EDS-10/40G
Ethernet Delay Simulator
10/100/1000, 10G & 40G

FEATURES / BENEFITS

√ **Hardware Architecture Providing High Throughput Performance and Repeatable Results / Accuracy**

√ **Interface - 10/100/1000, 10GbE, 40GbE Copper or Fiber**

√ **Supports UDP, TCP, MPLS, VLAN, ESP, LPD & Encrypted Packets**

√ **Supports multiple links and filtering of packets**

√ **Validate and Optimize your Network before Deployment to avoid Costly Application issues**

√ **Easy to use - Command Line Interface with Scripting Support or GUI Interface**

√ **Bandwidth - 300bps - 40GbE in 1bps increments**

√ **Delay - 0 ms to 10 sec. in 1ms increments, settings for Constant, Uniform and Normal**

√ **Other Features - Real time traffic graph and Network Statistics, output reports**

√ **Approvals - UL, CSA, CE, FCC and RoHS**

√ **2U Sturdy Rack Mount Enclosure, 90-240VAC**

DESCRIPTION

The EDS-10/40G is an Ethernet Delay Simulator allowing users to test/ stage critical network equipment by altering bandwidth, latency, packet loss, congestion and other important link impairments over 10/100/1000, 10GbE and 40GbE Ethernet.
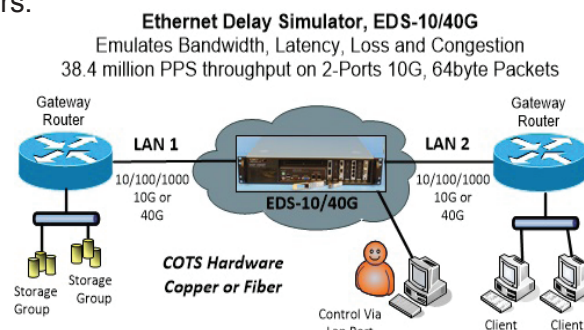
The EDS-10/40G utilizes the latest hardware and software design allowing Line Rate Performance. The unit is a must have test tool for product development / demonstrations, network validation, VoIP benchmark testing, video / IPTV simulation and transaction performance.

The hardware based architecture is coupled with custom software presenting an easy to use interface. The unit operates from a command line interface or web browser. The user has no cumbersome software or confusing licenses to deal with for secure operation.

The EDS-10/40G can act as a bridge or a router in the users network. The user configures the unit via a standard web browser. All commands and settings are displayed prominently. Simply set the band width, delay and any traffic congestion or loss if required. The unit also supports a filtering method of IP Packets and scripting support for automated testing. The user is presented with the results in real time and in a graph.

By using the EDS-10/40G in place of or in series with a real data link (WAN) a wide variety of error conditions can be introduced under controlled and testable conditions. The unit is an excellent choice for validating and evaluating new products and technologies. The software has been optimized for extreme accuracy and repeatable results.

The EDS-10/40G is housed in a sturdy 3U high metal enclosure which can be rack mounted. It is powered by an integrated 90-240V 50/60Hz power supply. The EDS-10/40G has a three year warranty and a 24 hour turnaround on warranty repairs.

Ethernet Delay Simulator, EDS-10/40G
Emulates Bandwidth, Latency, Loss and Congestion
38.4 million PPS throughput on 2-Ports 10G, 64byte Packets

EAST COAST DATACOM, INC.

SPECIFICATIONS

Application
Interconnection of 10GbE or 10/40GbE devices simulating bandwidth, latency, packet loss and congestion on two independent LAN channels

Protocols Supported
UDP, TCP, MPLS, VLAN, ESP, LPD, Encrypted Packets

Data Rates
300bps - 40GbE in 1bps increments, bidirectional or split speed on each LAN port

Jitter
Supports Jitter in 1Ms Increments

Configuration Ports
Two Independent 10/100/1000 Ethernet Ports

Data Interface on Delay Ports
10/100/1000, 10GbE or 40GbE Copper or Fiber

Link Rates
300bps - 40GbE in 1bps increments, bi-directional or split speed,bps, Kbps, Mbps or Gbps

Link Throughput
Over 38.4 million PPS throughput on 2-Ports 10GbE, 64byte Packets with delay enabled to 35Ms each port

