Cryostation Communication Specification

Document version 1.21

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Remote Control of the Cryostation

There are four ways to control the Cryostation or HILA remotely. All rely on a TCP/IP Ethernet connection between the system PC and the device running the control software. At the lowest level, the user may issue text commands over the connection. The next level up provides software routines for communicating via a DLL with text messages. With the third method, a LabVIEW VI (virtual instrument) can be used to issue the text commands. The last method of remote control uses the DLL in a LabVIEW VI.
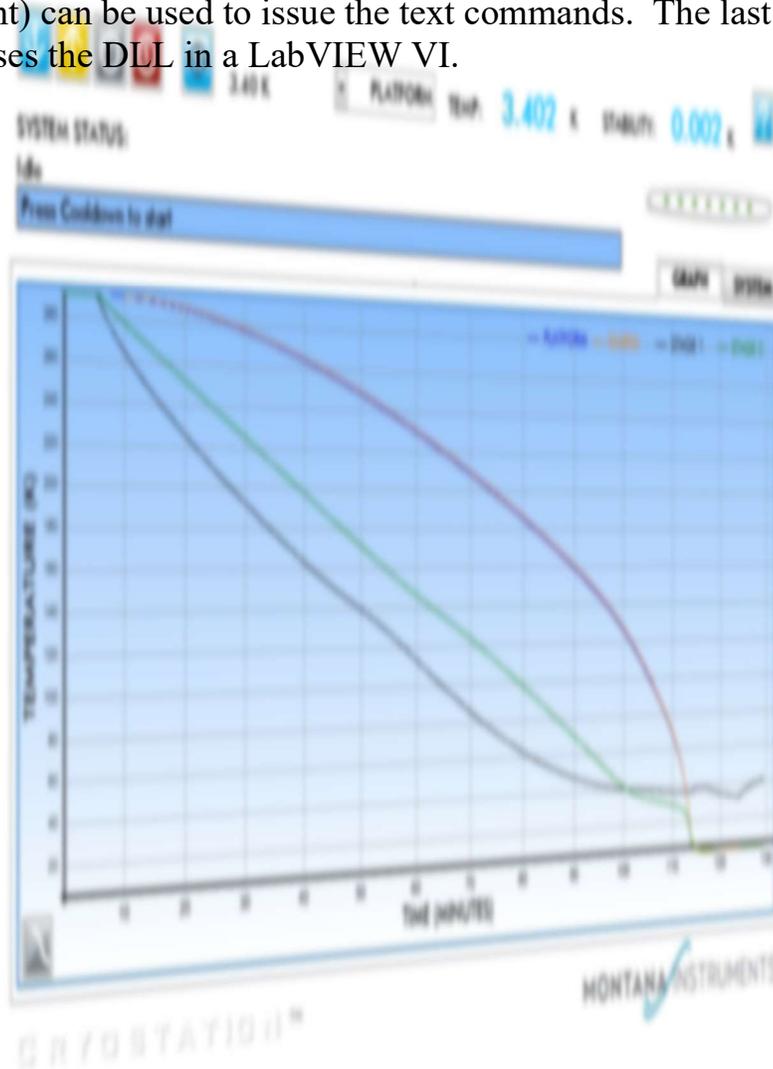
Cryostation Communication Specification

This guide defines the communication protocol between an external client computer and the Cryostation server computer and the Cryostation DLL. External clients can utilize the Cryostation DLL to simplify communication with the Cryostation server. Use of the Cryostation DLL is not required. External clients can communicate directly with the Cryostation server. The Cryostation DLL is CryostationComm.dll.

The communication interface is an Ethernet port connection. The Communications protocol is TCP/IP.

The Cryostation acts as a server and implements a typical Client-Server architecture

Client PC or
Device

Server PC-
Crvostation
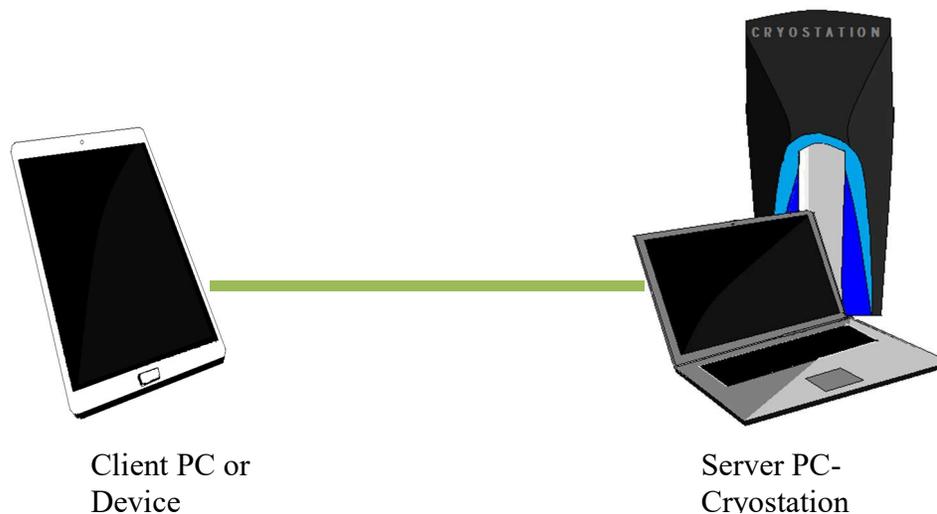
The default listen port for the Cryostation is **7773**. External clients connect to the IP address of the Cryostation on the default port.

