INSTRUCTION MANUAL

LoggerNet Server Software Development Kit Version 4.1 Programmer's Reference

Revision: 12/11

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Section 1. LoggerNet Server SDK Overview

1.1 Purpose of the LoggerNet Server SDK

The LoggerNet Server Software Development Kit (SDK) provides a method to communicate with a datalogger network through ActiveX® controls. These controls provide an abstraction to the server messaging and datalogger communication protocols. Together these controls encapsulate all of the messaging between client applications and the LoggerNet server whether the client resides on a local machine or accesses the LoggerNet server over a network.

Without these controls, creating custom client applications that communicate with Campbell Scientific dataloggers would require an implementation of all the protocol details when sending messages to dataloggers and reading messages from dataloggers. By using the SDK, developers not only reduce development time but also insulate their application from future changes with datalogger communication protocols.

1.2 Requirements

1.2.1 Required Campbell Scientific, Inc. Software

SDK communication requires access to a functioning LoggerNet server. Client applications use the SDK controls to create connections with dataloggers through the LoggerNet server DLL. This version of the SDK still allows the creation of custom software applications that can communicate to an existing installation of LoggerNet. Alternately, custom software can be created that starts, stops, and communicates through the included LoggerNet server DLL (CORALIB3.DLL). The SDK controls communicate with CSI dataloggers using LoggerNet server version 1.1 or higher.

1.2.2 Development Tools Requirements

The SDK's ActiveX® controls have been tested with the following development tools for Microsoft Windows:

TABLE 1-1. Supported Development Tools

Development Tool	Examples Available
Visual Basic 6.0	Yes
Delphi 2007	Yes
Visual C++ VS-2010 MFC	Yes
C#.NET	Yes
VB.NET	Yes

NOTE The C#.NET and VB.NET example code targets the x86 compilation platform to facilitate proper functionality on 64-bit versions of Windows®. Any new projects created on 64-bit platforms should use this compiler directive, since the ActiveX® controls in the SDK must run in a 32-bit process on 64-bit machines to work properly.

1.3 Included Components

1.3.1 Files Included in the LoggerNet Server SDK

The files included with the LoggerNet Server SDK installation are: ActiveX ® SDK controls, the LoggerNet server DLL, working examples for several development controls, licensing information, and the SDK Beginner's Guide and Programmer's Reference. Please note that although simple examples are provide for reference, the SDK does not contain a complete user interface software package for creating connections and manipulating data within datalogger networks. The SDK merely provides all the controls necessary for development of the user interface software.

1.3.1.1 ActiveX® Controls (DLLs)

The six included ActiveX controls are DLL files that are registered and must be added to your project. For help adding these controls to your project, see the next section "Adding the Controls to a Project".

1.3.1.2 LoggerNet Server (CORALIB3.DLL)

The LoggerNet server DLL available in the installed Controls folder can be started, stopped, and accessed with the included ActiveX Controls. This DLL does not need to be registered but must be placed in the application folder, in the PATH environmental variable, or in the Windows system directory.

1.3.1.3 Manuals

The SDK Beginner's Guide contains information comparing available Campbell Scientific SDK products. The LoggerNet Server SDK Programmer's Reference contains detailed information regarding the use of the LoggerNet Server SDK. Both manuals are in PDF format.

1.3.1.4 Example Projects

Example projects are included with the SDK. These projects collectively use all of the controls to demonstrate simple functionality. The example projects have been written in various development environments.

1.3.2 Adding Controls to a Project

This section describes how to add controls to a project in Visual Basic 6.0, Delphi, or .NET. Before trying to add any of the SDK controls to your development project, make sure that the installation program has installed all of

the controls. The standard installation program will register the SDK control DLLs.

1.3.2.1 Adding a Control to a Visual Basic Project

1. Start Visual Basic.

2. Create a new project (`File -> New Project`) and select the project of your choice. "Standard EXE" would be a good choice.

3. Add "Components" to your project (`Project -> Components...`). Check the controls that you would like to add to the project and click "OK".

4. Select a control on the toolbar by clicking it and draw the control onto the form by clicking and dragging (creating a rectangle or square).

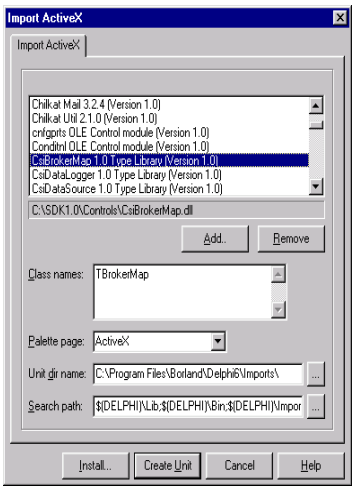
1.3.2.2 Adding a Control to a Delphi Project

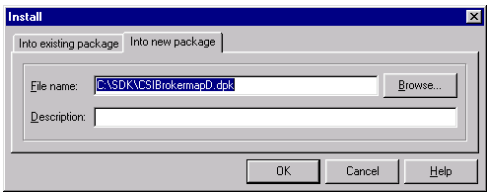
1. Start Delphi.

2. Delphi `Main menu -> Component -> Import ActiveX Control…`

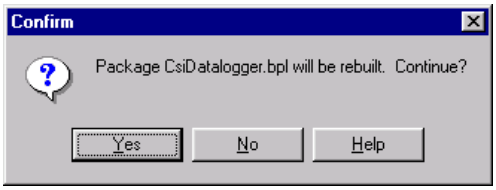
3. Select a SDK component (e.g., CsiBrokerMap 1.0 Type Library (Version 1.0)) from the Import Active X window and click on the Install button.

4. Select the tab Into New Package in the Install window and click on the Browse button. Locate the directory where you would like this new package to reside and assign a name to this new package, e.g., CsiBrokerMap. Click on OK button.





5. A confirmation message similar to one below will appear. Click on Yes.



6. A new window titled Information (not shown) will appear informing you that the package has been installed.

7. Finally you will be asked to save the changes. Click on Yes.

8. Follow the same procedure to obtain the other two ActiveX controls as icons on the ActiveX palette in Delphi.

1.3.2.3 Adding a Control to a .NET Project

ActiveX controls are imported using the COM Interop wrapper capability in the .NET development environment. This importing should happen automatically when the ActiveX DLL is referenced in the project.

1. From the Project menu item choose "Add Reference".

2. Find and select the SDK component to import (e.g. CsiBrokerMap 1.0 Type Library) under the COM tab.

3. Add the component to the project form.

Section 2. CsiServer Control

2.1 Purpose of the CsiServer Control

The CsiServer Control allows the user to start and stop the included, LoggerNet server DLL (CORALIB3.DLL). All SDK controls must connect to and use a LoggerNet server to communicate with Campbell Scientific dataloggers. Therefore, a LoggerNet server must be running on the network before the included examples or any custom SDK software will function.

Campbell Scientific sells a complete LoggerNet software package that includes the LoggerNet server and many complex software clients. This version of LoggerNet may already be installed and in use on the network where the custom SDK application will reside. If the LoggerNet software is already installed and running on the network, it is not necessary to use the CsiServer control to start another LoggerNet server. However, if a separate version of LoggerNet has not been started or installed on the network, use the CsiServer control to start the included CORALIB3.DLL. The included CORALIB3.DLL must be located in the same folder as the created application, the PATH environmental variable, or in the Windows system directory before it can be started.

All of the configuration information and data for the datalogger network will be stored in the LoggerNet working directory described in the CsiServer control properties. Only one LoggerNet server at a time can use the network configuration information contained in the working directory. If a previous installation of LoggerNet created the network map and configuration information, the LoggerNet server included in the SDK can point to and use this configuration information. However, avoid file conflict issues by making sure only one LoggerNet server accesses the same working directory at a time.

Careful consideration should be given before beginning a project using the SDK. Consider the type of software application needed. Many developers merely want to create custom software interfaces that extend a previous installation of LoggerNet. The CsiServer control won't be needed for this type of application. However, if you are interested in creating a complete software solution that will replace or be used instead of Campbell Scientific's LoggerNet software package, make sure a LoggerNet server is not running and then start the included LoggerNet server DLL with the CsiServer control. Moreover, an understanding of CoraScript commands, which are discussed in the next section, is required to set up and manipulate the datalogger network.

2.2 CsiServer Interface

See the Reference section in this manual for detailed descriptions of these properties, methods, and events.

2.2.1 Properties

- applicationWorkDir As String
- buildDate As String (read-only)
- logFileDir As String
- serverStarted As Boolean (read-only)
- serverVersion As String (read-only)
- serverWorkDir As String (Required)
- tcpPort As Integer
- tcpPortEx As Long

2.2.2 Methods

- startServer()
- stopServer()

2.2.3 Events

- onServerFailure(String Reason)

Section 3. Developing an Application Using the CsiServer Control

3.1 Purpose

This section shows by example how to build an application using the SDK CsiServer control. The application's functions are:

1. Start the LoggerNet server (CORALIB3.DLL).

2. Stop the LoggerNet server (CORALIB3.DLL).

3.2 Using the CsiServer Control

3.2.1 Getting Started with the CsiServer Control

The CsiServer SDK control (an ActiveX object) starts and stops the LoggerNet server (CORALIB3.DLL).

This example assumes that:

- you have registered the CsiServer control correctly
- you will develop the application with Visual Basic 6.0
- the CORALIB3.DLL exists in the folder with the created application, the PATH environmental variable, or the Windows system directory
- both the CORALIB3.DLL and application you are developing reside on the same computer

Complete the following steps first:

1. Start Visual Basic 6.0 (Start | Programs | Microsoft Visual Basic 6.0 | Microsoft Visual Basic 6)

2. Start a new project (File | New Project | Standard EXE | OK) opening a new, blank form.

3. View the toolbox for this new project (VB 6 Main Menu | View | Toolbox).

4. Right click on the toolbox area and select Components. A component window will open and the following SDK controls will appear within the list if they are registered properly:

   CsiBrokerMap 1.0 Type Library
   CsiCoraScript 1.0 Type Library
   CsiDatalogger 1.0 Type Library
   CsiDataSource 1.0 Type Library

CsiLogMonitor 1.0 Type Library
CsiServer 1.0 Type Library

Check the box next to the CsiServer 1.0 Type Library, click Apply, and then close the window. Now an icon for the CsiServer control and other common controls will appear in the toolbox.

3.2.2 CsiServer Control Application Example

Begin creating an application that will start and stop the LoggerNet server. An example of a user interface that accomplishes this task is shown in Figure 3-1. This interface includes the CsiServer control and other objects on the form to create a functional application that will start and stop the LoggerNet server.

FIGURE 3-1. CsiServer Example

Now that the interface has been designed, the code can be organized to accomplish the requirements of the application. Initially, the one required parameter, serverWorkDir, must be set and then the startServer() method can be called to start the LoggerNet server. A basic example of code used to start the LoggerNet server is listed in the table below:

```
Private Sub cmdStart_Click()

   'Set the required properties for the LoggerNet Server
   CsiServer.serverWorkDir = "c:\campbellsci\loggernet\sys\bin"

   'Start the LoggerNet Server
   If CsiServer.serverStarted Then
      txtServer.Text = "Server Already Started"
   Else
      CsiServer.startServer
      txtServer.Text = "Server Started"
      cmdStart.Enabled = False
      cmdStop.Enabled = True
   End If

End Sub
```

In order to stop the LoggerNet server, use the method stopServer(). A basic example of code used to stop the LoggerNet server is found in the following table:

```
Private Sub cmdStop_Click()
   'Stop the LoggerNet Server
   If CsiServer.serverStarted Then
      CsiServer.stopServer
      txtServer.Text = "Server Stopped"
      cmdStop.Enabled = False
      cmdStart.Enabled = True
   Else
      txtServer.Text = "Server Already Stopped"
   End If
End Sub
```

Add additional functionality and objects as necessary to meet the specific requirements of your application. Complete examples using the CsiServer control are included with the LoggerNet Server SDK installation.

Section 4. CsiCoraScript Control

4.1 Purpose of the CsiCoraScript Control

The CsiCoraScript control provides the power to administer the LoggerNet server. There are many different settings and commands available with this control.

Specific LoggerNet server functions and tasks are set by passing CoraScript commands to the LoggerNet server. CoraScript commands execute LoggerNet server operations that include adding devices to the network map, data collection, listing table and datalogger information, and changing settings in the LoggerNet server and attached devices. CoraScript commands and their purposes can be found in the Quick Reference help file installed with the LoggerNet Server SDK.

NOTE The following CoraScript commands are currently unsupported in the SDK: connect, disconnect, help, exit, bye, quit, and list-commands.

4.2 Connecting to the Server

There are two basic actions required for this control to connect to the LoggerNet server:

1. Set server properties:
    - serverName - The name or IP address of the LoggerNet server . The default value is `localhost`.
    - serverPort - The port on which the LoggerNet server is running. The default value is 6789.
    - serverLogonName (Optional) - If security has been enabled on the server, a valid logon name is required.
    - serverLogonPassword (Optional) - If security has been enabled on the server, a valid password that corresponds with a valid logon name is required.
2. Invoke the `serverConnect()` method.

4.3 Using CoraScript Commands

CoraScript commands are used to setup and manipulate the LoggerNet server. A complete listing of these commands can be found in the LoggerNet Server SDK Quick Reference. A thorough knowledge of these powerful commands is recommended before attempting to make changes to settings or devices in the LoggerNet server. The following sections outline some basic commands that can be used to quickly set up devices and collect data from the network.

4.3.1 Setting up a Network

Some of the commands that can be used when initially setting up a datalogger network on the LoggerNet server include:

- add-device – used to add root ports, dataloggers, and telecommunication devices to the network map.
- set-device-setting – used to change settings of specific devices in the network map.
- delete-branch – used to remove a device and any children of a device from the network map.
- list-devices – shows the devices in the network map

The following example shows the basic CoraScript commands used to set up a CR10X connected directly to the LoggerNet server via RS232:

```
add-device com-port COM1 as-child “”;
add-device cr10x CR10X as-child “COM1”;
```

The following example shows basic CoraScript commands used to set up a CR9000 connected to the LoggerNet server via Ethernet:

```
add-device tcp-com-port IPPort as-child “”;
set-device-setting IPPort 5 192.168.1.1:6781;
add-device cr9000 CR9000 as-child “IPPort”;
```

4.3.2 Real-Time Data Display

Some developers want to display data values as quickly as they change in the datalogger. Each time a datalogger program executes, new values are written as input locations. Collecting these input locations provides a snapshot of the most recent values contained in the datalogger. The DataSource control of the SDK can be used to set up an advisor that will watch the LoggerNet data cache and display new or existing data values that are collected. CoraScript commands are used to set up the collect areas of LoggerNet and to enable scheduled collection of specific datalogger tables to automate the collection process.

Please note that although the commands below will enable collection of input locations from a datalogger, using input locations for real-time comparison of values can be problematic. When input locations are collected, the collection is merely a snapshot of the current values that exist in each location. If, for example, the datalogger program has not completely executed, some of the values collected may be new while other values may have not changed from the previous program execution. Please keep this information in mind if input locations are used in real-time data display or calculations. If correlating values are necessary, a better approach writes values to Final Storage every program execution and collects those values as quickly as possible.

4.3.2.1 Table-Data Dataloggers

The LoggerNet server, by default, creates a collect area for the Public or InLocs table of table-data dataloggers such as the CR9000 or CR10X-TD. The basic CoraScript commands that are used to enable collection and establish scheduled collection are:

- `set-collect-area-setting` – used to enable a device for collection
- `set-device-setting` – used to activate scheduled collection for a device

If you have added a CR9000 to the datalogger network and you have a program running on that device, the following command will enable the public table for collection by activating the collect-area-setting scheduleEnabled (id = 2):

```
set-collect-area-setting CR9000 public 2 1;
```

Every time a manual poll or any other collection occurs, data will be collected for the public table of the CR9000. If a DataSource advisor has been created, it will trigger and display the new values. If you want to automate the data collection process, set the device's scheduled collection interval through the device setting collectSched (id = 5):

```
set-device-setting CR9000 5 {1 19900101 300000 120000 3 86400000};
```

With the above setting, the LoggerNet server will automatically collect all tables enabled for collection from the CR9000 every 300000 milliseconds. Once this setting is in place, the activated DataSource advisor will display updates as they are automatically collected.

4.3.2.2 Mixed-Array Dataloggers

Although the DataSource control can create a temporary data cache to watch all input locations, mixed-array dataloggers, like the CR7 and CR10X, require additional commands to create a permanent collect area for input locations. Input Locations (InLocs) contain values that are usually stored every time the program executes. However, the LoggerNet server does not create a permanent data cache by default containing data from InLocs for a mixed-array datalogger. If a permanent collect area for InLocs is desired or only specific InLocs are needed, the collect area must be created manually in the LoggerNet server. The following commands are used to set up a permanent InLocs collect area for a mixed-array datalogger:

- `create-inlocs-area` – create a collect area containing specified input locations
- `set-collect-area-setting` – used to enable a device for collection
- `set-device-setting` – used to activate scheduled collection for a device

The following example sets up collection for two input locations of a CR10X by identifying the station, declaring a name for the collect area, and listing the input locations to include:

```
create-inlocs-area CR10X InLocsArea {1 "inlocs1"} {2 {inlocs2}};
```

Collect area names must always be unique. Therefore, if an attempt is made to create a collect area with exactly the same name as a collect area that already exists, the LoggerNet server will automatically index the name of the collect area being created. For example, if collect area InLocsArea already exists and an attempt is made to create another collect area with the same name, the LoggerNet server will automatically name the new collect area InLocsArea1.

To activate a collect area for collection and to automate the collection process use the following commands:

```
set-collect-area-setting CR10X InLocsArea 2 1;
set-device-setting CR10X 5 {1 19900101 300000 120000 3 86400000};
```

With the above setting, the LoggerNet server will automatically collect all tables enabled for collection from the CR10X every 300000 milliseconds. Once this setting is in place, the activated DataSource advisor will display new data values as they are collected.

4.4 CsiCoraScript Interface

See the Reference section for descriptions of these properties, methods, and events.

4.4.1 Properties

- serverConnected As Boolean (read-only)
- serverLogonName As String
- serverLogonPassword As String
- serverName As String
- serverPort As Long

4.4.2 Methods

- executeScript(String script, Long asyncID) As String
- serverConnect()
- serverDisconnect()

4.4.3 Events

- onScriptComplete(Long asyncID, String result)
- onServerConnectStarted()
- onServerConnectFailure(server_failure_type server_failure)

Section 5. Developing an Application Using the CsiCoraScript Control

5.1 Purpose

This section shows an example of how to build an application using the CsiCoraScript control. The application's functions are:

1. Connect to a running LoggerNet server

2. Execute CoraScript commands to administer the LoggerNet server.

5.2 Using the CsiCoraScript Control

5.2.1 Getting Started with the CsiCoraScript Control

The CsiCoraScript SDK control (an ActiveX object) administers the datalogger network by passing CoraScript commands to the LoggerNet server.

This example assumes that:

- you have registered the CsiCoraScript control correctly
- you are developing the application in Visual Basic 6.0
- a LoggerNet server is running and accessible on the network

Complete the following steps first:

1. Start Visual Basic 6.0 (Start | Programs | Microsoft Visual Basic 6.0 | Microsoft Visual Basic 6)

2. Start a new project (File | New Project | Standard EXE | OK) opening a new, blank form.

3. View the toolbox for this new project (VB 6 Main Menu | View | Toolbox).

4. Right click on the toolbox area and select Components. A component window will open and the following SDK controls will appear within the list if they are registered properly:

   CsiBrokerMap 1.0 Type Library
   CsiCoraScript 1.0 Type Library
   CsiDatalogger 1.0 Type Library
   CsiDataSource 1.0 Type Library
   CsiLogMonitor 1.0 Type Library
   CsiServer 1.0 Type Library

Check the box next to the CsiCoraScript 1.0 Type Library, click Apply, and then close the window. Now an icon for the CsiCoraScript control and other common controls will appear in the toolbox.

5.2.2 CsiCoraScript Control Application Example

You are now ready to begin creating an application that executes CoraScript commands with the LoggerNet server. An example of a user interface that accomplishes this task is shown in Figure 5-1. This interface includes the CsiCoraScript control and other objects on the form to create a functional application.

