



Your Imagination, Our Creation

GL620USB-A

GeneLink
USB PC-to-PC Networking
Controller

SPECIFICATION 1.6

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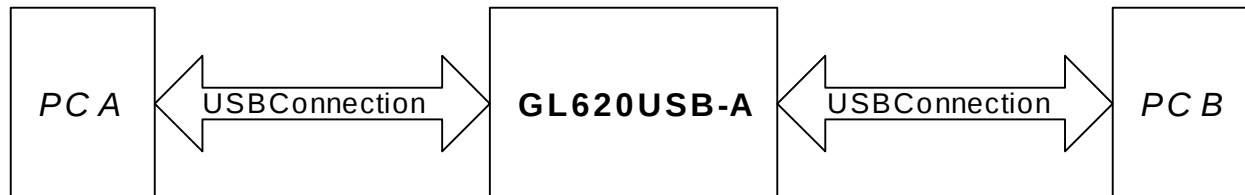
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1. Features

- Conforms to USB 12Mbps Specification, Version 1.1
- Patented architecture
- Single chip solution for host-to-host communication
- Network driver (NDIS standard) support running on Windows 98 and Windows 2000
- Support TCP/IP, NetBEUI, IPX/SPX protocols
- Up to 8.6Mbps transfer rate
- Suitable for mobile and SOHO environment
- Tiniest solution in the market – 16-pin SOP
- On-chip 3.3V output
- 12MHz external clock
- Internal power-on reset
- Power management support

2. Functional Overview

The GL620USB-A provides a single-chip solution for networking two or more PCs via their USB ports. According to USB protocol, the PC is the host and the device is a slave, where the host initiates all the USB traffic and the slave responds to the host's requests. In other words, a host cannot talk to another host via USB protocol; instead, a host can only talk to one or more devices. The GL620USB-A's patent-pending architecture overcomes the USB inherently incompatibility of connecting two or more PCs by providing two independent USB transceivers and SIEs for each host, i.e., data can be transferred in both directions simultaneously.



System Diagram

3. Applications

The windows network driver software comes with GL620USB-A can connect 2 or more PCs via USB ports easily. Genesys Logic also provides Macintosh driver software for GL620USB-A and supports the direct connection between two Macintosh machines. The plug-and-play nature of USB protocol makes the installation and usage of end products very simple.

Working with a full-featured windows driver, the GL620USB-A can perform the following functions between two or more PCs:

- File transfer
- Ethernet emulation
- Storage device sharing: hard drive, CD-ROM, floppy, ...
- Printer sharing
- Internet sharing

Working with a full-featured Macintosh driver, the GL620USB-A can perform the following functions between two Macintosh machines:

