
Fax Emulation and Analysis using VQuad™ and Webviewer™



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Dual UTA HD

- Cell Phones:
 - Bluetooth®
 - Mobile audio interface for Smartphones (iPhone, Android) – includes Audio Headset Jack
 - Wired Headset Smartphone ACC connectivity
- Mobile Radios with Push-to-Talk functionality
- RJ-11 POTS lines
- Handset Phones (POTS, Digital, VoIP):
- 2-wire Analog (WB, NB - FXO) supporting next generation gateways
- Dual UTA HD 4-wire analog interfaces supporting Tx/Rx Headset including HATS, Cell Phone Headset, and any Handset Phone (RJ22 connection).



VQuad™ Probe HD

A Self-Contained Unit with VQuad™, Dual UTA HD, and PC

Following PC interfaces are embedded in the VQuad™ Probe HD along with the Dual UTA HD interfaces:

- 4 USB ports (can be used as Keyboard/Mouse ports as well as connecting a second Dual UTA HD or T1 E1 Analyzer)
 - 2x USB 2.0 on front
 - 2x USB 3.0 on back
- GigaBit Ethernet ports
- Two HDMI ports (Optional Video port (VGA) to HDMI interface)
- In-built mSATA solid-state hard drive (256GB)
- In-built standard 8G memory
- Intel NUC Core i3 or optional i7 equivalent
- Windows® 10 64-bit Pro Operating System

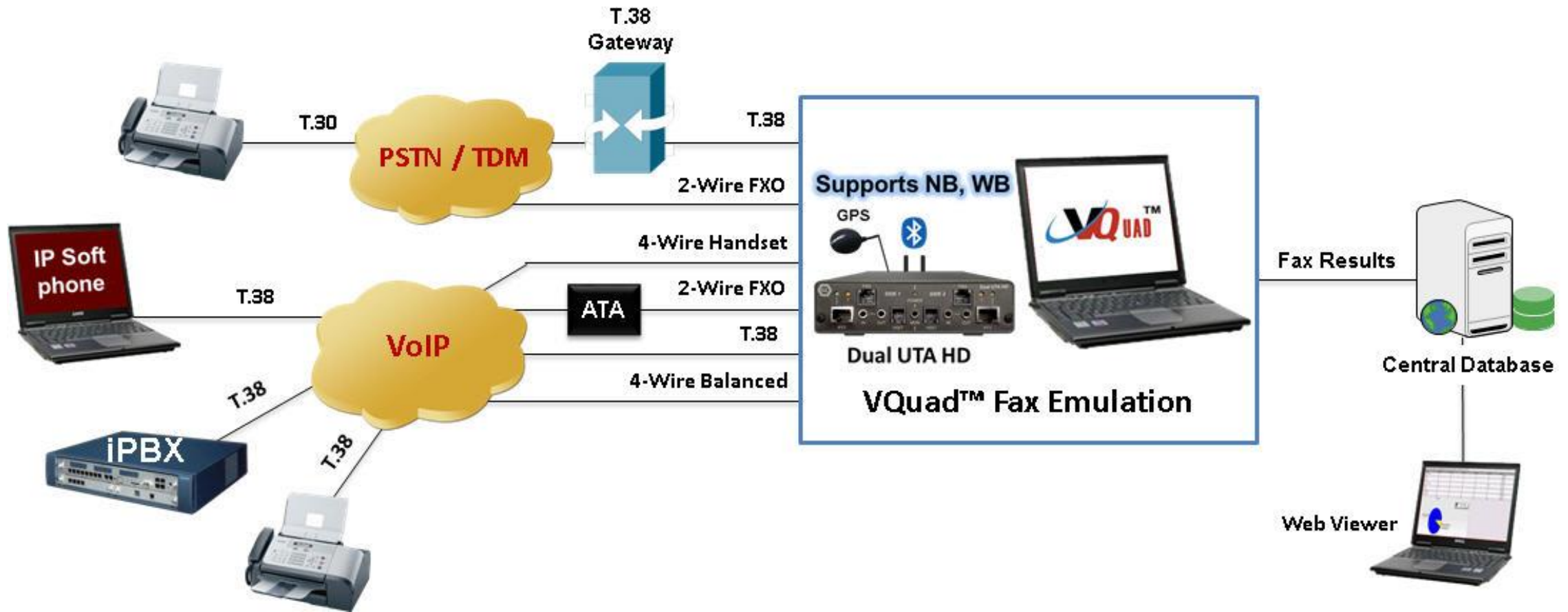


mTOP™ Rack System



GL's VQuad™ mTOP™ solution includes high density Rackmount and **portable Probe** variants. mTOP™ Probe is all-in-one self-contained VQuad™ with Dual UTA HD test instrument along with PC interface designed for conveniently testing independent telephony devices in your lab.