Emulated Latency
0 ms to 10 sec. in 1ms increments, settings for constant, uniform or normal

Emulation Statistics
Each link is capable of independent output statistics settings via the software scheduler

Packet Loss
0 to 100% in increments of 0.001%

Password Protection
Implemented via the user LAN Management Port and factory reset via the RS-232 Serial Port

Re-Ordering
Settings for Probability & Delay Min/Max

Background Traffic
0 to 100% in increments of 0.001%, settings for LAN Utilization and Burst Size

Surge Protection
Main power supply

Power Source
AC Mains: 100-240VAC @ 10%, 50/60Hz, 0.16/0.08A, Auto Range

Environmental
Operating Temperature....32º to 104º F (0º to 40º C)
Relative Humidity.............5 to 85% Non-Condensing
Altitude...........................0 to 10,000 feet

Dimensions
Height .... 3.50 inches (88.90 mm)
Width .... 17.20 inches (436.88 mm)
Length .... 14.50 inches (368.30 mm)

Warranty
Three Years hardware, includes software support and software feature upgrades/improvements

Software Upgrades
Administered via the LAN user management Port

Web Browser Compatibility
Explorer, FireFox, Opera, Google / Chrome, Safari

Regulatory Approvals
UL, CSA, CE, CCC, FCC and RoHS

ORDERING INFORMATION
Main Unit Part Number: 210000
Model: EDS-10G
Description: EDS-10G Delay Simulator Base Chassis

10/100/1000 NIC CARDS
Ecdata# 226000
Desc: 4-Port 10/100/1000GbE Copper NIC

Ecdata# 226001
Desc: 2-Port 10/100/1000GbE Fiber NIC

10GbE SFP+ NIC CARD
Ecdata# 226007
Desc: 2-Port 10GbE NIC Card

SFP+ Optics for ECDATA PT# 226007
Ecdata# 226004 = 10G Pluggable Optic(SR)
Ecdata# 226006 = 10G Pluggable Optic(LR)

SFP+ Twin Axial Copper Cables for PT# 226007
Ecdata# 712038 = 1 Meter
Ecdata# 712039 = 3 Meter
Ecdata# 712040 = 5 Meter

40G QSFP+ NIC CARD
Ecdata# 226005
Desc: 1-Port 40GbE QSFP+ NIC Card

QSFP+ Pluggable Optic for PT# 226006
Ecdata# 226011 = QSFP+ SR Optic
Ecdata# 226012 = QSFP+ LR Optic

 QSFP+ Twin Axial Cables for PT# 226006
(1) to (1) QSFP+ copper direct attach cable
Ecdata# 712041 = 1 Meter
Ecdata# 712042 = 3 Meter
Ecdata# 712043 = 5 Meter

QSFP+ Breakout Cables for PT# 226006
(1) to (4)SFP+ copper direct breakout cable
Ecdata# 712044 = 1 Meter
Ecdata# 712045 = 3 Meter
Ecdata# 712046 = 5 Meter

EAST COAST DATACOM, INC.