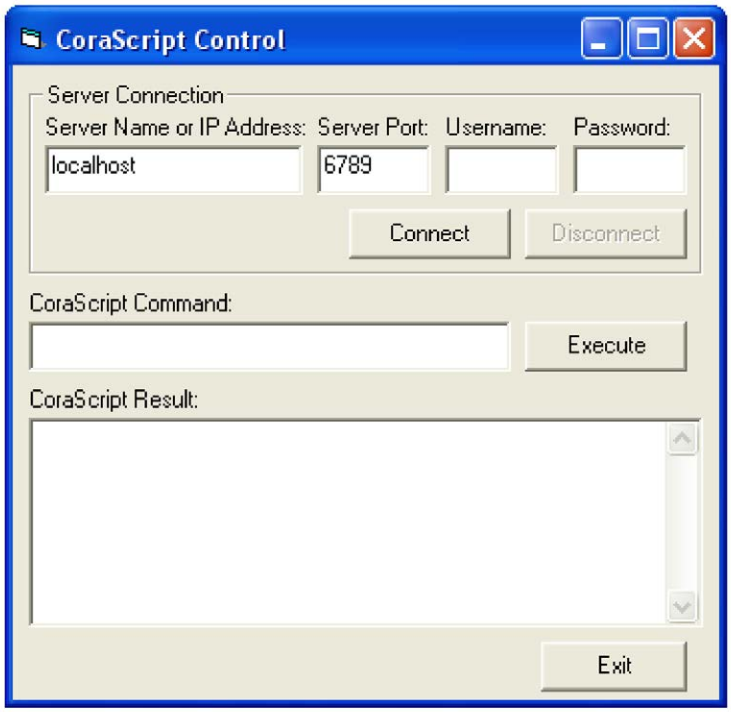


FIGURE 5-1. CsiCoraScript Example

Now that the interface has been designed, the code can be organized to accomplish the requirements of the application. Initially, the application must connect to the LoggerNet server using the serverConnect() method. A basic example of code used to accomplish this task is shown in the table that follows:

```
Private Sub cmdConnect_Click()

'Connect using the default logon settings.
CsiCoraScript.serverName = txtServerAddress
CsiCoraScript.serverPort = txtServerPort
CsiCoraScript.serverLogonName = txtUsername
CsiCoraScript.serverLogonPassword = txtPassword

'The following attempts to connect to the LoggerNet server
'and calls the event onServerConnectStarted()if the connection
'starts or the event onServerConnectFailure()if it fails.

CsiCoraScript.serverConnect

End Sub
```

If the connection succeeds, the onServerConnectStarted() event gets triggered. Otherwise, the onServerConnectFailure() event gets called if the connection fails.

In order to execute CoraScript commands on the LoggerNet server, use the method executeScript(). A basic example of code using this method to execute CoraScript commands and displaying the results in the interface follows:

```
Private Sub cmdCoraScript_Click()

Dim corascript As String

'Send CoraScript commands to the LoggerNet Server
'Sample CoraScript commands include:
'list-devices;
'add-device com-port Com1 before "";
'add-device CR10x CR10X_Test as-child Com1;
corascript = CsiCoraScript.executeScript(txtCoraScript.Text, 0)
txtCoraResult.Text = corascript

End Sub
```

Add additional functionality, error handling, and objects as necessary beyond the example interface and code listed above to meet the specific requirements of your application. Complete examples using the CsiCoraScript control are included in the LoggerNet SDK installation.

Section 6. CsiBrokerMap Control

6.1 Purpose of the CsiBrokerMap Control

The CsiBrokerMap control gives developers access to the broker map, which is the list of brokers or dataloggers known by the LoggerNet server. This control also keeps track of all tables on each of the brokers including the table definitions or columns. This table information is derived from the collect areas that are known by the LoggerNet server. Collect areas are known by the LoggerNet server after a datalogger program has been associated or table definitions have been retrieved. The user may also create collect areas manually in the LoggerNet server.

The information given by the CsiBrokerMap control can be used as parameters for other controls in the SDK. For example, the CsiDataLogger control can use the name of a datalogger that was displayed to the user through the CsiBrokerMap control. Similarly, the CsiBrokerMap control can display specific brokers, tables, and columns that the CsiDataSource control can use to create an advisor that monitors acquired data.

This control can also be used in combination with the CsiDatalogger control to set a value within a datalogger table. With information about the names of a broker, a table, and a column provided by the CsiBrokerMap control, the `variableSetStart` method of the CsiDatalogger control could be used to set the value of that column.

The CsiBrokerMap can be a useful tool to display the dataloggers, tables and columns that exist in the LoggerNet server datalogger network.

6.2 Connecting to the LoggerNet Server

There are two basic actions required to connect to the LoggerNet server:

1) Set server properties:

   a) `serverName` - The name of the LoggerNet server or IP address. The default value is `localhost`.

   b) `serverPort` - The port on which the LoggerNet server is running. The default value is `6789`.

   c) `serverLogonName` (Optional) - If security has been enabled on the server, a valid logon name is required.

   d) `serverLogonPassword` (Optional) - If security has been enabled on the server, a valid password that corresponds with a valid logon name is required.

2) Invoke the `start()` method.

6.3 How Collections Work

The CsiBrokerMap uses the concept of *collections* in its implementation. Collections provide layers of objects and a standard way to access those objects. There are two basic ways to look at collections. The Visual Basic (VB) view describes how a VB programmer would view a collection, which is simpler than for Delphi or Visual C++.

6.3.1 Visual Basic View of Collections

The CsiBrokerMap collections are simply three levels of grouped items. Brokers exist at the top-most level. Then within Brokers are Tables, and within Tables are Columns. Each of these levels can be accessed with the dot operator in Visual Basic. The following example illustrates how to access all of the Brokers in the BrokerMap:

6.3.1.1 Accessing Collections with For Each

```
For Each b in BrokerMap.Brokers
 Debug.Print b.name
Next
```

This simplistic code allows you to iterate through the BrokerMap simply without having to worry about indexes and going out of bounds. In the code above, it would be possible to access all of the tables in each broker by nesting a similar loop inside the existing one stating `For Each t in BrokerMap.Brokers(b).Tables.` By repeating similar code for the columns the whole broker map could be displayed.

6.3.1.2 Accessing Collections with Indexes and Names

The brokers, tables, and columns can be accessed not only with the "`For Each`" loop, but also by index and name. Consider the following examples:

```
BrokerMap.Brokers("CR9000").Tables("minute").Columns("temp").size
For i = 0 to BrokerMap.Brokers.Count – 1
 Debug.Print BrokerMap.Brokers(i)
Next
```

The first line of code assumes that a datalogger named CR9000 with a table named minute exists in the broker map. The code also assumes a column named temp exists in the table named minute. These names could also be `String` variables instead of literal strings.

6.3.2 Delphi/Visual C++ View of Collections

Delphi and Visual C++ require a little more work to capture the information provided by this control, but not much more than Visual Basic's iterative method using indexes. Please refer to the code in the Delphi and Visual C++ examples included with the LoggerNet SDK installation.

6.4 CsiBrokerMap Interfaces

The following interfaces are included in the CsiBrokerMap control:

- Broker
- BrokerMap
- BrokerCollection
- Column
- ColumnCollection
- Table
- TableCollection

6.4.1 BrokerMap Interface

See the Reference Section for detailed descriptions of these properties, methods, and events.

6.4.1.1 Properties

- serverName As String
- serverLogonName As String
- serverLogonPassword As String
- serverPort As Long
- autoExpand As Boolean
- serverConnected As Boolean

6.4.1.2 Methods

- brokers() As Object
- finish()
- start()

6.4.1.3 Events

- onAllStarted()
- onBrokerAdded(Object Broker)
- onBrokerDeleted(Object Broker)
- onFailure(BrokerMapFailureType failure_code)
- onTableAdded(Object Broker, Object Table)
- onTableDeleted(Object Broker, Object Table)
- onTableChanged(Object Broker, Object Table)
- onBrokerStarted(Object Broker)

6.4.2 BrokerCollection Interface

See the Reference Section for descriptions of these properties and methods.

6.4.2.1 Properties

- count As Long

6.4.2.2 Methods

- item(id) As Broker
- _NewEnum() (GetEnumerator() in .NET)

6.4.3 Broker Interface

See the Reference Section for descriptions of these properties and methods.

6.4.3.1 Properties

- id As Long
- name As String
- type As BrokerType
- datalogger_type as String
- allStarted as Boolean

6.4.3.2 Methods

- tables() As Object
- start_expansion()

6.4.4 Table Collection Interface

See the Reference Section for descriptions of these properties and methods.

6.4.4.1 Properties

- count As Long

6.4.4.2 Methods

- item(id) As Table
- _NewEnum() (GetEnumerator() in .NET)

6.4.5 Table Interface

See the Reference Section for descriptions of these properties and methods.

6.4.5.1 Properties

- interval As Long
- name As String
- originalSize As Long
- size As Long

6.4.5.2 Methods

- columns() As Object
- start_expansion()

6.4.6 ColumnCollection Interface

See the Reference Section for descriptions of these properties and methods.

6.4.6.1 Properties

- count As Long

6.4.6.2 Methods

- item(id) As Column
- _NewEnum() (GetEnumerator() in .NET)

6.4.7 Column Interface

See the Reference Section for descriptions of these properties.

6.4.7.1 Properties

- description As String
- name As String
- process As String
- type As CsiDataTypeCode
- units As String
- writable As Long

Section 7. Developing an Application Using the CsiBrokerMap Control

7.1 Purpose

This section shows by example how to build an application using the CsiBrokerMap SDK control. The application's stated functions are:

1. Display names of all stations in the current network.

2. Upon selection of any single station, display tables associated with that station's currently running program.

3. Upon selection of any single table, display all fields (columns) included in that table.

The following section illustrates how to build an application that can perform these tasks using SDK controls and the LoggerNet server.

7.2 Using the CsiBrokerMap Control

7.2.1 Getting Started with the CsiBrokerMap Control

The CsiBrokerMap is an SDK control (an ActiveX object) designed to display names of dataloggers in the current network. This control can also display names of all tables belonging to the selected datalogger and columns in the selected table. This information is derived from collect area information created when a program is associated with a datalogger or when table definitions are retrieved from the datalogger. Since the BrokerMap control does not list devices if collect areas are not known, use the CoraScript control to associate the program or to retrieve table definitions.

This example assumes that:

- you have registered the SDK controls correctly
- you are developing the application with Visual Basic 6.0
- a LoggerNet server is currently running and accessible on the network
- at least one station already exists in the LoggerNet server's network map
- the datalogger program has been associated or table definitions have been retrieved

Complete the following steps first:

1. Start Visual Basic 6.0 (Start | Programs | Microsoft Visual Basic 6.0 | Microsoft Visual Basic 6)

2. Start a new project (File | New Project | Standard EXE | OK). This will open a new, blank form.

3. View the toolbox for this new project (VB 6 Main Menu | View | Toolbox).

4. Right click on the toolbox area and then on the word Components to open the component window. If the SDK controls are registered on your PC, the following CSI components will appear:

   CsiBrokerMap 1.0 Type Library
   CsiCoraScript 1.0 Type Library
   CsiDatalogger 1.0 Type Library
   CsiDataSource 1.0 Type Library
   CsiLogMonitor 1.0 Type Library
   CsiServer 1.0 Type Library

Check the box next to CsiBrokerMap 1.0 Type Library, click on Apply, and then close the window. An icon for the CsiBrokerMap control will appear in the toolbox.

7.2.2 CsiBrokerMap Control Application Example

Begin creating an application that displays the stations, tables, and columns that exist in the LoggerNet server. Design the interface and change properties to meet the requirements of your application. An example for a user interface that accomplishes the tasks outlined in the previous section is shown in Figure 7-1. This interface includes the CsiBrokerMap control and other objects to create a functional application.

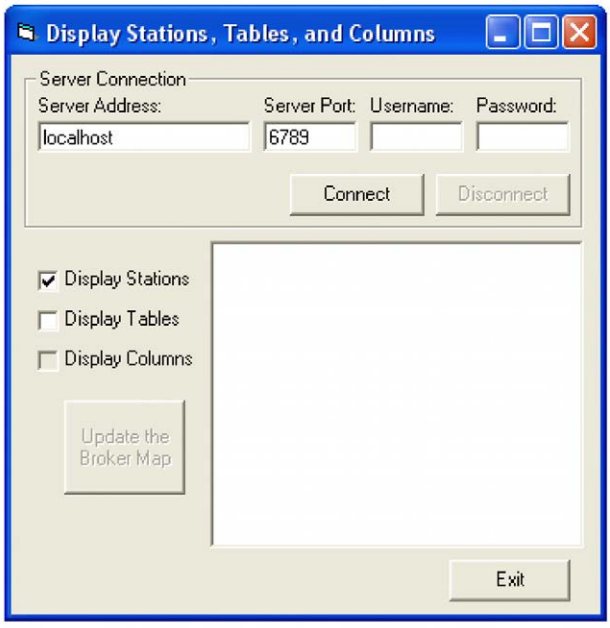


FIGURE 7-1. CsiBrokerMap Example

Now that the interface has been designed, the code can be organized to accomplish the requirements of the application. The control must be started using the correct parameters to connect with a LoggerNet server. A basic example of code used to accomplish this task is listed in the table below:

```
Private Sub cmdConnect_Click()

'Assign the connection parameters
BrokerMap.serverName = txtServerAddress.Text
BrokerMap.serverPort = txtServerPort.Text
BrokerMap.serverLogonName = txtUsername.Text
BrokerMap.serverLogonPassword = txtPassword.Text

'Start the BrokerMap control using the variables above
'The onAllStarted() event will be activated if a connection
'occurs or the onFailure() event will be activated if the
'connection fails
BrokerMap.start

End Sub
```

If the connection succeeds, the `onAllStarted()` event gets triggered. Otherwise, the `onFailure()` event gets called. The `onAllStarted()` event should contain code that iterates through the stations and displays the appropriate values in a window on the user interface. Example code for the `onAllStarted()` event is listed in the table below:

```
Private Sub BrokerMap_onAllStarted()

Dim n As Node
Dim b As Broker
Dim t As Table
Dim c As Column

'After the broker map starts, ignore any changes such as additions
'or deletions of brokers or tables from the broker map.
BrokerMap.finish

'Clear out the tree view for a fresh network map
tvwDisplay.Nodes.Clear

'Set the root node
Set n = tvwDisplay.Nodes.Add(, , "Root", "Broker Map")

'Read in the checkboxes to determine the names of the stations,
'tables and columns that will populate the TreeView object.
If chkStations.Value = 1 Then
    For Each b In BrokerMap.Brokers
        Debug.Print b.Name & " " & b.Type

    'Display the Broker Names if checked
    Set n = tvwDisplay.Nodes.Add("Root", tvwChild, b.Name, b.Name)

    'If Tables are checked, get all of the tables in that Broker
    If chkTables.Value = 1 Then
        For Each t In b.Tables
        'Display the table names
        Set n = tvwDisplay.Nodes.Add(b.Name, tvwChild, b.Name & "." & t.Name, t.Name)
'If Columns checked, get all of the columns in the tables
        If chkColumns.Value = 1 Then
            For Each c In t.Columns
            'Display the column names
            Set n = tvwDisplay.Nodes.Add(b.Name & "." & t.Name, tvwChild, b.Name & _
```

```
"." & t.Name & "." & c.Name, c.Name)
            Next
        End If
        Next
    End If
    Next

        Else
    MsgBox "You must first select to display the Stations."
End If

End Sub
```

Add additional functionality, error handling, and objects as necessary to meet the specific requirements of your application. Complete examples using the CsiBrokerMap control are included in the LoggerNet SDK installation.

Section 8. CsiDatalogger

8.1 Purpose of the CsiDatalogger Control

The CsiDatalogger control allows the developer to manage datalogger functions through the LoggerNet server. The basic managerial functions of this control include: sending a program to the datalogger, retrieving a program from the datalogger, checking the clock on the datalogger as well as setting it to the current time, setting variable values, and performing manual polls of the datalogger. Another important function creates an active connection between the server and the datalogger, to eliminate connection and disconnection overhead on slower connections.

8.2 Connecting to the Server

There are two basic actions required for this control to connect to the LoggerNet server:

1. Set server properties:
   - `serverName` - The name or IP address of the LoggerNet server . The default value is `localhost`.
   - `serverPort` - The port on which the LoggerNet server is running. The default value is 6789
   - `serverLogonName` (Optional) - If security has been enabled on the server, a valid logon name is required.
   - `serverLogonPassword` (Optional) - If security has been enabled on the server, a valid password that corresponds with a valid logon name is required.
2. Invoke the `serverConnect()` method.

8.3 Datalogger Interface

8.3.1 Properties

- clockBusy As Boolean
- loggerConnected As Boolean
- loggerName As String
- manualPollBusy As Boolean
- programReceiveBusy As Boolean
- programSendBusy As Boolean
- serverConnected As Boolean
- selectiveManualPollBusy As Boolean
- serverLogonName As String
- serverLogonPassword As String
- serverName As String
- serverPort As Long

8.3.2 Methods

- clockCancel()
- clockCheckStart()
- clockSetStart()
- loggerConnectCancel()
- loggerConnectStart(logger_priority_type priority)
- manualPollCancel()
- manualPollStart()
- programReceiveCancel()
- programReceiveStart(String fileName)
- programSendCancel()
- programSendStart(String file_name, String program_name)
- selectiveManualPollCancel()
- selectiveManualPollStart()
- serverConnect()
- serverDisconnect()

8.3.3 Events

- onClockComplete(Boolean successful, clock_outcome_type respose_code, Date current_date)
- onLoggerConnectFailure(logger_failure_type fail_code)
- onLoggerConnectStarted()
- onManualPollComplete(Boolean successful, manual_poll_outcome_type response_code)
- onProgramCompiled()
- onProgramReceiveComplete(Boolean successful, prog_receive_outcome_type response_code)
- onProgramReceiveProgress(Long received_bytes)
- onProgramSendComplete(Boolean successful, prog_send_outcome_type response_code, String compile_result)
- onProgramSendProgress(Long sent_bytes, Long total_bytes)
- onProgramSent()
- onSelectiveManualPollComplete(Boolean successful, selective_manual_poll_outcome_type response_code)
- onServerConnectFailure(server_failure_type failure_code,)
- onServerConnectStarted()

Section 9. Developing an Application Using the Datalogger Control

9.1 Purpose

This section illustrates the use of the CsiDatalogger control. This control interacts with dataloggers through the LoggerNet server to perform managerial tasks. These tasks require a connection with the specified datalogger. The user-interface we are about to develop will:

- Connect to the LoggerNet server
- Enter a datalogger to manage
- Establish an active connection with the datalogger
- Check and display time at the datalogger
- Send/Receive datalogger programs
- Retrieve data collected by a datalogger

The following section illustrates how to build an application that can perform these tasks using the CsiDatalogger control and the LoggerNet server.

9.2 Using the CsiDatalogger Control

9.2.1 Getting Started with the CsiDatalogger Control

CsiDatalogger is an SDK control (an ActiveX object) designed to display names of dataloggers in the current network. This control can also display names of all tables belonging to the selected datalogger and columns in the selected table.

This example assumes that:

- you have registered the SDK controls correctly
- you are developing the application with Visual Basic 6.0
- a LoggerNet server is currently running and accessible on the network
- at least one station already exists in the LoggerNet server's network map

Complete the following steps first:

1. Start Visual Basic 6.0 (Start | Programs | Microsoft Visual Basic 6.0 | Microsoft Visual Basic 6)

2. Start a new project (File | New Project | Standard EXE | OK). This will open a new, blank form.

3. View the toolbox for this new project (VB 6 Main Menu | View | Toolbox).

4. Right click on the toolbox area and then on the word Components to open a component window. If the SDK controls are registered on your PC, the following CSI components will appear:

   CsiBrokerMap 1.0 Type Library
   CsiCoraScript 1.0 Type Library
   CsiDatalogger 1.0 Type Library
   CsiDataSource 1.0 Type Library
   CsiLogMonitor 1.0 Type Library
   CsiServer 1.0 Type Library

Check the box next to the CsiDatalogger 1.0 Type Library, click Apply, and then close the window. An icon for the CsiDatalogger control will appear in the toolbox.

9.2.2 CsiDatalogger Control Application Example

Begin creating an application that manages an existing datalogger in the LoggerNet server network map. Design the interface and change properties to meet the requirements of your application. An example for a user interface that accomplishes the tasks outlined in the previous section is shown in Figure 9-1. This interface includes the CsiDatalogger control and other objects to create a functional application.