Fax Emulation using VQuad™



Features

- Fax Emulation supporting up to 4 independent and simultaneous sessions with speeds up to 33600 bps (V.34). Supports both Tx and Rx fax emulation using VQuad™ with Dual UTA HD analog interfaces (2-wire FXO, 4-wire balanced, 4-wire Handset, PTT)
- VQuad™ Fax events include messages, summary, and errors log
- Ability to auto save fax (both East and West directions) to PCM file for enhanced analysis using GL Insight™ and GL Fax Demodulator/Decoder
- VQuad™ scripting supports both fax send and receive session configuration
- Support for querying Fax events/results/errors over web interface

VQuad™ Fax Events

FAX Events - Messages Log

- VQuad™ Fax Emulation includes three event screens, Fax Messages, Fax Summary and Fax Errors
- The Fax Messages is shown in chronological order for simple understanding of the fax process
- Multiple Fax Message screens can be displayed simultaneously thus showing full duplex fax sessions
- The Fax status as shown on the Fax Event screen displays Total Successful and Total Failed faxes for each VQuad™ device ID

Timestamp	Duration(sec)	Message	Content	State
11/24/11 10:00:07.000	0.000	Send Started		
11/24/11 10:00:15.281	5.850	>> CSI		Pre-Message Proce.
11/24/11 10:00:15.734	6.300	>> DIS, len=15Bytes	9600, V29, ECH, MR, 204x196...	Pre-Message Proce.
11/24/11 10:00:15.796	6.350	<< TSI		Pre-Message Proce.
11/24/11 10:00:15.796	6.350	<< DCS, len=15Bytes		Pre-Message Proce.
11/24/11 10:00:18.453	9.000	TX Train Start		Pre-Message Proce.
11/24/11 10:00:20.171	10.740	TX Train End		Pre-Message Proce.
11/24/11 10:00:21.750	12.310	>> CFR		Pre-Message Proce.
11/24/11 10:00:40.15	30.590	<< PPS HPS		In-Message Procedu
11/24/11 10:00:42.984	33.560	>> MCF		In-Message Procedu

Choose a Device: test1 test2 test3 test4

Log to File: _____

Messages Summary Errors

Auto scroll to show latest events Semicolon Delimit Log Information

Open New Window Clear Status Clear Events

test1, Success: 2438, Failed: 18 test2, Success: 2416, Failed: 23 test3, Success: 2312, Failed: 22 test4, Success: 2416, Failed: 32

VQuad™ Fax Events...

Summary Log

- The Fax Summary includes one event per fax (Fax Send and Fax Receive) which shows initial settings and final settings upon fax completion (i.e. Fax Speed, Line Sent, Bad Lines, Pages Received)
- The Fax Summary also provides insight whether the Fax was successful or the Fax failed in which case an Error will be generated

VQuad™ Fax

Timestamp	Phone ID	Event	Duration (sec)	Error
11/24/11 09:57:35.953	test2	Send - Successful	54.300	No Error
11/24/11 09:57:48.93	test1	Send - Successful	54.370	No Error
11/24/11 09:58:21.984	test4	Send - Successful	54.070	No Error
11/24/11 09:58:34.328	test3	Send - Successful	53.970	No Error
11/24/11 09:59:14.78	test2	Send - Successful	53.470	No Error
11/24/11 09:59:26.484	test1	Send - Successful	55.410	No Error
11/24/11 09:59:59.578	test4	Send - Successful	53.300	No Error
11/24/11 10:00:11.734	test3	Send - Successful	53.310	No Error
11/24/11 10:00:53.687	test2	Send - Successful	54.730	No Error
11/24/11 10:01:05.765	test1	Send - Successful	56.360	No Error
11/24/11 10:01:38.906	test4	Send - Successful	54.670	No Error
11/24/11 10:01:50.968	test3	Send - Successful	54.580	No Error

