

Advantech AE Technical Share Document

Date	2022 / 01 / 05	Related Product	PCI-1671, USB-4671	
Category	■ FAQ □ SOP			
Abstract	Test GPIB card and transport data between two GPIB cards			
Keyword	GPIB, non-control,			
SR#	1-4752585931			
Revision History				
Date	Version	Author	Reviewer	Description
2022 / 01/ 05	V1.0	Watson.Liu	Owen.Chang	OS: Windows10 20H2 Driver: V18.5.1.49152

■ Problem Description & Architecture:

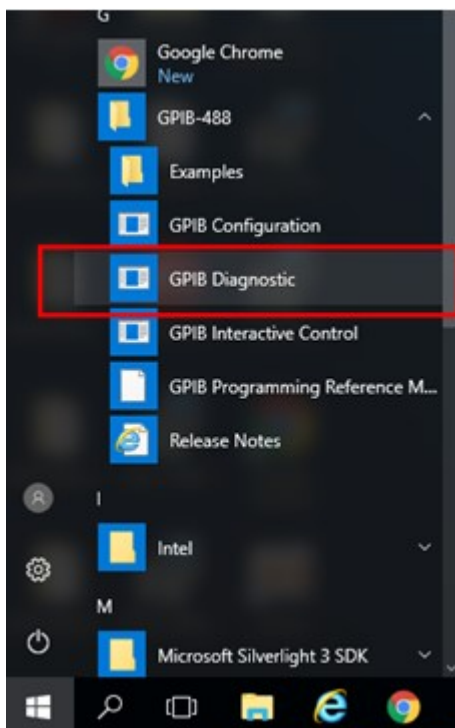
There's no document given by GPIB driver to inform user how to transport data between two different GPIB cards. This form main for help user to know how to quick start for using GPIB card communicate with an equipment also include how to transmit data and receive data using GPIB card.

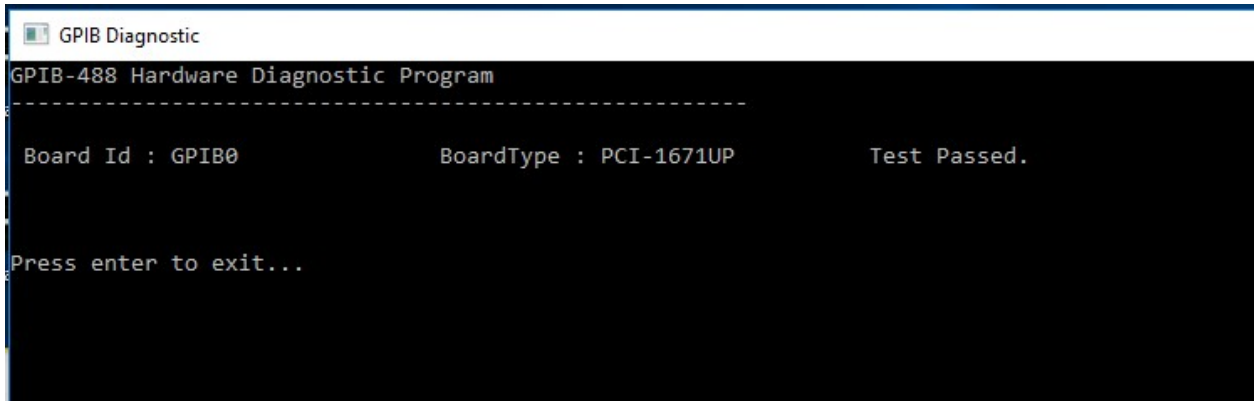
■ Brief Solution - Step by Step:

Firstly, user can find out how to test a single GPIB card to get the basic information back from an equipment which it has GPIB interface such like function generator.

Here's the SOP for getting information from equipment.

1. Open "Diagnostic" utility after finishing install GPIB driver and you can see all GPIB port in system list in the console result.

