LAN GPIB INTERFACE

4865

GPIB-to-LAN Instrument Interface

- Controls a LAN instrument from the GPIB bus.
  Adapts LAN instruments for GPIB Test Systems.
- Runs from any GPIB system.
  Transparently passes all commands to the companion LAN instrument.
- AutoFind feature simplifies instrument linkage.
  Eliminates changing IP addresses.
- Internal VXI-11 client talks to any VXI-11.3 instrument.
  Works with most LAN instruments.
- Aids in replacing failed GPIB instruments.
  Saves instrument replacement costs and helps reuse existing test software.
- Add newer LAN instruments to GPIB systems.
  Extends the number of instruments that will work in a GPIB test system.
- Internal HTML server handles 4865 configuration.
  Easy configuration from any computer or web browser.

CE Approved

RoHS Construction

DESCRIPTION

ICS's 4865 is a GPIB-to-LAN Instrument Interface that enables a VXI-11.3 compatible LAN instrument to be controlled from a GPIB Bus. Using the 4865, GPIB applications running on a computer can transparently interface to a LAN-based instrument just as if it were a GPIB Instrument. The 4865 converts 488.1 GPIB commands into the equivalent VXI-11 RPC and sends them to the instrument. Device messages are transparently sent to the instrument and instrument replies are returned to the GPIB Controller, just like a GPIB instrument.

The 4865 solves the problem of how to interface an instrument with an Ethernet interface to the GPIB bus. The 4865 adds a GPIB interface to VXI-11.3 compatible LAN or LXI instruments that do not have a GPIB interface. Applications include replacing obsolete or failed GPIB instruments with a newer instrument that may not have a GPIB interface or just adding a new LAN instrument to a GPIB bus system.

4865 GPIB-to-LAN Interface

Linking to the Instrument

The 4865 operates with any VXI-11.3 compatible instrument which includes most LAN and some LXI instruments (The LXI Specification only requires a minimum VXI-11 compatibility, so check VXI-11 compatibility with your LXI instrument manufacturer.)

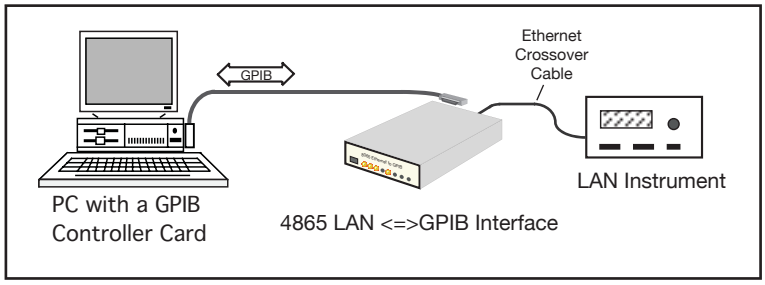
The 4865 can be set to operate with an instrument at a specific IP address or to automatically find the instrument. Either method can be used in a direct 4865-instrument connection.

If AutoFind is selected, the 4865 starts an instrument discovery process as soon as it completes its power turn-on and self-test sequence. The instrument and the 4865's IP address must be in the same IP address B range for Auto Find to work. When the 4865 finds a VXI-11.3 instrument, it opens a core channel to the instrument.

If the 4865 has been given a specific instrument's IP address, the 4865 only looks for an instrument at that address. Static address are recommended when the 4865 is connected to the company network or when multiple instruments may respond to the 4865.

Minimal Programming Changes

In most cases, existing programs that controlled the instrument in a LAN environment or ran the older version of the instrument through its GPIB interface can be used with the 4865 and the LAN instrument. The only requirement is that the new instrument must understand your existing commands. The 4865 works with any IEEE-488.2 compatible GPIB controller and can be used with LabVIEW, VEE, Visual Basic and C language programs. The 4865 and VXI-11.3 instruments support most 488.1



Connects a LAN Instrument to the GPIB Bus

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GPIB commands except for Remote with Lockout and Local with Lockout. The user will have to be sure that the instrument supports the device commands used in the existing program and that the device messages sent to the 4865 are terminated with the 488.2 New Line terminator.

Connections

While the 4865 is normally used in a back-to-back connection with its companion instrument as shown in Figure 1, it can be connected to the instrument in other ways.

Figure 2 shows the 4865 connected to the instrument through a hub. This is a typical lab bench connection. It lets the user configure the 4865 through the hub while developing the GPIB program.