Log to File:

Messages: **Summary** Errors

Auto scroll to show latest events Semicolon Delimit Log Information

Open New Window Clear Status Clear Events

● test1, Success: 2439, Failed: 18 ● test2, Success: 2417, Failed: 23 ● test3, Success: 2313, Failed: 22 ● test4, Success: 2417, Failed: 32

Call Status	Traffic	Volume	Script
1. Connected	Stopped	Running	
2. Connected	Stopped	Running	
3. Connected	Stopped	Running	
4. Idle	None	Running	

Events	Error Events	Detected Digits	Statistics
Timestamp	Device Name	Events	
11/24/2011 10:01:53...	test4	DualJTA GenericEvent: FAX Stream Stopped	
11/24/2011 10:01:54...	test3	Waiting 2 seconds	
11/24/2011 10:01:54...	test4	Waiting 5 seconds	
11/24/2011 10:01:57...	test2	Fax Stopped	

VQuad™ Fax Events...

Error Log

- The Fax Error screen provides all Fax Errors associated with the Fax Send/Receive. Additional information is provided for each Fax error in order to understand the cause of the error. All event screens can be saved to text file in real-time

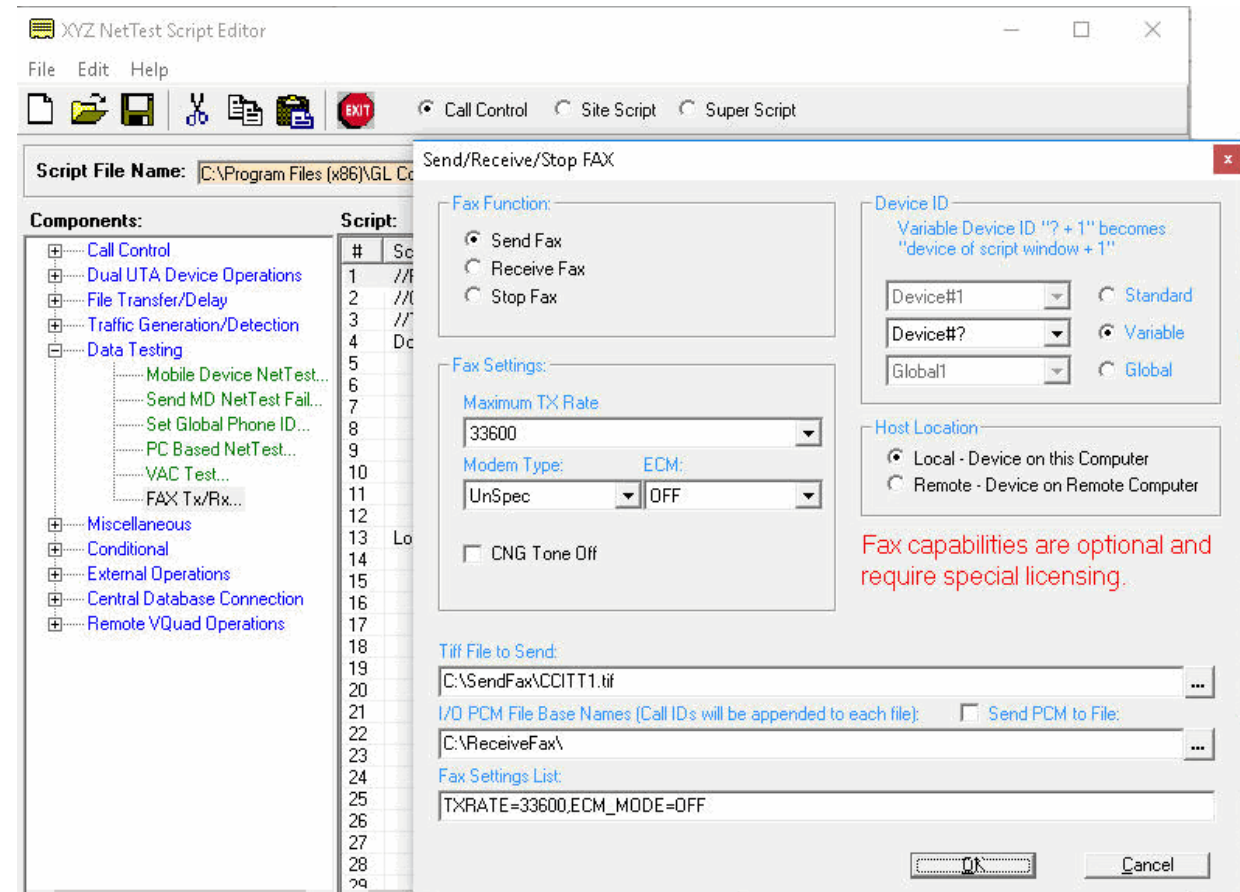
VQuad™

The screenshot displays the VQuad™ Fax Events software interface. The main window is titled "GL VQuad(TM)" and contains a menu bar (File, View, Functions, Setup, Window, Help) and a toolbar. The interface is divided into several sections:

- Configure / Start/Stop:** A panel on the left with "Start/Stop Devices:" and "Start/Stop Script:" sections. It lists test1, test2, test3, and test4, each with a green status indicator. Below this are buttons for "Stop All Scripts", "Continuous Traffic" (checked), "Pause All Traffic", and "Start All Traffic".