Command Response Architecture

The communications protocol is defined as command-response. For each command given to the server, a response is provided to the client.

Messaging Format

Commands and responses consist of text messages within the TCP/IP communications protocol.

The first 2 bytes of each command and response indicates the length of the remaining message.

The Cryostation DLL adds the length to each command and strips the length from each response. If the Cryostation DLL is not utilized the external client computer must include the 2 byte length on any command and must process the 2 byte length on any response.

For example, the command to request the platform temperature is GPT. Utilizing the Cryostation DLL the external client computer would send the command "GPT". If the platform temperature is 295.155, the Cryostation DLL, would respond to the command with "295.155".

If the Cryostation DLL is not used, the external client computer would send "03GPT" to the Cryostation server. If the platform temperature is 295.155, the Cryostation server would respond to the command with "07295.155".

Security

Due to the nature of the Cryostation hardware, it is assumed that the external client computer is a trusted computer or on a trusted network. No security or encryption is provided by the Cryostation server. Credentials are also not required.

Commands

Following is the list of commands supported by the Cryostation server.

GAS - Get Alarm State

Returns: Returns true or false indicating the presence or absence of a system error

   CryostationComm.dll Returns:

   T

   F

   Cryostation Server Returns:

   01T

   01F

GCP - Get Chamber Pressure

Returns: Returns the current chamber pressure or -0.1 to indicate the chamber pressure is not available.

   Units: mTorr

   CryostationComm.dll Returns:

   XXXXXX.X

   Examples:

   660848.6

   859.4

   -0.1

   Cryostation Server Returns:

   08XXXXXX.X

   Examples:

   08660848.6

   05859.4

   04-0.1

GCPT - Get Chamber Pressure in Torr

Returns: Returns the current chamber pressure or -1.00e-1 to indicate the chamber pressure is not available. Value is returned in scientific notation with 3 significant digits.

> *Units:* Torr
> *CryostationComm.dll Returns:*
>> 0.00e+0
>>> Examples:
>>>> 6.78e+2
>>>> 8.91e-2
>>> -1.00e-1
> *Cryostation Server Returns:*
>> 070.00e+0
>>> Examples:
>>>> 076.78e+2
>>>> 078.91e-2
>>> 08-1.00e-1

GCRP - Get Compressor Return Pressure

Returns: Returns the current compressor return pressure or -0.1 to indicate the compressor return pressure is not available.

> *Units:* MPa
> *CryostationComm.dll Returns:*
>> X.XXX
>>> Example:
>>>> 1.694
>>> -0.1
> *Cryostation Server Returns:*
>> 05X.XXX
>>> Examples:
>>>> 051.694
>>> 04-0.1

GCRS - Get Compressor Run State

Returns: Returns the current run state of the compressor.

> *CryostationComm.dll Returns:*
>> On
>> Off
> *Cryostation Server Returns:*
>> 02On
>> 03Off

GCS - Get Compressor Speed

Returns: Returns the current compressor speed or -0.1 to indicate the compressor speed is not available.

> *Units:* Hz
> *CryostationComm.dll Returns:*
>> XX
>>> Examples:
>>>> 22
>>>> 14
>> -0.1
> *Cryostation Server Returns:*
>> 02XX
>>> Examples:
>>>> 0222
>>>> 0214
>> 04-0.1

GCSP - Get Compressor Supply Pressure

Returns: Returns the current compressor supply pressure or -0.1 to indicate the compressor supply pressure is not available.

> *Units:* MPa
> *CryostationComm.dll Returns:*
>> X.XXX
>>> Example:
>>>> 1.694
>> -0.1
> *Cryostation Server Returns:*
>> 05X.XXX
>>> Examples:
>>>> 051.694
>> 04-0.1

GCVS - Get Case Valve State

Returns: Returns the current case valve state.

> *CryostationComm.dll Returns:*
>> Open
>> Closed
> *Cryostation Server Returns:*
>> 04Open
>> 06Closed

GHS - Get cold Head Speed

Returns: Returns the current cold head speed or -0.1 to indicate the cold head speed is not available.

> *Units:* Hz
> *CryostationComm.dll Returns:*
>> XX
>>> Examples:
>>>> 50
>>>> 70
>> -0.1
> *Cryostation Server Returns:*
>> 02XX
>>> Examples:
>>>> 0250
>>>> 0270
>> 04-0.1

GIS - Get Idle State

Returns: Returns T (true) if the system is idle. Returns F (false) if the system is in any automatic or error mode.

> *CryostationComm.dll Returns:*
>> T
>> F
> *Cryostation Server Returns:*
>> 01T
>> 01F

GMS - Get Magnet State

Returns: Returns the current magnet state

> *CryostationComm.dll Returns:*
>> MAGNET ENABLED
>> MAGNET DISABLED
>> System not able to execute command at this time. Activate the magnet module first.
> *Cryostation Server Returns:*
>> 14MAGNET ENABLED
>> 15MAGNET DISABLED
>> 83System not able to execute command at this time. Activate the magnet module first.

GMTF - Get Magnet Target Field

Returns: Returns the current set point for magnetic field or -9.999999 if the magnet is not enabled or the magnet module is not activated.

