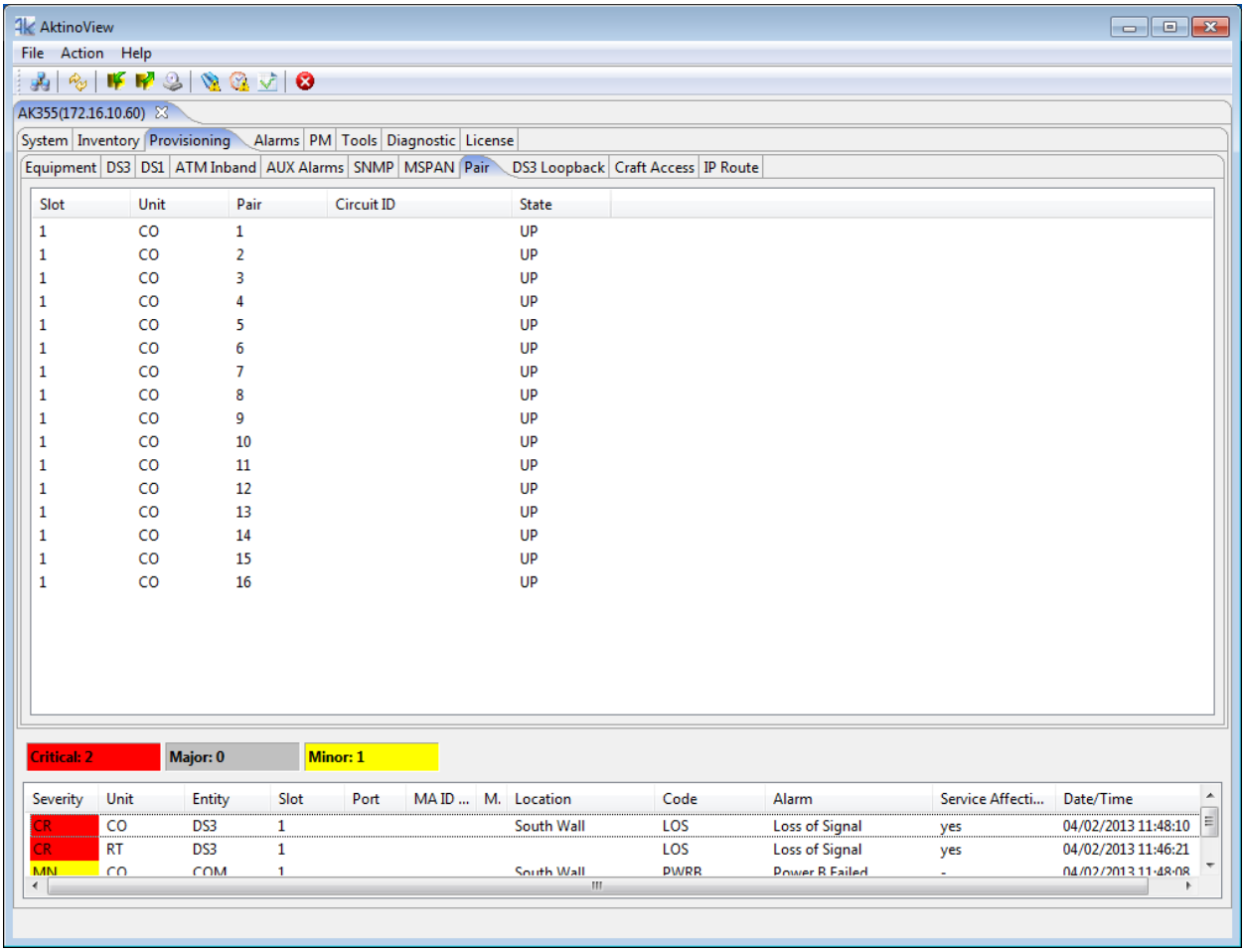
Note: PSD Masks attempt to equalize the upstream and downstream MSPAN rates and are optimized for particular loop lengths.

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

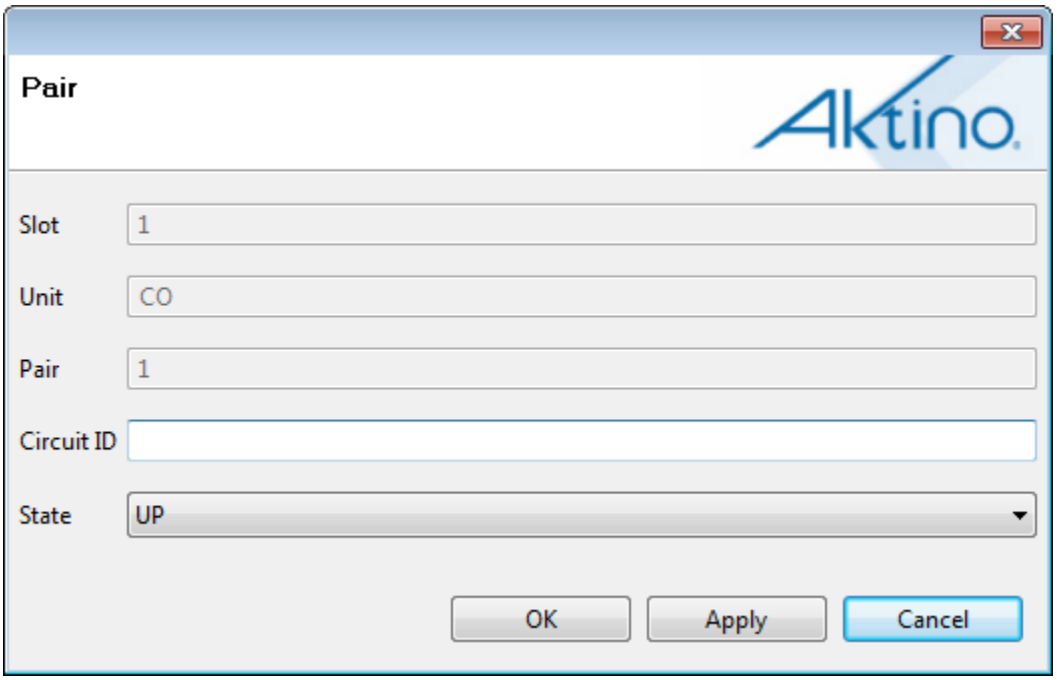
PSD Mask	Best for Loop Lengths (24 AWG)
M1	0 to 8667 feet
M2	8667 to 12667 feet
M3	12667 to 15333 feet
M4	15333 to 18000 feet
M5	Greater than 18000 feet

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.

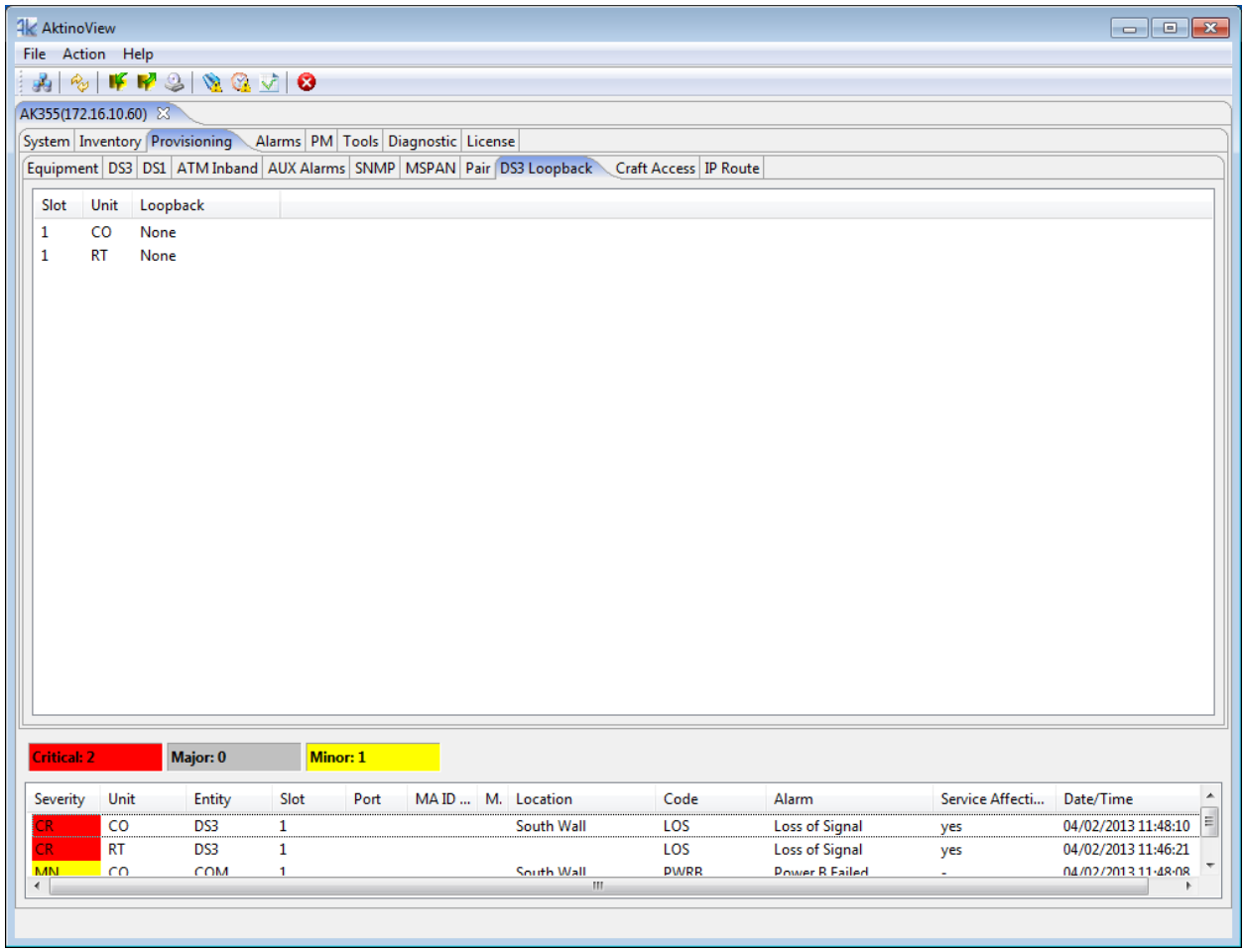


See the following table for Pair Provisioning Parameters and Values:

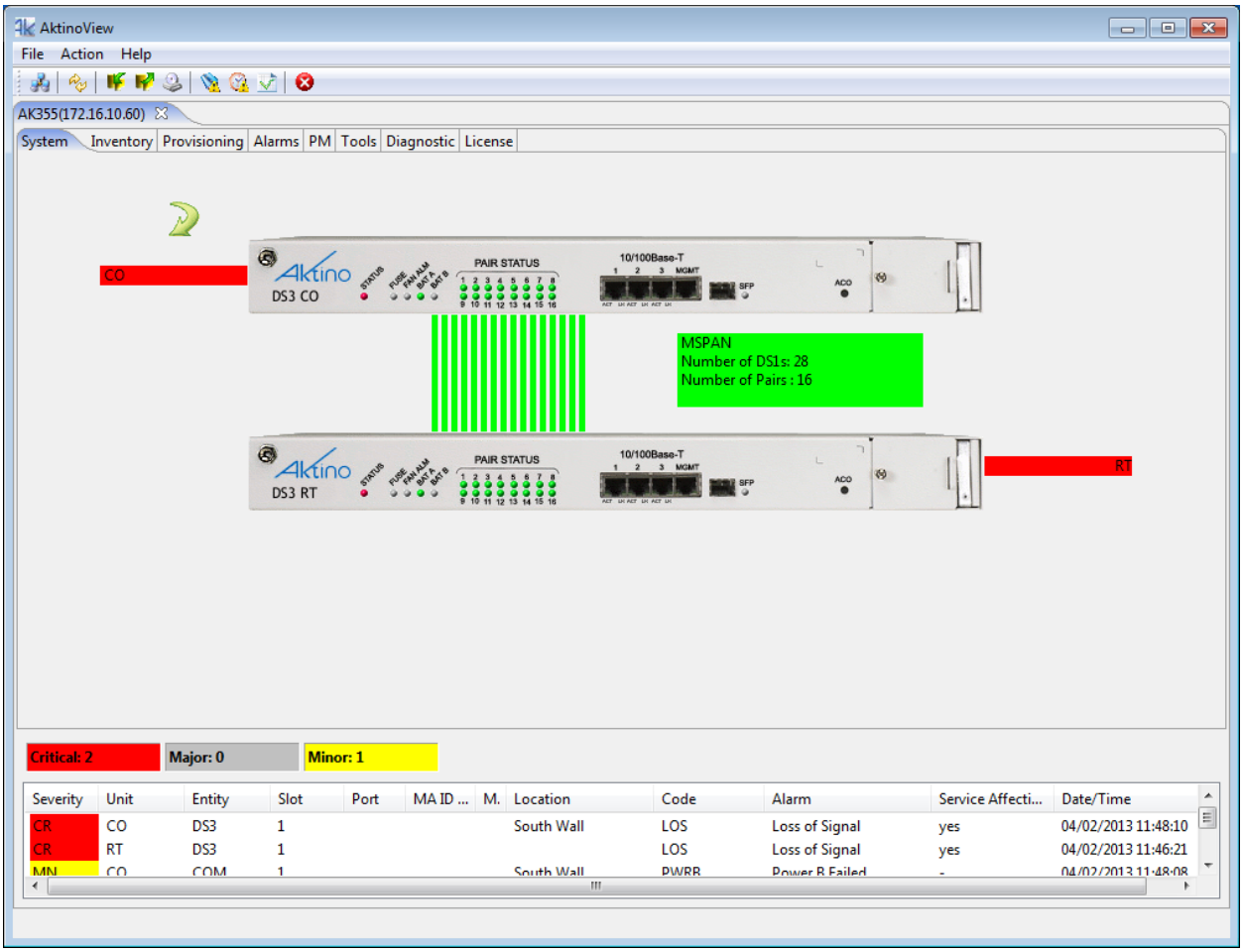
Pair Parameters	Values
Circuit ID	User configurable string of up to 48 characters
State	Sets the Pair State: Up - Pair is in service Down - Pair is out of service

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.