Figure 3 shows the 4865 connected to the instrument over a company network. The 4865 gives you standard GPIB control over a LAN instrument no matter where it is located.

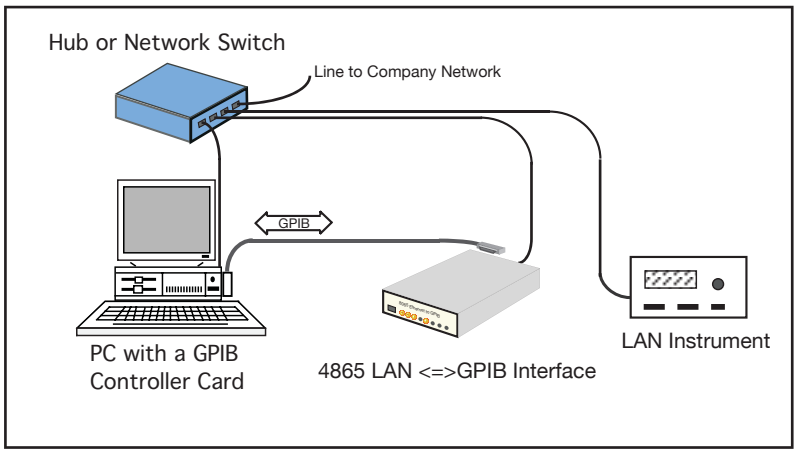

Figure 2 4865 Instrument Hub Connection

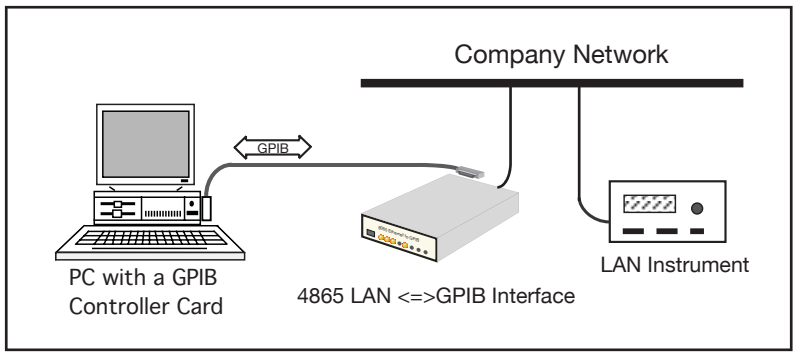

Figure 3 4865 Instrument Network Connection

4865's Operation

The 4865 transparently passes all device commands and IEEE-488.2 Common Commands onto the instrument and returns all instrument responses to the client application. The 4865 also does such familiar GPIB tasks as sending Selected Device Clears and Device Triggers to the instrument, set Local or set Remote modes and perform Serial Polls. Interface Clears (IFCs) only affect the 4865's GPIB Interface and are not passed on to the companion instrument.

The 4865 does a background poll of the LAN instrument's Status Register and asserts the GPIB bus SRQ line if a Service Request is detected. When the 4865 is Serial Polled, the instrument is sent a *device_readSTB* rpc and the response is returned to the GPIB Controller.

Setup & Installation

The 4865 is very easy to install. Plug the 4865 into a network access point adjacent to your computer as shown in Figure 2 or use an Ethernet crossover cable to connect the 4865 directly to a PC's network port. Launch a web browser and point it to the 4865's default AutoIP address of 169.254.48.65. The 4865's Welcome page provides all of the information about the 4865's current settings. On the Configuration page, you can set the 4865 to a static IP address or enable the 4865 to accept an DHCP address setting if the network has a server that can assign network addresses. You can also set the 4865's GPIB address and a fixed IP address for the companion instrument if that works better in your environment. Set the remaining network parameters, save the settings and the 4865 is ready to be connected to the instrument and GPIB bus.

A rear panel LAN Reset button is provided to reset the 4865's network settings to the factory default settings in case the 4865's configuration needs to be reset.

Easy Firmware Updates

The 4865 has a program download and store function which lets the 4865 receive program changes through its Ethernet interface. If a future firmware change is necessary, the new firmware and Upgrade Utility program can be downloaded from ICS's website. The 4865 validates the new code before saving it in its Flash memory.