> *Units:* Tesla
> *CryostationComm.dll Returns:*
> > X.XXXXXX
> > > Examples:
> > > > 0.670000
> > > > -0.200000
> > -9.999999
> *Cryostation Server Returns:*
> > 08X.XXXXXX
> > > Examples:
> > > > 080.670000
> > > > 09-0.200000
> > 09-9.999999

GNS - Get Nitrogen State

Returns: Returns T (true) if nitrogen supply to the system is detected. Returns F (false) if no nitrogen supply is detected.

> *CryostationComm.dll Returns:*
> > T
> > F
> *Cryostation Server Returns:*
> > 01T
> > 01F

GPHP - Get Platform Heater Power

Returns: Returns the current platform heater power reading or -0.100 to indicate the platform heater power is not available.

> *Units:* Watts
> *CryostationComm.dll Returns:*
> > XX.XXX
> > > Examples:
> > > > 4.904
> > > > 1.000
> > -0.100
> *Cryostation Server Returns:*
> > 06XX.XXX

Examples:
054.904
051.000
06-0.100

GPP - Get Platform Pid mode

Returns: Returns T (true) if the Platform PID is on. Returns F (false) if the platform PID is off or the state of the platform PID is unknown.

CryostationComm.dll Returns:
T
F
Cryostation Server Returns:
01T
01F

GPS - Get Platform Stability

Returns: Returns the current platform stability or -0.10000 to indicate the platform stability is not available.

Units: Kelvin
CryostationComm.dll Returns:
X.XXXXX
Examples:
0.00900
10.20239
-0.10000
Cryostation Server Returns:
07X.XXXXX
Examples:
070.00900
0810.20239
08-0.10000

GPT - Get Platform Temperature

Returns: Returns the current platform temperature or -0.100 to indicate the platform temperature is not available.

Units: Kelvin
CryostationComm.dll Returns:
XXX.XXX
Examples:

289.904

3.498

-0.100

Cryostation Server Returns:

07XXX.XXX

Examples:

07289.904

053.498

06-0.100

GS1HP - Get Stage 1 Heater Power

Returns: Returns the current stage 1 heater power reading or -0.100 to indicate the stage 1 heater power is not available.

Units: Watts

CryostationComm.dll Returns:

XX.XXX

Examples:

4.904

1.000

-0.100

Cryostation Server Returns:

06XX.XXX

Examples:

054.904

051.000

06-0.100

GS1T - Get Stage 1 Temperature

Returns: Returns the current stage 1 temperature or -0.10 to indicate the stage 1 temperature is not available.

Units: Kelvin

CryostationComm.dll Returns:

XXX.XX

Examples:

274.92

33.02

-0.10

Cryostation Server Returns:

06XXX.XX

Examples:

06274.92

0533.02
05-0.10

GS2HP - Get Stage 2 Heater Power

Returns: Returns the current stage 2 heater power reading or -0.100 to indicate the stage 2 heater power is not available.

Units: Watts
CryostationComm.dll Returns:
XX.XXX
Examples:
4.904
1.000
-0.100
Cryostation Server Returns:
06XX.XXX
Examples:
054.904
051.000
06-0.100

GS2T - Get Stage 2 Temperature

Returns: Returns the current stage 2 temperature or -0.10 to indicate the stage 2 temperature is not available.

Units: Kelvin
CryostationComm.dll Returns:
XXX.XX
Examples:
275.84
6.85
-0.10
Cryostation Server Returns:
06XXX.XX
Examples:
06275.84
046.85
05-0.10

GSS - Get Sample Stability

Returns: Returns the current sample stability or -0.10000 to indicate the sample stability is not available.

    Units: Kelvin

    CryostationComm.dll Returns:

        X.XXXXX

            Examples:

                0.00900

                10.20239

        -0.10000

    Cryostation Server Returns:

        07X.XXXXX

            Examples:

                070.00900

                0810.20239

        08-0.10000

GST - Get Sample Temperature

Returns: Returns the current sample temperature or -0.100 to indicate the sample temperature is not available.

    Units: Kelvin

    CryostationComm.dll Returns:

        XXX.XXX

            Examples:

                289.904

                3.498

        -0.100

    Cryostation Server Returns:

        07XXX.XXX

            Examples:

                07289.904

                053.498

        06-0.100

GTSP - Get Temperature Set Point

Returns: Returns the current temperature set point

    Units: Kelvin

    CryostationComm.dll Returns:

        XXX.XX

            Examples:

                295.00

4.20
Cryostation Server Returns:
06XXX.XX
Examples:
06295.00
044.20

GUS - Get User Stability

Returns: Returns the current user stability or -0.10000 to indicate the user stability is not available.
Units: Kelvin
CryostationComm.dll Returns:
X.XXXXX
Examples:
0.00900
10.20239
-0.10000
Cryostation Server Returns:
07X.XXXXX
Examples:
070.00900
0810.20239
08-0.10000

GUT - Get User Temperature

Returns: Returns the current user temperature or -0.100 to indicate the user temperature is not available.
Units: Kelvin
CryostationComm.dll Returns:
XXX.XXX
Examples:
289.904
3.498
-0.100
Cryostation Server Returns:
07XXX.XXX
Examples:
07289.904
053.498
06-0.100

GUTSP - Get User Temperature Set Point

Returns: Returns the current User module temperature set point

    Units: Kelvin

    CryostationComm.dll Returns:

        XXX.XX

            Example:

                395.00

        System not able to execute command at this time. Activate the User module first.