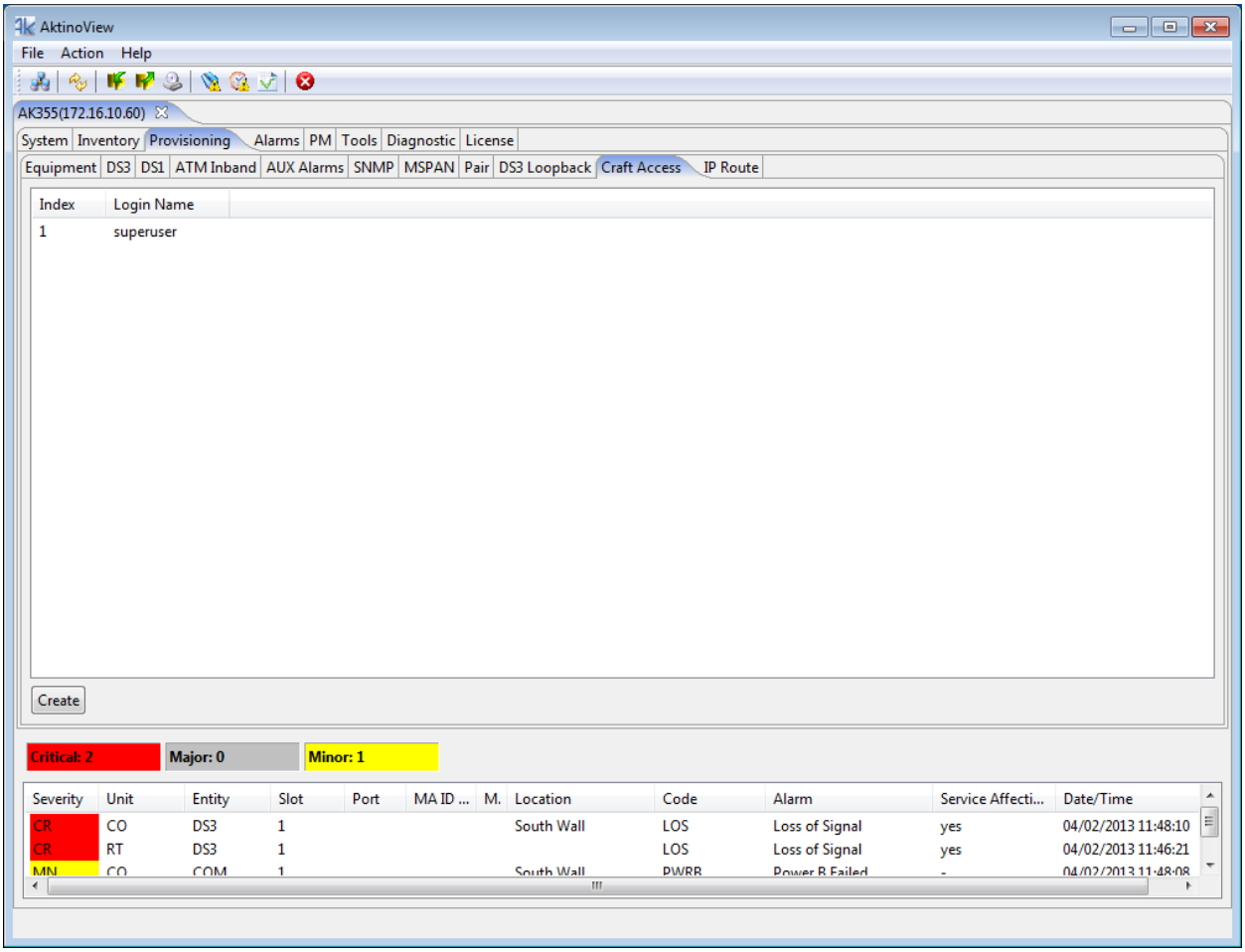


The following screen shot from the System tab reveals a loopback set Toward Network.

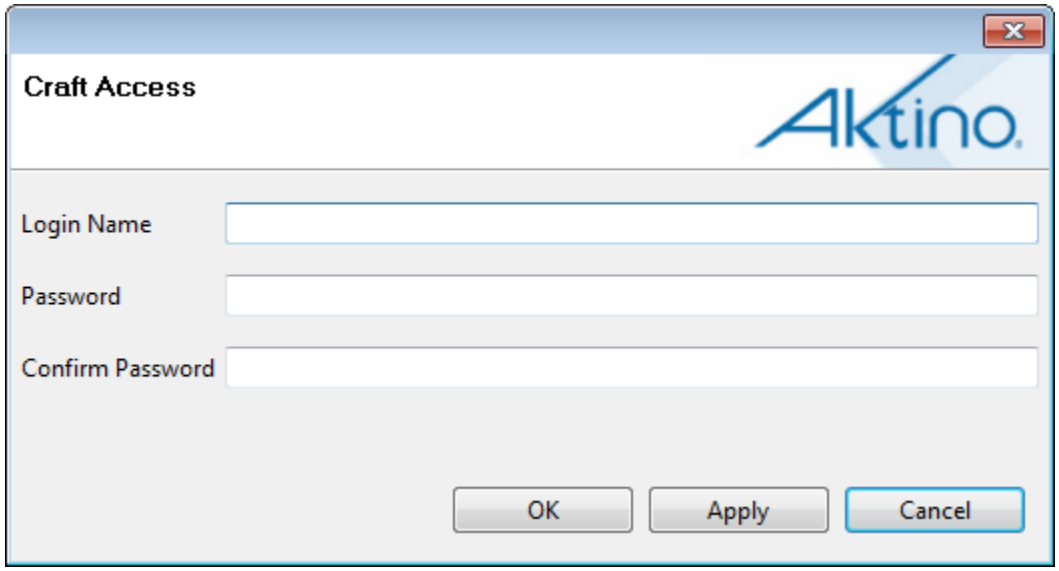


3.3.6.10 Craft Access

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



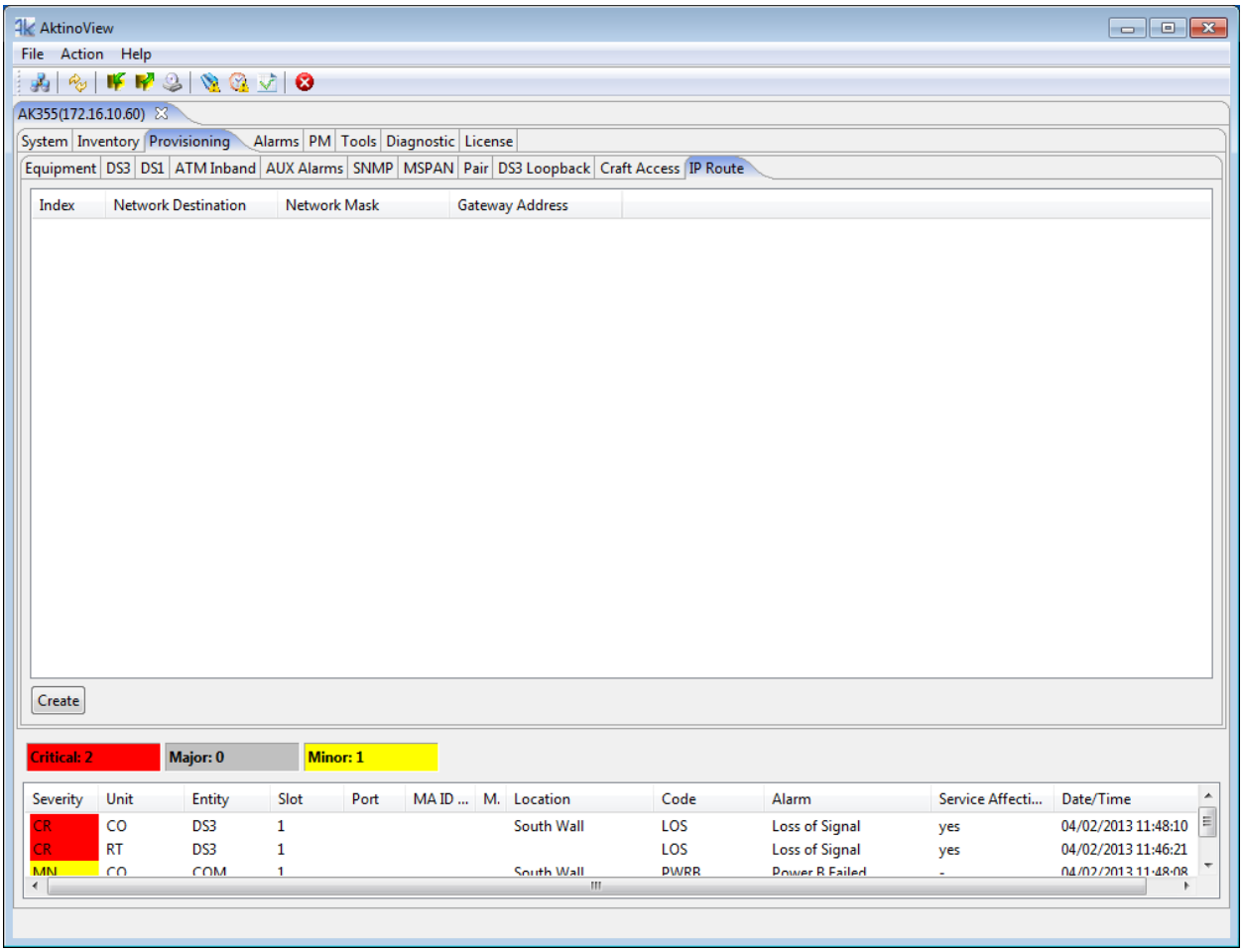
Click on **Create** to bring up the following Craft Access dialog box:



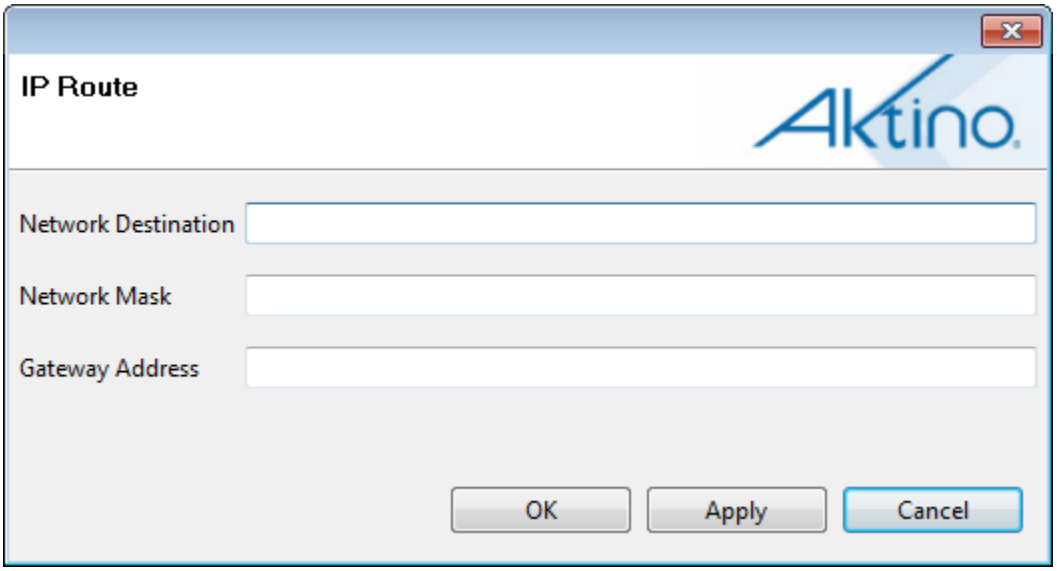
The Craft Access dialog box provides fields where the Login Name and Password is created for the new Craft Access user.

