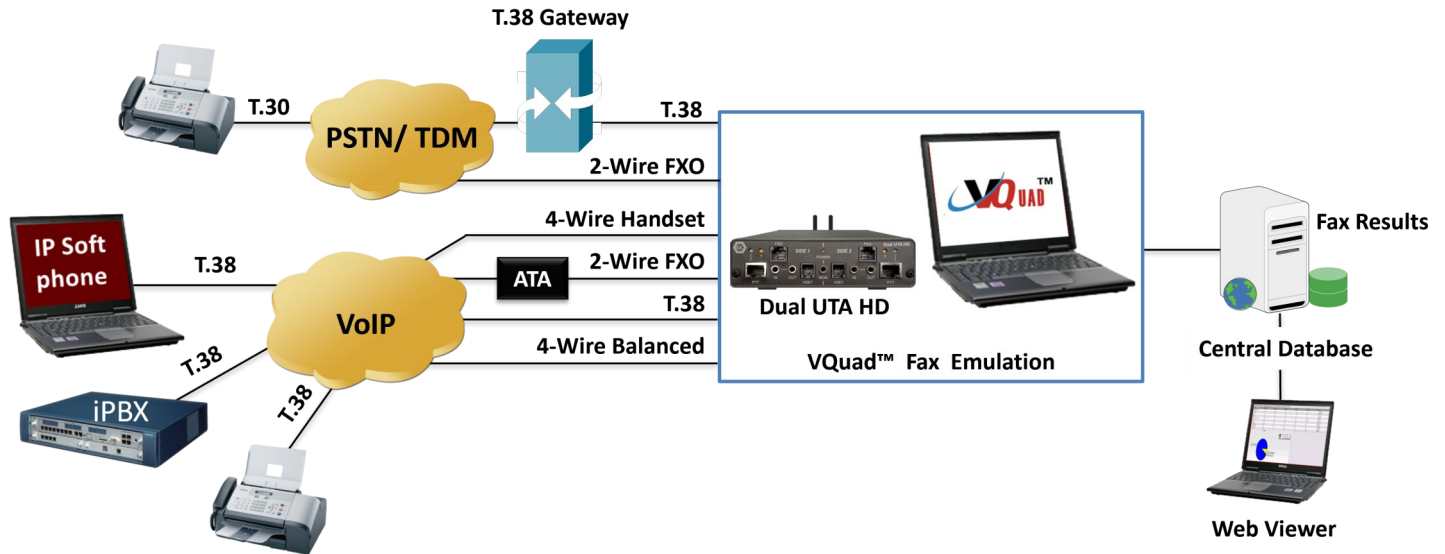


FAX Emulation using VQuad™



Overview

GL's VQuad™ software can send and receive up to 12 independent and simultaneous T.30 single or multiple page faxes using the Dual UTA HD hardware platform. The user can configure the transmit and receive fax rate from 2,400 bps to 33,600 bps with V.34 supported. Interfaces supported for fax generation include 2-Wire FXO and 4-Wire analog.

The VQuad™ software includes an easy-to-use graphical user interface for sending and receiving Fax calls. Furthermore, the VQuad™ software provides scripting capability for test automation. The VQuad™ software can be controlled remotely for added flexibility. VQuad™ Fax provides all pertinent real-time fax messaging with proper time sequences. One can follow the fax session from start to finish on both the send and receive sides.

VQuad™ also provides a summary for each fax (completed or failed along with results). VQuad™ provides all errors associated with each fax with proper time sequence and an understanding of what the error indicates. All results (errors and summary) can be sent automatically to a web-based dashboard, WebViewer™.

VQuad™ can automatically save the fax session (both East and West directions) to a PCM file. This file can be exported to GLInsight™ or GL Fax Demodulator/Decoder analysis software packages for further analysis of the fax session. GL's Fax Demodulator/Decoder can be configured for automated analysis.

GL's WebViewer™ provides access and display, in real time, to all results associated with VQuad™ including the Fax events, errors, and summary logs.

For more details, refer [Fax Emulation using VQuad™](#) webpage.