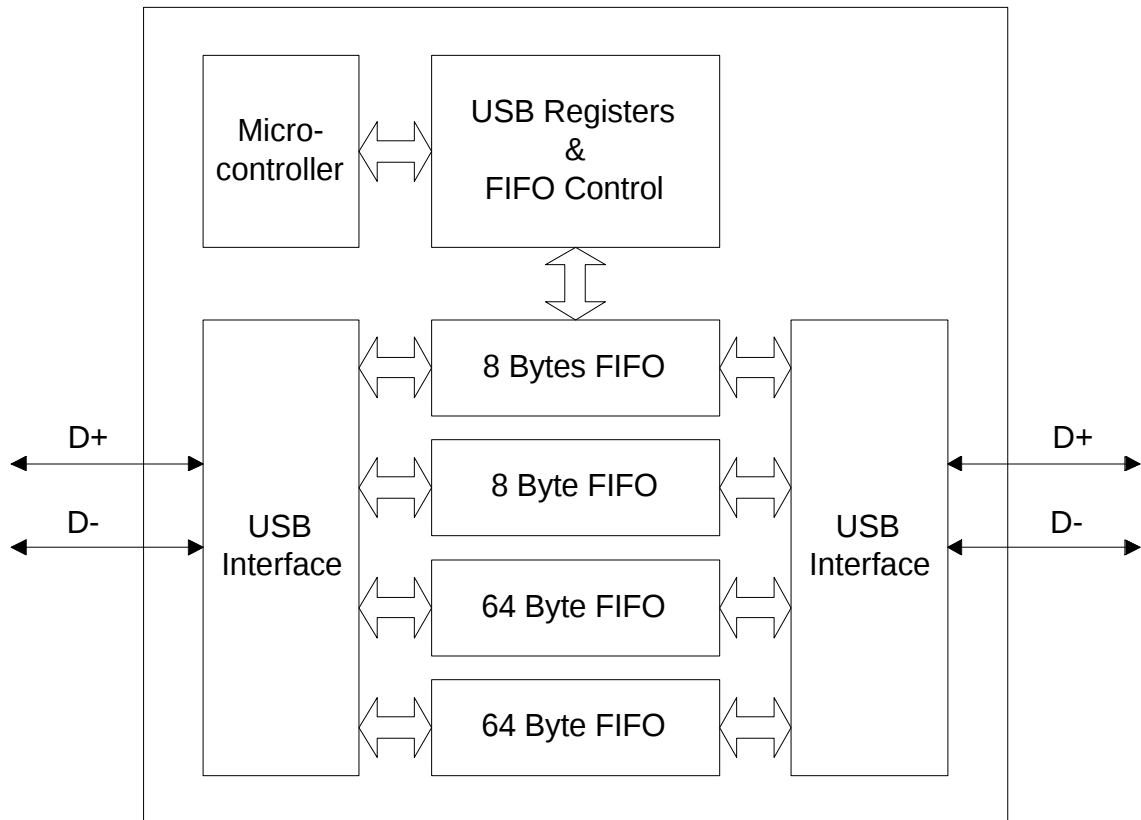
- Ethernet emulation
- Storage device sharing: hard drive, CD-ROM, floppy, ...
- Printer sharing

Working with GL620USB-A and its Windows/Macintosh drivers, PC can provide Internet sharing to Macintosh. GL620USB-A doesn't support file transfer/sharing function between PC and Macintosh except that the extra third-party software is installed.

The GL620USB-A networking function can be integrated with the following form factors:

- USB standalone cable
- USB standalone hub
- USB monitor with hub
- PC host

4. Functional Description



Block diagram of GL620USB-A

The GL620USB-A is equipped with two full-speed USB ports, and each port has four endpoints to provide different functions as follows:

- Endpoint 0: control transfer
- Endpoint 1: bulk-read transfer
- Endpoint 2: bulk-write transfer
- Endpoint 3: interrupt transfer

Two 8-bytes FIFO and four 64-bytes FIFO are built in the device as follows:

- Left 8-byte FIFO: provide a pipe to link left endpoint 0 and right endpoint 3. For example, if left host wants to communicate with right host, left host can issue a no data control transfer and the setup command will be

stored in the left 8-byte FIFO. Right host can request an interrupt transfer to get the setup command from left host. The status stage of the left side control transfer will not be terminated until the right side get the setup command via interrupt transfer.

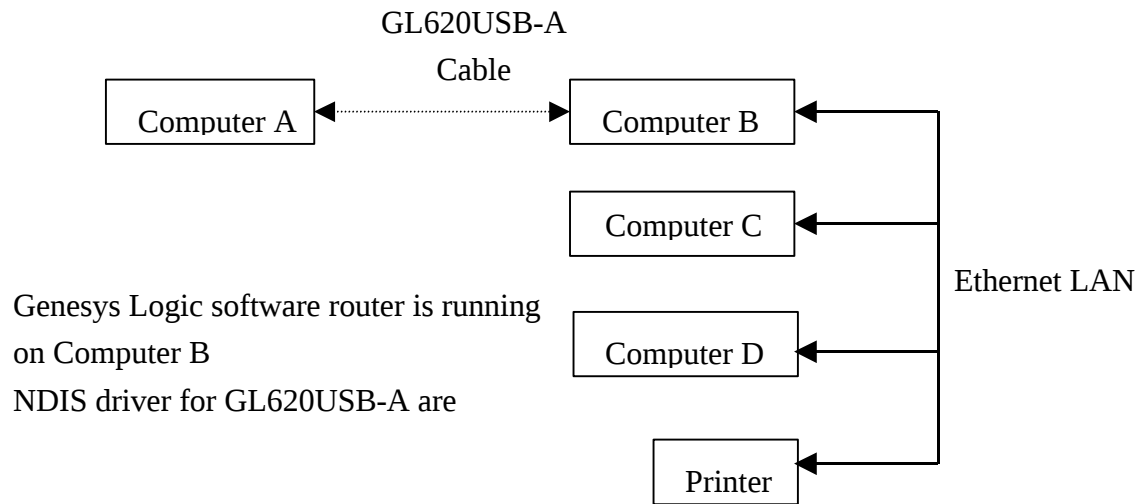
- Right 8-byte FIFO: provide a pipe to link right endpoint 0 and left endpoint 3.
- Left 64-bytes DATA0/DATA1 FIFOs: provide a pipe to link left endpoint 2 and right endpoint 1. For example, if left host wants to transfer data to right host, left host can issue bulk write transfer and the payload will be stored in the left 64-byte FIFOs. Right host can request a bulk read transfer to get the data from left host.
- Right 64-bytes DATA0/DATA1 FIFOs: provide a pipe to link right endpoint 2 and left endpoint 1.

