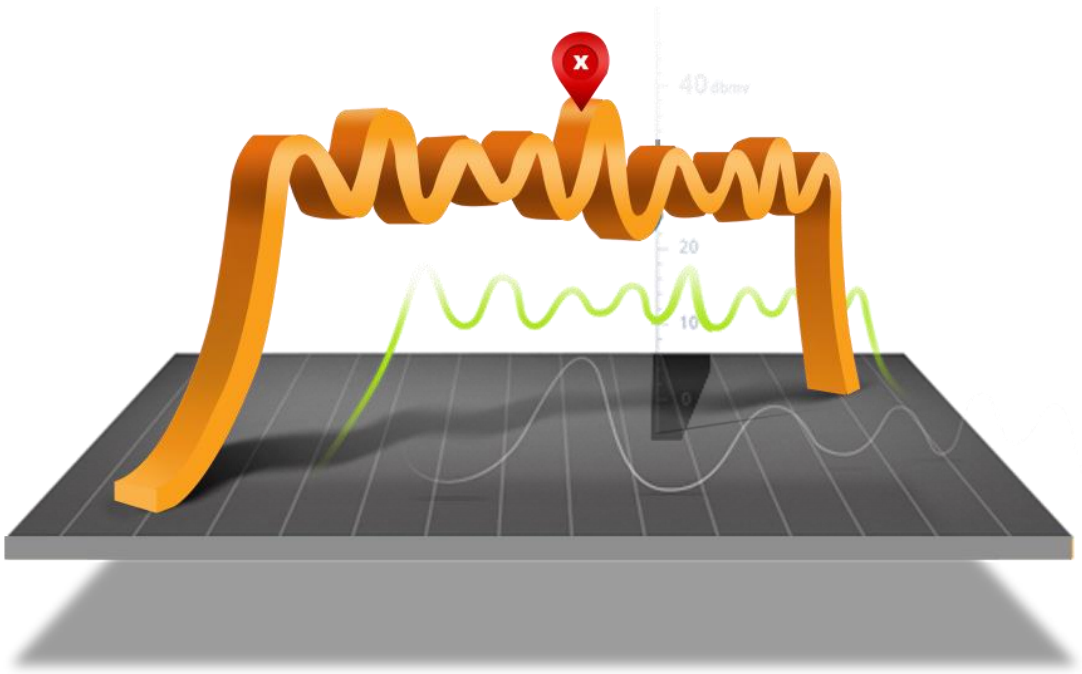
Intelligent Channel Optimizer

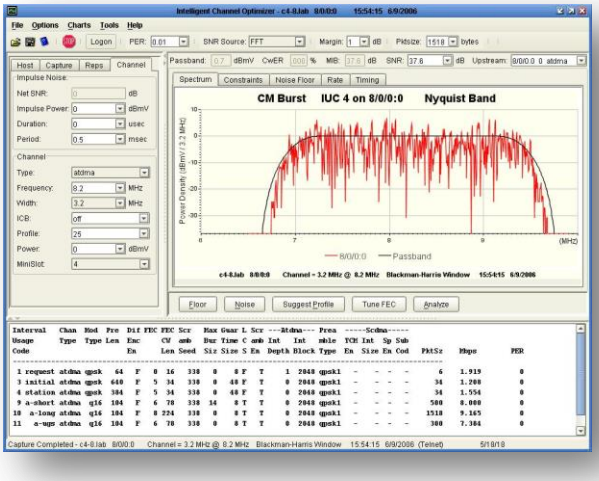
C4® & C4c™ CMTS
E6000® CER

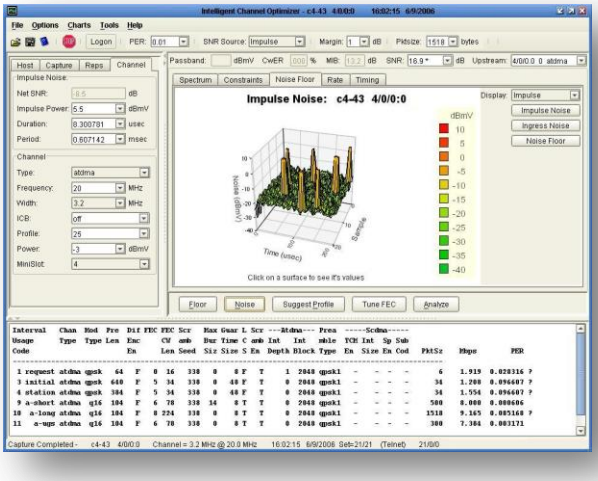


PRODUCT OVERVIEW:

The Intelligent Channel Optimizer (ICO) is a GUI-based tool used to maximize the throughput of RF upstream channels connected to ARRIS C4® / C4c™ CMTS DOCSIS® 2.0 (2Dx12U) CAMs, DOCSIS 3.0 (12U and 24U) CAMs, and E6000® CER UCAMs . After analyzing the noise conditions present for a particular upstream channel, the ICO employs error analysis algorithms to provide guidance on optimal modulation profile and upstream channel settings. The operator may then choose to use the ICO to apply the recommended profile and channel settings to the selected upstream. The ICO runs on a laptop or PC and may be used remotely via Telnet, SSHv2, and SNMP.