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Main Features

- Supports up to 12 independent and simultaneous T.30 single or multiple page faxes with speeds up to 33,600 bps (V.34). Supports both transmit and receive fax emulation over 2-Wire FXO and 4-Wire Analog
- Logs fax events include messages, summary, and errors
- Auto save fax calls (both directions) to a PCM file for enhanced analysis using GLInsight™ or GL Fax Demodulator/Decoder
- Supports Graphical User Interface and scripting capability
- View all fax events/results/errors through a web browser
- Save all fax call detail records to a central database

FAX Tx/Rx Configuration

VQuad™ scripting provides the ability to both 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)
- Supported modem types include UnSpec, V27, V29, V17, and V34
- For the specified modem type, the Tx Rx rate as per ITU standards are automatically applied. Standard Tx and Rx rates ranges from 2400baud to 33600baud
- Auto saved fax (both east and west) to PCM file can be analyzed using GLInsight™ and GL Fax Extractor

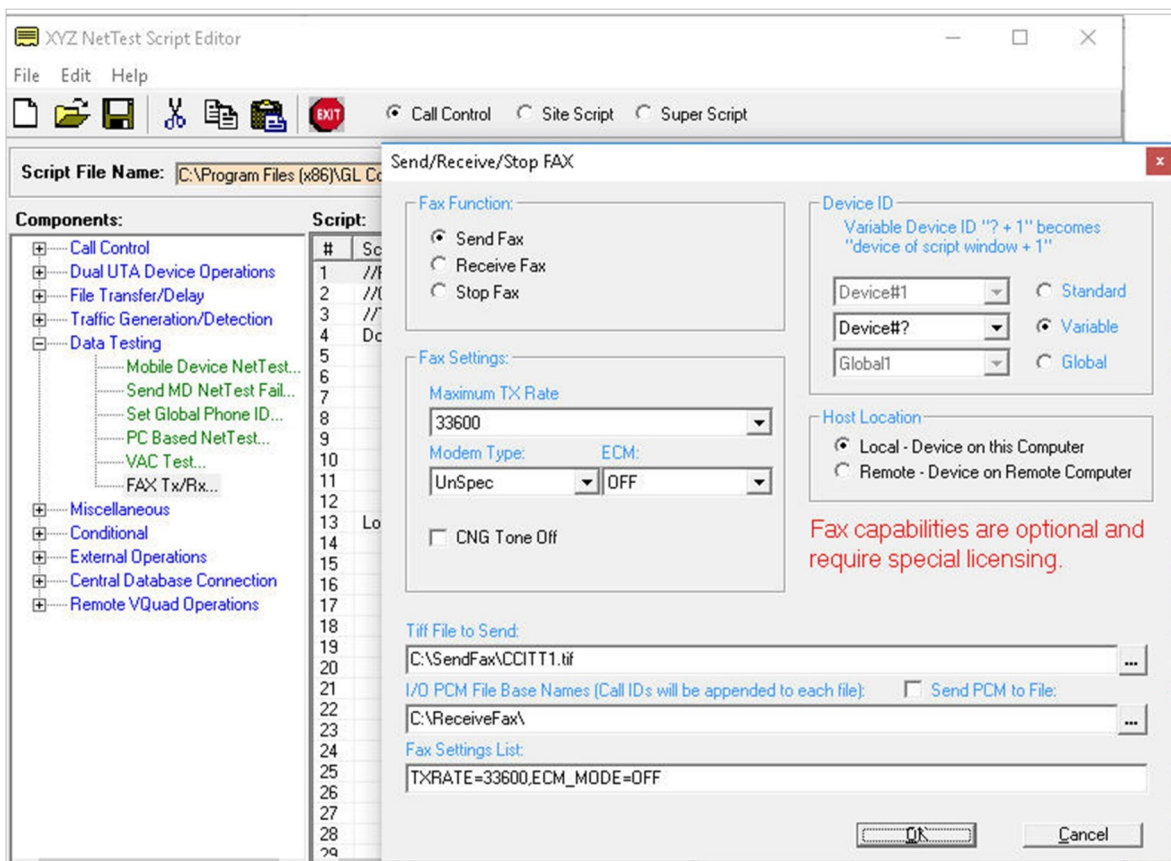


Figure: VQuad™ Fax Tx/Rx Configuration

VQuad™ FAX Events Log

The 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 Summary** includes one event per fax (Fax Send and Fax Receive) which shows both the 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.

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.

The **Fax Status** as shown on Fax Events screen displays Total Successful and Total Failed faxes for each VQuad™ device ID.

The screenshot displays two overlapping windows from the VQuad™ Fax Events Log application. The top window, titled 'Fax Events', shows a table of fax events. The bottom window, also titled 'Fax Events', shows a detailed view of a message log with various fields and controls.