    Cryostation Server Returns:

        06XXX.XX

            Example:

                06395.00

        81System not able to execute command at this time. Activate the User module first.

GVPS - Get Vacuum Pump State

Returns: Returns the current vacuum pump state.

    CryostationComm.dll Returns:

        On

        Off

    Cryostation Server Returns:

        02On

        03Off

GVVS - Get Vent Valve State

Returns: Returns the current vent valve state.

    CryostationComm.dll Returns:

        Open

        Closed

    Cryostation Server Returns:

        04Open

        06Closed

SCD – Start Cool Down

Returns: Status of the command.

    CryostationComm.dll Returns:

        OK

        System not able to cool down at this time

Cryostation Server Returns:
  02OK
  41System not able to cool down at this time

SCS – Set Compressor Speed

Sets the compressor and cold head speed and turns the compressor on or off.
Takes: Integer number corresponding to the combination of compressor and cold head speeds from the COMPRESSOR drop down selection on the MANUAL CONTROL tab page of the SYSTEM tab page. Send 0 to turn the compressor off.
For example, to turn the compressor on and set the compressor and cold head speed to the first selection send
  SCS1
To turn the compressor on and set the compressor and cold head speed to the third selection send
  SCS3
To turn the compressor off send
  SCS0
 Returns: Status of the command.
  CryostationComm.dll Returns:
    OK, Compressor off
    OK, Compressor = xxxxxxxx
      Example:
        OK, Compressor = Startup_14_70
    System not able to start compressor or set compressor speed at this time
    Error: Invalid compressor speed
  Cryostation Server Returns:
    18OK, Compressor off
    xxOK, Compressor = xxxxxxxx
      Example:
        30OK, Compressor = Startup_14_70
    72System not able to start compressor or set compressor speed at this time
    31Error: Invalid compressor speed

SCVC - Set Case Valve Closed

Returns: Status of the command
  CryostationComm.dll Returns:
    OK, Case valve set False
    Error: Invalid case valve state
  Cryostation Server Returns:
    24OK, Case valve set False
    31Error: Invalid case valve state

SCVO - Set Case Valve Open

Returns: Status of the command
> *CryostationComm.dll Returns:*
>> OK, Case valve set True
>> Error: Invalid case valve state
> *Cryostation Server Returns:*
>> 23OK, Case valve set True
>> 31Error: Invalid case valve state

SMD - Set Magnet Disabled

Returns: Status of the command.
> *CryostationComm.dll Returns:*
>> OK, MAGNET DISABLED
>> System not able to execute command at this time. Activate the magnet module first.
>> System not able to execute command at this time. The magnet is already disabled.
> *Cryostation Server Returns:*
>> 19OK, MAGNET DISABLED
>> 83System not able to execute command at this time. Activate the magnet module first.
>> 81System not able to execute command at this time. The magnet is already disabled.

SME - Set Magnet Enabled

Returns: Status of the command.
> *CryostationComm.dll Returns:*
>> OK, MAGNET ENABLED
>> System not able to execute command at this time. Activate the magnet module first.
>> System not able to execute command at this time. The magnet is already enabled.
> *Cryostation Server Returns:*
>> 18OK, MAGNET ENABLED
>> 83System not able to execute command at this time. Activate the magnet module first.
>> 80System not able to execute command at this time. The magnet is already enabled.

SMTF - Set Magnet Target Field

Takes: Takes a decimal value in the range -2.000000 to 2.000000
      Units: Tesla
Returns: Status of the set command and the current value of the target magnetic field if the set command is successful.
      CryostationComm.dll Returns:
            OK, Magnet Target Field = X.XXXXXX
                Example:
                    OK, Magnet Target Field = 0.123123
            System not able to execute command at this time. Activate the magnet module first.
            System not able to execute command at this time. Enable the magnet first.
            System not able to set magnetic field at this time.
            Error: Invalid target magnetic field: abc. Input string was not in a correct format.
      Cryostation Server Returns:
            34OK, Magnet Target Field = X.XXXXXX
                Example:
                    34OK, Magnet Target Field = 0.123123
            83System not able to execute command at this time. Activate the magnet module first.
            74System not able to execute command at this time. Enable the magnet first.
            51System not able to set magnetic field at this time.
            85Error: Invalid target magnetic field: abc. Input string was not in a correct format.

SMTZ – Start Magnet True Zero

Returns: Status of the command.
      CryostationComm.dll Returns:
            OK
            System not able to execute command at this time. Activate the magnet module first.
            System not able to execute command at this time. Enable the magnet first.
            System not able to erase remnant field at this time.
      Cryostation Server Returns:
            02OK
            83System not able to execute command at this time. Activate the magnet module first.
            74System not able to execute command at this time. Enable the magnet first.
            52System not able to erase remnant field at this time.