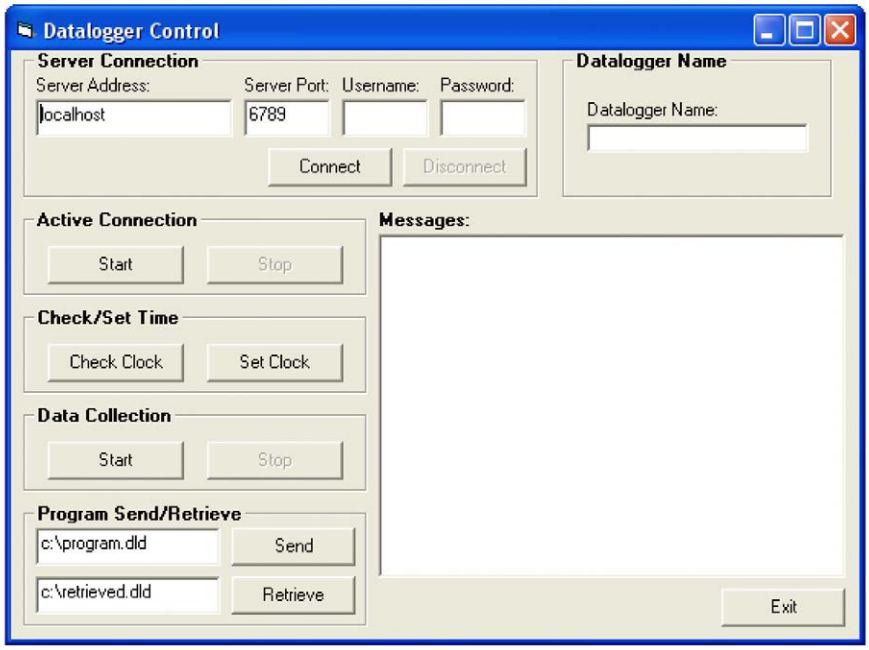


FIGURE 9-1. CsiDatalogger Example

Now that the interface has been designed, the code can be organized to accomplish the requirements of the application. The control must connect with the LoggerNet server using the correct parameters and the `serverConnect()` method. A basic example of code used to accomplish this task is listed in the table below:

```
Private Sub cmdConnect_Click()

  'Set the connection parameters
  DataLogger.serverName = txtServerAddress
  DataLogger.serverPort = txtServerPort
  DataLogger.serverLogonName = txtUsername
  DataLogger.serverLogonPassword = txtPassword

  'Connect to the LoggerNet server
  DataLogger.serverConnect

End Sub
```

If the connection succeeds, the `onServerConnectStarted()` event is triggered. Otherwise, the `onServerConnectFailure()` event is called. Next, set the name of the specific datalogger to be managed. An application can use the CsiBrokerMap control to display all stations and allow the user to select a specific datalogger from the network map. However, in this example, the user merely enters the name of a datalogger known to exist in the LoggerNet server network map. In this example, the user changes the datalogger to manage by entering a new datalogger name. However, if communication is in progress between the LoggerNet server and the datalogger, the user will not be able to change the datalogger name. An example of the code used to set the datalogger name can be found in the table below:

```
Private Sub txtDataloggerName_Change()

  'Make sure a datalogger connection is not active
  If DataLogger.loggerConnected Then
    MsgBox "Connection Active.  Can't change datalogger
name."
    TxtDataloggerName = DataLogger.loggerName
  Else
    DataLogger.loggerName = txtDataloggerName
  End If

End Sub
```

After setting the datalogger name, the managerial functions can be called to access the datalogger. The `loggerConnectStart()` method can be used to create a persistent connection between the LoggerNet server and the datalogger. The `onLoggerConnnectStarted()` event gets called if the connection succeeds. Otherwise, the `onLoggerConnectFailed()` event gets called if the connection fails. A persistent connection allows multiple transactions to occur without the need to connect and disconnect across the network to the datalogger. The following code illustrates the use of the loggerConnectStart() method:

```
Private Sub cmdDataloggerConnect_Click()

  'Create an active connection to the datalogger so that a
  'new connection isn't required for every transaction
  If DataLogger.serverConnected Then
    If DataLogger.loggerConnected Then
      WriteMessage "Already connected to datalogger"
      CmdDataloggerConnect.Enabled = False
      cmdDataloggerDisconnect.Enabled = True
    Else
      DataLogger.loggerConnectStart lp_priority_normal
      WriteMessage "Datalogger Connection Active"
    End If
  Else
    WriteMessage "Not connected to the LoggerNet server"
  End If

End Sub
```

The `loggerConnectCancel()` method cancels the managerial connection between the LoggerNet server and the datalogger. After running this method, the server will be returned to the default behavior of connecting and disconnecting from the datalogger for each transaction. The example code in the table below shows this method:

```
Private Sub cmdDataloggerDisconnect_Click()

  'Stop the active connection to the datalogger.
  If DataLogger.serverConnected Then
    If DataLogger.loggerConnected Then
      DataLogger.loggerConnectCancel
      WriteMessage "Active Datalogger Connection Stopped."
    Else
      WriteMessage "No Active Connection"
    End If
  Else
    WriteMessage "Not connected to the LoggerNet server"
  End If

End Sub
```

The `clockCheckStart()` method will check the clock on the datalogger while the `clockSetStart()` method sets the clock on the datalogger to the time on the LoggerNet server. Both of these methods call the `onClockComplete()` event that returns the current time of the datalogger clock. Example code for the clock check, clock set, and clock complete methods and event can be found in the following tables:

```
Private Sub cmdCheck_Click()

  'Check the clock on the datalogger.
  If DataLogger.clockBusy Then
    WriteMessage "Clock check already in progress"
  Else
    If DataLogger.serverConnected Then
      DataLogger.clockCheckStart
      WriteMessage "Clock Check Started"
    Else
      WriteMessage "Not connected to the LoggerNet server"
    End If
  End If

End Sub
```

```
Private Sub cmdSet_Click()

  'Set the clock on the
  If DataLogger.clockBusy Then
    WriteMessage "Clock set already in progress"
  Else
    If DataLogger.serverConnected Then
      DataLogger.clockSetStart
      WriteMessage "Clock Set Started"
    Else
      WriteMessage "Not connected to the LoggerNet server"
    End If
  End If

End Sub
```

```
Private Sub DataLogger_onClockComplete(ByVal successful _
As Boolean, ByVal response_code As _
CSIDATALOGGERLibCtl.clock_outcome_type, ByVal _
current_date As Date)

  'Clock check complete
  If successful Then
    WriteMessage "Current Datalogger Clock: " & _
current_date
  Else
    WriteMessage "Clock Check/Set failed. Code: " & _
response_code
  End If

End Sub
```

The `manualPollStart()` method connects to the datalogger and retrieves data. The `manualPollCancel()` method can be called to cancel a polling event in progress. Both of these methods trigger the `onManualPollComplete()` event, which returns the appropriate response code if the poll succeeded, failed, or was cancelled. The following tables contain code illustrating the use of these methods and event:

```
Private Sub cmdDataStart_Click()

  'Begin a manual poll to retrieve data
  If DataLogger.serverConnected Then
    DataLogger.manualPollStart
    WriteMessage "Manual Poll Started"
  Else
    WriteMessage "Not connected to the LoggerNet server"
  End If

End Sub
```

```
Private Sub cmdDataStop_Click()

  'Try to cancel a manual poll that is in progress.
  If DataLogger.serverConnected Then
    DataLogger.manualPollCancel
    WriteMessage "Trying to Cancel Manual Poll"
  Else
    WriteMessage "Not connected to the LoggerNet server"
  End If

End Sub
```

```
Private Sub DataLogger_onManualPollComplete(ByVal _
successful As Boolean, ByVal response_code As _
CSIDATALOGGERLibCtl.manual_poll_outcome_type)

  If successful Then
    WriteMessage "Manual Poll Complete"
  Else
    If response_code = mp_outcome_aborted Then
      WriteMessage "Manual Poll Aborted Successfully"
    Else
      WriteMessage "Manual Poll Failed. Code: " & _
response_code
    End If
  End If

End Sub
```

The `programReceiveStart()` method retrieves the current program from a datalogger and saves it as a specified filename. The `onProgramReceiveProgress()` event is triggered and provides information regarding the progress of the program retrieval. The `onProgramReceiveComplete()` event also runs when the file retrieval process either completes or fails. The following table shows example code for the `programReceiveStart()` method:

```
Private Sub cmdRetrieve_Click()

  'Get the current program from the datalogger
  If DataLogger.serverConnected Then
    DataLogger.programReceiveStart txtRetrieve
    WriteMessage "Retrieving Program from the Datalogger"
  Else
    WriteMessage "Not connected to the LoggerNet server"
  End If

End Sub
```

The programSendStart() method sends a program to the specified datalogger and calls the onProgramSendProgress() event, the onProgramSent() event, and the onProgramSendComplete() event respectively. The following table contains example code for the programSendStart() method:

```
Private Sub cmdSend_Click()

  'Send a program to the datalogger
  If DataLogger.serverConnected Then
    If txtSend = "" Then
      WriteMessage "Enter a Program to Send"
    Else
      DataLogger.programSendStart txtSend, ""
      WriteMessage "Sending Program " & txtSend
    End If
  Else
    WriteMessage "Not connected to the LoggerNet server"
  End If

End Sub
```

Additional functionality, error handling, and objects should be added as necessary beyond the example interface and code listed above to meet the specific requirements of your application. Complete examples using the CsiDatalogger control are included in the LoggerNet SDK installation.

Section 10. CsiDataSource Control

10.1 Purpose of the CsiDataSource Control

The CsiDataSource control allows an application to monitor data collected through the LoggerNet server. These sessions that monitor data are know as Advisors. Advisors display data collected in the LoggerNet server data cache. This control can have multiple advisor sessions with a single server connection.

This control requires that the LoggerNet server collect data for the same tables or final storage areas that are being monitored. If you start an advisor on a table that is not being collected by the LoggerNet server, you will not receive any onAdviseRecord events. An exception to this rule occurs if you are monitoring input locations on a mixed-array datalogger. When you create an advisor for an input location on a mixed-array datalogger, a temporary data cache is created. Then, with the advisor ready, enabling scheduled collection with the datalogger will return records to the advisor.

The CsiBrokerMap control is often used in conjunction with this control to display what tables and columns can be monitored. Additionally, the CsiDatalogger control can also be used to issue a manual data poll and collect records from the datalogger.

10.2 Connecting to the Server

There are two basic actions required to connect to the LoggerNet server:

1. Set server properties:

    - serverName - The name or IP address of the LoggerNet server. The default value is `localhost`.
    - serverPort - The port on which the LoggerNet server is running. The default value is `6789`
    - logonName (Optional) - If security has been enabled on the server, a valid logon name is required.
    - logonPassword (Optional) - If security has been enabled on the server, the correct password for a valid logon name is required.

2. Invoke the `connect()` method.

10.3 CsiDataSource Interfaces

The following interfaces are used in the CsiDataSource control:

- DSource – the controlling interface
- Advisor - created through the DSource interface to monitor certain data columns on a specified station and table.
- Record - received in the event onAdviseRecord. A record is a collection of values that contain data.
- Value - contains the name and value of a single column.

10.3.1 Dsource Interface

See the Reference Section for descriptions of these properties, methods, and events.

10.3.1.1 Properties

- logonName As String
- logonPassword As String
- serverName As String
- serverPort As Long
- state As data_source_state
- sendRecordBlocks as Boolean

10.3.1.2 Methods

- connect()
- createAdvisor() As Object
- disconnect()

10.3.1.3 Events

- onAdviseReady(Object myAdvisor)
- onAdviseRecord(Object myAdvisor, Object myRecord)
- onAdvisorFailure(csiAdvisorFailureCode failure, Object myAdvisor)
- onControlFailure(csidsFailureCode failureCode)
- onControlReady()
- onVariableSetComplete(Long tran_id, Object myAdvisor, Boolean successful, variable_outcome_type response_code)
- onAdviseRecords(Object myAdvisor, object record_collection)

10.3.2 Advisor Interface

See the Reference Section for descriptions of these properties, methods, and events.

10.3.2.1 Properties

- advisorName As String
- orderOption As csidsOrderOptionType
- startDate As Date
- startFileMarkNo As Long
- startIntervalSeconds As Long
- startOption As csidsStartOptionType
- startRecordNo As Long
- startRecordNoString As String
- state As advisor_state
- stationName As String
- tableName As String
- startDateNanoSeconds As Long
- maxRecordsPerBlock As Long

10.3.2.2 Methods

- columns() As Object
- start()
- stop()
- variableSetCancel(Long tran_id)
- variableSetStart(String column_name, String value) as Long

10.3.3 DataColumnCollection Interface

See the Reference Section for descriptions of these properties and methods.

10.3.3.1 Properties

- count As Long

10.3.3.2 Methods

- add(String columnName)
- addAll()
- find(String column_name) As Long
- Item(id) As DataColumn
- remove(String columnName)
- removeAll()
- _NewEnum() (GetEnumerator() in .NET)

10.3.4 DataColumn Interface

See the Reference Section for descriptions of these properties.

10.3.4.1 Properties

- name As String

10.3.5 Record

See the Reference Section for descriptions of these properties, methods, and events.

10.3.5.1 Properties

- fileMarkNo As Long
- recordNo As Long
- timeStamp As Date
- valuesCount As Long
- nanoSeconds as Long

10.3.5.2 Methods

- item(id) as value
- _NewEnum() (GetEnumerator() in .NET)

10.3.6 RecordCollection

10.3.6.1 Properties

- Count As Long

10.3.6.2 Methods

- Item(id, record)
- _NewEnum() (GetEnumerator() in .NET)

10.3.7 Value Interface

See the Reference Section for descriptions of these properties, methods, and events.

10.3.7.1 Properties

- columnName As String
- value As Variant

Section 11. Developing an Application Using the CsiDataSource Control

11.1 Purpose

The CsiDataSource control primarily monitors data residing in the LoggerNet server data cache. The LoggerNet server data cache is a location where the server stores collected datalogger records. The control can also be used to see measurements performed in real-time; for example, values being recorded for input locations in *mixed-array dataloggers*. The BrokerMap control often accompanies this control to display the names of tables and columns in each table so they can be selected for data monitoring. However, the example illustrated in this section requires that the user enter a station and table that are known to exist on the LoggerNet server and all columns will be monitored within that table. The application we develop will:

- Connect to a LoggerNet server
- Allow the user to enter a known station and table
- Monitor data in all columns of the table

The following section illustrates how to build an application that can perform these tasks using the CsiDataSource control and the LoggerNet server.

11.2 Using the CsiDataSource Control

11.2.1 Getting Started with the CsiDataSource Control

CsiDataSource is an SDK control (an ActiveX object) designed to monitor data collected from the dataloggers in the LoggerNet network. This example assumes that:

- you have registered the SDK controls correctly
- you are developing the application with Visual Basic 6.0
- a LoggerNet server is currently running and accessible on the network
- at least one station already exists in the LoggerNet server's network map

Complete the following steps first:

1. Start Visual Basic 6.0 (Start | Programs | Microsoft Visual Basic 6.0 | Microsoft Visual Basic 6)
2. Start a new project (File | New Project | Standard EXE | OK). This will open a new, blank form.

3. View the toolbox for this new project (VB 6 Main Menu | View | Toolbox).

4. Right click on the toolbox area and then on the word Components to open a component window. If the SDK controls are registered on your PC, the following CSI components will appear:

   CsiBrokerMap 1.0 Type Library
   CsiCoraScript 1.0 Type Library
   CsiDatalogger 1.0 Type Library
   CsiDataSource 1.0 Type Library
   CsiLogMonitor 1.0 Type Library
   CsiServer 1.0 Type Library

Check the box next to the CsiDataSource 1.0 Type Library, click Apply, and then close the window. An icon for the CsiDataSource control will appear in the toolbox.

11.2.2 CsiDataSource Control Application Example

You are now ready to begin creating an application that monitors data from an existing datalogger table in the LoggerNet server network map. Design the interface and change properties to meet the requirements of your application. An example interface that accomplishes the tasks outlined previously in this section is shown in Figure 11-1. This interface includes the CsiDataSource control and other objects to create a functional application.

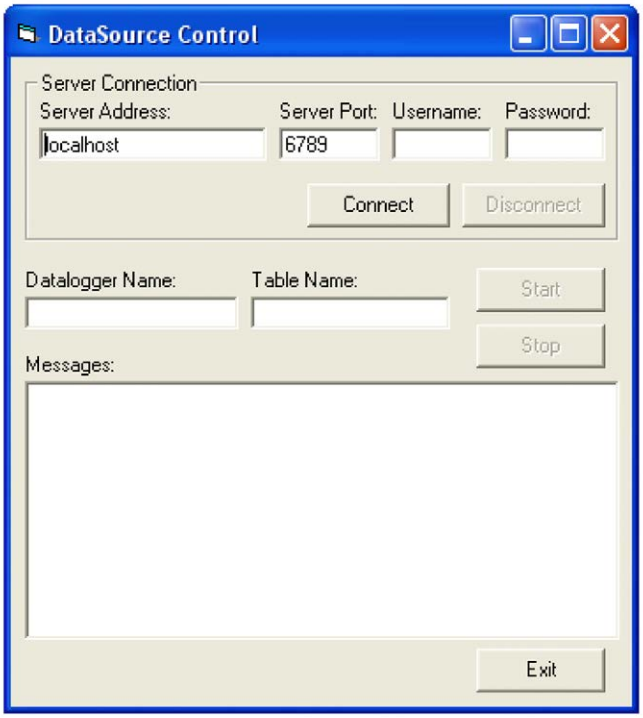


FIGURE 11-1. CsiDataSource Example

Now that the interface has been designed, the code can be organized to accomplish the requirements of the application. The control must connect with the LoggerNet server using the correct parameters and the `connect()` method. If the connection succeeds, the onControlReady() event will be called. A basic example of code used to accomplish this task is listed in the table below:

```
Private Sub cmdConnect_Click()

'Set connection parameters
DSource.serverName = txtServerAddress
DSource.serverPort = txtServerPort
DSource.logonName = txtUsername
DSource.logonPassword = txtPassword

'Connect to the LoggerNet server.  Successful connections will be
'handled by the onControlReady() function.  If the control fails,
'the onControlFailure() function will handle these failures
DSource.Connect

End Sub
```

Once connected to the LoggerNet server, the Advisor can be created by entering a known datalogger and table in the text fields and calling the createAdvisor() method. An application may use the CsiBrokerMap to display all stations and allow the user to select a specific datalogger, table, and column. However, in this example, the user merely enters the name of a datalogger and table known to exist in the LoggerNet server network map. An example of the code used to start an Advisor that will monitor data in all columns of a specific datalogger and table can be found in the table below:

```
Private Sub cmdStartAdvisor_Click()
Dim CurrentAdvisor as Advisor
Dim dcc as DataColumnCollection

   'Create a new advisor.  Make sure a connection is active to the
   'LoggerNet server before attempting to start the Advisor.
   'Add all columns to the Advisor to simplify the example.
     Set CurrentAdvisor = Dsource.createAdvisor

     'Set some properties for the advisor
     CurrentAdvisor.advisorName = "NewAdvisor"
     CurrentAdvisor.stationName = txtDatalogger
     CurrentAdvisor.tableName = txtTable

     'Add all columns to the advisor.
     Set dcc = CurrentAdvisor.columns
     dcc.addAll

     'Start the Advisor. When started, onAdviseReady and
     'onAdviseRecord will activate.  If an advisor fails, the
     'onAdvisorFailure event will be called.
     CurrentAdvisor.start
   End If

End Sub
```

After starting the Advisor, the onAdviseReady() event will run and begin watching the specified table and columns for new data. The onAdviseRecord() event gets called when new records appear in the LoggerNet server data cache from the specified datalogger table and columns. The following code illustrates how records are received:

```
Private Sub DSource_onAdviseRecord(ByVal myAdvisor As Object, _
ByVal myRecord As Object)

   'Declare Variables
   Dim val As Value
   Dim rec As Record

   Set rec = myRecord

   'Display the Advisor and record information to the user
   WriteMessage ""
   WriteMessage "OnAdvise ready event occurred"
   WriteMessage "Advisor Name: " & CurrentAdvisor.advisorName
   WriteMessage "FileMarkNo. " & rec.fileMarkNo
   WriteMessage "RecordNo. " & rec.recordNo
   WriteMessage "TimeStamp. " & rec.TimeStamp

   'Display the values for all columns in the record
   For Each val In rec
     WriteMessage val.columnName & ": " & val.Value
   Next

End Sub
```

The Advisor will continue displaying new records as they are received until the stopAdvisor() method is called to stop the Advisor. The following code illustrates the use of this method:

```
Private Sub cmdStopAdvisor_Click()

   'Stop the Advisor.
   CurrentAdvisor.stop
   WriteMessage "Advisor Stopped"

End Sub
```

Additional functionality, error handling, and objects should be added as necessary beyond the example interface and code listed above to meet the specific requirements of your application. Complete examples using the CsiDataSource control are included in the LoggerNet SDK installation.

Section 12. CsiLogMonitor Control

12.1 Purpose of the CsiLogMonitor Control

The CsiLogMonitor Control provides access to log message from the LoggerNet server. The log messages stream to this control as a text string. Use this control to display log messages or to monitor events as they occur on the server and call other operations or programs based on these LoggerNet server events.

The types of log files that can be retrieved from the LoggerNet server with the CsiLogMonitor control include the transaction log and the communication log. The transaction log messages use the following basic format:

"StationName", "MessageNumber", "Message"

The developer can create a program using the CsiLogMonitor control to filter each message by station name and watch for message numbers and messages that indicate a specific event. By parsing the transaction log text string and looking for the triggering messages listed below, the declared station event can be monitored.

Some station events require a preceding message. In these cases, look for the preceding message and then for the triggering message to appear later in the log messages. The preceding message will not necessarily appear in the logs immediately prior to the triggering log message.

Station Event	**Triggering Log Message "MessageNumber", "Message"**	**Preceding Log Message "MessageNumber", "Message"**
On Call-Back	"114", "Call-back Started"	N/A
After Call-Back	"116", "Call-back Stopped"	N/A

The communication log messages use the following basic format:

"StationName", "MessageType", "Message"

The message types in the communication log are "S" for a status message, "W" for a warning message, and "F" for a failure message. Status messages are general communication messages, warning messages declare a possible problem and communication retries, and failure messages appear when all retries have been exhausted and communication will no longer be attempted by the LoggerNet server for a specific transaction.