5. Driver Support

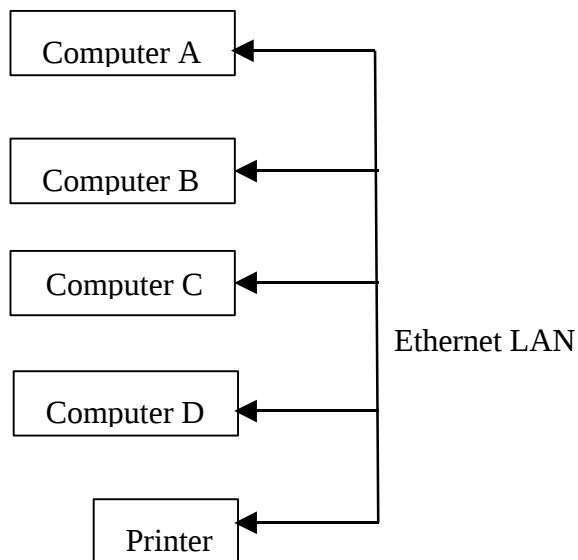
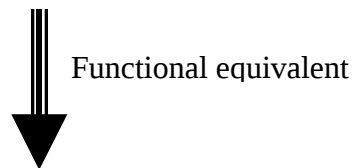
The Genesys Logic Ethernet Driver is a mini-port device driver emulating a network interface running on Windows 98 and Windows 2000. The Genesys Logic Ethernet Driver conforms to the NDIS (Network Driver Interface Specification) standard. The users can use standard Windows utilities such as Windows Explorer, Network Neighborhood and standard file sharing security features. Even though there's no Ethernet card present, the Genesys Logic Ethernet Driver performs all the functions an Ethernet card can do, and more, the plug-and-play feature. The users can build up their own private network by connecting several PCs via the GL620USB-A embedded cables.

The Genesys Logic software router is a network protocol layer driver. The software router can forward packet between the GL620USB-A embedded cable and Ethernet LAN to emulate all PCs on the network build by GL620USB-A is also on the Ethernet LAN. This function can share all resources on Ethernet LAN to GL620USB-A connected PCs.

The Genesys Logic Ethernet Macintosh Driver is a device driver emulating a network interface running on Mac OS 8.5, 8.6 and 9.0. After enable the standard Macintosh file sharing service, the users can share the device resources such as HD, CD-ROM between two Macintosh machines by the Macintosh Network Browser.

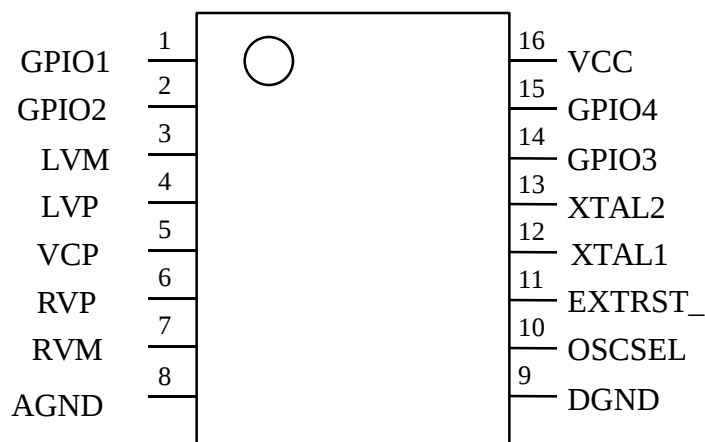


Genesys Logic software router is running
on Computer B
NDIS driver for GL620USB-A are