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:

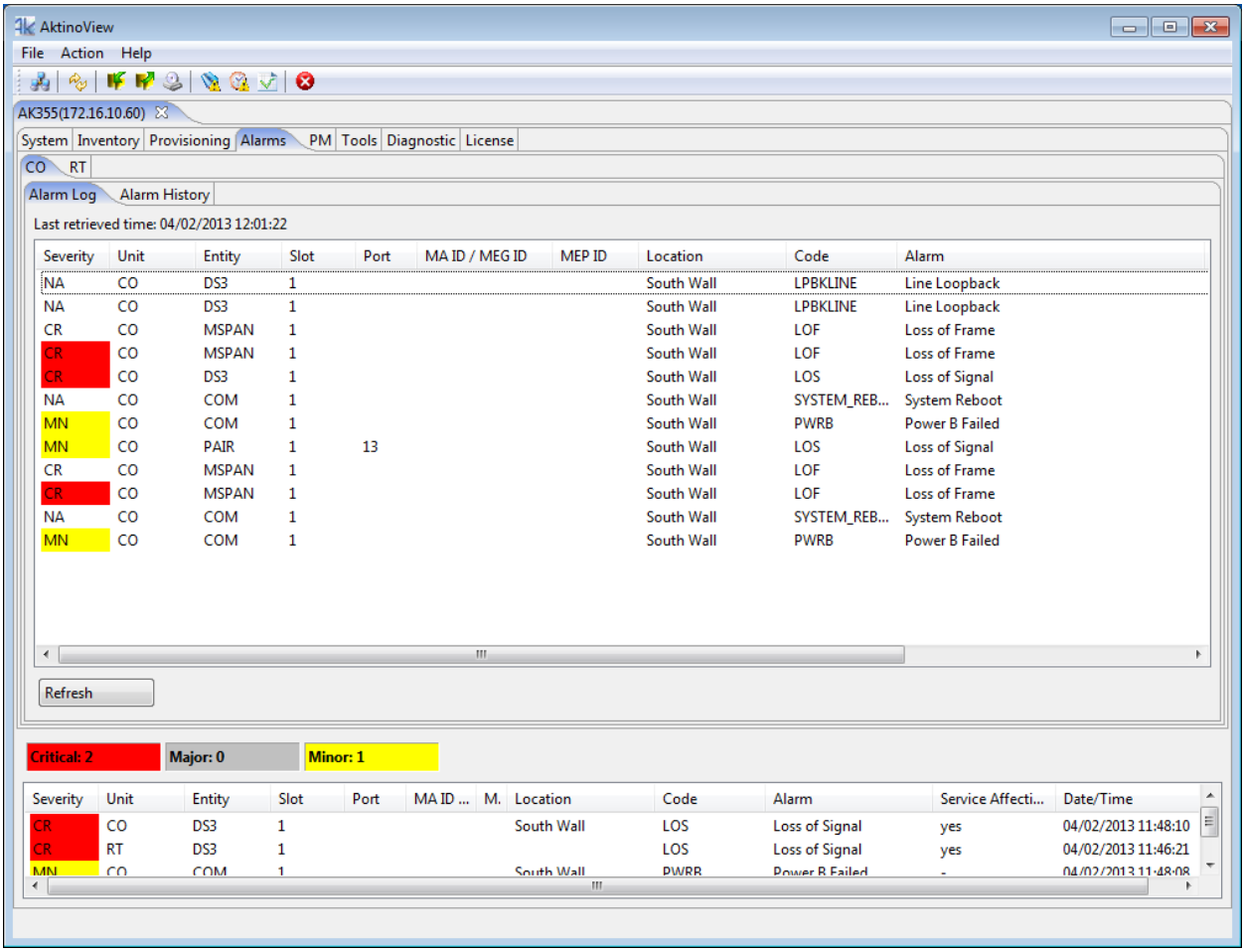
IP Route Parameters	Values
Network Destination	Destination Network Address
Network Mask	Network Mask
Gateway Address	Default Gateway Address

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.

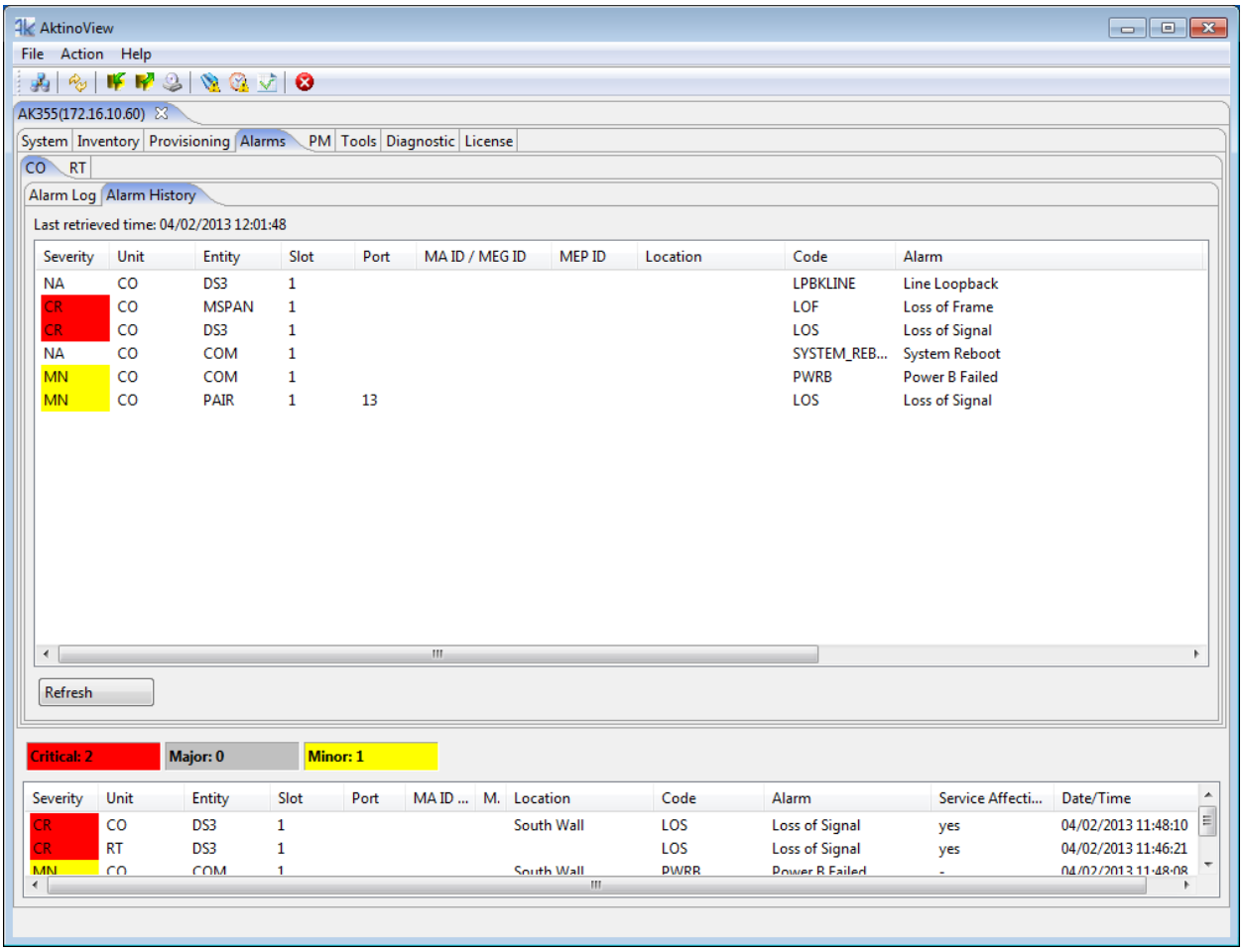
Note: See Appendix B for more Alarm details.



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.

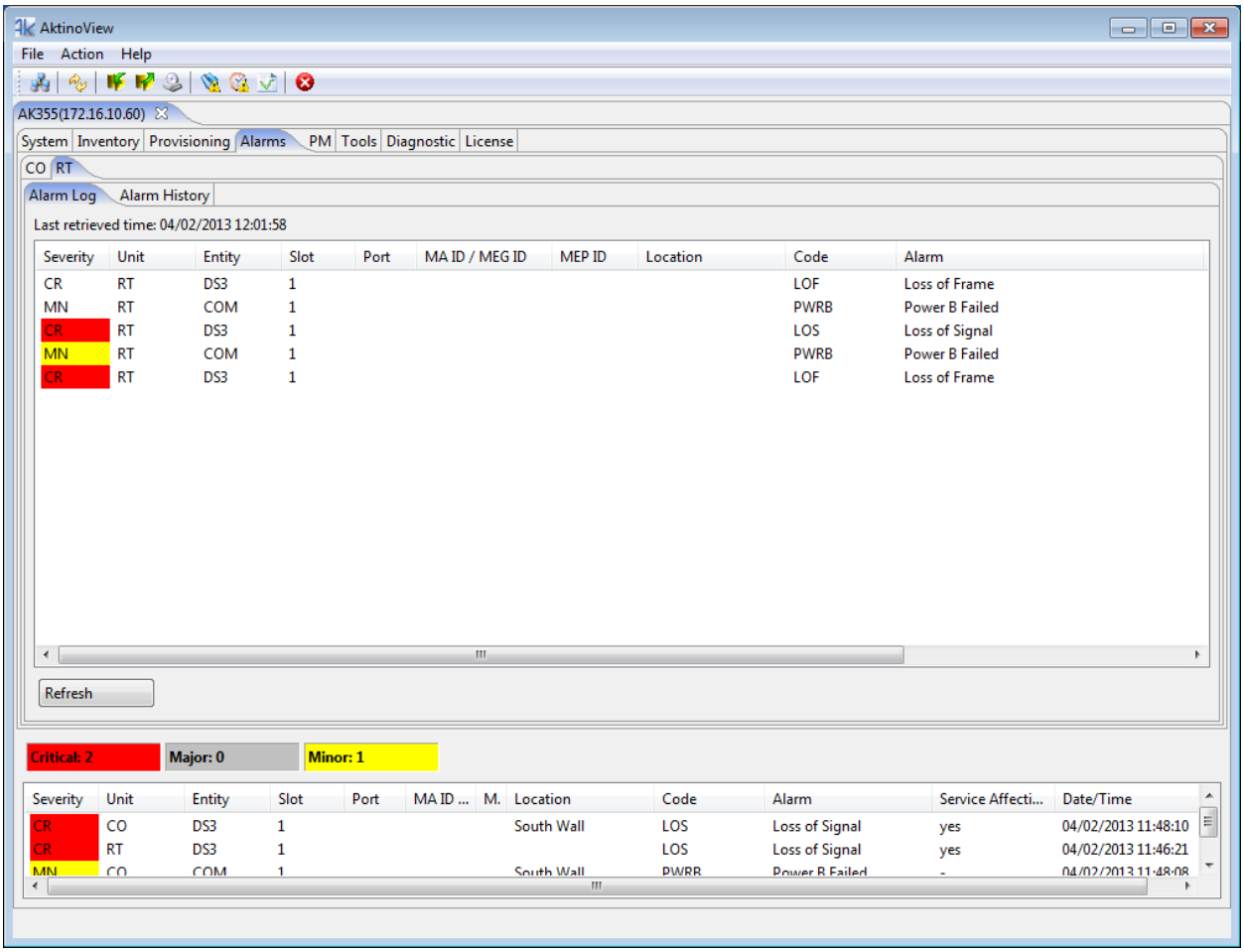
Note: See Appendix B for more Alarm details.



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.

