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AGILENT E2050 LAN/GPIB Gateway Overview

Agilent Technologies

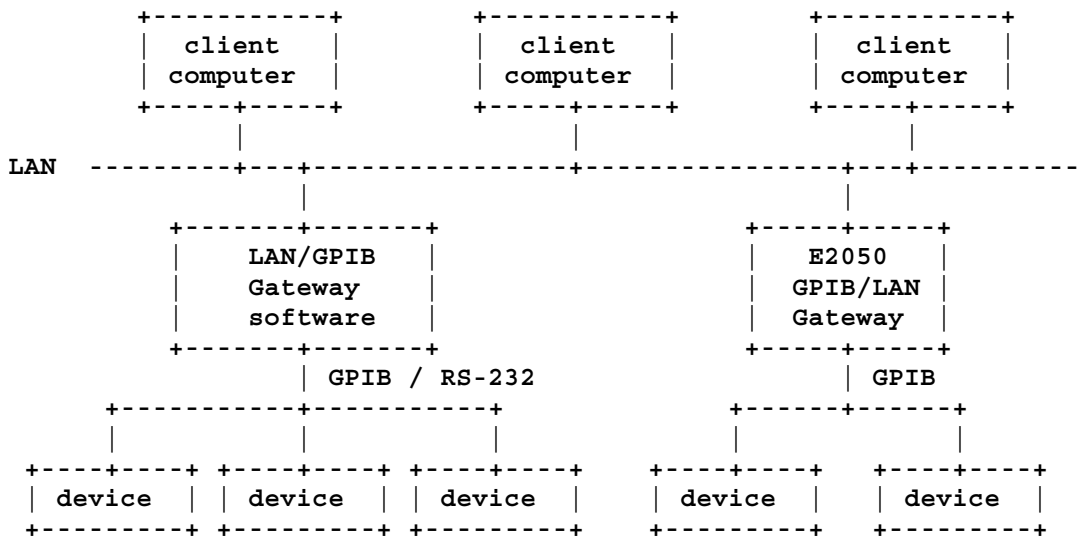
The Agilent E2050 LAN/GPIB Gateway allows you to communicate with GPIB-based instruments over LAN from your PC or Series 700 HP-UX controller. Series 300s and 400s are not supported.

The E2050 is a small box containing LAN and GPIB ports that contain enough intelligence to act as a network "server" providing access to its GPIB port from other "clients" on the network. It is supported by SICL software on all these platforms.

SICL by default also includes LAN/GPIB server software to allow a controller (a PC with Win95/98/Me/NT/2000 or an S700 controller) to act as a LAN gateway to GPIB. The LAN/GPIB Gateway software is similar to the E2050's built-in server software (and in fact the E2050's server software is derived from it).

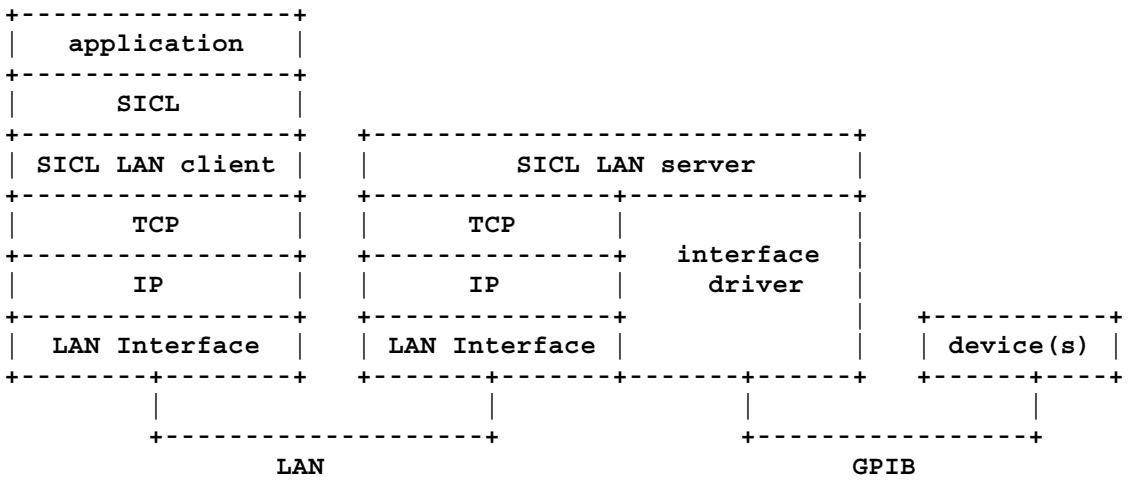
E2050 OVERVIEW

The E2050 and the LAN/GPIB gateway operate in a networked environment; an instrument controller acts as a "client" on the LAN to access services provide by the E2050 or LAN/GPIB "servers":