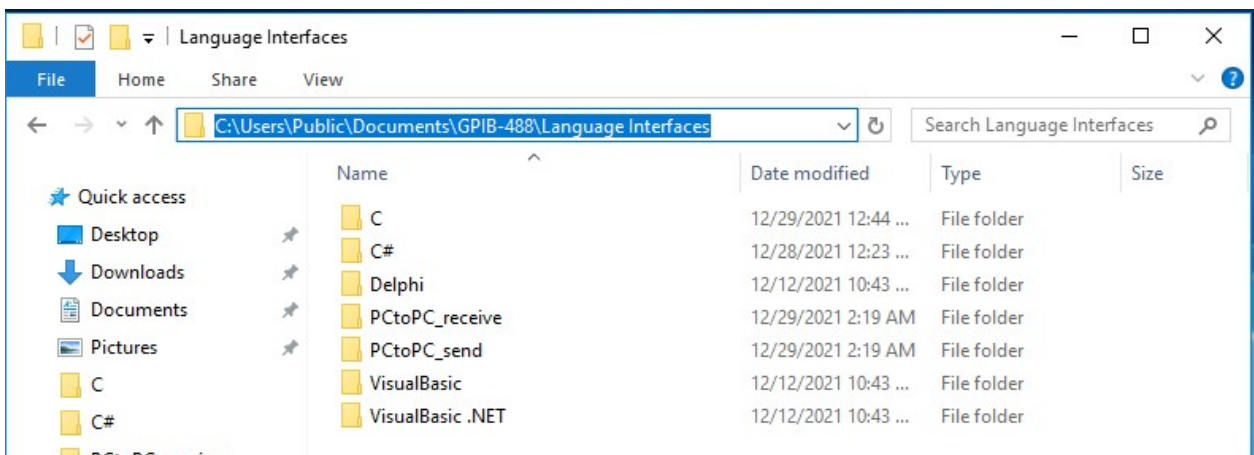




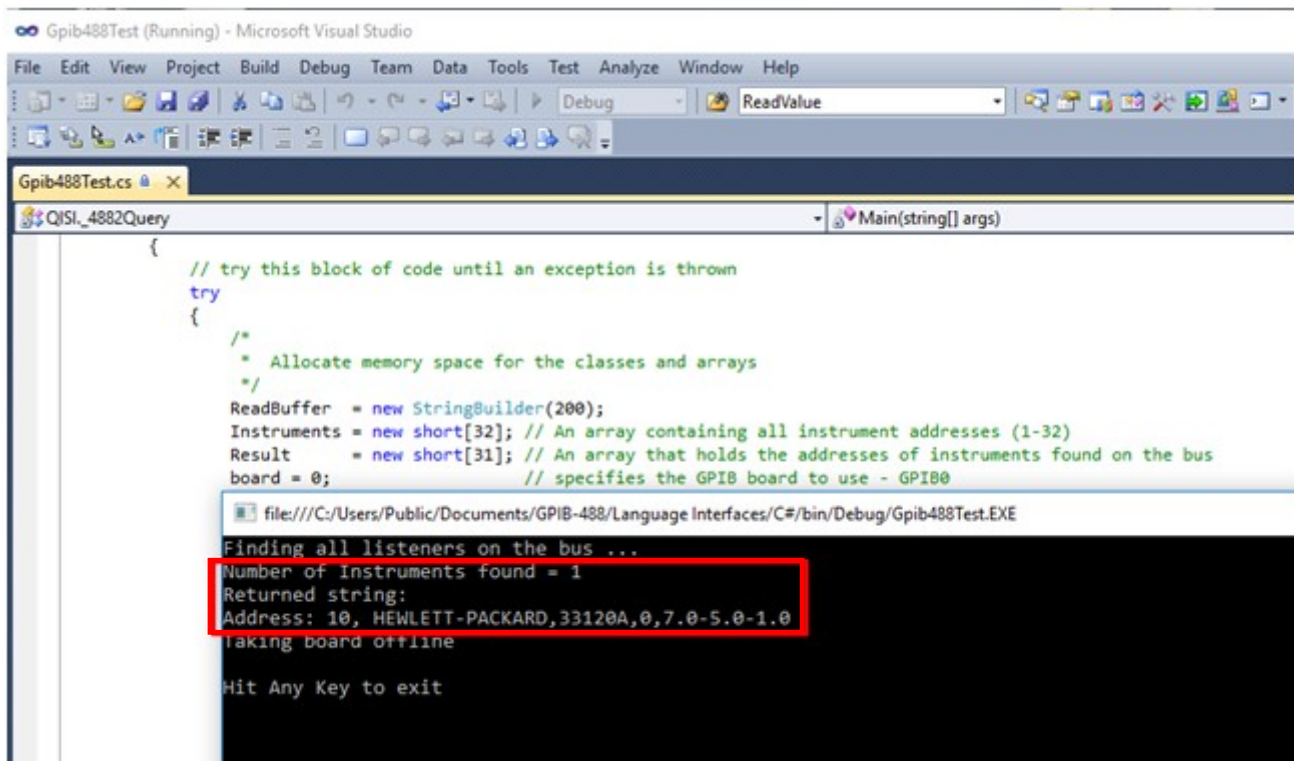
2. Connect the equipment (here use a function generator) and GPIB card with GPIB cable.