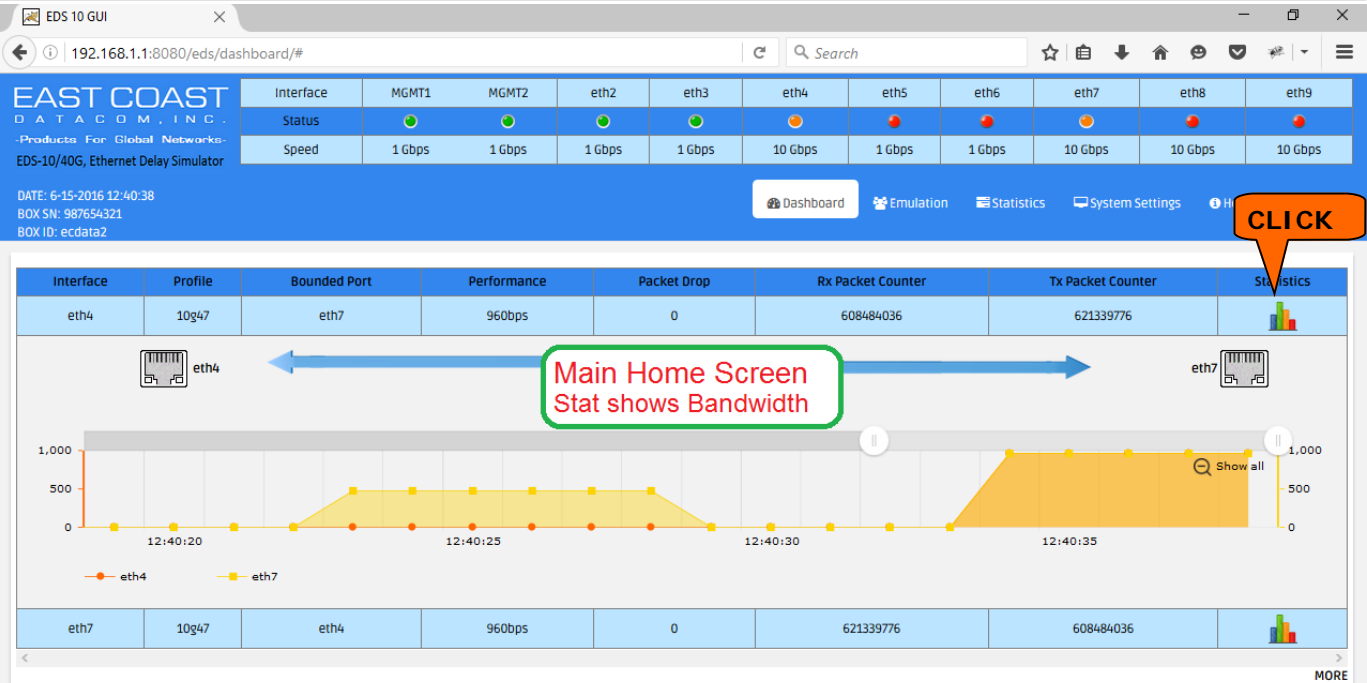245 Gus Hipp Boulevard, STE 3 • Rockledge, FL 32955-4812 U.S.A.

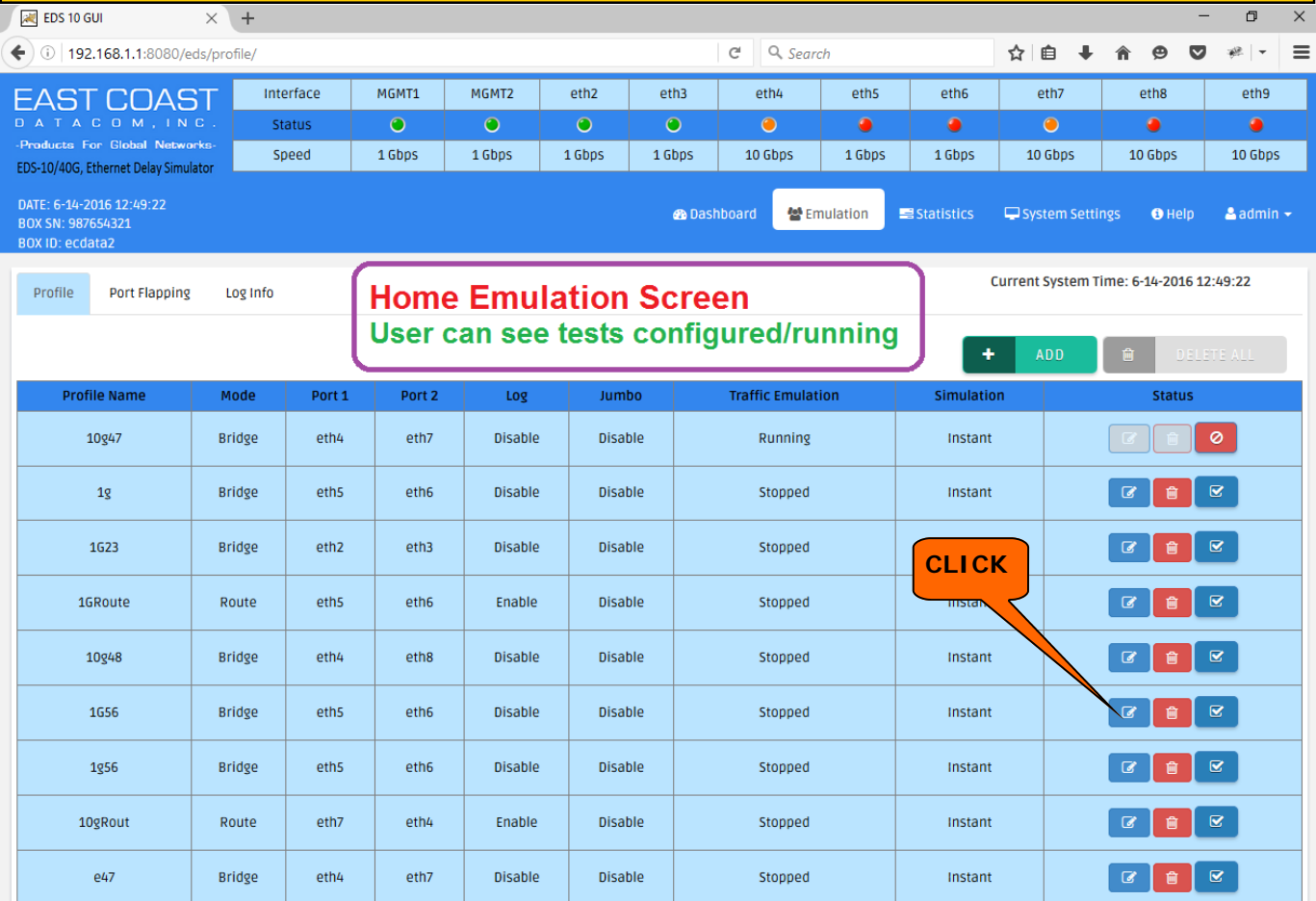**TEL: (321) 637-9922**   **WEB SITE: www.ecdata.com**   **FAX: (321) 637-9980**