6. Pin Definitions and Descriptions

PIN	SYMBOL	I/O	DESCRIPTION
1	GPIO1	B	General purpose IO pin / Driving LED capability
2	GPIO2	B	General purpose IO pin / Driving LED capability
3	LVM	B	Left D-
4	LVP	B	Left D+
5	VCP	O	3.3V output
6	RVP	B	Right D+
7	RVM	B	Right D-
8	AGND	-	Ground
9	DGND	-	Ground
10	OSCSEL	I	Selection of clock type
11	EXTRST_	I	External reset
12	XTAL1	I	12M crystal input
13	XTAL2	O	Crystal output
14	GPIO3	B	General purpose IO pin
15	GPIO4	B	General purpose IO pin
16	VCC	-	5V power



16-pin SOP

7. Electrical Characteristics

7.1 Absolute Maximum Ratings (Voltages referenced to GND)

SYMBOL	Description	MIN	MAX
VCC	DC supply voltage	-0.5V	+7V
V _I	DC input voltage	-0.5V	VCC+0.5V
V _{I/O}	DC input voltage range for bidirect pins	-0.5V	VCC+0.5V
V _{AI/O}	DC input voltage for USB D+/D- pins(PIN3, 4, 6, 7)	-0.5V	VCC+0.5V
V _{I/OZ}	DC voltage applied to outputs in High Z state	-0.5V	VCC+0.5V
V _{ESD}	static discharge voltage	4000V	

7.2 DC Characteristics (VCP/D+/D-)

SYMBOL	Description	MIN	TYP	MAX	UNIT
V _{3.3}	VCP regulator output	3.0	3.3	3.6	V
I _{3.3}	VCP maximum supply current	27	41	56	mA
V _{OL}	D+/D- static output LOW(R _L of 1.5K to 3.6V)			0.3	V
V _{OH}	D+/D- static output HIGH (R _L of 15K to GND)	2.8		3.6	V
V _{DI}	Differential input sensitivity	0.2			V
V _{CM}	Differential common mode range	0.8		2.5	V
V _{SE}	Single-ended receiver threshold	0.2			V
C _{IN}	Transceiver capacitance			20	pF
I _{LO}	Hi-Z state data line leakage	-10		+10	μA
Z _{DRV}	Driver output resistance	28		43	Ohms

7.3 DC Characteristics (PIN1, 2)

SYMBOL	Description	MIN	TYP	MAX	UNIT
V _{DD}	Power Supply Voltage	4.5	5.0	5.5	V
I _{OL}	DC output sink current at 0.4V	13.01	19.54	24.82	mA
I _{OH}	DC output source current at V _{DD} -0.4V	6.35	9.82	12.37	mA
I _{OHTTL}	DC output source current at TTL high	24.62	49.45	69.12	mA
V _{IL}	LOW level input voltage			0.7	V
V _{IH}	HIGH level input voltage	2.66			V
V _{TLH}	LOW to HIGH threshold voltage	2.02	2.38	2.66	V
V _{THL}	HIGH to LOW threshold voltage	0.7	0.83	1.0	V
V _{HYS}	Hysteresis voltage	1.1	1.55	1.79	V
V _{OL}	LOW level output voltage when I _{OL} =16mA			0.4	V

7.4 DC Characteristics (PIN10, 11)

SYMBOL	Description	MIN	TYP	MAX	UNIT
V _{DD}	Power Supply Voltage	4.5	5.0	5.5	V
V _{IL}	LOW level input voltage			0.69	V
V _{IH}	HIGH level input voltage	2.65			V
V _{TLH}	LOW to HIGH threshold voltage	2.01	2.37	2.65	V
V _{THL}	HIGH to LOW threshold voltage	0.69	0.82	0.99	V
V _{HYS}	Hysteresis voltage	1.1	1.55	1.79	V
R _{UP}	Pad internal pullup resister	191.27	240.69	376.34	Kohms