12.2 CsiLogMonitor Interface

See the Reference section in this manual for detailed descriptions of these properties, methods, and events.

12.2.1 Properties

- commLogMonitorBusy As Boolean
- commLogRecordsBack As Long
- serverConnected As Boolean
- serverLogonName As String
- serverLogonPassword As String
- serverName As String
- serverPort As Long
- tranLogMonitorBusy As Boolean
- tranLogRecordsBack As Long

12.2.2 Methods

- commLogMonitorStart()
- commLogMonitorStop()
- serverConnect()
- serverDisconnect()
- tranLogMonitorStart()
- tranLogMonitorStop()

12.2.3 Events

- onCommLogFailure(log_monitor_failure_type failure_code)
- onCommLogRecord(Date timestamp, String comm_log_record)
- onServerConnectFailure(server_failure_type failure_code)
- onServerConnectStarted()
- onTranLogFailure(log_monitor_failure_type failure_code)
- onTranLogRecord(Date timestatmp, String tran_log_record)

Section 13. Developing an Application Using the CsiLogMonitor Control

13.1 Purpose

This section shows an example of how to build an application using the CsiLogMonitor control. The application's functions are:

1. Connect to a running LoggerNet server

2. Monitor the LoggerNet server transaction and communication logs.

13.2 Using the CsiLogMonitor Control

13.2.1 Getting Started with the CsiLogMonitor Control

The CsiLogMonitor SDK control (an ActiveX object) connects to the LoggerNet server and monitors transaction and communication logs.

This example assumes that:

- you have registered the CsiLogMonitor control correctly
- you are developing the application in Visual Basic 6.0
- a LoggerNet server is running and accessible on the network

Complete the following steps first:

1. Start Visual Basic 6.0 (Start | Programs | Microsoft Visual Basic 6.0 | Microsoft Visual Basic 6)

2. Start a new project (File | New Project | Standard EXE | OK) opening a new, blank form.

3. View the toolbox for this new project (VB 6 Main Menu | View | Toolbox).

4. Right click on the toolbox area and select Components. A component window will open and the following SDK controls will appear within the list if they are registered properly:

   CsiBrokerMap 1.0 Type Library
   CsiCoraScript 1.0 Type Library
   CsiDatalogger 1.0 Type Library
   CsiDataSource 1.0 Type Library
   CsiLogMonitor 1.0 Type Library
   CsiServer 1.0 Type Library

Check the box next to the CsiLogMonitor 1.0 Type Library, click Apply, and close the window. An icon for the CsiLogMonitor control will appear in the toolbox.

13.2.2 CsiLogMonitor Control Application Example

You are now ready to begin creating an application that monitors log messages from the LoggerNet server. An example of a user interface that accomplishes this task is shown in Figure 13-1. This interface includes the CsiLogMonitor control and other objects on the form to create a functional application.

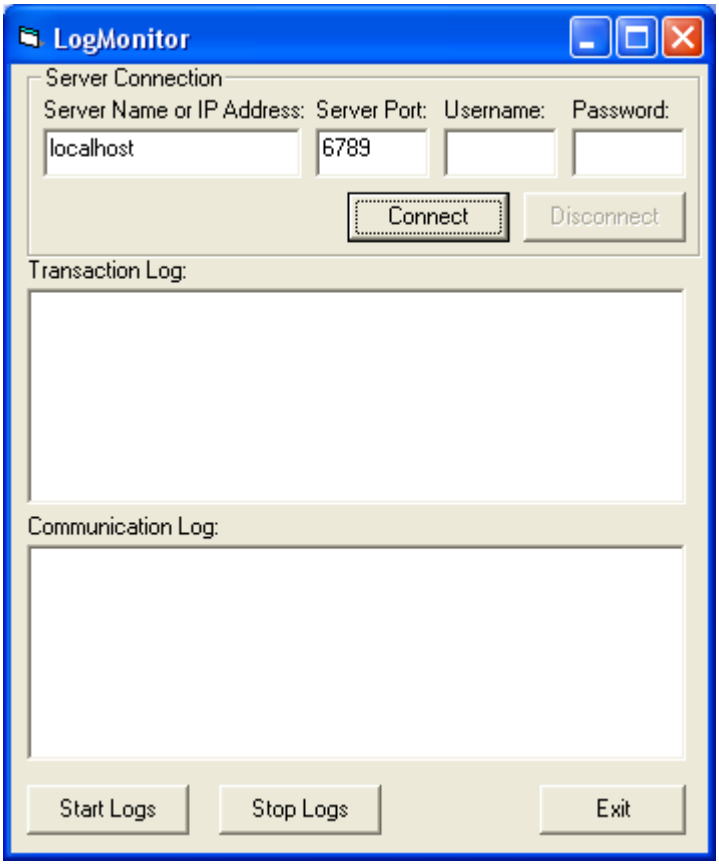


FIGURE 13-1. CsiLogMonitor Example

Now that the interface has been designed, the code can be organized to accomplish the requirements of the application. Initially, the application must connect to the LoggerNet server using the serverConnect() method. A basic example of code used to accomplish this task is shown in the table that follows:

```
Private Sub cmdConnect_Click()
'Connect using the default logon settings.
CsiLogMonitor.serverName = txtServerAddress
CsiLogMonitor.serverPort = txtServerPort
CsiLogMonitor.serverLogonName = txtUsername
CsiLogMonitor.serverLogonPassword = txtPassword

'Start the connection to the LoggerNet server
CsiLogMonitor.serverConnect

Exit Sub
```

If the connection succeeds, the onServerConnectStarted() event gets triggered. Otherwise, the onServerConnectFailure() event gets called if the connection fails.

In order to start monitoring the transaction log, the tranLogMonitorStart() method must be called. To monitor communication log messages, call the commLogMonitorStart() method.

The LoggerNet server maintains a buffer of historical log messages. By default, the last 100 log file messages will be retrieved when log monitoring first starts. To change the number of historical log messages that are retrieved, set the commLogRecordsBack and tranLogRecordsBack properties before starting log monitoring. A basic example of code using these methods to set the number of historical records received and to start collecting both types of log messages follows:

```
Private Sub cmdStart_Click()
'Set the number of historical log messages to retrieve from the
'LoggerNet server when monitoring starts
CsiLogMonitor.commLogRecordsBack = 5
CsiLogMonitor.tranLogRecordsBack = 5

'Start Monitoring the Tranaction Log and the Communications Log
'on the LoggerNet server
CsiLogMonitor.commLogMonitorStart
CsiLogMonitor.tranLogMonitorStart

End Sub
```

Log messages will be passed as Strings to the onCommLogRecord() and onTranLogRecord() events respectively as they are generated by the LoggerNet server. A timestamp for when the log message is generated is also passed to these events. The String can be displayed or parsed and manipulated by station name and message type.

```
Private Sub CsiLogMonitor_onCommLogRecord(ByVal timestamp As Date,
ByVal comm_log_record As String)

lstCommLog.AddItem timestamp & " : " & comm_log_record
If lstCommLog.ListCount = 10 Then
    lstCommLog.Clear
End If

End Sub
```

Stop monitoring logs with the commLogMonitorStop() and tranLogMonitorStop() events. You can check for active log monitoring by checking the commLogMonitorBusy and tranLogMonitorBusy properties or this control.

```
Private Sub cmdStop_Click()
If CsiLogMonitor.commLogMonitorBusy Then
    CsiLogMonitor.commLogMonitorStop
End If

If CsiLogMonitor.tranLogMonitorBusy Then
    CsiLogMonitor.tranLogMonitorStop
End If

End Sub
```

Add additional functionality, error handling, and objects as necessary beyond the example interface and code listed above to meet the specific requirements of your application. Complete examples using the CsiLogMonitor control are included in the LoggerNet SDK installation.

Section 14. CsiServer Control Reference

14.1 Server Interface

14.1.1 Properties

Server.applicationWorkDir

Name

```
Server.applicationWorkDir As String
```

Description

This property gives the location where the LoggerNet server data files are stored and must be set before starting the LoggerNet. If this property needs to be changed after the LoggerNet server has been started, call stopServer(), set the new location, and then call startServer().

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

Server.buildDate

Name

```
Server.buildDate As String
```

Description

This read-only property displays the build date of the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_STARTED	Error: The LoggerNet server is not started

Server.logFileDir

Name

```
Server.logFileDir As String
```

Description

This property specifies the location where the LoggerNet server writes log files and must be set before starting the LoggerNet server. If this property needs to be changed after the LoggerNet server has been started, call stopServer(), set the new location, and then call startServer(). By default the log file directory will be placed in the LoggerNet server working directory.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

Server.serverStarted

Name

```
Server.serverStarted As Boolean
```

Description

This read-only value displays the current state of a LoggerNet server that has been started by the Server control. If the LoggerNet server is running, this value will be TRUE. Otherwise, this value will be FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Server.serverVersion

Name

```
Server.serverVersion As String
```

Description

This property is a read-only value that displays the version of the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_STARTED	Error: The LoggerNet server is not started

Server.serverWorkDir

Name

```
Server.serverWorkDir As String (Required)
```

Description

This required property must be specified before starting the LoggerNet server and describes the location of the LoggerNet server configuration files. This property must be set before starting the LoggerNet server or the startServer() event will fail. If this location needs to be changed after the LoggerNet server has been started, call stopServer(), set the new location, and then call startServer().

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

Server.tcpPort

Name

```
Server.tcpPort As Integer
```

Description

This property sets the TCP port that the LoggerNet server will use when listening for client connections and must be set before starting the LoggerNet server. LoggerNet uses the TCP port 6789 by default. This property accepts 1 - 32767 as valid values.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Server.tcpPortEx

Name

```
Server.tcpPortEx As Long
```

Description

This property sets the TCP port that the LoggerNet server will use when listening for client connections and must be set before starting the LoggerNet server. LoggerNet uses TCP port 6789 by default This property accepts the full range of valid TCP port numbers 1 – 65535.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

14.1.2 Methods

Server.startServer()

Name

```
Server.startServer()
```

Description

This method starts the limited LoggerNet server (CORALIB3.DLL). The CORALIB3.DLL must exist in the application folder, the PATH environmental variable, or the Windows directory or this method will fail.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ALREADY_STARTED	Error: This error is returned if the Server control has already started the LoggerNet server
E_CSI_INVALIDARG	Error: No working directory set
E_CSI_FAIL	Error: Another LoggerNet server not started by the Server control is already running or an unexpected error has occurred

Server.stopServer()

Name

```
Server.stopServer()
```

Description

This method will stop the limited LoggerNet server (CORALIB3.DLL).

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

14.1.3 Events

Server_onServerFailure()

Name

```
onServerFailure(String reason)
```

Description

This event gets triggered when the LoggerNet server started by the Server control fails.

Section 15. CsiCoraScript Control Reference

15.1 CoraScript Interface

15.1.1 Properties

CoraScript.serverConnected

Name

```
CoraScript.serverConnected As Boolean (read-only)
```

Description

This Boolean property describes the state of the connection between the CoraScript control and the LoggerNet server. The property returns TRUE if the connection exists. Otherwise, the property returns FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

CoraScript.serverLogonName

Name

```
CoraScript.serverLogonName As String
```

Valid Values

If security is enabled on the target LoggerNet server, this string must be one of the account names recognized by the LoggerNet server.

Default Value

The default value for this property is an empty string. This property will only affect the operation of the control if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

CoraScript.serverLogonPassword

Name

```
CoraScript.serverLogonPassword As String
```

Valid Values

If security is enabled on the target LoggerNet server, this string must be the password associated with the account named by CoraScript.serverLogonName.

Default Value

The default value for this property is an empty string. This property will only affect the operation of the control if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

CoraScript.serverName

Name

```
CoraScript.serverName As String
```

Description

Specifies the TCP/IP interface address for the computer hosting the LoggerNet server. This string must be formatted either as a qualified Internet machine domain name or as an Internet address string. An example of a valid machine domain name address is `www.campbellsci.com`. An example of a valid Internet address string is `63.255.173.183`.

The default value for this property is the string `localhost`.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Attempt to set serverName while connected to the LoggerNet server

CoraScript.serverPort

Name

```
CoraScript.serverPort As Long
```

Description

Specifies the TCP port number that the LoggerNet server is using on the hosting computer. The valid range for this property is port 1 to port 65535.

The default value for this property is port 6789, which is the default port number assigned for the LoggerNet server. The default value for this property will connect to a LoggerNet server port in most cases.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_INVALIDARG	Error: The port value is out of range or invalid
E_CSI_BUSY	Error: Attempt to set serverPort while connected to the LoggerNet server

15.1.2 Methods

CoraScript.executeScript()

Name

```
CoraScript.executeScript(String script, Long asychID)
As String
```

Description

This method allows CoraScript commands to be executed by the LoggerNet server. Pass the CoraScript command in as the first parameter and use the second parameter to determine whether the method performs asynchronously or synchronously. If you want this command to execute synchronously, pass in a zero (0) for the asyncID. If an asyncID other than zero (0) is specified, the onScriptComplete() event will be triggered with the result and the asyncID that was specified.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_FAIL	Error: Unexpected Error

CoraScript.serverConnect()

Name

`CoraScript.serverConnect()`

Description

This method attempts to connect to the LoggerNet server using the values in the previously set properties: serverName, serverPort, serverLogonName, and serverLogonPassword. This method triggers `onServerConnectStarted()` if the connection is successful, or `onServerConnectFailure`() if the connection fails.

COM Return Values

Table of Possible Values

Code	Meaning
`S_OK`	Success: Normal return
`E_CSI_FAIL`	Error: Unexpected error

CoraScript.serverDisconnect()

Name

`CoraScript.serverDisconnect()`

Description

This method will disconnect from the LoggerNet server and will set the `serverConnected` state to FALSE. This method should only be called when the value of `serverConnected`, is TRUE. Otherwise, this method will return `E_CSI_NOT_CONNECTED`.

COM Return Values

Table of Possible Values

Code	Meaning
`S_OK`	Success: Normal return

15.1.3 Events

CoraScript_onScriptComplete()

Name

onScriptComplete(Long asyncID, String result)

Description

This event displays the results from the method CoraScript.executeScript(). However, this event is only activated when an asyncID other than “0” is passed to that method.

CoraScript_onServerConnectStarted()

Name

```
onServerConnectStarted()
```

Description

The control has connected to the LoggerNet server.

CoraScript_onServerConnectFailure()

Name

```
onServerConnectFailure(server_failure_type
server_failure)
```

Description

An error has occurred that caused the connection to the LoggerNet server to fail for this control.

Table of Possible failure codes.

Enumeration Name	Value	Description
server_failure_unknown	0	Indicates that an error has occurred but its nature is unknown
server_failure_logon	1	Indicates that this control was unable to logon to the LoggerNet server because either the logonName or logonPassword property is incorrect
server_failure_session	2	Indicates that the communication session with the LoggerNet server failed resulting in a failed transaction
server_failure_unsupported	3	The version of the LoggerNet server does not support this transaction
server_failure_security	4	Indicates that the account specified by logonName does not have sufficient privileges to start this transaction with the LoggerNet server
server_failure_bad_host_or_port	5	Indicates that either the serverName or the serverPort property is incorrect

Section 16. CsiBrokerMap Control Reference

16.1 BrokerMap Interface

16.1.1 Properties

BrokerMap.serverName

Name

```
BrokerMap.serverName As String
```

Description

Specifies the TCP/IP interface address for the computer that is hosting the LoggerNet server. This string must be formatted either as a fully qualified Internet machine domain name or as an IP address string. An example of a valid machine domain name address is www.campbellsci.com. An example of a valid IP address string is `63.255.173.183.`

Default Value

The default value for this property is the string `localhost.`

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Attempt to set serverName while connected to the server

BrokerMap.serverLogonName

Name

```
BrokerMap.serverLogonName As String
```

Valid Values

If security is enabled on the target LoggerNet server, this string must be an account name recognized by the LoggerNet server. These accounts can be set up using the *Security Manager* that is part of the LoggerNet Admin software suite or through the CsiCoraScript control.

Default Value

The default value for this property is an empty string.

Notes

This property is only used if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Attempt to set serverLogonName while connected to the LoggerNet server

BrokerMap.serverLogonPassword

Name

```
BrokerMap.serverLogonPassword As String
```

Valid Values

If security is enabled on the target LoggerNet server, this string must be a valid password associated with the account described in the serverLogonName property.

Default Value

The default value for this property is an empty string.

Notes

This property is only used if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Attempt to set serverLogonPassword while connected to the LoggerNet server

BrokerMap.serverPort

Name

```
BrokerMap.serverPort As Long
```

Description

Specifies the TCP port number that the LoggerNet server is using on the hosting computer. The valid range for this property is 1 to 65535.

Default Value

The default value for this property, assigned to the LoggerNet server, is 6789. In most cases, the default value for this property is acceptable.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Attempt to set serverPort while connected to the LoggerNet server
E_CSI_INVALIDARG	Error: The port value is invalid (out of range)

BrokerMap.autoExpand

Name

```
BrokerMap.autoExpand As Boolean
```

Description

This setting determines if the broker will automatically expand to include all brokers and tables or if the Broker.start_expansion() method must be called to list all the brokers and Table.start_expansion() method to list all tables for each broker. If the list of brokers and tables is extensive, it may be quicker to list the brokers and expand the tables for each broker separately. The default setting is true, which means that all brokers and tables will be expanded automatically.

Default Value

The default value for this property is true

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

BrokerMap.serverConnected

Name

```
BrokerMap.serverConnected As Boolean
```

Description

This property describes the state of the connection between the BrokerMap control and the LoggerNet server. If the connection is active, the property is TRUE. Otherwise, the property is FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal Return

16.1.2 Methods

BrokerMap.Brokers()

Name

```
BrokerMap.Brokers() As Object
```

Description

Use this method to iterate through the Brokers and return a Broker Collection.

BrokerMap.finish()

Name

```
BrokerMap.finish()
```

Description

This method tells the control to discontinue sending events or changes to the brokers, which holds the current broker map in a static format for your application. This method should only be called after the start() method has been invoked.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

BrokerMap.start()

Name

```
BrokerMap.start()
```

Description

This method starts the broker map query to get the brokers, tables, and columns. Immediately following the invocation of this method, the events `onBrokerAdded()` and `onTableAdded()` will follow to describe the brokers and tables currently in the broker map.

If there is already a connection to the server, this method will return the error `E_CSI_ALREADY_CONNECTED`. If an error occurs while trying to connect, this method will return the error `E_CSI_BAD_HOST_OR_PORT`.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ALREADY_CONNECTED	Error: Already connected to the LoggerNet server
E_CSI_BAD_HOST_OR_PORT	Error: Cannot connect. Property serverName or serverPort possibly wrong

16.1.3 Events

BrokerMap_onAllStarted()

Name

```
onAllStarted()
```

Description

This event is a result of invoking the `start()` method. This event gets called after all of the initial `onBrokerAdded()` and `onTableAdded()` events have been called from the `start()` method and the broker map is known.

BrokerMap_onBrokerAdded()

Name

```
onBrokerAdded(Object Broker)
```

Description

This event gets called as new brokers are added to the broker map. Information about the new broker can be accessed with the broker object returned with this event.

BrokerMap_onBrokerDeleted()

Name

```
onBrokerDeleted(Object Broker)
```

Description

This event gets called as brokers are deleted from the broker map. Information about the broker deleted from the broker map can be accessed with the broker object returned with this event. After the broker object returned by this event goes out of scope, the referenced object in the control will be permanently deleted. The broker is kept alive for this event so that its properties can be referenced by the client application one last time.

BrokerMap_onFailure()

Name

```
onFailure(BrokerMapFailureType failure_code)
```

Description

When the BrokerMap control fails, an error from the following table will be returned with this event:

Table of Failure Codes

Name	Value	Description
`failure_unknown`	0	The cause of the failure could not be determined
`failure_connection_failed`	1	The connection has failed. Check the serverName and serverPort
`failure_invalid_logon`	2	The LoggerNet server has security enabled and the logon is invalid. Check serverLogonName and serverLogonPassword
`failure_server_security`	3	The LoggerNet server has security enabled and you do not have sufficient privileges to complete this transaction
`failure_table_browser`	4	There has been an error while getting table information

BrokerMap_onTableAdded()

Name

```
onTableAdded(Object Broker, Object Table)
```

Description

This event gets called when a new table is added to a broker in the broker map. Information about the table added to the broker in the broker map can be accessed with the table object and broker object returned by this event.

BrokerMap_onTableDeleted()

Name

```
onTableDeleted(Object Broker, Object Table)
```

Description

This event gets called when a table is deleted from a broker in the broker map. The table that was deleted will be returned as a broker object and table object with this event.

BrokerMap_onTableChanged()

Name

```
onTableChanged(Object Broker, Object Table)
```

Description

This event executes when a Table in a Broker changes. Information about the Broker and Table that changed are returned with this event.