Overview of the EDS-10G, WAN Delay Emulator User Interface

The **Dashboard Tab** is the main landing screen. The user can easily see the status of the LAN ETH Interfaces and system assigned port numbers in the top of the GUI interface. The user can view the active running profiles and active bandwidth as well.

EDS 10 GUI

192.168.1.1:8080/eds/dashboard/#

EAST COAST DATACOM, INC.
-Products For Global Networks-
EDS-10/40G, Ethernet Delay Simulator

Interface	MGMT1	MGMT2	eth2	eth3	eth4	eth5	eth6	eth7	eth8	eth9
Status	🟢	🟢	🟢	🟢	🟠	🔴	🔴	🟠	🔴	🔴
Speed	1 Gbps	1 Gbps	1 Gbps	1 Gbps	10 Gbps	1 Gbps	1 Gbps	10 Gbps	10 Gbps	10 Gbps

DATE: 6-15-2016 12:40:38
BOX SN: 987654321
BOX ID: ecdata2

Dashboard   Emulation   Statistics   System Settings   Help

CLICK

Interface	Profile	Bounded Port	Performance	Packet Drop	Rx Packet Counter	Tx Packet Counter	Statistics
eth4	10g47	eth7	960bps	0	608484036	621339776	

eth4

Main Home Screen
Stat shows Bandwidth

eth7

1,000 / 500 / 0

12:40:20   12:40:25   12:40:30   12:40:35

Show all   1,000 / 500 / 0

eth4   eth7

eth7	10g47	eth4	960bps	0	621339776	608484036	

MORE

The **Emulation Screen** shows all user created profiles. The user simply clicks as shown below to edit the profile.

EDS 10 GUI

192.168.1.1:8080/eds/profile/

EAST COAST DATACOM, INC.
-Products For Global Networks-
EDS-10/40G, Ethernet Delay Simulator

Interface	MGMT1	MGMT2	eth2	eth3	eth4	eth5	eth6	eth7	eth8	eth9
Status	🟢	🟢	🟢	🟢	🟠	🔴	🔴	🟠	🔴	🔴
Speed	1 Gbps	1 Gbps	1 Gbps	1 Gbps	10 Gbps	1 Gbps	1 Gbps	10 Gbps	10 Gbps	10 Gbps