- Fax Events:** A large table in the center-right showing a list of events. The table has columns for Timestamp, Phone ID, Event, Duration(sec), and Error. The events listed are all "Send - Successful" with various durations and "No Error" status.
- Log to File:** A checkbox and a file selection button.
- Messages / Summary / Errors:** A section with tabs for "Messages", "Summary", and "Errors". The "Summary" tab is active, showing a status bar with test results: "test1, Success: 2439, Failed: 18", "test2, Success: 2417, Failed: 23", "test3, Success: 2313, Failed: 22", and "test4, Success: 2417, Failed: 32".
- Events:** A table at the bottom showing a list of events with columns for Timestamp, Device Name, and Events. The events listed include "DualJTA GenericEvent: RX Stream Stopped" and "Waiting 2 seconds".

Fax Tx/Rx Configuration

- VQuad™ scripting provides the ability to send and receive a fax session along with specifying necessary fax configuration settings
- The settings include Max Transmit Rate and Min Receive Rate which can effectively restrict available fax sessions
- The other configuration settings include:
 - ECM (Error Correction mode) on / off option to automatically detect and correct errors
 - RX Image Coding (receive fax only) options - MH (Modified Huffman), MR (Modified read), MMR (Modified Modified READ)
 - Auto saved fax (both east and west) to PCM file can be analyzed using GL Insight and GL Fax Extractor



VQuad™ Remote Control

VQuad™ CLI (Windows)