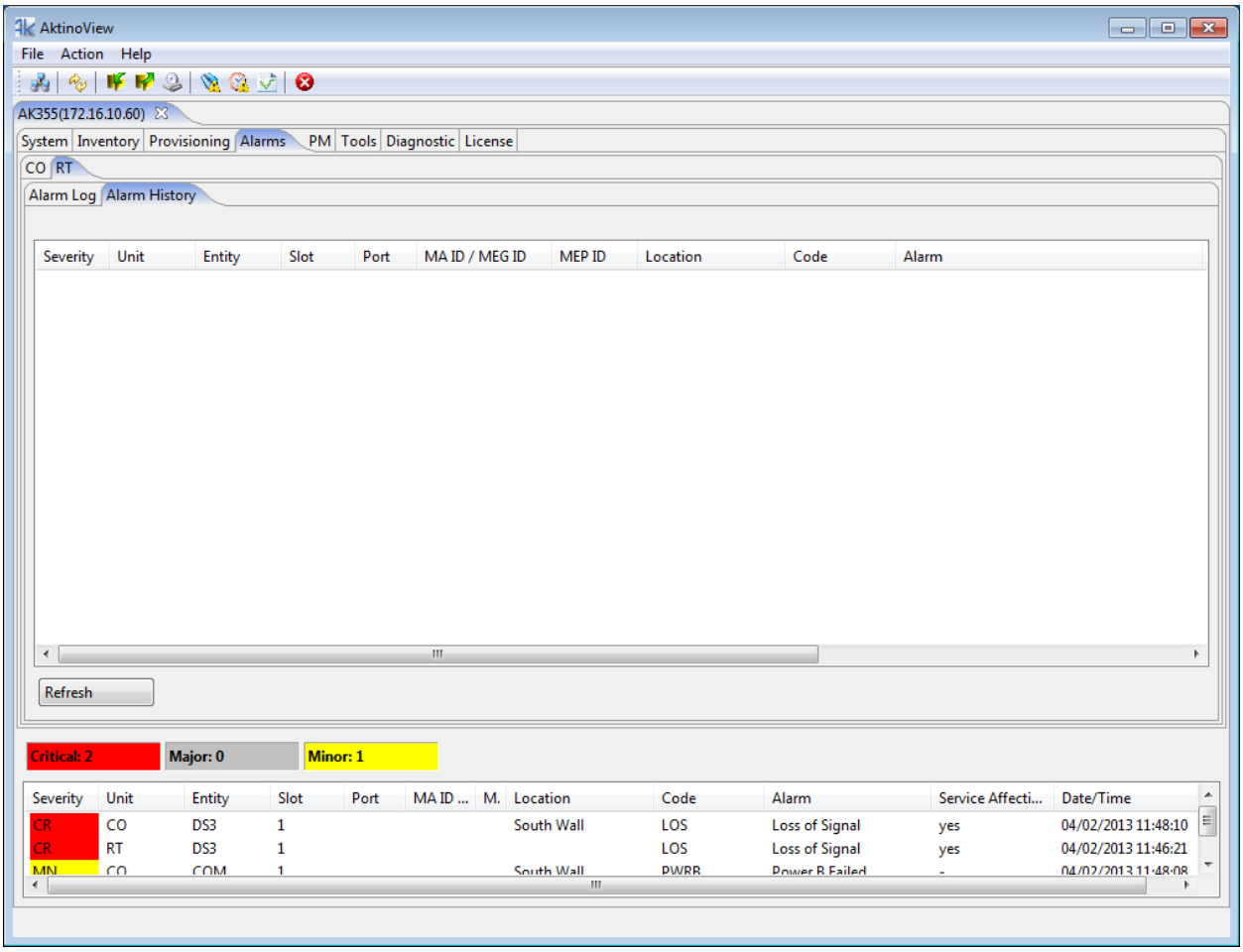
Note: See Appendix B for more Alarm details.



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.



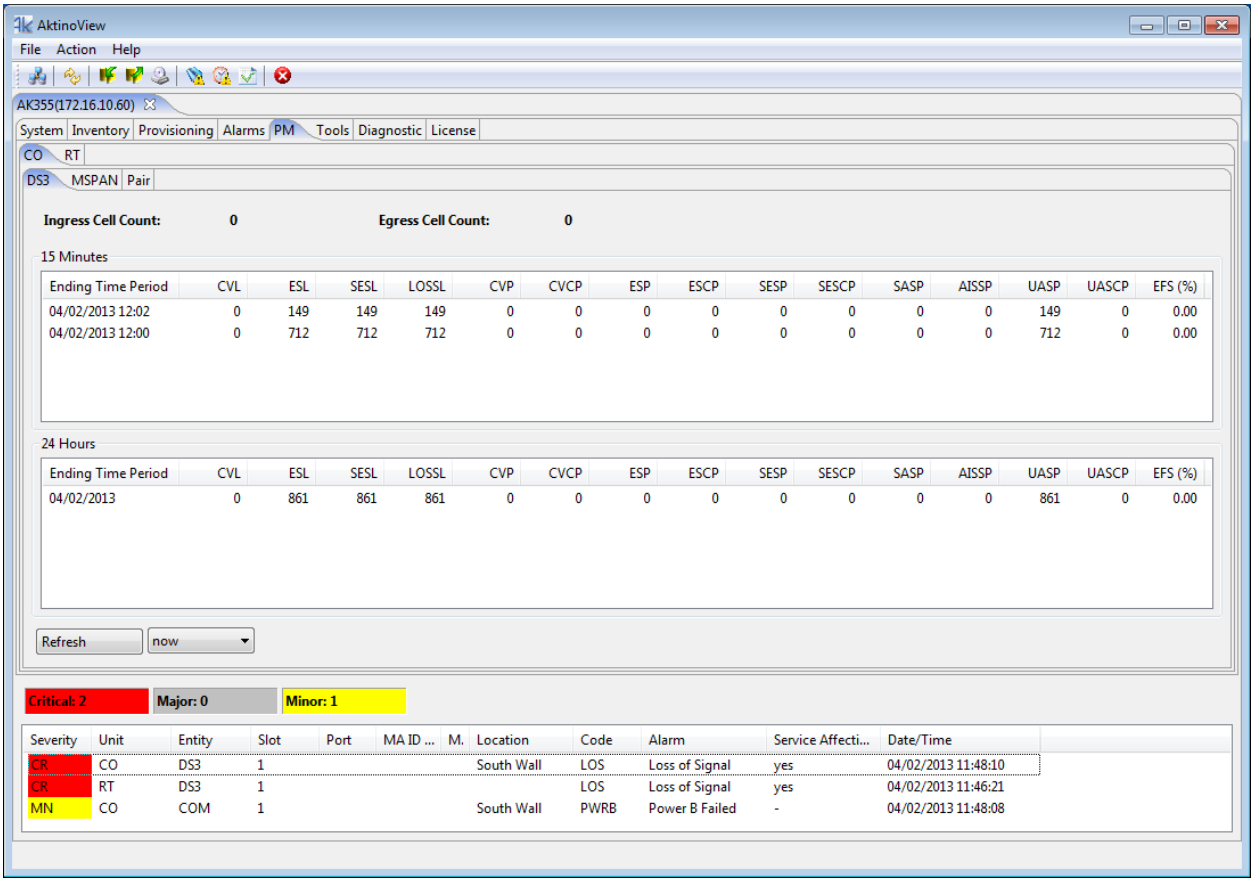
3.3.8 Performance Monitoring (PM)

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.



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

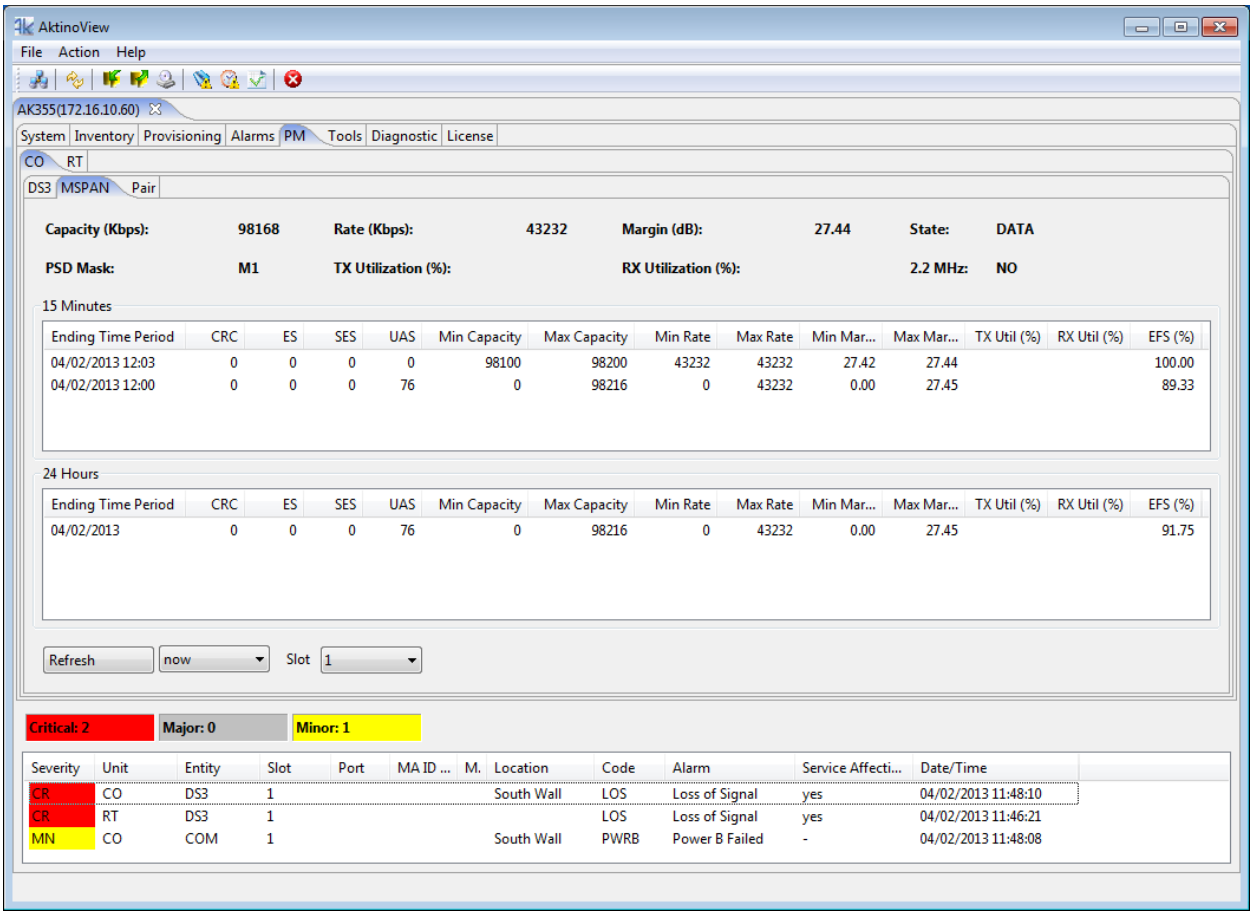
The MSPAN tab displays the upstream PM information for the MSPAN. This PM data is separated into three sections:

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.

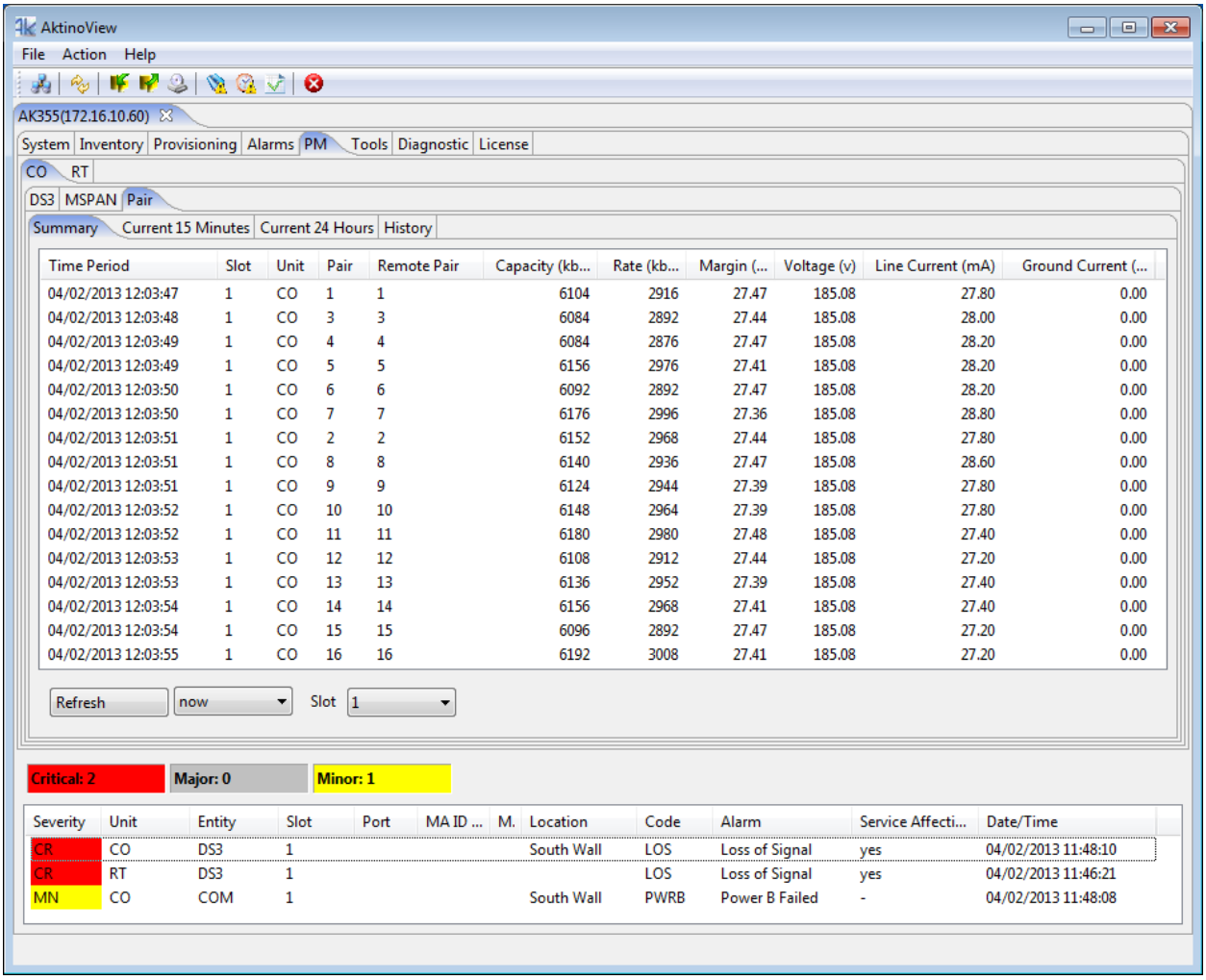
3 The 24-Hours section provides PM data for the previous 7 days.