SPPF – Set Platform Pid False

Returns: Status of the command.
>   *CryostationComm.dll Returns:*
>>   OK, Platform temperature PID mode set False
>>   Error: Invalid platform PID mode
>   *Cryostation Server Returns:*
>>   43OK, Platform temperature PID mode set False
>>   32Error: Invalid platform PID mode

SPPT – Set Platform Pid True

Returns: Status of the command.
>   *CryostationComm.dll Returns:*
>>   OK, Platform temperature PID mode set True
>>   Error: Invalid platform PID mode
>   *Cryostation Server Returns:*
>>   42OK, Platform temperature PID mode set True
>>   32Error: Invalid platform PID mode

SSB – Start StandBy

Returns: Status of the command.
>   *CryostationComm.dll Returns:*
>>   OK
>>   System not able to standby at this time
>   *Cryostation Server Returns:*
>>   02OK
>>   39System not able to standby at this time

STP – SToP

Returns: Status of the command.
>   *CryostationComm.dll Returns:*
>>   OK
>>   System not able to stop at this time
>   *Cryostation Server Returns:*
>>   02OK
>>   36System not able to stop at this time

STSP - Set Temperature Set Point

Takes: Takes a decimal value in the range 2.00 to 350.00
> *Units:* Kelvin

Returns: Status of the set command and the current temperature set point if the set command is successful.
> *CryostationComm.dll Returns:*
>> OK, Temperature Set Point = XXX.XX
>>> Example:
>>>> OK, Temperature Set Point = 4.20
>> Error: Invalid set point
> *Cryostation Server Returns:*
>> 34OK, Temperature Set Point = XXX.XX
>>> Example:
>>>> 32OK, Temperature Set Point = 4.20
>> 24Error: Invalid set point

SUPDT – Set User Pid Derivative Time

Note: Changing PID parameters may cause a brief pause in the PID functionality. Use caution when changing User PID parameters during an experiment.
Takes: Takes a decimal value in the range 0.0 to 100.0
> *Units:* seconds

Returns: Status of the set command and the current User PID derivative time if the set command is successful.
> *CryostationComm.dll Returns:*
>> OK, User PID derivative time = xxx.xxxxxx
>>> Example:
>>>> OK, User PID derivative time = 2.000000
>> Error: Invalid User PID derivative time
>> System not able to execute command at this time. Activate the User module first.
> *Cryostation Server Returns:*
>> 41OK, User PID derivative time = xxx.xxxxxx
>>> Example:
>>>> 39OK, User PID derivative time = 2.000000
>> 39Error: Invalid User PID derivative time
>> 81System not able to execute command at this time. Activate the User module first.

SUPF – Set User Pid mode False (off)

Returns: Status of the command.
> *CryostationComm.dll Returns:*
>> OK, User Temperature PID mode = False

Error: Invalid user PID setting

System not able to execute command at this time. Activate the User module first.

Cryostation Server Returns:

37OK, User Temperature PID mode = False

31Error: Invalid user PID setting

81System not able to execute command at this time. Activate the User module first.

SUPIF – Set User Pid Integral Frequency

Note: Changing PID parameters may cause a brief pause in the PID functionality. Use caution when changing User PID parameters during an experiment.

Takes: Takes a decimal value in the range 0.0 to 100.0

    Units: Hertz

Returns: Status of the set command and the current User PID integral frequency if the set command is successful.

    CryostationComm.dll Returns:

OK, User PID integral frequency = xxx.xxxxxx

    Example:

        OK, User PID integral frequency = 0.100000

Error: Invalid User PID integral frequency

System not able to execute command at this time. Activate the User module first.

    Cryostation Server Returns:

44OK, User PID integral frequency = xxx.xxxxxx

    Example:

42OK, User PID integral frequency = 0.100000

42Error: Invalid User PID integral frequency

81System not able to execute command at this time. Activate the User module first.

SUPPG – Set User Pid Proportional Gain

Note: Changing PID parameters may cause a brief pause in the PID functionality. Use caution when changing User PID parameters during an experiment.

Takes: Takes a decimal value in the range 0.000001 to 100.0

    Units: W/deg K

Returns: Status of the set command and the current User PID proportional gain if the set command is successful.

    CryostationComm.dll Returns:

OK, User PID proportional gain = xxx.xxxxxx

    Example:

        OK, User PID proportional gain = 0.003000

Error: Invalid User PID proportional gain

System not able to execute command at this time. Activate the User module first.

Cryostation Server Returns:
43OK, User PID proportional gain = xxx.xxxxxx
Example:
41OK, User PID proportional gain = 0.003000
41Error: Invalid User PID proportional gain
81System not able to execute command at this time. Activate the User module first.

SUPT – Set User Pid mode True (on)

Returns: Status of the command.
CryostationComm.dll Returns:
OK, User Temperature PID mode = True
Error: Invalid user PID setting
System not able to execute command at this time. Activate the User module first.
Cryostation Server Returns:
36OK, User Temperature PID mode = True
31Error: Invalid user PID setting
81System not able to execute command at this time. Activate the user module first.

SUTSP - Set User Temperature Set Point

Takes: Takes a decimal value in the User module temperature range
Units: Kelvin
Returns: Status of the set command and the current User module temperature set point if the set command is successful.
CryostationComm.dll Returns:
OK, User Temperature Set Point = XXX.XX
Example:
OK, User Temperature Set Point = 395.00
Error: Invalid set point
System not able to execute command at this time. Activate the User module first.
Cryostation Server Returns:
39OK, User Temperature Set Point = XXX.XX
Example:
39OK, User Temperature Set Point = 395.00
24Error: Invalid set point
81System not able to execute command at this time. Activate the User module first.