BrokerMap_onBrokerStarted()

Name

```
onBrokerStarted(Object Broker)
```

Description

An event that indicates a Broker is in a started state. Information about the Broker is returned with this event.

16.2 BrokerCollection Interface

16.2.1 Properties

BrokerCollection.Count

Name

```
BrokerCollection.Count As Long
```

Description

This property returns the number of brokers in the network map

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

16.2.2 Methods

BrokerCollection.Item()

Name

```
BrokerCollection.Item(id) As Broker
```

Description

A Broker can be referenced by an integer, a long, or by the name of the Broker (a string). If the number is less than zero or is greater than the number of brokers minus one, then the COM error E_CSI_ARRAY_OUT_OF_BOUNDS will be returned. If the broker cannot be found by name, then the COM error E_CSI_NOT_FOUND will be returned.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ARRAY_OUT_OF_BOUNDS	Error: Array out of bounds
E_CSI_NOT_FOUND	Error: Couldn't find the broker by name in the broker map
E_CSI_FAIL	Error: Wrong variant type passed to this method or unexpected error

Visual Basic

Return Type
Broker

Example
Referencing the broker by a number value

```
Dim iterator As Long
For iterator = 0 to BrokerMap.Broker.Count – 1
 Debug.Print
 BrokerMap.Brokers(iterator).ID
Next iterator
```

Referencing the broker by name:

```
Dim brokerName as String
Dim myid as long
brokerName = "cr10x"
myid = BrokerMap.Brokers(brokerName).id
```

BrokerCollection._NewEnum()

Name

`BrokerCollection._NewEnum()` — Return the next broker in the broker map sequence.

Important

This method is only intended for use with the Visual Basic programming language. Visual Basic programmers do not need to access this method directly but can use it indirectly with the `For Each` loop. This method is included in the documentation to explain why the method exists, but, again, it is not accessed directly.

Visual Basic

Example

```
Dim b As Broker
For Each b in BrokerMap.Brokers
  Debug.print b.name
Next
```

16.3 Broker Interface

16.3.1 Properties

Broker.ID

Name

`Broker.id As Long`

Description

This is a read-only property describing the unique ID of each broker.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Broker.name

Name

`Broker.name As String`

Description

This read-only property returns the name of a broker.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Broker.type

Name

`Broker.type As BrokerType` — The type of the broker (read only).

Description

This read-only property returns the type of the broker.

Possible Values

Table of Broker Type Enumeration

Name	Value	Description
broker_active	1	The data broker associated with the current configuration of a device object
broker_backup	2	A data broker associated with a previous configuration of a device object
broker_client	3	A data broker created at the request of a client
broker_statistics	4	A data broker created by the LoggerNet server to report operating statistics

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Broker.datalogger_type

Name

```
Broker.datalogger_type As String
```

Description

The read-only device type of the Broker

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Broker.allStarted

Name

```
Broker.allStarted As Boolean
```

Description

Set to TRUE when all the tables for the broker have been reported.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

16.3.2 Methods

Broker.Tables()

Name

```
Broker.Tables() As Object
```

Description

This method returns a reference to a TableCollection, which can be used to iterate through the tables in a broker.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Broker.start_expansion()

Name

```
Broker.start_expansion()
```

Description

If the BrokerMap autoExpand property has been set to FALSE, use this method to access the list of tables for a Broker.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal Return

16.4 TableCollection Interface

16.4.1 Properties

TableCollection.Count

Name

```
TableCollection.Count As Long
```

Description

This property returns the number of tables in a TableCollection

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

16.4.2 Methods

TableCollection.Item()

Name

```
TableCollection.Item(id) As Table
```

Description

Returns the requested table if it exists. A table can be referenced by a number (like an index), or by a string (the name of the table). If the number is less than zero or is greater than the number of tables, then the error `E_CSI_ARRAY_OUT_OF_BOUNDS` will be returned. If the table cannot be found by name, then the error `E_CSI_NOT_FOUND` will be returned.

Prototypes

TableCollection.Item(Number) - Array index.
TableCollection.Item(String) - Table name.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ARRAY_OUT_OF_BOUNDS	Error: Array subscript out of bounds
E_CSI_NOT_FOUND	Error: Table not found by name in the broker map
E_CSI_FAIL	Error: Wrong variant type passed or unexpected error

Visual Basic

Return Type
Table

Example
By number:

```
long iterator
For iterator = 0 to BrokerMap.Broker("cr9000").Tables.Count – 1
 Debug.Print BrokerMap.Brokers("cr9000").Tables.ID
Next iterator
```

By string:

```
Dim tableName as String
Dim myid as long
tableName = "cr10x"
myid = BrokerMap.Broker("cr9000").Tables(tableName).id
```

TableCollection._NewEnum()

Name

`TableCollection._NewEnum()` — Return the next Table in the sequence.

Important

This method is only intended for use with Visual Basic. Visual Basic programmers do not need to access this method directly. They use it indirectly by using the collections with the `For Each` loop. This method is included in the documentation to explain why the method exists, but, again, it is not accessed directly.

16.5 Table Interface

16.5.1 Properties

Table.interval

Name

```
Table.interval As Long
```

Description

The time interval between records. If the table is event-driven, a value of zero will be used.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Table.name

Name

```
Table.name As String
```

Description

This read-only property returns the name of the table.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Table.originalSize

Name

```
Table.originalSize As Long
```

Description

This property returns the number of records that can be stored in the original datalogger table.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Table.size

Name

```
Table.size As Long
```

Description

This property returns the number of records that can be stored in this table.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

16.5.2 Methods

Table.Columns()

Name

```
Table.Columns() As Object
```

Description

This method is used as a reference for a ColumnCollection to get the columns of a table.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Visual Basic

Example

```
Dim cc As ColumnCollection
Set cc = BrokerMap.Brokers("cr9000").Tables("public").Columns
```

Table.start_expansion

Name

```
Table.start_expansion()
```

Description

If the BrokerMap autoExpand property has been set to FALSE, use this method to access the list of Columns for a Table within a Broker.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal Return

16.6 ColumnCollection Interface

16.6.1 Properties

ColumnCollection.Count

Name

```
ColumnCollection.Count As Long
```

Description

This property returns the number of columns in the ColumnCollection.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

16.6.2 Methods

ColumnCollection.Item()

Name

```
ColumnCollection.Item(id) As Column
```

Description

This method returns the reference id for a Column. If the number is less than zero or is greater than the number of columns, then the error E_CSI_ARRAY_OUT_OF_BOUNDS will be returned. If the column cannot be found by name, then the error `E_CSI_NOT_FOUND` will be returned.

Prototypes

ColumnCollection.Item(Number) - Array index.
ColumnCollection.Item(String) - Table name.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ARRAY_OUT_OF_BOUNDS	Error: Array out of bounds
E_CSI_NOT_FOUND	Error: Column not found in broker map by name
E_CSI_FAIL	Error: Wrong variant type passed or unexpected error

Visual Basic

Return Type
Column

Examples

```
(1)
Dim myColumn as Column
BrokerMap.Brokers("cr9000").Tables("public").Columns.Item(0)

(2)
Dim myColumn as Column
BrokerMap.Brokers("cr9000").Tables("public").Columns(0)

(3)
Dim myColumn as Column
BrokerMap.Brokers("cr9000").Tables("public").Columns.Item("speed")

(4)
Dim myColumn as Column
BrokerMap.Brokers("cr9000").Tables("public").Columns("speed")

Examples (1) and (2) are equivalent, as well as examples
(3) and (4).  The default method for collection interfaces
is Item().
```

ColumnCollection._NewEnum()

Name

`ColumnCollection._NewEnum()` — Return the next Column in the sequence.

Important

This method is only intended for use with Visual Basic. Visual Basic programmers do not need to access this method directly. They use it indirectly by using the collections with the `For Each` loop. This method is included in the documentation to explain why the method exists, but, again, there is no need to access this method directly.

16.7 Column Interface

16.7.1 Properties

Column.description

Name

```
Column.description As String
```

Description

This read-only property returns a description of the column.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Column.name

Name

`Column.name` As String

Description

This read-only property returns the name of the column.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Column.process

Name

```
Column.process As String
```

Description

A read-only property that identifies the processing performed on the data. For data coming from table-data and mixed-array dataloggers, this value will be an empty string.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Column.type

Name

```
Column.type As CsiDataTypeCode
```

Description

This read-only property identifies the type of data for the column.Following are the possible values for this enumerated property:

Table of Data Type Enumeration

Name	Value	Description
dt_CsiUInt1	1	1 byte unsigned int
dt_CsiUInt2	2	2 byte unsigned int
dt_CsiUInt4	3	4 byte unsigned int
dt_CsiInt1	4	1 byte signed int
dt_CsiInt2	5	2 byte signed int
dt_CsiInt4	6	4 byte signed int
dt_CsiInt8	32	8 byte signed integer
dt_CsiFs2	7	2 byte final storage (also known as FP2)
dt_CsiFs3	15	3 byte final storage (also known as FP3)
dt_CsiFs4	26	4 byte final storage
dt_CsiFsf	27	allows storage of either CsiFs2 or CsiFs4. Requires 4 bytes
dt_CsiFp4	8	4 byte CSI float
dt_CsiIeee4	9	4 byte IEEE float
dt_CsiIeee8	18	8 byte IEEE float
dt_CsiBool	10	1 byte Boolean (0 or 1)
dt_CsiBool8	17	1 byte bit field
dt_CsiSec	12	4 byte sec since 1 Jan 1990
dt_CsiUSec	13	6 byte 10s of Usec since 1 Jan 1990
dt_CsiNSec	14	4 byte sec since 1 Jan 1990 + 4 byte Nsec

Name	Value	Description
dt_CsiAscii	11	fixed-length string
dt_CsiAsciiZ	16	null-terminated variable-length string
dt_CsiInt4Lsf	20	4 byte signed int (LSB first)
dt_CsiUInt2Lsf	21	2 byte signed int (LSB first)
dt_CsiUInt4Lsf	22	4 byte signed int (LSB first)
dt_CsiNSecLsf	23	same as NSec with the components in LSB
dt_CsiIeee4Lsf	24	4 byte IEEE float (LSB first)
dt_CsiIeee8Lsf	25	8 byte IEEE float (LSB first)
dt_CsiInt8Lsf	33	8 byte signed integer (LSB first)
dt_CsiBool2	30	2 byte Boolean (non-zero = true)
dt_CsiBool4	31	4 byte Boolean (non-zero = true)
dt_CsiInt2Lsf	19	2 byte signed int (LSB first)
dt_CsiLgrDate	29	8 bytes of nanoseconds since 1990
dt_CsiLgrDateLsf	28	8 bytes of nanoseconds since 1990 (LSB first)

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Column.units

Name

```
Column.units As String
```

Description

This read-only property identifies the data engineering units.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Column.writable

Name

```
Column.writable As Long
```

Description

This property is read-only and describes whether or not this column can be changed or set by using the variableSet() method as described in the CsiDatalogger Control.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Section 17. CsiDatalogger Control Reference

17.1 Datalogger Interface

17.1.1 Properties

Datalogger.clockBusy

Name

```
Datalogger.clockBusy As Boolean
```

Description

This property describes the state of the control concerning clock transactions. If a clock check or a clock set is currently executing, clockBusy returns TRUE, and any attempt to execute another clock check or clock set will return an error.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.loggerConnected

Name

```
Datalogger.loggerConnected As Boolean
```

Description

This Boolean property describes the state of the LoggerNet server connection management invoked from loggerConnectStart(). This property only describes the state of connection management not the state of the physical connection to the datalogger. To monitor the physical line state, start an advisor with the DataSource control and monitor the statistics table for that device. For information on devices statistics tables, look in the appendix of this document.

If connection management is active, then a persistent connection between the server and the datalogger is present or in process. This type of connection can be very useful if you must make requests to the datalogger on a frequent basis because you avoid reconnection overhead for each request. To turn off active connection management, see loggerConnectCancel.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.loggerName

Name

```
Datalogger.loggerName As String
```

Valid Values

Specifies the datalogger or station name that will be accessed. This property must match one of the actual datalogger device names in the LoggerNet server network map.

Default Value

The default value for this property is an empty string.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the datalogger is present

Datalogger.manualPollBusy

Name

```
Datalogger.manualPollBusy As Boolean
```

Description

This Boolean property describes the state of the control concerning a manual poll. If a manual poll is currently executing then manualPollBusy will return TRUE, and any attempt to execute another manual poll will return an error.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.programReceiveBusy

Name

```
Datalogger.programReceiveBusy As Boolean
```

Description

This read-only, Boolean property describes the state of the LoggerNet server in relation to the method programReceiveStart(). If the LoggerNet server is currently retrieving a program from the datalogger, then this property will return TRUE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.programSendBusy

Name

```
Datalogger.programSendBusy As Boolean
```

Description

This Boolean property describes the state of the LoggerNet server in relation to the method programSendStart(). If the LoggerNet server is currently sending a program to the datalogger, then this property will return TRUE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.selectiveManualPollBusy

Name

```
Datalogger.selectiveManualPollBusy As Boolean
```

Description

This Boolean property describes the state of the control concerning a selective manual poll. If a selective manual poll is currently in process, this property will return TRUE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.serverConnected

Name

```
Datalogger.serverConnected As Boolean
```

Description

This Boolean property describes the state of the connection between the client application and the LoggerNet server. If the connection is successful, the property is returned as TRUE. Otherwise, the property is returned as FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.serverLogonName

Name

```
Datalogger.serverLogonName As String
```

Valid Values

If security is enabled on the target LoggerNet server, this property must be one of the account names recognized by the LoggerNet server. These accounts can be set up using the *LoggerNet Security Administration Client* that is part of the LoggerNet software suite or the CsiCoraScript control that is part of the SDK.

Default Value

The default value for this property is an empty string. This property is only used if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

Datalogger.serverLogonPassword

Name

```
Datalogger.serverLogonPassword As String
```

Valid Values

If security is enabled on the target LoggerNet server, this property must be the password associated with the account described by serverLogonName.

Default Value

The default value for this property is an empty string. This property is only used if security is enabled on the LoggerNet server.

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

Datalogger.serverName

Name

```
Datalogger.serverName As String
```

Description

This property specifies the TCP/IP interface address for the computer hosting the LoggerNet server. This string must be formatted either as a fully qualified Internet machine domain name or as an IP address string. An example of a valid machine domain name address is www.campbellsci.com. An example of a valid IP address string is `207.201.118.35`. The default value for this property is the string, `localhost`.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Attempt to set serverName while connected to the LoggerNet server

Datalogger.serverPort

Name

```
Datalogger.serverPort As Long
```

Description

Specifies the TCP port number that the LoggerNet server is using on the hosting computer. The valid range for this property is 1 to 65535.

Default Value

The default value for this property, assigned to the LoggerNet server during install, is 6789. In most cases, the default value for this property is acceptable.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_INVALIDARG	Error: The port value is invalid
E_CSI_BUSY	Error: Attempt to set serverPort while connected to the LoggerNet server

17.1.2 Methods

Datalogger.clockCancel()

Name

```
Datalogger.clockCancel()
```

Description

This method should be called to cancel either a clockCheckStart(), or a clockSetStart(). If the clock set or clock check was successfully cancelled, then the event onClockComplete(), will return a cancellation code. If the clockCancel() was called too late in the process, then the event onClockComplete(), will return either a success or failure code instead. This method should only be called when the clockCheckStart() method or the clockSetStart() method is in process.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.clockCheckStart()

Name

```
Datalogger.clockCheckStart()
```

Description

This method should be called to check the date and time on a specified datalogger. This method should only be called when the value of serverConnected, is true. If not, this method will return `E_CSI_NOT_CONNECTED`. Upon completion, this method will fire the event onClockComplete.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Clock communication is busy servicing a request
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not connected to the LoggerNet server

Datalogger.clockSetStart()

Name

```
Datalogger.clockSetStart()
```

Description

This method should be called to set the date and time on the specified datalogger to the date and time of the LoggerNet server. This method should only be called when the value of serverConnected is true. If not, this method will return E_CSI_NOT_CONNECTED. Upon completion, this method calls the event onClockComplete.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Clock communication is busy servicing a request
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not connected to the LoggerNet server

Datalogger.loggerConnectCancel()

Name

```
Datalogger.loggerConnectCancel()
```

Description

This method cancels an active connection between the LoggerNet server and the specified datalogger. When a persistent connection is cancelled, the LoggerNet server returns to the default behavior of connecting to the datalogger for each transaction and disconnecting from the datalogger after each transaction finishes.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.loggerConnectStart()

Name

```
Datalogger.loggerConnectStart(logger_priority_type
priority)
```

Parameters

The following values indicate the priority of maintaining the connection when other devices might need the resources:

Table of 'priority' values:

priority_high = 0
priority_normal = 1
priority_low = 2

Description

This method will open a persistent connection to the specified datalogger. Keeping the connection open will allow the LoggerNet server to handle multiple transactions without disconnecting. The default behavior of the server is to disconnect from the datalogger after finishing each task, such as a clockCheckStart. Keeping the connection open is very helpful if it takes a considerable amount of time for the server to connect to a datalogger, such as on a dialup connection.

This method should only be called when the value of serverConnected, is true. If not, this method will return `E_CSI_NOT_CONNECTED`. This method triggers onLoggerConnectStarted, or onLoggerConnectFailure, depending on its success or failure.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: A persistent communications link has already been started with this datalogger
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not connected to the LoggerNet server

Datalogger.manualPollCancel()

Name

`Datalogger.manualPollCancel()`

Description

This method should be called to cancel a manualPollStart() command. If the manual poll was successfully cancelled, then the event onManualPollComplete(), will return a cancellation code. If the manualPollCancel() was called too late in the manual poll process, then the event onManualPollComplete(), will return either a success or failure code instead. This method should only be called when a manual poll is in process.

COM Return Values

Table of Possible Values

Code	Meaning
`S_OK`	Success: Normal return

Datalogger.manualPollStart()

Name

`Datalogger.manualPollStart()`

Description

This method should be called when the client desires to perform a manual poll of the specified datalogger. This method should only be called when the value of serverConnected, is TRUE. If not, this method will return `E_CSI_NOT_CONNECTED`. Upon completion, this method calls the event onManualPollComplete().

COM Return Values

Table of Possible Values

Code	Meaning
`S_OK`	Success: Normal return
`E_CSI_BUSY`	Error: Manual poll communication is busy servicing a request
`E_CSI_FAIL`	Error: Unexpected error
`E_CSI_NOT_CONNECTED`	Error: Not connected to the LoggerNet server

Datalogger.programReceiveCancel()

Name

```
Datalogger.programReceiveCancel()
```

Description

This method attempts to cancel the programReceiveStart() command. Mixed-array dataloggers will not recognize this request and will continue to transfer their program even though the datalogger control is no longer receiving it.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.programReceiveStart()

Name

```
Datalogger.programReceiveStart(String fileName)
```

Description

This method retrieves the current program from the connected datalogger and saves that file as the specified filename. This event triggers onProgramReceiveProgress(), and onProgramReceiveComplete(), during the programReceive() and after the programReceive() respectively.

This method should only be called when the value of serverConnected, is true. If not, this method will return `E_CSI_NOT_CONNECTED`.

Parameters

FileName: This location is the full path and name where the file will be saved.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: A previous call to programReceiveStart() has not completed
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not connected to the LoggerNet server

Datalogger.programSendCancel()

Name

```
Datalogger.programSendCancel()
```

Description

This method attempts to cancel the programSendStart() method. The program send process can be cancelled if it has not already begun. Otherwise, the method will be ignored.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.programSendStart()

Name

```
Datalogger.programSendStart(String file_name, String
program_name)
```

Description

This method starts to transfer a file designated by file_name to the specified datalogger. It also calls the events: onProgramSendProgress(), onProgramSent(), and onProgramSendComplete(). This method should only be called when the value of serverConnected, is TRUE. Otherwise, this method will return E_CSI_NOT_CONNECTED.

Parameters

file_name: The full path on the local machine designating the location of the program that will be sent.

program_name: Designates the name of the program that will be sent to the specified datalogger. If this setting is specified as an empty string, the name will be derived from the file_name property when this method gets called. This parameter string should have the following syntax:

```
program_name := [ device-name ":" ] file-name.
```

The device name optionally indicates the datalogger storage device on Crx000 dataloggers. If omitted for Crx000 dataloggers, the default device will be the "CPU" device. The file name that follows should not have any path specification but should merely be the name of the file. The server may truncate the file name on Crx000 dataloggers in order to make it fit the file system on those devices.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: A previous call to programSendStart() has not completed
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not connected to the LoggerNet server

Datalogger.selectiveManualPollCancel

Name

```
Datalogger.selectiveManualPollCancel()
```

Description

This method should be called to cancel a selectiveManualPollStart() command. If the selective manual poll is successfully cancelled, the event onManualPollComplete() will return a cancellation code.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger.selectiveManualPollStart

Name

```
Datalogger.selectiveManualPollStart(table_name As
String)
```

Description

Use this method to poll a specific table in a datalogger. Upon completion, this method calls the event onSelectiveManualPollComplete().