DATE: 6-14-2016 12:49:22
BOX SN: 987654321
BOX ID: ecdata2

Dashboard   Emulation   Statistics   System Settings   Help   admin

Profile   Port Flapping   Log Info

Home Emulation Screen
User can see tests configured/running

Current System Time: 6-14-2016 12:49:22

+ ADD   🗑 DELETE ALL

Profile Name	Mode	Port 1	Port 2	Log	Jumbo	Traffic Emulation	Simulation	Status
10g47	Bridge	eth4	eth7	Disable	Disable	Running	Instant	
1g	Bridge	eth5	eth6	Disable	Disable	Stopped	Instant	
1G23	Bridge	eth2	eth3	Disable	Disable	Stopped	Instant	
1GRoute	Route	eth5	eth6	Enable	Disable	Stopped	Instant	
10g48	Bridge	eth4	eth8	Disable	Disable	Stopped	Instant	
1G56	Bridge	eth5	eth6	Disable	Disable	Stopped	Instant	
1g56	Bridge	eth5	eth6	Disable	Disable	Stopped	Instant	
10gRout	Route	eth7	eth4	Enable	Disable	Stopped	Instant	
e47	Bridge	eth4	eth7	Disable	Disable	Stopped	Instant	

CLICK

Manufactured By: East Coast Datacom, Inc.   www.ecdata.com   Tel: (321) 637-9922

Overview of the EDS-10G, WAN Delay Emulator User Interface

The **Emulation Profile Tab** allows the user to create and edit emulations for experiments. The user can select any of the ETH port interfaces to be bound together. This tab allows all settings for emulation such as Bridge or Route Mode, Band Width, Delay, Loss and other advanced rules such as Packet Re-Ordering, Duplication & Corruption. All settings are on a per port basis if desired. The Route Mode also offers further advanced filtering techniques based upon MAC, IP Address, Port Number, Protocol and several other user defined settings. Custom filters may also be purchased from East Coast Datacom, Inc.

EAST COAST DATACOM, INC. -Products For Global Networks- EDS-10/40G, Ethernet Delay Simulator

Interface	MGMT1	MGMT2	eth2	eth3	eth4	eth5	eth6	eth7	eth8	eth9
Status	●	●	●	●	●	●	●	●	●	●
Speed	1 Gbps	1 Gbps	1 Gbps	1 Gbps	10 Gbps	1 Gbps	1 Gbps	10 Gbps	10 Gbps	10 Gbps

DATE: 6-14-2016 12:51:42
BOX SN: 987654321
BOX ID: ecdata2

🖥 Dashboard 👥 Emulation ☰ Statistics 🖥 System Settings ❶ Help 👤 admin ▾

Profile   Port Flapping   Log Info

Emulation Screen
User can easily configure links

Current System Time: 6-14-2016 12:51:42

💾 UPDATE   🗑 CANCEL

Profile Name* : 10g47

Traffic Emulation* : Non-Filter   Mode* : Bridge   Simulation : Instant

Jumbo-Frame ☐   Log ☐

Interface Settings

Interface 1* : eth4   Interface 2* : eth7

Default Rules

eth4 -- eth7

Delay	Constant
	35 ms
Jitter	0 ms
Bandwidth	10 Gb ▾
Loss	0 %

eth7 -- eth4

Delay	Constant
	35 ms
Jitter	0 ms
Bandwidth	10 Gb ▾
Loss	0 %

EAST COAST DATACOM, INC. -Products For Global Networks- EDS-10/40G, Ethernet Delay Simulator

Interface	MGMT1	MGMT2	eth2	eth3	eth4	eth5	eth6	eth7	eth8	eth9
Status	●	●	●	●	●	●	●	●	●	●
Speed	1 Gbps	1 Gbps	1 Gbps	1 Gbps	10 Gbps	1 Gbps	1 Gbps	10 Gbps	10 Gbps	10 Gbps