SVPR - Set Vacuum Pump Running

Returns: Status of the command
    CryostationComm.dll Returns:
        OK, Vacuum pump set True
        Error: Invalid vacuum pump state
    Cryostation Server Returns:
        24OK, Vacuum pump set True
        32Error: Invalid vacuum pump state

SVPS - Set Vacuum Pump Stopped

Returns: Status of the command
    CryostationComm.dll Returns:
        OK, Vacuum pump set False
        Error: Invalid vacuum pump state
    Cryostation Server Returns:
        25OK, Vacuum pump set False
        32Error: Invalid vacuum pump state

SVVC - Set Vent Valve Closed

Returns: Status of the command
    CryostationComm.dll Returns:
        OK, Vent valve set False
        Error: Invalid vent valve state
    Cryostation Server Returns:
        24OK, Vent valve set False
        31Error: Invalid vent valve state

SVVO - Set Vent Valve Open

Returns: Status of the command
    CryostationComm.dll Returns:
        OK, Vent valve set True
        Error: Invalid vent valve state
        Error: Cannot set vent valve open with current system temperature
    Cryostation Server Returns:
        23OK, Vent valve set True
        31Error: Invalid vent valve state

65Error: Cannot set vent valve open with current system temperature

SWU – Start Warm Up

Returns: Status of the command.

  CryostationComm.dll Returns:
    OK
    System not able to warmup at this time
 *Cryostation Server Returns:*
    02OK

How to Use the "CryostationComm" DLL

This document describes how to implement the Cryostation communications DLL into another project.

Install the CryostationComm.dll to the following directory

      C:\Montana Instruments

This guide assumes the use of Visual Studio 2008 or later, using the .NET framework 3.5. This example demonstrates adding the .dll to a c# project.
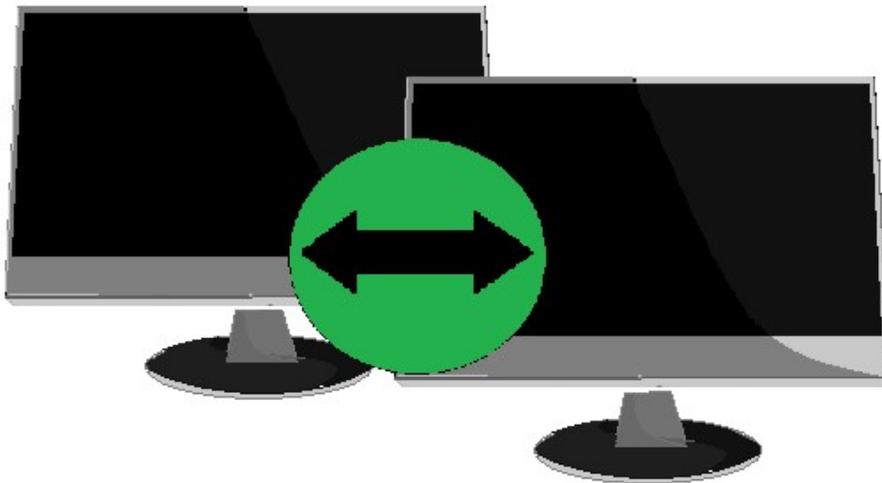
NOTE: Both PCs that will be communicating must be able to ping one another. This may require adding the programs to the windows firewall exception list and/or adjusting firewall settings. Contact your System Administrator for assistance if needed.

Creating a new project

- Open VS2008
- Select File->New->Project
- Select Visual C#->Windows->Windows Form Application
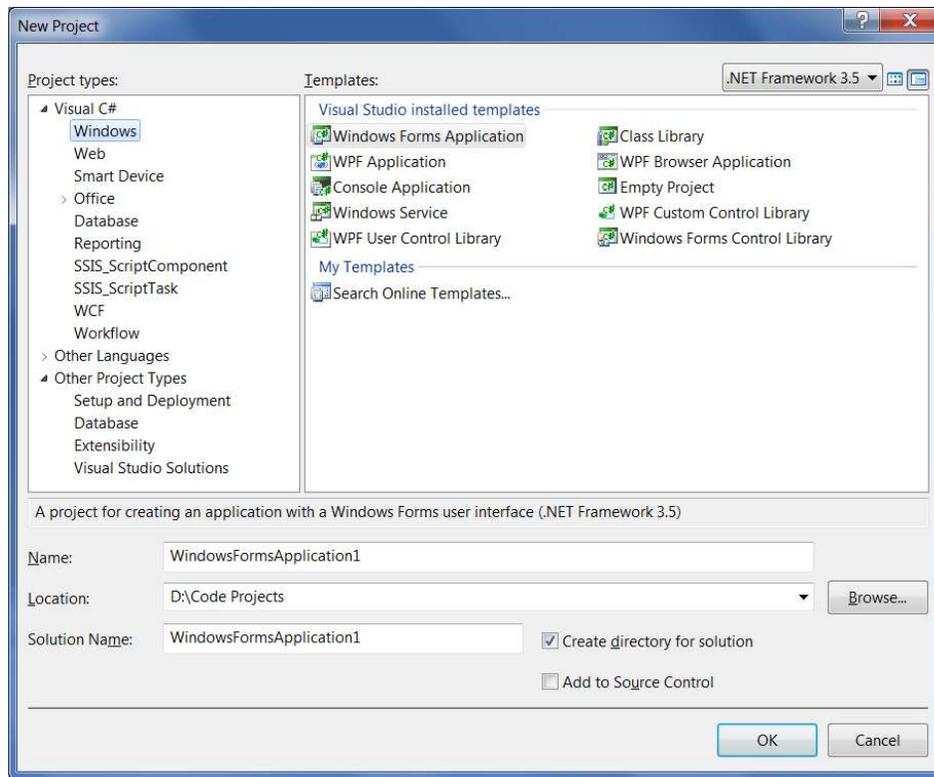
- For this example, the default name WindowsFormsApplication1 will be used
- Select the location to place the project and click the OK button.