7.5 DC Characteristics (PIN14, 15)

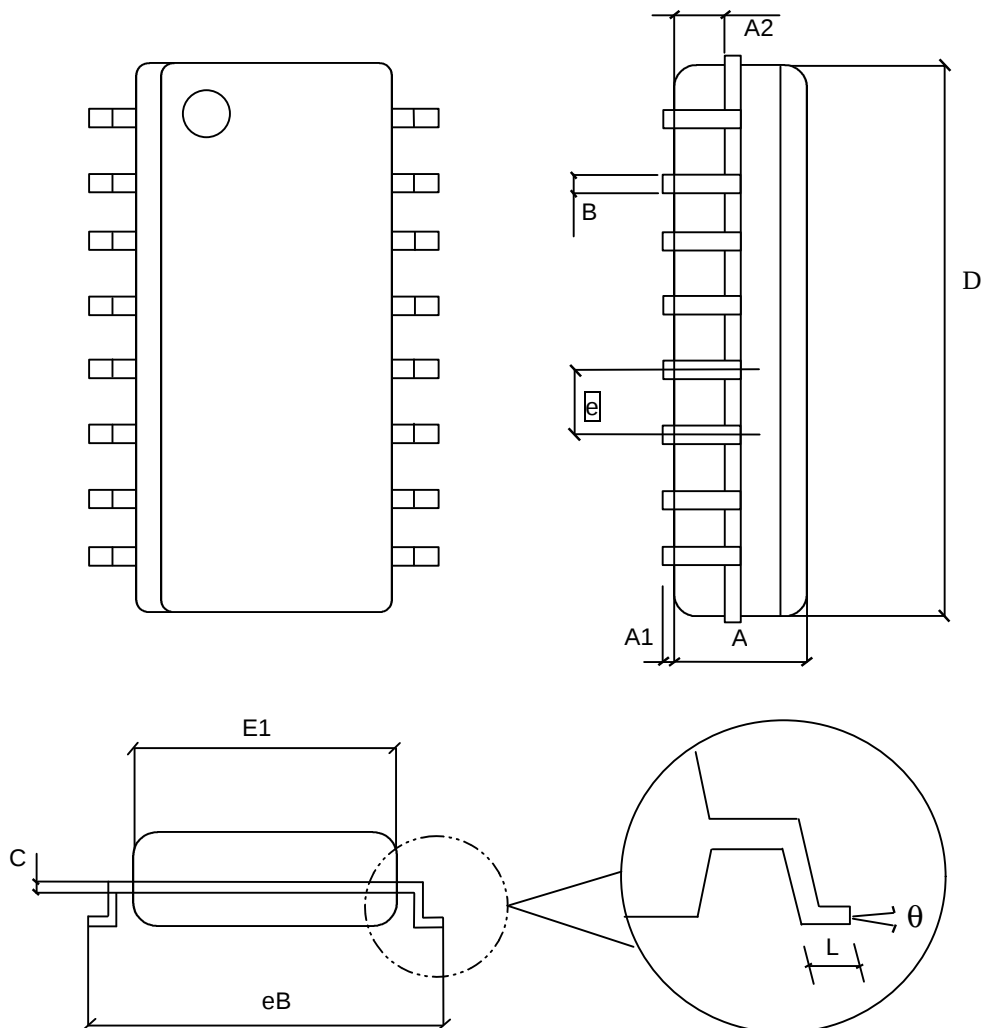
SYMBOL	Description	MIN	TYP	MAX	UNIT
V _{DD}	Power Supply Voltage	4.5	5.0	5.5	V
I _{OL}	DC output sink current at 0.4V	3.89	5.94	7.56	mA
I _{OH}	DC output source current at V _{DD} -0.4V	2.85	4.36	5.46	mA
I _{OHTTL}	DC output source current at TTL high	10.9	21.5	29.75	mA
V _{IL}	LOW level input voltage			0.71	V
V _{IH}	HIGH level input voltage	2.68			V
V _{TLH}	LOW to HIGH threshold voltage	2.03	2.39	2.68	V
V _{THL}	HIGH to LOW threshold voltage	0.71	0.83	1.0	V
V _{HYS}	Hysteresis voltage	1.1	1.55	1.8	V
V _{OL}	LOW level output voltage when I _{OL} =4mA			0.4	V
R _{DN}	Pad internal pulldown resister	122.08	160	267.31	Kohms