- VQuad™ CLI and API is enhanced to support fax simulation (both Windows® and Linux)
- The VQuad™ Remote Access (Client) allows VQuad™ operations to be remotely controlled by one (or several) VQuad™ clients over a LAN, WAN, or Internet

```
C:\Windows\system32\cmd.exe - vquadcli 192.168.1.36
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\Poornima>cd C:\Program Files (x86)\GL Communications Inc\UQuad
C:\Program Files (x86)\GL Communications Inc\UQuad>vquadcli 192.168.1.36
Uquad Remote Access (client) v.6.12 Release
Uquad IP Address: 192.168.1.36

Uquad 1: Connecting...
Daemon: Connecting...
Daemon: Connected.
type 'h' for help

h
Commands:
xvquad - Run Uquad.exe
evquad - Exit Uquad
exit - Exit program
lcc - Load Call Control Script Configuration [device ID] [script name]
lmc - Load Uquad Master Configuration [configuration name]
scc - Start Stop Call Control Script [device ID] [start<0>/stop<1>]
slog - Set Log File Option [All<-1>/Event<0>/Error<1>/Digit<2>/RTD<3>/Call<4>/<5>Fax/Client<6>] [
glog - Get Log File [All<-1>/Event<0>/Error<1>/Digit<2>/RTD<3>/Call<4>/Fax<5>/Client<6>] [local f
startes - Start Event Saving [device ID] [Saving Options]
note: Saving Option: All<null>/RTDPDD<a>/ProgressTone<b>/CallStatus<c>/Digits<d>/Error<e>/CallEve
le/RecordFileName<h>
stopes - Stop Event Saving [device ID]
getes - Get Event Saving [device ID]
call - Place Call [device ID] [called party address]
answ - Answer Call [device ID]
disc - Disconnect Call [device ID]
offhook - Set Off Hook [device ID]
onhook - Set On Hook [device ID]
flashhook - Send flash Hook [device ID] [Duration]
dprog - Detect Progress Tones [device ID]
sdprog - Stop Detecting Progress [device ID]
gstatus - Get Uquad Status [device ID] [Status Options]
note: Status Option: All<null>/CallStatus<a>/TrafficStatus<b>/ScriptStatus<c>
ghealthstatus - Get Uquad Health Status
note: Uquad Return: 0<Health>/2<Dual UTA Error>/3<Firmware Error>
setcallid - Set Call ID [device ID] [CallID]
setdevicetype - Set device type [device ID] [device type] [device name optional]
note: Device Type Option: DuFXO/DuBalanced/DuBluetooth/DuPTT/DuHandset/DuMobile
setcalltype - Set call type [device ID] [call type text] IO or I]
svf - Send Voice File [device ID] [Filename] [ALaw<0>/MuLaw<1>/Raw<2>] [I<1>continuous/<0>not con
ruf - Record Voice File [device ID] [Filename] [ALaw<0>/MuLaw<1>/Raw<2>] [record period<seconds>]
note: name format: Time+CallId<0>/Time+GPS+CallId<1>/Auto Incr+CallId<2>/CallId only<3>
sruf - Send and Record Voice File [device ID1] [Send Filename] [device ID2] [Record Filename] [le
note: name format: Time+CallId<0>/Time+GPS+CallId<1>/Auto Incr+CallId<2>/CallId only<3>
sdt - Send Digits [device ID] [dtmf<0>/mf<1>] [digits]
ston - Send Tones [device ID] [lfreq] [lpwr] [hfreq] [hpwr] [duration<ms> must>=600ms]
ddit - Detect Digits [device ID] [dtmf<0>/mf<1>]
```

Remote Client WebViewer™

GL Communications Inc.
Telecommunication Products and Consulting

Hi Administrator
VQuad WebViewer - Real Time Monitoring System, Version 5.1

Results | Call Events | Statistics/Status | Filters | Graphics | Output Results | Configuration | Logout

Load Filter: AppleTest ON OFF

Time Filter: 10 min | Auto refresh: 5 sec

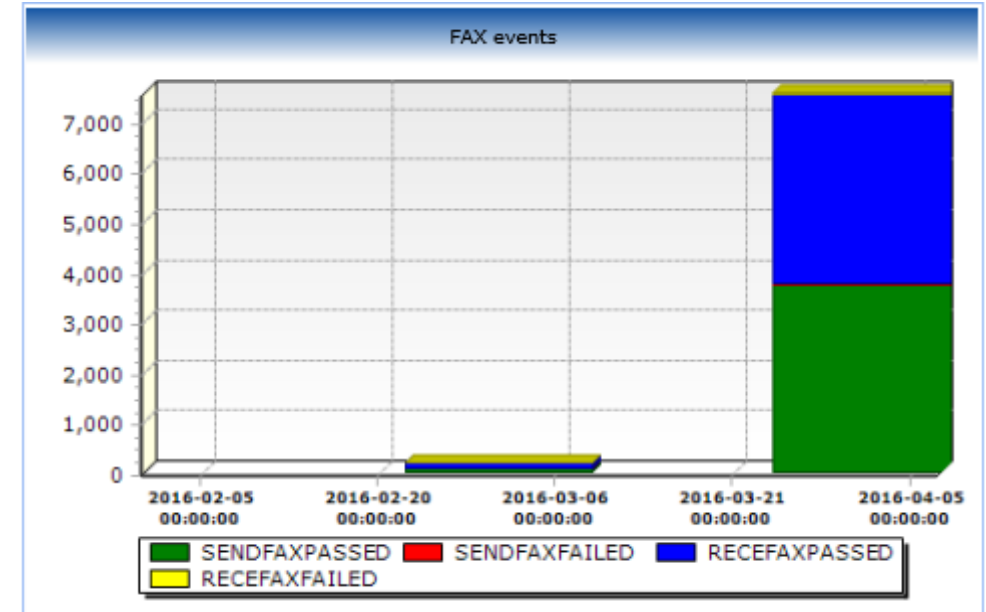
Timestamp Search: VQuad Timestamp | Event ID / Device ID Filter: VQuad Event ID ; VQuad Device ID ; O/I | Help