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: A previous call has not completed
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not connected to the LoggerNet server

Datalogger.serverConnect()

Name

```
Datalogger.serverConnect()
```

Description

This method attempts to connect to the LoggerNet server using the previously set properties: serverName, serverPort, serverLogonName, and serverLogonPassword. This method triggers onServerConnectStarted or onServerConnectFailure depending on its success or failure.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BAD_HOST_OR_PORT	Error: Server name or port is invalid or unreachable
E_CSI_ALREADY_CONNECTED	Error: Already connected to the LoggerNet server

Datalogger.serverDisconnect()

Name

```
Datalogger.serverDisconnect()
```

Description

This method will disconnect from the LoggerNet server. This method will set serverConnected to FALSE and should only be called when the value of serverConnected is TRUE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

17.1.3 Events

Datalogger_onClockComplete()

Name

```
onClockComplete(Boolean successful,
clock_outcome_type response_code, Date current_date)
```

Parameters

successful: Describes whether a clock set or clock check succeeded.
response_code: The following list describes the possible response codes from a clock transaction:

Table of response code values.

Enumeration Name	Value	Description
co_outcome_unknown	0	Indicates that an error has occurred but its nature is unknown
co_outcome_success_clock_checked	1	Indicates that the clock was successfully checked on the specified datalogger (see loggerName)
co_outcome_success_clock_set	2	Indicates that the clock was successfully set on the specified datalogger (see loggerName)
co_outcome_session_failed	3	Indicates that the communication session with the LoggerNet server failed resulting in the clock check/set transaction failing
co_outcome_invalid_logon	4	Indicates that this control was unable to logon to the LoggerNet server because either the serverLogonName or serverLogonPassword property is incorrect
co_outcome_server_security_blocked	5	Indicates that the account specified by serverLogonName does not have sufficient privileges assigned to start the transaction with the LoggerNet server
co_outcome_communication_failed	6	Indicates that there was a communication failure between the LoggerNet server and the datalogger. If this happens, retry the transaction
co_outcome_communication_disabled	7	Indicates that LoggerNet has not been set up to communicate with this datalogger. You will need to enable communications before you will be able to successfully communicate with the datalogger
co_outcome_logger_security_blocked	8	Indicates that security has been enabled on the LoggerNet server and that the account specified by serverLogonName does not have sufficient privileges to communicate with the datalogger

Enumeration Name	Value	Description
co_outcome_invalid_device_name	9	Indicates that the device named by loggerName was not found in the broker map
co_outcome_unsupported	10	Indicates that the device “loggerName” does not support this transaction
co_outcome_cancelled	11	Indicates that a previous clock check or set command was cancelled successfully
co_outcome_device_busy	12	Indicates the datalogger is busy with another transaction

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger_onLoggerConnectFailure()

Name

```
onLoggerConnectFailure(logger_failure_type fail_code)
```

Description

This event indicates there was an error when making an persistent connection with the specified datalogger.

Parameter

Table of fail_code values.

Enumeration Name	Value	Description
lf_failure_unknown	0	Indicates that an error has occurred but its nature is unknown
lf_failure_unexpected	1	Indicates than an unexpected error has occurred
lf_failure_connection_failed	2	Indicates that the connection failed. This can happen if a connection has been successfully established but then lost or an invalid serverName or serverHostPort property value was specified. This type of failure can also occur if the IP stack on the server host or on the host for this application is not configured correctly.

Enumeration Name	Value	Description
lf_failure_invalid_logon	3	Indicates that this control was unable to logon to the LoggerNet server because either the serverLogonName or serverLogonPassword property is incorrect
lf_failure_server_security_blocked	4	Indicates that security has been enabled on the server and that the serverLogonName does not have sufficient privileges or serverLogonPassword is incorrect
lf_failure_device_name_invalid	5	Indicates that the device "loggerName" was not found in the network map
lf_failure_server_terminated_transaction	6	Indicates that the server has terminated the transaction
lf_failure_device_does_not_support	7	Indicates that the device “loggerName” does not support this transaction
lf_failure_path_does_not_support	8	This transaction is not supported for this network path. The name of the blocking device will be supplied as the next parameter

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Datalogger_onLoggerConnectStarted()

Name

```
onLoggerConnectStarted()
```

Description

This event gets called when a connection to the datalogger has been established and is a result of invoking the method loggerConnectStart().

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Datalogger_onManualPollComplete()

Name

`onManualPollComplete(Boolean successful, manual_poll_outcome_type response_code)` — A response from the server upon the completion of a manual poll transaction.

Description

A response from the LoggerNet server upon the completion of a manual poll.

Parameters

success: Describes whether the manual poll was successful.

response_code: The following list describes the possible response codes from a manual poll transaction.

Table of response_code values.

Enumeration Name	Value	Description
mp_outcome_unknown	0	Indicates that an error has occurred but its nature is unknown
mp_outcome_success	1	Indicates that the manual poll was successful on the specified datalogger
mp_outcome_invalid_logon	2	Indicates that this control was unable to logon to the LoggerNet server because either the serverLogonName or serverLogonPassword property is incorrect
mp_outcome_server_session_failed	3	Indicates that the communication session with the server failed resulting in the manual poll transaction failing
mp_outcome_invalid_device_name	4	Indicates that the datalogger device “loggerName” was not found in the broker map
mp_outcome_unsupported	5	Indicates that the device does not support the manual poll transaction
mp_outcome_server_security_blocked	6	Indicates that the account specified by serverLogonName does not have sufficient privileges assigned to start the transaction with the LoggerNet server
mp_outcome_logger_security_blocked	7	Indicates that security is set on the datalogger blocking this transaction
mp_outcome_comm_failure	8	Indicates that there was a communication failure between the LoggerNet server and the datalogger. If this happens, retry the transaction

Enumeration Name	Value	Description
mp_outcome_communication_disabled	9	Indicates that LoggerNet has been set up not to communicate with this datalogger. Enable communications before attempting communication with the datalogger.
mp_outcome_table_defs_invalid	10	Indicates that the table definitions in the LoggerNet server do not match those in the datalogger
mp_outcome_aborted	11	Indicates that a previous manual poll command was cancelled successfully
mp_outcome_logger_locked	12	Indicates that the datalogger is locked
mp_outcome_file_io_failed	13	Indicates that the LoggerNet server could not write to the data cache
mp_outcome_no_table_defs	14	Indicates that table definitions have not been downloaded by the LoggerNet server

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger_onProgramCompiled()

Name

```
onProgramCompiled()
```

Description

This event returns notification when the program has compiled successfully on the datalogger, and table definitions are being retrieved.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Datalogger_onProgramReceiveComplete()

Name

```
onProgramReceiveComplete(Boolean successful,
prog_receive_outcome_type response_code)
```

Description

This event gets called when the method programReceiveStart() has completed.

Parameters

successful: Describes if the program was retrieved successfully.

response_code:

Table of possible response codes.

Enumeration Name	Value	Description
pr_success	0	Indicates that the program was received successfully
pr_failure_unknown	1	Indicates that an unknown failure has occurred
pr_failure_no_cached_file	2	Indicates that the datalogger does not have a file to receive
pr_failure_logger_communication_error	3	Indicates that the connection failed. This can happen if a connection has been successfully established but then lost or because an invalid serverName or serverPort property value was specified. This type of failure can also occur if the IP stack on the server host or on the host for this application is not configured correctly.
pr_failure_disabled_communication	4	Indicates that LoggerNet has not been set up to communicate with this datalogger
pr_failure_logger_security	5	Indicates that the LoggerNet server can not communicate with the datalogger because the datalogger security code is incorrect
pr_failure_invalid_server_logon	6	Indicates that the serverLogonName or the serverLogonPassword is incorrect
pr_failure_server_connection_failure	7	Indicates that the control could not connect to the server
pr_failure_invalid_device_name	8	Indicates that the device set in the property loggerName could not be found in the network map

Enumeration Name	Value	Description
pr_failure_cannot_open_file	9	Indicates that the file could not be opened for writing. You may not have permissions to write in that directory or the file may be in use
pr_failure_server_security	10	Indicates that security has been enabled on the LoggerNet server and that you do not have sufficient privileges to connect
pr_failure_not_supported	11	Indicates that this transaction is not supported
pr_aborted_by_client	12	Indicates that this transaction was cancelled

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger_onProgramReceiveProgress()

Name

```
onProgramReceiveProgress(Long Received_bytes)
```

Description

This event periodically returns notification of how many bytes have been received from the datalogger during the retrieval of a program. This event gets called after the programReceiveStart() method has been called.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Datalogger_onProgramSendComplete()

Name

```
onProgramSendComplete(Boolean successful,
prog_send_outcome_type response_code, String
compile_result)
```

Description

This event gets called when the program sending process has finished

Parameters

successful: Describes if the programSendStart was successful.
response_code: Found in the table of possible response codes.
compile_result: Result string from the datalogger.

Table of possible response codes.

Enumeration Name	Value	Description
ps_outcome_unknown	0	Indicates that an error has occurred but its nature is unknown
ps_outcome_success	1	Indicates that the program was sent successfully
ps_outcome_in_progress	2	Indicates that another program file send transaction is already in progress
ps_outcome_invalid_program_name	3	Indicates that the program specified to send is invalid or non-existent
ps_outcome_server_resource_error	4	Indicates that the LoggerNet server has encountered a resource error
ps_outcome_communication_failed	5	Indicates that the connection failed. This can happen if a connection has been successfully established but then lost or because an invalid serverName or serverPort property value was specified. This type of failure can also occur if the IP stack on the server host or on the host for this application is not configured correctly.
ps_outcome_communication_disabled	6	Indicates that LoggerNet has not been set up to communicate with this datalogger
ps_outcome_logger_compile_error	7	Indicates that the datalogger was unable to compile the program. The program should be reviewed for errors and resent to the datalogger
ps_outcome_logger_security_failed	8	Indicates that the LoggerNet server can not communicate with the datalogger because the datalogger security code is incorrect
ps_outcome_invalid_logon	9	Indicates that the property serverLogonName or serverLogonPassword is invalid
ps_outcome_session_failed	10	Indicates that the communication session with the server failed causing the program send transaction to fail
ps_outcome_invalid_device_name	11	Indicates that the device named by loggerName was not found in the network map

Enumeration Name	Value	Description
ps_outcome_cannot_open_file	12	Indicates that the program to send could not be opened to read
ps_outcome_server_security_failed	13	Indicates that the LoggerNet server has security enabled and that the serverLogonName or serverLogonPassword is incorrect
ps_outcome_logger_buffer_full	14	Indicates that the datalogger's storage buffer is full
ps_outcome_network_locked	15	Indicates that the network is locked by another transaction
ps_outcome_aborted_by_client	16	Indicates that this transaction has been cancelled
ps_outcome_table_defs_failed	17	Indicates that the table definitions were not obtained from the datalogger

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger_onProgramSendProgress()

Name

```
onProgramSendProgress(Long sent_bytes, Long
total_bytes)
```

Description

This event periodically returns notification of how many `sent_bytes` out of a program's `total_bytes` have been sent to the datalogger. This event could be helpful in a progress bar and gets called periodically after invoking the method programSendStart().

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger_onProgramSent()

Name

```
onProgramSent()
```

Description

This event returns notification when the program has been sent but gets called before the program has been compiled on the datalogger and table definitions have been retrieved.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Datalogger_onSelectiveManualPollComplete()

Name

```
onSelectiveManualPollComplete(Boolean successful,
selective_manual_poll_outcome_type response_code)
```

Description

The response from the LoggerNet server when the selective manual poll completes

Parameters

Table of response_code values

Enumeration Name	Value	Description
smp_outcome_unknown	0	Indicates that an unknown error as occurred
smp_outcome_success	1	Indicates that the selective manual poll was successful
smp_outcome_invalid_logon	2	Indicates that this control was unable to logon to the LoggerNet server because either the serverLogonName or serverLogonPassword property is incorrect
smp_outcome_server_session_failed	3	Indicates that the communication session with the server failed causing the selective manual poll transaction to fail
smp_outcome_invalid_device_name	4	Indicates that the datalogger device “loggerName” was not found in the broker map
smp_outcome_unsupported	5	Indicates that the device does not support the selective manual poll process

Enumeration Name	Value	Description
smp_outcome_server_security_blocked	6	Indicates that the account specified by serverLogonName does not have sufficient privileges assigned to start the transaction with the LoggerNet server
smp_outcome_logger_security_blocked	7	Indicates that security is set on the datalogger blocking this transaction
smp_outcome_comm_failure	8	Indicates that there was a communication failure between the LoggerNet server and the datalogger
smp_outcome_communication_disabled	9	Indicates that communication to this datalogger has been disabled in the LoggerNet server
smp_outcome_table_defs_invalid	10	Indicates that the table definitions in the LoggerNet server do not match those in the datalogger
smp_outcome_table_name_invalid	11	Indicates that the table specified was not found
smp_outcome_file_io_failure	12	Indicates that the LoggerNet server could not write to the data cache table

Datalogger_onServerConnectFailure()

Name

```
onServerConnectFailure(server_failure_type
failure_code)
```

Description

This event gets called if a connection cannot be established with the LoggerNet server using the serverConnect() method.

Parameters

failure_code: The following are possible values for failure_code.

Table of possible failure codes

Enumeration Name	Value	Description
server_failure_unknown	0	Indicates that an unknown failure has occurred
server_failure_logon	1	Indicates that there was a failure connecting to the LoggerNet server because either serverLogonName or serverLogonPassword is incorrect

Enumeration Name	Value	Description
server_failure_session	2	Indicates that the communication session with the server failed resulting in the serverConnect transaction failing
server_failure_unsupported	3	Indicates that the datalogger defined in the property loggerName could not support this transaction
server_failure_security	4	Indicates that the server has security enabled and that the serverLogonName or the serverLogonPassword properties did not have sufficient privileges to perform this method
server_failure_bad_host_or_port	5	Indicates that either the serverName or the serverPort property is incorrect

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Datalogger_onServerConnectStarted()

Name

```
onServerConnectStarted()
```

Description

This event gets called once a connection has been established with the LoggerNet server using the serverConnect() method.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Section 18. CsiDataSource Control Reference

18.1 DSource Interface

18.1.1 Properties

DSource.logonName

Name

```
DSource.logonName As String
```

Description

Specifies the account name that should be used to when connecting to the LoggerNet server. If security is enabled on the target LoggerNet server, this string must be one of the account names recognized by the LoggerNet server. These accounts can be set up using the *LoggerNet Security Administration Client* that is part of the LoggerNet software suite or the CsiCoraScript control in the LoggerNet SDK.

Default Value

The default value for this property is an empty string. This property is only used if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal Return
E_CSI_BUSY	Error: Attempt to set serverLogonPassword while connected to the LoggerNet server.

DSource.logonPassword

Name

```
DSource.logonPassword As String
```

Description

This property specifies the password that should be when connecting to the LoggerNet server. If security is enabled on the target LoggerNet server, this password string must be associated with the account described in the logonName property.

Default Value

The default value for this property is an empty string. This property is only used if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.
E_CSI_BUSY	Error: Attempt to set serverLogonPassword while connected to the LoggerNet server.

DSource.serverName

Name

```
DSource.serverName As String
```

Description

This property specifies the TCP/IP interface address for the computer hosting the LoggerNet server. This string must be formatted either as a fully qualified Internet machine domain name or as an IP address string. An example of a valid machine domain name address is www.campbellsci.com. An example of a valid IP address string is `207.201.118.35`

Default Value

The default value for this property is the string, `localhost`.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.
E_CSI_BUSY	Error: Attempt to set `serverName` while connected to the LoggerNet server.

DSource.serverPort

Name

```
DSource.serverPort As Long
```

Description

This property specifies the TCP port number that the LoggerNet server is using on the hosting computer.The valid range for this property is 1 to 65535.

Default Value

The default value for this property, assigned to the LoggerNet server during install, is 6789. In most cases, the default value for this property is acceptable.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.
E_CSI_BUSY	Error: Cannot write to this property because there is a connection to the LoggerNet server.
E_CSI_INVALIDARG	Error: Value out of range.

DSource.state

Name

```
DSource.state As data_source_state
```

Description

This property describes the state of the control in regards to a connection with the LoggerNet server. The following are the possible values of this property:

Table of Possible values.

Enumeration Name	Value	Description
dataSourceDisconnected	1	The control is currently disconnected and its read/write properties are accessible
dataSourceConnecting	2	The connect method has been invoked and the control is attempting to connect to the LoggerNet server. Properties are read-only at this time
dataSourceConnected	3	The connect method has been successfully invoked and the control has a connection to the server. It is appropriate at this time to create advisors and start them.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

DSource.sendRecordBlocks

Name

```
DSource.sendRecordBlocks As Boolean
```

Description

When set to TRUE, records will be sent back from LoggerNet to an Advisor in blocks rather than one at a time. This is a more efficient method of receiving records if a large number of records are being collected.

Default Value

This property is set to FALSE by default.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

18.1.2 Methods

DSource.connect()

Name

```
DSource.connect()
```

Description

This method allows you to connect to the LoggerNet server. When you invoke this method, the control will attempt to connect to the specified LoggerNet server. If it succeeds, you will receive the event onControlReady. If you are already connected, you will receive the COM error E_CSI_ALREADY_CONNECTED. If the serverName and/or serverPort properties cannot be resolved or are incorrect, then you will receive the error code E_CSI_BAD_HOST_OR_PORT.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ALREADY_CONNECTED	Error: Already connected to the server
E_CSI_BAD_HOST_OR_PORT	Error: Server hostname or port is incorrect

DSource.createAdvisor()

Name

```
DSource.createAdvisor()As Object
```

Description

This method creates a new advisor object. Keep a reference to the advisor so that it will not go out of scope. If you create and start an advisor but don't get any data, then you are probably letting the advisor go out of scope. When handling multiple advisors, use a collection or list. The property advisorName is provided for convenience when using a collection to hold names of the advisors you create.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_NOT_CONNECTED	Error: The control is not connected to the LoggerNet server and therefore cannot create any advisors. Connect to the LoggerNet server first
E_FAIL	Error: An unexpected error has occurred

Visual Basic

Example

```
Dim myAdvisor As new advisor
Set myAdvisor = DSource.createAdvisor
```

DSource.disconnect()

Name

`DSource.disconnect()`

Description

This method attempts to disconnect from the current LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

18.1.3 Events

DSource_onAdviseReady()

Name

`onAdviseReady(Object myAdvisor)` — Notification that an advisor has been started and will send onAdviseRecord() events.

Description

This event returns notification that an advisor has be started and will send onAdviseRecord() events when records are collected by the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DSource_onAdviseRecord()

Name

```
onAdviseRecord(Object myAdvisor, Object myRecord)
```

Description

This event returns notification of newly acquired data from an advisor. If records are not being acquired, the advisor will not display them. Please make sure the tables specified in the advisor are enabled for collection through the use of CoraScript commands (set-collect-area-setting setting ID 2). Once the tables are enabled for collection, use the Datalogger control to manually collect records or use the CoraScript control to enable scheduled collection.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DSource_onAdvisorFailure()

Name

```
onAdvisorFailure(csiAdvisorFailureCode failure,
Advisor myAdvisor)
```

Description

Indicates there was a failure with the advisor specified in myAdvisor.

Parameters

Table of Possible response codes.

Enumeration Name	Value	Description
csiAdvisorFailureUnknown	0	Indicates that an error has occurred but its nature is unknown
csiAdvisorFailureConnectionFailed	1	Indicates that the connection failed. This can happen if a connection has been successfully established but then lost or because an invalid serverName or serverPort property value was specified. This type of failure can also occur if the IP stack on the server host or on the host for this application is not configured correctly.

Enumeration Name	Value	Description
csiAdvisorFailureInvalidLogon	2	Indicates that this control was unable to logon to the LoggerNet server because either the logonName or logonPassword property is incorrect
csiAdvisorFailureInvalidStationName	3	Indicates that the datalogger device named by stationName is not found in the server's network map at the time the Advisor is started. Changes made to the station name after the Advisor is started are triggered with code value 9 – csiAdvisorFailureStationShutDown (see below).
csiAdvisorFailureInvalidTableName	4	Indicates that the table specified by tableName does not exist for the specified station at the time the Advisor is started. A table name change that occurs after the Advisor is activated will trigger code value 8 – csiAdvisorFailureTableDeleted (see below).
csiAdvisorFailureServerSecurity	5	Indicates that the account specified by logonName does not have sufficient privileges assigned to start the data advise transaction with the LoggerNet server
csiAdvisorFailureInvalidStartOption	6	Indicates that the startOption is either invalid or not supported by the LoggerNet server
csiAdvisorFailureInvalidOrderOption	7	Indicates that the orderOption is either invalid or not supported by the LoggerNet server
csiAdvisorFailureTableDeleted	8	Indicates that the table has been deleted (or renamed) while the data advise transaction is in progress. This can happen if table definitions are refreshed on the device or if a new program file is sent to the datalogger.
csiAdvisorFailureStationShutDown	9	Indicates that the station that owns the table has been shut down while the data advise transaction is in progress. This can happen if the device is deleted, renamed, or if the LoggerNet server is shut down.
csiAdvisorFailureUnsupported	10	The version of the LoggerNet server doesn't support this transaction
csiAdvisorFailureInvalidColumnName	11	Indicates that the column name is invalid
csiAdvisorFailureInvalidArrayAddress	12	Indicates that the array address is invalid

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DSource_onControlFailure()

Name

```
onControlFailure(csidsFailureCode failure_code)
```

Description

This event is triggered when an error has occurred that affects the control as a whole.