Add the DLL to the project

- On the right side of Visual Studio in the Solution Explorer tab, right-click on the References node and select Add Reference
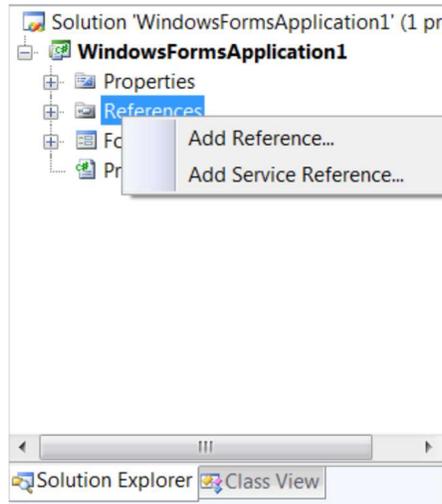
- Select the browse tab then browse to the C:\Montana Instruments directory (or the installation directory) and select the CryostationComm.dll file
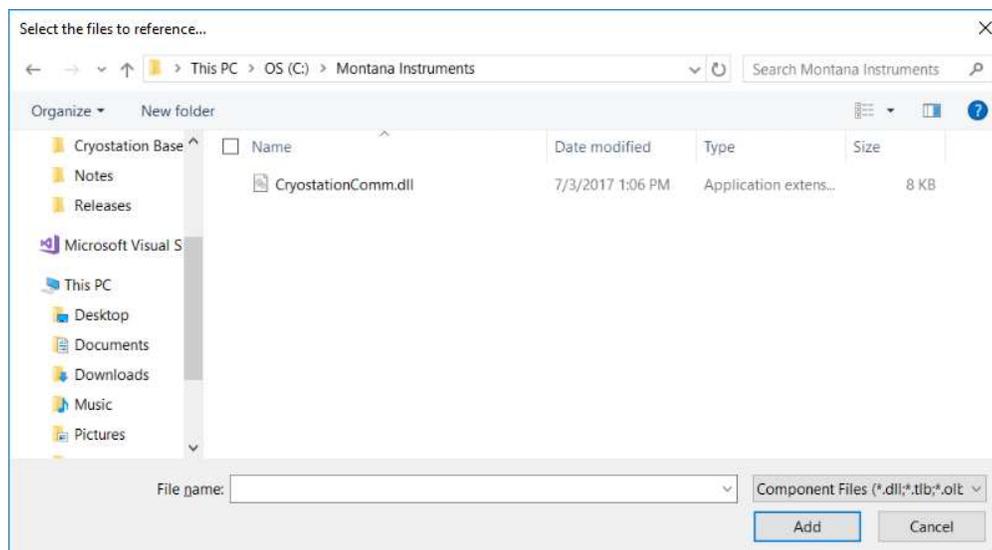
- Click on the OK button to add the dll to the project.

Use the DLL

- Add the using statement

  `using CryostationComm;`

- Add a Private member called m_CryoCom

  `private CryoComm m_CryoComm;`

- Create a new instance of the class using the default constructor

  `m_CryoComm = new CryoComm();`

- Access the public functions of the DLL

m_CryoComm.