3. Move to the path "C:\Users\Public\Documents\GPIB-488\Language Interfaces" and select a programming language about the example for testing.



4. Open the example then compile it and run. And you can see the equipment information have read back as below if you already connect the equipment in Step2.



```

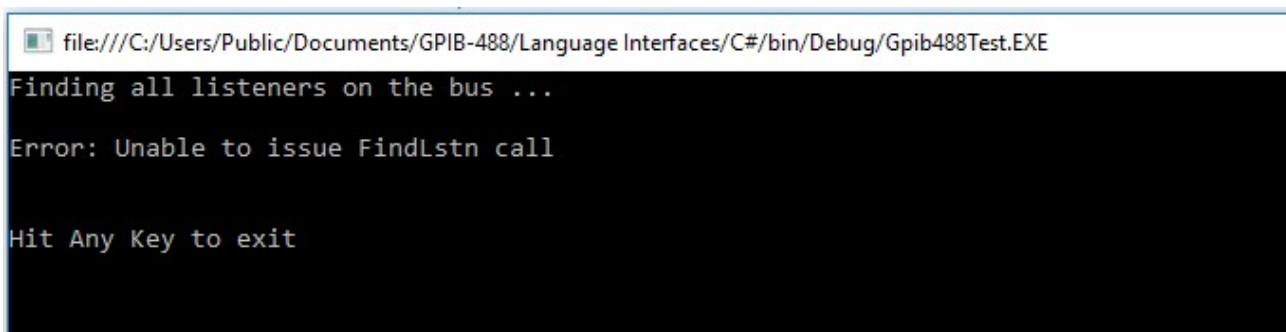
Gpib488Test (Running) - Microsoft Visual Studio
File Edit View Project Build Debug Team Data Tools Test Analyze Window Help
Debug ReadValue
Gpib488Test.cs
QSI_4882Query Main(string[] args)
{
    // try this block of code until an exception is thrown
    try
    {
        /*
         * Allocate memory space for the classes and arrays
         */
        ReadBuffer = new StringBuilder(200);
        Instruments = new short[32]; // An array containing all instrument addresses (1-32)
        Result = new short[31]; // An array that holds the addresses of instruments found on the bus
        board = 0; // specifies the GPIB board to use - GPIB0

        file:///C:/Users/Public/Documents/GPIB-488/Language Interfaces/C#/bin/Debug/Gpib488Test.EXE
        Finding all listeners on the bus ...
        Number of Instruments found = 1
        Returned string:
        Address: 10, HEWLETT-PACKARD,33120A,0,7.0-5.0-1.0
        Taking board offline

        Hit Any Key to exit
    }
    catch { }
}

```

5. You'll see some error as below if you haven't connect the equipment in Step2.



```

file:///C:/Users/Public/Documents/GPIB-488/Language Interfaces/C#/bin/Debug/Gpib488Test.EXE
Finding all listeners on the bus ...
Error: Unable to issue FindLstn call
Hit Any Key to exit

```

Then, user can reference two possible way try to transmit data or receive data using two GPIB cards.

- a. Use "GPIB Interactive Control" utility which given by GPIB driver to test data transport.
 1. Open utility twice, one for setup to control side (transmit) and another setup for non-control side (receive).
 2. Follow below step to setting non-control side.