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.



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.

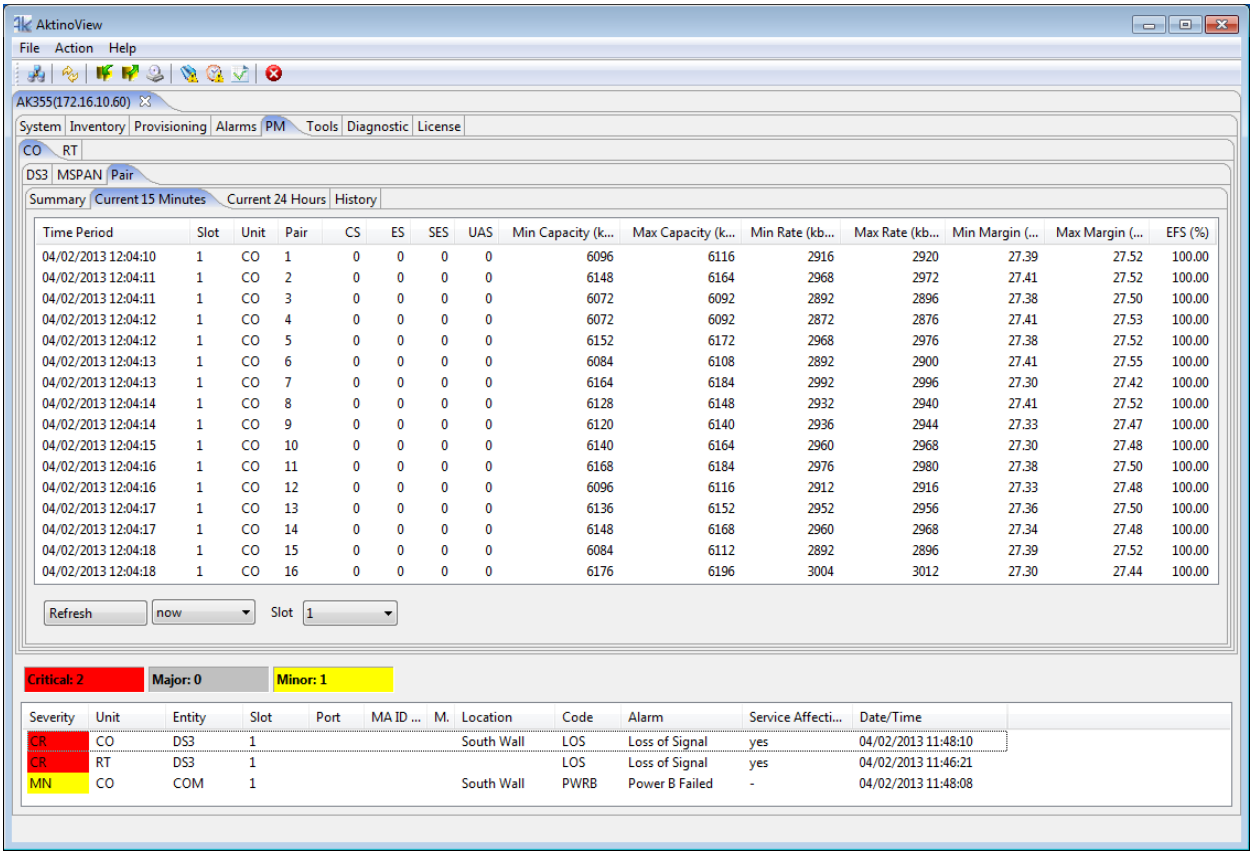


Time Period	Slot	Unit	Pair	Remote Pair	Capacity (kb...	Rate (kb...	Margin (...	Voltage (v)	Line Current (mA)	Ground Current (...
04/02/2013 12:03:47	1	CO	1	1	6104	2916	27.47	185.08	27.80	0.00
04/02/2013 12:03:48	1	CO	3	3	6084	2892	27.44	185.08	28.00	0.00
04/02/2013 12:03:49	1	CO	4	4	6084	2876	27.47	185.08	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

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

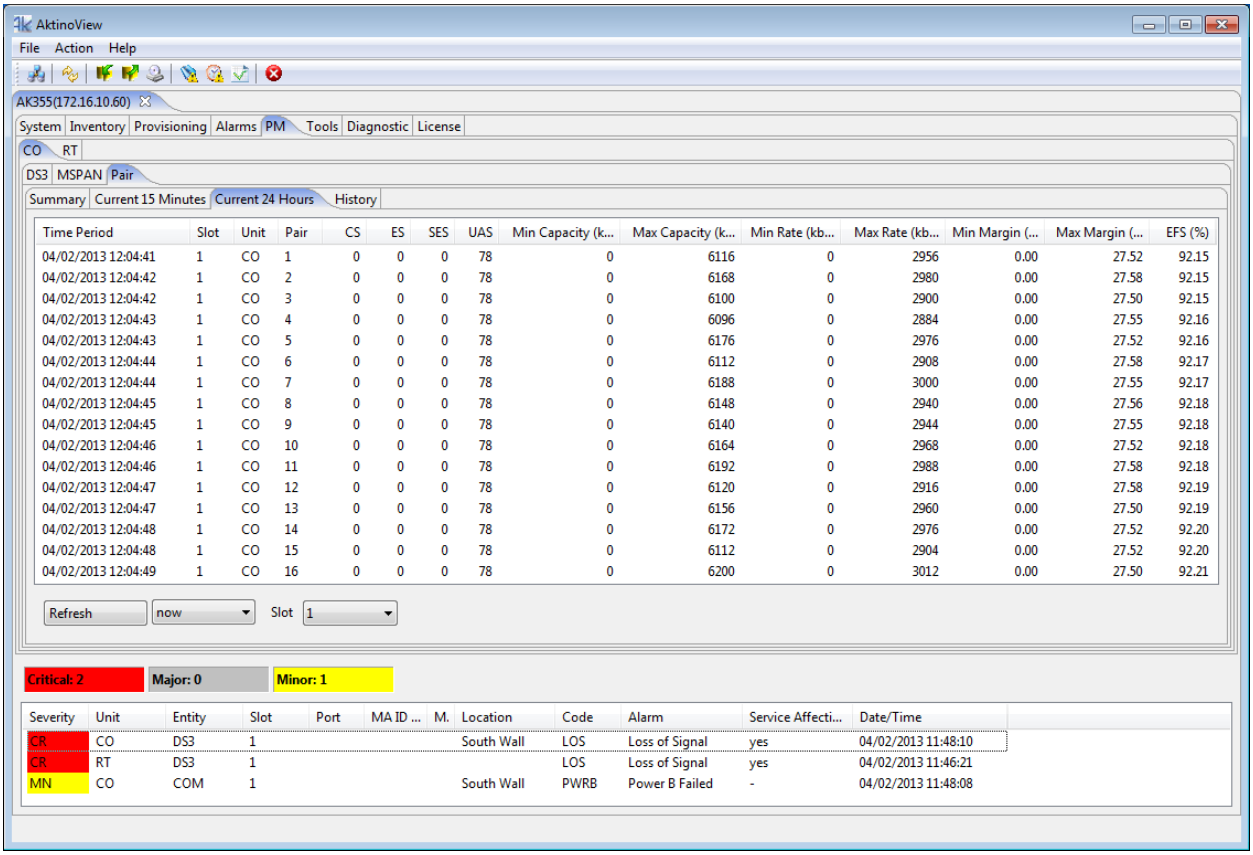
3.3.8.4 *CO > Pair > Current 15 Minutes*

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.



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.



3.3.8.6 CO > Pair > History

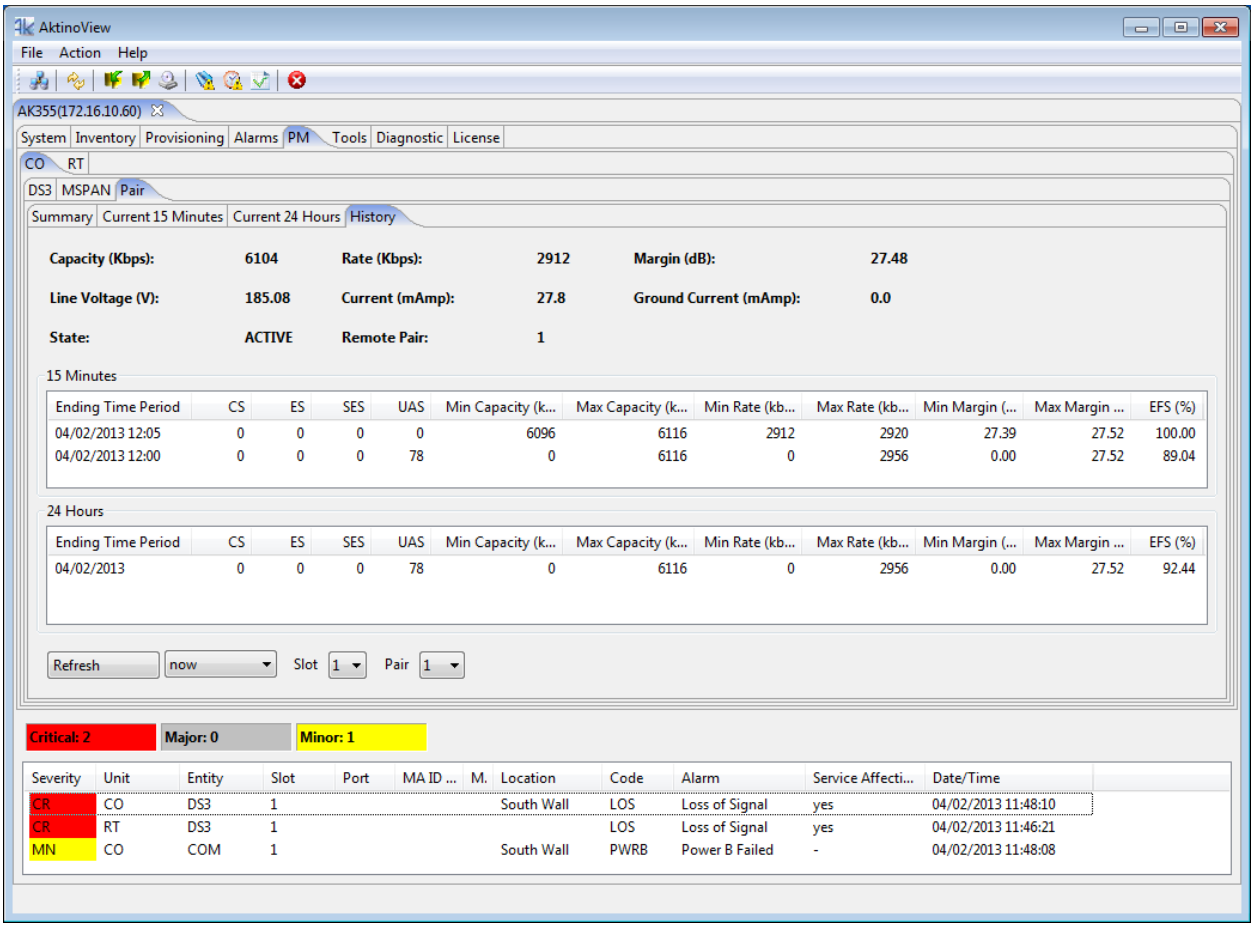
The History tab displays the upstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

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.