7.6 Switching Characteristics

SYMBOL	Description	MIN	TYP	MAX	UNIT
F _{X1}	X1 crystal frequency	11.97	12	12.03	MHz
T _{CYC}	X1 cycle time		83.3		ns
T _{X1L}	X1 clock LOW time	0.45T _{CYC}			ns
T _{X1H}	X1 clock HIGH time	0.45T _{CYC}			ns
T _{r30pf}	Output pad rise time from 10% to 90% swing with 30pF loading	6	8	12	ns
T _{f30pf}	Output pad fall time from 10% to 90% swing with 30pF loading	5.3	7	10.4	ns
T _{r50pf}	Output pad rise time from 10% to 90% swing with 50pF loading	9.5	13	19	ns
T _{f50pf}	Output pad fall time from 10% to 90% swing with 50pF loading	7.7	10	16	ns
T _{rUSB}	D+/D- rise time with 50pF loading	4		20	ns
T _{fUSB}	D+/D- fall time with 50pF loading	4		20	ns

8. Package Diagram

Symbol	Dimension in mils			Dimension in mm		
	Min	Nom	Max	Min	Nom	Max
A	---	58	---	---	1.473	---
A1	6	---	---	0.152	---	---
A2	---	24	---	---	0.610	---
B	---	16	---	---	0.406	---
C	---	8	---	---	0.203	---
D	388	390	392	9.855	9.906	9.957
E1	152	154	156	3.861	3.912	3.962
e	---	50	---	---	1.270	---
eB	---	238	---	---	6.045	---
L	25	---	---	0.635	---	---
θ	0°	3°	6°	0°	3°	6°



OPTIONAL COMPONENTS

Component	Value	Notes
GP1	1	VCC
GP2	2	CS
GP3	3	NC2
GP4	4	DI
GP5	5	DO
GP6	6	VCC
GP7	7	NC2
GP8	8	DI
GP9	9	DO
GP10	10	VCC
GP11	11	NC2
GP12	12	DI
GP13	13	DO
GP14	14	VCC
GP15	15	NC2
GP16	16	DI
GP17	17	DO
GP18	18	VCC
GP19	19	NC2
GP20	20	DI
GP21	21	DO
GP22	22	VCC
GP23	23	NC2
GP24	24	DI
GP25	25	DO
GP26	26	VCC
GP27	27	NC2
GP28	28	DI
GP29	29	DO
GP30	30	VCC
GP31	31	NC2
GP32	32	DI
GP33	33	DO
GP34	34	VCC
GP35	35	NC2
GP36	36	DI
GP37	37	DO
GP38	38	VCC
GP39	39	NC2
GP40	40	DI
GP41	41	DO
GP42	42	VCC
GP43	43	NC2
GP44	44	DI
GP45	45	DO
GP46	46	VCC
GP47	47	NC2
GP48	48	DI
GP49	49	DO
GP50	50	VCC
GP51	51	NC2
GP52	52	DI
GP53	53	DO
GP54	54	VCC
GP55	55	NC2
GP56	56	DI
GP57	57	DO
GP58	58	VCC
GP59	59	NC2
GP60	60	DI
GP61	61	DO
GP62	62	VCC
GP63	63	NC2
GP64	64	DI
GP65	65	DO
GP66	66	VCC
GP67	67	NC2
GP68	68	DI
GP69	69	DO
GP70	70	VCC
GP71	71	NC2
GP72	72	DI
GP73	73	DO
GP74	74	VCC
GP75	75	NC2
GP76	76	DI
GP77	77	DO
GP78	78	VCC
GP79	79	NC2
GP80	80	DI
GP81	81	DO
GP82	82	VCC
GP83	83	NC2
GP84	84	DI
GP85	85	DO
GP86	86	VCC
GP87	87	NC2
GP88	88	DI
GP89	89	DO
GP90	90	VCC
GP91	91	NC2
GP92	92	DI
GP93	93	DO
GP94	94	VCC
GP95	95	NC2
GP96	96	DI
GP97	97	DO
GP98	98	VCC
GP99	99	NC2
GP100	100	DI

USB CONNECTOR 1

USB CONNECTOR 2