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The client computer deals with the servers through the SICL LAN software. The operations are based on the standard TCP/IP protocols and can be diagrammed as follows:



Once the software has been configured, however, a programmer does not need to be concerned with the fine details of networking operation; he or she can open up a session with an instrument on the E2050 or LAN server software by invoking an "iopen" call with the appropriate address. For example:

```
lan[instserv.agilent.com]:hpib,7 // Access GPIB device
lan[128.10.0.3]:hpib,3,2         // Access device with secondary address
lan[intserv]:iscpi,32            // Access register-based VXI card via ISCPI
```

For example, the following C program takes measurements through a VXI DVM and multiplexer attached to an E2050 or LAN server software:

```
#include <sicl.h>
#include <stdio.h>

main()
{
  INST dvm;
  INST sw:
  double res;
  int i;

  ionerror( I_ERROR_EXIT );  /* Print message & terminate on error. */

  dvm = iopen( "lan[intserv]:hpib,9,3" );  /* Open DMM session. */
  sw = iopen( "lan[intserv]:hpib,9,14" );  /* Open mux session. */
  itimeout( dvm, 10000 );                  /* Set timeouts. */
  itimeout( sw, 10000 );

  iprintf( sw, "TRIG:SOUR BUS\n" );       /* Set up trigger. */
  iprintf( sw, "SCAN (@100:103)\n" );     /* Set up scan list. */
  iprintf( sw, "INIT\n" );                /* Start scan. */

  for( i=1; i<=4; i++ )
  {
    iprintf( dvm, "MEAS:VOLT:DC?\n" );    /* Get reading. */
    iscanf( dvm, "%lf", &res );
    printf( "Data = %f\n", res );
    iprintf( dvm, "TRIG\n" );             /* Scan next channel. */
```

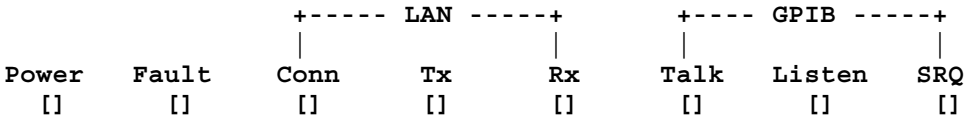
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```
  }