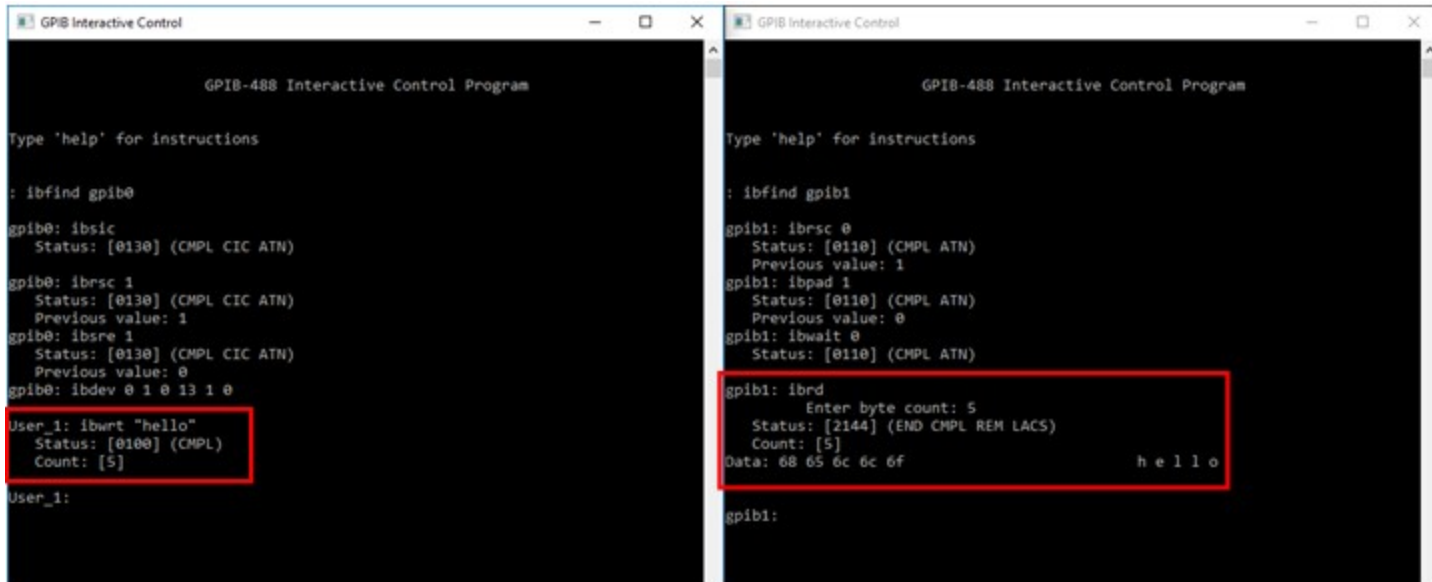

```

Command>> ibfind gpib0 (you can modify the port number which mark in red)
Command>> ibrsc 0
Command>> ibpad 1
Command>> ibwait 0
                    
```
 3. Follow below set to setting control side in another utility.


```

Command>> ibfind gpib0 (you can modify the port number which mark in red)
Command>> ibsic
Command>> ibrsc 1
Command>> ibsre 1
Command>> ibdev 0 1 0 13 1 0
                    
```

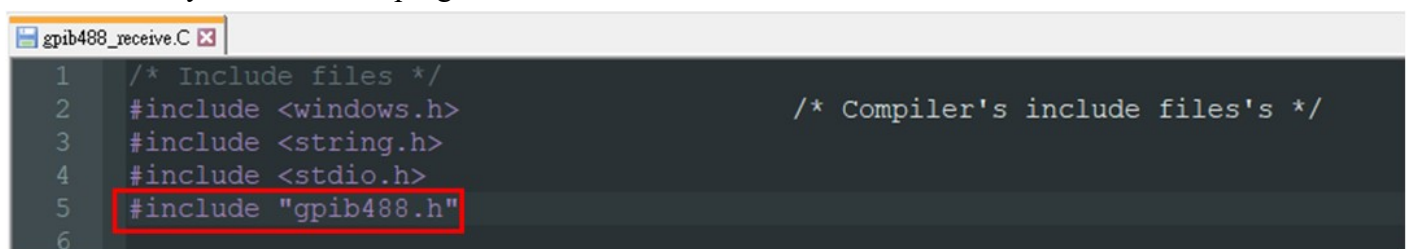
4. Now you've done for initialize both GPIB cards. You can try to send message in the control side.
Command>> ibwrt "hello" (you can modify the string as you want to send)
5. To receive the message in non-control side.
Command>> ibrd
- Command>> 5 (please modify the byte number to the same as which you send in Step4)
6. Then, you can see the result in both side as below picture.