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

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 MPS		In-Message Procedu
11/24/11 10:00:42.984	33.560	>> MCF		In-Message Procedu

Labels in the image point to the following elements:

- Fax Summary Log**: Points to the top window's table.
- Fax Messages Log**: Points to the bottom window's message table.
- Fax Events Log Options**: Points to the 'Messages', 'Summary', and 'Errors' tabs in the bottom window.
- Fax Test Status**: Points to the status bar at the bottom of the bottom window, showing success and failure counts for test1, test2, test3, and test4.

Figure: VQuad™ Fax Events Log

VQuad™ Remote Control

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. Supported modem types include UnSpec, V27, V29, V17, and V34. For the specified modem type, the Tx Rx rate as per ITU standards are automatically applied. Standard Tx and Rx rates ranges from 2400baud to 33600baud.

The following table refers to Maximum Tx and Minimum Rx data transmission rates.

ITU Standard	Data Rates (bit/s)
V.27	2400 to 4800 bps
V.29	4800 to 9600 bps
V.17	7200 to 14400 bps
V.34	2400 to 33600 bps (incompatible with other modems)
Unspec	All the modem supporting the configured rate (tx/rx) will be used

```

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\Poornina>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:
xuquad - 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/DuPIT/DuHandset/DuMobile
setcalltype - Set call type [device ID] [call type text] [0 or 1]
svf - Send Voice File [device ID] [Filename] [ALaw<0>/MuLaw<1>/Raw<2>] [(<1>continuous/<0>not con
rvf - 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>
srvf - 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>
adit - 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>]

```

Figure: VQuad™ CLI (Windows)

Remote Client WebViewer™

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.

Various Fax results can be queried over web interface including VQuad Timestamp, Call Timestamp, VQuad Location, VQuad Phone ID, VQuad Lat/Long, Duration (sec), Error, Event, Modem, Starting Speed, Final Speed, Completed Pages, Tx/Rx lines, Bad Lines, Encoding, Resolution, ECM (Error Correction Mode), Call Type Originating, Call Type Terminating, and VQuad™ Call ID parameters.

The screenshot displays the 'Remote Client WebViewer™' interface. At the top, there is a navigation bar with 'GL Communications Inc.' logo and 'Hi Administrator' text. Below this is a menu bar with options: Results, Call Events, Statistics/Status, Filters, Graphics, Output Results, Configuration, and Logout. The main content area shows a 'Load Filter' dropdown set to 'AppleTest' and a 'Time Filter' set to '10 min'. There are also 'Auto refresh' and 'Timestamp Search' options. A table titled 'FAX Results (Display duration: 05-05-2017 02:36:46 - 05-05-2017 02:49:46)' is displayed with the following columns: 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, and VQuad Event ID. The table contains multiple rows of data representing individual fax events.

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	N39°08'36" W077°12'58"	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	N39°08'36" W077°12'58"	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	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	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-1	N39°08'36" W077°12'58"	49.3000	No Error	Send - Successful	V29	4800	9600	3	6464	0	MR	204x196	ON			I_GLRobFaxVQTTTest94_VQFXO-1_20170505023924
05/05/2017 02:41:06	05/05/2017 02:39:24	GLRobFaxVQTTTest94	VQFXO-2	N39°08'36" W077°12'58"	47.9800	No Error	Receive - Successful	V29	9600	9600	3	6464	0	MR	204x196	ON		PSTN	O_GLRobFaxVQTTTest94_VQFXO-2_20170505023924;_PSTN
05/05/2017 02:40:55	05/05/2017 02:37:33	NACFullTest	NAC2	000000000000	44.1800	No Error	Send - 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	37.7900	No Error	Receive - 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	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	188.8200	No Error	Receive - Successful	V34	2400	33600	8	17886	0	MR	204x196	ON			I_FXOHDTesting_UTAHD-2_20170505023614

Figure: Remote Client WebViewer™

Buyer's Guide

Item No	Product Description
VQT022	VQuad™ Fax Emulation (2 simultaneous ports)
VQT022a	VQuad™ Fax Emulation (8 simultaneous ports)
VBA038	FaxScan™

Item No	Related Software
FXT001	GLInsight™ - Single Fax Analysis - TDM
FXT002	GLInsight™ - Single Fax Analysis - IP
VQT010	VQuad™ Software (Stand Alone)
VQT013	VQuad™ with SIP (VoIP) Call Control
VQT015	VQuad™ with T1 E1 Call Control
VQT040	VQuad™ WebViewer™

Item No	Related Hardware
VQT251	Dual UTA HD Next generation with FXO Wideband support

Note: PCs which include GL hardware/software require Intel or AMD processors for compliance.

For more details, refer [Fax Emulation using VQuad™](#) webpage.



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