DATE: 6-15-2016 15:35:49
BOX SN: 987654321
BOX ID: ecdata2

🖥 Dashboard 👥 Emulation ☰ Statistics 🖥 System Settings ❶ Help 👤 admin ▾

Profile Name* : 1GRoute

💾 UPDATE   🗑 CANCEL

Traffic Emulation* : Filter   Mode* : Route   Simulation : Instant

Jumbo-Frame ☐   Log ☐

Interface Settings

Default Rules

Advance Rules

The Route Mode Settings
Advanced options such as Filtering may also be applied

Types of Filters

eth5 -- eth6

IP Address

Add More

Enter IP address
Source : Source IP
Destination : Destination IP

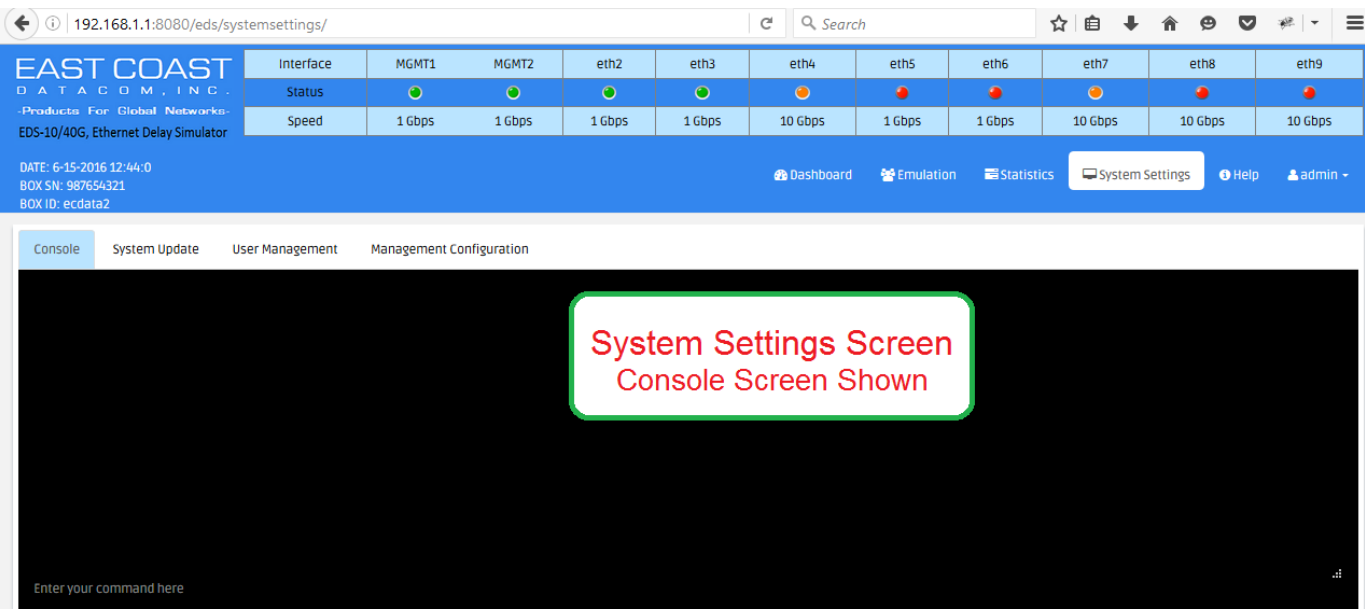Remove

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The **Statistics Tab** allows the user an intuitive view of the EDS-10G WAN Emulation stats. The screen displays the defined settings for the user profile. As well an easy to follow Packet Counter for TX, RX, Drops, Re-Order and Duplicate. If the user clicks on the graph symbol, a real time graph will display packets in Packets Per Second(PPS) and a Loss Graph will also appear if the user experiences any Packet Loss.

Interface	MGMT1	MGMT2	eth2	eth3	eth4	eth5	eth6	eth7	eth8	eth9
Status	🟢	🟢	🟢	🟢	🟠	🔴	🔴	🟠	🔴	🔴
Speed	1 Gbps	1 Gbps	1 Gbps	1 Gbps	10 Gbps	1 Gbps	1 Gbps	10 Gbps	10 Gbps	10 Gbps

DATE: 6-14-2016 12:50:35
BOX SN: 987654321
BOX ID: ecdata2

🐜 Dashboard 👥 Emulation ▤ Statistics 🖥 System Settings ❶ Help 👤 admin ▾

Home Stat Screen
User can view stats and graphs

STOP PRINT Byte

Interface	Profile Name	Mode	Status	Bandwidth	Delay (ms)	Jitter (ms)	Loss (%)	Reorder (%)	Duplication (%)	Rx Pkt Counter	Rx Byte Counter	Tx Pkt Counter	Tx Byte Counter	Pkt Drop	Pkt Reorder	Pkt Duplicate	Graph
eth2	None	None	S	0	0	0	0	0	0	0	0	0	0	0	0	0	
eth3	None	None	S	0	0	0	0	0	0	0	0	0	0	0	0	0	
eth4	10g47	bridge	R	10gbit	35	0	0	0	0	1007673325	2671122268	1036572785	120857292	0	0	0	

CLICK

Show all

pps: 2.5, 2.0, 1.5, 1.0, 0.5, 0.0

12:50:20   12:50:25   12:50:30   12:50:35

— Packet Count   — Loss

The **System Settings Tab** allows the user access to the Console Port, System Update, User Management and Management Configuration.