Records Per Page: 200 | Update Screen

Help | Error Events | Thresholds

FAX Results (Display duration: 05-05-2017 02:36:46 - 05-05-2017 02:49:46)

VQuad Timestamp	Call Timestamp	VQuad Call ID	VQuad Device ID	VQuad GPS	Duration (sec)	Error	Event	Modem	Starting Speed	Final Speed	Completed Pages	Tx/Rx Lines	Bad Lines	Encoding	Resolution	ECM	Call Type Originating	Call Type Terminating	VQuad Event ID
05/05/2017 02:45:21	05/05/2017 02:43:38	GLRobFaxVQTTTest95_VQFXO-1	N39908'36"	W077912'58"	47.9600	No Error	Send - Successful	V29	9600	9600	3	6464	0	MR	204x196	ON		PSTN	O_GLRobFaxVQTTTest95_VQFXO-1_20170505024338;_PSTN
05/05/2017 02:45:21	05/05/2017 02:43:38	GLRobFaxVQTTTest95_VQFXO-2	N39908'36"	W077912'58"	49.2800	No Error	Receive - Successful	V29	4800	9600	3	6464	0	MR	204x196	ON			I_GLRobFaxVQTTTest95_VQFXO-2_20170505024338
05/05/2017 02:44:59	05/05/2017 02:41:58	FXOHDTesting_UTAHD-1	000000000000	000000000000	142.8400	No Error	Send - Successful	V34	33600	33600	8	17888	0	MR	204x196	ON			O_FXOHDTesting_UTAHD-1_20170505024158
05/05/2017 02:44:59	05/05/2017 02:41:58	FXOHDTesting_UTAHD-2	000000000000	000000000000	144.1000	No Error	Receive - Successful	V34	2400	33600	8	17886	0	MR	204x196	ON			I_FXOHDTesting_UTAHD-2_20170505024158
05/05/2017 02:41:06	05/05/2017 02:39:24	GLRobFaxVQTTTest94_VQFXO-2	N39908'36"	W077912'58"	49.3000	No Error	Receive - Successful	V29	4800	9600	3	6464	0	MR	204x196	ON			I_GLRobFaxVQTTTest94_VQFXO-2_20170505023924
05/05/2017 02:41:06	05/05/2017 02:39:24	GLRobFaxVQTTTest94_VQFXO-1	N39908'36"	W077912'58"	47.9800	No Error	Send - Successful	V29	9600	9600	3	6464	0	MR	204x196	ON		PSTN	O_GLRobFaxVQTTTest94_VQFXO-1_20170505023924;_PSTN
05/05/2017 02:40:55	05/05/2017 02:37:33	NACFullTest_NAC2	000000000000	000000000000	44.1800	No Error	Receive - Successful	V17	14400	14400	3	6461	0	MR	204x196	ON			I_NACFullTest_NAC2_20170505023733
05/05/2017 02:40:55	05/05/2017 02:37:34	NACFullTest_NAC1	000000000000	000000000000	37.7900	No Error	Send - Successful	V17	14400	14400	3	6461	0	MR	204x196	ON			O_NACFullTest_NAC1_20170505023734
05/05/2017 02:40:01	05/05/2017 02:36:14	FXOHDTesting_UTAHD-1	000000000000	000000000000	187.5600	No Error	Send - Successful	V34	33600	33600	8	17888	0	MR	204x196	ON			O_FXOHDTesting_UTAHD-1_20170505023614
05/05/2017 02:40:01	05/05/2017 02:36:14	FXOHDTesting_UTAHD-2	000000000000	000000000000	188.8200	No Error	Receive - Successful	V34	2400	33600	8	17886	0	MR	204x196	ON			I_FXOHDTesting_UTAHD-2_20170505023614



- The VQuad™ Fax emulation summary and error results can be sent to the WebViewer™ Central database. These events can be queried using the WebViewer™ web based browser
- From the WebViewer™, one can filter the results based on specific Error, Starting or Ending speed, Completed pages, Tx/Rx Lines including Bad Lines, Resolution and ECM settings

Thank You

For more details, visit <https://www.gl.com/fax-emulation-using-vquad.html>