CheckConnection
Connect
Equals
Error
Exit
GetHashCode
GetType
IP_Address
Port
SendCommandAndGetResponse
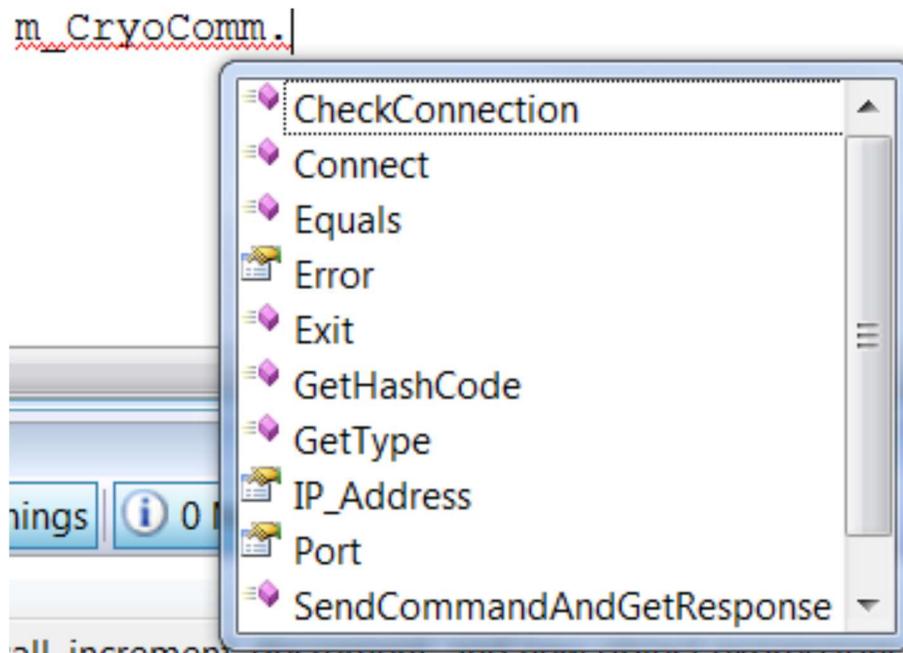
Example program

```csharp
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;

using CryostationComm;

namespace WindowsFormsApplication1
{
    public partial class Form1 : Form
    {
        private CryoComm m_CryoComm;

        public Form1()
        {
            string szCmd = string.Empty;
            string szResponse = string.Empty;

            InitializeComponent();

            m_CryoComm = new CryoComm();

            m_CryoComm.IP_Address = "192.168.28.24";
            m_CryoComm.Port = 7773;

            if (m_CryoComm.Connect() == true)
            {
                szCmd = "STSP4.2";
                if( m_CryoComm.SendCommandAndGetResponse( szCmd, ref
szResponse) == true )
                {
                    //Got valid value, show it
                    MessageBox.Show(szResponse);
                }
                else
                {
                    //Show error
                    MessageBox.Show(m_CryoComm.Error);
                }
            }
            else
            {
                //Show error
                MessageBox.Show( m_CryoComm.Error );
            }

            //When done make sure exit is called to clean up
            m_CryoComm.Exit();
        }
    }
}
```

Commands with a parameter

To call a command with a parameter, simply append the parameter to the end of a command.

Example:

```
szCmd = "STSP4.2";
```

Using the Cryostation with LabVIEW

There are two ways to communicate with the Cryostation from LabVIEW:

1. Communicate directly to the Cryostation via TCP/IP
2. Import the dll and use the functions similarly as a .net program as outlined above
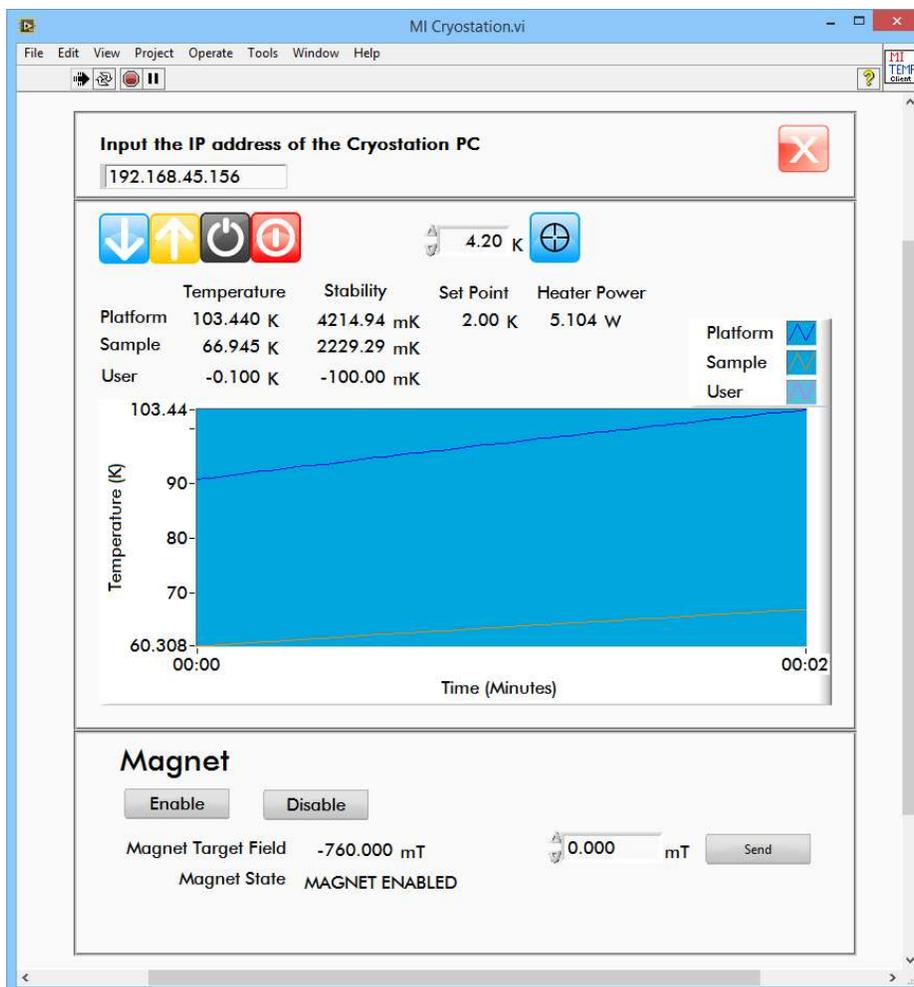
Example LabVIEW VI

NOTE: After enabling the remote control button on the Cryostation, the Cryostation acts as a server and waits for clients to connect to it. It is the client's responsibility to connect, maintain a connection, and correctly handle communication errors as well as being disconnected. If a client loses connection, it must re-connect to the Cryostation (the Cryostation will auto reset as necessary and will be available immediately after a client disconnect.