Network Features

The 4865 uses the VXI-11 protocol or RPC over TCP/IP to communicate with the test program (client application). The TCP transportation layer and IP protocol guarantees error free communication with the 4865 over the network or Internet as long as the connection is maintained.

4865 SPECIFICATIONS

Supported Standards

IEEE 488.1 Capabilities:
The 488-USB meets IEEE-STD-488.1 with the following capabilities:
AH1, SH1, T6, L4, SR1, RL2, PP0, DC1, DT1, C0 and E2
E2 Drivers incorporate power up/down protection.

4865 Address 0 to 30 [0]

488 Bus Performance
Long term GPIB transfer rates are limited by the LAN data transfer rate, the Client-computer performance, the GPIB controller and the LAN instrument or device. Internal delays vary with the amount of data transferred and 4865's activity when the message was received.

Short term transfer rates:
GPIB to 4865 >20 kbyte/s
4865 to GPIB >18 kbytes/s
Internal delays:
*IDN? query 46 ms typical
*CLS command 18 ms typical

Supported GPIB (IEEE-488.1) Commands
Converted to the equivalent VXI-11 rpc.
Device Clear
Device Trigger
Local
Remote
Serial Poll

VXI-11 Capabilities
Fully VXI-11.3 compliant

VXI-11.3	Client side
Channel types	Data
Instrument links	64 max
Locking	By instrument link

RPC Protocol
Conforms to ONC RPC Version 2

Ethernet Interface

Type	IEEE 802.3 compliant
Speeds	10BaseT (10 Mb/s) 100BaseT (100 Mb/s)
IP Address	Static or DHCP (AutoIP)
Factory setting	DHCP with default to 169.254.48.65 if no DHCP server found.
Net Mask	255.255.0.0
Interface name	inst0

Companion Instrument

The 4865 supports single instrument that is VXI-11.3 and IEEE-488.2 compatible.

System Requirements

Computer with an IEEE-488.2 GPIB Controller. Device messages must be terminated with the IEEE-488.2 new line terminator (linefeed with EOI asserted) or with just EOI asserted if the LAN instrument does not require a terminator.

Computer with an IEEE 802.3 LAN interface and a web browser for configuring the 4865.

Internal WebServer
The internal WebServer provides HTML web pages for viewing and setting the 4865's network settings.

Controls and Indicators

CONTROLS

Power	Front-panel switch
LAN Reset	Rear-panel push-button

LEDs

PWR	Power on
LAN	Unit connected to an active network or network device.
ACT	Transferring messages to/ from the network.
RDY	Blinks when looking for an instrument. Steady on when linked to an instrument
TALK	4865 is addressed to talk
LSTN	4865 is addressed to listen
SRQ	4865 asserting SRQ on the GPIB bus.
ERR	Unit has detected an error

Physical

Size 7.45" L x 5.57" W x 1.52" H
(18.92 cm L x 14.15 cm W x 3.86 cm H)

Weight	1.6 lbs. (0.73 kg.) plus power adapter
Construction	RoHS Compliant
Temperature	
Operating	-10 °C to +65 °C
Storage	-40 °C to + 70 °C
Humidity	0-90% RH non-condensing
Shock/Vibration	Normal handling
Connectors	
GPIB	GPIB 24 pin ribbon with metric studs.
Ethernet	RJ-45
Power	9 to 32 Vdc @ 4 VA
RFI/EMI	CE Certified
EEC Standards	EN 61000-6-4:2001, EN 61000-6-2:2001, EN 55024:1998, and EN 55022:1998.

Included Accessories

Instruction Manual
CD-ROM with support information.
LAN Crossover Cable.
UL/CSA/VDE approved AC power Adapters provided for:
US - 115±10% Vac, 60 Hz (std.)
-U Universal - 115/230±10% Vac, 50/60 Hz with UK, Europe, Australia (China) and US plugs

The VXI-11 Specification is available from the VXI Consortium at http://www.vxibus.org/specs.html or from ICS's website at http://www.icselect.com/vxi_spec.html

ORDERING INFORMATION

	Part Number
Ethernet - GPIB Controller with 115 VAC adapter, Manual and CD-ROM	4865
Ethernet - GPIB Controller with 115/230 VAC adapter with universal plug set, Manual and CD-ROM	4865-U
GPIB Accessary Cables	See separate data sheet
Rack Mounting Kits (holds one or two 4865s). See separate data sheet	Single - 114210, Dual - 114211