- b. Here use C language to develop two program and one for transmit data then the other for receive data.
1. Create two project, one for control (send) and another for non-control (receive)



2. Add library reference into program.



3. Here's the code for setting the non-control side include how to read message back.

```
int main ()
{
    // Open a session to the GPIB board
    noncontroller = ibfind ("gpib1");
    // Release system control
    ibjsc (noncontroller, 0);
    // Change primary address from 0 to 1
    ibpad (noncontroller, 1);

    printf("gpi488 receive Initial setting Ready\n");
}
```

```

while (1)
{
    // Update Status variable
    ibwait (noncontroller, 0);

    // Wait until non-controller is listener and ATN line is dropped.
    if ((ibsta&LACS)&&!(ibsta&ATN)))
    {
        ibrd (noncontroller, buffer, getDataByte);    // Read data bytes
        buffer[ibcnt] = '\n';    // Add linefeed and 0 to string.
        buffer[ibcnt + 1] = 0;
        printf ("%s",buffer);//print buffer
        //return 0;
    }    // first if

    // If addressed to talk, send the response "I am a talker"
    if ((ibsta&TACS)&&!(ibsta&ATN)))
    {
        // Send data across the bus.
        ibwrt (noncontroller, "I am a talker", strlen("I am a talker"));
        return 0;
    }    // second if
}    // while
}    // main

```

4. Here's the code for setting the control side include how to send message.

```

int main ()
{
    // Open a session to the GPIB board
    controller = ibfind ("gpib0");
    ibsic;
    ibrsc (controller, 1);
    // Change primary address from 0 to 1
    ibsre (controller, 1);

    getReturn = ibdev(0, 1, 0, 13, 1, 0);
    printf("Return value: %d\n",getReturn);

    printf("gpib send Initial setting Ready.\n");

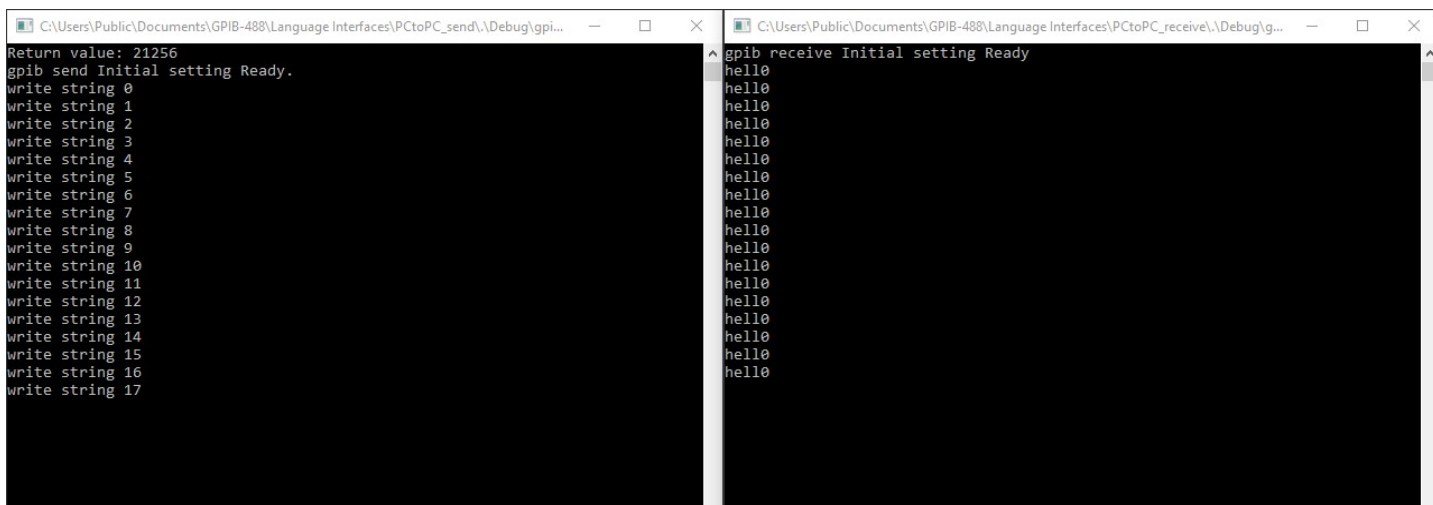
    buffer[0] = 'h';
    buffer[1] = 'e';
    buffer[2] = 'l';
    buffer[3] = 'l';