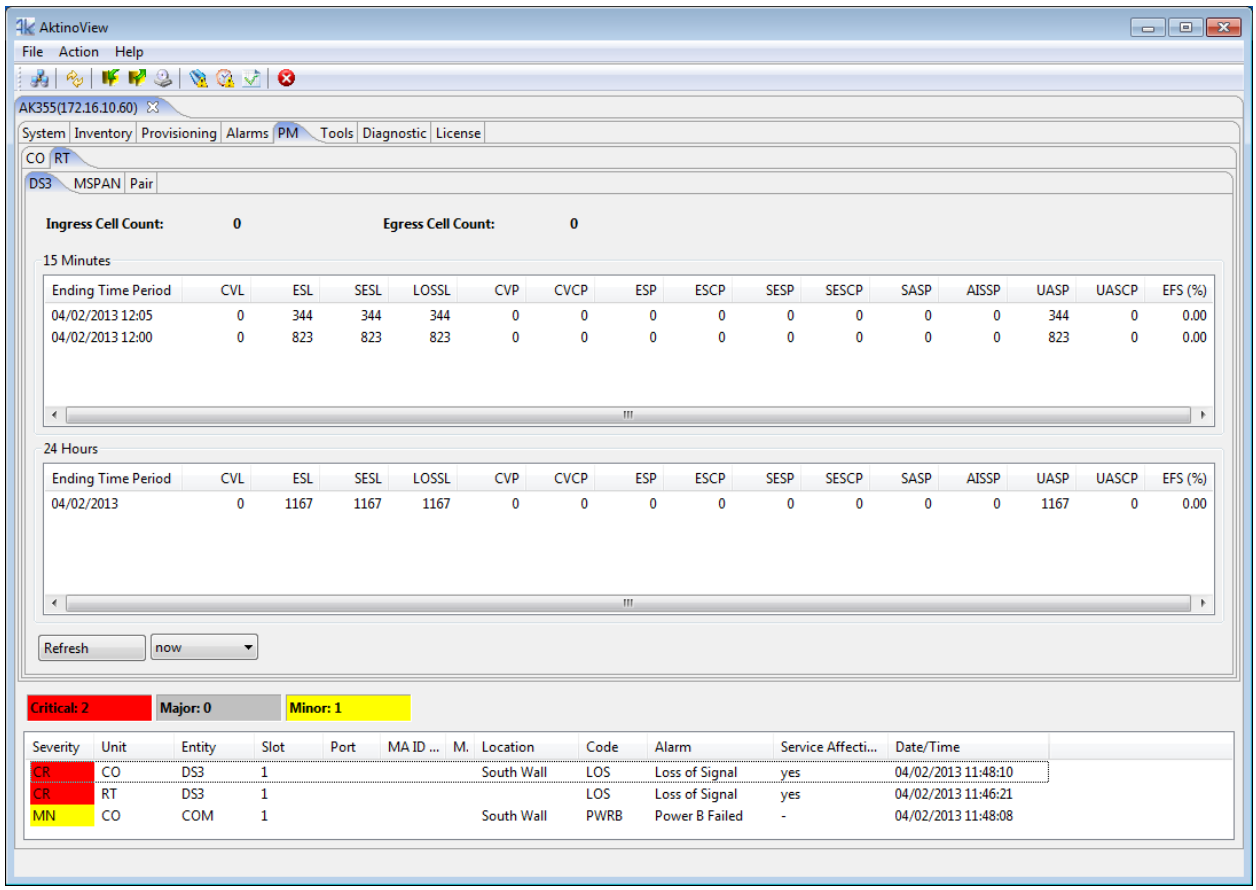


Note the highlighted portion of the Pair History screen shown below:

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.



3.3.8.8 RT > MSPAN

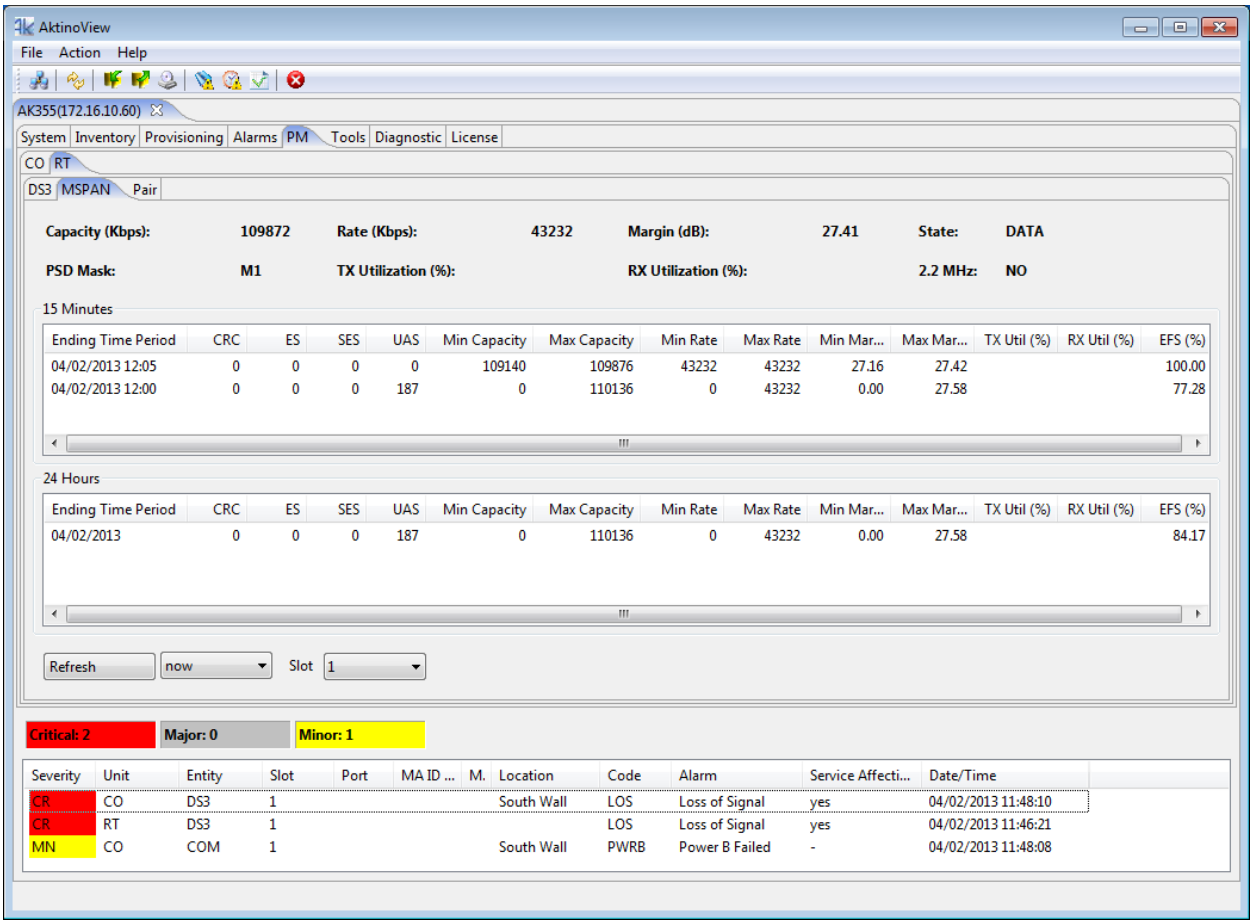
The MSPAN tab displays the upstream PM information for the MSPAN. This PM data is separated into three sections:

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.

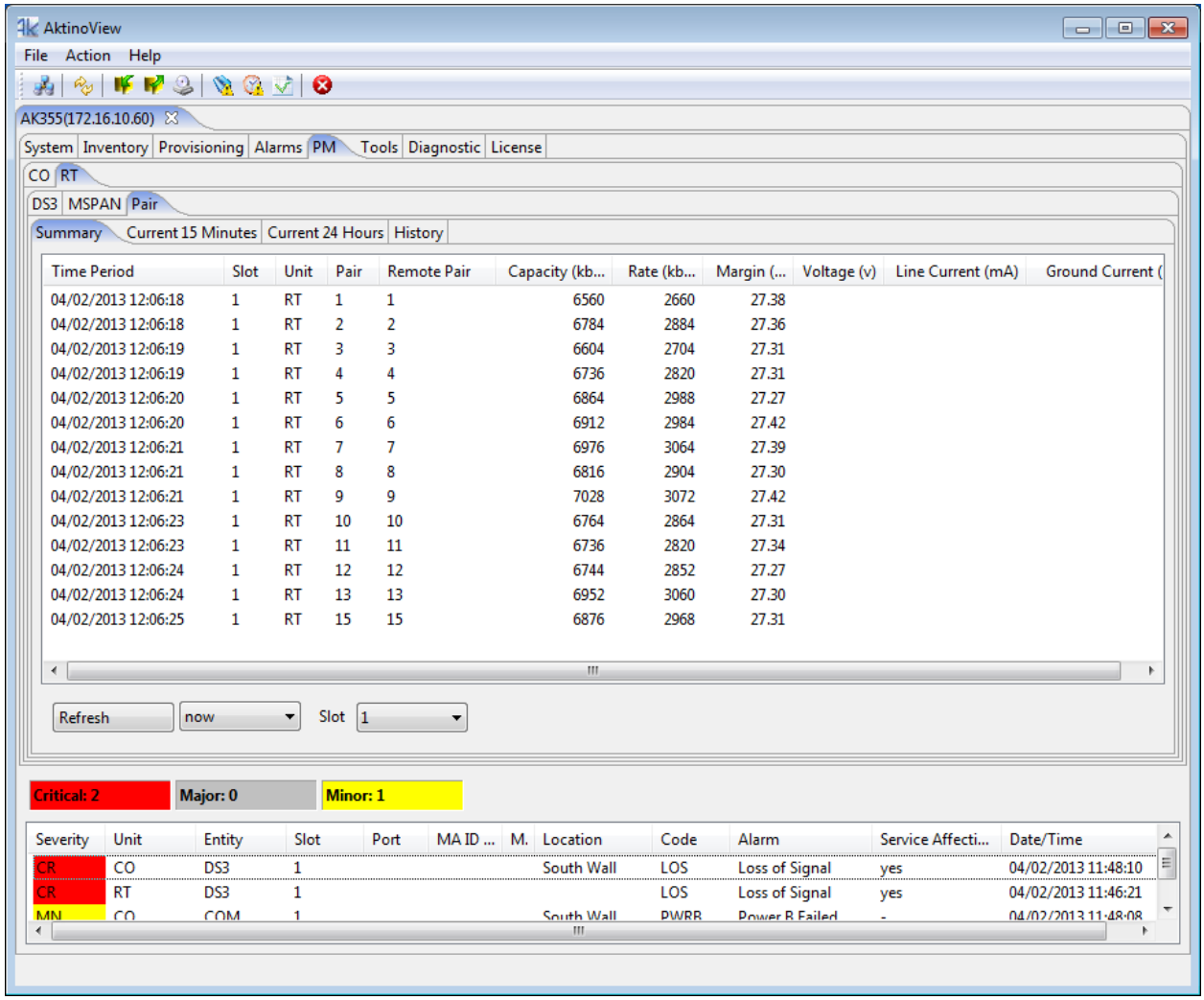
3 The 24-Hours section provides PM data for the previous 7 days.

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.



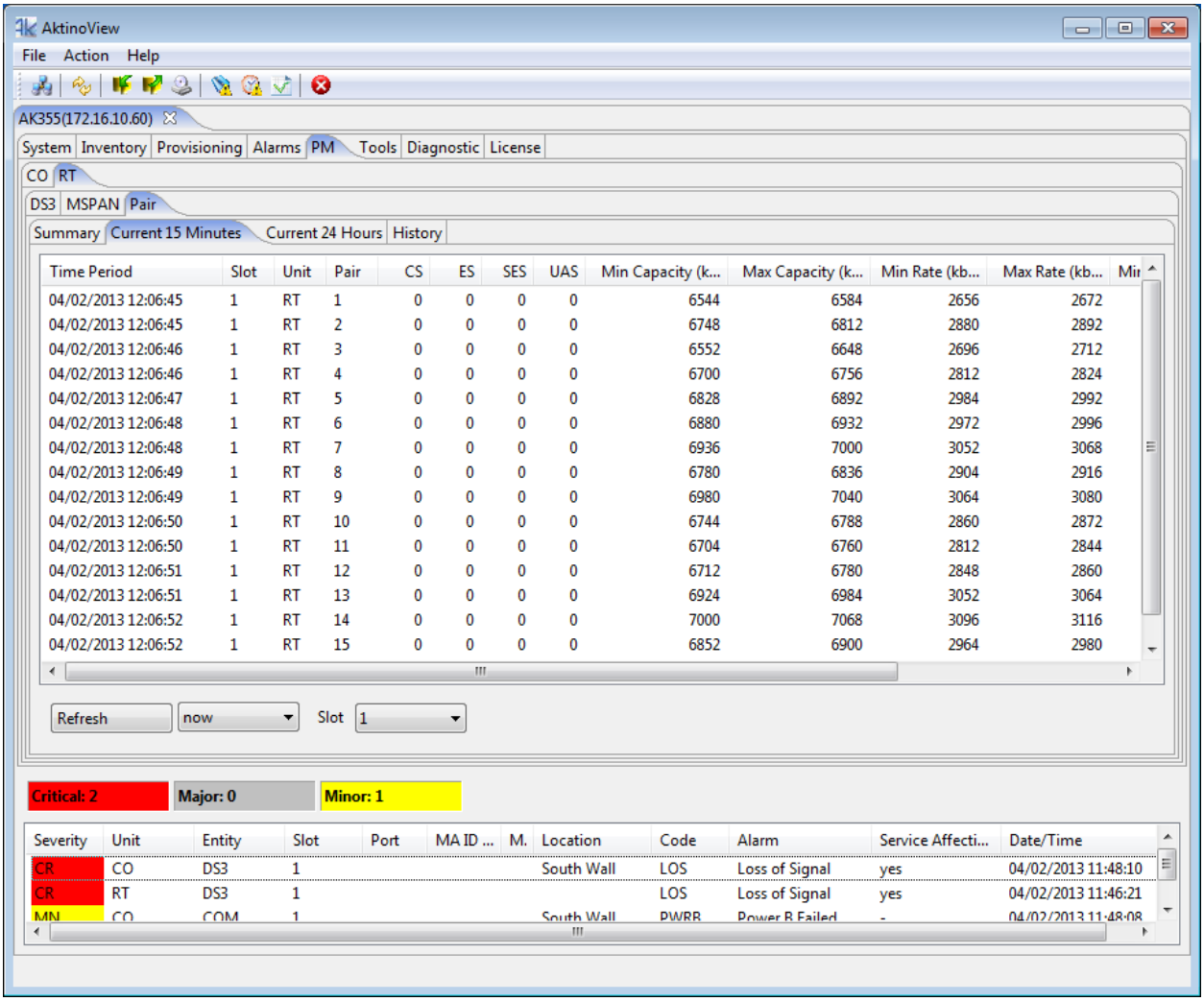
3.3.8.9 *RT > Pair > Summary*

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.