192.168.1.1:8080/eds/systemsettings/

Interface	MGMT1	MGMT2	eth2	eth3	eth4	eth5	eth6	eth7	eth8	eth9
Status	🟢	🟢	🟢	🟢	🟠	🔴	🔴	🟠	🔴	🔴
Speed	1 Gbps	1 Gbps	1 Gbps	1 Gbps	10 Gbps	1 Gbps	1 Gbps	10 Gbps	10 Gbps	10 Gbps

DATE: 6-15-2016 12:44:0
BOX SN: 987654321
BOX ID: ecdata2

🐜 Dashboard 👥 Emulation ▤ Statistics 🖥 System Settings ❶ Help 👤 admin ▾

Console | System Update | User Management | Management Configuration

System Settings Screen
Console Screen Shown

Enter your command here

Overview of the EDS-10G, WAN Delay Emulator User Interface

The **System Settings Tab** allows the user set the EDS-10G for a user defined box name or test lab location. Other important options are also presented to the user.

System Update Screen
Define Box Name ect...

The **User Management Tab** allows the ADMIN to set-up individual users access levels for the EDS-10G. Only the ADMIN has access to individual users authority to testing.

User MGMT Screen
Define User Roles

User Name	Roles			
admin	ROLE_ADMIN_ACCESS			
User1	ROLE_ADMIN_ACCESS			
demo_user	ROLE_USER_VIEW			

The **Edit MGMT Port Tab** allows the ADMIN to set-up MGMT 2 access port for any user defined address and be retained after power boot. MGMT 1 always reverts to 192.168.1.1 after any power boot. This will guarantee access to the EDS-10G.

Edit Mgmt Configuration

IP address : 192.168.1.1
Gateway : 192.168.1.10
Netmask : 255.255.255.0

MGMT Port IP Address
Easily set managment
Ports IP Addresses

Port	IP Address		...mask
MGMT1	192.168.1.1		5.255.0
MGMT2	192.168.1.9		5.255.0

Overview of the EDS-10G, WAN Delay Emulator User Interface

The EDS-10G also has a full **Command Line Interface (CLI)** that supports all features of the box. The CLI is accessed via SSH on the IP Port.

```
192.168.1.1 - PuTTY

**********************************************
East Coast Datacom, Inc.
Model: EDS-10/40G, Ethernet Delay Simulator
Software Version: v0.5.0
**********************************************
Customer Box ID: ecdata2
Serial Number: 987654321
**********************************************


        TOP LEVEL SYSTEM MENU

   1   :   Scan Ethernet Interface

   2   :   Display Profile Statistics

   3   :   Profile Settings

   4   :   System Settings

   5   :   Help

   6   :   Exit

Enter Choice:█
```