```



```
buffer[4] = '0';
while (1)
{
    ibwrt(getReturn, buffer, 5);
    printf("write string %d\n", writeCount);
    writeCount++;
    Sleep(2000);
} // while
} // main
```

5. Compile and run both program then you can see the result in console as below picture.

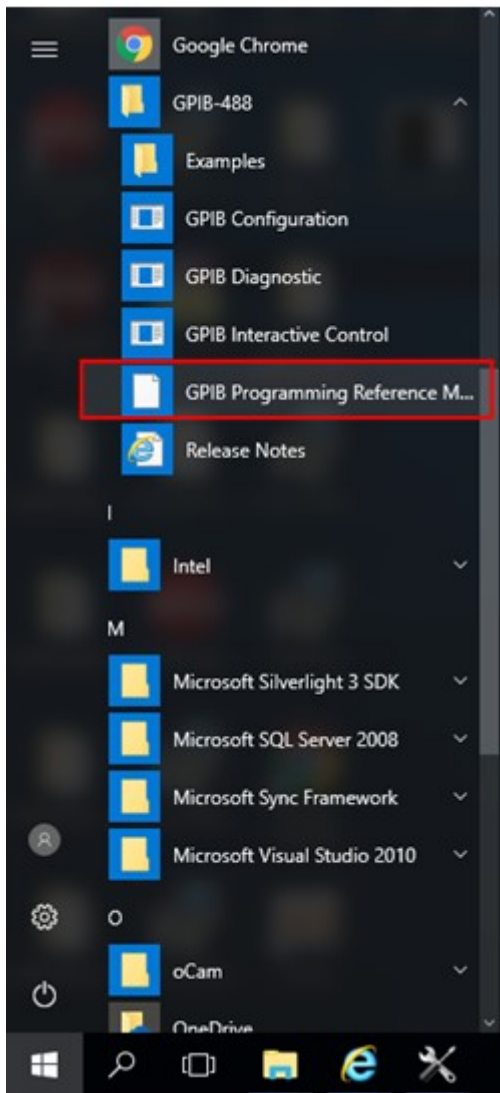


```
C:\Users\Public\Documents\GPIB-488\Language Interfaces\PCtoPC_send\Debug\gpi...
Return value: 21256
gpiB send Initial setting Ready.
write string 0
write string 1
write string 2
write string 3
write string 4
write string 5
write string 6
write string 7
write string 8
write string 9
write string 10
write string 11
write string 12
write string 13
write string 14
write string 15
write string 16
write string 17

C:\Users\Public\Documents\GPIB-488\Language Interfaces\PCtoPC_receive\Debug\g...
gpiB receive Initial setting Ready
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
hello
```

■ **Reference:**

1. GPIB Programing Reference Manual.



2. <https://www.advantech.tw/support/details/driver?id=1-1OXGZ1E>
 3. <https://knowledge.ni.com/KnowledgeArticleDetails?id=kA03q000000YHIWCAW&l=zh-TW>
 4. <https://knowledge.ni.com/KnowledgeArticleDetails?id=kA03q000000x2Y3CAI&l=zh-TW>
 5. <https://drive.google.com/drive/folders/1m2X1jpPFXr6XiD13uNrA3EGs5Sd4udHW?usp=sharing>
- p.s. Here's the path above can get the two C program from google drive.