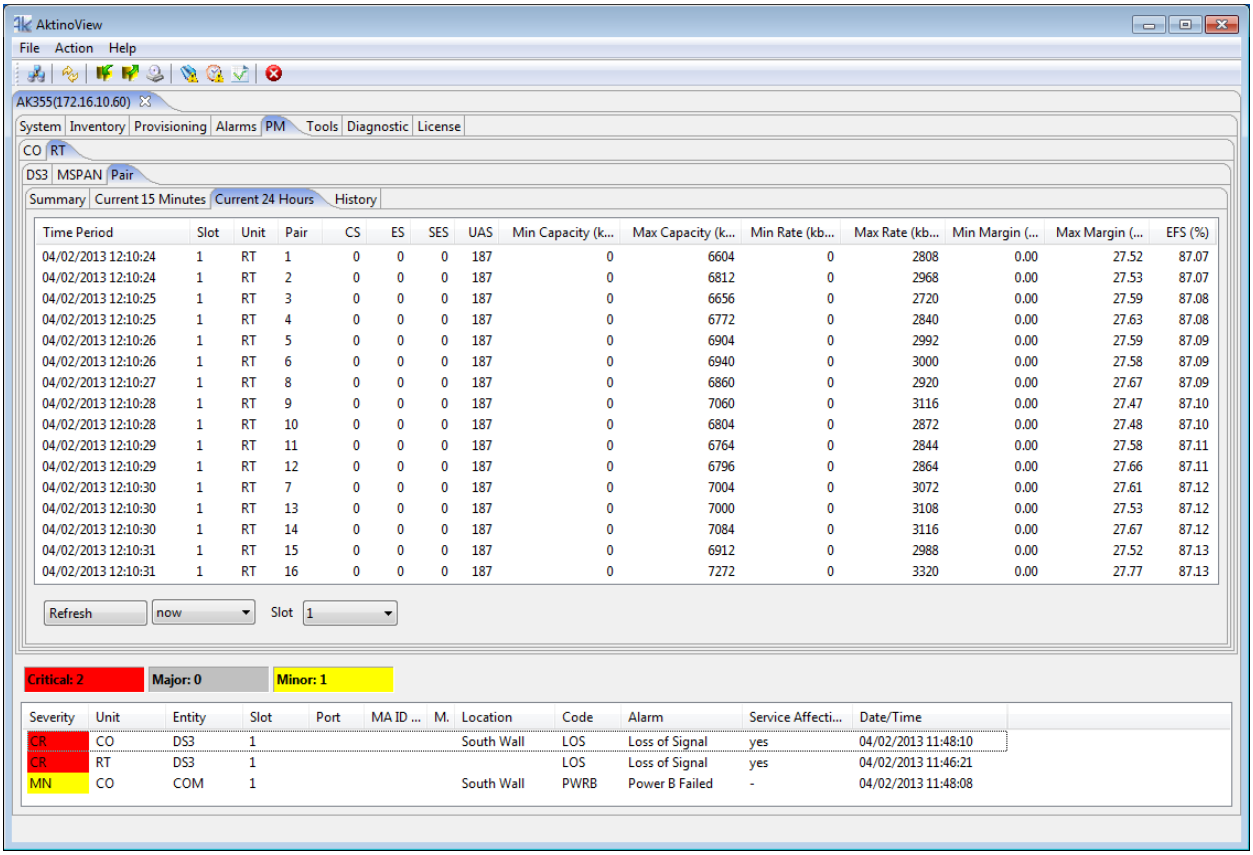
3.3.8.10 RT > Pair > Current 15 Minutes

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.



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.



3.3.8.12 RT > Pair > History

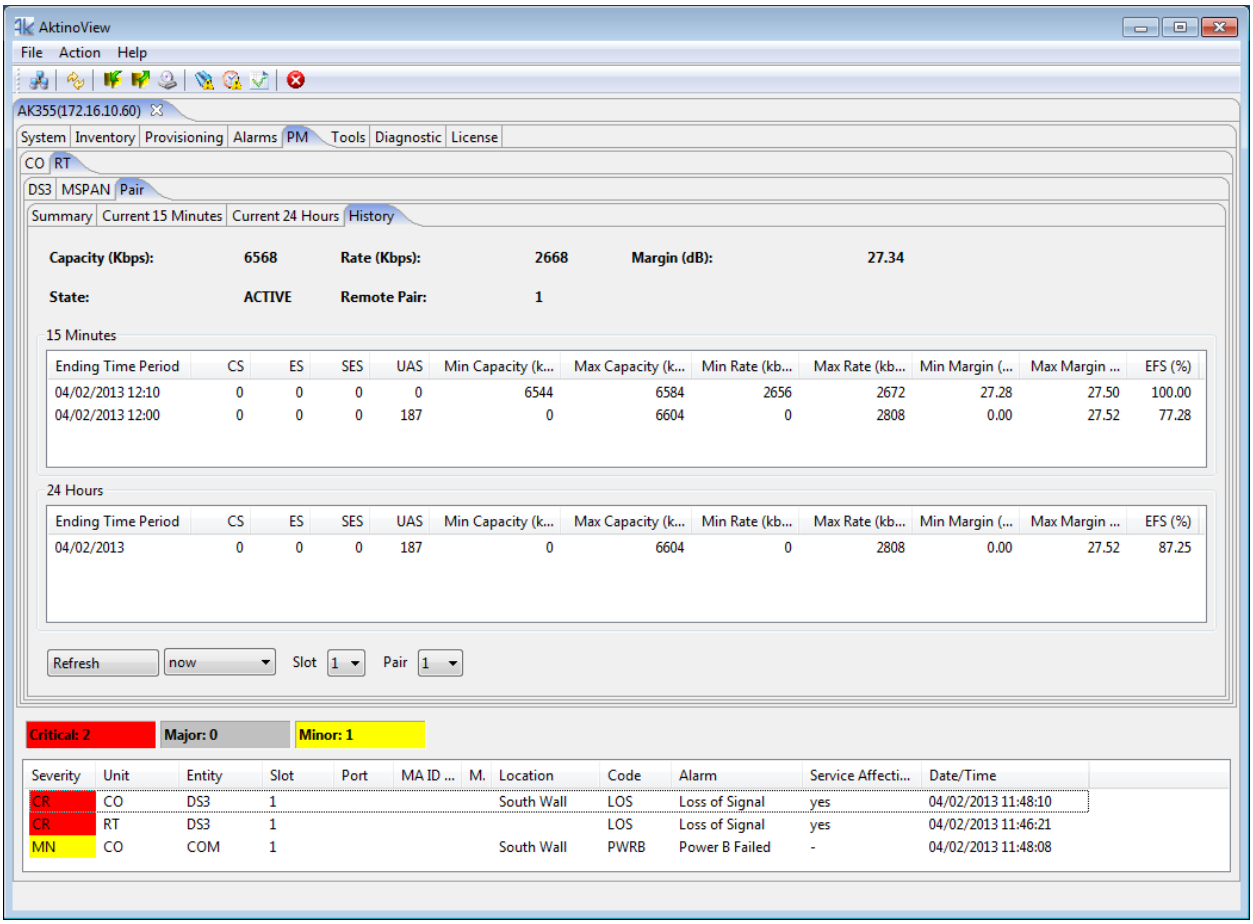
The History tab displays the upstream PM information for the Pairs supported by the MSPAN. This PM data is separated into three sections and the PM can be displayed for each of the Pairs of the MSPAN.

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.

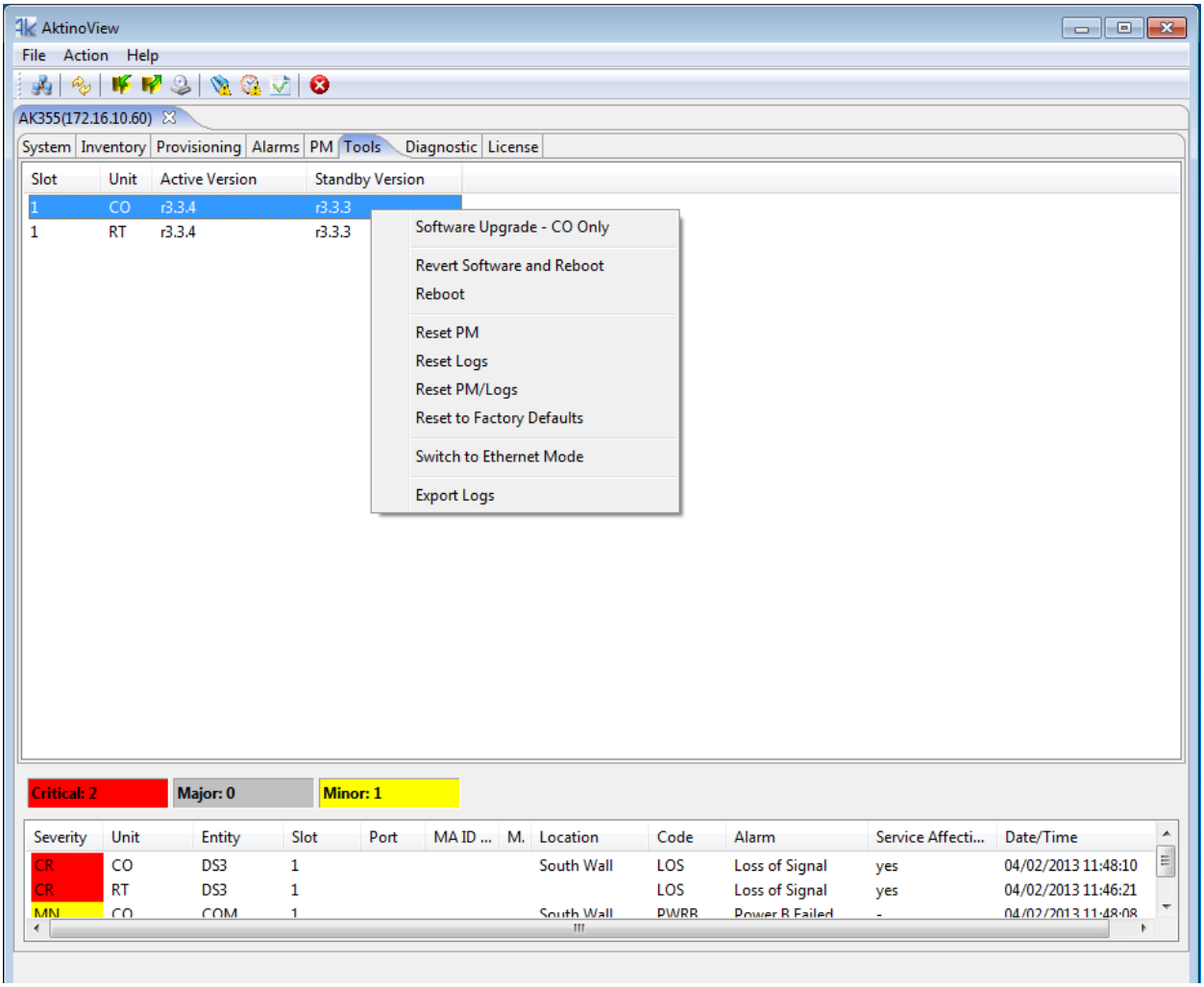


Note the highlighted portion of the Pair History screen shown below:

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.