  iclose( dvm );                          /* Close sessions. */
  iclose( sw );
}
```

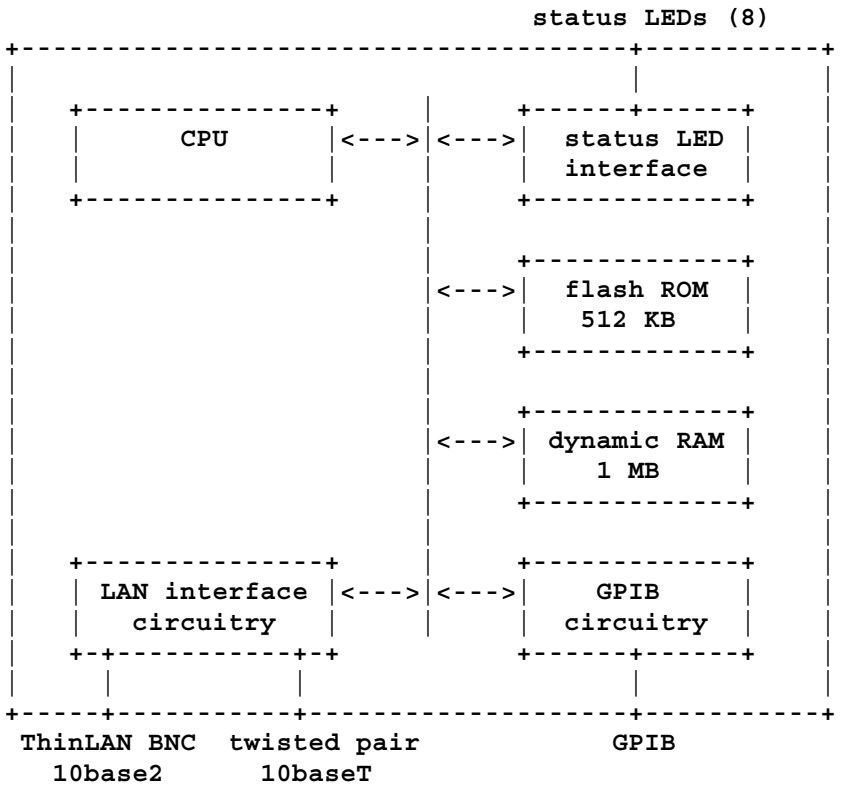
E2050 HARDWARE

The E2050 is a little white box that contains 8 status LEDs on the front, with the designations:



The back contains a GPIB port, two LAN ports -- a ThinLAN BNC / 10base2 port and an RJ-45 (phone-jack) twisted-pair / 10baseT port -- and a jack for the external DC power supply included with the product. (There's also a 9-pin male RS-232 connector, but RS-232 is not supported.)

The E2050 is actually a self-contained special-purpose computer, with the internal architecture:



A single E2050 can support up to 14 GPIB instruments connected to its GPIB; up to 10 client transactions can be connected at any single time. (The default GPIB address of the E2050 itself is 21.) The E2050 *cannot* be a non-system controller!

When installing the E2050, you must configure it as a node on your network, using the LAN hardware address marked on the bottom of the box. Your local system administrator can use (among other configuration methods) the standard "telnet" network-terminal program to log into the E2050 and configure its networking parameters.

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Note that you cannot have two E2050s communicate with each other directly; a client computer can deal with multiple E2050s but the multiple E2050s don't have the smarts to deal with each other. In other words, you can't use two E2050s as a GPIB extender.

An optional rack-mount kit, the E2051, is available to allow mounting two E2050s side-by-side in an instrument rack. (A light-duty fixed shelf must also be available; an Agilent E3666 is acceptable.)

SPECIFICATIONS / NOTES

The E2050 conforms to the following physical specifications:

```
DIMENSIONS:           173 x 35 x 147 mm (0.68 x 0.14 x 0.58 inches).
WEIGHT:               0.635 kg (1.4 pounds).
INPUT VOLTAGE:        5 VDC.
INPUT CURRENT:        0.8 A typical.
POWER CONSUMPTION:    4 W typical, 10 W maximum.
TEMPERATURE RANGE:    0 to 40 C (operating), -40 to 70 C (non-operating).
RELATIVE HUMIDITY:    15% to 80% at 40 C (operating), 90% at 60 C for
                      24 hours (non-operating).
```

The external power supply has the specifications:

```
INPUT VOLTAGE:        100 to 240 VAC.
INPUT CURRENT:        9.75 A max.
FREQUENCY RANGE:      50/60 Hz.
OUTPUT CURRENT:       2.0 A at 5 VDC max.
ACCESSORY OUTPUT:     100 to 240 VAC, 9.5 A at 50/60 Hz.
```

The product meets the following safety specs:

```
IEC 950, UL1950, CSA950/234
```

The product meets the following EMI specs:

```
FCC, CISPR-22 Class A, EN 55022 Class A, VCCI Class 1
ESD Immunity:  IEC 801-2
Radiated Immunity:  IEC 801-3
```

Performance tests show that there is an 12 millisecond latency required to establish a transaction; once the transaction has been established, write rates are 110 KB per second and read rates are 85 KB per second. However, remember that a LAN is a multiple-access medium, and since you don't have exclusive access to the thing, you can't guarantee any particular performance or response time. However, in practice this has not proven a big problem.

A few notes on the product:

- If you have trouble accessing the E2050 from VEE on a PC, please make sure you can "ping" it, and have an entry for it in your "hosts" file (which should be in the Windows or Windows\System directory).
- The E2050 uses a 10BaseT (10 MBPS) LAN port. Can it operate with a 100BaseT (100 MBPS) network? Yes. 10BaseT devices are not compatible with 100BaseT devices, but it doesn't matter much. The twisted pair wiring is routed through a "hub" box for both classes of network; in the case of 100BaseT, many hubs are "smart" enough to autosense whether a network node is 10BaseT or 100BaseT and adjust communications accordingly. Since 10BaseT is faster than the theoretical limit of GPIB, as long as autosensing hubs are available there is no need for 100BaseT.

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