Table of possible failure codes.

Enumeration Name	Value	Description
csidsFailureUnknown	0	Indicates that an error has occurred but its nature is unknown
csidsFailureLogon	1	Indicates that this control was unable to logon to the LoggerNet server because either the logonName or logonPassword property is incorrect
csidsFailureSession	2	Indicates that the communication session with the server failed resulting in failed transactions
csidsFailureUnsupported	3	The version of the LoggerNet server doesn't support this transaction
csidsFailureSecurity	4	Indicates that the account specified by logonName does not have sufficient privileges to start the transaction with the LoggerNet server

NOTE Other codes besides those shown above are included in the enumeration of the DataSource control's interface, but they are never triggered.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DSource_onControlReady()

Name

```
onControlReady()
```

Description

This event is triggered when a connection to the server has been established and is a result of invoking the connect() method. Once this event has been called, advisors can be created and started.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DSource_onVariableSetComplete()

Name

```
onVariableSetComplete(Long tran_id, Object myAdvisor,
Boolean successful, variable_outcome_code
response_code)
```

Description

This event gets called when the method variableSetStart() has completed.

Parameters

tran_id: The transaction ID used to track this event
myAdvisor: References the advisor that started the variable set transaction.
successful: Indicates whether the transaction succeeded.
response_code: Values from the following table:

Table of possible response_code outcomes.

Enumeration Name	Value	Description
vo_outcome_unknown	0	Indicates that the outcome could not be determined
vo_outcome_succeeded	1	Indicates that the setting of the variable was set successfully
vo_outcome_connection_failed	2	Indicates that the control could not connect to the LoggerNet server
vo_outcome_invalid_logon	3	Indicates that the logonName or logonPassword was incorrect
vo_outcome_server_security_blocked	4	Indicates that security has been enabled on the LoggerNet server and that you do not have sufficient privileges to connect

Enumeration Name	Value	Description
vo_outcome_column_read_only	5	Indicates that the column sent is read-only
vo_outcome_invalid_table_name	6	Indicates that the table name was not found on the datalogger
vo_outcome_invalid_column_name	7	Indicates that the column name was not found on the datalogger
vo_outcome_invalid_subscript	8	Indicates that the index of the variable was invalid. For array values, subscripts start at "1"
vo_outcome_invalid_data_type	9	Indicates that the type of the data sent for this variable does not match the variable type
vo_outcome_communication_failed	10	Indicates that communication has failed during this transaction
vo_outcome_communication_disabled	11	Indicates that LoggerNet has not been set up to communicate with this datalogger
vo_outcome_logger_security_blocked	12	Indicates that the datalogger's security has been enabled, and you do not have sufficient privileges to set a variable
vo_outcome_unmatched_logger_table_definition	13	Indicates that the LoggerNet server's table definitions are not the same as the datalogger's table definitions
vo_outcome_invalid_device_name	14	Indicates that the device named by stationName could not be found in the network map
vo_outcome_aborted_by_user	15	Indicates that a VariableSetCancel command successfully prevented the variable change from occurring

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DSource_onAdviseRecords()

Name

```
onAdviseRecords(Object myAdvisor, Object
record_collection)
```

Description

This event notification returns a block of records delivered by LoggerNet to an active advisor. The sendRecordBlocks property must be set to TRUE and the table specified in the advisor must be enabled for collection for this event to work.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

18.2 Advisor Interface

18.2.1 Properties

Advisor.advisorName

Name

```
Advisor.advisorName As String
```

Description

A user-defined field used to distinguish between advisors.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Advisor.orderOption

Name

```
Advisor.orderOption As csidsOrderOptionType
```

Description

This property specifies the order in which the LoggerNet server will send records to the advisor. This property must use one of the following values:

Table of possible csidsOrderOptionType values.

Enumeration Name	Value	Description
csidsOrderCollected	1	The records will be sent in the same order that the LoggerNet server collects them. This option can send the records out of sequence particularly with Campbell Scientific table-data dataloggers but all collected records will be sent.

Enumeration Name	Value	Description
csidsOrderLoggedWithHoles	2	The records will be sent in the order they were logged in the datalogger. This order is determined by the record number (which is assigned by the datalogger) and the file mark number (which is assigned by the server) to create a unique key for each record. If a record has not yet been collected but the LoggerNet server judges (by datalogger table size) that the record can still be collected, no record will be sent until the missing record (hole) has either been collected or the LoggerNet server decides that the record can no longer be collected.
csidsOrderLoggedWithoutHoles	3	The records will be sent in the order that they were logged by the datalogger. This option is similar to the csidsOrderLoggedWithHoles only uncollected records (holes) will be skipped.
csidsOrderRealTime	4	The records will be sent in the order they were logged in the datalogger but if more than one record is collected at a time, all other records except for the most recent of the collection will be ignored.

Default Value

The default value for this property is csidsOrderRealTime (4)

Notes

This property can be read at any time but can only be set when the state of the property is advisorStopped.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.startDate

Name

```
Advisor.startDate As Date
```

Description

This property specifies the timestamp for the earliest record to be selected when the value of the startOption property is csidsStartAtTimeStamp.

Notes

This property can be read at any time but can only be set when the state of the property is advisorStopped.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.startFileMarkNo

Name

```
Advisor.startFileMarkNo As Long
```

Description

In conjunction with startRecordNo, this property specifies the first record to be sent when the value of startOption is equal to csidsStartAtRecordId. The file mark number in an internal tag used by LoggerNet that is applied to each record. The file mark number is assigned to each record by the LoggerNet server and used in combination with the record ID to create a unique key for each record.

Valid Values

Any integer from 0 to 2147483647 inclusive is a valid value.

Default Value

The default value for this property is 0.

Notes

This property can be read at any time but can only be set when the state of the property is advisorStopped.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.
E_CSI_BUSY	Error: Cannot write to property. Advisor is running. Disconnect first with stop

Advisor.startIntervalSeconds

Name

```
Advisor.startIntervalSeconds As Long
```

Description

This property specifies the number of seconds back from the newest record in the table to collect when the value of startOption is set to csidsStartRelativeToNewest.

Valid Values

A valid value must either be zero or a positive integer.

Default Value

The default value for this property is 0 (meaning select the newest record).

Notes

This property can be read at any time but can only be set when the state of the property is advisorStopped.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.startOption

Name

```
Advisor.startOption As csidsStartOptionType
```

Description

This property specifies how to select the first record when retrieving collected data from the LoggerNet server data cache.

Valid Values

This property must take on one of the following values:

Table of possible csidsStartOptionType values

Enumeration Name	Value	Description
csidsStartAtRecordId	1	The first record will be the record identified by startFileMarkNo and startRecordNo. If no such record exists in the table, the record that is closest and newer than the specified record will be selected.
csidsStartAtTimeStamp	2	The first record that has a time stamp equal to the time stamp specified by the startDate will be selected. If no such record exists in the table, the record that has the closest time stamp that is newer than the one specified will be selected.
csidsStartAtNewest	3	The newest record (determined by the combination of record number and file mark number) will be selected.
csidsStartAfterNewest	4	The next new record to be logged in the table will be the first record sent.
csidsStartRelativeToNewest	5	The first record selected will be the one that has a time stamp closest to the time stamp of the newest record less the value of startIntervalSeconds.
csidsStartAtRecordOffset	6	The first record selected will be a specified number of records back from the newest in the data cache.

Default Value

The default value for this property is `csidsStartAtNewest` (3)

Notes

This property can be read at any time but can only be set when the state of the property is advisorStopped.

COM Return Values

Table of Possible Values

Code	Meaning
`S_OK`	Success: Normal return
`E_CSI_BUSY`	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.startRecordNo

Name

```
Advisor.startRecordNo As Long
```

Description

This property, in conjunction with the property startFileMarkNo, specifies the first record to be sent when the value of startOption is equal to csidsStartAtRecordId. Any value can be assigned to this property.

Default Value

The default value for this property is 0.

Notes

This property can be read at any time but can only be set when the state of the property is advisorStopped. Internally the control and the LoggerNet server treat this property as an unsigned 32-bit integer. Visual Basic and other container environments, however, do not have the capability of formatting and properly manipulating unsigned integers. Developers in these environments should consider using the startRecordNoString property instead.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.
E_CSI_BUSY	Error: Cannot write to property. Advisor has already started. Stop the advisor first.

Advisor.startRecordNoString

Name

```
Advisor.startRecordNoString As String
```

Description

This property, in conjunction with startFileMarkNo, is used to specify the first record to be sent when the value of startOption is equal to csidsStartAtRecordId. This string should be formatted as an unsigned integer with a range of 0 to 4294967295.

Default Value

The default value for this property is 0.

Notes

This property can be read at any time but can only be set when the state of the property is advisorStopped.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.state

Name

```
Advisor.state As advisor_state
```

Description

This property returns the current state of the advisor. The following table describes the states that might be returned:

Table of possible advisor_state values

Enumeration Name	Value	Description
advisorStopped	1	The advisor is stopped and its properties can be modified. This is the default state when an advisor is created.
advisorStarting	2	The control is starting but is not yet in a state to listen for data. No properties can be set at this point. The control is in a state where none of its properties can be set.
advisorStarted	3	The advisor is waiting for data from the server and will notify the client through onAdviseRecord when new data arrives.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Advisor.stationName

Name

```
Advisor.stationName As String
```

Description

This property describes the name of the station that will be monitored for data. Whenever this property is set, the DataColumns in the DataColumnCollection for this advisor are removed in order to avoid having invalid columns in the collection for a station and table.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.tableName

Name

```
Advisor.tableName As String
```

Description

This property describes the name of the table in the LoggerNet server being monitored by the advisor. Whenever this property is set, the DataColumns in the DataColumnCollection for this advisor are removed in order to avoid having invalid columns in the collection for a station and table.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.startDateNanoSeconds

Name

Advisor.startDateNanoSeconds As Long

Description

This property specifies the sub-second resolution to associate with the start date.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

Advisor.maxRecordsPerBlock

Name

Advisor.maxRecordsPerBlock As Long

Description

This property sets the maximum number of records that will be included in a block of records received from LoggerNet if the sendRecordBlocks property is set to TRUE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The Advisor is started and already accessing the LoggerNet server data

18.2.2 Methods

Advisor.columns

Name

```
Advisor.columns() As Object
```

Description

This method returns a reference to the DataColumnCollection for this advisor, which can be used to iterate through the DataColumns.

Visual Basic

Return Value
DataColumnCollection

Example

```
Dim dcc As DataColumnCollection
dcc = myAdvisor.Columns
```

Advisor.start()

Name

```
Advisor.start()
```

Description

This method starts the advisor to monitor data for a specified station, table, and column. This is an asynchronous event that calls onAdvisorRecord(). If the advisor fails the onAdvisorFailure() event will get called.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ALREADY_CONNECTED	Error: This advisor has already been started
E_FAIL	Error: An unexpected error has occurred

Advisor.stop()

Name

```
Advisor.stop()
```

Description

This method will stop the advisor from monitoring the LoggerNet data cache for transactions. When an advisor is stopped, its properties can be modified.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Advisor.variableSetCancel()

Name

```
Advisor.variableSetCancel(Long tran_id)
```

Description

This method attempts to cancel a variableSetStart() transaction. The event onVariableSetComplete() will notify you if the cancellation was successful. This method should only be called when the state of advisorStarted is TRUE.

Parameter

tran_id: The unique transaction ID given by variableSetStart()

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Advisor.variableSetStart()

Name

```
Advisor.variableSetStart(String column_name, String
value) As Long
```

Description

This method sets a variable in the specified datalogger. The event onVariableSetComplete() will be called upon the completion of variableSetStart(). This method should only be called when the state dataSourceConnected is TRUE and an advisor has been started. If not, this method will return E_CSI_NOT_CONNECTED.

Parameters

columnName: The name of the column that is being changed. If this is an array value, then use the CRBasic Editor syntax for arrays. Parentheses are used with element subscripts separated by commas.

```
myArray(3) or,

myArray(2,4,1)
```

If the column is not an array value, then the brackets for the index are not needed.

value: The value of the variable as a String.

Return value

The transaction ID associated with this command can be used to cancel a specific variable set command with variableSetCancel() or to keep track of the variables displayed in a form that were set successfully.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not connected to the LoggerNet server or no current advisor started

18.3 DataColumnCollection Interface

18.3.1 Properties

DataColumnCollection.count

Name

```
DataColumnCollection.count As Long
```

Description

This property returns the number of DataColumns in the collection.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

18.3.2 Methods

DataColumnCollection.add()

Name

```
DataColumnCollection.add(String column_name)
```

Description

This method adds a column name to the collection of DataColumns. By adding a column name to this collection, you tell the advisor to retrieve values in the record for that column. The column name added must be valid for the station and table specified in the advisor. If no column names are added to this collection, data records will only contain file mark numbers, record numbers, and timestamps.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_FAIL	Error: The column name is not a valid column for this station and table

DataColumnCollection.addAll()

Name

```
DataColumnCollection.addAll()
```

Description

This method adds all of the columns for the defined station and table to the DataColumnCollection. If any previous columns existed in the collection for this advisor, they will be cleared out before the new DataColumns are added.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DataColumnCollection.find()

Name

```
DataColumnCollection.find(String column_name) As
Boolean
```

Description

This property returns whether the specified column exists in the DataColumn Collection.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

DataColumnCollection.Item()

Name

```
DataColumnCollection.Item(id) As DataColumn
```

Description

A DataColumn can be referenced by a numeric type such as an integer or a long. If the number is less than zero or is greater than the number of brokers - 1, then the COM error E_CSI_ARRAY_OUT_OF_BOUNDS will be returned.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_INVALIDARG	Error: An incorrect Variant type was passed. Expecting a numerical value
E_CSI_ARRAY_OUT_OF_BOUNDS	Error: The numerical index was out of the bounds of the array. Please specify a value from zero (0) to Count - 1
E_CSI_FAIL	Error: An unexpected error has occurred

DataColumnCollection.remove()

Name

```
DataColumnCollection.remove(String columnName)
```

Description

This method removes the specified column from the DataColumnCollection. If the column does not exist in the collection, then an error will be returned.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_INVALIDARG	Error: Cannot remove. The column specified does not exist in the collection

DataColumnCollection.removeAll()

Name

```
DataColumnCollection.removeAll()
```

Description

This method removes all of the DataColumns that are presently a part of the DataColumnCollection. This method does not return an error if the collection is already empty.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

DataColumnCollection._NewEnum()

Name

```
DataColumnCollection._NewEnum()
```

Important

This method is only intended for use with the Visual Basic programming language. Visual Basic programmers do not need to access this method directly. They use it indirectly by using the collections with the `For Each` loop. This method is included in the documentation to explain why the method exists, but, again, there is no need to access this method directly.

18.4 DataColumn Interface

18.4.1 Properties

DataColumn.name

Name

```
DataColumn.name As String
```

Description

This read-only property gives the name of the DataColumn added to the DataColumnCollection.

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

18.5 Record Interface

18.5.1 Properties

Record.fileMarkNo

Name

```
Record.fileMarkNo As Long
```

Description

This read-only property returns the file mark number associated with the current record. The file mark number is assigned to each record by the LoggerNet server and used in combination with the record ID to create a

unique key for each record. This property can take on any value from 0 to 2147483647.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Record.nanoSeconds

Name

```
Record.nanoSeconds As Long
```

Description

This read-only property returns the sub-second resolutions of the timestamp associated with the current record. This property can take on any value from 0 to 2147483647.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Record.recordNo

Name

```
Record.recordNo As Long
```

Description

This read-only property returns the record number associated with the current record. This property can take on any value from 0 to 2147483647.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Record.timeStamp

Name

```
Record.timeStamp As Date
```

Description

This read-only property returns the time stamp associated with the current record.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

Record.valuesCount

Name

```
Record.valuesCount As Long
```

Description

This read-only property returns the number of values in this record.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

18.5.2 Methods

Record.Item()

Name

```
Record.Item(id) As Value
```

Description

This method returns a reference to a value found by the specified ID. A broker can be referenced by an integer (a Long) or by the name of the broker (a String). If the number is less than zero or is greater than the number of brokers, then the COM error E_CSI_ARRAY_OUT_OF_BOUNDS will be returned. If the broker cannot be found by name, then the COM error E_CSI_NOT_FOUND will be returned.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ARRAY_OUT_OF_BOUNDS	Error: Array out of bounds
E_CSI_NOT_FOUND	Error: Couldn't find the broker by name in the broker map
E_CSI_FAIL	Error: Wrong variant type passed to this method or unexpected error

Visual Basic

Return Type
value

Example
Number value (like an array):

```
Long iterator
For iterator = 0 to myRecord.Count – 1
 ... = myRecord(iterator).value
Next iterator
```

Referencing the Broker by name:

```
DIM valueName as String
valueName = "battTemp"
DIM value as long
value = myRecord("battTemp").value
       OR
value = myRecord(valueName).value
```

Record._NewEnum()

Name

```
Record._NewEnum()
```

Important

This method is only intended for use with the Visual Basic programming language. Visual Basic programmers do not need to access this method directly. They use it indirectly by using the collections with the For Each loop. This method is included in the documentation to explain why the method exists, but, again, there is no need to access this method directly.

Visual Basic

Example

```
Dim v As value
For Each v in myRecord
   ... = v.value
Next
```

18.6 RecordCollection

18.6.1 Properties

RecordCollection.Count

Name

```
RecordCollection.Count As Long
```

Description

The number of values in the collection

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal Return

18.6.2 Methods

RecordCollection.Item()

Name

```
RecordCollection.Item(Value id, Record ppIRecord)
```

Description

This method is used to iterate through the values by the specified index ID.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_ARRAY_OUT_OF_BOUNDS	Error: Array out of bounds
E_CSI_FAIL	Error: An unexpected error has occurred

RecordCollection._NewEnum()

Name

```
RecordCollection._NewEnum()
```

Important

This method is not accessed directly. It is used indirectly with the use of a For Each loop.

18.7 Value Interface

18.7.1 Properties

Value.columnName

Name

```
Value.columnName As String
```

Description

This property returns the name of the column.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Value.value

Name

```
Value.value As Variant
```

Description

This property returns the actual data value.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return.

Section 19. CsiLogMonitor Control Reference

19.1 LogMonitor Interface

19.1.1 Properties

LogMonitor.commLogMonitorBusy

Name

```
LogMonitor.commLogMonitorBusy As Boolean
```

Description

This Boolean property describes the state of the LogMonitor control accessing communication logs on the LoggerNet server. The property returns TRUE if the communication logs are being accessed. Otherwise, the property returns FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

LogMonitor.commLogRecordsBack

Name

```
LogMonitor.commLogRecordsBack As Long
```

Description

The LoggerNet server maintains a communication log history buffer that can be accessed using this property. When the `commLogMonitorStart()` method is called, by default 100 historical log files will be retrieved from the LoggerNet server. If a different number of historical log entries are desired, set this property to the exact number of entries to initially retrieve from the LoggerNet server. This number must be one or greater.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_INVALIDARG	Error: The number must be one or greater
E_CSI_BUSY	Error: Attempting to set this property while the logs are being actively monitored

LogMonitor.serverConnected

Name

```
LogMonitor.serverConnected As Boolean
```

Description

This Boolean property describes the state of the connection between the LogMonitor control and the LoggerNet server. The property returns TRUE if the connection exists. Otherwise, the property returns FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

LogMonitor.serverLogonName

Name

```
LogMonitor.serverLogonName As String
```

Description

This property specifies the account name that should be used when connecting to the LoggerNet server. If security is enabled on the target LoggerNet server, this string must be one of the account names recognized by the LoggerNet server.

Default Value

The default value for this property is an empty string. This property will only affect the operation of the control if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

LogMonitor.serverLogonPassword

Name

```
LogMonitor.serverLogonPassword As String
```

Description

This property specifies the password that should be used when connecting to the LoggerNet server. If security is enabled on the target LoggerNet server, this string must be the password associated with the account named by LogMonitor.serverLogonName.

Default Value

The default value for this property is an empty string. This property will only affect the operation of the control if security is enabled on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: The property cannot be set while a connection to the LoggerNet server is present

LogMonitor.serverName

Name

```
LogMonitor.serverName As String
```

Description

This property specifies the TCP/IP interface address for the computer hosting the LoggerNet server. This string must be formatted either as a qualified Internet machine domain name or as an Internet address string. An example of a valid machine domain name address is `www.campbellsci.com`. An example of a valid Internet address string is `63.255.173.183`.

Default Value

The default value for this property is the string `localhost`.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_BUSY	Error: Attempt to set serverName while connected to the LoggerNet server

LogMonitor.serverPort

Name

```
LogMonitor.serverPort As Long
```

Description

This property specifies the TCP port number that the LoggerNet server is using on the hosting computer. The valid range for this property is port 1 to port 65535.