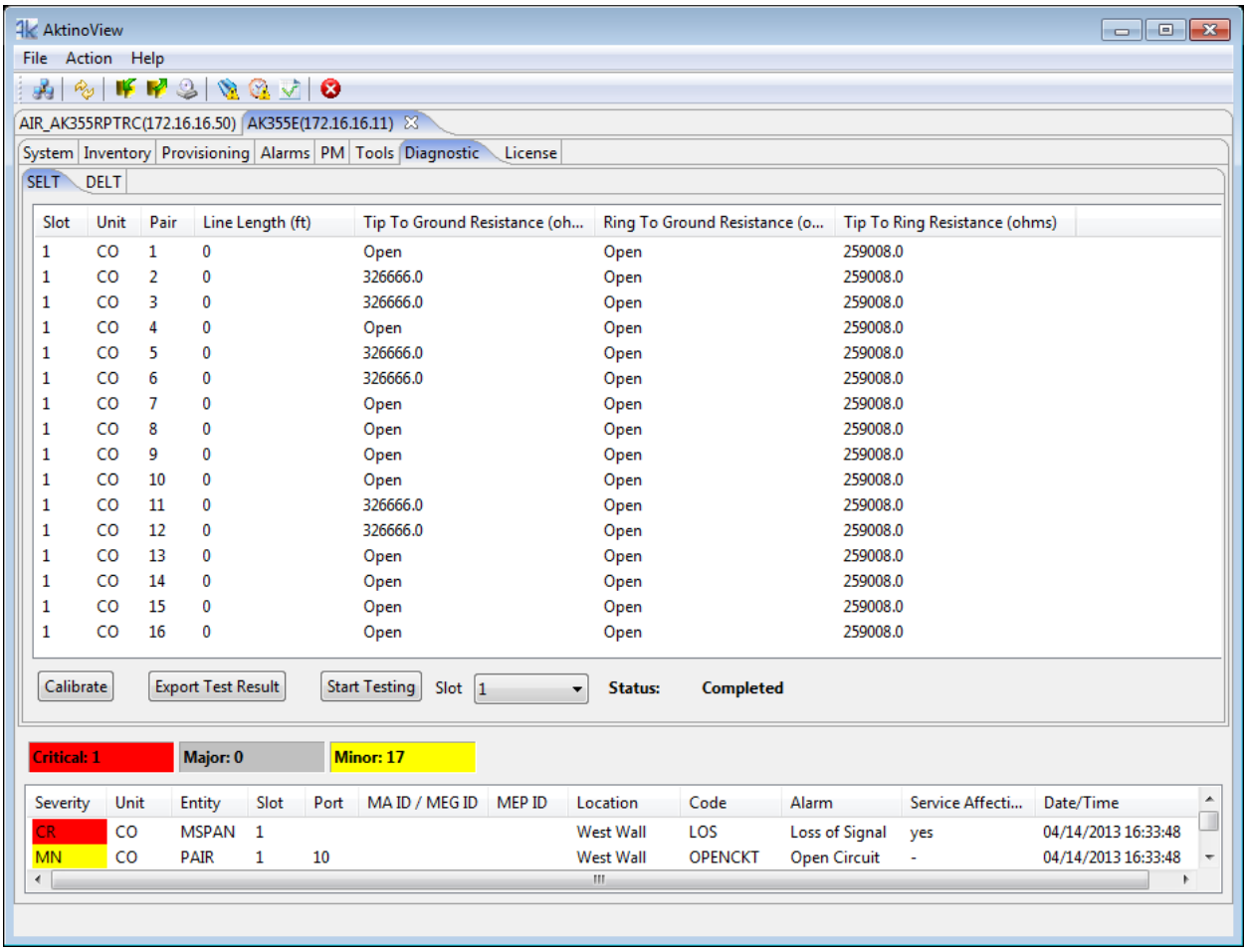
3 Click on the Calibrate button to start the calibration process. The Status of the calibration is indicated.

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:



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

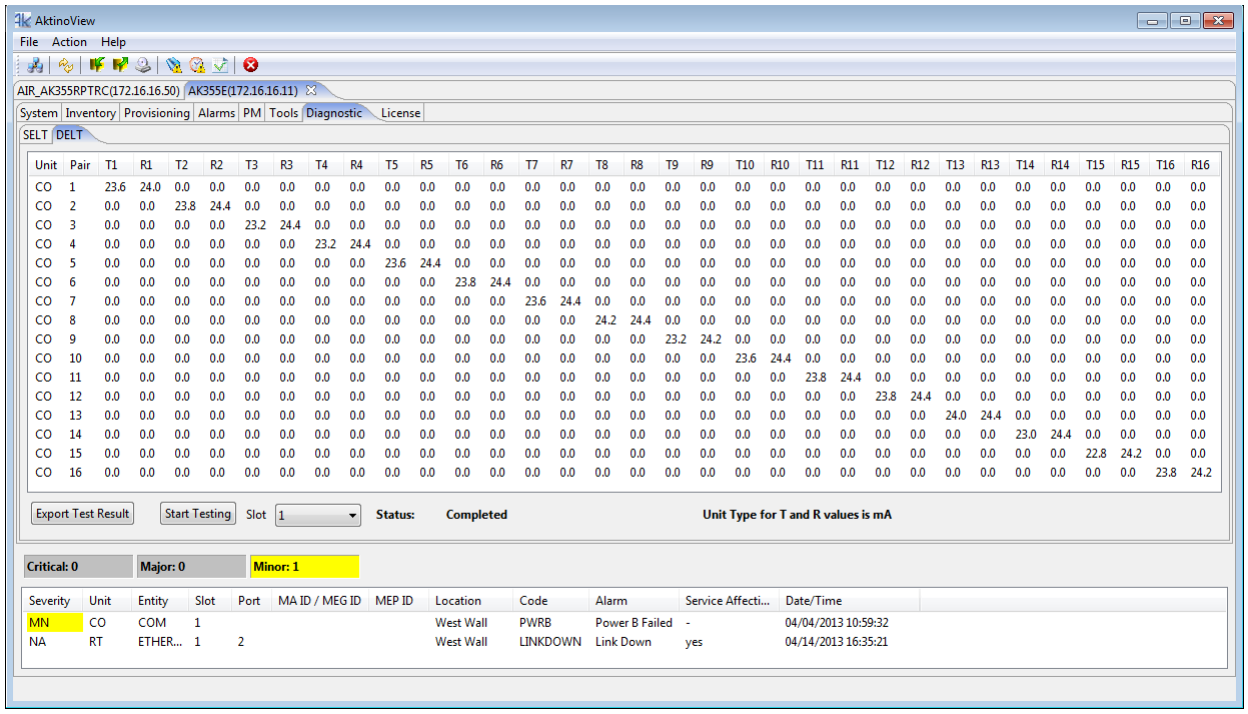
Dual Ended Loop Test (DELT) provides diagnostics for each pair. Follow this procedure to run DELT:

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.

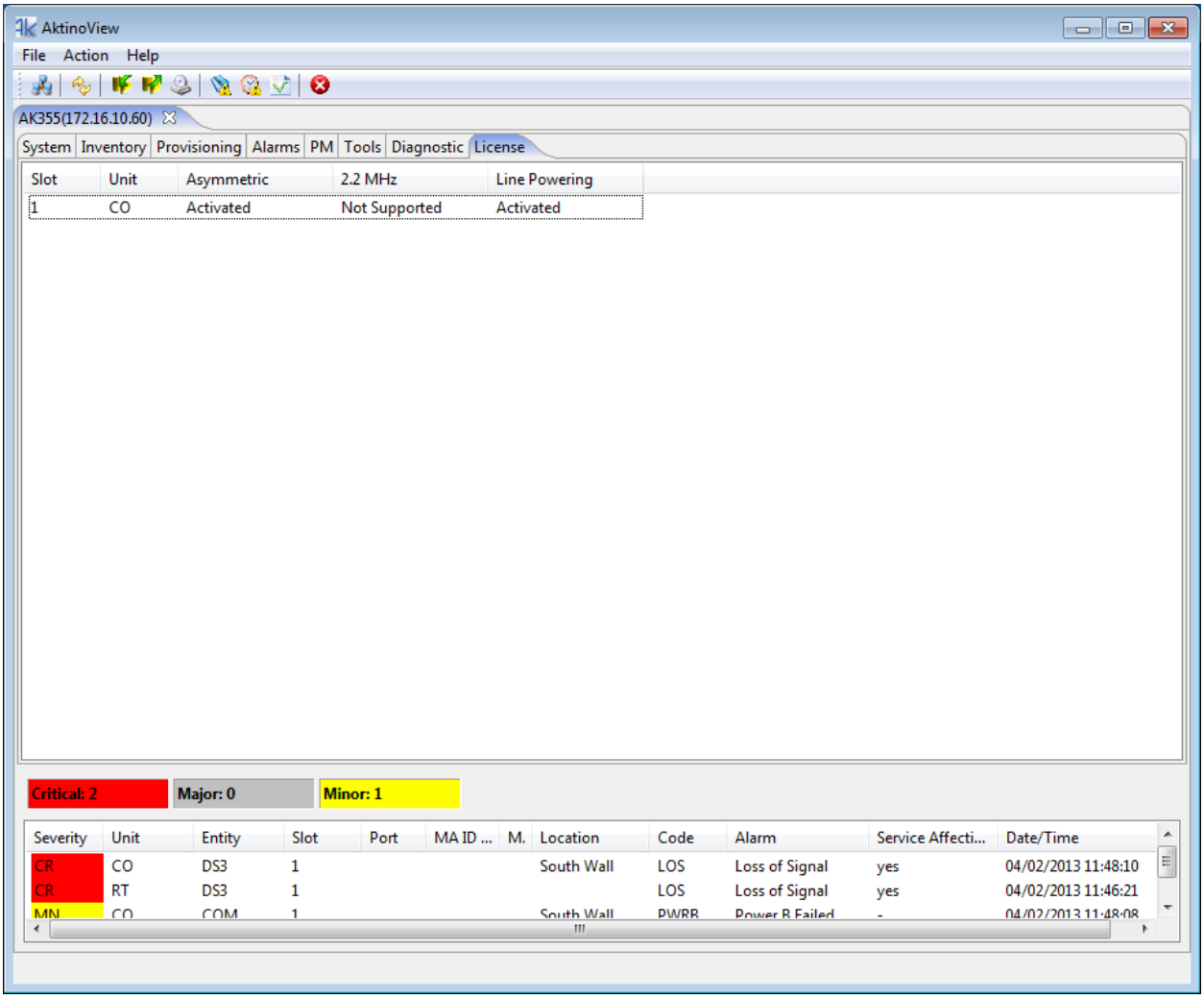
The results of the DELT test are indicated below:



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

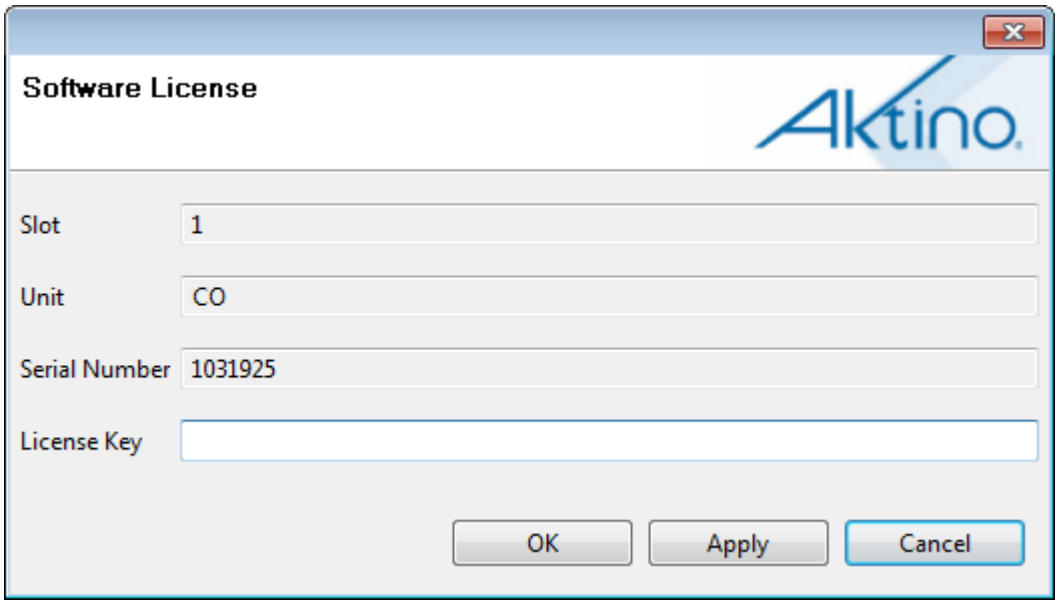
The License tab displays the features that are activated for the various units of the AK355 System.



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.



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 Disturbers.
  Ethernet: 100 Mbps Symmetric at 4 Kft 100 Mbps Asymmetric, 55 Mbps Symmetric at CSA Reaches with Full Disturbers.
- 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 ± 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 + 65º C
- Storage Temperature: - 40 to +70º 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.

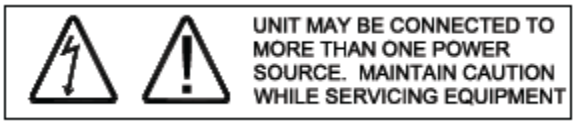
All fuses on the unit are located in non accessible areas and are not field serviceable. Please return the unit to Positron for repair.

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)