ARRIS Intelligent Channel Optimizer (ICO)





FEATURES

- ICO runs on laptop or desktop PCs
- Optimize modulation profiles & upstream channel parameters for maximum throughput
- May be used remotely via Telnet, SSHv2, and SNMP
- Works with C4® CMTS Release 5.x, 7.4 or higher, C4c™ CMTS Release 7.4 or higher, and E6000® CER Release 1.1 or higher
- The ICO analysis is accomplished for a wide range of:
  - Modulation Profile Types
  - Channel Widths
  - Center Frequencies
  - Forward Error Correction (FEC) Values

Maximizing Upstream Throughput

With the wide array of parameters that must be specified for modulation profiles and upstream channels, operators may be uncertain as to whether the parameters they have selected are maximizing upstream throughput. By looking at the actual noise conditions and employing sophisticated algorithms, ICO takes the guesswork out of selecting the best set of parameters to obtain the maximum channel throughput in the upstream at an acceptably low packet error rate.

Optimal Modulation Profile and Upstream Channel Parameters

Utilizing Fast Fourier Transform (FFT) data from the RF burst receiver, the spectrum from a specific C4/C4c CMTS or E6000 CER upstream is displayed (Power Density vs. Frequency). ICO can then measure the noise level in the upstream channel. Using the upstream noise spectrum data, the ICO calculates the effective Signal-to-Noise Ratio (SNR) and Packet Error Rate (PER) for a wide range of possible modulation profiles and upstream channel parameters. Based on the calculation results, the ICO provides guidance on optimal modulation profile and upstream channel parameter settings. The operator can then use the ICO to apply the optimal settings to the particular CMTS upstream.

Optimization Within Operator-specified Restrictions and Limitations

As an option, the operator may use the ICO to recommend a new, optimized modulation profile without changing basic parameters such as center frequency, channel width, or channel type (TDMA, ATDMA, TDMA-ATDMA, or SCDMA). The operator can also specify limits for parameters like center frequency and cable modem power level range, and ICO will run the optimization algorithm within the specified limits.

Optimization That Accounts for Changing Noise Conditions

The ICO can be run in an iterative mode in which noise samples are taken at operator-specified time intervals. These noise samples can then be averaged to account for changing noise conditions and the averaged result is used for the optimization calculation. Alternatively, the worst of the noise samples may be used for the optimization calculation for even more robust performance in meeting levels of service committed to subscribers.

Performance Metric Calculations

Using a given modulation profile and the upstream channel noise spectrum data, the ICO calculates important performance metrics such as total available user bandwidth and expected packet error rate. Alternatively, the upstream channel noise level can be specified by the operator to perform “what-if” optimization analyses.

ARRIS Intelligent Channel Optimizer (ICO)

GENERAL SPECIFICATIONS

Minimum Requirements for Customer Supplied Hardware Platform	
Laptop/PC equipped with:	Pentium III @500Mhz, 512 MB RAM
	512 MB Hard-Disk free space for installation
	1024 x 768 True-color
	10baseT Ethernet Card
Minimum Requirements for Customer Supplied Operating System	
	Windows XP, Windows 7 or Windows 8
	Java 1.5 or later
Required CMTS Hardware	
	C4/C4c CMTS with DOCSIS 2.0 CAMs (2Dx12U) and DOCSIS 3.0 CAMs (12U and 24U).
	E6000 CER
Required CMTS Software	
	C4 Release 5.x, 7.4 or higher
	C4c Release 7.4 or higher
	E6000 Release 1.1 or higher
Connection Protocol	
C4/C4c	C4/C4c : Telnet, SSHv2, SNMP
E6000	Telnet, SSHv2
ICO Operation Modes	
Major Operation Modes:	FFT Capture Mode – uses time domain sampling of the specified upstream spectrum
	Optimizer Mode – uses the FFT capture data to provide guidance on parameter optimization
	Theory Mode – explores how changes in various channel characteristics and burst profile parameters might affect performance
Minor Operation Modes:	Iterative Mode – schedules FFT data captures to be taken at specified intervals over a specified time period
	Averaging Mode – uses FFT data averaged over a specified time period to run the Optimizer Mode functions
	Worst-case Mode – takes samples at specified time intervals for a specified period; uses worst-case FFT data to run the Optimizer Mode functions
ICO Charts and Graphs	
	Power density versus frequency
	Packet error rate versus Signal-to-Noise Ratio (SNR)
	Achievable bit rate versus SNR
	Bit rate, packet rate or packet error rate versus packet size

ORDERING INFORMATION

Part Number	Description
#1000226	Intelligent Channel Optimizer Release 1.0.2, Per C4/C4c Chassis License
#783907	Intelligent Channel Optimizer Release 1.0.2, Per E6000 Chassis License
#719484	Annual Service Contract for cable operators and resellers
#721042	Annual Service Contract for value-added resellers

RELATED SERVICES

Contact Customer Care for product information and sales

- United States: 866-36-ARRISBullet
- International: +1-678-473-5656