Full Command Line Interface (CLI) is also Included in EDS-10G for SSH Access

The **CLI** allows is easy to use and very responsive. The screen below shows a scan of the ETH ports in the EDS-10G. This includes MGMT 1 and MGMT 2 as well as all ETH ports installed in the box. The ETH ports support specific INTEL NIC cards and the NIC cards are loaded at the factory with specific drivers that are optimized with special user space drivers. All of these have been carefully tuned for optimum performance. The result is Line Rate Performance with superb delay accuracy that rivals FPGA based systems for half the cost.

```
192.168.1.1 - PuTTY

EDS 1/10-G Version: v0.5.0

******************************************* System Ethernet Interface Information *******************************************

INTERFACE      LINK STATUS       IP           MAC            FW-VERSION            SPEED

*****************************************************************************************************************************
eth0(MGMT1)    LINK UP       192.168.1.1    0c:c4:7a:c7:cf:b8   2.1-2                10baseT/Half 10baseT/Full
                                                                                    100baseT/Half 100baseT/Full
                                                                                    1000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth1(MGMT2)    LINK UP       192.168.1.9    0c:c4:7a:c7:cf:b9   2.1-2                10baseT/Half 10baseT/Full
                                                                                    100baseT/Half 100baseT/Full
                                                                                    1000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth2           LINK UP       0.0.0.0        a0:36:9f:87:79:25   1.63, 0x80000cbc     10baseT/Half 10baseT/Full
                                                                                    100baseT/Half 100baseT/Full
                                                                                    1000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth3           LINK UP       0.0.0.0        a0:36:9f:87:79:24   1.63, 0x80000cbc     10baseT/Half 10baseT/Full
                                                                                    100baseT/Half 100baseT/Full
                                                                                    1000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth4           LINK UP       0.0.0.0                                                 1000baseT/Full
                                                                                    10000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth5           LINK DOWN     0.0.0.0                                                 10baseT/Half 10baseT/Full
                                                                                    100baseT/Half 100baseT/Full
                                                                                    1000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth6           LINK DOWN     0.0.0.0        a0:36:9f:87:79:26   1.63, 0x80000cbc     10baseT/Half 10baseT/Full
                                                                                    100baseT/Half 100baseT/Full
                                                                                    1000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth7           LINK UP       0.0.0.0        3c:fd:fe:9d:b2:8d   4.42 0x80001920 0.0.0   1000baseT/Full
                                                                                    10000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth8           LINK DOWN     0.0.0.0        3c:fd:fe:9d:b2:94   4.42 0x80001920 0.0.0   1000baseT/Full
                                                                                    10000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
eth9           LINK DOWN     0.0.0.0        3c:fd:fe:9d:b2:95   4.42 0x80001920 0.0.0   1000baseT/Full
                                                                                    10000baseT/Full
---------------------------------------------------------------------------------------------------------------------------
Press q and Hit Enter to go back to Main Menu
```

CLI Interface of ETH Ports Easily Identify ETH Settings

Overview of the EDS-10G, WAN Delay Emulator User Interface

The **Display Ethernet Interface Statistics** page displays the current state of running or stopped created profiles.

```
 192.168.1.1 - PuTTY
EDS 1/10-G Version: v0.5.0

********************************* Displaying Ethernet Interface Statistics *********************************

        PROFILE
LAN   R/S  NAME  Mode    B/W    Delay(ms) Loss Reorder  Duplicate    RxPctr      RxBctr      TxPctr      TxBctr     PktL  PktR  PktD
--------------------------------------------------------------------------------------------------------------------------------


 eth2  S   NONE  NONE    NONE   0         0%   0%       0%           0           0           0           0          0     0     0

 eth3  S   NONE  NONE    NONE   0         0%   0%       0%           0           0           0           0          0     0     0

 eth4  R   10g47 bridge  10gbit 35        0%   0%       0%           539660034   857859000   546935004   1294357200 0     0     0

 eth5  S   NONE  NONE    NONE   0         0%   0%       0%           0           0           0           0          0     0     0

 eth6  S   NONE  NONE    NONE   0         0%   0%       0%           0           0           0           0          0     0     0

 eth7  R   10g47 bridge  10gbit 35        0%   0%       0%           546935004   1294357200  539660034   857859000  0     0     0

 eth8  S   NONE  NONE    NONE   0         0%   0%       0%           0           0           0           0          0     0     0

 eth9  S   NONE  NONE    NONE   0         0%   0%       0%           0           0           0           0          0     0     0

 R-Running    S-Stopped

Press q and Hit Enter to go back to Main Menu
```

CLI Interface for ETH Stats
An intuative overview for users

In Closing:

The EDS-10G offers many features only found is very high end systems. The unit offers a secure SSH CLI interface and an easy to use GUI interface, each accessible from MGMT-1 or MGMT-2 Ethernet Ports.

The EDS-10G supports Interfaces of:

10/100/1000 in copper or Fiber,

10GbE with SFP+ for Fiber or Twin Axial Copper

40GbE with QSFP+ for Fiber, Twin Axial Copper or 1-4 Breakout Cables for 4-Ports 10G

*** All sales include 3-Years Warranty, Support and Maintenance Upgrades ***

Please review our data sheet or user manual for further details located at:

https://www.ecdata.com/network-latency-simulators.html

SALES CONTACT:

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