Default Value

The default value for this property is port 6789, which is the default port number assigned for the LoggerNet server. Therefore, the default value for this property will connect to a LoggerNet server port in most cases.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_INVALIDARG	Error: The port value is out of range or invalid
E_CSI_BUSY	Error: Attempt to set serverPort while connected to the LoggerNet server

LogMonitor.tranLogMonitorBusy

Name

```
LogMonitor.tranLogMonitorBusy As Boolean
```

Description

This Boolean property describes the state of the LogMonitor control accessing transaction logs on the LoggerNet server. The property returns TRUE if the communication logs are being accessed. Otherwise, the property returns FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

LogMonitor.tranLogRecordsBack

Name

```
LogMonitor.tranLogRecordsBack As Long
```

Description

The LoggerNet server maintains a transaction log history buffer that can be accessed using this property. When the `tranLogMonitorStart()` method is called, by default 100 historical log files will be retrieved from the LoggerNet server. If a different number of historical log entries are desired, set this property to the exact number of entries to initially retrieve from the LoggerNet server. This number must be one or greater.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_INVALIDARG	Error: The number must be one or greater
E_CSI_BUSY	Error: Attempting to set this property while the logs are being actively monitored

19.1.2 Methods

LogMonitor.commLogMonitorStart()

Name

```
LogMonitor.commLogMonitorStart()
```

Description

This method starts monitoring the communication log entries on the LoggerNet server. This method triggers `onCommLogRecord()` as log entries are retrieved or `onCommLogFailure`() if the method fails.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_FAIL	Error: Unexpected error
E_CSI_NOT_CONNECTED	Error: Not Connected to the LoggerNet server
E_CSI_BUSY	Error: Log monitoring is already active

LogMonitor.commLogMonitorStop()

Name

```
LogMonitor.commLogMonitorStop()
```

Description

This method will stop active monitoring of the communication logs on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

LogMonitor.serverConnect()

Name

```
LogMonitor.serverConnect()
```

Description

This method attempts to connect to the LoggerNet server using the values in the previously set properties: serverName, serverPort, serverLogonName, and serverLogonPassword. This method triggers `onServerConnectStarted()` if the connection is successful, or `onServerConnectFailure`() if the connection fails.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_FAIL	Error: Unexpected error

LogMonitor.serverDisconnect()

Name

```
LogMonitor.serverDisconnect()
```

Description

This method will disconnect from the LoggerNet server and will set the `serverConnected` state to FALSE.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

LogMonitor.tranLogMonitorStart()

Name

```
LogMonitor.tranLogMonitorStart()
```

Description

This method starts monitoring the transaction log entries on the LoggerNet server. This method triggers `onTranLogRecord()` as log entries are retrieved or `onTranLogFailure`() if the method fails.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return
E_CSI_FAIL	Error: Unexpected error

LogMonitor.tranLogMonitorStop()

Name

```
LogMonitor.tranLogMonitorStop()
```

Description

This method will stop active monitoring of the transaction logs on the LoggerNet server.

COM Return Values

Table of Possible Values

Code	Meaning
S_OK	Success: Normal return

19.1.3 Events

LogMonitor_onCommLogFailure()

Name

```
onCommLogFailure(log_monitor_failure_type
failure_code)
```

Description

This event indicates an error has occurred while trying to retrieve communication log entries from the LoggerNet server. This failure codes are in the following table:

Table of Possible failure codes.

Enumeration Name	Value	Description
lm_failure_unknown	0	Indicates that an error has occurred but its nature is unknown
lm_failure_session_failure	1	Indicates that communication with the LoggerNet server failed resulting in a failed session
lm_failure_invalid_logon	2	Indicates that this control was unable to logon to the LoggerNet server because either the logonName or logonPassword property is incorrect
lm_failure_server_security_blocked	3	Indicates that the account specified by logonName does not have sufficient privileges to start this transaction with the LoggerNet server
lm_failure_unsupported_transaction	4	This version of the LoggerNet server does not support this transaction
lm_invalid_log_id	5	The log ID is not valid. Note: this ID is only used internally by the LogMonitor control
lm_failure_server_cancelled	6	The LoggerNet server is shutting down the connection

LogMonitor_onCommLogRecord()

Name

```
onCommLogRecord(Date timestamp, String
comm_log_record)
```

Description

When actively monitoring the communication log, this event is triggered when a new log record is passed from the LoggerNet server. The communication log entry is a string that contains the station name, message type, and message. Possible message types include “S” for Status, “W” for Warning, and “F” for failure.

LogMonitor_onServerConnectFailure()

Name

```
onServerConnectFailure(server_failure_type
failure_code)
```

Description

This event indicates there was an error with the connection to the LoggerNet server. This event triggers when an error has occurred that affects the control as a whole.

Table of Possible failure codes.

Enumeration Name	Value	Description
server_failure_unknown	0	Indicates that an error has occurred but its nature is unknown
server_failure_logon	1	Indicates that this control was unable to logon to the LoggerNet server because either the logonName or logonPassword property is incorrect
server_failure_session	2	Indicates that the communication session with the LoggerNet server failed resulting in a failed transaction
server_failure_unsupported	3	The version of the LoggerNet server does not support this transaction
server_failure_security	4	Indicates that the account specified by logonName does not have sufficient privileges to start this transaction with the LoggerNet server
server_failure_bad_host_or_port	5	Indicates that either the serverName or the serverPort property is incorrect

LogMonitor_onServerConnectStarted()

Name

```
onServerConnectStarted()
```

Description

This event triggers when the LogMonitor control has connected to the LoggerNet server.

LogMonitor_onTranLogFailure()

Name

```
onTranLogFailure(log_monitor_failure_type
failure_code)
```

Description

This event indicates an error has occurred while trying to retrieve transaction log entries from the LoggerNet server. This event triggers when an error has occurred that affects the method that monitors the transaction logs on the LoggerNet server.

Table of Possible failure codes.

Enumeration Name	Value	Description
lm_failure_unknown	0	Indicates that an error has occurred but its nature is unknown
lm_failure_session_failure	1	Indicates that communication with the LoggerNet server failed resulting in a failed session
lm_failure_invalid_logon	2	Indicates that this control was unable to logon to the LoggerNet server because either the logonName or logonPassword property is incorrect
lm_failure_server_security_blocked	3	Indicates that the account specified by logonName does not have sufficient privileges to start this transaction with the LoggerNet server
lm_failure_unsupported_transaction	4	This version of the LoggerNet server does not support this transaction
lm_invalid_log_id	5	The log ID is not valid. Note: this ID is only used internally by the LogMonitor control
lm_failure_server_cancelled	6	The LoggerNet server is shutting down the connection

LogMonitor_onTranLogRecord()

Name

```
onTranLogRecord(Date timestatmp, String
tran_log_record)
```

Description

When actively monitoring the transaction log, this event is triggered when a new log record is passed from the LoggerNet server. The transaction log entry is a string that contains the station name, message number, and message.

Appendix A. Server and Device Operational Statistics Tables

The LoggerNet server and devices in the network map maintain statistics that help to describe their operation. These statistics are made available to the clients in a collection of tables associated with a special data broker of type "__Statistics__". The LoggerNet server guarantees that there is only one data broker of this type available.

Each device in the network map is represented by two tables in the Statistics data broker. The names of the tables are the result of appending the strings "_hist" and "_std" to the device name. The network controller also maintains statistics regarding the operation of the server in general. The statistics are available in the "__LgrNet___controller__" table.

A.1 Device History Statistics

The name of a history table for a device is the result of appending the string "_hist" to the device name. This table consists of three columns and has a row size of seventy-two. A new record of the table is generated every ten minutes. This allows the table to describe the operation of the datalogger over the last 24 hours if the LoggerNet server version is 1.3.6.8 or greater. If the LoggerNet server version is less than 1.3.6.8, only the last 12 hours will be stored. The counters for this table are set to zero at the beginning of each ten-minute interval. The columns of the table are as follows:

A.1.1 Attempts

Column Name: "Attempts"
Column Definition Description: "Attempts"
Type: uint4
Description: Records the total number of communication attempts the device made during the ten-minute interval. This counter is incremented by on for every entry that appears in the communication status log and is associated with the device.

A.1.2 Failures

Column Name: "Failures"
Column Definition Description: "Failures"
Type: uint4
Description: Records the total number of communication failures that the device experienced during the ten-minute interval. This counter is incremented by one for every "F" record that appears in the communication status log and is associated with the device.

A.1.3 Retries

Column Name: "Retries"
Column Definition Description: "Retries"
Type: uint4

Description: Records the total number of retires that the device experienced during the ten-minute interval. This counter is incremented by one for every "W" record that appears in the communication status log and is associated with the device.

A.2 Device Standard Statistics

The name of the standard statistics table associated with a device is the result of appending the string "_std" to the device name. The number of columns in the table is variable depending on the device type although there are statistics that are common to all device types.

A.2.1 Communication Enabled

Column Name: "Communication Enabled"
Column Definition Description: "Comm Enabled"
Type: Boolean
Applies To: All Device Types
Description: Relays whether communication is enabled for this device.

A.2.2 Average Error Rate

Column Name: "Avg Error Rate"
Column Definition Description: "Avg Err %"
Type: Float
Applies To: All Device Types
Description: A running average of the number of "W" or "F" messages that are logged in the communication status log for the device versus the total number of messages logged.

A.2.3 Total Retries

Column Name: "Total Retries"
Column Definition Description: "Total Retries"
Type: uint4
Applies To: All Device Types
Description: A running total of the number of communication retry events that have been logged since the device was started or the statistic was last reset.

A.2.4 Total Failures

Column Name: "Total Failures"
Column Definition Description: "Total Failures"
Type: uint4
Applies To: All Device Types
Description: A running total of the number of communication failure events that have been logged since the device was stared or the statistic was last reset.

A.2.5 Total Attempts

Column Name: "Total Attempts"
Column Definition Description: "Total Attempts"
Type: uint4

Applies To: All Device Types
Description: A running total of the number of communication attempts that have been made for the device since the device was stared or the statistic was last reset.

A.2.6 Communication Status

Column Name: “Communication Status”
Column Definition Description: “Comm Status”
Type: Byte Enumeration
Applies To: All Device Types
Description: Describes the current communication state of the device. The following values are defined:

1. Normal (last communication succeeded)
2. Marginal (last communication needs to be retried)
3. Critical (last communication failed)
4. Unknown (No communication attempt occurred during the interval)

A.2.7 Last Clock Check

Column Name: “Last Clock Check”
Column Definition Description: “Last Clk Chk”
Type: TimeStamp
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, CR850, and RF95T.
Description: Relays the server time when the clock was last checked.

A.2.8 Last Clock Set

Column Name: “Last Clock Set”
Column Definition Description: “Last Clk Set”
Type: TimeStamp
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, CR850, and RF95T.
Description: Relays the server time when the clock was last set.

A.2.9 Last Clock Difference

Column Name: “Last Clock Diff”
Column Definition Description: “Last Clk Diff”
Type: Interval (int8)
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, CR850, and RF95T.
Description: Relays the difference between the server clock and the datalogger clock at the last time the clock was checked or set.

A.2.10 Collection Enabled

Column Name: “Collection Enabled”
Column Definition Description: “Coll Enabled”
Type: Boolean
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: Set to true to indicate that the scheduled collection is enabled for the datalogger.

A.2.11 Last Data Collection

Column Name: “Last Data Collection”
Column Definition Description: “Last Data Coll”
Type: TimeStamp
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: The server time when the last data collection took place for the datalogger. This statistic will be updated after a manual poll or scheduled data collection succeeds or partially succeeds (brings in some data from some areas but not all data from all selected areas).

A.2.12 Next Data Collection

Column Name: “Next Data Collection”
Column Definition Description: “Next Data Coll”
Type: TimeStamp
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: The server time when the next polling event will take place for the datalogger with the currently active schedule.

A.2.13 Last Collect Attempt

Column Name: “Last_Collect_Attempt”
Column Definition Description: “Last Coll Attempt”
Type: TimeStamp
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: Describes the last time data collection (manual poll or scheduled collection) was started for this device.

A.2.14 Collection State

Column Name: “Collection State”
Column Definition Description: “Coll State”
Type: Enumeration

Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: The current state of scheduled collection for the datalogger. The following values are defined:

1. Normal – The normal collection schedule is active
2. Primary – The primary retry schedule is active
3. Secondary – The secondary retry schedule is active
4. Schedule Off – The collection schedule is disabled
5. Comm Disabled – Communication for this device, one of its parents, or for the entire network is disabled
6. Invalid Table Defs – Collection for this station is disabled until the table definitions are refreshed
7. Network Paused – Automated operations are paused for the network
8. Unreachable – The device cannot be reached through the network

A.2.15 Values in Last Collection

Column Name: “Vals in Last Collect”
Column Definition Description: “Vals Last Coll”
Type: uint4
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: The number of scalar values that have been collected from the datalogger since the last poll began

A.2.16 Values to Collect

Column Name: “Values to Collect”
Column Definition Description: “Vals to Coll”
Type: uint4
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: The number of scalar values expected in the current or last poll.

A.2.17 Values in Holes

Column Name: “Values in Holes”
Column Definition Description: “Holes”
Type: uint4

Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: The number of values in holes that need to be collected from the datalogger.

A.2.18 Values in Uncollectable Holes

Column Name: "Values in Uncollectable Holes"
Column Definition Description: "Uncoll Holes"
Type: uint4
Applies To: CR10T, CR0X-TD, CR510-TD, CR23X-TD
Description: The total number of values that have been in uncollectable holes since the device was started or the statistic was reset.

A.2.19 Line State

Column Name: "Line State"
Column Definition Description: "Line State"
Type: Enumeration
Applies To: All Devices
Description: The current line state for this device. The following values are defined:

1. Not Applicable – In its current configuration, this device will not communicate directly with the server. This value will appear in association with BMP1 dataloggers connected to the server through an RF95T.

2. Off-Line – The server has no communication resources open for this device.

3. On-Line – The server has communication resources open for this device.

4. Transparent – This device has been dialed to reach a child device.

5. Undialing – The child devices have gone off-line and this device is cleaning up the link so that it can go to an off-line state.

6. Comm-Disabled – Communications are disabled for either this device, its parent, or for the whole network.

7. Unreachable – This device cannot be reached through the network.

8. Pending – The device has requested the link from its parent but that request is still pending.

9. Targeted – The device has requested the link from its parent and its parents are being dialed to open the link.

A.2.20 Polling Active

Column Name: “Polling Active”
Column Definition Description: “Polling Active”
Type: Boolean
Applies To: All datalogger devices
Description: Reflects whether there is presently a polling operation that is active for the device. A value of true indicates that some sort of polling is taking place.

A.2.21 FS1 to Collect

Column Name: “FS1_Values_to_Collect”
Column Definition Description: “FS1 to Collect”
Type: uint4
Applies To: 21X, CR7, CR10, CR10X, CR500, CR510, CR23X
Description: Reflects the total number of final storage values that need to be collected from final storage area one of a mixed-array datalogger if collect is active for that area. If collection is not active for that area, this statistic reflects the last count that should have been collected.

A.2.22 FS1 Collected

Column Name: “FS1_Values_Collected”
Column Definition Description: “FS1 Collected”
Type: uint4
Applies To: 21X, CR7, CR10, CR10X, CR500, CR510, CR23X
Description: Reflects the total number of final storage values that have been collected from a mixed-array datalogger’s final storage area one.

A.2.23 FS2 to Collect

Column Name: “FS2_Values_to_Collect”
Column Definition Description: “FS2 to Collect”
Type: uint4
Applies To: CR10, CR10X, CR510, CR23X
Description: Reflects the total number of final storage values that need to be collected from final storage area two of a mixed-array datalogger if collect is active for that area. If collection is not active for that area, this statistic reflects the last count that should have been collected.

A.2.24 FS2 Collected

Column Name: “FS2_Values_Collected”
Column Definition Description: “FS2 Collected”
Type: uint4
Applies To: CR10, CR10X, CR510, CR23X
Description: Reflects the total number of final storage values that have been collected from a mixed-array datalogger’s final storage area two.

A.2.25 Logger Ver

Column Name: “Logger_Interface_Version”
Column Definition Description: “Logger Ver”

Type: uint4
Applies To: 21X, CR7, CR10, CR10X, CR500, CR510, CR23X
Description: Relays the datalogger interface version as given in the datalogger's response to the "A" command.

A.2.26 Watchdog Err

Column Name: "Watchdog_Timer_Reset Count"
Column Definition Description: "Watchdog Err"
Type: uint4
Applies To: 21X, CR7, CR10, CR10X, CR500, CR510, CR23X
Description: Relays the datalogger watchdog error count as given in the mixed-array datalogger's response to the "A" command.

A.2.27 Prog Overrun

Column Name: "Program_Table_Overruns_Count"
Column Definition Description: "Prog Overrun"
Type: uint4
Applies To: 21X, CR7, CR10, CR10X, CR500, CR510, CR23X
Description: Relays the number of datalogger program overruns that have occurred since the last reset as given in the mixed-array datalogger's response to the "A" command.

A.2.28 Mem Code

Column Name: "Memory_Size_Code"
Column Definition Description: "Mem Code"
Type: uint4
Applies To: 21X, CR7, CR10, CR10X, CR500, CR510, CR23X
Description: Relays the memory size code as given by the mixed-array datalogger's response to the "A" command.

A.2.29 Collect Retries

Column Name: "Collect_Retries"
Column Definition Description: "Coll Retries"
Type: uint4
Applies To: 21X, CR7X, CR10, CR10X, CR500, CR510, CR23X, CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: Reports the number of collection retries that the datalogger device has had since the first collection error occurred. This statistic is reset to zero when the logger returns to a normal collection state.

A.2.30 Low Voltage Stopped Count

Column Name: "Low_Volt_Stopped"
Column Definition Description: "Low Volt Stopped"
Type: uint4
Applies To: CR10X, CR500, CR510, CR23X
Description: Reports the number of times that a mixed-array datalogger has

shut itself down because its supply voltage has been to low. This information is read from the "A" command.

A.2.31 Low Five Volts Error Count

Column Name: "Low_5v"
Column Definition Description: "Low 5v"
Type: uint4
Applies To: CR23X
Description: Reports the number of times the CR23X +5 volt supply has been reported below five volts. This information is read from the "A" command result.

A.2.32 Lithium Battery Voltage

Column Name: "Lith_Batt_Volt"
Column Definition Description: "Lith Batt Volt"
Type: Float
Applies To: CR10X, CR500, CR510, CR23X
Description: Reports the lithium battery voltage on mixed-array dataloggers. This value is extracted from the results of the "A" command.

A.2.33 Table Definitions State

Column Name: "TableDefState"
Column Definition Description: "Table Defs State"
Type: Enumeration
Applies To: CR10T, CR10X-TD, CR510-TD, CR23X-TD, CR9000, CR5000, CR10X-PB, CR510-PB, CR23X-TP, CR205, CR210, CR215, CR1000, CR3000, CR800, and CR850.
Description: Relays the current state of cached table definitions for a table-based datalogger. The following values are defined:

1. None – No table definitions have been received from the datalogger.
2. Current – The LoggerNet server's table definitions are believed to be current for the datalogger.
3. Suspect – A collection attempt has returned an invalid table definitions code. The LoggerNet server needs to verify the table definitions for the datalogger.
4. Getting – Indicates that the LoggerNet server is currently trying to get the table definitions from the datalogger.
5. Invalid – The table definitions are known to be invalid and the need to be refreshed before collection can continue.

A.3 Server Statistics

The statistics relating to the host machine for the LoggerNet server or to the operation of the LoggerNet sever as a whole can be found in the table name "__LgrNet____controller__". These statistics are updated every ten seconds.

There is only one row defined for the table. The statistics available in this table are as follows:

A.3.1 Disc Space Available

Column Name: “DiscSpaceAvail”
Column Definition Description: “Disc Space Avail”
Type: int8
Description: Relays how many bytes are free on the volume where the server’s working directory resides.

A.3.2 Available Virtual Memory

Column Name: “AvailVirtMem”
Column Definition Description: “Avail Virt Mem”
Type: uint4
Description: Relays the amount of virtual memory that is available to the server process.

A.3.3 Used Virtual Memory

Column Name: “UsedVirtMem”
Column Definition Description: “Used Virt Mem”
Type: uint4
Description: Relays the amount of virtual memory that is being used by the server process. This value is derived from the AvailVirtMem by subtracting the value of that statistic from the maximum win32 memory size.

The table structure of a PakBus datalogger is given in the example below. This example shows a datalogger with two user defined tables plus the Status table and Public or Inlocs table. The second table in the example below contains three records and the third table contains four records. Both the Status table and Public or Inlocs table will always return the most recent records and will not contain any historical data records.

The first table is the Status table, which shows the status of the datalogger. The Public or Inlocs table contains all public variables or input locations. All other tables found in the datalogger are created and defined by the user in the datalogger program. The tables in a PakBus datalogger will always contain a record number and timestamp followed by the data fields.

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